

## Insider Trading After the 2022 Rule 10b5-1 Amendment

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### Abstract

We investigate the impact of the controversial 2022 amendment to Rule 10b5-1, which imposed a cooling-off period and restricted overlapping and single-trade plans on prearranged insider transactions. The amendment led insiders to (i) execute stock sales under 10b5-1 plans with longer cooling-off periods; (ii) curtail opportunistic sales under 10b5-1 plans prior to stock price drops or earnings misses; (iii) limit the backdating of stock gifts; and (iv) decrease the granting of options around material information events. Further evidence suggests a reduction in opportunistic 10b5-1 trades rather than a migration toward non-10b5-1 sales. However, we find that firms more affected by the rule amendment experience lower price efficiency after the amendment, implying a potential cost of restricting the flow of information through insider trading. In addition, terminations of 10b5-1 plans are associated with positive subsequent stock returns, suggesting that insiders avoid selling when they expect favorable news. Overall, our findings indicate that while the amendment substantially curtailed the opportunistic use of 10b5-1 plans, it increased the costs of 10b5-1 plans and lowered stock price efficiency.

**Keywords:** insider trading; 10b5-1; regulation.

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## Insider Trading After the 2022 Rule 10b5-1 Amendment

### 1 Introduction

In this paper, we provide the first evidence to evaluate whether the 2022 amendment to Rule 10b5-1 by the SEC achieved its intended goal of curbing opportunistic insider trading. Established in 2000, Rule 10b5-1 was designed to provide insiders with a compliant way to trade their own shares without violating insider trading laws. A trading plan adopted pursuant to Rule 10b5-1 may serve as an affirmative defense against allegations of insider trading, provided the plan was adopted at a time when the insider was not in possession of material nonpublic information (MNPI). However, critics highlight significant loopholes in the rule: corporate insiders can (i) commence trades soon after adopting a 10b5-1 plan; (ii) adopt multiple overlapping plans and selectively cancel trades; and (iii) influence a company's timing of the release of MNPI to benefit their trading schedules.<sup>1</sup>

In December 2022, the SEC announced an amendment to Rule 10b5-1 and introduced five key measures: (i) a 90-day cooling-off period following plan adoption or modification, ending no earlier than two business days after the 10-Q/K filing for the quarter in which the plan was adopted or modified; (ii) limitations on the number of Rule 10b5-1 plans an insider may have and on single-trade arrangements; (iii) a certification from insiders that when they adopt or modify a plan that they are acting in good faith and have no MNPI; (iv) new disclosures by companies about Rule 10b5-1 plans, insider trading policies, and option grant practices; and (v) applying the good faith requirement not only at adoption but throughout the duration of the plan.

Despite the SEC's claim that the new rule would curb opportunistic insider trading, the amendment was heavily criticized by law firms and industry trade associations. Dissenters argued that (i) the cooling-off period of 90 days was too long; (ii) the amendments would discourage insiders from setting up 10b5-1 plans; and (iii) the ban on overlapping plans was far too overreaching.<sup>2</sup>

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<sup>1</sup> HR Policy Association, "Re: Rule 10b5-1 and Insider Trading (Release Nos. 33-11013, 34-93782; File No. S7-20-21)" (April 1, 2022) <https://www.sec.gov/comments/s7-20-21/s72021-20122207-278246.pdf>.

<sup>2</sup> Association of the Bar of the City of New York, "Re: File No. S7-20-21 Rule 10b5-1 and Insider Trading" (October 28, 2022) <https://www.sec.gov/comments/s7-20-21/s72021-20148519-314873.pdf>.

Arguing for the rule, Senators Warren, Van Hollen, Baldwin, and Sanders asserted that abuse of 10b5-1 plans was rampant.<sup>3</sup> They pointed to a Wall Street Journal analysis released in June 2022, finding that about a fifth of sales by corporate insiders occur within 60 days of 10b5-1 plan adoption.<sup>4</sup> The analysis further noted that insiders who sold within this timeframe earned \$500 million more in profits than they would have if they had waited three months to sell. The Journal’s analysis also found that insiders often adopted plans just before a quarter ended and sold stock before the quarter’s results were made public, with some executives even trading on the same day they adopted the plan. As Professor Nejat Seyhun put it, when CEOs use recently adopted plans to sell stock in advance of negative news, it “isn’t a smoking gun, it’s a smoking bazooka,” raising serious concerns about insider trading.

Several papers provide evidence of opportunistic trades under the original Rule 10b5-1 consistent with these senators’ statements (Jagolinzer 2009; Henderson, Jagolinzer, and Muller 2015; Larcker et al. 2021). However, a few studies provide a more optimistic perspective on the rule’s potential to deter abusive trading practices. Fich, Parrino, and Tran (2023) find that trades made under the older 10b5-1 plans are generally less opportunistic than those made outside of 10b5-1 plans, and Henry, Plesko, and Rawson (2024) find that, during the pandemic, insider selling was profitable only for non-10b5-1 trades. In sum, there is considerable debate on the efficacy of the 10b5-1 amendment. Our paper provides early evidence on this debate.

We begin by examining whether and how insider stock transactions have changed after the new rule became effective. We focus on insider sales and not purchases, as purchases under 10b5-1 plans are relatively rare and typically much smaller in size. Consistent with the imposition of a cooling-off period under the amended 10b5-1 rule, we document a significant decrease in sales made soon after plan adoption: the proportion of sales under 10b5-1 plans made within 90 days of plan adoption drops from 31.1 percent

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<sup>3</sup> Letter to Chair Gensler by Senators Warren, Van Hollen, Baldwin, and Sanders (August 12, 2022) <https://www.sec.gov/comments/s7-20-21/s72021-20136042-306780.pdf>.

<sup>4</sup> McGinty, T. and M. Maremount, “CEO stock sales raise questions about insider trading,” *Wall Street Journal*, June 29, 2022, <https://www.wsj.com/articles/executive-stock-sales-questions-insider-trading-11656514551>.

to 1.7 percent following the amendment.

Next, we assess whether the proportion of insider sales under 10b5-1 plans changes after the amendment. As discussed above, critics argued that the amendment might discourage insiders from using 10b5-1 plans, leading them to transact outside of these plans. Consistent with this concern, we find a statistically significant decline in the proportion of sales executed under 10b5-1 plans relative to total insider sales, from 52.5 percent to 50.3 percent. While the economic magnitude of this decline is relatively modest, we find evidence consistent with under-reporting of 10b5-1 sales during the pre-period when the Form 4 checkbox was not mandated. Thus, our estimates of the post-amendment shift away from 10b5-1 plans likely represent a lower bound.

We then evaluate whether the amendment limits the opportunistic use of 10b5-1 plans. Prior studies document a pattern of negative stock returns immediately following the announcement of insider sales under 10b5-1 plans, indicating opportunistic behavior (Jagolinzer 2009; Henderson et al. 2015). Milian (2016) also documents that insiders sell prior to bad earnings news using 10b5-1 plans. We find that, following the amendment, insider sales under 10b5-1 plans are less associated with subsequent negative abnormal returns, and insiders are less likely to sell under 10b5-1 plans before earnings misses. Collectively, these findings indicate that the amendment has, by and large, succeeded in curbing opportunistic trading based on MNPI under 10b5-1 plans.

Next, given that we find insider trading activity has shifted from 10b5-1 to non-10b5-1 sales following the amendment, we also examine abnormal return patterns around non-10b5-1 transactions. We find that abnormal returns following non-10b5-1 sales have significantly increased, suggesting a decline in opportunistic behavior in these transactions as well, potentially due to general deterrence effects of the amendment. However, when comparing the improvement between 10b5-1 and non-10b5-1 sales in a difference-in-difference framework, we find that the cumulative abnormal returns associated with 10b5-1 sales have increased more significantly. Additionally, insiders using 10b5-1 plans are less likely to sell shares before an earnings miss compared to those selling outside of such plans. Overall, while opportunistic trading in non-10b5-1 sales has also declined, the reduction is less pronounced than that observed in 10b5-

1 sales. These findings are largely robust to using different measures of abnormal returns and different pre-periods as controls, which mitigates the concern that our results are driven by changes in market conditions around the rule amendment.

A natural follow-up question is whether the decline in opportunistic trading under 10b5-1 plans reflects a true reduction in such behavior or a shift to non-10b5-1 transactions. To address this, we focus on potential abusers who historically sold shares shortly after plan adoption and are likely to face higher compliance costs due to the cooling-off provision. We examine whether these insiders are more likely to move their transactions outside of 10b5-1 plans and whether their non-10b5-1 sales exhibit signs of increased opportunism post-amendment. Our findings show that these potential abusers reduced their use of 10b5-1 plans by 8.6 percentage points more than other insiders after the amendment. This change is driven by the sharp decline in the number of 10b5-1 trades by potential abusers post-amendment, while the number of non-10b5-1 trades remains relatively stable. Moreover, even among abusers who continue using 10b5-1 plans, the amended rules, especially the mandatory cooling-off period, appear to constrain opportunistic behavior. This pattern is more consistent with a reduction in opportunistic trading under 10b5-1 plans rather than a migration toward non-10b5-1 sales.

However, these potential abusers persist in engaging in opportunistic trading through non-10b5-1 channels. Taken together, the evidence suggests that while the Rule 10b5-1 amendment significantly curtailed opportunistic trading under 10b5-1 plans, it did not fully eliminate such behavior, particularly for trades executed outside of these plans.

Next, we examine cross-sectional differences based on the strength of firm-level insider trading policies. We proxy for the strength of insider trading policies using the prevalence of 10b5-1 sales with short cooling-off periods across firms. We find that the effects of the amendment on constraining opportunistic insider selling are concentrated among firms with weaker insider trading policies (i.e., firms that potentially abused 10b5-1 sales before the amendment). This result reinforces the interpretation that the amendment curtailed opportunistic behavior most effectively where internal insider trading policies were less robust.

Finally, we study the potential costs of the amendment to provide a more balanced and policy-relevant assessment of its impact. We investigate whether the amendment adversely affected price efficiency by limiting the information conveyed through insider trading. To evaluate this, we employ variance ratios from WRDS Intraday Indicators, which compare return volatility over different time horizons (e.g., 15-second versus 5-second intervals). Under market efficiency, volatility measured over longer windows should approximate that of shorter windows; thus, greater deviation from a variance ratio of one indicates lower price efficiency. We find that firms most affected by the amendment—those with high pre-amendment reliance on short cooling-off periods—exhibit variance ratios that deviate more from one following the rule change, indicating a decline in price efficiency. These results suggest that while the amendment curtailed opportunistic insider sales, it may have come at the modest cost of reducing market efficiency by dampening the information content of insider sales.

Our findings are subject to two important caveats. First, our analysis of opportunistic behavior based on post-sale abnormal stock returns is inherently a joint test of both the informational content of insider trades and investor perception of those trades. The observed increase in post-sale abnormal returns can also be driven by a change in investor belief that 10b5-1 sales are less informed under the amended Rule 10b5-1. To address this concern, we examine the price impact (Kyle's  $\lambda$ ) of insider sales on the transaction date, which is typically one to two days prior to the public disclosure via Form 4. Because investors are unaware of the trade or its 10b5-1 designation at transaction execution, this analysis is less likely to be confounded by changes in investor perception. We find that the price impact of 10b5-1 sales declines in the post-amendment period, consistent with a reduction in informational content or opportunistic behavior.

Second, as alluded to in the first paragraph, abnormal returns following insider trades do not necessarily imply trading on material nonpublic information (MNPI). Instead, corporate executives may earn abnormal returns by trading on market mispricing of public information. To address this concern, we examine whether our results are robust to trades less likely to be motivated by public mispricing. We use short interest as a proxy for publicly recognized overvaluation (Dechow et al. 2001; Ben-David, Drake, and

Roulstone 2015) in the context of insider selling. We partition the sample by the median level of short interest prior to each insider sale and test for differential return patterns. We find that the observed reduction in abnormal post-sale returns persists even when short interest is low (i.e., in settings where mispricing of public information is unlikely).

Finally, to evaluate the amended rules more comprehensively, we conduct three supplementary analyses. First, we examine whether terminations of 10b5-1 plans are associated with positive stock returns, indicating that insiders still may cancel plans in anticipation of higher future returns. Jagolinzer (2009) provided early evidence of plan terminations before positive stock returns based on voluntary disclosures of terminations. Similarly, Voelcker (2024) shows that insiders do not completely follow through with their preplanned stock sales prior to a future increase in the stock price. The amendment added disclosure requirements for plan terminations in subsequent 10-Q/K filings. Hence, the disclosure requirement may curb opportunistic plan termination. Because we do not have a comprehensive sample of plan terminations prior to the rule amendment, we cannot test whether plan termination behavior has changed. However, we find that terminations disclosed after the amendment are followed by positive returns, suggesting that insiders avoid selling when stock returns are expected to go up. We conjecture that perhaps a timelier disclosure requirement for terminations may help fully deter opportunistic plan cancellations.

Second, we examine the effect of requiring timely disclosure of insider stock gifts, a measure aimed at curbing the backdating of gifts to coincide with local price peaks.<sup>5</sup> Prior to the amendment, stock gifts were allowed to be reported long after the transaction, enabling insiders to backdate the gift to obtain greater tax benefits. Hence, prior studies documented a pattern of stock prices increasing up to the gift date and then declining subsequently (Yermack 2009; Avci et al. 2021; Yost and Shu 2022). By requiring timely disclosure of stock gifts, the amendment reduced the opportunity to backdate. Our results show that stock prices no longer fall after the gift date, consistent with reduced backdating. Although in different contexts, our two additional tests highlight the importance of timely disclosure in curbing opportunistic behavior.

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<sup>5</sup> A stock gift involves a transfer of ownership of the stock from a corporate insider to an institution or individual, for various reasons such as personal generosity, tax benefits, or estate planning.

Third, we examine the provision requiring the reporting of option grants made close to material information disclosures. The SEC was concerned with option grants made shortly before good news or shortly after bad news intended to benefit option recipients (Yermack 1997; Aboody and Kasznik 2000). Under the amendment, option grants made within [-4,+1] business days of a 10-Q/K filing or an 8-K filing with MNPI are required to be disclosed in the following proxy statement. However, this information was publicly available even before the amendment in a timely manner: one could link the timing of news disclosures to the option grants reported in Form 4 filings. Still, we find that firms are less likely to grant options close to material information disclosure dates, consistent with them trying to avoid option grants that may raise suspicion. However, we do not find any evidence of opportunistic option grant behavior before or because of the amendment.

Our study contributes to the literature on the effectiveness of Rule 10b5-1 in restricting opportunistic insider trading. The efficacy of the amended rule was intensely debated. Our study provides critical evidence on whether the amendment achieved its intended goal of reducing opportunistic insider trading. We evaluate whether the past abuses of 10b5-1 documented in the scholarly literature (Jagolinzer 2009; Henderson et al. 2015; Larcker et al. 2021) have been mitigated or continue to be observed after the amended 10b5-1 rule. We believe that conducting a post-implementation review is a crucial step in assessing the efficacy of the SEC's regulatory initiatives, a question that has been debated extensively in the literature (Cochrane 2014). Our paper also identifies unintended consequences of the amendment on insider trading outside of 10b5-1 plans. Finally, our evidence is potentially useful for policymakers, practitioners, and researchers aiming to strike a balance between preventing abuse of private information and allowing insiders to engage in legitimate transactions without excessive litigation risk.

## **2 Background and Related Literature**

### **2.1 Rule 10b5-1 and the 2022 Amendment**

Rule 10b5-1, introduced in 2000, provides a mechanism for corporate insiders to trade company stock under prearranged plans, protecting them from insider trading allegations, if the plan was established

in good faith while not in possession of MNPI. These plans enable trades on a predetermined schedule, irrespective of the insider's later access to MNPI at the time of execution. Over time, however, concerns have arisen about significant loopholes in the rule, including the absence of a mandatory cooling-off period, the ability to maintain overlapping plans and terminate plans at will, and the frequent use of single-trade plans. These weaknesses have been exploited by some insiders to engage in opportunistic trading while preserving a defense against regulatory scrutiny (Jagolinzer 2009; Henderson et al. 2015). Such concerns led to calls for reform to enhance the rule's safeguards against abuse.

The amendment introduced several key changes aimed at enhancing the rule's integrity and curbing potential misuse by insiders. The amendment mandated a cooling-off period between the adoption or modification of a 10b5-1 plan and the execution of the first trade under the plan, thereby preventing insiders from trading immediately after establishing a plan, significantly reducing the potential to trade under a 10b5-1 plan while in possession of MNPI. The new rule also prohibited overlapping plans, addressing concerns about insiders using multiple plans to cherry-pick advantageous trades. Additionally, single-trade plans were limited to one plan per 12-month period, reducing their potential use for opportunistic one-off trades. The amendment further requires public companies to disclose detailed information about the adoption, modification, and termination of 10b5-1 plans, as well as their insider trading policies, in periodic filings, thereby enhancing transparency for investors. Finally, the amendment introduced a certification requirement, obligating insiders to attest that the plan is being adopted in good faith and not based on MNPI. To be sure, even prior to the amendment, 10b5-1 plans had to be adopted when not in possession of MNPI, but no certification was required. These measures collectively aim to curb the opportunistic use of 10b5-1 plans and align insider trading practices with the rule's original intent.

The discussion about amending Rule 10b5-1 surfaced with the SEC Chair Clayton calling for a cooling-off period mandate in September 2020.<sup>6</sup> Rule 10b5-1 sales came under greater scrutiny as several executives at COVID-19 vaccine developers made well-timed sales under 10b5-1 plans in late 2020, and

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<sup>6</sup> Letter to Chairman Sherman by Jay Clayton (September 14, 2020) <https://www.sec.gov/files/clayton-letter-to-chairman-sherman-20200914.pdf>.

those transactions were reported in the business media.<sup>7</sup> Larcker et al. (2021), in January 2021, released a report documenting that insiders sell soon after adopting 10b5-1 plans. These events led to more calls for reform by lawmakers.<sup>8</sup> In March 2021, SEC Commissioner Crenshaw and Professor Daniel Taylor urged a cooling-off period and additional disclosure on 10b5-1 plans.<sup>9</sup> In June 2021, SEC Chair Gensler announced that the SEC was considering changes to Rule 10b5-1, including a four- to six-month cooling-off period, limits on canceling plans, disclosure requirements for adoption, modification, and termination, and limits on multiple overlapping plans.<sup>10</sup> The proposed rule was released on December 15, 2021, proposing a 120-day cooling-off period.<sup>11</sup> The final rule was released on December 14, 2022, with a change to the cooling-off period from 120 days to 90 days, ending no earlier than two business days after the 10-Q/K filing for the quarter in which the plan was adopted or modified.<sup>12</sup> The provisions became effective in early 2023.

Prior to the amendment, Rule 10b5-1 trading plans generally provided a reasonably strong (but not definitive) defense for executives against securities fraud claims. In numerous securities fraud cases, trades executed under Rule 10b5-1 plans have typically not been viewed as indicative of suspicious intent or scienter, even when they occur shortly after the plan's adoption or the plan is adopted during the class period (Drylewski, Milstead, and Rasheed 2022). However, in cases such as *Employees' Retirement System of the Government of the Virgin Islands v. Blanford* (2015) and *Indiana Public Retirement System v. Pluralsight* (2022), the courts did not find the defendants' Rule 10b5-1 defense persuasive because they sold soon after plan adoption or the sales during the class period were sizable and unusual.<sup>13</sup> The SEC's rule amendment

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<sup>7</sup> Hopkins, J.S. and G. Zuckerman, "Pfizer CEO joins host of executives at Covid-19 vaccine makers in big stock sale," *Wall Street Journal*, November 11, 2020. <https://www.wsj.com/articles/pfizer-ceo-joins-host-of-executives-at-covid-19-vaccine-makers-in-big-stock-sale-11605139164>.

<sup>8</sup> Letter to Acting Chair Lee by Senators Warren, Brown, and Van Hollen (February 12, 2021) <https://www.banking.senate.gov/newsroom/majority/warren-brown-van-hollen-sec-insider-trading-rule>.

<sup>9</sup> Crenshaw, C. and D. Taylor, "Insider Trading Loopholes Need to Be Closed," *Bloomberg*, March 15, 2021. <https://www.bloomberg.com/opinion/articles/2021-03-15/insider-trading-loopholes-need-to-be-closed>.

