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**AN EMPIRICAL ANALYSIS OF INSIDER TRADE WITHIN RULE 10b5-1**

A Thesis in

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by

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## ABSTRACT

This thesis examines the association between insider trade behavior and participation within Rule 10b5-1 trade plans to provide evidence about how insiders respond to regulation that reduces litigation risk and how the Rule affects insiders' informed trade profits. Rule 10b5-1 includes a safe harbor provision that protects certain insiders from litigation associated with their trades. Evidence suggests the safe harbor allows insiders a better opportunity to profit from trade, which is not consistent with the traditional concept of regulatory intent. Specifically, evidence suggests participation is associated with: (1) insiders with greater personal litigation risk who likely have access to and control over disclosure of material nonpublic information; (2) a large volume increase not fully explained by proxies for insiders' diversification needs; (3) an increase in abnormal trade profits; and (4) more sales volume immediately before disclosure of negative management earnings forecasts than immediately after disclosure.

This thesis also examines firms' voluntary decision to disclose insiders' participation within Rule 10b5-1 to provide evidence of the costs and benefits associated with this disclosure choice. Evidence suggests firms disclose this information to reduce litigation costs and to reduce stock price volatility related to disclosure of insider trade activity. Specifically, disclosure is positively associated with firm size, a proxy for a firm's litigation risk, and with a measure of the firm's price sensitivity to disclosure of insiders' trades. Evidence also suggests that insiders prefer that disclosure not occur, perhaps because disclosure reduces potential trade profits. Disclosure is positively associated with a variable capturing insiders' influence over the board of directors interacted with both the firm's price sensitivity to disclosure of insiders' trades and the level of insider trading volume.

## TABLE OF CONTENTS

List of Tables	v
Acknowledgements	vi
1. Introduction	1
2. Background	8
2.1. Insider Trade Regulation	8
2.2. Rule 10b5-1	9
2.3. Rule 10b5-1 Disclosure and Sample Description	13
3. Participation within Rule 10b5-1	22
4. Volume and Frequency within Rule 10b5-1	28
5. Abnormal Profits	34
6. Volume Surrounding Management Earnings Forecasts	42
7. Firm Decision to Disclose 10b5-1 Participation	47
8. Conclusion	54
References	56
Appendix A: Stock Sales Plan	59
Appendix B: Computation of Litigation Risk Proxy	63

## LIST OF TABLES

Table 1	Descriptive Statistics for Rule 10b5-1 Disclosures	18
Table 2	Sample Selection	19
Table 3	Univariate Statistics	20
Table 4	Decision to Participate within Rule 10b5-1	27
Table 5	Univariate Volume and Frequency Analysis	32
Table 6	Multivariate Volume and Frequency Analysis	33
Table 7	Abnormal Profits	39
Table 8	Difference in Abnormal Profits	41
Table 9	Sales Volume in Close Proximity to Negative Management Earnings Forecasts	46
Table 10	Firm Decision to Disclose 10b5-1 Participation	53
Table A1	Determinants of Insiders' Litigation Risk	66

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*I just kept looking down at this little boat in the middle of this huge ocean saying, “you have got to be kidding me.”*

– Michael C. Biemiller, U.S. Naval Aviator, before his first aircraft carrier landing.

Naval aviators have often held that the biggest challenge in aviation is landing on an aircraft carrier. Through my decade of flying for the Air Force, I was never forced to find, home to, and then safely land on a small moving target floating in a vast, turbulent sea. This dissertation, then, characterizes my first carrier landing. I can honestly say that the process of fulfilling the doctoral degree requirements and completing this thesis has been, perhaps, the most challenging endeavor in my life.

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## 1. Introduction

In this thesis, I analyze the association between insider trade behavior and participation within Rule 10b5-1 trade plans to provide evidence of how insiders respond to changes in litigation risk associated with the regulation and how this new regulation affects insiders' informed trade profits. Rule 10b5-1 is interesting to examine because it might not conform to traditional regulatory intent to reduce or eliminate insiders' informed trade profit opportunities. This is because the Rule provides a safe harbor that protects certain insiders from litigation associated with their trade activity, which might provide insiders a better opportunity to profit from information based trade. Insiders protected by the safe harbor may be more apt to trade while in possession of material nonpublic information or delay disclosure of material information until previously planned trades execute. For example, Kenneth Lay, Enron's CEO, sold over \$100 million of Enron stock within the protection of the Rule before the value of his company plummeted. He may not have chosen to make these transactions had the safe harbor not been available.<sup>1</sup> My analysis of the Rule should help regulators evaluate whether the Rule enhances fairness in the equity markets.

I examine Rule 10b5-1 within the context of the intent of insider trading regulation. Some believe regulation should eliminate insiders' information based trade profits because nonpublic information is technically shareholder property. For example, the 2<sup>nd</sup> District Court ruled that an agent "who acquires special knowledge or information by virtue of a...fiduciary relationship with another...must account to his principal for any profits derived therefrom."<sup>2</sup> Bainbridge (2001) suggests there is emerging consensus that federal regulation is designed to protect shareholders' property rights in information. He suggests that federal insider trading restrictions

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<sup>1</sup> Lichtblau, Eric, and David G. Savage. January 28, 2002. "Convictions for Enron Execs Would Be Hard Won." *Los Angeles Times* [cited: October 25, 2002]. <<http://www.latimes.com/business/la-012802legal.story>>.

effectively vest property rights in information to firm owners to whom an insider owes a fiduciary duty. In principle, this implies that regulation should prevent insiders from profiting from their access to nonpublic information.

Because of practical issues, regulatory enforcement is relegated to reducing insiders' information based trade profits to some tolerable level. In other words, enforcement falls short of eliminating insiders' information based trade profits. This is because courts require that an insider's trade profits meet a materiality threshold to be deemed illegal.<sup>3</sup> Prior research has, therefore, focused on documenting the extent to which regulation reduces insiders' trade profit opportunities.

Evidence from prior research suggests that regulation appears to reduce, but not eliminate, insiders' trade profit opportunities. Specifically, insiders seem reluctant to trade when it might appear advantageous, however still garner abnormal trade profits. For example, Givoly and Palmon (1985) do not find an association between the type of trade transaction (i.e., purchase or sale) and the type of forthcoming news event (i.e., good or bad news) during 10-, 20-, 60- and 90-day windows preceding disclosure of firm news. Park, Jang, and Loeb (1995) find that insiders increase their trades several weeks prior to earnings announcements, but refrain from trading in the period immediately preceding the announcement. And, Noe (1999) finds that insiders' trades are made after, not before, management earnings forecasts are issued. These studies, however, document that insiders nevertheless garner abnormal profits from their trade activity.

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<sup>2</sup> Diamond v. Oreamuno, 248 N.E.2d 910, 912 (N.Y. 1969).

<sup>3</sup> Materiality is relevant because civil courts require a preponderance of evidence that an insider is responsible for damages related to trading with possession of nonpublic information. Criminal courts require evidence of guilt beyond a reasonable doubt related to an insiders' trading with possession of nonpublic information. ["Criminal Law: Frequently Asked Questions." Lawinfo.com. [cited June 14, 2004]. <<http://www.lawinfo.com/legalFAQs/criminallaw.html>>.]

Evidence from prior research also suggests that insiders' trade patterns change in response to regulatory changes governing illegal trade. Congress enacted the Insider Trading Sanctions Act (ITSA) of 1984 to provide "increased sanctions against insider trading in order to increase deterrence of violations."<sup>4</sup> The ITSA allows the SEC to levy a civil penalty up to three times the profit gained or loss avoided in transactions that are deemed illegal.<sup>5</sup> Congress also passed the Insider Trading and Securities Fraud Enforcement Act (ITSFEA) of 1988, which, among other things, increases criminal penalties from five to ten years and increases criminal fines from \$100,000 to \$1,000,000 for illegal trade activity. Fried (1998) suggests that these regulatory actions are attempts to reduce insiders' profits.

Seyhun (1992) finds that insiders are less likely to trade prior to takeover announcements following the passage of both Acts and Garfinkel (1997) finds that, after the passage of ITSFEA, insiders are more likely to postpone liquidity sales until after negative earnings surprises. Seyhun (1992), however, fails to observe any evidence of a decline in insider trade volume or trade profits related to the passage of either Act. This may be because the Acts' penalties only affect a small subset of insiders who are most likely to be associated with illegal trade, and Seyhun (1992) aggregates insider trade data to a firm unit of observation. If the Acts' penalties are only relevant to certain insiders, this aggregation may reduce the power of his tests.

The Rule provides a setting for more powerful tests of the association between regulatory change and insiders' informed trade profits. Rule 10b5-1's safe harbor provides a substantive change in litigation risk because it modifies the probability that insider trade activity is deemed illegal. In addition, the Rule requires analysis where the unit of observation is an individual

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<sup>4</sup> H.R. Rep. No. 98-355, at 2 (1984).

<sup>5</sup> Bainbridge (1985) suggests there is some disagreement among courts as to the appropriate measure of illegally obtained profits. *Texas Gulf Sulphur* provides a commonly used measure, where profit is the difference between the

insider rather than a single firm. This is because the decision to participate within the Rule is delegated to individual insiders and the Rule's safe harbor protects individual insiders. Using individual insider observations provides a more direct analysis of the association between regulation and trade behavior that may result in more powerful tests.

In my first analysis, I examine the factors associated with the decision to participate within a 10b5-1 plan. I find a positive association between my proxy for an insider's level of personal litigation risk and the decision to participate within a plan. This suggests that those insiders most likely to value litigation relief seek the Rule's protection. These insiders, however, are those who are most apt to have access to nonpublic information and control over its disclosure. This sets up the potential for observing profitable trade within plans under the Rule.

In my next analysis, I examine the association between participation within the Rule and trade volume and trade frequency. Insiders generally trade to profit from nonpublic information, to diversify their portfolios, or to liquidate holdings for cash needs. Litigation risk constrains insiders' ability to trade for any of these reasons, so relaxation of this risk should generally result in larger trade volume. Consistent with this, I find a positive and economically significant relationship between volume and frequency of trade and participation within the Rule. The documented trade increase is not fully explained by proxies for insiders' diversification needs, which suggests that the Rule relaxes litigation risk constraints for trades based on information.

To corroborate this evidence, I examine the association between participation and insiders' profits from trades in my next analysis. I find evidence of a positive association between participation within the Rule and an insider's abnormal trade profits. Participating insiders earn statistically positive profits in spite of the need to commit trade execution in advance.

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price paid for shares at the time of purchase and the price of the shares shortly after the disclosure of the inside information.

Participating insiders also earn larger trade profits than in similar trade windows before the Rule, in spite of the fact that they have less control over the timing of trade execution.

To provide evidence of how insiders might structure more profitable trades within the Rule, I analyze the association between participation and insiders' sales activity immediately preceding disclosure of negative management earnings forecasts. Subject to my choice of trading windows, I find some evidence that participating insiders increase their sales volume immediately preceding negative forecasts. I also find evidence that participating insiders sell more shares immediately preceding the negative forecast than they sell immediately following the forecast. In contrast, Noe (1999) finds that managers are reluctant to sell immediately prior to negative forecasts to avoid the appearance of impropriety. This evidence is consistent with insiders planning sales trades to execute profitably before release of bad news or delaying the release of bad news to make planned sales trades more profitable.

The evidence, thus far, is derived from a sample of insiders at firms that voluntarily disclose the existence of participation within Rule 10b5-1. Generalizing these results beyond this sample is difficult because it is not clear whether there are systematic differences in trade behavior by insiders at firms that choose not to disclose participation. The issue, however, naturally raises the question of what factors are associated with the decision to disclose participation, so I examine this disclosure choice to help provide evidence of costs and benefits associated with the disclosure.

Why firms disclose 10b5-1 participation is a relevant question since the SEC is considering mandating disclosure of Rule 10b5-1 participation and is therefore likely interested in identifying which firms may be most affected by this mandate.<sup>6</sup> Disclosure of participation likely provides

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<sup>6</sup> "Form 8-K Disclosure of Certain Management Transactions," SEC Release No. 33-8090, April 12, 2002. This proposal was tabled, and it is not clear when it will be revisited (phone conversation with Anne M. Krauskopf,

better monitoring of trade activity within the plans and enhances insiders' commitment to these plans. In addition, Fried (1998) suggests that preannouncing insider trades eliminates insider trade profit opportunities because the market can infer insiders' private information from the pre-trade announcement and adjust price before insiders can trade on this information. If so, then preannouncing 10b5-1 participation may reduce the profitability of pending plan trades. It is interesting to determine what factors are associated with a firm's choice to voluntarily disclose pending trade information when it may impact insiders' trade profits.

I find some evidence that suggests firms disclose participation to reduce their litigation risk. Specifically I find a positive association between disclosure and firm size, which proxies for the firm's level of litigation risk. However, I fail to find evidence of an association between disclosure and other litigation risk proxies, perhaps because of noise in these proxies.

I find evidence consistent with firms disclosing participation to convey that pending trades are not informative. Specifically, I find that firms whose share price is relatively more sensitive to the disclosure of insider trades are more likely to disclose participation.

Finally, I find some evidence that suggests insiders prefer not to disclose participation because it might reduce their trade profits. Specifically, I find that firms with greater insider influence over the board of directors combined with high insider trade volume or higher price sensitivity to insider trade signals are less likely to disclose participation. These firms may be the most negatively affected if the SEC passes its proposal to mandate to disclosure.

This study adds to existing literature evidence that regulation may result in unintended consequences or that regulation may be designed for reasons other than to reduce or eliminate insiders' informed trade profit opportunities. Macey (1988) contends that the SEC implements

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Special Counsel, Office of the Chief Counsel, SEC Division of Corporate Finance, March 24, 2003. Status confirmed with the SEC on December 29, 2003).

insider trading policy not necessarily to promote fairness in the equity markets, but to fulfill “a hodgepodge of special-interest concerns.” The evidence in this study might support this contention.

This study proceeds as follows: Chapter 2 provides background information about insider trade regulation and SEC Rule 10b5-1. Chapter 3 presents hypotheses and analyses related to insider participation within the Rule. Chapter 4 presents hypotheses and analyses related to trade volume and frequency changes associated with participation. Chapter 5 provides hypotheses and analyses related to participating insiders’ ability to generate abnormal profits from trade within the Rule. Chapter 6 provides hypotheses and analyses related to insider sales volume related to negative management earnings forecasts. Chapter 7 provides hypotheses and analyses related to the firm level decision to disclose participation. Finally, Chapter 8 concludes the paper and discusses future research ideas.

## 2. Background

### 2.1. Insider Trade Regulation

Bainbridge (2001) provides a comprehensive history of the evolution of U.S. insider trade regulation. In the early 1900s, insider trading was governed primarily through individual states' corporate laws. The federal government became the dominant force in regulation after the stock market crash of 1929. Congress passed the Securities and Exchange Acts of 1933 and 1934 to protect investors and assure the integrity of the securities markets. The 1934 Act provides the foundation for federal insider trade regulation by authorizing the Securities and Exchange Commission to interpret federal securities laws, amend existing rules governing securities markets, propose new rules to address changing market conditions, and enforce existing rules and laws.<sup>7</sup>

Section 10b of the 1934 Act provides the fundamental basis for prohibiting illegal trade by making it unlawful for anyone to use any manipulative or deceptive device in connection with the purchase or sale of any security. Section 10b does not specifically mention behavior by corporate insiders; however, it is broad enough to encompass inappropriate behavior by insiders. Congress directly addressed insider trade behavior in Section 16(b) of the Act, by requiring insiders to disgorge short-swing profits. Insiders are defined within this section as officers, directors, and shareholders owning more than 10 percent of company stock. Short-swing profits are defined within this section as "any purchase and sale, or any sale and purchase, of any equity security" within a six-month period. Section 16(b) also requires these specific insiders to regularly file changes in their direct or indirect ownership of the firm, which is currently provided to the SEC via Form 3, 4, or 5.

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<sup>7</sup> "The Investor's Advocate: How the SEC Protects Investors and Maintains Market Integrity." The Security and Exchange Commission. [cited June 7, 2004]. <<http://www.sec.gov/about/whatwedo.shtml>>.



In 1942, the SEC enacted Rule 10b5 to clarify Section 10b of the 1934 Act. Like Section 10b, Rule 10b5 does not specifically address trade behavior by insiders, however, it has become the foundation for regulation governing insider trade enforcement. The majority of legal claims by shareholders and the SEC against corporations and their insiders fall within 10b5, because the Rule states that it is “unlawful for any person...to employ any device, scheme, or artifice to defraud...or to engage in any act, practice, or course of business which operates or would operate as a fraud or deceit upon any person in connection with the purchase or sale of any security.”<sup>8</sup>

Several court rulings have modified the regulatory regime governing insider trade. Perhaps the most prominent is *SEC vs. Texas Gulf Sulphur Co.*, 445 F.2d 833 (2d Cir. 1968), which provides the case law most commonly referred to as “disclose or abstain (from trade).” In *Texas Gulf Sulphur*, the 2<sup>nd</sup> Circuit Court of Appeals ruled that insiders have the duty to disclose material nonpublic information or abstain from trade until that information has been revealed. “Disclose or abstain” was modified by subsequent rulings to require a fiduciary relationship. For example, the Supreme Court ruled in *Chiarella vs. United States* 445 U.S. 222, 230 (1980) that the requirement to disclose information or abstain from trade “is premised upon a duty to disclose arising from a relationship of trust and confidence between parties to a transaction.”

## 2.2. Rule 10b5-1

The Securities and Exchange Commission released Rule 10b5-1 with Regulation Fair Disclosure in October 2000, to clarify its position on the link between material nonpublic information and illegal insider trading. Rule 10b5-1, ancillary to Rule 10b5, solidifies a shift in the legal framework for illegal insider trading, from a “use” of material nonpublic information

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<sup>8</sup> *Employment of Manipulative and Deceptive Devices*, Rule 10b5 of Securities and Exchange Act of 1934 [cited November 16, 2003]. <<http://taft.law.uc.edu/CCL/34ActRIs/rule10b-5.html>>.

framework to a “knowing possession” of material nonpublic information framework. “In our (the Commission’s) view, the goals of insider trading prohibitions—protecting investors and the integrity of securities markets—are best accomplished by a standard closer to the ‘knowing possession’ standard. Whenever a person purchases or sells a security while aware of material nonpublic information...that person has the type of unfair informational advantage over other participants in the market that insider trading law is designed to prevent.”<sup>9</sup> Before the Rule, the SEC enforced the possession standard, but courts were mixed on upholding the standard.

Possession of material nonpublic information was a necessary condition for illegal trade, but it was not sufficient in some jurisdictions. For example, *United States v. Teicher*, 987 F.2d 112, 119 (2d Cir.1993) supported the possession standard, but *United States v. Adler*, 137 F.3d 1325 (11<sup>th</sup> Cir. 1998) and *United States v. Smith*, 155 F.3d 1325 (9<sup>th</sup> Cir. 1998) supported the use standard. Since the SEC favored the possession standard for enforcement, it implemented Rule 10b5-1 within the Commission’s rule-making authority to make mere possession sufficient for illegal trade.

The possession standard makes it more difficult for insiders to trade for legitimate liquidity purposes, since they must refrain from trade even if they do not intend to use their private information as a basis for the trade. For example, assume an insider in possession of private information liquidates firm holdings to fund the purchase of a new house. Under the use standard, he can argue that material nonpublic information did not motivate his equity-liquidation decision, therefore he has not violated Rule 10b5. However, under the possession standard, he has violated 10b5, even if his decision to liquidate shares does not rely on the private information. The SEC believes it is “highly doubtful that a person who knows inside

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<sup>9</sup> Proposed Rule: S7-31-99, IIIA. Rule 10b5-1: Trading “On the Basis of” Material Nonpublic Information. The Securities and Exchange Commission [cited November 27, 2003]. <<http://www.sec.gov/rules/proposed/34->

information relevant to the value of a security can completely disregard that knowledge when making the decision to purchase or sell that security. ...Indeed, even if the trader could put forth purported reasons for trading other than awareness of the inside information, other traders in the marketplace would clearly perceive him or her to possess an unfair advantage.”<sup>10</sup>

The SEC recognized that the possession standard limits insiders’ ability to legitimately diversify, so it implemented some relief. “[W]e recognize that an absolute standard based on knowing possession, or awareness, could be overbroad in some respects. Sometimes a person may reach a decision to make a particular trade without any awareness of material nonpublic information, but then come into possession of such information before the trade actually takes place. A rigid ‘knowing possession’ standard would lead to liability in that case. We believe, however, that for many cases of this type, a reasonable standard would not make such trading automatically illegal.”<sup>11</sup> Within the Rule, corporate insiders are provided an affirmative defense against litigation if specific terms in the Rule are followed.<sup>12</sup> An affirmative defense is a defense in which the defendant introduces evidence, which, if found to be credible, will negate criminal or civil liability, even if it is proven that the defendant committed the alleged acts.<sup>13</sup> To qualify for the defense, 10b5-1 insiders must: (1) enter into an irrevocable and explicit contract to purchase or sell firm securities; (2) transfer trade execution authority to a noninformed party (e.g., a broker), relinquishing influence over the execution decision; or (3) provide a written

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42259.htm>.

<sup>10</sup> Ibid.

<sup>11</sup> Ibid.

<sup>12</sup> Rule 10b5-1 does not prevent a party from initiating a lawsuit against a person trading in securities. It provides an affirmative defense for the securities trader, who maintains the burden of proof that he complied with the terms of the Rule (Quinlivan, S., and M. Phelps. June 6, 2001. *SEC Rule 10b5-1: A New Opportunity for Officers and Directors of Public Companies to Sell Stock Legally* [online]. Minneapolis: Leonard, Street, and Dienard law firm [cited October 2, 2003]. <<http://www.leonard.com/generic.asp?item=/frontpageweb/generic/newsitem53.html>>].

<sup>13</sup> Legal Information Institute, Cornell Law School [cited June 6, 2003]. <[http://www.law.cornell.edu/lexicon/affirmative\\_defense.htm](http://www.law.cornell.edu/lexicon/affirmative_defense.htm)>.

explicit formula or algorithm for trade execution. Further, the insider must enter (1), (2), or (3), above, only when he does not possess material nonpublic information.

Within a 10b5-1 plan, an insider's precommitted trade can execute even when the insider possesses material nonpublic information, since the possession standard applies only at the plan initiation date. In other words, as long as the insider initiates the plan when he does not possess material nonpublic information, his trades can execute as planned—even if he subsequently acquires material nonpublic information indicating that the trade is favorable. Under these conditions, the plan effectively absolves the insider of the duty to either disclose his information or abstain from trade. For this reason, many corporations now allow insiders to trade during blackout periods as long as the trades are made pursuant to 10b5-1 trading plans.<sup>14</sup> Most 10b5-1 plans utilize some combination of specific date formulas or limit order formulas. For example, a plan may be set up to buy or sell stock on a set of prespecified dates, or on any date if the market price passes a specified threshold, or on set of specific dates, subject to the stock price passing a specified threshold.

There is some question whether insiders truly commit to trade within plans since they may terminate plans, may trade outside of these plans, and are not required to disclose either situation. There are, however, potential costs associated with these actions that likely enhance commitment. The Rule expressly prohibits insiders' influence over the execution of 10b5-1 trades, therefore insiders may not selectively choose which of their planned trades may execute and which may not. In addition, the SEC suggests that "termination of a plan...could affect the availability of the Rule 10b5-1(c) defense for prior plan transactions if it calls into question

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<sup>14</sup> Many firms impose blackout windows, in which insiders are not allowed to trade, prior to events like earnings announcements. See Jeng (1999), Bettis, Coles, and Lemmon (2000), and Roulstone (2003) for discussion and analysis of blackout windows.

whether the plan was ‘entered into in good faith.’”<sup>15</sup> Similarly, a roundtable of corporate attorneys suggests that trading outside of an existing plan, particularly to hedge or negate positions within the plan, will likely jeopardize the plan’s legal protection.<sup>16</sup> In addition, voluntary disclosure of the existence of a plan, which suggests an insider’s intent to trade within that plan, acts as a commitment mechanism, since there are reputation costs associated with not executing a previously announced trade.<sup>17</sup>

In most firms, the board of directors chooses whether to amend the firm’s insider trade policy to allow 10b5-1 trade. Then firms generally delegate the decision of whether to trade within 10b5-1 to the insider.<sup>18</sup>

### 2.3. *Rule 10b5-1 Disclosure and Sample Description*

#### 2.3.1. Disclosure information

In April 2002, the SEC proposed to mandate 8-K disclosure of insiders’ enrollment in 10b5-1 trading plans and also considered mandating disclosure of 10b5-1 participation within Form 4 for

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<sup>15</sup> Division of Corporation Finance: Manual of Publicly Available Telephone Interpretations, May 2001. <<http://www.sec.gov/interps/telephone/phonesupplement4.htm>>.

<sup>16</sup> “Electronic Roundtable on Rule 10b5-1.” [Cited: May 29, 2003].

<<http://www.realcorporatelawyer.com/ElectronicRoundtable10b5-1.html>>.

<sup>17</sup> Healtheon/WebMD represents one example: “Healtheon/WebMD has secured a top ranking for investment PR gaffes of 2000... On April 7 the company issued a press release trumpeting that Internet venture legends Jim Clark and John Doerr, who had founded and funded Healtheon as a startup, would buy up to \$220 million of Healtheon/WebMD stock. The news sent the price up 35%. On July 20 Forbes.com reported that Clark and Doerr had so far delivered on just 6% of their touted intent, having purchased only \$13 million worth of Healtheon/WebMD stock. An Aug. 6 *New York Times* story repeated the observation... Tuesday’s \$12.44 closing price of Healtheon stock is 37% below the \$19.67 per share average that billionaires Clark and Doerr paid for their \$13 million May-June nibble” (Simons, David. *Healtheon/WebMD’s Misguided PR Scheme*. Forbes.com. [Cited: August 9, 2000]). <<http://www.forbes.com/2000/08/09/mu6.html>>.

<sup>18</sup> A few firms mandate that all insider trade occur through 10b5-1. For example, a senior executive at Libbey, Inc. (LBY) told me that all trades by firm executives must be made through 10b5-1 plans. He suggested that this mandate protects the firm from litigation-risk and may reduce the sensitivity of the firm’s stock price to insider trades. Executives and corporate attorneys at other firms, however, told me that their firms allow insiders the choice to trade within 10b5-1. They suggested that their firms value insider trading flexibility, which is consistent with Roulstone (2003). Roulstone (2003) finds that firms that restrict insider trade opportunities by establishing restricted trade windows pay a four to ten percent compensation premium.

trades that are executed pursuant to these plans.<sup>19</sup> Currently, however, there is no regulatory requirement to disclose enrollment in 10b5-1 programs.

Some firms, however, choose to voluntarily disclose participation in 10b5-1 trading programs. To identify these firms, I performed a keyword search within the Lexis-Nexis SEC Filings and Business Newswire databases for the term “10b5-1.” Between the Rule’s adoption in October 2000 and the end of December 2002, 288 firms made 421 announcements pertaining to 10b5-1 plan initiations, amendments, or terminations. Table 1 summarizes these disclosures. The majority of disclosures came via an 8K filing or through a newswire press release (63%). Other disclosure channels include 10Q filing (24%), 10K filing (6%), Schedule 13D filing (5%), Form 144 filing (1.8%), and annual reports (0.2%). There is virtually no duplication among disclosure channels, i.e., firms generally provide a single disclosure for each event.

The extent of information disclosed varies widely. The majority of announcements name specific insiders who choose to participate (81%). Most announcements, however, are vague with respect to terms of the 10b5-1 trading arrangement. Only 6% of the announcements provide the explicit details of the trading rule employed by the insider (see Appendix 1 for an example), only 52% state the plan commencement date, and only 41% state the plan termination date. Within the 6% group that provides explicit trading plans, 92% are limit-order sales plans and the other 8% are specific-date market-order sales plans. Less than one quarter of the announcements provide the insiders’ rationale behind the decision to enter the 10b5-1 plan.<sup>20</sup> Among firms that

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<sup>19</sup> Prior to August 28, 2002, corporate directors, executives, and beneficial (10%) owners were required to file a report of their firm transactions with the SEC within ten days after the end of the trade execution month [Rule 16(a) of the Securities and Exchange Act of 1934]. This report is normally provided on Form 4. With the passage of the Sarbanes-Oxley Act (implementation date of August 28, 2002), insiders are now required to file their firm transactions within two days of trade execution, or within two days of notification of execution when execution authority has been delegated.

<sup>20</sup> For example, Alexion Pharmaceuticals states in its June 3, 2002 8-K that “Dr. Bell intends to use the proceeds of these sales primarily to pay taxes incurred by him in connection with his exercise of expiring options to purchase Alexion common stock earlier this year.”

provide information, the average 10b5-1 plan length is 13.35 months and the average maximum shares tradable within the plan (i.e., the maximum number of shares that the firm will allow an insider to trade within a given trading plan) is 1.3% of common shares outstanding and 1.4% of common shares traded in the prior year.<sup>21</sup> On average, firms disclose plan participation 12.88 days before the first potential trade date.