<sup>10</sup> Prepared remarks before the CFO Network Summit by Chair Gary Gensler (June 7, 2021) <https://www.sec.gov/newsroom/speeches-statements/gensler-cfo-network-2021-06-07>.

<sup>11</sup> Rule 10b5-1 and Insider Trading, proposed rule. <https://www.sec.gov/files/rules/proposed/2022/33-11013.pdf>.

<sup>12</sup> Rule 10b5-1 and Insider Trading, final rule. <https://www.sec.gov/files/rules/final/2022/33-11138.pdf>.

<sup>13</sup> The Pluralsight case was influenced an amicus brief arguing that 10b5-1 sales that are disproportionately large and have short cooling-off periods should not qualify as an affirmative defense against securities fraud charges. <https://ai-analytics.wharton.upenn.edu/wp-content/uploads/2022/04/Amicus-Curiae-in-Support-of-Claims-that-10B5-1-Trading-Plans-Can-Be-Probative-of-Scienter.pdf>.

has substantially raised the bar for a successful 10b5-1 defense, although a significant body of case law has not yet emerged.

We define the post-amendment period (*Post*) as beginning on April 1, 2023, which is the effective date for amendments to Form 4 reporting, disclosure of 10b5-1 plan termination, and extended option grant timing disclosure. However, the adoption of a 90-day cooling-off period and stock gift reporting had an effective date of February 27, 2023. We use April 1, 2023 for consistency and because sales under 10b5-1 plans adopted before February 27, 2023, were grandfathered in and allowed to sell within 90 days of adoption. Our results remain unchanged if we define *Post* using the February 27, 2023, cutoff. See Appendix A for a summarized timeline of events related to the amendment.

The amendment significantly tightens the regulatory framework governing insider trading under Rule 10b5-1. By imposing stricter procedural safeguards and enhancing disclosure requirements, the SEC aims to address long-standing concerns about the misuse of these plans while maintaining their purpose of enabling legitimate, prearranged trades. However, these changes also raised concerns about unintended consequences, such as a shift towards insider sales outside of 10b5-1 sales. The broader implications of these reforms warrant further investigation to assess their effectiveness and potential trade-offs.

## **2.2 Debate about the Efficacy of the Amendment**

In this sub-section, we summarize the key objections to the amendment and our attempt to provide evidence related to these objections. Several commentators objected to the draft version of the amendment on the following grounds:

- (i) *The SEC has not demonstrated market failure:* The National Association of Manufacturers argues, “under current law, officers and directors are already prohibited from entering into a Rule 10b5-1 plan when they are aware of MNPI about an issuer or its securities. They are also required to enter into any plan “in good faith and not as part of a plan or scheme to evade the prohibitions” of Rule 10b5-1.”<sup>14</sup>

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<sup>14</sup> National Association of Manufacturers, “Re: File No. S7-20-21; Release Nos. 33-11013, 34-93782: Rule 10b5-1 and Insider Trading” (April 1, 2022) <https://www.sec.gov/comments/s7-20-21/s72021-20122034-275415.pdf>.

- (ii) *Longer cooling periods will lead to alternate means to transact:* The American Bar Association was against the longer 90-day cooling-off period. They point out, “the longer the required cooling-off period, the more those with legitimate trading needs, such as unforeseen liquidity requirements, will use alternative means to transact, resulting in a chilling effect on the use of Rule 10b5-1.”<sup>15</sup>
- (iii) *Evidence of abuse is overstated:* Wilson Sonsini, the law firm, argued, “such concerns, however, appear to be premised on the erroneous assumption that Section 16 officers and directors routinely seek to engage in fraudulent conduct. In our experience, the opposite is true: the overwhelming majority of Section 16 officers and directors seek to comply with existing rules and regulations and their fiduciary duties. Indeed, some Section 16 officers cancel 10b5-1 trading plans that are about to trade at highly advantageous times and prices in order to avoid even the appearance that the predetermined transactions yield disproportionate personal benefit or advantage, even though the plan was instituted long before the officer knew or could have known the good news that moved the company’s stock price higher.”<sup>16</sup>
- (iv) *Insiders will transact outside the 10b5-1 regime:* An interest group, consisting of the US Chamber of Commerce and NIRI (National Investor Relations Institute) warned, “in seeking to update Rule 10b5-1, the SEC should be careful that any new requirements do not make operating a plan so cost-prohibitive that insiders refrain from establishing a plan in the first place.”<sup>17</sup>
- (v) *The gift reporting window is too short:* The HR Policy Association points out, “the proposed requirement to report gift transactions within two business days is unnecessarily short and will increase compliance burdens while offering little benefit to the public. The Commission should consider removing this requirement or permitting a longer period (e.g., 45 days) for filing.”<sup>18</sup>

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<sup>15</sup> American Bar Association “Re: File No. S7-20-21 Release Nos. 33-11013; 34-93782 Rule 10b5-1 and Insider Trading” (April 29, 2022) <https://www.sec.gov/comments/s7-20-21/s72021-20127542-288684.pdf>.

<sup>16</sup> Wilson Sonsini, “Re: File No. S7-20-21; Rule 10b5-1 and Insider Trading” (April 11, 2022) <https://www.sec.gov/comments/s7-20-21/s72021-20125146-284365.pdf>.

<sup>17</sup> American Property Casualty Insurance Association et al., “Re: Share Repurchase Disclosure Modernization (Release Nos. 34-93783, IC-34440; File No. S7-21-21); Rule 10b5-1 and Insider Trading (Release Nos. 33-11013, 34-93782; File No. S7-20-21)” (April 1, 2022) <https://www.sec.gov/comments/s7-20-21/s72021-20122313-278364.pdf>.

<sup>18</sup> HR Policy Association, “Re: Rule 10b5-1 and Insider Trading (Release Nos. 33-11013, 34-93782; File No. S7-20-21)” (April 1, 2022) <https://www.sec.gov/comments/s7-20-21/s72021-20122207-278246.pdf>.

Our empirical analyses attempt to specifically address these objections. Sections 4 and 5 assess whether opportunistic insider selling was evident prior to the amendment to address, thereby evaluating the SEC's justification for regulatory intervention and addressing claims that the extent of abuse may have been overstated. Specifically, Section 4.1 examines the effect of imposing a cooling-off period on the timing of insider trade. Section 4.2 investigates whether insiders shifted their trades outside the 10b5-1 framework following the amendment. Section 4.3 evaluates whether 10b5-1 sales became less opportunistic post-amendment. Finally, Section 5.2 examines the backdating of gifts by insiders.

### **2.3 Related Literature**

Several studies highlight the controversy surrounding the effectiveness of Rule 10b5-1 plans in preventing opportunistic insider trading. On the one hand, Jagolinzer (2009), Henderson et al. (2015), and Larcker et al. (2021) document evidence of insiders exploiting 10b5-1 plans to engage in opportunistic sales and selling shortly after plan adoption. These findings suggest that the original Rule 10b5-1 contained significant loopholes that insiders could exploit, raising the necessity for regulatory adjustments that could effectively curb such behavior.

On the other hand, a few studies provide a more optimistic perspective on the rule's potential to deter abusive trading practices. Fich et al. (2023) find that trades conducted under 10b5-1 plans are generally less opportunistic than non-10b5-1 plan sales, indicating that the rule might already be effective in mitigating abusive behavior in certain contexts. Similarly, Henry et al. (2024) report that during the COVID-19 pandemic, insider sales were profitable only for non-10b5-1 trades, suggesting that even without a cooling-off period, the rule restricted opportunistic trading during periods of market stress.

Theoretical work adds nuance to this debate. Deng et al. (2024) model the effects of introducing mandatory cooling-off periods and find that such measures could reduce the frequency of opportunistic trades. This aligns with the intent of the 2022 amendment to Rule 10b5-1, which introduced a cooling-off period. However, theoretical predictions do not always translate into real-world effectiveness, leaving open the question of whether this regulatory change can truly close loopholes or if insiders will find alternative

ways to exploit the system.

Comparisons to similar regulations in other jurisdictions provide additional context, highlighting the unique features of the U.S. regulatory framework. Guo and Ke (2024) and Ye, Zeng, and Zhang (2025) examine insider trading regulations in China, which require pre-disclosure of all insider sales, including specifics such as the amount, reason, and duration of the sales period, alongside a 15-day cooling-off period. By contrast, U.S. Rule 10b5-1 plans are voluntary, and disclosures of plan adoption are required only in subsequent 10-Q/K filings. The voluntary nature of Rule 10b5-1 plans continues to differentiate it from China's regulatory regime, which requires pre-disclosure for all insiders.

Insights from parallel settings also provide implications for the context we study. Bernard et al. (2022) analyze bettors' reactions to horse race disclosures, finding that bettors often fail to fully incorporate new information into their decision-making. This behavioral evidence suggests that stronger regulations may be necessary to limit insiders' ability to exploit private information, as market participants might not fully anticipate opportunistic behavior even under enhanced disclosure regimes.

Overall, the existing literature underscores the complex nature of the trade-offs involved in regulating insider trading. While some evidence supports the potential effectiveness of Rule 10b5-1 in curbing abuse, persistent concerns about its loopholes and the voluntary nature of its provisions leave room for skepticism. The Rule 10b5-1 amendment introduces significant reforms aimed at enhancing market transparency and integrity, but its actual impact remains an empirical question.

### **3 Sample Construction**

We use insider transactions by officers and directors from 2021 to 2024 provided by the SEC Division of Economic and Risk Analysis (DERA).<sup>19</sup> The pre-period includes nine quarters from 2021Q1 to 2023Q1, and the post-period includes seven quarters from 2023Q2 to 2024Q4. We begin our sample in 2021 to ensure that the pre- and post-periods are balanced, thereby capturing the effect of the rule

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<sup>19</sup> We exclude Section 16 insiders who are not officers and directors because they were not subject to the 90-day cooling-off provision.

amendment tightly. We exclude 2020 to minimize the impact of the pandemic and to compare the insider sales within a consistent regulatory environment. The first Trump administration had weaker enforcement of insider trading, while the Biden administration, which began in January 2021, was perceived to have strengthened such enforcement.<sup>20</sup>

We rely on two sources to determine whether an insider sale is pursuant to Rule 10b5-1 plans: the footnote and checkbox of Form 4 filings. First, if the footnote text includes variants of “10b5-1,” we classify those trades as 10b5-1.<sup>21</sup> The footnote disclosure, which we obtain from the SEC DERA Insider Transactions dataset, is voluntary. Second, if the 10b5-1 checkbox is checked, we classify those trades as 10b5-1. The checkbox is unavailable for the pre-period and is mandatory for filings on and after March 20, 2023. We obtain the checkbox information from Insiders Data by WRDS. To most accurately distinguish between 10b5-1 and non-10b5-1 trades, we rely on both data sources, even though relying on the checkbox, which is only available for the post-period, may reduce intertemporal comparability. We discuss the implications of this approach in Section 4.2.

We also scrape Form 4 footnotes for the plan adoption date, when available, to calculate the number of days from plan adoption to execution. The percentage of 10b5-1 sales that disclose the plan adoption date increases from around 50% in the pre-amendment period to around 80% in the post-amendment period (Figure OA1 of the Online Appendix). The amendment required the disclosure of the plan adoption date, which explains the increased disclosure rate following the amendment. But the final rule did not specify where to disclose the date of adoption, nor did the Form 4 designate space to report this information, which may explain the less-than-full compliance. Because we find significantly more insider sales made shortly after plan adoption during the pre-period when plan adoption date disclosure was voluntary, underreporting

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<sup>20</sup> See, for example, NPR, “Under Trump, SEC enforcement of insider trading dropped to lowest point in decades,” (August 14, 2020) and DLA Piper, “Expectations for white collar enforcement under the Biden Administration,” (February 17, 2021).

<sup>21</sup> We drop Form 4 filings if the footnote mentions “automatic sales instruction,” as it is difficult to classify whether they qualify as Rule 10b5-1 or not. If the footnote mentions a “non-Rule 10b5-1” plan, we classify it as a non-10b5-1 trade. A non-Rule 10b5-1 trading arrangement refers to a trading plan that does not satisfy Rule 10b5-1 requirements, such as the cooling-off period. Our search of non-Rule 10b5-1 adoptions in 10-Q/K filings suggests that the use of non-Rule 10b5-1 plans is relatively rare.

during the pre-period biases against our results.

Similar to prior studies on Rule 10b5-1 plans (Jagolinzer 2009; Henderson et al. 2015; Larcker et al. 2021; Fich et al. 2023), we focus only on sales and do not examine purchases because purchases under 10b5-1 plans are smaller and less common. In our sample, the median 10b5-1 sales are \$334,634, compared to the median 10b5-1 purchase amount of \$29,134. Also, 51.6 percent of open market sales are made pursuant to Rule 10b5-1 plans, whereas only 9.2 percent of open market purchases are made pursuant to Rule 10b5-1 plans.

Our sample includes 174,634 insider sales made by officers and directors between 2021 and 2024. We aggregate insider sales at the transaction date level. A single Form 4 with multiple transactions may be combined into a single observation if the sales occurred on the same date or split into multiple observations if the sales took place on different dates. The descriptive statistics are reported in Table 1. Note that 51.6 percent of the sales are made pursuant to 10b5-1 plans. On average, the returns to insider sales are negative: -0.4% on the 30-day horizon and -0.6% on the 180-day horizon, suggesting that the insider sales are potentially informed. We winsorize the cumulative abnormal returns to insider sales at the 1<sup>st</sup> and 99<sup>th</sup> percentiles for each year quarter to mitigate the influence of extreme values, but the results are largely similar without winsorization.

For the sample of 10b5-1 terminations, we rely on full-text search on SEC EDGAR of 10-Q/K filings through the end of 2025Q2. The 2022 Rule 10b5-1 amendment requires firms to disclose terminations on 10b5-1 plans in the following 10-Q/K filing. We collect terminations from a random sample of 100 firms to understand the expressions used in these disclosures and read all relevant filings. Searching SEC filings with those expressions (e.g., “terminated a Rule 10b5-1 plan”), we find 687 cases mentioning 10b5-1 terminations in 10-Q/K filings. We then confirm that our search has picked up all terminations by cross-checking with another random sample of 100 firms’ 10-Q/K filings. By reading the description of terminations, we exclude from the sample if (i) the plan termination is by a former insider and, hence, related to a departure from the firm; (ii) the plan is terminated as a result of the plan being fully executed or terminated on the expiration date; and (iii) the plan termination is followed by a new plan adoption,

which suggests a plan modification, to ensure a sample of discretionary plan terminations.<sup>22</sup> We find only five cases of stock purchase plan terminations disclosed in 10-Q/K filings and thus focus only on sales plan terminations for the same reasons we focus on insider selling in our main analysis.

For the tests of insider gifts, we use insider transactions with transaction code “G” from 2021 to 2024 from the SEC DERA. We follow Yost and Yu (2023) and exclude stock gifts to family members. For the tests of option grant timing, we use option grants from the SEC DERA. 10-Q/K filing dates are from the SEC Analytics Suite by WRDS.

Other data used in this study are retrieved from the following sources. Company financials are taken from Compustat. Stock returns are computed using CRSP. We use IBES to calculate the consensus of quarterly earnings.

## **4 Main Test Results**

### **4.1 Cooling-off Mandate**

We first examine whether corporate insiders comply with the cooling-off period provision of the amendment. Larcker et al. (2021) find that a significant portion of 10b5-1 sales prior to the rule amendment were made within 90 days of plan adoption. The rule amendment aimed to restrict opportunistic insider transactions by prohibiting 10b5-1 sales made soon after plan adoption. The number of observations in this analysis is smaller than our full sample because not all filings include the disclosure of the 10b5-1 adoption date.

Figure 1 shows that most insiders comply with the cooling-off period mandate. In Panel A, the proportion of 10b5-1 sales made within 90 days of plan adoption hovers around 30 percent during the pre-period but drops immediately to near zero after the rule amendment.<sup>23</sup> Panel B provides a histogram of the

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<sup>22</sup> Terminating existing plans and adopting new plans can delay sales, hence, potentially indicating an insider’s intention to sell at a higher price later. Our results remain unchanged if we include these cases of plan modifications.

<sup>23</sup> We focus on the days between plan adoption and insider sale throughout the paper, although the amendment added another criterion (i.e., at least two business days following the 10-Q/K filing for the quarter of plan adoption). We do so because the results are similar and to maintain consistency with prior research.

cooling-off period length in 30-day intervals for 10b5-1 sales in the pre- and post-periods, respectively. The histogram shows that insider sales that were previously executed within 30, 60, or 90 days of plan adoption shift mostly to waiting 90-120 days after plan adoption. This pattern suggests that the cooling-off provision effectively enforces a longer waiting period before sales, but insiders tend to cluster their trades just beyond the 90-day threshold, indicating strong adherence to the bright-line rule.

Table 2 Panel A documents that the proportion of 10b5-1 sales made within 90 days of plan adoption (*Under90days*) decreased significantly. During the pre-amendment period, insider sales within 90 days of plan adoption accounted for 31.1 percent of 10b5-1 sales.<sup>24</sup> However, in the post-amendment period, insider sales within 90 days of plan adoption decreased to 1.7 percent of 10b5-1 sales. We also use the cooling-off period defined by the new rule: the later of (i) 90 days after plan adoption or (ii) two business days following the 10-Q/K filing for the fiscal quarter in which the plan was adopted (*Short Cooling-Off*). Insider sales with short cooling-off periods decrease from 32.8 percent in the pre-period to 2.2 percent in the post-period. The small proportion of 10b5-1 sales made shortly after plan adoption in the post-amendment period is consistent with compliance with the cooling-off provision. Some of the transactions that appear out of compliance are due to grandfathered 10b5-1 plans that were adopted prior to the effective date of the rule. We also find several hundred insider sales based on plans adopted after the effective date but not compliant with the cooling-off period mandate, and would not receive legal protection under Rule 10b5-1.<sup>25</sup>

Using regression analysis, we formally test the change in the probability of 10b5-1 sales with short cooling-off periods. To control for other factors affecting the length of cooling-off periods, we estimate the following regression:

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<sup>24</sup> The percentage of 10b5-1 sales made within 90 days of plan adoption, prior to the amendment, in our sample (31.1%) is lower than the 58% reported by Larcker et al. (2021). This discrepancy could stem from the fact that our statistic is based on insiders' voluntary disclosure of the plan adoption date in Form 4 footnotes, whereas Larcker et al. (2021) use the mandatory disclosure of plan adoption date in Form 144. Additionally, the difference may also be due to Larcker et al.'s focus on 10b5-1 sales of unregistered stock reported in Form 144, which represent a small fraction of insider sales. Moreover, a significant portion of proposed sales reported in Form 144 is often delayed and not executed on schedule (Voelcker 2024).

<sup>25</sup> However, these sales that did not satisfy the cooling-off periods in the post-amendment period, on average, do not yield significantly negative abnormal returns.

$$Outcome = \beta_1 Post + \beta' Controls + FEs + \epsilon, \quad (1)$$

where *Under90days* and *Short Cooling-Off* are the outcome variables, and *Post* is an indicator that equals one if the sale is made after April 1, 2023. The set of control variables includes *Log(MVE)*, the log of the firm's market value; *M/B*, the firm's market-to-book ratio; *Leverage*, the firm's liability to asset ratio; *ROA*, the firm's quarterly net income divided by total assets; *AbRet [-30,-1]*, the 30-day cumulative abnormal returns leading up to the insider sale; *Log(Value)*, the log of the transaction value; and *CSuite*, an indicator variable that equals one if sales are made by a CEO, CFO, or COO. The firm-level control variables, *Log(MVE)*, *M/B*, *Leverage*, and *ROA*, are measured as of the quarter-end immediately prior to the insider transaction. We include industry fixed effects to control for economic conditions that affect specific industries. The standard errors are double-clustered by firm and transaction date to correct for cross-sectional dependence.

The regression analysis in Panel B confirms a 28.0 (29.0) percentage point decrease in the probability of 10b5-1 sales within 90 days of plan adoption (with short cooling-off periods). These tests are based on Form 4 filings that disclose the plan adoption date, which may not represent the characteristics of all 10b5-1 sales, especially during the pre-period when plan adoption date disclosure was voluntary. However, because significantly more insider sales were made shortly after plan adoption during the pre-period when plan adoption date was voluntary, underreporting during the pre-period likely biases against our results. In Figure OA2 and Table OA1 of the Online Appendix, we find similar patterns of compliance with the 30-day cooling-off period applied to Section 16 insiders other than officers and directors.