Disclosure firms are small; the majority of firms (64%) trade on the Nasdaq exchange, only 4% of the firms are in the Fortune 500, and the median market value of equity is \$525,590,000.<sup>22</sup> The sample firms represent nearly all industry classifications and do not cluster within particular industries. On average, disclosure firms are not profitable. The mean ROA and ROE are  $-0.093$  and  $-0.347$ , respectively, in the fiscal year preceding the first participation disclosure.

### 2.3.2. Sample identification

Firms' voluntary disclosures of participation provide the opportunity to identify 10b5-1 plan participants, since there is no current mandate for firms to provide this information. The results of this study, however, may be difficult to generalize because of systematic differences in firms that choose to disclose this information. It is possible that traders in the disclosure sample are willing to trade more on nonpublic information because they feel that the preannounced disclosure provides more protection. This disclosure might thwart plaintiffs from filing suit because it makes them aware of the affirmative defense. On the other hand, traders in the disclosure sample may be less willing to trade on nonpublic information because they belong to firms that choose to allow better monitoring of trade activity. Evidence presented in Chapter 7

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<sup>21</sup> Plan length is the length of time the plan is considered active. I measure this as the difference between the plan's prespecified termination date and its begin date, if provided. If the begin date is not provided, I use the disclosure date in place of the begin date.

<sup>22</sup> Lakonishok and Lee (2001) document that insider trades better predict future firm performance in smaller firms. In addition, Seyhun (1986) finds that insiders in small firms earn substantially higher abnormal trading returns than insiders from large firms. If small firm insiders are more apt to trade on private information, they may be more likely to seek litigation relief through 10b5-1 participation.

provides some understanding of the factors associated with the decision to disclose participation, but it is still not clear how well the observed trade behavior results extrapolate to participants from nondisclosure firms.

From the original sample of firms that voluntarily disclose participation within Rule 10b5-1, I perform several sample modifications to arrive at the samples used in the analyses. Table 2 summarizes these modifications. As shown in Panel a, I begin with the 288 disclosure firms outlined above. I eliminate 52 firms that do not disclose the names of any insiders who participate. I then merge trade data from Thomson Financial Wealth Analytics database and eliminate 20 firms for which I do not observe any trade activity in either the POST or PRE periods.<sup>23</sup> I define the POST period as the six-month window immediately following the firm's first disclosure of participation and the PRE period as the six-month window preceding the firm's first disclosure of participation, aligned in calendar time to the POST window. I align the windows in calendar time to control for seasonal factors that might influence insiders' trade decisions (e.g., insiders might generally trade more before certain holidays). This process yields 1,377 insiders from 216 firms who actively trade in either the PRE or POST periods.

As shown in Panel b of Table 2, I separate the main sample into five subsamples, depending on the analysis that I perform. The first four subsamples are for analyses related to insider trade behavior: the decision to participate within 10b5-1, volume and frequency changes associated with participation, abnormal profits associated with participation, and sales in proximity to disclosure of negative management earnings forecasts. For these four analyses, my unit of observation is an individual insider, rather than a single firm, for two reasons. First, the SEC is concerned about each insider's trade behavior. This is supported by the requirement to report

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<sup>23</sup> The Thomson Financial Wealth Analytics database collects all SEC-mandated filings (Form 3, 4, and 5) of changes in firm ownership for Section 16 insiders.



changes in ownership for each insider and the fact that the Rule's affirmative defense protects individual insiders. Second, many firms allow their insiders to choose whether to participate within 10b5-1. If there are participants and nonparticipants within the firm, then aggregating behavior to the firm level would pool two different trader types, making it difficult to interpret results. I begin these analyses with the primary sample of 1,377 insiders from 216 firms who actively trade in either the PRE or POST periods.

The final subsample is for the analysis of the firm level decision to disclose participation. For this analysis, I begin with the sample of 288 firms that chose to voluntarily disclose participation and add a sample of 63 firms that chose not to disclose participation. To identify the nondisclosure sample, I conducted a survey of all firms listed on the Nasdaq exchange as of March 31, 2003, that provide an investor or media relations electronic mail address on their corporate website. I emailed each firm this question: "Did any (at least one) Section 16 insider (i.e. officer, director, or beneficial owner) from your firm participate in a written preplanned 10b5-1 trading program between October 2000 and December 2002? Yes or No?" I sent out 2,690 electronic mail surveys to firms not represented in my disclosure sample and received 376 responses, for a 14% response rate. Of the 376 firms that responded to the survey, 63 said that they had at least one insider participate within a 10b5-1 trade plan during the period.

Table 3 provides univariate statistics for variables used in multivariate analyses of the decision to participate, the volume and frequency changes, and the firm decision to disclose. Univariate statistics for abnormal profit analyses are provided in Table 7.

Table 1. Descriptive Statistics for Rule 10b5-1 Disclosures

Firms	Exchange	Number	Percent
		Nasdaq	185
	NYSE	63	22%
	Other/Unknown	25	9%
	Over the Counter	9	3%
	Amex	6	2%
	Total	288	100%

Announcements	Channel	Number	Percent
		8-K	143
	Newswire	123	29%
	10-Q	102	24%
	10-K	24	6%
	Sched 13-D	20	5%
	Form 144	8	1.8%
	Annual Report	1	0.2%
	Total	421	100%

Facts contained in disclosure	Number	Percent
	Names of Participants	339
Plan is for pending sales	457	74%
Plan is for pending purchases	27	4%
Plan start date	323	52%
Plan end date	254	41%
Reason for plan initiation	92	22%
Explicit trade contract	25	6%

Named Insiders	Insider's position	Number	Percent
		CB, CEO, Dir, or President	228
	CFO, COO, VP, or Officer	175	38%
	Other/Unknown	34	7%
	Beneficial Owner	27	6%
	Total	464	100%

Table 2. Sample selection

*Panel a. General*

Firms disclosing 10b5-1 participation	288
Less: Firms that do not disclose specific insiders participating	52
Less: Firms missing active traders either PRE or POST	20
Firms that have active traders either PRE or POST	216
Total active traders either PRE or POST within these firms	1377

*Panel b. Derivation of sub-samples for specific analyses*

Action	Participation Decision (Table 4)		Volume and Frequency (Tables 5 and 6)		Abnormal Profits (Table 8)		Mgmt Earns Forecasts (Table 9)		Disclosure Decision (Table 10)
	Traders	Firms	Traders	Firms	Traders	Firms	Traders	Firms	Firms
Active traders PRE or POST	1,377	216	1,377	216	1,377	216	1,377	216	288
Less: Observations missing compensation data	593	45	815	83					
Less: Observations with inactive trade in either the pre or post periods					1085	105			
Less: Observations missing price/profit data					91	26			
Less: Observations from firms with all traders participating or no traders participating within 10b5-1	89	36	62	26	120	62			
Less: Observations from firms missing negative management earnings forecasts							498	72	
Add: Nondisclosure firms									63
Less: Observations missing board composition or MVE data									97
Less: Observations missing three insider trading days									79
Analysis sample	695	135	500	107	81	23	879	144	175

Table 3. Univariate Statistics

Univariate statistics for variables used in regression analyses. The POST period represents the six-month window immediately following the firm's announcement of the existence of 10b5-1 participating traders. The PRE period represents a six-month period in the year preceding the firm's 10b5-1 announcement, aligned in calendar time to the POST period.

Variable	Table	<i>n</i>	Mean	Min	50%	Max	Std Dev
PART	4	695	0.3180	0.0000	0.0000	1.0000	0.4660
LITRISK	4	695	0.2273	0.0467	0.1635	0.8359	0.2358
INFREQ	4	695	0.3093	0.0000	0.0000	1.0000	0.4628
HOLDS	4	695	0.0371	0.0000	0.0057	0.8492	0.0930
STOCKCOMP	4	695	0.2353	0.0000	0.0000	0.9946	0.3256
PART	6	500	0.3180	0.0000	0.0000	1.0000	0.4662
VOLUME (PRE =1; PART=0)	6	341	1,473.3361	0.0000	142.5550	43,303.4520	4,504.0000
VOLUME (PRE =1; PART=1)	6	159	1,710.7320	0.0000	5.5405	50,880.0000	4,809.0000
VOLUME (POST=1; PART=0)	6	341	891.2334	0.0000	24.0000	38,899.5200	3,555.0000
VOLUME (POST=1; PART=1)	6	159	4,183.3215	0.0000	723.4500	90,706.5460	11,159.0000
FREQ (PRE =1; PART=0)	6	341	2.3666	0.0000	1.0000	103.0000	6.1575
FREQ (PRE =1; PART=1)	6	159	3.7226	0.0000	1.0000	123.0000	10.5027
FREQ (POST=1; PART=0)	6	341	2.0205	0.0000	1.0000	84.0000	7.2483
FREQ (POST=1; PART=1)	6	159	13.3019	0.0000	3.0000	121.0000	24.3765
HOLDS (PRE =1; PART=0)	6	341	0.0256	0.0000	0.0003	0.8597	0.0789
HOLDS (PRE =1; PART=1)	6	159	0.0987	0.0000	0.0032	0.8597	0.1614
HOLDS (POST=1; PART=0)	6	341	0.0202	0.0000	0.0003	0.8492	0.0692
HOLDS (POST=1; PART=1)	6	159	0.0822	0.0001	0.0312	0.8492	0.1288
STOCKCOMP (PRE =1; PART=0)	6	341	0.1975	0.0000	0.0000	0.9971	0.3091
STOCKCOMP (PRE =1; PART=1)	6	159	0.3353	0.0000	0.2671	0.9964	0.3523
STOCKCOMP (POST=1; PART=0)	6	341	0.1766	0.0000	0.0000	0.9924	0.2948
STOCKCOMP (POST=1; PART=1)	6	159	0.3050	0.0000	0.1664	0.9780	0.3283
DISCLOSE	10	175	0.7771	0.0000	1.0000	1.0000	0.4174
MVE	10	175	3,075.4112	14.7094	616.3474	102,428.9428	10,930.0000
HITECH	10	175	0.2514	0.0000	0.0000	1.0000	0.4351
AVGTURN	10	175	0.0128	0.0005	0.0099	0.0888	0.0119
VARRET	10	175	0.0037	0.0002	0.0031	0.0391	0.0038
INSVOL	10	175	82,265.9334	28.1152	935.8310	1,873,230.0000	243,297.0000
SENS	10	175	0.0016	-0.0838	0.0000	0.1675	0.0167
INSINFL	10	175	0.2883	0.0000	0.2500	1.0000	0.1509

PART is a dichotomous variable that equals one if insider  $i$  is disclosed as a 10b5-1 plan participant and is zero otherwise.

LITRISK is the predicted probability insider  $i$  will be named as a defendant in a 10b5 lawsuit, computed from parameters from a two-stage estimation of the probability of being named as a 10b5 defendant in Appendix 2.

INFREQ is a dichotomous variable that equals one if the insider trades, on average, at least once but no more than three times during the year preceding the firm's 10b5-1 plan announcement date and is zero otherwise;

HOLDS is the number of shares held by the insider at the end of the fiscal year preceding the firm's 10b5-1 plan announcement date (Table 4), or in the year preceding the period (Tables 6 and 12) as a percentage of average shares outstanding.

STOCKCOMP is the insider's ratio of stock compensation to total compensation in the year preceding the 10b5-1 announcement date (Table 4), or in the year preceding the period (Tables 6 and 12). The numerator is computed as the value of restricted shares granted plus the stated value of options granted by the firm in its proxy statements utilizing a 5% rate of growth assumption, and the denominator is the numerator plus salary, bonus, and all other compensation.

VOLUME is the value, in thousands of dollars, of shares transacted by insider  $i$  during the period.

FREQ is the number of days insider  $i$  initiated an open-market transaction during the period.

DISCLOSE is a dichotomous variable that equals one if the firm chooses to disclose 10b5-1 participation and is zero otherwise.

MVE is the market value of equity at the end of September 2000.

HITECH is a dichotomous variable that equals one if the firm is a member of the computer hardware (SIC 3570-3577) or software (SIC 7370-7379) industries and zero otherwise.

AVGTURN is the average firm daily trade volume scaled by shares outstanding during the year ending September 2000.

VARRET is the variance of daily stock returns for the year ending September 2000.

INSVOL is the cumulative insider trading dollar volume during the year ending September 2000.

SENS is the coefficient from a firm-specific regression of the one-day abnormal return on the magnitude of insider trade during that day.

INSINFL is the ratio of insider-directors to total directors on the firm's board.

$i$  is a subscript for firm.

### 3. Participation within Rule 10b5-1

I first analyze the decision to participate in a 10b5-1 plan to provide evidence of the costs and benefits associated with participation. It is interesting to identify which traders choose to participate because participation requires a trade off between obtaining litigation protection and retaining control over the timing of trade execution. This trade off is particularly salient for insiders with better access to nonpublic information since they are likely at highest risk for litigation yet are also in the best position to generate profits from strategic timing of trades.

Commitment to trades may be costly to insiders who cannot anticipate future liquidity needs and may also reduce insiders' informed trade profits. Therefore, participating insiders are likely those who value litigation protection more than the ability to control trade execution timing. I hypothesize, then that the decision to participate in 10b5-1 is increasing in the level of the insider's litigation-risk and decreasing in the insider's desire to control execution timing.

*H1a: The decision to participate in 10b5-1 is increasing in an insider's personal litigation-risk.*

*H1b: The decision to participate in 10b5-1 is decreasing in an insider's desire to control execution timing.*

I test H1a and H1b by estimating a probit regression on a sample of insiders who actively trade either within the POST period or the PRE period. To remain in the test sample, I match each participating insider with at least one nonparticipating trader from the same firm. This matching controls for firm-level factors that might influence the decision to participate to allow an analysis of factors associated with an individual insider's decision to participate. For example, this restriction eliminates insiders at firms where the board requires that all trades take

place within 10b5-1 plans. Therefore, I am able to examine the 10b5-1 participation decision within a set of insiders who have the choice to opt in or out.<sup>24</sup>

I estimate the following probit regression on this sample, with firm fixed effects to control for potentially correlated errors across observations from the same firm and firm-level omitted factors, such as governance, performance, and risk.

$$\text{PART}_i = \alpha_0 + \alpha_1 \text{LITRISK}_i + \alpha_2 \text{INFREQ}_i + \alpha_3 \text{STOCKCOMP}_i + \alpha_4 \text{HOLDS}_i + \chi_i, \quad (1)$$

where,

PART is a dichotomous variable that equals one if an insider is disclosed as a 10b5-1 plan participant and is zero otherwise;<sup>25</sup>

LITRISK is the predicted probability an insider will be named as a defendant in a 10b5 lawsuit, computed from parameters from a two-stage estimation of the probability of being named as a 10b5 defendant, as explained in Appendix B;

INFREQ is a dichotomous variable that equals one if the insider trades, on average, at least once but no more than three times during the year preceding the firm's 10b5-1 plan announcement date and zero otherwise;<sup>26</sup>

STOCKCOMP is the insider's ratio of stock compensation to total compensation in the fiscal year ending prior to the firm's 10b5-1 announcement date: the numerator is computed as the value of restricted shares granted plus the stated value of options granted by the firm in its proxy statements utilizing a 5% rate of growth assumption, and the denominator is the numerator plus salary, bonus, and all other compensation; and

HOLDS is the number of shares held by the insider as a percentage of average shares outstanding in the fiscal year ending prior to the firm's 10b5-1 announcement date.