#### 4.2 Proportion of Sales Under 10b5-1 Plans

A concern raised by critics and the SEC is whether the stricter conditions imposed by the 2022 amendment might deter insiders from relying on Rule 10b5-1 plans. The SEC noted, "If insiders find the conditions of this defense to be overly burdensome, they may elect not to rely on it. If migration of trading outside of Rule 10b5-1 plans results, in some instances, in an increase or no change in the incidence of insider trading, the benefits of the amendments may be attenuated or offset" (SEC 2022, p. 140). This raises

an important question on whether the new restrictions incentivize insiders to shift their trading activity away from 10b5-1 plans or to adapt by increasing their reliance on compliant plans.

On the one hand, the stricter requirements could make Rule 10b5-1 plans less appealing to insiders, leading to a decline in their use. This could result in more trading activity occurring outside the safeguards of Rule 10b5-1, potentially undermining the amendment's intended purpose of curbing opportunistic behavior. On the other hand, if the revised rules are perceived as a credible defense against insider trading allegations, insiders may continue to maintain or even increase their use of these plans despite the added restrictions.

Figure 2 Panel A depicts the proportion of 10b5-1 sales as a proportion of all insider sales. We find that the proportion of 10b5-1 sales peaked at 61 percent in 2021Q3, following SEC Chair Gensler's speech announcing proposed changes to Rule 10b5-1. It then gradually declined, reaching around 50% in the post-amendment period, suggesting that insiders began shifting away from 10b5-1 plans even before the amendment took effect. The initial spike in 10b5-1 sales may reflect a rush by insiders to execute potentially opportunistic sales ahead of regulatory changes. However, in Panel B, we find that in 2021Q3, the increase in the proportion of 10b5-1 sales is driven by a decrease in non-10b5-1 sales rather than an increase in 10b5-1 sales. To the extent that selling soon after plan adoption is a proxy for opportunistic 10b5-1 sales, as depicted in Figure 1 Panel A, we find no change in such opportunism immediately after Chair Gensler's speech in 2021Q3.

In Table 3 Panel A, we find that the proportion of 10b5-1 sales decreased by 2.2 percentage points, from 52.5 percent in the pre-amendment period to 50.3 percent in the post-amendment period. Using regression analysis, we formally test the change in the proportion of 10b5-1 sales before and after the amendment. We apply the same regression specification in equation (1), replacing the outcome variable with *10b5-1*, an indicator that equals one for insider sales pursuant to Rule 10b5-1. In Panel B, the coefficient of *Post* is -0.029 ( $p < 0.10$ ), implying a 2.9 percentage point decrease in 10b5-1 sales after the rule amendment. Collectively, these results suggest that insiders shifted towards sales outside of 10b5-1 plans after the rule amendment, consistent with the SEC's concern that the amendments may have increased

the compliance burden associated with using 10b5-1 plans.

While the economic significance of the decrease in 10b5-1 sales may seem modest, we find evidence consistent with under-reporting of 10b5-1 sales during the pre-period when the Form 4 checkbox did not exist. Insiders who disclosed in the footnotes during the post-period report 81 percent of their pre-period sales as 10b5-1. However, insiders who only checked the box during the post-period report 58 percent of their pre-period sales as 10b5-1 in the footnotes. Assuming insiders who disclosed 10b5-1 sales in Form 4 footnotes during the pre-period continue doing so in the post-period (and those who did not will only disclose in the checkbox), we project that at least 1,496 pre-period sales (1.1 percent of pre-period sales) are likely misclassified as non-10b5-1 due to underreporting.

### **4.3 Opportunism in Insider Sales**

We compare the cumulative abnormal returns to insider sales under 10b5-1 plans in the pre- and post-amendment periods. In Figure 3, we plot cumulative abnormal returns around 10b5-1 sales before and after the rule amendment. The sales executed before the amendment (in black) show an inverse-V-shaped pattern consistent with opportunistic loss avoidance by insiders adopting plans with negative MNPI about the firm. In contrast, the sales executed after the rule amendment (in red) show a slightly positive return after the sale. These patterns suggest that the Rule 10b5-1 amendment restricted opportunistic insider selling.

In Figure 4, we plot cumulative abnormal returns around 10b5-1 sales before the rule amendment, comparing sales executed within 90 days of plan adoption with those made more than 90 days after plan adoption. The sales executed within 90 days of plan adoption (in black) exhibit a clear inverse-V-shaped pattern consistent with opportunistic loss avoidance by insiders adopting plans with negative news about the firm. In contrast, the sales executed more than 90 days after plan adoption (in red) show a less pronounced negative return after the sale. This plot is consistent with the findings of Larcker et al. (2021) and also implies that the cooling-off mandate curbed the opportunistic use of 10b5-1 plans.

Figure 5 plots cumulative abnormal returns around non-10b5-1 sales before and after the rule amendment. In contrast to the patterns observed for 10b5-1 sales in Figure 3, the plot presents quite different

patterns. While cumulative abnormal returns after the rule amendment (in red) appear flatter relative to cumulative abnormal returns before the amendment (in black), both lines exhibit sharp negative abnormal returns right after sales. These patterns suggest that opportunistic insider selling behavior is not completely curbed for non-10b5-1 sales, or at least the stock market still views these sales as containing negative signals of future performance.

In Table 4, we report regression analyses using three proxies of insider trading opportunism: 30-day and 180-day cumulative abnormal stock returns ( $AbRet [0,30]$  and  $AbRet [0,180]$ ) and insider sales preceding quarterly earnings misses (*Earnings Miss*). We use two different specifications to test our predictions. First, we compare the cumulative abnormal returns and the probability of selling prior to earnings miss in the pre- and post-amendment periods using equation (1) separately for 10b5-1 sales and non-10b5-1 sales. Second, we employ a difference-in-differences specification comparing 10b5-1 and non-10b5-1 sales in the pre- and post-amendment periods. The difference-in-differences approach employs non-10b5-1 transactions as a control group to mitigate concerns that other economic factors drive the changes in return patterns of 10b5-1 insider sales after the amendment. We estimate the following regression:

$$Outcome = \beta_1 Post + \beta_2 10b5-1 + \beta_3 Post \times 10b5-1 + \beta' Controls + FEs + \epsilon, \quad (2)$$

Unlike in equation (1), we additionally include year-quarter fixed effects for the difference-in-differences approach, which subsumes the coefficient of *Post*. The coefficient of  $Post \times 10b5-1$  is designed to capture relative changes in opportunistic behavior under 10b5-1 and non-10b5-1 plans after the amendment.

For the tests using the subsample of 10b5-1 sales, the coefficient of *Post* in column (1) is 0.019 ( $p < 0.01$ ), suggesting that 30-day cumulative abnormal returns to insider sales increased by 1.9 percent. Consistently, in column (2), the coefficient of *Post* is 0.063 ( $p < 0.01$ ), implying a 6.3 percent increase in 180-day cumulative abnormal returns. The coefficient of *Post* in column (3) is -0.034 ( $p < 0.05$ ), implying that the probability of selling under 10b5-1 plans prior to earnings misses decreases by 3.4 percent after the rule amendment. Thus, insiders are less able to avoid losses from 10b5-1 sales and are less likely to use 10b5-1 plans to sell opportunistically when they are privy to negative earnings news.

The tests using the subsample of non-10b5-1 sales are reported in columns (4) – (6). In column (4),

we find that 30-day cumulative abnormal returns to sales outside of 10b5-1 plans increased by 0.8 percent ( $p < 0.10$ ) in the post-period. This suggests that the opportunism in non-10b5-1 sales also decreased, potentially due to the general deterrence effects of the amendment. However, the magnitude of change is smaller than for 10b5-1 sales. In column (5), using 180-day cumulative abnormal returns, the coefficient of *Post* is insignificant. Also, in column (6), we do not find significant evidence of fewer insider sales prior to earnings misses. Overall, the decrease in opportunism for non-10b5-1 sales is less evident compared to that of 10b5-1 sales.

In columns (7) – (9), using the difference-in-difference specification, we find that the cumulative abnormal returns of 10b5-1 sales increase incrementally more than that of non-10b5-1 sales and that 10b5-1 sales are incrementally less likely to be made prior to earnings misses compared to non-10b5-1 sales.

Our results imply a decrease in insider opportunism and suggest that insiders are less likely to sell based on MNPI following the amendment. However, there are potential alternative explanations for our results. First, the less negative returns to 10b5-1 sales in the post-period may be driven by a change in investor perception that 10b5-1 sales are no longer based on private information. To address this concern, we examine the price impact of insider sales on the day of the transaction, as an alternative to longer-run returns. Specifically, we examine the intraday price impact of insider sales using *Kyle's lambda* from WRDS Intraday Indicators. *Kyle's lambda* is the slope coefficient of a regression of 5-minute returns on the corresponding order flow (i.e., buy minus sell volume) on the transaction date, not the filing date of the Form 4, to capture the effect of the insider sale rather than the reaction to disclosure of the insider sale. We find that *Kyle's lambda* for 10b5-1 sales declines in the post-period, suggesting a decline in private information content (Table OA2 of the Online Appendix).<sup>26</sup>

Second, profitable insider trades may be based on insiders exploiting the mispricing of publicly available information rather than MNPI. To address this concern, we focus on insider sales made when the stock is less likely to be mispriced. In the context of insider selling, we use short interest as a proxy for

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<sup>26</sup> Because *Kyle's lambda* is measured at the daily level, it may be influenced by broader market-wide liquidity conditions. Accordingly, interpretations of this result should account for this limitation.

publicly recognized overvaluation (Dechow et al. 2001; Ben-David et al. 2015). Specifically, we use the bi-weekly short volume from Compustat divided by shares outstanding, prior to the insider sale. We find that our results are robust even in the sample with low short interest (i.e., less mispricing), consistent with a decrease in insider selling based on MNPI (Table OA3 of the Online Appendix).

#### 4.4 Reduction in Opportunism vs. Migration to Non-10b5-1 Plans

A natural follow-up question is whether the decline in opportunistic trading under 10b5-1 plans reflects a true reduction in such behavior or a shift to non-10b5-1 transactions. To address this, we focus on potential abusers who sold within 90 days of adopting a 10b5-1 plan during the pre-period, who are the main target of the rule. Insiders who historically sold shares shortly after plan adoption are likely to face higher compliance costs due to the 90-day cooling-off period, making them more inclined to shift to non-10b5-1 sales. We examine whether these insiders are more likely to move their transactions outside of 10b5-1 plans and whether their non-10b5-1 sales exhibit signs of increased opportunism post-amendment.

In Figure 6, we plot the proportion of 10b5-1 sales and the frequency of 10b5-1 and non-10b5-1 sales by potential abusers. Panel A shows that the proportion of 10b5-1 sales by potential abusers declines significantly following the amendment. Panel B further illustrates that while the number of 10b5-1 trades drops sharply in the post-period, the number of non-10b5-1 trades remains relatively stable. This suggests that the decline in the proportion of 10b5-1 sales is primarily driven by a reduction in 10b5-1 trades, rather than a shift toward non-10b5-1 transactions. Overall, this pattern is more consistent with a decrease in opportunistic 10b5-1 trading than with a mere migration to alternative trading mechanisms.

To further investigate this issue, we estimate the following regression:

$$Outcome = \beta_1 Post + \beta_2 Abuser + \beta_3 Post \times Abuser + \beta' Controls + FEs + \epsilon, \quad (3)$$

We define potential abusers as insiders who had previously sold within 90 days of 10b5-1 plan adoption during the pre-period (*Abuser*). Table 1 reports a mean of 0.693 for *Abuser*, which reflects that 69.3 percent of transactions are made by insiders who had sold within 90 days of 10b5-1 plan adoption at least once during the pre-period.

In Table 5 Panel A, we estimate Equation (3) using only 10b5-1 sales to assess whether potential abusers continue to trade opportunistically under the amended rules. In column (1), we find that potential abusers are less likely to sell under a 10b5-1 plan after the rule amendment. The coefficient of  $Post \times Abuser$  is  $-0.086$  ( $p < 0.01$ ), indicating an 8.6 percentage point decrease in sales under 10b5-1 plans by insiders who had sold at least once within 90 days of plan adoption prior to the rule amendment.<sup>27</sup> This result is consistent with higher compliance costs of the Rule 10b5-1 amendment on insiders who potentially abused the rule to sell shortly after plan adoption.

Columns (2) – (7) reveal that both abusers and non-abusers exhibit significantly reduced opportunism in 10b5-1 trades in the post-period. Although the coefficients are generally larger for non-abusers, the declines among abusers are directionally consistent and economically meaningful. Moreover, in columns (8) – (10), the coefficients of  $Post \times Abuser$  are all statistically insignificant. These results suggest that even among those abusers who continue using 10b5-1 plans, the amended rules (especially the mandatory cooling-off period) seem to curtail opportunistic behavior.

In Panel B of Table 5, we re-estimate Equation (3) using only non-10b5-1 sales. Most results are statistically insignificant, except for column (4), where the coefficient on  $Post$  is  $0.019$  ( $p < 0.05$ ), suggesting that insiders who did not previously abuse 10b5-1 plans reduce opportunistic non-10b5-1 sales in the post-period. In column (7), the coefficient on  $Post \times Abuser$  is  $-0.023$  ( $p < 0.05$ ), implying that potential abusers continue to engage in opportunistic trading outside of 10b5-1 plans even after the amendment.

Overall, the results indicate that the Rule 10b5-1 amendment effectively curbed opportunistic trading under 10b5-1 plans by potential abusers, but it did not eliminate such behavior entirely, particularly for trades conducted outside of these plans.

#### **4.5 The Role of Firm-level Insider Trading Policies and Culture**

Executive discretion in choosing between Rule 10b5-1 plans and unplanned trades likely varies

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<sup>27</sup> In untabulated results, which include year-quarter fixed effects, the coefficient of  $Post \times Abuser$  is  $-0.087$  ( $p < 0.01$ ), similar to the estimate with only industry fixed effects.

across firms, reflecting differences in both formal insider trading policies and informal culture. To more thoroughly examine institutional structures that shape trading discretion, and to bolster the robustness of our interpretation, we analyze firm-level heterogeneity in the amendment's effect on opportunistic 10b5-1 sales. Specifically, we partition the sample based on the strength of insider trading policies, measured by whether the proportion of insiders selling within 90 days of 10b5-1 plan adoption in the pre-amendment period is above or below the median. This analysis is restricted to firms with Form 4 filings that include footnotes disclosing the plan adoption date.

In Table 6, in columns (1) – (3), we repeat our difference-in-difference regression for firms with above-median proportion of 10b5-1 sales within 90 days of plan adoption (i.e., weaker insider trading policies). The coefficients on  $Post \times 10b5-1$  are significant in all three columns. In columns (4) – (6), for firms with stronger insider trading policies, the coefficients on  $Post \times 10b5-1$  are smaller in magnitude and weaker in significance.<sup>28</sup> These findings suggest that the observed reduction in opportunistic 10b5-1 trading is primarily driven by firms with weaker pre-amendment controls.

#### 4.6 Robustness Tests

While we complement our main specification by comparing opportunism in the pre- and post-periods with a difference-in-difference specification, the results may be affected by changing market conditions and their effects on abnormal return calculations. For example, during our sample period, the pre-period includes a bear market from January 2022 to October 2022, whereas the post-period is characterized by an overall bull market. We run four variations of Table 4 to examine the robustness of our results.

First, we repeat our results using different abnormal return measures. Our main tests are based on

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<sup>28</sup> We also explore firm-level heterogeneity in the use of 10b5-1 plans. For example, forty-nine firms (including Amazon and JP Morgan) have a strict policy of always using 10b5-1 plans, and 939 firms (including Procter & Gamble and Texas Instruments) never use 10b5-1 plans (Table OA4 of the Online Appendix). Dropping these firms from the sample does not affect our main results. There are more firms that decrease the use of 10b5-1 plans than those that increase it, and our results on the change in opportunism are mainly driven by firms that decrease the use of 10b5-1 plans (Table OA5 of the Online Appendix).

abnormal returns adjusted for the equal-weighted market index (e.g., Lakonishok and Lee 2001), which we believe is appropriate given the recent dominance of large-cap tech stocks on the value-weighted market index. Nonetheless, we use size-adjusted abnormal returns, which subtract the size-decile portfolio return from raw returns and abnormal returns adjusted for the value-weighted market index. For consistency, in these robustness tests, we calculate the control variable  $AbRet [-30,-1]$  using the same calculation method as the dependent variable in the specification.

In Table 7 Panel A, we report the change in abnormal returns around the rule amendment for 10b5-1 and non-10b5-1 sales, using size-adjusted abnormal returns. In columns (1) and (2), we find significant increases in abnormal returns for 10b5-1 sales, consistent with less opportunism in 10b5-1 sales after the rule amendment. In column (3), we find a significant decrease in 10b5-1 sales prior to earnings misses. We do not further discuss the results using *Earnings Miss* as the dependent variable because the only difference from Table 4 is the change in the calculation of the control variable,  $AbRet [-30,-1]$ , and the results are not materially changed. In columns (4) and (5), we find weak evidence for a decrease in the opportunism of non-10b5-1 sales. In columns (7) and (8), using the difference-in-difference specification, we find an increase in cumulative abnormal returns for 10b5-1 sales that is incremental to that of non-10b5-1 sales. In Panel B, using abnormal returns adjusted for the value-weighted market index, we find largely similar results, except for the weaker increases in stock returns to non-10b5-1 sales in columns (4) and (5).

Second, we repeat our results using different sample periods. Our main tests compare the insider sales made during a nine-quarter pre-period (2021Q1 to 2023Q1) to those made during a seven-quarter post-period (2023Q2 to 2024Q4). Notably, the pre-period encompasses a bear market, during which the S&P 500 declined by approximately 25 percent between January and October 2022, while the post-period is marked by a strong bull market. To mitigate potential confounding effects of broader market trends on insider selling behavior and the measurement of abnormal returns, we replicate the analyses in Table 4 after excluding the 2022 bear market. Furthermore, to address concerns that our findings may reflect unique characteristics of the pre-period rather than the impact of the rule amendment, we extend the pre-period back to 2006, the earliest year for which insider trading data is available from the SEC DERA.

In Panel C, we repeat Table 4 without insider sales from the 2022 bear market. In columns (1) and (2), we find a significant positive coefficient of *Post*, consistent with our main results. However, in column (3), the coefficient of *Post* loses significance. Still, the results in the difference-in-differences specification in columns (7) – (9) remain significant. In Panel D, we repeat the analyses using an extended sample from 2006 to 2024. While the results are weaker, the direction of the coefficients on the variables of interest is consistent with our main results. Additionally, in an untabulated analysis, we randomly choose observations from the pre-period to reduce their weight in the estimation, and this analysis yields similar results.

Finally, we acknowledge that our results may also reflect forces beyond the impact of the Rule 10b5-1 amendment. One such factor is the SEC and Department of Justice cases against Terren Peizer, announced on March 1, 2023, close to the effective date of the amendment. This landmark case was the first criminal prosecution for insider trading under a 10b5-1 plan, which involved stock sales initiated just three days after plan adoption while Peizer, the CEO of Ontrak, possessed undisclosed information about the loss of a major customer.<sup>29</sup> The case likely increased perceived litigation risks surrounding 10b5-1 sales, thereby deterring opportunistic use of such plans. Consequently, the observed higher abnormal returns to 10b5-1 sales and the reduced incidence of such sales preceding earnings misses may reflect both heightened enforcement risk and the effects of compliance with the rule amendment. Therefore, our findings may capture the combined influence of stronger enforcement and regulatory reform.

Given the proximity of the amendment's effective date and the Peizer announcement, empirically disentangling their respective impacts is challenging. However, our evidence suggests that compliance with the cooling-off period mandate is a primary mechanism curbing opportunistic trading, an effect less likely attributable to the Peizer case alone. Specifically, we document that insiders frequently avoided losses by selling shortly after plan adoption in the pre-amendment period (Figure 4), a practice curtailed following the implementation of the cooling-off period (Figure 1). Furthermore, we find that potential 10b5-1 abusers reduced trading under 10b5-1 plans in the post-amendment period (Table 5), consistent with higher

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<sup>29</sup> <https://www.justice.gov/criminal/criminal-vns/case/united-states-v-terren-s-peizer>.

compliance costs. Together, these findings underscore the role of the compliance channel in limiting opportunistic insider sales.