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<sup>24</sup> An implicit assumption is that insiders are not authorized to choose against participation in firms where all insiders participate. If this assumption is not valid, then I eliminate potentially influential observations from firms that may have little within-firm variation across insiders.

<sup>25</sup> This classification assumes that the decision to disclose is made by the firm and that, once a firm has decided to disclose specific insiders' participation in 10b5-1, it will disclose all insiders who participate. Misclassification incorrectly places participants in my zero group, which should bias against finding results. To mitigate misclassification error, I examine whether trades executed during the period following disclosure are coded as "Automatic" in the *Yahoo Finance Insider Transactions* database, <[<http://finance.yahoo.com/q/it?s=\(ticker\)>](http://finance.yahoo.com/q/it?s=(ticker))>, and code "Automatic" traders as 10b5-1 participants. Yahoo has recently started collecting voluntary ex-post (Form 4) disclosure of trades executed within 10b5-1 plans. Yahoo codes these trades as "Automatic Purchases" or "Automatic Sales." Because participation disclosure captured by Yahoo is voluntary, this does not capture all potential trades made within 10b5-1.

<sup>26</sup> Zero traders could, in fact, be considered infrequent. I exclude zero traders, however, because the test is designed to contrast behavior across traders with specific diversification needs that must be met through active trade.

LITRISK captures insiders' personal litigation-risk relative to other insiders within the firm. It is a function of the insider's job title within the firm and prior trading behavior. This measure ignores the firm's level of litigation-risk (a determinant of insiders' absolute litigation-risk) since I assume firm risk affects insiders within the same firm equally. I include LITRISK to determine whether insiders with higher relative litigation-risk prefer to trade under 10b5-1's litigation umbrella. Hypothesis 1a predicts a positive relationship between LITRISK and PART.

Two types of traders may prefer not to precommit trade to retain control over timing of trade execution. One is an insider who expects to receive information in the future but who does not currently possess it. The other is a liquidity trader who is uncertain about his future liquidity needs or who has immediate liquidity needs. He might prefer to trade only when his liquidity needs emerge. For either trader, it is likely that trades occur less frequently than for those traders who have more precise information or foreseeable liquidity needs. This is because both types of traders delay trades to await pending signals (private information or liquidity needs, respectively). I use INFREQ to proxy for these two insider types since it captures those traders with sporadic trade activity. Hypothesis 1b predicts a negative relationship between PART and INFREQ.

Finally, STOCKCOMP and HOLDS are control variables that capture insiders' portfolio rebalancing needs. Ofek and Yermack (2000) suggest insiders sell shares to rebalance firm-specific risk in response to new equity grants. The authors find that this rebalancing behavior is increasing in firm ownership. Insiders with greater portfolio diversification needs may be more inclined to trade within 10b5-1 plans, irrespective of their vulnerability to litigation. This is because 10b5-1 plans, by design, offer a systematic mode for diversification trade with a reduced



threat of litigation. Therefore, I predict a positive relationship between PART and both STOCKCOMP and HOLDS.

I begin with the primary sample of 1,377 insiders from 216 firms who actively trade in either the PRE or POST periods. I then collect compensation and holdings data for each insider from his firm's proxy statements. I eliminate 593 observations from 45 firms for which I could not find compensation data in the year preceding the POST period.<sup>27</sup> Finally, I delete 89 observations from 36 firms in which all the remaining insiders (after the compensation cuts) either participate or do not participate in 10b5-1 plans. This results in a final analysis sample of 695 insiders from 135 firms.

Table 4 summarizes the results for the decision to participate analysis. Consistent with H1a, I find that the probability of participating within 10b5-1 is increasing in the level of an insider's personal litigation-risk. The coefficient on LITRISK is 1.801 and is significant at the 1% level (one-tailed). This translates to a 0.44% increase in the probability of participation for a 1% increment in LITRISK, when all independent variables are evaluated at their mean values. This positive association suggests that high litigation-risk insiders value the litigation protection afforded by the plan. Appendix B shows that LITRISK surrogates for an insider's position within the firm and is positively correlated with positions associated with access to nonpublic information and control over disclosure of this information. When I estimate equation (1), replacing LITRISK with dichotomous variables representing an insider's title and position within the firm, I find a significant positive association between PART and whether the insider is the firm's CEO, president or board chairman. An alternative interpretation, then, is that insiders in

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<sup>27</sup> Firms typically do not report holdings and compensation data for lower-level executives in their proxy statements. Therefore, this restriction implies that my sample contains relatively higher-level executives. This potentially reduces the within-firm variation across the remaining insiders in my sample, but it is not clear whether it systematically biases my results.

positions to better access and control disclosure of nonpublic information appear most likely to participate within 10b5-1 plans. If these insiders employ means to exploit nonpublic information within their trade plans, the potential exists to observe abnormal profits. I examine whether participation is associated with informative trade, directly, in subsequent chapters.

Consistent with H1b, the probability of initiating a plan is lower for infrequent traders, with a coefficient of  $-0.537$ , significant at the 1% level (one-tailed).<sup>28</sup> This translates to a 12.6% reduction in the probability of participation for infrequent traders when the other independent variables are evaluated at their mean values. This negative association suggests that insiders with sporadic trade activity are less likely to participate. This suggests it is costly to preplan trade within 10b5-1 for traders who do not trade frequently.

Both STOCKCOMP and HOLDS are significantly positively associated with the decision to participate. The 0.449 coefficient on STOCKCOMP translates to a 0.11% increase in the probability of participation for a 1% increment in STOCKCOMP and the 6.526 coefficient on HOLDS translates to a 1.58% increase in the probability of participation for a 1% increment in HOLDS, when all independent variables are evaluated at their mean values. These positive associations are consistent with insiders' desire to rebalance their portfolios in a systematic fashion with reduced litigation-risk.

As noted above, the evidence in this chapter suggests that participation is associated with those insiders who have the highest litigation risk, yet the best access to nonpublic information within the firm. There is potential, then, for information based trade from these insiders within their 10b5-1 plans. I explore this further, in the following chapters, beginning with an analysis of volume changes associated with participation.

Table 4. Decision to Participate

Probit estimation of an individual insider's decision to participate within a 10b5-1 plan on a sample of 695 insiders in 135 firms. Each firm has at least one 10b5-1 participant and one nonparticipant. Firm fixed-effects coefficients are not reported.

$$PART_i = \alpha_0 + \alpha_1 LITRISK_i + \alpha_2 INFREQ_i + \alpha_3 STOCKCOMP_i + \alpha_4 HOLDS_i + \chi_i$$

Variable	Predicted Sign	Coefficient	$\chi^2$	<i>p</i> -value
Intercept		-1.606	7.497	0.006
LITRISK	+	1.801	36.656	<.0001
INFREQ	-	-0.537	13.754	0.002
STOCKCOMP	+	0.449	2.950	0.086
HOLDS	+	6.526	33.497	<.0001
Pseudo <i>R</i> -squared				0.329
% Concordant				87.3
% Discordant				12.6

PART is a dichotomous variable that equals one if an insider is disclosed as a 10b5-1 plan participant (zero otherwise).

LITRISK is the predicted probability an insider will be named as a defendant in a 10b5 lawsuit, computed from parameters from a two-stage estimation of the probability of being named as a 10b5 defendant, which is reported in Appendix B.

INFREQ is a dichotomous variable that equals one if the insider trades, on average, at least once but no more than three times during the year preceding the firm's 10b5-1 plan announcement date (zero otherwise).

STOCKCOMP is the insider's ratio of stock compensation to total compensation in the fiscal year ending prior to the firm's 10b5-1 announcement date: the numerator is computed as the value of restricted shares granted plus the stated value of options granted by the firm in its proxy statements utilizing a 5% rate of growth assumption, and the denominator is the numerator plus salary, bonus, and all other compensation.

HOLDS is the number of shares held by the insider as a percentage of average shares outstanding in the fiscal year ending prior to the firm's 10b5-1 announcement date.

*i* is a subscript that indexes the insider.

<sup>28</sup> I reestimate this analysis using TOTFREQ instead of INFREQ, where TOTFREQ is the total frequency of trade during the year preceding the firm's 10b5-1 plan announcement date. Consistent with H2b, the estimated coefficient for TOTFREQ is 0.024, significant at the 1% level (1-tailed).

#### 4. Volume and Frequency within Rule 10b5-1

Evidence suggests participation within the Rule is associated with insiders' litigation risk, so it is interesting to examine the trade effects associated with relaxing this risk through the safe harbor. Without 10b5-1, high litigation-risk insiders may not trade since high litigation costs exceed trade benefits. If these insiders believe that the Rule provides litigation protection, then trade benefits may exceed the lower litigation costs. Therefore, within the Rule, they are apt to trade more. This leads to the following hypotheses.

*H2a: Insiders who participate trade more share volume relative to prior periods.*

*H2b: Insiders who participate trade more frequently relative to prior periods.*

To test H2a and H2b, I first examine the mean difference in VOLUME and FREQ for the sample of insiders who actively trade in either the PRE or POST windows. VOLUME is the dollar volume (in thousands) of trade initiated by an insider within the period and FREQ is the number of days an insider initiated an open-market transaction during the period. To compute FREQ, I sum all transactions by an insider on the same day. In other words, I count as one daily trade all trades made by the same insider within a particular day.<sup>29</sup>

I compare changes in these variables for participants to those for nonparticipants within the same firm, to control for firm-level events across periods that might influence changes across both groups.

I begin with the primary sample of 1,377 insiders from 216 firms who actively trade in either the PRE or POST periods. Within each period, I compute the total trade volume and frequency for each active trader. For inactive traders, I code these variables as zero after confirming the

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<sup>29</sup> It is not clear whether the insider decides to initiate multiple trades within a particular day or whether his broker decides to initiate multiple trades to split a trade lot. I make the assumption that insider decides how much to sell on a particular day, but that the broker then determines how to execute the transaction(s) within the day. Results are not sensitive to this assumption.

insider was associated with the firm (listed in the proxy statement) during the inactive period. I then collect compensation and holdings data for each insider from his firm's proxy statements. I eliminate 815 observations from 83 firms for which I could not find compensation data in the years preceding the PRE and POST periods. Finally, I delete 62 observations from 26 firms in which all the remaining insiders (after the compensation cuts) either participate or do not participate in 10b5-1 plans. This results in a final analysis sample of 500 insiders from 107 firms.

Table 5 summarizes the univariate analyses of volume and frequency changes across periods for participating versus nonparticipating insiders. On average, participants trade \$2,472,590 more volume in the POST period than they did in the PRE period. This compares to a \$582,110 reduction in volume for nonparticipants across the same period.<sup>30</sup> In addition, 10b5-1 participants, on average, trade 10.201 times more frequently during the POST period than they did during the PRE period. This compares to a mean reduction in frequency for nonparticipants of 0.346 that is not statistically different from zero. This suggests that participating insiders trade more volume and trade more frequently within the Rule, which is consistent with the Rule relaxing litigation risk constraints on trade. It is not clear from this analysis, however, whether insiders simply trade more for liquidity or diversification needs, or whether insiders increase trade based on information. To provide more evidence, I estimate the following multivariate regressions and report results in Table 6:

$$\text{VOLUME}_{it} = \text{POST}_{it} * [\beta_0 + \beta_1 \text{PART}_i + \beta_2 \text{HOLDS}_{it} + \beta_3 \text{STOCKCOMP}_{it}] + \text{PRE}_{it} * [\beta_4 + \beta_5 \text{PART}_i + \beta_6 \text{HOLDS}_{it} + \beta_7 \text{STOCKCOMP}_{it}] + \varepsilon_{it}, \quad (2a)$$

$$\text{FREQ}_{it} = \text{POST}_{it} * [\gamma_0 + \gamma_1 \text{PART}_i + \gamma_2 \text{HOLDS}_{it} + \gamma_3 \text{STOCKCOMP}_{it}] + \text{PRE}_{it} * [\gamma_4 + \gamma_5 \text{PART}_i + \gamma_6 \text{HOLDS}_{it} + \gamma_7 \text{STOCKCOMP}_{it}] + \sigma_{it}, \quad (2b)$$

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<sup>30</sup> The results are similar when trade volume is scaled by total firm volume throughout the period.

where,

VOLUME and FREQ are as defined above;

PART is as defined in equation (1);

POST is a dichotomous variable that equals one for the six-month window immediately following 10b5-1 disclosure and is zero otherwise;

PRE is a dichotomous variable that equals one for the six-month window in the year preceding 10b5-1 disclosure, aligned in calendar time to the POST window and is zero otherwise;

HOLDS is the number of shares held by the insider as a percentage of average shares outstanding in the fiscal year ending prior to the period;

STOCKCOMP is the insider's ratio of stock compensation to total compensation in the fiscal year ending prior to the period: the numerator is computed as the value of restricted shares granted plus the stated value of options granted by the firm in its proxy statements utilizing a 5% rate of growth assumption, and the denominator is the numerator plus salary, bonus, and all other compensation;

and  $i$ ,  $t$  are subscripts for insider and time period, respectively.

I estimate stacked regressions to allow a difference-of-difference design without constraining coefficients across periods. I include firm fixed effects to control for potentially correlated errors across observations from the same firm and firm-level omitted factors such as momentum and future performance.

Hypothesis 2a predicts that 10b5-1 participants trade more volume than they did in prior periods. This would be consistent with  $\beta_1 > \beta_5$ . Similarly, Hypothesis 2b predicts that 10b5-1 participants trade more frequently than they did in prior periods. This would be consistent with  $\gamma_1 > \gamma_5$ .

Table 6 provides results consistent with Table 5. Here, and in Table 9, I report White's (1980) corrected  $t$ -statistics because a Breusch-Pagan test (Wooldridge 2000, 257) rejects homoskedasticity at the 1% level. After controlling for diversification needs, 10b5-1 participating insiders' trade volume is \$2,685,190 higher than non-participating insiders' volume

in the POST period. This is a significant increase in relative volume of \$3,126,200 from the prior period.<sup>31</sup> In addition, participating insiders increase their relative periodic trade frequency by 7.440 trades.

Changes in volume associated with relaxation of constraints on diversification based trade are reflected in the coefficients on STOCKCOMP and HOLDS. The \$3,126,200 increase in relative volume remains unexplained after controlling for these diversification needs. Although indirect, this increase in unexplained volume suggests participants increased information based trade, to the extent STOCKCOMP and HOLDS fully capture insiders' diversification needs. This implies Rule relaxes constraints on informed trade. To corroborate this evidence, I examine the association between participation and abnormal trade profits in the next chapter.

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<sup>31</sup> The results are similar when I estimate a model that allows PART to interact with both diversification needs variables, HOLDS and STOCKCOMP. Results are also similar when I include the return over the 20-day window immediately preceding each insider's first trade execution within the window. This return variable attempts to capture insider-specific momentum trade. Including the inverse mills ratio from equation (1) in the POST window does not affect results, either.

Table 5. Univariate Volume and Frequency Analysis

Comparison of trading volume and frequency for 10b5-1 participating and nonparticipating insiders over two six-month sample periods. The POST period represents the six-month window immediately following the firm's announcement of the existence of 10b5-1 participating traders. The PRE period represents a six-month period in the year preceding the firm's 10b5-1 announcement, aligned in calendar time to the POST period.

VOLUME							
Trader type	<i>n</i>	Statistic	POST		PRE	Difference	
10b5-1	159	Mean	4183.32		1710.73	2472.59	***
		Median	723.45		5.54	717.91	***
Non	341	Mean	891.23		1473.34	-582.11	**
		Median	24.00		142.56	-118.56	***
Difference		Mean	3292.09	***	237.39	3054.70	***
		Median	699.45	***	-137.02	836.47	***

  

FREQ							
Trader type	<i>n</i>	Statistic	POST		PRE	Difference	
10b5-1	159	Mean	13.302		3.101	10.201	***
		Median	3.000		1.000	2.000	***
Non	341	Mean	2.021		2.367	-0.346	
		Median	1.000		1.000	0.000	
Difference		Mean	11.281	***	0.734	10.547	***
		Median	2.000	***	0.000	2.000	***

\*\*\* Significance at the 1% level (one-tailed).

\*\* Significance at the 5% level (one-tailed).

Median difference *p*-values computed using the Kruskal-Wallis Test (Conover 1999, 288).

VOLUME is the value, in thousands of dollars, of shares sold by insider *i* during the period.

FREQ is the number of days on which the insider initiated an open-market transaction during the period.



Table 6. Multivariate Volume and Frequency Analysis

Analysis of trading volume and frequency for 10b5-1 participating and nonparticipating insiders over two six-month sample periods. Sample is 500 insiders from 107 firms. At least one 10b5-1 participant and one nonparticipant from each firm is represented in the sample. Firm fixed-effects coefficients are not reported. White's (1980) corrected *t*-statistics reported.

$$\begin{aligned} \text{VOLUME}_{it} = & \text{POST}_{it} * [\beta_0 + \beta_1\text{PART}_i + \beta_2\text{HOLDS}_{it} + \beta_3\text{STOCKCOMP}_{it}] + \\ & \text{PRE}_{it} * [\beta_4 + \beta_5\text{PART}_i + \beta_6\text{HOLDS}_{it} + \beta_7\text{STOCKCOMP}_{it}] + \varepsilon_{it} \\ \text{FREQ}_{it} = & \text{POST}_{it} * [\beta_0 + \beta_1\text{PART}_i + \beta_2\text{HOLDS}_{it} + \beta_3\text{STOCKCOMP}_{it}] + \\ & \text{PRE}_{it} * [\beta_4 + \beta_5\text{PART}_i + \beta_6\text{HOLDS}_{it} + \beta_7\text{STOCKCOMP}_{it}] + \sigma_{it} \end{aligned}$$

Variable	Predicted Sign	VOLUME			FREQ		
		PRE Period Estimate ( <i>t</i> -value)	POST Period Estimate ( <i>t</i> -value)	Difference ( <i>t</i> -value)	PRE Period Estimate ( <i>t</i> -value)	POST Period Estimate ( <i>t</i> -value)	Difference ( <i>t</i> -value)
Intercept		12,890.00 (2.07)	7,033.18 (1.54)		0.281 (0.73)	1.771 (2.94)	
PART	+	-441.01 (-1.08)	2685.19 (4.20)	3126.20 (4.12)	0.549 (0.71)	7.989 (5.50)	7.440 (4.52)
HOLDS	+	11,230.17 (3.10)	18,784.31 (3.25)		5.119 (3.00)	39.348 (3.01)	
STOCK COMP	+	428.20 (0.52)	528.19 (0.77)		2.392 (1.79)	3.250 (1.20)	
<i>n</i>				500			500
<i>R</i> <sup>2</sup>				0.475			0.560
Adj. <i>R</i> <sup>2</sup>				0.326			0.436

VOLUME is dollar volume (in thousands) of shares sold by an insider during the period.

FREQ is the number of days an insider initiated an open-market transaction during the period.

PART is a dichotomous variable that equals one if an insider is disclosed as a 10b5-1 plan participant and is zero otherwise.

HOLDS is the number of shares held by the insider as a percentage of average shares outstanding in the fiscal year ending prior to the period.

STOCKCOMP is the insider's ratio of stock compensation to total compensation in the fiscal year ending prior to the period. The numerator is computed as the value of restricted shares granted plus the stated value of options granted by the firm in its proxy statements utilizing a 5% rate of growth assumption, and the denominator is the numerator plus salary, bonus, and all other compensation.

POST is a dichotomous variable that equals one for the six-month window immediately following 10b5-1 disclosure and is zero otherwise.

PRE is a dichotomous variable that equals one for the six-month window (aligned in calendar time to the POST window) in the year preceding 10b5-1 disclosure and is zero otherwise.

*i* and *t* are subscripts for insider and time period, respectively.

## 5. Abnormal Profits

To better determine whether insiders increase informed trade, I examine the association between participation and insiders' abnormal trade profits. If participants increase informed trade, as suggested by the unexplained increase in trade volume, then one should observe a corresponding increase in abnormal trade profits.

It is not clear, however, whether participants can garner abnormal trade profits. The Rule specifically requires participants to precommit trades when they do not possess material nonpublic information. If participants abide by this condition and trade only for liquidity, they should not be able to generate abnormal profits in an efficient market. Even if participants initiate plans when they do possess material nonpublic information, the requirement to precommit trades increases the likelihood that trades will execute at less profitable times. This possibility of poor trade timing reduces the potential for informed trade profits. It may, in fact, reduce trade profitability below that in prior periods when the insider retained control over execution timing.

The Rule, however, may provide sufficient litigation protection to catalyze participants to trade on nonpublic information or to trade within previously restricted windows when they might not have otherwise.<sup>32</sup> It may also motivate participants to modify the timing of information disclosures to obtain increased profit from planned trades. This might allow participants to garner abnormal trade profits that may, in fact, be larger than those generated in prior periods.

This suggests the following hypotheses.

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<sup>32</sup> There is anecdotal evidence to support this point. "Glen Meakem, chairman and CEO of FreeMarkets Inc., sold 170,000 shares of the business-to-business software maker under a Rule 10b5-1 trading plan earlier this year [2001] for about \$3 million. The trading period ended just five days before the company lowered earnings guidance for the year. It [is] fair to assume that if the rule had not been adopted, he might have thought twice before selling so much stock in advance of an earnings report" (Lane, Marc J. December 3, 2001. *SEC Insider Trading Rule Doesn't Instill Confidence*. Crain's Chicago Business [cited October 2, 2003]). <<http://www.marcjlane.com/article/SECinsider120301.html>>.

*H3: Participating insiders garner positive abnormal profits from trade.*

*H4: Participating insiders garner either smaller or larger abnormal profits from trade relative to trade profits in prior periods.*

To examine H3, I compute univariate abnormal profit statistics for trades made by participating insiders within the six-month window immediately following disclosure of their participation. I examine abnormal profits instead of abnormal returns (i.e., I dollar-weight abnormal returns) because it is the relevant economic metric to regulators and it provides within-firm variation across insiders who may trade in close proximity. If participating insiders are able to garner abnormal profits, I expect to observe statistically positive abnormal profits. I report statistics for MEANPROF and TOTPROF, where MEANPROF is the mean abnormal profit per trade from all trades executed by an insider during the period and TOTPROF is the total abnormal profit of all trades executed by the same insider during the period. If volume per trade remains constant then MEANPROF is a measure of advantageous trade timing. If, on average, an insider's trades execute at advantageous times (e.g., prior to release of nonpublic information) then MEANPROF should be positive. TOTPROF measures the insider's cumulative ability to garner trade profits during a period. It is a measure of the insider's total profitability during a specified window. If insiders earn informed profits from trade during the period, then TOTPROF should be positive.

Seyhun (1998) defines an active trading strategy as one that motivates transactions based on anticipation of future stock price movements. I focus on active profits since this appears to be most relevant to regulators and requires fewer computational assumptions relative to passive profits.<sup>33</sup> Since it is not clear which benchmark or time horizon is appropriate, I compute active abnormal profits using three different time horizons and three different benchmarks. For

purchases, I compute abnormal profits as the buy-and-hold return over one-, three-, and six-month horizons minus the buy-and-hold return to an appropriate benchmark, times the dollar size of the trade executed. For sales, I compute the same abnormal profit, but multiply it by  $-1$  since sales represent foregone profits or avoidance of loss. I use the returns on the Nasdaq index, the S&P500 index, and the S&P500 index multiplied by the firm's beta (denoted as  $\beta * S\&P500$ ) as benchmarks.<sup>34</sup> Because some of my sample firms may have nonsynchronous trading, I compute  $\beta$  in accordance with Scholes and Williams (1977). I use a time series of 250 daily returns during an estimation period ending 45 days prior to the first trade initiated by each trader and require at least 50 days for the estimation.

For hypothesis 4, I examine whether there is an increase or decrease in MEANPROF and TOTPROF (computed using the Nasdaq benchmark over a six-month horizon) for a sample of 10b5-1 participants who actively trade in both periods. To help control for firm-level factors that may affect profit changes, I also examine the difference in MEANPROF and TOTPROF for nonparticipants within the same firms who also actively trade in both periods. Hypothesis 4 suggests that participants should have either a larger positive or negative change in profits than nonparticipants.

I begin with the primary sample of 1,377 insiders from 216 firms who actively trade in either the PRE or POST periods. I then eliminate 1,085 observations from 105 firms where traders are not active in either the PRE or POST period. This allows an analysis of changes in abnormal profits across periods for the subsample of 292 insiders from 111 firms who actively trade in

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<sup>33</sup> The Insider Trading Sanctions Act of 1984 provides a civil penalty based, in part, on active profits. In addition, passive profits require assumptions about an insider's basis in his holdings.

<sup>34</sup> I obtain security price data from the CRSP database (through December 31, 2002) and from *Yahoo Historical Prices* database (January 1, 2003 through November 5, 2003). <[http://finance.yahoo.com/q/hp?s=\(ticker\)](http://finance.yahoo.com/q/hp?s=(ticker))>.

both the PRE and POST periods.<sup>35</sup> I eliminate 91 observations from 26 firms for which I could not find price data to compute abnormal profits. Finally, I delete 120 observations from 62 firms in which all the remaining insiders either participate or do not participate in 10b5-1 plans. This results in a final analysis sample of 81 insiders from 23 firms. For the TOTPROF analyses, I also delete 8 observations from 7 firms that disclosed 10b5-1 participation after November 5, 2002. This prevents truncation of total profits due to missing price data after November 5, 2003.

Table 7 presents univariate statistics for mean and median MEANPROF and TOTPROF for 10b5-1 participants who actively trade in the six-month window following firm disclosure. The median MEANPROF is statistically positive at the 10% level (two-tailed) for eight out of nine of the specifications. Also, the median TOTPROF is statistically positive at the 10% level (two-tailed) for eight out of nine of the specifications. The mean TOTPROF is also statistically positive for five out of six of the longer-window horizon (>one month) specifications. Consistent with H3, this evidence suggests that participating insiders are able to generate abnormal profits from informed trade within 10b5-1 plans, particularly in anticipation of longer-term firm performance.

Table 8 provides univariate mean and median difference tests for MEANPROF and TOTPROF for participating and nonparticipating insiders who actively trade in both the PRE and POST windows. The results for MEANPROF suggest that participants are able to eliminate a relative profit disadvantage they face in the PRE period. Specifically, a participant's trade averages \$520,090 less profit than a nonparticipant's trade, in the PRE period. However, in the

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<sup>35</sup> I focus only on active traders because regulatory agencies are concerned with profits from active trade. Also, it is not clear how to measure profits for those who choose not to trade. One suggestion is to compute the opportunity cost profit or foregone profit from the decision not to trade. This measure, however, is difficult to compute because it requires assumptions about when the insider would have traded and the size of the trade he chose not to execute.

POST period, there is no observed statistical difference between mean trade profits by either trader type.

Table 8 also provides evidence that participants improve their total periodic trade profits relative to nonparticipants from within their firms. Specifically, participants improve their total abnormal trade profits by an average of \$1,102,430 across periods. This increase is \$709,980 more than the average change in total trade profits to nonparticipants.<sup>36</sup>

The evidence in Table 8 suggests that the Rule provides participating insiders an opportunity to generate informed trade profits that appears better than that in prior periods, in spite of the need to precommit trade which exposes trades to market risk. This evidence, combined with the unexplained increase in volume documented in the preceding chapter, suggests that Rule 10b5-1 does not reduce insiders' profit opportunities. In the next chapter, I examine how insiders might structure their trades to improve their trade profits.

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<sup>36</sup> Results are consistent when I estimate the following regressions with fixed effects to control for potentially correlated errors across observations within the same firm and firm level omitted factors such as risk and performance:  $MEANPROF_{it} = POST_{it} * [\kappa_0 + \kappa_1 PART_i] + PRE_{it} * [\kappa_2 + \kappa_3 PART_i] + \xi_{it}$ , and  $TOTPROF_{it} = POST_{it} * [\varphi_0 + \varphi_1 PART_i] + PRE_{it} * [\varphi_2 + \varphi_3 PART_i] + \tau_{it}$ .