#### 4.7 Potential Costs of the Amendment – Price Efficiency

Next, we examine the potential costs of the amendment to provide a more balanced and policy-relevant assessment of its impact. We examine whether the decrease in informed insider selling affects the price efficiency of highly affected firms. The theoretical effects are ambiguous. On the one hand, Leland (1992) argues that insider trading facilitates price discovery, so restricting such activity may reduce price efficiency. On the other hand, Fishman and Hagerty (1992) suggest that limiting opportunistic insider trading can foster a fairer informational environment, which encourages broader participation in information acquisition and may improve efficiency.

To empirically assess this, we follow Haslag and Ringgenberg (2023) and use variance ratios from WRDS Intraday Indicators, which compare volatility measured over different time horizons (e.g., 15-second to 5-second windows). The premise is that long-window volatility should equal the short-window volatility under market efficiency. Hence, a greater deviation from a variance ratio of one indicates lower price efficiency. We use quarterly averages of the daily variance ratio measured in different intervals: 15-second to 5-second volatility (*VarRatio [15s,5s]*), 1-minute to 15-second volatility (*VarRatio [1m,15s]*), 5-minute to 1-minute volatility (*VarRatio [5m,1m]*), 15-minute to 5-minute volatility (*VarRatio [15m,5m]*), and 30-minute to 15-minute volatility (*VarRatio [30m,15m]*). We note that these measures are normalized by subtracting one, so larger values indicate greater deviations from efficiency. As in Table 6, we compare firms with above- and below-median proportion of 10b5-1 sales within 90 days of plan adoption prior to the amendment (i.e., weak vs. strong insider trading policy firms), as firms with weaker policies are more likely to be affected by the amendment.

In Table 8, we find a consistent positive coefficient of  $Post \times WeakPolicyFirm$ , suggesting that firms more affected by the rule amendment experience a greater increase in variance ratios post-amendment (i.e., lower price efficiency). This effect is consistent across multiple versions of the variance ratio. These

findings suggest that reduced informativeness of insider sales, particularly due to curtailed opportunistic 10b5-1 sales, may negatively affect market efficiency.

## **5 Additional Tests**

We next examine the effectiveness of three provisions under the 10b5-1 rule amendment other than the cooling-off period provision. Specifically, we focus on the (i) disclosure requirement for 10b5-1 terminations in subsequent 10-Q/K filings, (ii) timelier disclosure requirement for insider stock gifts, and (iii) additional disclosure requirement for option grants that occur around material information events.

### **5.1 10b5-1 Terminations**

A related provision of the amendment requires the disclosure of 10b5-1 plan terminations in subsequent 10-Q/K filings. The 90-day cooling-off period mandate, examined in the previous section, was designed to restrict the use of 10b5-1 plans where insiders begin selling stock soon after plan adoption. However, other opportunistic uses of 10b5-1 plans were possible. Insiders could enter into multiple plans and follow through with stock sales prior to bad news events, but terminate the stock sales prior to good news events. To restrict this type of opportunistic use, the amendment prohibited multiple overlapping plans and mandated the disclosure of plan adoption, modification, and termination.

However, instead of requiring immediate disclosure of changes to 10b5-1 plans, the rule amendment requires such changes to be disclosed in subsequent 10-Q/K filings. Based on our reading of the rule and comment letters, the disclosure in a 10-Q/K filing appears to be a regulatory compromise between no disclosure requirement and immediate disclosure of changes to 10b5-1 plans. Several comment letters opposed the immediate disclosure of 10b5-1 terminations, arguing that it could send a signal to the market, such as the possibility of an upcoming merger, with more sophisticated investors being better equipped to capitalize on this information. Because plan termination is not disclosed immediately, we predict that the disclosure requirement may not fully curb opportunistic plan terminations.

We find that 10b5-1 plan terminations are relatively rare, which may be an outcome of the

disclosure requirement restraining insiders from opportunistic terminations. However, since comprehensive data on 10b5-1 plan termination prior to the rule amendment is unavailable, we cannot draw any firm conclusions on the change in termination behavior. Our sample includes 311 cases since the disclosure requirement in June 2023 to the end of our sample collection period in June 2025. Table 9 Panel A reports the descriptive statistics regarding the disclosure delay and plan duration. We report the number of days from plan adoption to termination and the days left on the plan at termination, whenever the information is available in 10-Q/K filings. Because 10b5-1 plan terminations are disclosed in a subsequent 10-Q/K filing, the average number of days from plan termination to disclosure is 82 days. The substantial delay in disclosure likely renders the signal less informative to investors. The delay could also reduce the effectiveness of the disclosure in limiting opportunistic insider behavior (Cheng et al. 2007; Heron and Lie 2007; Brochet 2010). The average termination occurs 213 days after adoption, and the remaining days on the plan at termination are, on average, 246 days.

Figure 7 illustrates the cumulative abnormal returns surrounding 10b5-1 plan terminations. The pattern indicates a steady increase in cumulative abnormal returns leading up to plan termination, followed by a gradual increase afterward. This behavior suggests the possibility of opportunistic 10b5-1 plan terminations, potentially driven by expectations of favorable stock performance in the near future.

In Table 9 Panel B, consistent with Figure 7, we find that abnormal returns following plan terminations are positive and significant. Overall, our results are consistent with those of Jagolinzer (2009), which find that 10b5-1 plan terminations voluntarily disclosed on 8-Ks are followed by stock price increases. However, while Jagolinzer's finding can be attributed to the market signaling of plan terminations, in our sample, we only find two cases where the termination is disclosed in a timely manner in an 8-K filing. The majority of 10b5-1 plan terminations are disclosed to investors in subsequent 10-Q/K filings long after the termination is made. Our results suggest that the opportunistic use of the 10b5-1 plan termination is not fully restricted by the disclosure requirement provision, perhaps because it does not require immediate disclosure.

## 5.2 Insider Stock Gifts

Another provision of the amendment requires stock gifts by insiders to be reported on Form 4 instead of on Form 5. Insider bona fide stock gifts have long been suspected of backdating to a date of higher stock price to increase income tax deduction benefits, exploiting the longer period of time allowed to report a stock gift in Form 5 (Yermack 2009; Avci et al. 2021). Form 5 is required to be filed 45 days after the end of the fiscal year during which the transaction was made, whereas Form 4 must be filed within two business days of a transaction. Because timely disclosure has been effective in restricting backdating behavior (Heron and Lie 2007), we expect stock gift backdating to become more difficult after the amendment. Arya, Mittendorf, and Ramanan (2022) also predict that timelier disclosure of stock gifts may curb insiders' exploitative behavior.

The cumulative abnormal stock return patterns around the stock gift date are depicted in Figure 8. We use abnormal returns adjusted for the equal-weighted market index following prior research on stock gift backdating (Yermack 2009; Avci et al. 2021; Yost and Shu 2022).<sup>30</sup> In Panel A, which includes gifts of all sizes, the stock return patterns do not differ between the pre- and post-amendment periods. In Panel B, we focus on gifts exceeding \$1 million, following Yermack (2009), for which the tax benefits of backdating are more substantial. In Panel C, we include gifts exceeding \$10 million. For stock gifts larger than \$1 million and \$10 million, we find a reverse V-shaped stock pattern for the pre-period (in black) consistent with backdating. In the post-period (in red), stock returns following the gift transaction are non-negative, which is inconsistent with patterns associated with backdating.

In Table 10 Panel A, we report the number of days between the stock gift date and the disclosure date. Since most stock gifts were reported on Form 5 during the pre-period, the disclosure occurred 54.8 days after the stock gift date, indicating ample time for insiders to backdate. However, after stock gifts are required to be disclosed on Form 4 in the post-amendment period, the disclosure delay decreases significantly to five days. These results are consistent with compliance with the stock gift reporting

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<sup>30</sup> The stock return patterns are largely similar when using raw returns, which may be more relevant to the insider who wants to maximize tax deductions.

provision under the Rule 10b5-1 amendment, restricting insiders' ability to backdate stock gifts.

In Table 10 Panel B, we apply regression analysis using equation (1) to test whether stock gift backdating is restricted by the rule amendment. We compare cumulative abnormal stock returns following the stock gift transactions in the pre- and post-amendment periods. If backdating behavior is restricted in the post-amendment period, the coefficient of the variable of interest, *Post*, is predicted to be positive. In columns (1) and (2), we use the full sample of stock gifts and examine the cumulative abnormal returns in the [0,30] and [0,180] day periods, respectively. For the full sample, the coefficient of *Post* is unexpectedly negative and significant using 30-day cumulative abnormal returns. In columns (3) and (4), we find positive and significant coefficients of *Post* using stock gifts over \$1 million that are more likely to provide tax benefits from backdating to higher stock prices. The results are stronger in columns (5) and (6) using gifts over \$10 million. Consistent with the cumulative abnormal return plots in Figure 8, the abnormal returns following stock gift dates increase after the rule amendment, suggesting the timely disclosure requirement introduced by the amendment is associated with restricting the backdating of stock gifts.

In untabulated results, we also consider whether stock gifts decrease after the rule amendment. If insiders had benefited from the higher tax deductions from backdating stock gifts, the timely disclosure requirement might discourage them from giving their stock to charity. However, we find no evidence that the value of stock gifts decreased in the post-amendment period.

### **5.3 Option Grant Timing**

The amendment requires stock options granted close to material information events to be separately disclosed, to mitigate the opportunistic timing of option grants before good news disclosures or after bad news disclosures. Specifically, option grants made within [-4,+1] business days of a 10-Q/K filing or an 8-K filing that discloses MNPI (including earnings information) need to be disclosed in a subsequent proxy statement. However, the disclosure requirement does not offer new information as option grant dates and news disclosure dates were already publicly available. Still, the disclosure requirement may motivate firms to move option grants outside of material information event dates to avoid any suspicion.

Unlike previous analyses conducted at the insider level, option grants are examined at the firm level because most firms issue them to insiders on the same day. As a result, in the regression analyses, we do not control for the size of the transaction (*Log(Value)*) or whether the insider was a top executive (*CSuite*).

In Table 11 Panel A, we report the probability of granting options within  $[-4,+1]$  business days of 10-Q/K filings and earnings announcements (*Within [-4,+1]*) and the abnormal returns following option grants. Although the amendment requires that option grants made around an 8-K filing disclosing MNPI be included in the subsequent proxy statement, we focus on option grants made around earnings announcements due to the ambiguity in determining which 8-K filings contain MNPI. We find that the probability of option grants close to the disclosure of material information was 13.1 percent in the pre-period but decreased to 9.3 percent in the post-amendment period. The decrease of 3.8 percentage points is statistically significant at the 1% level, consistent with firms avoiding option grants around 10-Q/K filings and earnings announcements after the amendment.

We also examine whether option grants are less likely to be followed by positive abnormal returns after the amendment. The provision was intended to restrict option grants around material information events. However, in Panel A, we find that the average 30-day cumulative abnormal returns to option grants in the pre-period are -1.4% ( $p < 0.05$ ), which is inconsistent with the opportunistic timing of option grants to benefit the recipient. If those option grants were opportunistically timed to benefit recipients, we would find positive cumulative abnormal returns following the grant date. Also, we find no change in the cumulative abnormal returns to option grants in the post-amendment period.

In Panel B, we find results similar to those of the univariate analysis when using regressions. The coefficient of *Post* in column (1) testing the probability of option grants around 10-Q/K filings and earnings announcements is -0.033 ( $p < 0.01$ ), which implies a 3.3 percentage point decrease in option grants around these information events following the rule amendment. In columns (2) and (3), testing the change in abnormal returns to option grants following the amendment, we find insignificant results. Overall, the expanded disclosures for option grant timing appear effective at reducing option grants that were suspiciously timed. However, we do not find any evidence of positive stock returns following option grants,

suggesting that these grants were not opportunistically timed even before the adoption of the rule.

## **6 Conclusions**

Our study provides the first comprehensive evidence of the effectiveness of the 2022 amendment to Rule 10b5-1 in curbing opportunistic insider trading. We document that the amendment has achieved its primary objective: insider trading under 10b5-1 plans has become compliant with the longer cooling-off period, is less effective in avoiding losses, and is less likely to be made before disappointing earnings announcements.

Consistent with higher compliance costs, we find a post-amendment decline in 10b5-1 sales, particularly among potential abusers who previously sold shortly after plan adoption. Even among those who continued using 10b5-1 plans, the new rules appear to constrain opportunistic behavior. This pattern is more consistent with a reduction in opportunistic trading under 10b5-1 plans rather than a migration toward non-10b5-1 sales. However, we find that firms more affected by the amendment experienced a decline in price efficiency, consistent with restrictions on insider trading reducing the incorporation of private information into stock prices.

We also examine three provisions of the amendment related to the disclosure of plan terminations, timelier disclosure of stock gifts, and extended disclosure of option grant timing. We find evidence of opportunistic use of plan terminations after the amendment, perhaps because the disclosure is made with substantial delay in 10-Q/K filings rather than immediately. In contrast, for stock gift timing, the pattern consistent with stock gift backdating disappears after the amendment, likely due to timelier disclosure requirements. We also find a decrease in option grants made around material information disclosures.

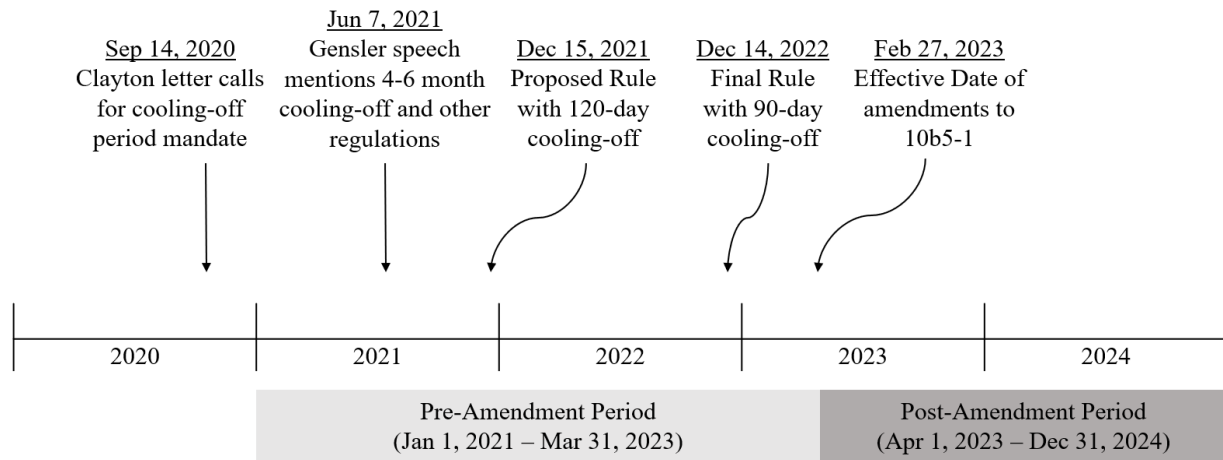
By comprehensively investigating multiple provisions of Rule 10b5-1 amendment, our study contributes to the broader literature on insider trading regulations and offers important implications for policymakers and regulators. We conclude that while the SEC's 2022 10b5-1 amendment substantially curtailed the opportunistic use of 10b5-1 plans, it also increased the compliance costs of 10b5-1 plans and reduced stock price efficiency.

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## Appendix A. Rule 10b5-1 Amendment Timeline



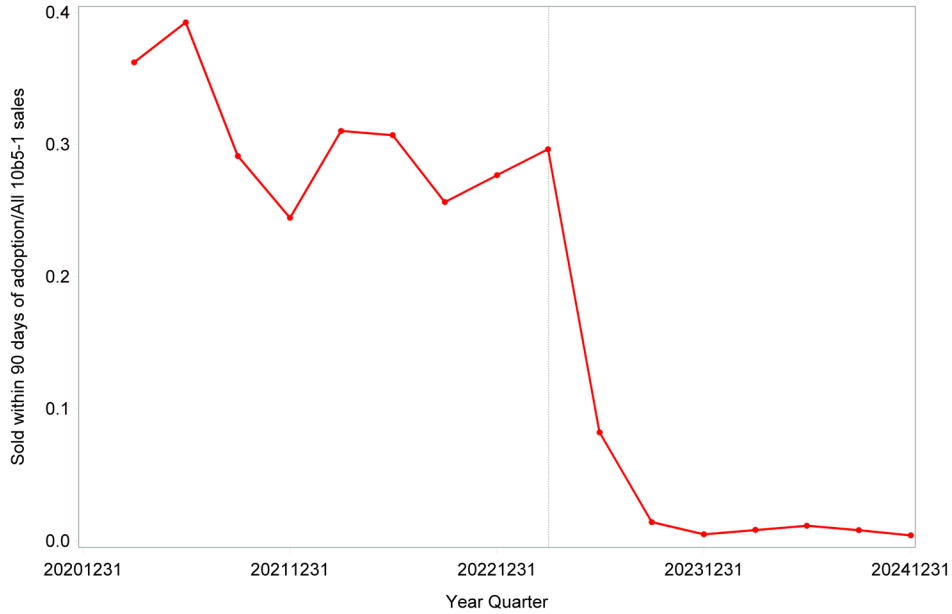
## Appendix B. Variable Definitions

Variable	Definition
<i>Post</i>	Equals one if the insider sells after April 1, 2023.
<i>10b5-1</i>	Equals one if the insider sale is under a Rule 10b5-1 plan, based on the Form 4 footnote and checkbox disclosures. Footnotes are from SEC DERA, and the checkbox is from Insiders Data by WRDS.
<i>Under90days</i>	Equals one if the insider sale is executed within 90 days of Rule 10b5-1 plan adoption. Defined only for insiders who disclosed their plan adoption date in their Form 4 footnote.
<i>Short Cooling-Off</i>	Equals one if the insider sale is executed within 90 days of Rule 10b5-1 plan adoption or within two business days following the 10-Q/K filing for the quarter of plan adoption. Defined only for insiders who disclosed their plan adoption date in their Form 4 footnote.
<i>AbRet [0,30]</i>	30-day buy-and-hold raw returns minus the equal-weighted index returns following the insider transaction.
<i>AbRet [0,180]</i>	180-day buy-and-hold raw returns minus the equal-weighted index returns following the insider transaction.
<i>Earnings Miss</i>	Equals one if actual quarterly earnings are lower than the average of analyst forecasts.
<i>log(MVE)</i>	Log of the market value of equity.
<i>M/B</i>	Ratio of market capitalization to book value of equity.
<i>Leverage</i>	Ratio of total liabilities to total assets.
<i>ROA</i>	Quarterly net income divided by total assets.
<i>AbRet [-30,-1]</i>	30-day buy-and-hold raw returns minus the equal-weighted index returns leading up to the insider transaction.
<i>Log(Value)</i>	Log of insider transaction value.
<i>CSuite</i>	Equals one if the insider transaction is by a CEO, CFO, or COO.
<i>Abuser</i>	Equals one for transactions by insiders that sold within 90 days of Rule 10b5-1 plan adoption at least once during the pre-amendment period. Defined only for insiders who disclosed their plan adoption date in their Form 4 footnote during the pre-amendment period.
<i>WeakPolicyFirm</i>	Equals one for firms that had above-median proportion of 10b5-1 sales made within 90 days of plan adoption during the pre-period. Defined only for firms with insiders that disclosed their plan adoption date in their Form 4 footnote during the pre-amendment period.
<i>VarRatio [15s,5s]</i>	Quarterly average of daily variance ratio, $\left  \frac{Var(Ret_{15s})}{3 \times Var(Ret_{5s})} - 1 \right $
<i>VarRatio [1m,15s]</i>	Quarterly average of daily variance ratio, $\left  \frac{Var(Ret_{1m})}{4 \times Var(Ret_{15s})} - 1 \right $
<i>VarRatio [5m,1m]</i>	Quarterly average of daily variance ratio, $\left  \frac{Var(Ret_{5m})}{5 \times Var(Ret_{1m})} - 1 \right $
<i>VarRatio [15m,5m]</i>	Quarterly average of daily variance ratio, $\left  \frac{Var(Ret_{15m})}{3 \times Var(Ret_{5m})} - 1 \right $
<i>VarRatio [30m,15m]</i>	Quarterly average of daily variance ratio, $\left  \frac{Var(Ret_{30m})}{2 \times Var(Ret_{15m})} - 1 \right $
<i>Within [-4,+1]</i>	Equals one if the option grant is made within [-4,+1] business days of a 10-Q/K filing or earnings announcement.