Table 7. Abnormal Profits

Univariate statistics for abnormal profit measures (in thousands of dollars) for trades made by 10b5-1 participating active traders during the six-month window immediately following announcement of their participation. Profit measures are winsorized at the 1% tails to control for the influence of outliers. Median  $p$ -values (one-tailed) reported from signed-rank test. Abnormal profits are computed as the buy-and-hold return over the designated horizon minus the buy-and-hold return to the designated benchmark index, times the dollar size of the trade executed.  $\beta$  is computed in accordance with Scholes and Williams (1977), using a time series of 250 daily returns during an estimation period ending 45 days prior to the first trade initiated by an insider.

Variable	Horizon	$n$	Benchmark index	Mean ( $p$ -value)	Min	Median ( $p$ -value)	Max
MEANPROF	6-month	212	Nasdaq	11.197 (0.24)	-1305.164	6.533 ( $<.0001$ )	815.987
			S&P500	13.388 (0.18)	-1104.162	3.174 (0.01)	921.674
			$\beta$ * S&P500	3.138 (0.42)	-1109.333	1.76 (0.15)	1065.116
	3-month	215	Nasdaq	5.555 (0.29)	-800.439	3.308 (0.0001)	542.701
			S&P500	10.548 (0.16)	-831.159	3.673 (0.0001)	658.631
			$\beta$ * S&P500	8.245 (0.23)	-880.459	1.897 (0.002)	633.264
	1-month	216	Nasdaq	-6.202 (0.87)	-369.480	0.714 (0.09)	200.258
			S&P500	-4.355 (0.79)	-433.835	1.091 (0.03)	300.144
			$\beta$ * S&P500	-4.210 (0.78)	-477.746	0.714 (0.05)	256.271
TOTPROF	6-month	191	Nasdaq	156.825 (0.07)	-7830.983	56.252 ( $<.0001$ )	5790.743
			S&P500	367.105 (0.01)	-5065.166	36.812 (0.001)	11550.978
			$\beta$ * S&P500	90.845 (0.27)	-10579.689	17.162 (0.01)	11164.349
	3-month	205	Nasdaq	96.359 (0.075)	-3256.695	21.973 (0.001)	4842.096
			S&P500	210.609 (0.003)	-3057.656	22.991 ( $<.0001$ )	6282.475
			$\beta$ * S&P500	171.685 (0.005)	-3178.388	13.639 (0.0004)	4399.334
	1-month	216	Nasdaq	-75.296 (0.78)	-6533.222	2.583 (0.16)	2422.386
			S&P500	-32.590 (0.74)	-4772.186	3.837 (0.06)	2701.292
			$\beta$ * S&P500	-38.211 (0.79)	-4751.656	3.989 (0.05)	1826.111

MEANPROF is the mean abnormal profit per trade (in thousands of dollars) executed by an insider during the period. For each trade executed, the abnormal profit is computed as the buy-and-hold return over the horizon indicated in the table minus the same-horizon buy-and-hold return to the benchmark indicated in the table times the dollar amount traded.

TOTPROF is the total abnormal profit (in thousands of dollars) accumulated by an insider from trades executed during the period. For each trade executed, the abnormal profit is computed as the buy-and-hold return over the horizon indicated in the table minus the same-horizon buy-and-hold return to the benchmark indicated in the table times the dollar amount traded.



Table 8. Difference in Abnormal Profits

Analysis of abnormal profits for 10b5-1 participating and nonparticipating insiders who actively trade in both the PRE and POST periods. At least one 10b5-1 participant and one nonparticipant from each firm is represented in the sample. Profit measures are computed using the Nasdaq benchmark over a six-month horizon, and are winsorized at the 1% tails to control for outliers.

MEANPROF							
Trader type	<i>n</i>	Statistic	POST	PRE	Difference		
10b5-1	32	Mean	-13.06	-616.39 *	603.33 *		
		Median	7.76	-14.24 *	22.00 **		
Non	49	Mean	23.63	-96.30	119.93		
		Median	3.17	-7.47	10.64		
Difference		Mean	-36.69	-520.09 **	483.40		
		Median	4.59	-6.77	11.36		

  

TOTPROF							
Trader type	<i>n</i>	Statistic	POST	PRE	Difference		
10b5-1	30	Mean	388.32 *	-714.11	1,102.43 **		
		Median	15.76 **	-21.60	37.36 **		
Non	47	Mean	109.75	-282.71	392.45		
		Median	6.33	-16.63	22.96		
Difference		Mean	278.57	-431.40	709.98 *		
		Median	9.43 *	-4.97	14.40 *		

\*\* Significance at the 5% level (two-tailed).

\* Significance at the 10% level (two-tailed).

Median difference *p*-values computed using the Kruskal-Wallis Test (Conover 1999, 288).

## 6. Volume Surrounding Management Earnings Forecasts

There appears to be a positive association between participation and increased trade profits, so it is interesting to examine how participants might structure trades to improve their trade profits. The Rule relaxes trade constraints and firms allow trades to execute within previously restricted trade windows, so it is possible that participants increase profitable trade preceding news events. I examine this possibility by providing evidence of the association between participants' sales volume and disclosure of negative management forecasts of earnings.

Noe (1999) documents that insiders trade less volume immediately before disclosure of management forecasts of earnings to avoid the appearance of trading improperly. Because of the Rule's litigation protection, participating insiders may now consider planning sales prior to the revelation of "bad-news" forecasts to avoid losses associated with holding the stock.

Alternatively, insiders may consider delaying disclosure of bad news forecasts until after planned trade occurs. In either case, one would observe increased sales volume prior to the realization of "bad-news" forecasts. This leads to the following hypothesis.

*H5: For participating insiders, there is an increase in sales volume preceding negative management forecasts of earnings.*

Evidence in Chapter 4 documents an increase in sales volume associated with participation, suggesting the Rule relaxes litigation constraints on trade. If this increase is due to insiders fulfilling previously constrained diversification needs, then one should observe a uniform increase in volume across all periods. If, however, participating insiders strategically plan sales prior to disclosing negative forecasts or delay disclosure of negative forecasts, then one should observe larger sales volume immediately preceding negative forecasts than volume immediately following these forecasts. This leads to the following hypothesis.

*H6: If participating insiders strategically plan sales, there is more sales volume preceding negative management forecasts of earnings than sales volume following these forecasts.*

To test these hypotheses, I examine sales volume during 20-trading day windows immediately preceding and immediately following negative management forecasts of earnings. I choose 20-trading day windows to remain consistent with Noe (1999). I focus exclusively on sales volume since sales represent 92% of all transactions within sample during the period.<sup>37</sup> I collect management earnings forecasts from First Call Historical Database for Company Issued Guidelines. I code each forecast as negative if First Call designates the forecast as below or possibly below expectations. For insiders within firms with negative management earnings forecasts, I estimate the following regression, with firm fixed effects to control for potentially correlated errors from observations within the same firm and firm-level omitted factors such as litigation risk and insider trade restrictions.

$$\text{SQRTSALES}_{ipw} = \text{POST}_i * [\psi_0 + \psi_1 \text{PART}_i + \psi_2 \text{PRECEDE}_{ip} + \psi_3 \text{PART}_i * \text{PRECEDE}_{ip}] + \text{PRE}_i * [\psi_4 + \psi_5 \text{PART}_i + \psi_6 \text{PRECEDE}_{ip} + \psi_7 \text{PART}_i * \text{PRECEDE}_{ip}] + \mu_{ipw}, \quad (3)$$

where,

SQRTSALES is the square root of dollar sales volume (in thousands) executed by an insider during a 20-trading day window either immediately preceding or following a management earnings forecast coded as bad news by First Call;

PRECEDE is a dichotomous variable that equals one for the 20-trading day window immediately preceding the management earnings forecast and is zero for the 20-trading day window immediately following the forecast;

PART, PRE, and POST are as defined in equation (2);

and  $i$ ,  $p$ , and  $w$  are subscripts for insider, time period (i.e., PRE or POST), and window (i.e., 20-trading day window immediately preceding or immediately following disclosure of the management forecast) respectively.

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<sup>37</sup> I do not have enough purchase observations to perform a similar analysis regarding positive management forecasts of earnings.

To remain consistent with Noe (1999), I use the square root of sales to control for the effects of outliers. If the trader did not sell in these 20-day windows, I code his volume as zero.

Evidence that  $\psi_3 > \psi_7$  is consistent with H5. A positive coefficient on  $\psi_3$  is consistent with H6.

I begin the analysis with the primary sample of 1,377 insiders from 216 firms who actively trade in either the PRE or POST periods. I eliminate 498 observations from 72 firms for which I could not find negative management earnings forecasts from First Call. This results in a final analysis sample of 879 insiders from 144 firms.

Table 9 provides results pertaining to sales activity in proximity to negative management earnings forecasts. Using the 20-trading day window, I do not statistically detect a change in sales volume by participants in the period immediately preceding a negative forecast. The coefficient difference on PART \* PRECEDE of 0.7802 is not different from zero at 10% significance levels (one-tailed). Using a 25- or 30-trading day window, however, the coefficient difference is statistically different from zero at 10% levels (results not tabulated). This provides some evidence that participants increase sales volume preceding disclosure of negative earnings forecasts, however this result is influenced by the window choice. In longer windows, there is more active trade which may provide more power for my test. However, extending the window increases the likelihood that factors other than disclosure of the management forecast are associated with the observed increase in sales volume. Therefore, one should interpret these results with caution.

Table 9 also shows that, in the POST period, participants have larger sales volume immediately preceding disclosure of negative forecasts than volume immediately following

disclosure.<sup>38</sup> This is shown by the coefficient of 0.8293 on PART \* PRECEDE in the POST window. In contrast with Noe (1999), this result suggests that participants are less concerned about executing profitable trades in proximity to news events, providing some evidence of how participants may structure trade to improve profit opportunities. It is still not clear, from this evidence, whether participants plan sales trade prior to the revelation of the “bad-news” forecasts or they delay the disclosure of these forecasts until after the sales transactions have executed. This is an interesting question for future research.

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<sup>38</sup> I fail to find similar evidence preceding “bad-news” earnings releases, perhaps due to earnings news being preempted by management forecasts. I code an earnings release as “bad-news” if the 3-day cumulative abnormal return, centered on the announcement date provided by Compustat, is negative.

Table 9. Sales Volume in Close Proximity to Negative Management Earnings Forecasts

Analysis of volume of sales trade during 20-trading day windows immediately preceding and after management forecasts of negative earnings news. At least one 10b5-1 participant and one nonparticipant from each firm is represented in the sample. Firm fixed-effects coefficients are not reported. White's (1980) corrected *t*-statistics reported.

$$\text{SQRTSALES}_{ipw} = \text{POST}_i * [\psi_0 + \psi_1 \text{PART}_i + \psi_2 \text{PRECEDE}_{ip} + \psi_3 \text{PART}_i * \text{PRECEDE}_{ip}] + \text{PRE}_i * [\psi_4 + \psi_5 \text{PART}_i + \psi_6 \text{PRECEDE}_{ip} + \psi_7 \text{PART}_i * \text{PRECEDE}_{ip}] + \mu_{ipw}$$

Variable	Predicted Sign	POST Period Estimate ( <i>t</i> -value)	Predicted Sign	PRE Period Estimate ( <i>t</i> -value)	Difference
Intercept		-0.0623 (-0.06)		0.2891 (0.33)	
PART	+	0.8934 (2.59)	+/-	0.2478 (0.46)	
PRECEDE	-	-0.1372 (-0.99)	-	-0.6144 (-1.96)	
PART * PRECEDE	+	0.8293 (1.86)	-	0.0491 (0.10)	0.7802 (1.04)
<i>n</i>					879
<i>R</i> <sup>2</sup>					0.2868
Adj. <i>R</i> <sup>2</sup>					0.2217

SQRTSALES is the square root of dollar sales volume (in thousands) executed by an insider during a 20-trading day window in proximity of disclosure of a management earnings forecast coded as bad news by First Call.

PRECEDE is a dichotomous variable that equals one if the 20-trading day window immediately precedes the management earnings forecast and zero if the 20-trading day window immediately follows the forecast.

PART is a dichotomous variable that equals one if an insider is disclosed as a 10b5-1 plan participant and zero otherwise.

POST is a dichotomous variable that equals one for the six-month window immediately following 10b5-1 disclosure and zero otherwise.

PRE is a dichotomous variable that equals one for the six-month window (aligned in calendar time to the POST window) in the year preceding 10b5-1 disclosure and zero otherwise.

*i*, *p*, and *w* are subscripts for insider, time period (i.e., PRE or POST), and window (i.e., 20-trading day window immediately preceding or immediately following the disclosure of the management forecast) respectively.

## 7. Firm Decision to Disclose 10b5-1 Participation

Evidence suggests that Rule 10b5-1 provides participating insiders improved profit opportunities; however, the evidence is derived from a sample of insiders from firms that voluntarily disclose participation information. It is not clear whether these results generalize to insiders at firms that choose not to disclose this information. This issue naturally raises the question of what factors are associated with the decision to disclose participation. In this chapter, I examine this directly to provide some evidence regarding costs and benefits of the voluntary disclosure decision.

Firms may believe that voluntary disclosure of participation reduces litigation costs. For example, firms may believe that disclosing 10b5-1 participation might reduce the likelihood that shareholders or the SEC will seek legal remedy for trades executed by participating insiders. This might occur, for example, if a lawyer for a potential plaintiff considers 10b5-1 participation in his decision to pursue litigation. An announcement regarding participation might lower his expectation of winning a suit, thereby making it less likely he will file suit. If firms believe disclosure may reduce litigation costs, then one might observe a positive association between a firm's litigation risk and the decision to disclose 10b5-1 participation. This leads to the following hypothesis.

*H7: The decision to disclose 10b5-1 participation is increasing in a firm's level of litigation risk.*

Firms may choose to disclose 10b5-1 participation if their stock price reacts more to disclosure of insiders' trades. In this case, the 10b5-1 participation disclosure might be to inform investors that pending trades by firm insiders are noninformative, which might reduce the firm's

stock price volatility.<sup>39</sup> If firms disclose participation to convey that pending trades are not based on information, then one might expect the following hypothesis.

*H8: The decision to disclose 10b5-1 participation is increasing in the firm's sensitivity of stock price to insider trading signals.*

Participating insiders may prefer that their firms not disclose pending trade information because it lowers potential trade profits. Fishman and Hagerty (1995) model the effects of mandatory insider trade disclosure on insiders' trade profits. They show that an informed insider's trade is less profitable when it follows disclosure of a previously executed trade because the market infers information from the disclosure and adjusts price before the subsequent trade executes. The authors suggest that the market will infer information from trade disclosure, even when an insider's motive for trade is not observed, since there is some probability the insider is informed. Fried (1998) implies a similar model in a setting where the SEC mandates predisclosure of pending trades. Specifically, Fried (1998) suggests that predisclosure of pending trades would eliminate insiders' trade profits, since the market would adjust price before insiders' trades execute. It is possible that this model also applies to disclosure of 10b5-1 participation. The market may infer information from the participation disclosure and adjust price before insiders' trades execute. If so, then insiders would not favor participation disclosure since their trades would be less profitable.