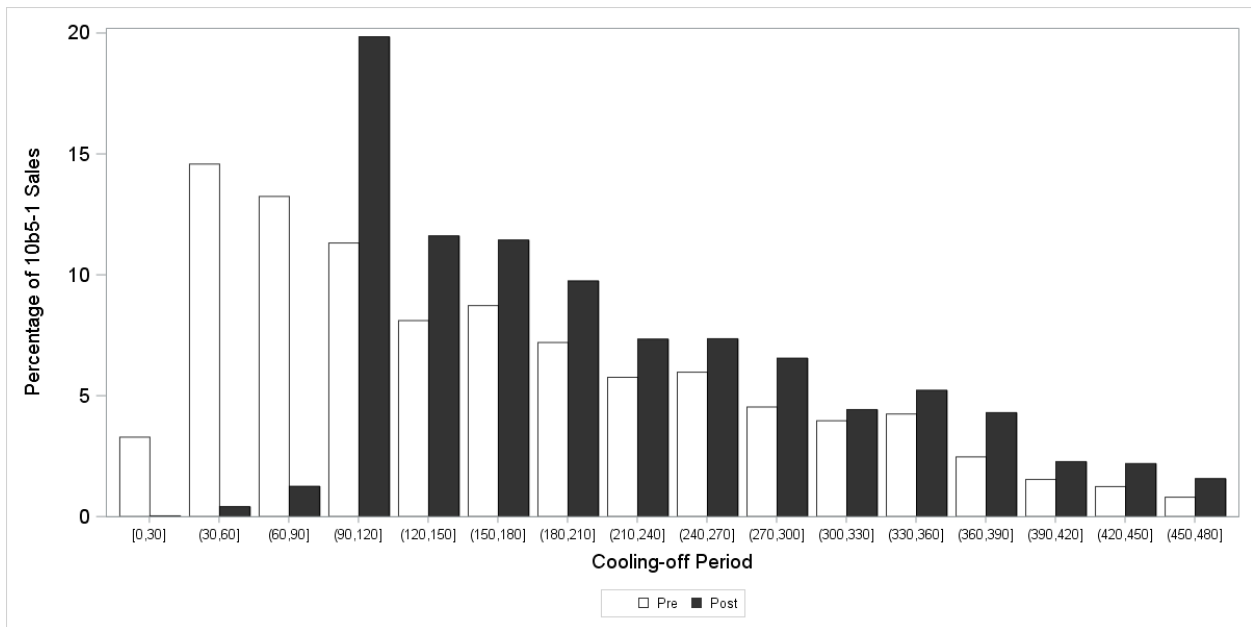
### Figure 1. Compliance with Cooling-off Period Provision

This figure plots information on the days between 10b5-1 plan adoption and insider sale. Panel A plots the proportion of 10b5-1 sales executed within 90 days of plan adoption by quarter. Panel B provides a histogram of the length of cooling-off periods for the pre- vs. post-amendment periods in 30-day intervals.

**Panel A. Proportion of 10b5-1 Sales Within 90 Days of Plan Adoption**



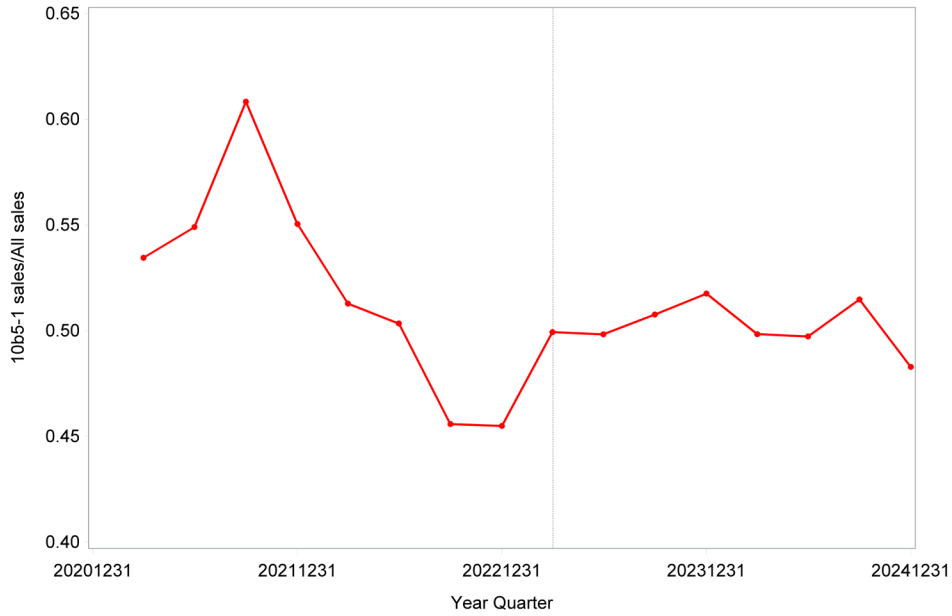
**Panel B. Length of Cooling-off Periods Pre- vs. Post-Amendment**



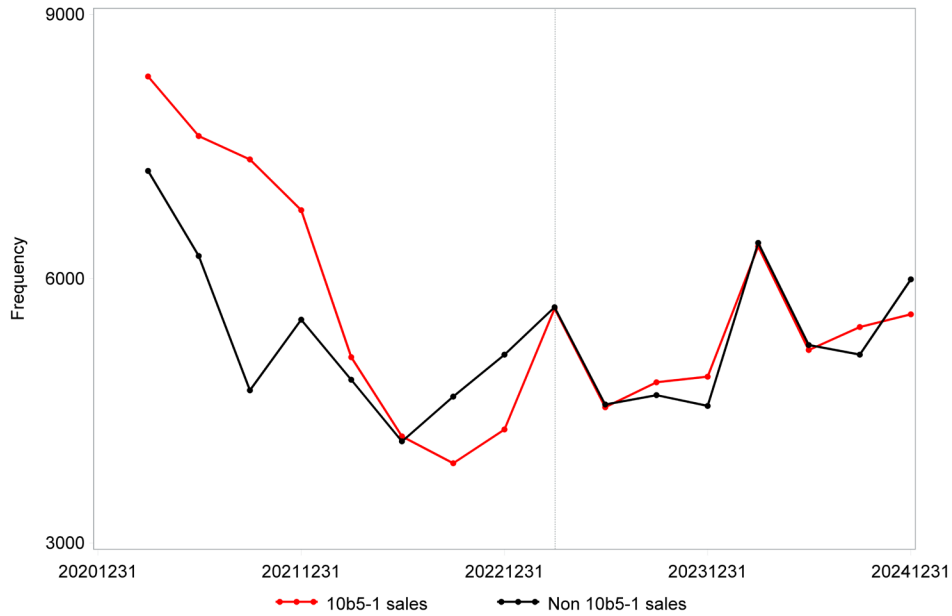
**Figure 2. Change in the Proportion and Frequency of 10b5-1 Sales**

This figure plots the proportion of 10b5-1 sales and the frequency of 10b5-1 and non-10b5-1 sales by quarter. Panel A plots the percentage of 10b5-1 plan sales as a proportion of all sales. Panel B plots the number of 10b5-1 sales and non-10b5-1 sales.

**Panel A. 10b5-1 Sales as a Proportion of All Sales**

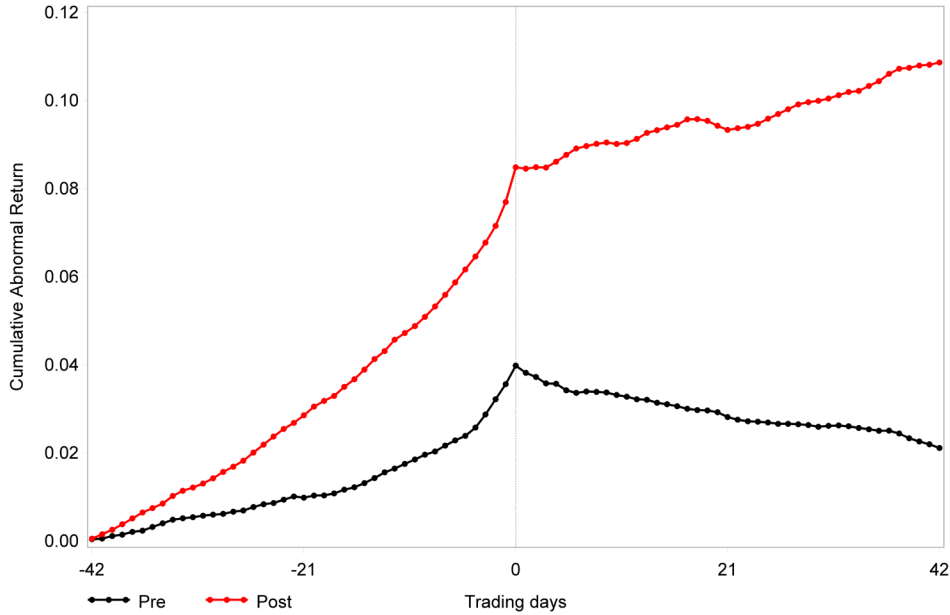


**Panel B. Number of 10b5-1 Sales vs. Non-10b5-1 Sales**



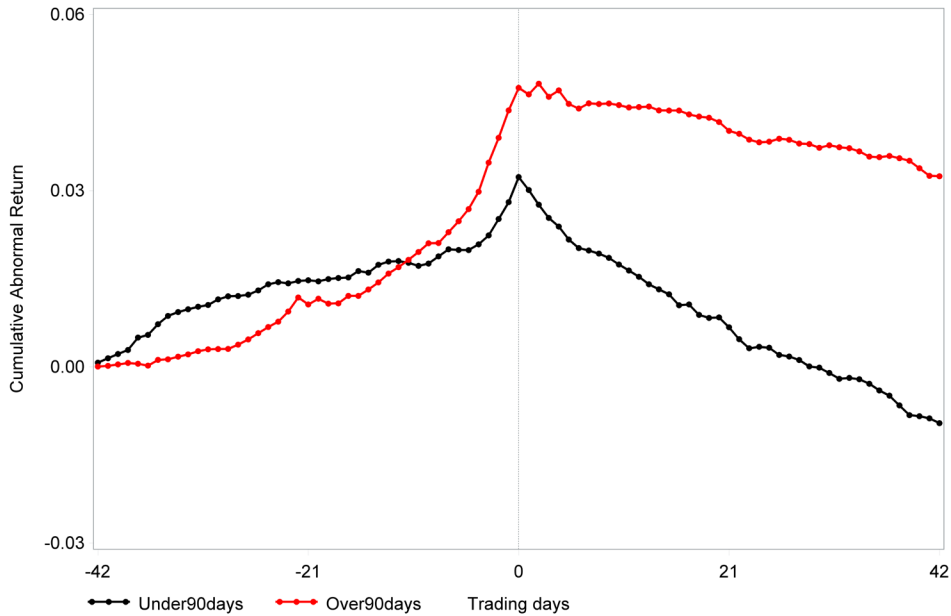
**Figure 3. Returns to 10b5-1 Sales Before and After Rule Amendment**

This figure plots cumulative abnormal returns around 10b5-1 insider sales. Cumulative abnormal returns for sales in the pre-amendment period are shown in black, and those in the post-amendment period are shown in red.



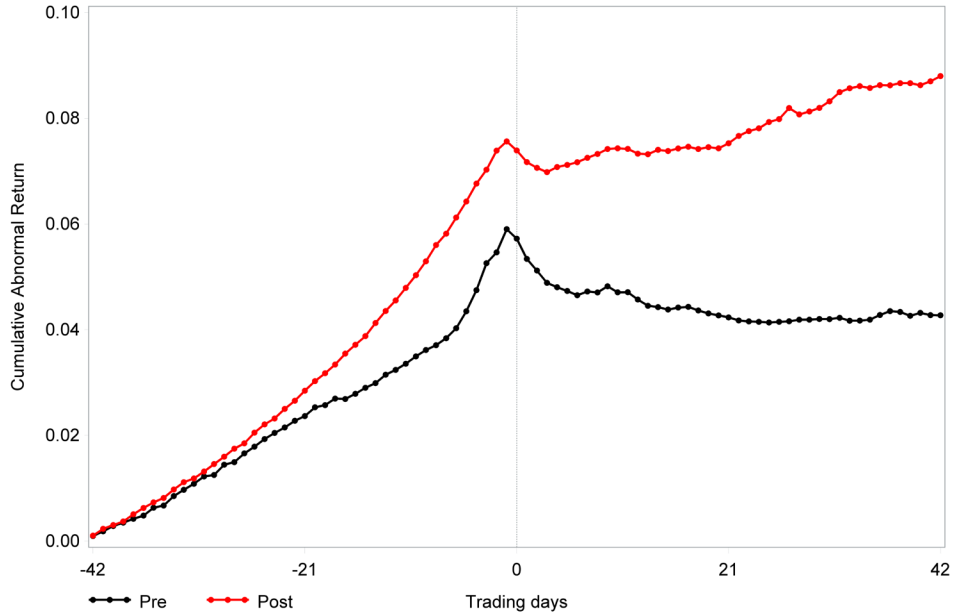
**Figure 4. Returns to 10b5-1 Sales Before Rule Amendment by Cooling-off Period**

This figure plots cumulative abnormal returns around 10b5-1 insider sales before the rule amendment. Cumulative abnormal returns for sales made within 90 days of plan adoption are shown in black, and those made more than 90 days after plan adoption are shown in red.



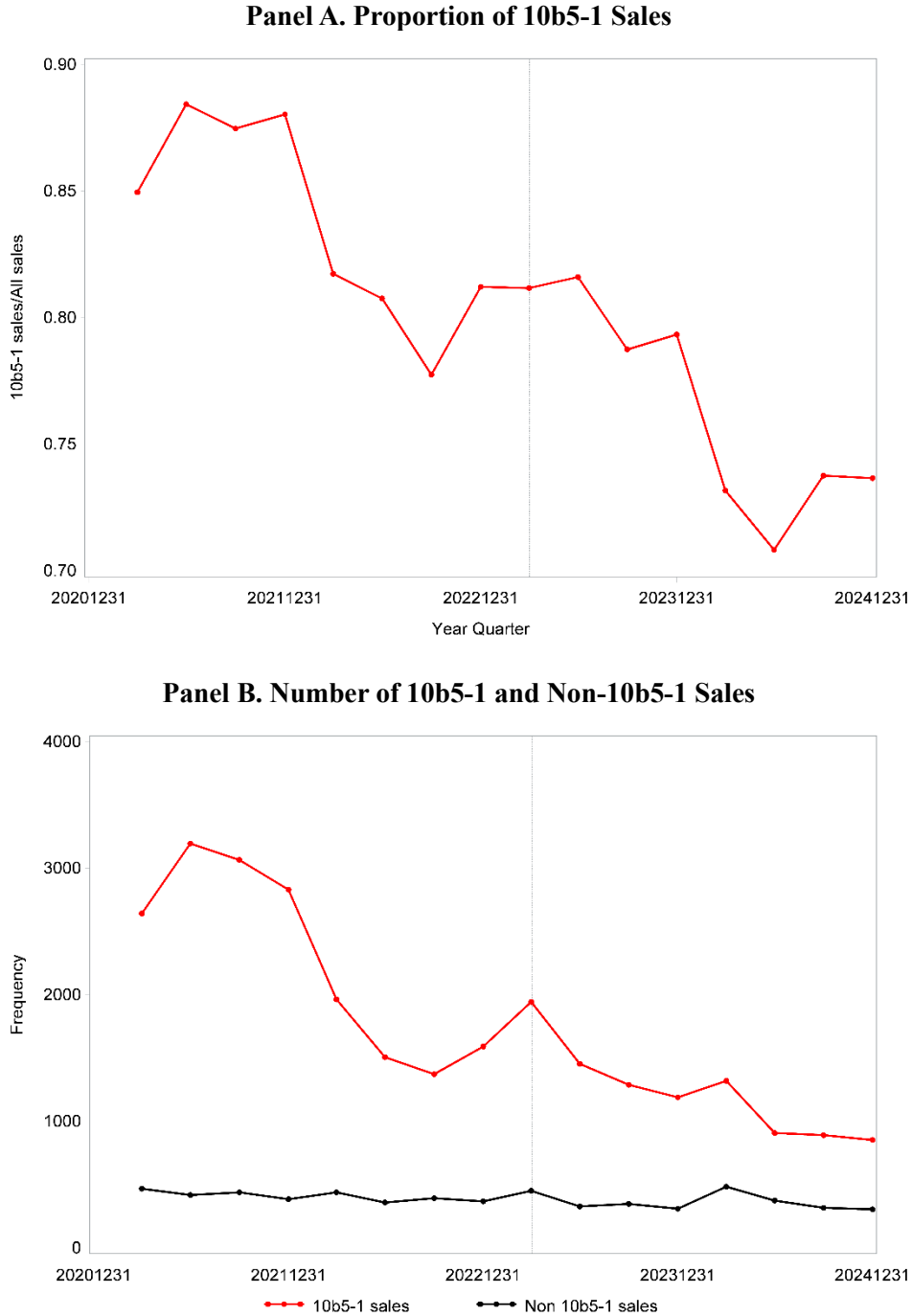
**Figure 5. Returns to Non-10b5-1 Sales Before and After Rule Amendment**

This figure plots cumulative abnormal returns around non-10b5-1 insider sales. Cumulative abnormal returns for sales in the pre-amendment period are shown in black, and those in the post-amendment period are shown in red.



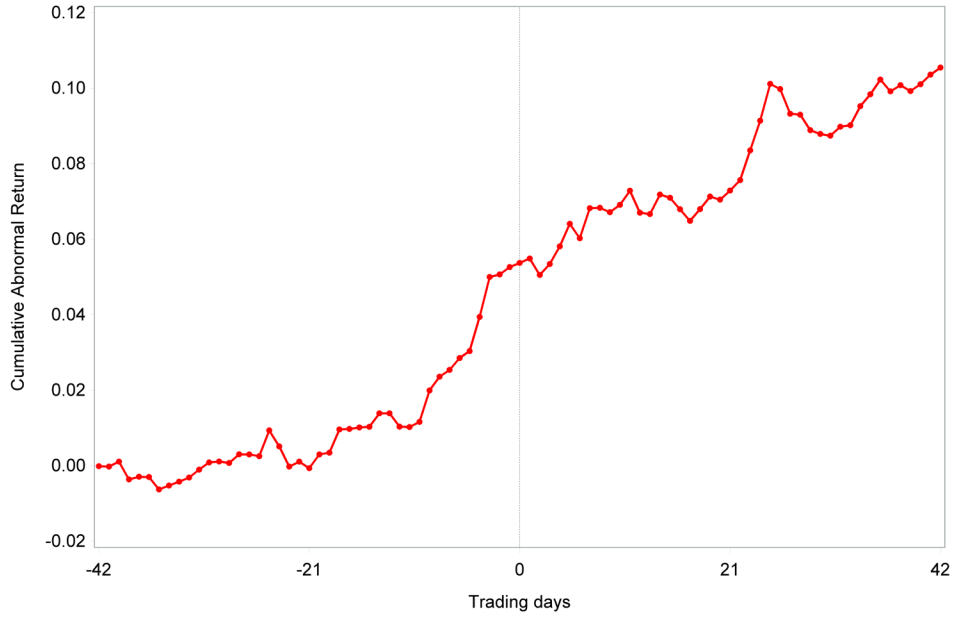
**Figure 6. Change in the Proportion and Frequency of 10b5-1 Sales by Potential Abusers**

This figure plots the proportion of 10b5-1 sales and the frequency of 10b5-1 and non-10b5-1 sales by potential abusers, by quarter. Panel A plots the percentage of 10b5-1 plan sales as a proportion of all sales. Panel B plots the number of 10b5-1 sales and non-10b5-1 sales.



### Figure 7. Returns to 10b5-1 Terminations

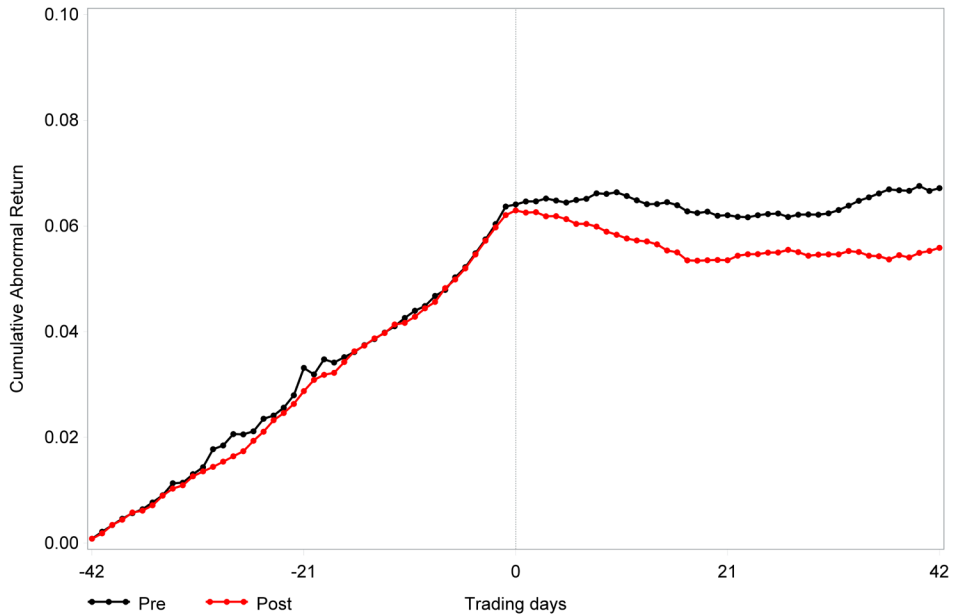
This figure plots cumulative abnormal returns around 10b5-1 terminations disclosed in 10-Q/K filings from June 2023 to June 2025.



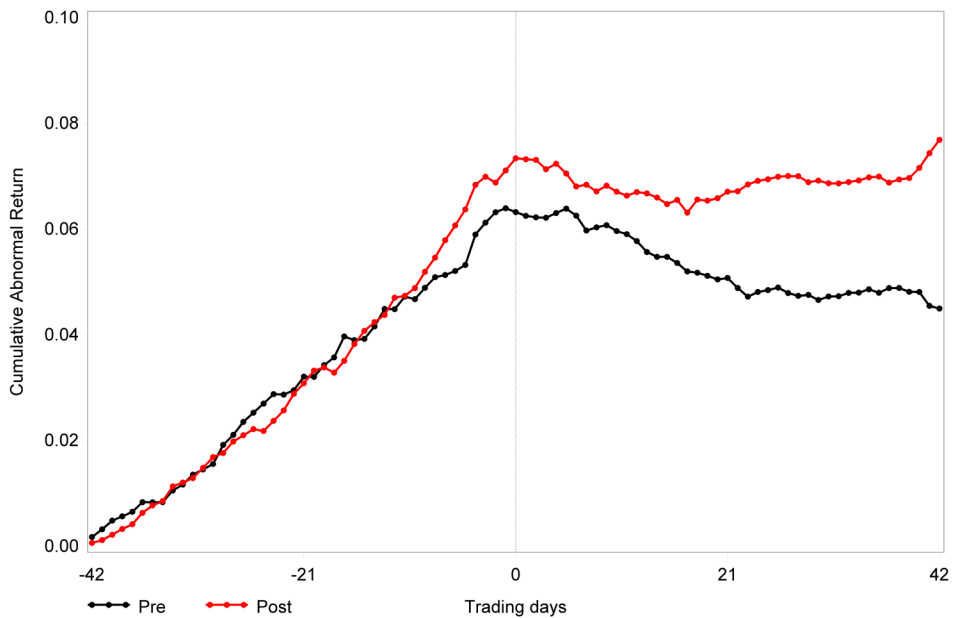
### Figure 8. Returns around Insider Gifts

This figure plots cumulative abnormal returns around insider stock gifts. Cumulative abnormal returns around stock gifts during the pre-amendment period are in black, and those during the post-amendment period are in red. Panel A is based on the full sample of stock gifts, Panel B focuses on gifts of over \$1 million, and Panel C focuses on gifts of over \$10 million.

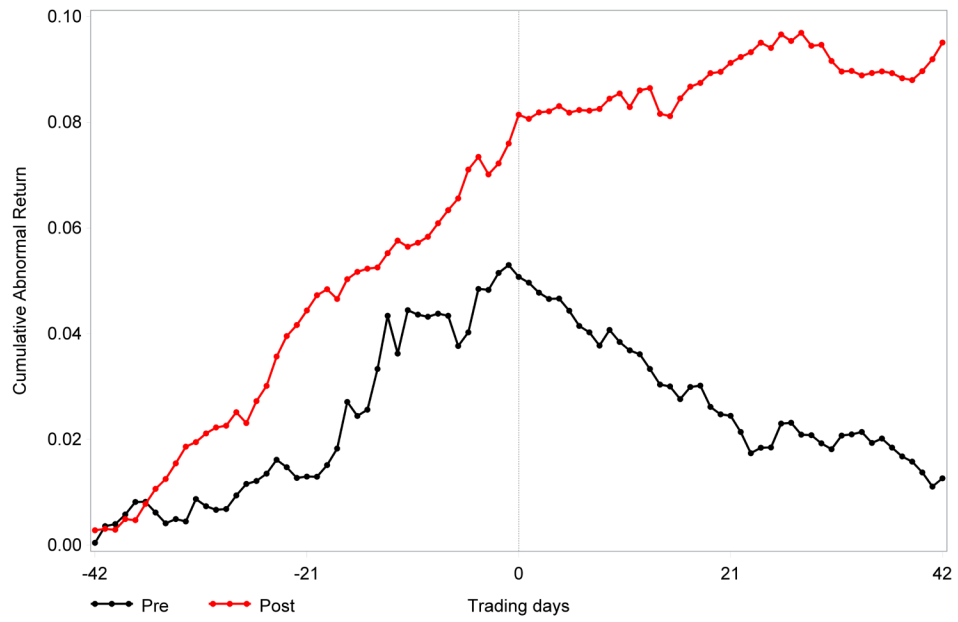
**Panel A. All Stock Gifts**



**Panel B. Stock Gifts over \$1 million**



**Panel C. Stock Gifts over \$10 million**



**Table 1. Firm and Transaction Characteristics**

This table presents descriptive statistics for the firm and transaction characteristics of open market sales made by officers and directors between 2021 and 2024. Variable definitions are provided in Appendix B.

	# Obs.	Mean	S.D.	P25	P50	P75
<i>Post</i>	174,634	0.420	0.494	0.000	0.000	1.000
<i>Iob5-1</i>	174,634	0.516	0.500	0.000	1.000	1.000
<i>AbRet [0,30]</i>	174,634	-0.004	0.140	-0.079	-0.007	0.062
<i>AbRet [0,180]</i>	160,696	-0.006	0.337	-0.205	-0.017	0.162
<i>I(UE&lt;0)</i>	156,324	0.294	0.456	0.000	0.000	1.000
<i>log(MVE)</i>	174,634	8.209	2.012	6.966	8.141	9.487
<i>M/B</i>	174,634	8.400	388.064	1.785	3.587	7.803
<i>Leverage</i>	174,634	0.562	0.326	0.333	0.540	0.753
<i>ROA</i>	174,634	-0.012	0.120	-0.027	0.003	0.019
<i>AbRet [-30,-1]</i>	174,634	0.037	0.249	-0.057	0.023	0.105
<i>Log(Value)</i>	174,634	-1.272	2.251	-2.641	-1.219	0.155
<i>CSuite</i>	174,634	0.309	0.462	0.000	0.000	1.000
<i>Abuser</i>	49,342	0.693	0.461	0.000	1.000	1.000

**Table 2. Compliance with Cooling-off Period Provision**

This table examines the effect of the 10b5-1 amendment on compliance with the cooling-off period. *Under90days* equals one for sales made within 90 days of Rule 10b5-1 plan adoption, and *Short Cooling-off* equals one for sales made within 90 days of a Rule 10b5-1 plan's adoption or before the second business day following the 10-Q/K filing for the quarter of plan adoption. In Panel B, the explanatory variable of interest is *Post*, which equals one for insider sales after April 1, 2023. Variable definitions are provided in Appendix B. *t*-statistics are reported in parentheses. \*\*\*, \*\*, and \* denote significance at the one, five, and ten percent levels, respectively, in two-tailed tests.

**Panel A. Univariate Analysis**

	Pre-period	Post-period	Diff
<i>Under90days</i>	0.311	0.017	-0.294***
<i>Short Cooling-Off</i>	0.328	0.022	-0.305***
# Obs.	25,486	28,618	

**Panel B. Regression Analysis**

	(1) <i>Under90days</i>	(2) <i>Short Cooling-Off</i>
<i>Post</i>	-0.280*** (0.014)	-0.290*** (0.014)
<i>Log(MVE)<sub>q-1</sub></i>	-0.022*** (0.004)	-0.024*** (0.004)
<i>M/B<sub>q-1</sub></i>	-0.000 (0.000)	-0.000 (0.000)
<i>Leverage<sub>q-1</sub></i>	0.033** (0.016)	0.032* (0.016)
<i>ROA<sub>q-1</sub></i>	0.066 (0.094)	0.071 (0.095)
<i>AbRet [-30,-1]</i>	-0.064*** (0.019)	-0.065*** (0.019)
<i>Log(Value)</i>	0.017*** (0.004)	0.018*** (0.004)
<i>CSuite</i>	-0.036*** (0.010)	-0.038*** (0.010)
# Observations	54,104	54,104
Fixed Effects	Industry	Industry
Adj. R-squared	0.181	0.186

**Table 3. Proportion of Rule 10b5-1 Sales**

This table examines the effect of the amendment on the use of 10b5-1 plans. *10b5-1* equals one for insider sales pursuant to Rule 10b5-1. Panel A reports the univariate comparison. Panel B reports the regression results. In Panel B, the explanatory variable of interest is *Post*, which equals one for insider sales after April 1, 2023. Variable definitions are provided in Appendix B. Standard errors corrected for heteroscedasticity and clustered by firm and transaction date are reported in parentheses. \*\*\*, \*\*, and \* denote significance at the one, five, and ten percent levels, respectively, in two-tailed tests.

**Panel A. Univariate Analysis**

	Pre-period	Post-period	Diff
<i>10b5-1</i>	0.525	0.503	-0.022***
# Obs.	101,316	73,318	

**Panel B. Regression Analysis**

	(1) <i>10b5-1</i>
<i>Post</i>	-0.029* (0.015)
$\text{Log}(MVE)_{q-1}$	0.044*** (0.005)
$M/B_{q-1}$	-0.000* (0.000)
$\text{Leverage}_{q-1}$	-0.144*** (0.027)
$ROA_{q-1}$	-0.153** (0.059)
$AbRet [-30,-1]$	0.024 (0.016)
$\text{Log}(\text{Value})$	-0.013*** (0.004)
<i>CSuite</i>	0.154*** (0.012)
# Observations	174,634
Fixed Effects	Industry
Adj. R-squared	0.074

**Table 4. Opportunism in 10b5-1 Insider Sales**

This table examines the effect of the amendment on the opportunistic insider selling behavior under 10b5-1 plans. We proxy for opportunism using three variables: 30-day and 180-day cumulative abnormal stock returns (*AbRet* [0,30] and *AbRet* [0,180]) and insider sales preceding next quarter's earnings misses (*Earnings Miss*). The explanatory variable of interest is *Post* in columns (1) – (6) and *Post*×*10b5-1* in columns (7) – (9). Variable definitions are provided in Appendix B. Standard errors corrected for heteroscedasticity and clustered by firm and transaction date are reported in parentheses. \*\*\*, \*\*, and \* denote significance at the one, five, and ten percent levels, respectively, in two-tailed tests.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	<i>AbRet</i>	<i>10b5-1=1</i>	<i>Earnings</i>	<i>AbRet</i>	<i>10b5-1=0</i>	<i>Earnings</i>	<i>AbRet</i>	Diff-in-Diff	<i>Earnings</i>
	[0,30]	<i>AbRet</i>	<i>Miss</i>	[0,30]	<i>AbRet</i>	<i>Miss</i>	[0,30]	<i>AbRet</i>	<i>Miss</i>
		[0,180]			[0,180]			[0,180]	
<i>Post</i>	0.019*** (0.003)	0.063*** (0.014)	-0.034** (0.016)	0.008* (0.004)	0.022** (0.010)	0.020 (0.013)			
<i>10b5-1</i>							0.001 (0.003)	-0.020** (0.009)	0.047*** (0.015)
<i>Post</i> × <i>10b5-1</i>							0.012*** (0.004)	0.039*** (0.015)	-0.054*** (0.019)
<i>Log</i> ( <i>MVE</i> ) <sub><i>q-1</i></sub>	0.002* (0.001)	0.015*** (0.004)	-0.026*** (0.007)	0.004*** (0.002)	0.019*** (0.003)	-0.038*** (0.005)	0.003*** (0.001)	0.018*** (0.003)	-0.037*** (0.005)
<i>M/B</i> <sub><i>q-1</i></sub>	0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
<i>Leverage</i> <sub><i>q-1</i></sub>	0.010 (0.007)	0.063*** (0.024)	-0.018 (0.031)	0.011** (0.005)	0.037** (0.015)	0.010 (0.026)	0.010** (0.005)	0.049*** (0.015)	-0.008 (0.023)
<i>ROA</i> <sub><i>q-1</i></sub>	0.056* (0.031)	0.416*** (0.098)	-1.362*** (0.138)	0.049** (0.020)	0.178** (0.081)	-0.182 (0.138)	0.051*** (0.017)	0.237*** (0.088)	-0.419* (0.228)
<i>AbRet</i> [-30,-1]	0.007 (0.011)	0.007 (0.022)	-0.007 (0.034)	-0.010 (0.006)	-0.017 (0.013)	-0.060** (0.028)	-0.005 (0.007)	-0.005 (0.015)	-0.035 (0.025)
<i>Log</i> ( <i>Value</i> )	0.001 (0.001)	0.001 (0.003)	-0.003 (0.005)	-0.001 (0.001)	-0.001 (0.002)	0.001 (0.004)	-0.000 (0.001)	0.001 (0.002)	0.000 (0.003)
<i>CSuite</i>	-0.001 (0.002)	0.001 (0.008)	-0.011 (0.012)	-0.003 (0.003)	-0.010 (0.006)	-0.010 (0.010)	-0.002 (0.002)	-0.003 (0.006)	-0.014* (0.008)
# Observations	90,046	83,192	82,448	84,588	77,504	73,876	174,634	160,696	156,324
Fixed Effects		Industry			Industry		Industry & Year Quarter		
Adj. R-squared	0.009	0.038	0.097	0.010	0.026	0.037	0.012	0.039	0.060

**Table 5. Effect on 10b5-1 Plan Abusers**

This table examines the effect of the amendment on the opportunistic insider selling behavior of potential abusive users of 10b5-1 plans (*Abuser*). We proxy for opportunism using three variables: 30-day and 180-day cumulative abnormal stock returns (*AbRet [0,30]* and *AbRet [0,180]*) and insider sales preceding next quarter's earnings misses (*Earnings Miss*). The explanatory variable of interest is  $Post \times Abuser$  in columns (1) and (8) – (10), and the variable of interest is *Post* in columns (2) – (7). In Panel A, columns (2) – (10), we estimate the regression for a subsample of 10b5-1 sales. In Panel B, columns (1) – (9), we estimate the regression for a subsample of non-10b5-1 sales. Variable definitions are provided in Appendix B. Standard errors corrected for heteroscedasticity and clustered by firm and transaction date are reported in parentheses. \*\*\*, \*\*, and \* denote significance at the one, five, and ten percent levels, respectively, in two-tailed tests.

**Panel A: 10b5-1 Sales**

	(1)	(2) (3) (4) <i>Abuser=1 &amp; 10b5-1=1</i>			(5) (6) (7) <i>Abuser=0 &amp; 10b5-1=1</i>			(8) (9) (10) Diff-in-Diff ( <i>10b5-1=1</i> )		
	<i>10b5-1</i>	<i>AbRet</i> [0,30]	<i>AbRet</i> [0,180]	<i>Earnings</i> <i>Miss</i>	<i>AbRet</i> [0,30]	<i>AbRet</i> [0,180]	<i>Earnings</i> <i>Miss</i>	<i>AbRet</i> [0,30]	<i>AbRet</i> [0,180]	<i>Earnings</i> <i>Miss</i>
<i>Post</i>	0.003 (0.023)	0.016*** (0.005)	0.061*** (0.022)	-0.059*** (0.023)	0.027*** (0.007)	0.106*** (0.032)	-0.059** (0.026)			
<i>Abuser</i>	0.017 (0.015)							-0.002 (0.004)	0.021 (0.015)	-0.022 (0.020)
$Post \times Abuser$	-0.086*** (0.026)							-0.006 (0.007)	-0.044 (0.037)	0.008 (0.033)
$Log(MVE)_{q-1}$	0.016*** (0.006)	0.005*** (0.001)	0.020*** (0.005)	-0.010 (0.010)	0.000 (0.002)	0.015* (0.009)	-0.021** (0.009)	0.003** (0.001)	0.017*** (0.005)	-0.014* (0.008)
$M/B_{q-1}$	0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000* (0.000)	0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)
$Leverage_{q-1}$	-0.009 (0.030)	0.019** (0.009)	0.106*** (0.040)	-0.035 (0.048)	0.001 (0.012)	0.006 (0.051)	-0.094* (0.052)	0.011 (0.008)	0.072** (0.034)	-0.058 (0.039)
$ROA_{q-1}$	0.053 (0.076)	0.102* (0.054)	0.307* (0.169)	-1.356*** (0.269)	0.120* (0.062)	0.503* (0.260)	-1.297*** (0.217)	0.104** (0.044)	0.370** (0.148)	-1.347*** (0.195)
$AbRet [-30,-1]$	0.036** (0.018)	0.011 (0.014)	-0.003 (0.039)	-0.038 (0.046)	-0.017** (0.008)	-0.010 (0.024)	-0.003 (0.058)	-0.009 (0.009)	0.004 (0.024)	-0.030 (0.039)
$Log(Value)$	0.010* (0.005)	-0.000 (0.001)	0.001 (0.003)	-0.011* (0.006)	0.001 (0.001)	-0.016** (0.007)	0.006 (0.006)	0.000 (0.001)	-0.001 (0.004)	-0.005 (0.005)
<i>CSuite</i>	0.033** (0.014)	0.004 (0.003)	0.013 (0.012)	0.009 (0.017)	-0.004 (0.005)	0.067*** (0.020)	0.008 (0.020)	0.001 (0.003)	0.023** (0.010)	0.006 (0.014)
# Observations	49,322	28,015	26,835	25,297	12,511	11,718	11,614	40,527	38,554	36,912
Fixed Effects	Industry		Industry			Industry		Industry & Year Quarter		
Adj. R-squared	0.023	0.014	0.045	0.085	0.013	0.049	0.124	0.025	0.062	0.101