Insiders may also be concerned that a participation disclosure increases the costs associated with terminating their 10b5-1 plans, which reduces their trade flexibility. For these reasons, one might find a lower probability of participation disclosure in firms where there is a higher degree of insider influence over the board of directors. This leads to the following hypothesis.

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<sup>39</sup> A senior executive at Libbey, Inc. (LBY) suggested this as a primary motivation for disclosing 10b5-1 participation.



*H9: The decision to disclose 10b5-1 participation is decreasing in the level of insider influence over the board of directors.*

To test these hypotheses I estimate a probit regression of the decision to disclose 10b5-1 participation on a sample of firms for which the disclosure decision is relevant. I pool a sample of firms that chose to disclose 10b5-1 participation with a sample of firms that did not disclose participation, yet responded to a survey claiming they had 10b5-1 participants during the same time period. For this sample, I estimate the following probit regression:

$$\begin{aligned} \text{DISCLOSE}_i = & \theta_0 + \theta_1 \text{MVE}_i + \theta_2 \text{HITECH}_i + \theta_3 \text{AVGTURN}_i + \theta_4 \text{VARRET}_i + \\ & \theta_5 \text{INSVOL}_i + \theta_6 \text{SENS}_i + \theta_7 \text{INSINFL}_i + \\ & \theta_8 [\text{INSVOL} * \text{INSINFL}]_i + \theta_9 [\text{SENS} * \text{INSINFL}]_i + v_i, \end{aligned} \quad (5)$$

where,

DISCLOSE is a dichotomous variable that equals one if the firm chooses to disclose 10b5-1 participation and is zero otherwise;

MVE is the market value of equity at the end of September 2000;

HITECH is a dichotomous variable that equals one if the firm is a member of the computer hardware (sic 3570-3577) or software (sic 7370-7379) industries and is zero otherwise;

AVGTURN is the average firm daily trade volume scaled by shares outstanding during the year ending September 2000;

VARRET is the variance of daily stock returns for the year ending September 2000;

INSVOL is the cumulative insider trading dollar volume during the year ending September 2000;

SENS is the coefficient from a firm-specific regression of the one-day abnormal return on the magnitude of insider trade during that day;<sup>40</sup>

INSINFL is the ratio of insider-directors to total directors on the firm's board;

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<sup>40</sup> Specifically, SENS is the  $\xi_1$  coefficient from the following firm-specific regression:  $\text{ABNRET}_d = \xi_0 + \xi_1 \text{NETPURCHS}_d + v_d$ . ABNRET is the firm's one-day return minus the CRSP value-weighted return measured on the actual trade day; NETPURCHS is the firm's net insider purchases; and  $d$  is a subscript for trade day. I require three observations per firm for computations (i.e. each firm must have at least three active insider trade days during the year). This specification assumes the market response to trade signals occurs on the actual trade day, even though disclosure of trades can lag up to one month during the time period examined. Results are similar when ABNRET is measured on the day trades are filed with the SEC.

and  $i$  is a subscript for firm.

MVE, AVGTURN, HITECH, INSVOL and VARRET are proxies for the firm's level of litigation risk. Johnson, Nelson, and Pritchard (2002) suggest a firm's 10b5 litigation risk is increasing in its market capitalization, its share turnover, its affiliation with high-tech industries, and its insider sales volume. Jones (2002) suggests firms with higher price volatility are less likely to incur litigation costs. Although counterintuitive, Jones (2002) argues that 10b5 lawsuits are conditioned on large price drops and that lawyers are more prone to initiate suits if a large stock price drop is unexpected. Large stock price drops are expected less in firms with lower price volatility. If these proxies effectively capture a firm's level of litigation risk, I expect positive coefficients for MVE, AVGTURN, HITECH, INSVOL and a negative coefficient for VARRET.

SENS is a proxy for the firm's price response to disclosure of insiders' trades. If firms with higher price sensitivity to trade disclosure choose to disclose 10b5-1 participation, I expect a positive coefficient for SENS.

INSINFL is a proxy for the influence of insiders over the board of directors. If insiders prefer that firms not disclose information about their pending trades, I expect a negative coefficient for INSINFL. I also expect a negative coefficient for INSINFL interacted with both INSVOL and SENS if insiders are more reluctant to disclose information about pending trades when insiders tend to trade more volume and when the market tends to infer more from insider trade signals.

I begin with the primary sample of 288 firms that voluntarily disclose 10b5-1 participation between October 1, 2000 and December 31, 2002. I pool this with a sample of 63 nondisclosure firms that had insiders participating within 10b5-1 during the same period. This nets a beginning

sample of 351 firms. I collect market capitalization and industry data from COMPUSTAT, turnover and return variation data from CRSP, and insider trade volume data from the Thomson Financial Wealth Analytics database. I obtain board composition data from The Corporate Library, and fill in missing board data from corporate proxy statements. I delete 84 observations missing board composition data, 13 observations missing market value of equity data, and 79 more observations missing three insider trading days during the year ending September 2000 (to compute SENS). This results in a final sample of 175 (136 disclosure and 39 nondisclosure) firms for the analysis.

Table 10 reports the results of the probit regression. To test H7, I examine the coefficients on my proxies for litigation risk: MVE, HITECH, AVGTURN, VARRET, and INSVOL. In partial support of this hypothesis, I find the probability of disclosure is positively associated with the firm's market value of equity. I am not able to detect a significant relationship between my other litigation risk proxies and the disclosure choice, likely due to noise in the proxies.

Consistent with H8, I find a positive association between SENS and disclose. This suggests that firms with greater price response to disclosure of insiders' trades are more likely to disclose 10b5-1 participation. This suggests that firms might disclose participation to convey that pending trades are not informative.

Consistent with H9, I find some evidence that insider board influence is associated with the decision to disclose 10b5-1 participation. While I observe a negative coefficient for INSINFL, it is not statistically significant. However, both interactive coefficients,  $INSINFL * INSVOL$  and  $INSINFL * SENS$ , are negative and statistically significant at 10% (one-tailed) levels. This suggests that firms where insiders have greater board influence combined with larger insider trade volume or greater price sensitivity to insider trade signals are less likely to disclose 10b5-1

participation. This is consistent with insiders preferring to not disclose participation information because the disclosure might reduce pending trade profits.

Table 10. Firm Decision to Disclose 10b5-1 Participation

Probit estimation of the decision to disclose participation within a 10b5-1 plan on a sample of 175 firms.

$$\text{DISCLOSE}_i = \theta_0 + \theta_1\text{MVE}_i + \theta_2\text{HITECH}_i + \theta_3\text{AVGTURN}_i + \theta_4\text{VARRET}_i + \theta_5\text{INSVOL}_i + \theta_6\text{SENS}_i + \theta_7\text{INSINFL}_i + \theta_8[\text{INSVOL} * \text{INSINFL}]_i + \theta_9[\text{SENS} * \text{INSINFL}]_i + v_i$$

Variable	Predicted Sign	Coefficient	$\chi^2$	p-value
Intercept		0.8487	8.388	0.004
MVE	+	0.0001	3.618	0.029
HITECH	+	0.1808	0.378	0.269
AVGTURN	+	-7.7048	0.571	0.775
VARRET	-	6.1765	0.034	0.573
INSVOL	+	0.0004	0.260	0.350
SENS	+	38.5350	1.821	0.089
INSINFL	-	-0.2869	0.140	0.354
INSVOL * INSINFL	-	-0.0083	3.026	0.041
SENS * INSINFL	-	-240.027	2.024	0.077
Pseudo R-squared				0.130
% Concordant				65.7
% Discordant				33.5

DISCLOSE is a dichotomous variable that equals one if the firm chooses to disclose 10b5-1 participation and is zero otherwise.

MVE is the market value of equity at the end of September 2000.

HITECH is a dichotomous variable that equals one if the firm is a member of the computer hardware (SIC 3570-3577) or software (SIC 7370-7379) industries and is zero otherwise.

AVGTURN is the average firm daily trade volume scaled by shares outstanding during the year ending September 2000.

VARRET is the variance of daily stock returns for the year ending September 2000.

INSVOL is the cumulative insider trading dollar volume during the year ending September 2000.

SENS is the coefficient from a firm-specific regression of the one-day abnormal return on the magnitude of insider trade during that day.

INSINFL is the ratio of insider-directors to total directors on the firm's board.

$i$  is a subscript for firm.

## **8. Conclusion**

In this thesis, I examine how insiders respond to changes in litigation risk associated with Rule 10b5-1's safe harbor and how the Rule's safe harbor affects insiders' informed trade profits. Results suggest that Rule 10b5-1 improves participants' trade profits, which is not consistent with traditional regulatory intent.

Specifically, participation within the Rule is associated with: (1) insiders who have better access to and control over disclosure of nonpublic information; (2) increased trade volume that is not fully explained by proxies for insiders' diversification needs; (3) an increase in abnormal trade profits relative to periods preceding Rule adoption; (4) an increase in sales volume immediately preceding disclosure of negative management earnings forecasts (subject to my choice of trading windows); and (5) more sales volume by participants immediately preceding disclosure of negative management earnings forecasts than immediately following disclosure of these forecasts. Collectively, this evidence suggests that the Rule may have unintended results, or that these results may reflect the outcome of some alternative intent by the SEC. In any case, these results should interest those who care to evaluate the effects of the Rule and understand the costs and benefits associated with participation within the Rule.

I also examine firms' voluntary decision to disclose participation within Rule 10b5-1 to provide evidence of the costs and benefits associated with this disclosure choice. I find evidence that suggests firms disclose participation to reduce their litigation risk and to reduce stock price volatility associated with insiders' trade disclosures. Specifically, I find the decision to disclose participation is positively associated with firm size, which is a proxy for litigation risk, and a firm's stock price sensitivity to disclosure of insiders' trades. I also find evidence that suggests insiders prefer to not disclose participation because disclosure may reduce the profitability of

pending trades. Specifically, I find the decision to disclose participation is negatively associated with a proxy for insiders' influence over the board of directors interacted with both the firm's stock price sensitivity to disclosure of insiders' trades and the level of insider trade volume for the firm. These results should interest the SEC, which is currently evaluating a proposal to mandate disclosure of participation, since it provides some evidence of which firms might be most negatively affected by the disclosure mandate.

The Rule's disclosure environment provides an opportunity for future research regarding the market effects of pretrade disclosure. Admati and Pfleiderer (1991) model the market effects of predisclosing insiders' liquidity trades. They find that predisclosing insiders' demand for liquidity trade reduces uncertainty surrounding liquidity trade, improves the informativeness of the price at the time of trade, and reduces the total expected trading cost to all liquidity traders. This theoretical result provides testable empirical implications that might be examined within the Rule 10b5-1 disclosure setting. In addition, descriptive data in Chapter 2 shows wide variation in the substance of information regarding participation that is voluntarily provided by firms. It would be interesting to identify, in future research, what factors are associated with a firm's choice to provide more detailed information about participation relative to disclosures from other firms.

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## Appendix A. Stock Sales Plan

### Stock Selling Plan AmeriCredit Corp. Common Stock

January 15, 2001 through July 13, 2001

THIS STOCK SELLING PLAN (the "Plan") is executed by Clifton H. Morris, Jr. ("Executive"), an executive officer and stockholder of AmeriCredit Corp. ("AmeriCredit").

#### Recitals

A. Executive has decided to enter into this written plan of disposition to sell 700,000 shares of AmeriCredit common stock, which shares are comprised of (i) 282,666 shares to be acquired by Executive upon the exercise of certain stock options granted to Executive by AmeriCredit on April 28, 1994 that expire on April 28, 2001 (the "April Options"), (ii) 400,000 shares to be acquired by Executive upon the exercise of certain stock options granted to Executive by AmeriCredit on July 16, 1991 that expire on July 16, 2001 (the "July Options" and, together with the April Options, the "Options"), and (iii) 17,334 shares owned by Executive (the "Owned Shares" and, together with the shares to be acquired by Executive upon exercise of the Options, the "Plan Shares").

B. Executive has engaged Paine Webber ("Broker") to effect sales of the Plan Shares in accordance with this Plan, and to exercise the Options to the extent necessary to acquire the Plan Shares to be sold.

C. Executive acknowledges that he is not subject to any legal, regulatory or contractual restriction or undertaking that would prevent Broker from conducting sales in accordance with this Plan and is entering into this Plan in good faith. Further, Executive acknowledges that he is subject to AmeriCredit's insider trading policy (XIV-316), as supplemented and amended from time to time (the "Policy").