**Panel B: Non-10b5-1 Sales**

	(1) <i>Abuser=1 &amp; 10b5-1=0</i>			(4) <i>Abuser=0 &amp; 10b5-1=0</i>			(7) Diff-in-Diff ( <i>10b5-1=0</i> )		
	<i>AbRet</i>	<i>AbRet</i>	<i>Earnings</i>	<i>AbRet</i>	<i>AbRet</i>	<i>Earnings</i>	<i>AbRet</i>	<i>AbRet</i>	<i>Earnings</i>
	[0,30]	[0,180]	Miss	[0,30]	[0,180]	Miss	[0,30]	[0,180]	Miss
<i>Post</i>	-0.003	0.029	-0.025	0.019**	0.050	-0.040			
	(0.007)	(0.027)	(0.035)	(0.010)	(0.031)	(0.036)			
<i>Abuser</i>							0.015**	0.027	-0.028
							(0.007)	(0.024)	(0.028)
<i>Post</i> × <i>Abuser</i>							-0.023**	-0.022	0.008
							(0.010)	(0.036)	(0.042)
<i>Log(MVE)<sub>q-1</sub></i>	0.004*	0.015*	-0.036***	0.003	0.009	-0.023**	0.005**	0.013**	-0.032***
	(0.002)	(0.008)	(0.012)	(0.003)	(0.008)	(0.012)	(0.002)	(0.007)	(0.010)
<i>M/B<sub>q-1</sub></i>	0.000**	0.000	0.000	-0.000	-0.000	0.000	0.000**	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
<i>Leverage<sub>q-1</sub></i>	0.018	0.111**	-0.104	-0.000	0.067	-0.110	0.012	0.100**	-0.109
	(0.012)	(0.056)	(0.079)	(0.014)	(0.050)	(0.081)	(0.010)	(0.047)	(0.071)
<i>ROA<sub>q-1</sub></i>	0.038***	0.074	-0.012	0.003	0.051	-0.005	0.028***	0.064	-0.010
	(0.010)	(0.055)	(0.057)	(0.008)	(0.040)	(0.050)	(0.008)	(0.049)	(0.052)
<i>AbRet [-30,-1]</i>	-0.007	-0.020	-0.093	0.026	0.062	-0.026	-0.003	0.022	-0.080
	(0.023)	(0.052)	(0.067)	(0.023)	(0.073)	(0.085)	(0.019)	(0.050)	(0.056)
<i>Log(Value)</i>	-0.001	-0.001	-0.010	0.001	0.003	-0.009	-0.000	0.001	-0.009
	(0.002)	(0.006)	(0.008)	(0.002)	(0.007)	(0.010)	(0.002)	(0.005)	(0.007)
<i>CSuite</i>	-0.015***	-0.021	-0.004	-0.000	-0.016	-0.035	-0.010**	-0.019	-0.012
	(0.005)	(0.024)	(0.032)	(0.007)	(0.025)	(0.034)	(0.004)	(0.019)	(0.023)
# Observations	6,172	5,769	5,484	2,611	2,423	2,401	8,784	8,194	7,886
Fixed Effects		Industry			Industry			Industry & Year Quarter	
Adj. R-squared	0.015	0.030	0.053	0.005	0.014	0.042	0.021	0.048	0.052

**Table 6. Firm-level Partition by Strength of Insider Trading Policy**

This table examines the effect of the amendment on the opportunistic insider selling behavior using firm-level partitions. The sample is partitioned by the median firm-level percentage of 10b5-1 sales within 90 days of plan adoption in the pre-period, which proxies for the strength of the firm's insider trading policy. We proxy for opportunism using three variables: 30-day and 180-day cumulative abnormal stock returns (*AbRet* [0,30] and *AbRet* [0,180]) and insider sales preceding next quarter's earnings misses (*Earnings Miss*). The explanatory variable of interest is *Post* × *10b5-1*. Firms that had above-median percentage 10b5-1 sales executed shortly after plan adoption in the pre-period are included in the subsample for columns (1) – (3), and others are included in the subsample for columns (4) – (6). Variable definitions are provided in Appendix B. Standard errors corrected for heteroscedasticity and clustered by firm and transaction date are reported in parentheses. \*\*\*, \*\*, and \* denote significance at the one, five, and ten percent levels, respectively, in two-tailed tests.

	(1) <i>Above-median Under90days</i> (Weaker Insider Trading Policy)	(2) <i>Under90days</i>	(3) <i>Earnings</i>	(4) <i>Below-median Under90days</i> (Stronger Insider Trading Policy)	(5) <i>Under90days</i>	(6) <i>Earnings</i>
	<i>AbRet</i> [0,30]	<i>AbRet</i> [0,180]	<i>Miss</i>	<i>AbRet</i> [0,30]	<i>AbRet</i> [0,180]	<i>Miss</i>
<i>10b5-1</i>	-0.005 (0.006)	-0.017 (0.019)	0.052** (0.026)	0.020*** (0.006)	0.019 (0.020)	0.056** (0.028)
<i>Post</i> × <i>10b5-1</i>	0.023** (0.011)	0.085** (0.034)	-0.120*** (0.041)	0.007 (0.009)	0.070 (0.043)	-0.048 (0.035)
<i>Log(MVE)<sub>q-1</sub></i>	0.008*** (0.002)	0.022*** (0.006)	-0.025** (0.011)	0.002 (0.002)	0.011* (0.007)	-0.022*** (0.008)
<i>M/B<sub>q-1</sub></i>	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
<i>Leverage<sub>q-1</sub></i>	-0.009 (0.015)	0.050 (0.032)	0.004 (0.052)	0.015 (0.014)	0.065 (0.049)	-0.094** (0.044)
<i>ROA<sub>q-1</sub></i>	0.033* (0.018)	0.070 (0.058)	-0.212 (0.197)	0.150*** (0.050)	0.471** (0.185)	-1.071*** (0.175)
<i>AbRet</i> [-30,-1]	0.017 (0.020)	0.020 (0.049)	-0.078 (0.051)	-0.018*** (0.007)	0.000 (0.025)	-0.026 (0.033)
<i>Log(Value)</i>	-0.001 (0.001)	0.006* (0.003)	-0.008 (0.005)	-0.000 (0.001)	0.003 (0.004)	-0.006 (0.004)
<i>CSuite</i>	0.007** (0.003)	0.019 (0.012)	0.005 (0.016)	-0.006* (0.004)	0.000 (0.012)	0.010 (0.015)
# Observations	49,434	46,047	45,220	49,458	46,395	44,518
Fixed Effects	Industry & Year Quarter			Industry & Year Quarter		
Adj. R-squared	0.029	0.049	0.036	0.035	0.079	0.143

**Table 7. Robustness Tests: Opportunism in 10b5-1 Insider Sales**

This table replicates Table 4 using different abnormal return measurements and sample periods. We proxy for opportunism using three variables: 30-day and 180-day cumulative abnormal stock returns (*AbRet* [0,30] and *AbRet* [0,180]) and insider sales preceding next quarter's earnings misses (*Earnings Miss*). The explanatory variable of interest is *Post* in columns (1) – (6) and *Post*×*10b5-1* in columns (7) – (9). Panel A reports the results using abnormal returns adjusted for the value-weighted market index. Panel B reports the results using size-adjusted abnormal returns. Panel C reports the results excluding insider sales in the 2022 bear market. Panel D reports the results using an extended sample from 2006 to 2024. Variable definitions are provided in Appendix B. Standard errors corrected for heteroscedasticity and clustered by firm and transaction date are reported in parentheses. \*\*\*, \*\*, and \* denote significance at the one, five, and ten percent levels, respectively, in two-tailed tests.

**Panel A: Value-weighted Index Adjusted Cumulative Abnormal Returns**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	<i>AbRet</i> [0,30]	<i>10b5-1=1</i> <i>AbRet</i> [0,180]	<i>Earnings</i> <i>Miss</i>	<i>AbRet</i> [0,30]	<i>10b5-1=0</i> <i>AbRet</i> [0,180]	<i>Earnings</i> <i>Miss</i>	<i>AbRet</i> [0,30]	Diff-in-Diff <i>AbRet</i> [0,180]	<i>Earnings</i> <i>Miss</i>
<i>Post</i>	0.019*** (0.004)	0.069*** (0.015)	-0.034** (0.016)	0.010** (0.004)	0.026*** (0.010)	0.020 (0.013)			
<i>10b5-1</i>							0.005 (0.003)	-0.017* (0.009)	0.047*** (0.015)
<i>Post</i> × <i>10b5-1</i>							0.009** (0.004)	0.036** (0.015)	-0.055*** (0.019)
# Observations	90,046	83,192	82,448	84,588	77,504	73,876	174,634	160,696	156,324
Controls		Yes			Yes			Yes	
Fixed Effects		Industry			Industry		Industry & Year Quarter		
Adj. R-squared	0.008	0.040	0.097	0.010	0.027	0.037	0.021	0.047	0.060

**Panel B: Size-Adjusted Cumulative Abnormal Returns**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		<i>10b5-1=1</i>			<i>10b5-1=0</i>			Diff-in-Diff	
	<i>AbRet</i>	<i>AbRet</i>	<i>Earnings</i>	<i>AbRet</i>	<i>AbRet</i>	<i>Earnings</i>	<i>AbRet</i>	<i>AbRet</i>	<i>Earnings</i>
	[0,30]	[0,180]	Miss	[0,30]	[0,180]	Miss	[0,30]	[0,180]	Miss
<i>Post</i>	0.018***	0.063***	-0.034**	0.006	0.016*	0.021			
	(0.003)	(0.015)	(0.016)	(0.004)	(0.010)	(0.013)			
<i>10b5-1</i>							0.001	-0.019**	0.048***
							(0.003)	(0.009)	(0.015)
<i>Post</i> × <i>10b5-1</i>							0.013***	0.043***	-0.055***
							(0.004)	(0.015)	(0.019)
# Observations	89,520	82,737	82,013	84,083	77,029	73,430	173,603	159,766	155,443
Controls		Yes			Yes			Yes	
Fixed Effects		Industry			Industry			Industry & Year Quarter	
Adj. R-squared	0.006	0.023	0.096	0.006	0.011	0.037	0.012	0.026	0.060

**Panel C: Excluding 2022 Bear Market**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		<i>10b5-1=1</i>			<i>10b5-1=0</i>			Diff-in-Diff	
	<i>AbRet</i>	<i>AbRet</i>	<i>Earnings</i>	<i>AbRet</i>	<i>AbRet</i>	<i>Earnings</i>	<i>AbRet</i>	<i>AbRet</i>	<i>Earnings</i>
	[0,30]	[0,180]	Miss	[0,30]	[0,180]	Miss	[0,30]	[0,180]	Miss
<i>Post</i>	0.019***	0.071***	-0.012	0.002	0.011	0.048***			
	(0.004)	(0.016)	(0.015)	(0.004)	(0.010)	(0.014)			
<i>10b5-1</i>							-0.003	-0.037***	0.049***
							(0.004)	(0.011)	(0.014)
<i>Post</i> × <i>10b5-1</i>							0.015***	0.053***	-0.055***
							(0.005)	(0.016)	(0.018)
# Observations	72,551	66,007	66,443	65,833	59,042	57,470	138,384	125,049	123,913
Controls		Yes			Yes			Yes	
Fixed Effects		Industry			Industry			Industry & Year Quarter	
Adj. R-squared	0.009	0.045	0.103	0.010	0.024	0.039	0.012	0.043	0.060

**Panel D: Extended 2006 – 2024 Sample**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	<i>AbRet</i>	<i>AbRet</i>	<i>Earnings</i>	<i>AbRet</i>	<i>AbRet</i>	<i>Earnings</i>	<i>AbRet</i>	Diff-in-Diff <i>AbRet</i>	<i>Earnings</i>
	[0,30]	[0,180]	Miss	[0,30]	[0,180]	Miss	[0,30]	[0,180]	Miss
<i>Post</i>	0.008*** (0.003)	0.032** (0.013)	0.001 (0.014)	0.001 (0.004)	0.024*** (0.008)	0.017 (0.012)			
<i>10b5-1</i>							0.007*** (0.001)	0.015*** (0.004)	-0.006 (0.007)
<i>Post</i> × <i>10b5-1</i>							0.006* (0.004)	0.006 (0.012)	-0.006 (0.015)
# Observations	361,496	350,187	313,573	433,024	421,482	345,603	794,520	771,669	659,176
Controls		Yes			Yes			Yes	
Fixed Effects		Industry			Industry		Industry & Year Quarter		
Adj. R-squared	0.004	0.009	0.049	0.002	0.006	0.026	0.015	0.047	0.041

**Table 8. Effects on Price Efficiency**

This table examines the effect of the amendment on price efficiency for firms with above- and below-median proportion of 10b5-1 sales within 90 days of plan adoption in the pre-period (i.e., weak vs. strong insider trading policy firms). The dependent variables are quarterly averages of the variance ratio ratios measured using various intervals: 15-second to 5-second volatility (*VarRatio [15s,5s]*), 1-minute to 15-second volatility (*VarRatio [1m,15s]*), 5-minute to 1-minute volatility (*VarRatio [5m,1m]*), 15-minute to 5-minute volatility (*VarRatio [15m,5m]*), and 30-minute to 15-minute volatility (*VarRatio [30m,15m]*). We compare firms that had an above-median proportion of 10b5-1 sales made within 90 days of plan adoption during the pre-period (*WeakPolicyFirm*) to those with a below-median proportion of those sales during the pre-period. The explanatory variable of interest is *Post* × *WeakPolicyFirm*. Variable definitions are provided in Appendix B. Standard errors corrected for heteroscedasticity and clustered by firm are reported in parentheses. \*\*\*, \*\*, and \* denote significance at the one, five, and ten percent levels, respectively, in two-tailed tests.

	(1)	(2)	(3)	(4)	(5)
	<i>VarRatio</i> <i>[15s,5s]</i>	<i>VarRatio</i> <i>[1m,15s]</i>	<i>VarRatio</i> <i>[5m,1m]</i>	<i>VarRatio</i> <i>[15m,5m]</i>	<i>VarRatio</i> <i>[30m,15m]</i>
<i>Post</i> × <i>WeakPolicyFirm</i>	0.010*** (0.003)	0.014*** (0.004)	0.012*** (0.004)	0.005*** (0.002)	0.068 (0.069)
<i>Log(MVE)<sub>q-1</sub></i>	-0.031*** (0.003)	-0.046*** (0.003)	-0.037*** (0.003)	-0.014*** (0.002)	-0.026 (0.026)
<i>M/B<sub>q-1</sub></i>	0.000* (0.000)	0.000 (0.000)	-0.000*** (0.000)	0.000 (0.000)	0.000 (0.000)
<i>Leverage<sub>q-1</sub></i>	-0.000 (0.008)	0.010 (0.012)	0.015 (0.010)	0.001 (0.004)	-0.020 (0.020)
<i>ROA<sub>q-1</sub></i>	-0.003 (0.005)	0.002 (0.007)	0.007 (0.005)	-0.000 (0.002)	0.011 (0.014)
# Observations	16,161	16,161	16,161	16,161	16,161
Fixed Effects			Firm & Year Quarter		
Adj. R-squared	0.910	0.886	0.784	0.477	0.000

**Table 9. Returns to 10b5-1 Plan Terminations**

This table examines terminations of 10b5-1 plans following the amendment. We use 10b5-1 plan terminations disclosed in 10-Q/K filings from June 2023 to May 2025. Panel A reports (i) the number of days from plan termination to disclosure, (ii) the number of days from plan adoption to termination, and (iii) the number of days left on the plan at termination. Panel B reports the cumulative abnormal returns to 10b5-1 plan terminations. Variable definitions are provided in Appendix B. \*\*\*, \*\*, and \* denote significance at the one, five, and ten percent levels, respectively, in two-tailed tests.

**Panel A. Descriptive Statistics**

	# Obs.	Mean	S.D.	P25	P50	P75
Termination to Disclosure (days)	311	82.4	32.2	63	83	101
Adoption to Termination (days)	256	212.6	139.7	104	180	271
Termination to Plan End (days)	198	246.2	178.1	126	219	324

**Panel B. Cumulative Abnormal Returns to 10b5-1 Plan Terminations**

	# Obs.	Mean	t-stat
<i>AbRet [0,30]</i>	311	0.015	1.52
<i>AbRet [0,60]</i>	302	0.045***	2.77
<i>AbRet [0,90]</i>	284	0.068***	2.53
<i>AbRet [0,180]</i>	245	0.107**	2.50

**Table 10. Effect of Amendment on Stock Returns around Insider Gifts**

This table examines the effect of the amendment on disclosure and stock returns around insider stock gifts. Panel A reports the number of days from stock gift to disclosure in the pre- and post-amendment periods. Panel B reports the estimation of regression models that compare the cumulative abnormal returns following insider gifts after the rule amendment. The dependent variables are 30-day and 180-day cumulative abnormal stock returns adjusted for the equal-weighted market index. The explanatory variable of interest is *Post*, which equals one for insider gifts after April 1, 2023. Variable definitions are provided in Appendix B. Standard errors corrected for heteroscedasticity and clustered by firm and transaction date are reported in parentheses. \*\*\*, \*\*, and \* denote significance at the one, five, and ten percent levels, respectively, in two-tailed tests.

**Panel A. Number of Days from Stock Gift to Disclosure**

	Pre-period	Post-period	Diff
All Gifts	54.8	4.8	-50.0***
# Obs.	6,040	4,327	
Over \$1m	57.2	4.2	-53.0***
# Obs.	1,160	836	
Over \$10m	56.4	5.3	-51.0***
# Obs.	285	192	

**Panel B. Regression Analyses**

	(1) All Gifts <i>AbRet</i> [0,30]	(2) <i>AbRet</i> [0,180]	(3) Over \$1m <i>AbRet</i> [0,30]	(4) <i>AbRet</i> [0,180]	(5) Over \$10m <i>AbRet</i> [0,30]	(6) <i>AbRet</i> [0,180]
<i>Post</i>	-0.009*** (0.003)	0.007 (0.010)	0.012* (0.006)	0.065** (0.029)	0.027** (0.012)	0.154*** (0.056)
<i>Log(MVE)<sub>q-1</sub></i>	0.002* (0.001)	0.009*** (0.003)	0.001 (0.002)	0.015*** (0.006)	-0.002 (0.003)	0.009 (0.007)
<i>M/B<sub>q-1</sub></i>	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	0.000 (0.000)	-0.000 (0.001)
<i>Leverage<sub>q-1</sub></i>	0.006 (0.008)	0.050** (0.025)	-0.010 (0.012)	0.039 (0.047)	0.021 (0.019)	0.197** (0.082)
<i>ROA<sub>q-1</sub></i>	0.090*** (0.025)	0.244*** (0.065)	0.086*** (0.032)	0.222** (0.102)	0.228 (0.160)	0.709* (0.375)
<i>AbRet [-30,-1]</i>	-0.034* (0.020)	0.018 (0.072)	-0.067** (0.027)	-0.114** (0.054)	-0.097*** (0.026)	-0.125*** (0.038)
<i>Log(Value)</i>	-0.001 (0.001)	-0.005* (0.003)	-0.002 (0.002)	0.000 (0.011)	0.003 (0.004)	0.008 (0.012)
<i>CSuite</i>	-0.001 (0.002)	0.007 (0.009)	0.001 (0.006)	0.012 (0.024)	-0.003 (0.010)	0.062 (0.042)
# Observations	10,297	9,092	1,970	1,725	474	430
Fixed Effects	Industry	Industry	Industry	Industry	Industry	Industry
Adj. R-squared	0.015	0.019	0.048	0.052	0.110	0.205

**Table 11. Effect of Amendment on Stock Returns around Option Grants**

This table examines the effect of the amendment on the timing of and stock returns around option grants. Panel A reports the probability of option grants within  $[-4,+1]$  business days of 10-Q/K filings or earnings announcements (*Within*  $[-4,+1]$ ) and 30-day cumulative abnormal returns (*AbRet*  $[0,30]$ ) and 180-day cumulative abnormal returns (*AbRet*  $[0,180]$ ) following option grants for the pre- and post-amendment periods. Panel B reports the estimation of regression models. Column (1) estimates the change in the probability of option grants around material information events, and columns (2) and (3) estimate the cumulative abnormal returns following the grant date for a subsample of options granted around material information events. The explanatory variable of interest is *Post*, which equals one for option grants after April 1, 2023. Grants to multiple insiders at the same firm are treated as a single observation, and insider-level control variables are not included. Variable definitions are provided in Appendix B. *t*-statistics are reported in brackets. Standard errors corrected for heteroscedasticity and clustered by firm and transaction date are reported in parentheses. \*\*\*, \*\*, and \* denote significance at the one, five, and ten percent levels, respectively, in two-tailed tests.