#### Agreement

In consideration of the foregoing, the Executive agrees to enter into this Plan in accordance with the following terms and conditions:

##### 1. Sales Plan; Exercise of Options.

(a) The Executive agrees and agrees to instruct the Broker to sell the Plan Shares and to exercise the Options to acquire the Plan Shares, as provided below:

(i) For the period commencing on January 15, 2001 and ending on and including January 31, 2001, Broker will sell as many as possible of the Plan Shares, and exercise the Options to acquire the Plan Shares to be sold, up to a maximum of 100,000 shares, at any per share price of \$28.50, or higher; provided, however, that the Options shall only be exercised by Broker to the extent the shares acquired therefrom will be sold pursuant to this Plan;

(ii) For the period commencing on February 1, 2001 and ending on and including February 28, 2001, Broker will sell as many as possible of the Plan Shares, and exercise the

Options to acquire the Plan Shares to be sold, up to a maximum of 100,000 shares, at any per share price of \$29.50, or higher; provided, however, that the Options shall only be exercised by Broker to the extent the shares acquired therefrom will be sold pursuant to this Plan;

(iii) For the period commencing on March 1, 2001 and ending on and including March 31, 2001, Broker will sell as many as possible of the Plan Shares, and exercise the Options to acquire the Plan Shares to be sold, up to a maximum of 100,000 shares, at any per share price of \$30.50, or higher; provided, however, that the Options shall only be exercised by Broker to the extent the shares acquired therefrom will be sold pursuant to this Plan;

(iv) For the period commencing on April 1, 2001 and ending on and including April 30, 2001, Broker will sell as many as possible of the Plan Shares, and exercise the Options to acquire the Plan Shares to be sold, up to a maximum of 100,000 shares, at any per share price of \$31.50, or higher; provided, however, that the Options shall only be exercised by Broker to the extent the shares acquired therefrom will be sold pursuant to this Plan; and, provided, further, to the extent that all or some portion of the April Options remain unexercised and the Plan Shares underlying such April Options remain unsold by Broker on April 1, 2001, then in such event the remaining, unexercised portion of the April Options shall be exercised in full and the Plan Shares underlying such April Options sold by Broker during the period from April 1, 2001 through April 27, 2001 at such times (within such period), in such amounts and at such per share price as will maximize the aggregate proceeds to Executive from such transactions;

(v) For the period commencing on May 1, 2001 and ending on and including May 30, 2001, Broker will sell as many as possible of the Plan Shares, and exercise the Options to acquire the Plan Shares to be sold, up to a maximum of 100,000 shares, at any per share price of \$32.50, or higher; provided, however, that the Options shall only be exercised by Broker to the extent the shares acquired therefrom will be sold pursuant to this Plan;

(vi) For the period commencing on June 1, 2001 and ending on and including June 30, 2001, Broker will sell as many as possible of the Plan Shares, and exercise the Options to acquire the Plan Shares to be sold, up to a maximum of 100,000 shares, at any per share price of \$33.50, or higher; provided, however, that the Options shall only be exercised by Broker to the extent the shares acquired therefrom will be sold pursuant to this Plan

(vii) For the period commencing on July 1, 2001 and ending on and including July 13, 2001, Broker will sell as many as possible of the Plan Shares, and exercise the Options to the extent necessary to acquire the Plan Shares to be sold, up to a maximum of 100,000 shares, at any per share price of \$34.50, or higher; provided, however, that the Options shall only be exercised by Broker to the extent the shares acquired therefrom will be sold pursuant to this Plan; and, provided, further, to the extent that all or some portion of the July Options remain unexercised and the Plan Shares underlying such July Options remain unsold by Broker on July 1, 2001, then in such event the remaining, unexercised portion of the July Options shall be exercised in full and the Plan Shares underlying such July Options sold by Broker during the period from July 1, 2001 through July 13, 2001 at such times (within such period), in such amounts and at such per share price as will maximize the aggregate proceeds to Executive from such transactions

(b) Notwithstanding anything to the contrary contained herein, the Plan Shares to be sold by Broker pursuant to Section 1(a) above shall be sold in the following order of priority: first, the shares acquired upon exercise of the April Options; second, the shares acquired upon exercise of the July Options; and third, the Owned Shares.

(c) All sales of Plan Shares and exercises of the Options to the extent necessary to acquire such Plan Shares will be placed through or effected by Broker. The timing (within each sales period specified above) and execution of all sales will be made at the sole discretion of Broker to maximize the value to the Executive, provided that in all cases the specified number of Plan Shares must be sold during each sales period specified above in section 1(a). The Executive will provide no other instruction or guidance to Broker with respect to any sales. Broker will be provided with a copy of this Plan. The Executive will obtain from Broker an acknowledgement of the receipt of this Plan and an agreement that Broker will cease sales (but not exercises of the Options, to the extent necessary to cause the Options to be exercised in full before the respective expirations thereof as provided above in section 1(a)) under this Plan at such time as Broker may become in possession of material nonpublic information regarding AmeriCredit (as that phrase is used in 17 C.F.R.(S)240.10b-5). The number of Plan Shares sold under this Plan will be appropriately adjusted from time to time to reflect any stock split, stock dividend, reorganization, reclassification, consolidation or similar event with respect to AmeriCredit common stock.

(d) Notwithstanding the sales provisions of this Plan, the Executive will cease all sales under this Plan (but not Option exercises, to the extent necessary to cause the Option to be exercised in full before the respective expirations thereof, as provided above in section 1(a)), and will instruct Broker to cease all sales, promptly upon notice from the Secretary of AmeriCredit that the independent directors of the AmeriCredit Board of Directors have determined that sales under this Plan must be suspended for the period determined by those directors. In this regard, the Executive acknowledges that it may be necessary or appropriate for AmeriCredit to instruct Executive to suspend sales under this Plan in connection with certain events, including without limitation public or private offerings of securities, mergers or acquisitions, tender offers or similar events.

(e) Broker will conduct all sales in accordance with the requirements of Rule 144 under the Securities Act of 1933, including, but not limited to, the completion and filing by Broker of appropriate Form 144s. Broker will be instructed by Executive to provide AmeriCredit any information requested by AmeriCredit in connection with AmeriCredit's efforts to determine compliance with the terms of this Plan by Executive and Broker. Executive will be responsible for all filings required under Section 16 of the Securities and Exchange Act of 1934 (i.e., Form 4 filings). It is the intent of the Executive that this Plan comply with the requirements of Rule 10b5-1 (c) under the Exchange Act and this Plan shall be interpreted to comply with the requirements of Rule 10b5-1 (c).

(f) Notwithstanding this Plan, Executive may sell or purchase shares of AmeriCredit common stock (other than Plan Shares) pursuant to the Policy and subject to the terms and conditions thereof, and such sales or purchases shall not be subject to this Plan.

3. Term. This Plan shall become effective on the date executed by the Executive and shall terminate on the earliest to occur of: (i) July 15, 2001, (ii) the date on which a total of 700,000 shares of AmeriCredit common stock have been sold in accordance with the terms of this Plan, and (iii) the death of the Executive; provided, however, that Executive may terminate this Plan at any time upon written notice delivered to Broker with a copy to the Secretary of AmeriCredit.

4. Covenants. The Executive acknowledges and agrees that he will not exert any influence over how, when or whether to effect sales of Plan Shares subsequent to the effective date of this Plan and during the time period the Plan remains in effect.

5. Filing of Plan. The Executive agrees to file a copy of this Plan with the Secretary of AmeriCredit. Executive further acknowledges and agrees that a copy of this Plan may be filed by AmeriCredit with the Securities and Exchange Commission ("SEC") and disclosed in reports filed by AmeriCredit with the SEC.

IN WITNESS WHEREOF, this Stock Selling Plan is executed and effective as of the date set forth below the Executive's signature below.

## Appendix B. Computation of LITRISK

To proxy for the insider's litigation-risk, I estimate a probit regression of the probability an insider will be specifically named as a defendant in 10b5 litigation within a sample of firms that defended 10b5 litigation complaints during 1999. From the Stanford Law School Securities Class Action Clearinghouse, I identify 35 firms that had 10b5 complaints with allegations of illegal insider trading during 1999. I hand collect the names of all defendants from each complaint or docket filed relating to the 10b5 action, which yields 154 individual defendants. I merge the 154 defendants into a dataset containing all possible defendants for each of the 35 firms, which I create by hand collecting the names of all directors and officers listed in each company's 1999 proxy statements. This yields a total of 382 insiders (including the 154 defendants). I delete 29 observations that are missing holdings and compensation data. I obtain trade data from the *Thomson Financial Insider Data Feed Lite* database. If trade data is missing, I set the trade activity variable (NETPURCHS) to zero. I estimate the following probit regression on the final sample of 353 insiders. I estimate using firm fixed effects to control for multiple observations within firm and firm-level omitted variables such as litigation-risk.

$$\text{DEFENDANT}_i = \alpha_1 + \alpha_2 \text{NETPURCHS}_i + \alpha_3 \text{CEODUM}_i + \alpha_4 \text{CBDUM}_i + \alpha_5 \text{DIRDUM}_i + \alpha_6 \text{CFODUM}_i + \alpha_7 \text{PRESUM}_i + \zeta_i \quad (\text{A1})$$

where:

DEFENDANT is a dichotomous variable that equals one if the insider is specifically named as a defendant in the 10b5 complaint (zero otherwise);

NETPURCHS is the total purchases minus sales by the insider during the 12-month period preceding the end of the class action period outlined in the 10b5 complaint, scaled by average shares outstanding;

CEODUM, CBDUM, DIRDUM, CFODUM and PRESUM are dichotomous variables that equal one if the insider held the position of CEO, Chairman of the Board, Director, CFO, or President, respectively (zero otherwise); and

$i$ , is a subscript for insider.

DEFENDANT and NETPURCHS are likely jointly determined.<sup>41</sup> To avoid simultaneity bias, I estimate a two-stage procedure outlined in Maddala (1983, 244) by including the following model.

$$\text{NETPURCHS}_i = \rho_1 + \rho_2 \text{DEFENDANT}_i + \rho_3 \text{HOLDS}_i + \rho_4 \text{STOCKCOMP}_i + \phi_i \quad (\text{A2});$$

where:

HOLDS is the insider's personal firm holdings scaled by total shares outstanding in the fiscal year ending prior to the beginning of the 12-month period for NETPURCHS; and

STOCKCOMP is the ratio of the value of stock compensation to total compensation paid to the insider in the fiscal year ending prior to the beginning of the 12-month period for NETPURCHS. The numerator is computed as the value of stock grants (5% growth assumption as provided in the proxy statements) plus restricted stock grant value. The denominator is the numerator plus salary, bonus, and all other pay.

Prior research suggests 10b5 litigation claims follow large price declines (Francis, Philbrick, and Schipper 1994; Jones 2002). Insiders' sales prior to these price declines are more likely to be scrutinized by outside shareholders for impropriety. On the other hand, insiders' purchases prior to price declines are less likely to be scrutinized, since insiders will have earned a negative return on the purchases. Therefore, I expect a negative relationship between DEFENDANT and NETPURCHS.

Since most 10b5 complaints allege accounting disclosure fraud, I expect a positive relationship between the probability of being named a defendant and CEODUM, PRESUM, and CFODUM, which represent insiders with the greatest control over accounting information.

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<sup>41</sup> I perform an exogeneity test in accordance with Smith and Blundell (1986), which rejects at the 1% level (two-tailed). Specifically, I estimate equation (A1) including the residual vector computed from equation (A2) as an independent variable. Since the coefficient on the residual vector is statistically different from zero, I reject the null of exogeneity.



I expect a positive relationship between DEFENDANT and both DIRDUM and CBDUM if plaintiffs hold directors responsible for the behavior that triggers 10b5 litigation or a negative relationship between these variables if plaintiffs believe directors are independent.

For equation (A2), I expect a positive relationship between NETPURCHS and DEFENDANT if the litigation-risk increases litigation costs of sales to insiders. I expect a negative relationship between these variables if insiders with higher litigation-risk are those who may profit more from informed stock sales. I expect a negative relationship between NETPURCHS and both HOLDS and STOCKCOMP to reflect insiders' portfolio rebalancing needs.

Table A1 outlines my results. Consistent with expectations, I find that insiders who sell shares are more likely to be named as 10b5 litigants and that this probability increases in the size of trades as a percentage of outstanding firm shares. Additionally, CEOs, board chairmen, and CFOs appear to be most susceptible to being named as litigants, perhaps because of their access to information and their control over firm disclosures. Outside directors are less likely to be named as 10b5 litigants. This is consistent with Black, Cheffins, and Klausner (2003) who suggest that outside directors have virtually no liability under any source of law.

Table A1. Determinants of Insiders' Litigation-risk

$$\text{DEFENDANT}_i = \alpha_1 + \alpha_2 \text{NETPURCHS}_i + \alpha_3 \text{CEODUM}_i + \alpha_4 \text{CBDUM}_i + \alpha_5 \text{DIRDUM}_i + \alpha_6 \text{CFODUM}_i + \alpha_7 \text{PRESUM}_i + \zeta_i \quad (\text{A1})$$

$$\text{NETPURCHS}_i = \rho_1 + \rho_2 \text{DEFENDANT}_i + \rho_3 \text{HOLDINGS}_i + \rho_4 \text{STOCKCOMP}_i + \phi_i \quad (\text{A2})$$

Simultaneous estimation on a sample of 353 corporate insiders at 35 firms defending 10b5 litigation during 1999. Firm fixed-effects coefficients are not reported.

Dependent Variable = DEFENDANT			
Variable	Prediction	Probit Estimation (p-value)	2-stage Probit Estimation (p-value)
Intercept		-0.939 (0.037)	-0.980 (0.030)
NETPURCHS	-	-0.122 (0.003)	-0.271 (0.000)
CEODUM	+	1.279 (0.001)	1.302 (0.001)
CBDUM	+/-	1.247 (0.002)	0.762 (0.070)
DIRDUM	+/-	-0.631 (0.003)	-0.674 (0.001)
CFODUM	+	1.154 (0.000)	1.174 (0.000)
PRESUM	+	1.140 (0.009)	0.550 (0.224)
% Concordant		88.8	89.6
% Discordant		10.8	10.3
Pseudo $R^2$		0.400	0.407

  

Dependent Variable = NETPURCHS			
Variable	Prediction	OLS Estimation (p-value)	2-stage OLS Estimation (p-value)
Intercept		-0.156 (0.908)	-0.139 (0.919)
DEFENDANT	+/-	-1.393 (0.021)	-1.452 (0.252)
HOLDS	-	-18.853 (<.0001)	-18.898 (<.0001)
STOCKCOMP	-	0.564 (0.730)	0.577 (0.729)
$R^2$		0.219	0.209
Adj $R^2$		0.130	0.119

DEFENDANT is a dichotomous variable that equals one if the insider is specifically named as a defendant in the 10b5 complaint (zero otherwise).

NETPURCHS is the total purchases minus sales by the insider during the 12-month period preceding the end of the class action period outlined in the 10b5 complaint, scaled by average shares outstanding.

CEODUM, CBDUM, DIRDUM, CFODUM and PRESUM are dichotomous variables that equal one if the insider held the position of CEO, Chairman of the Board, Director, CFO, or President, respectively (zero otherwise).

HOLDS is the insider's personal firm holdings scaled by total shares outstanding in the fiscal year ending prior to the beginning of the 12-month period for NETPURCHS; and

STOCKCOMP is the ratio of the value of stock compensation to total compensation paid to the insider in the fiscal year ending prior to the beginning of the 12-month period for NETPURCHS. The numerator is computed as the value of stock grants (5% growth assumption as provided in the proxy statements) plus restricted stock grant value. The denominator is the numerator plus salary, bonus, and all other pay.

## VITA

Alan Jagolinzer was born in Portland, Maine. After graduating from East Providence Senior High School in Rhode Island, Alan attended the Pennsylvania State University where he earned his B. S. degree in Accounting, *with distinction* and learned to devote his life to Nittany Lions football. Alan served ten years with the United States Air Force as a T-37B Instructor, Evaluator, and Spin Demonstration Pilot and an E-3 AWACS Aircraft Commander. He served in operations supporting United Nations sanctions against Iraq, refugee extraction during the Yemen civil war, and interdiction of drug smuggling aircraft. Alan completed his M. B. A. degree through Syracuse University and his Ph.D. in Business Administration with a concentration in accounting at the Pennsylvania State University. Alan is currently an assistant professor at the Stanford University Graduate School of Business, and lives in Woodside, California with his wife, Connie, and his daughters Megan and Taylor.