**Panel A. Descriptive Statistics**

	Pre-period	Post-period	Diff
<i>Within</i> $[-4,+1]$	0.131	0.093	-0.038***
# Obs.	7,283	3,854	
<i>AbRet</i> $[0,30]$	-0.014**	-0.011	-0.004
	[-2.49]	[-0.85]	[-0.30]
# Obs.	948	357	
<i>AbRet</i> $[0,180]$	-0.073***	-0.103***	0.030
	[-6.34]	[-3.94]	[1.20]
# Obs.	939	321	

**Panel B. Regression Analyses**

	(1) All Option Grants <i>Within</i> $[-4,+1]$	(2) <i>Within</i> $[-4,+1]=1$ <i>AbRet</i> $[0,30]$	(3) <i>Within</i> $[-4,+1]=1$ <i>AbRet</i> $[0,180]$
<i>Post</i>	-0.033*** (0.011)	0.012 (0.014)	0.008 (0.026)
$\text{Log}(MVE)_{q-1}$	0.013*** (0.003)	0.003 (0.002)	0.024*** (0.005)
$M/B_{q-1}$	0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
$\text{Leverage}_{q-1}$	0.010 (0.007)	-0.007 (0.018)	-0.057 (0.036)
$ROA_{q-1}$	0.010 (0.008)	0.102** (0.045)	0.310*** (0.113)
<i>AbRet</i> $[-30,-1]$	-0.004 (0.011)	0.015 (0.040)	-0.066 (0.084)
# Observations	10,916	1,279	1,235
Fixed Effects	Industry	Industry	Industry
Adj. R-squared	0.013	0.011	0.051

**Online Appendix**

**“Insider Trading After the 2022 Rule 10b5-1 Amendment”**

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## **Table of Contents**

Figure OA1. Disclosure of Plan Adoption Date

Figure OA2. Proportion of Short Cooling-off

Figure OA3. Proportion of 10b5-1 Sales Within 30 Days of Plan Adoption

Table OA1. Compliance with Cooling-off Period Provision (Section 16 Insiders that are not a Director or Officer)

Table OA2. Price Impact of Insider Sales

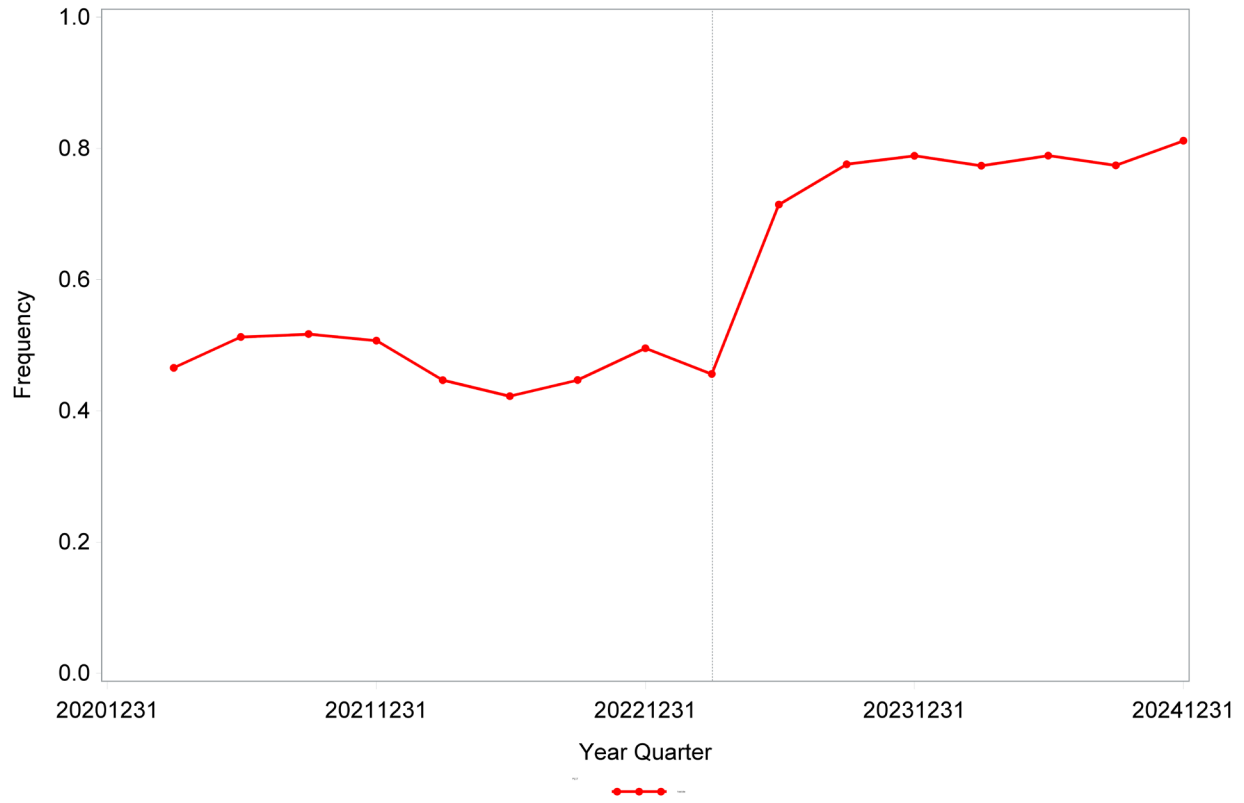
Table OA3. Transaction-level Partitions: High vs. Low Mispricing

Table OA4. Firm-level Percentage Changes of 10b5-1 Sales

Table OA5. Firm-level Partition: Change in the Percentage of 10b5-1 Sales

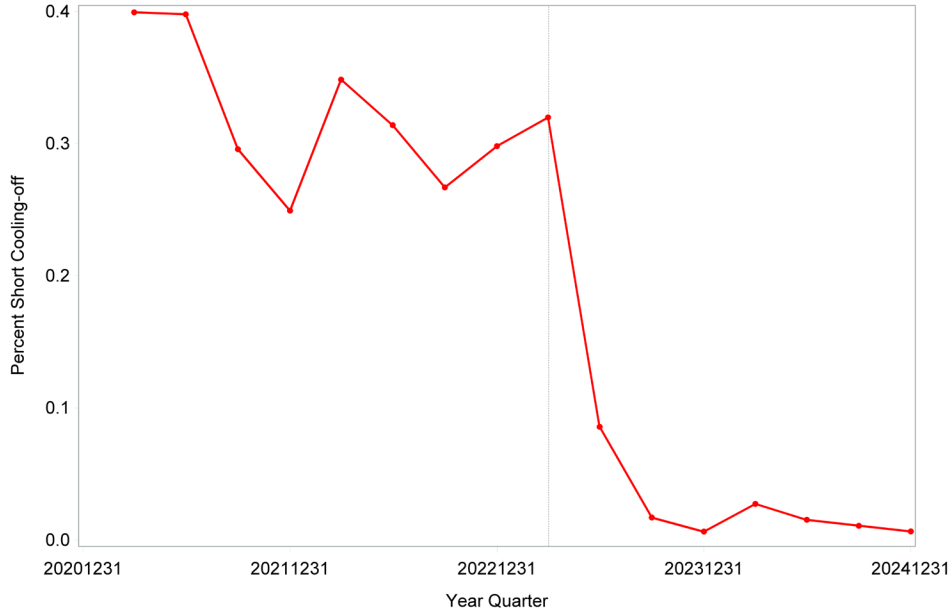
**Figure OA1. Disclosure of Plan Adoption Date**

This figure plots the proportion of 10b5-1 sales that disclose the plan adoption date in the Form 4 footnotes by quarter.



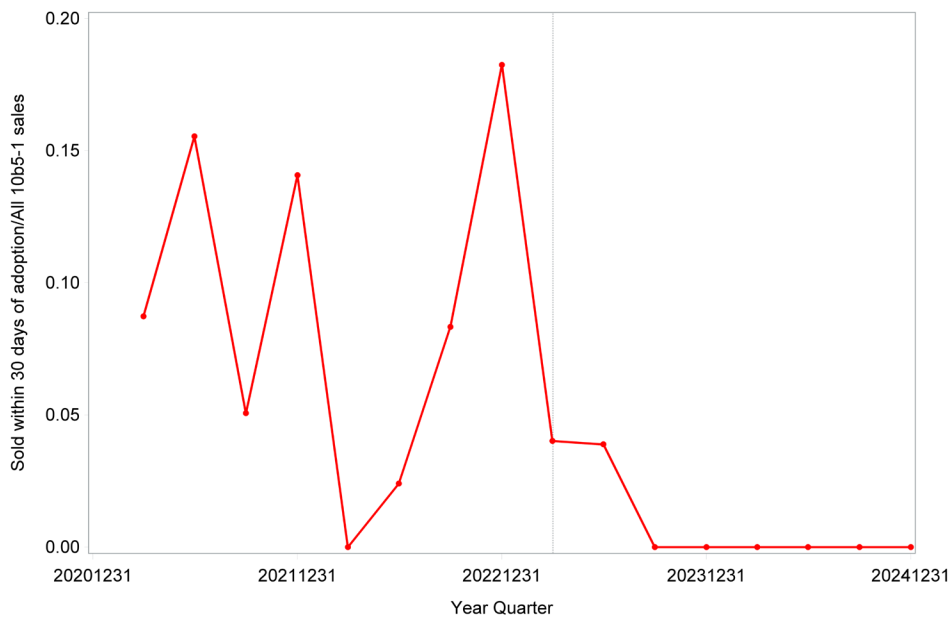
**Figure OA2. Proportion of Short Cooling-off**

This figure plots the proportion of 10b5-1 sales executed within (i) 90 days of plan adoption or (ii) two business days following the 10-Q/K filing for the fiscal quarter in which the plan was adopted, by quarter.



**Figure OA3. Proportion of 10b5-1 Sales Within 30 Days of Plan Adoption (Section 16 Insiders that are not a Director or Officer)**

This figure plots the proportion of 10b5-1 sales executed within 30 days of plan adoption for Section 16 insiders who are not directors or officers, who are subject to a 30-day cooling-off period after the amendment.



**Table OA1. Compliance with Cooling-off Period Provision  
(Section 16 Insiders that are not a Director or Officer)**

This table examines the effect of the 10b5-1 amendment on compliance with the cooling-off period by Section 16 insiders who are neither directors nor officers, who are subject to a 30-day cooling-off period after the amendment. *Under30days* equals one for sales made within 30 days of Rule 10b5-1 plan adoption. In Panel B, the explanatory variable of interest is *Post*, which equals one for insider sales after April 1, 2023. Variable definitions are provided in Appendix B. *t*-statistics are reported in parentheses. \*\*\*, \*\*, and \* denote significance at the one, five, and ten percent levels, respectively, in two-tailed tests.

**Panel A. Univariate Analysis**

	Pre-period	Post-period	Diff
<i>Under30days</i>	0.104	0.004	-0.100***
# Obs.	2,394	2,475	

**Panel B. Regression Analysis**

	(1) <i>Under30days</i>
<i>Post</i>	-0.104*** (0.032)
<i>Log(MVE)<sub>q-1</sub></i>	0.005 (0.013)
<i>M/B<sub>q-1</sub></i>	-0.000 (0.000)
<i>Leverage<sub>q-1</sub></i>	-0.011 (0.036)
<i>ROA<sub>q-1</sub></i>	-0.039 (0.132)
<i>AbRet [-30,-1]</i>	-0.009 (0.079)
<i>Log(Value)</i>	-0.005 (0.009)
<i>CSuite</i>	
# Observations	4,869
Fixed Effects	Industry
Adj. R-squared	0.061

**Table OA2. Price Impact of Insider Sales**

This table examines the effect of the amendment on the price impact of insider selling under 10b5-1 plans. We use two variables of price impact coefficient from WRDS Intraday Indicators,  $\Lambda_1$ , estimated with an intercept, and  $\Lambda_2$ , estimated without an intercept. Price impact is measured on the transaction date, not the filing date of Form 4, to capture the effect of the insider sale rather than the reaction to the disclosure of the insider sale. The explanatory variable of interest is  $Post \times 10b5-1$ . Variable definitions are provided in Appendix B. Standard errors corrected for heteroscedasticity and clustered by firm and transaction date are reported in parentheses. \*\*\*, \*\*, and \* denote significance at the one, five, and ten percent levels, respectively, in two-tailed tests.

	(1)	(2)
	$\Lambda_1$	$\Lambda_2$
$10b5-1$	0.003 (0.002)	0.003 (0.002)
$Post \times 10b5-1$	-0.006* (0.003)	-0.006** (0.003)
$Log(MVE)_{q-1}$	-0.018*** (0.001)	-0.018*** (0.001)
$M/B_{q-1}$	-0.000 (0.000)	-0.000 (0.000)
$Leverage_{q-1}$	0.007** (0.003)	0.007** (0.003)
$ROA_{q-1}$	-0.096*** (0.031)	-0.096*** (0.030)
$AbRet [-30,-1]$	-0.005 (0.005)	-0.007 (0.005)
$Log(Value)$	-0.003*** (0.000)	-0.003*** (0.000)
$CSuite$	0.000 (0.001)	0.000 (0.001)
# Observations	211,250	211,250
Fixed Effects	Industry & Year Quarter	
Adj. R-squared	0.106	0.120

**Table OA3. Transaction-level Partitions: High vs. Low Mispricing**

This table examines the effect of the amendment on opportunistic insider selling behavior by analyzing insider sales made at points of high versus low mispricing. We proxy for mispricing using the extent of short interest as a proportion of shares outstanding. The explanatory variable of interest is  $Post \times 10b5-1$ . Sales made when short interest was above the sample median are included in the subsample for columns (1) – (3), and sales made when short interest was below the sample median are included in the subsample for columns (4) – (6). Variable definitions are provided in Appendix B. Standard errors corrected for heteroscedasticity and clustered by firm and transaction date are reported in parentheses. \*\*\*, \*\*, and \* denote significance at the one, five, and ten percent levels, respectively, in two-tailed tests.

	(1) Above-median Short Interest (More Mispricing)			(4) Below-median Short Interest (Less Mispricing)		
	<i>AbRet</i> [0,30]	<i>AbRet</i> [0,180]	<i>Earnings</i> <i>Miss</i>	<i>AbRet</i> [0,30]	<i>AbRet</i> [0,180]	<i>Earnings</i> <i>Miss</i>
<i>10b5-1</i>	0.007* (0.004)	-0.012 (0.012)	0.032** (0.016)	-0.004 (0.003)	-0.023** (0.011)	0.054*** (0.020)
<i>Post</i> × <i>10b5-1</i>	0.009 (0.007)	0.035* (0.019)	-0.046** (0.022)	0.015*** (0.005)	0.039** (0.019)	-0.058** (0.027)
<i>Log(MVE)<sub>q-1</sub></i>	0.000 (0.002)	0.016*** (0.005)	-0.028*** (0.008)	0.005*** (0.001)	0.019*** (0.003)	-0.039*** (0.005)
<i>M/B<sub>q-1</sub></i>	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
<i>Leverage<sub>q-1</sub></i>	0.010 (0.007)	0.056*** (0.020)	-0.013 (0.028)	0.010** (0.005)	0.043** (0.019)	-0.012 (0.032)
<i>ROA<sub>q-1</sub></i>	0.070*** (0.023)	0.237*** (0.069)	-0.910*** (0.150)	0.044** (0.020)	0.226** (0.109)	-0.189 (0.166)
<i>AbRet</i> [-30,-1]	-0.012* (0.007)	-0.028*** (0.011)	-0.020 (0.029)	0.012 (0.010)	0.057** (0.028)	-0.073** (0.035)
<i>Log(Value)</i>	0.000 (0.001)	-0.000 (0.003)	0.002 (0.004)	-0.001 (0.001)	0.002 (0.002)	-0.001 (0.004)
<i>CSuite</i>	-0.007** (0.003)	-0.012 (0.007)	-0.011 (0.010)	0.002 (0.002)	0.006 (0.007)	-0.021* (0.011)
# Observations	87,181	80,437	80,359	87,184	80,045	75,731
Fixed Effects	Industry & Year Quarter			Industry & Year Quarter		
Adj. R-squared	0.017	0.036	0.068	0.018	0.055	0.070

**Table OA4. Firm-level Percentage Changes of 10b5-1 Sales**

This table categorizes firms based on changes in the firm-level percentage of 10b5-1 sales and lists the number of firms and example names within each category.

<b>Pre 10b5-1</b>	<b>Post 10b5-1</b>	<b># of Firms</b>	<b>Examples</b>
<b><u>No Change</u></b>			
100%	100%	49	Amazon, JP Morgan, Nike
(0,100%)	(0,100%)	10	Lennar Group, Entergy Corp
0%	0%	970	Procter & Gamble, Texas Instruments
<b><u>Increase</u></b>			
0%	100%	23	OneMain Holdings, Victory Capital Holdings
0%	(0,100%)	201	AbbVie, Caterpillar
(0,100%)	100%	114	Deere & Co, Northrop Grumman
(0,100%)	(0,100%)	427	Alphabet, Walmart
<b><u>Decrease</u></b>			
(0,100%)	(0,100%)	520	Apple, Microsoft
(0,100%)	0%	383	UnitedHealth Group, Goldman Sachs
100%	(0,100%)	81	AECOM, Lyft
100%	0%	31	Bridgewater Bancshares

**Table OA5. Firm-level Partition: Change in the Percentage of 10b5-1 Sales**

This table examines the effect of the amendment on the opportunistic insider selling behavior for firms with that decreased vs. increased the use of 10b5-1 plans. We proxy for opportunism using three variables: 30-day and 180-day cumulative abnormal stock returns (*AbRet* [0,30] and *AbRet* [0,180]) and insider sales preceding next quarter's earnings misses (*Earnings Miss*). The explanatory variable of interest is *Post*×*10b5-1*. Firms that decreased the percentage of 10b5-1 sales are included in the subsample for columns (1) – (3), and firms that increased the percentage of 10b5-1 sales are included in the subsample for columns (4) – (6). Variable definitions are provided in Appendix B. Standard errors corrected for heteroscedasticity and clustered by firm and transaction date are reported in parentheses. \*\*\*, \*\*, and \* denote significance at the one, five, and ten percent levels, respectively, in two-tailed tests.

	(1)	(2)	(3)	(4)	(5)	(6)
	$\Delta 10b5-1 < 0$			$\Delta 10b5-1 \geq 0$		
	(Decrease 10b5-1 Use)			(Increase 10b5-1 Use)		
	<i>AbRet</i>	<i>AbRet</i>	<i>Earnings</i>	<i>AbRet</i>	<i>AbRet</i>	<i>Earnings</i>
	[0,30]	[0,180]	<i>Miss</i>	[0,30]	[0,180]	<i>Miss</i>
<i>10b5-1</i>	0.008*	0.016	0.069***	0.009**	0.000	0.043*
	(0.005)	(0.016)	(0.025)	(0.004)	(0.016)	(0.023)
<i>Post</i> × <i>10b5-1</i>	0.024***	0.096***	-0.113***	0.001	0.012	-0.055*
	(0.008)	(0.032)	(0.029)	(0.007)	(0.024)	(0.032)
<i>Log(MVE)<sub>q-1</sub></i>	0.003*	0.011	-0.037***	0.003**	0.017***	-0.036***
	(0.002)	(0.007)	(0.009)	(0.001)	(0.003)	(0.006)
<i>M/B<sub>q-1</sub></i>	0.000**	-0.000	0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
<i>Leverage<sub>q-1</sub></i>	0.015	0.058*	-0.021	0.009	0.044**	-0.005
	(0.010)	(0.033)	(0.036)	(0.006)	(0.022)	(0.037)
<i>ROA<sub>q-1</sub></i>	0.048*	0.166	-0.230	0.077**	0.354***	-0.637***
	(0.025)	(0.107)	(0.198)	(0.030)	(0.092)	(0.136)
<i>AbRet</i> [-30,-1]	-0.004	-0.001	-0.036	-0.005	0.031	-0.050
	(0.014)	(0.024)	(0.038)	(0.012)	(0.033)	(0.042)
<i>Log(Value)</i>	-0.001	0.005	-0.010**	0.001	0.000	0.011***
	(0.001)	(0.003)	(0.005)	(0.001)	(0.002)	(0.004)
<i>CSuite</i>	-0.006*	-0.020	-0.007	0.001	0.015*	-0.026**
	(0.003)	(0.013)	(0.014)	(0.003)	(0.008)	(0.013)
# Observations	88,471	83,266	81,080	110,078	100,860	95,438
Fixed Effects	Industry & Year Quarter			Industry & Year Quarter		
Adj. R-squared	0.014	0.048	0.070	0.017	0.049	0.069