

Determinants of Insider Trading Windows*

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Abstract: We use observed insider trades to assess the economic determinants of the enforcement of company-imposed insider trading restrictions. We find that the timing of quarterly allowed trading windows reflects concerns about information asymmetry, the strength of external monitoring, and executives' liquidity needs. Enforced trading windows constrain optimistic insider trading activity, with insiders generating larger trading profits when boards set trading windows that are abnormally loose. We also identify and explore the enforcement of unscheduled, event-specific "ad hoc blackout windows" by firms engaged in material corporate events. Interestingly, the absence of insider trading in these windows is associated with contemporaneously *higher* information asymmetry. These periods are then followed by increased trading volume and higher stock returns, suggesting investors may not immediately incorporate all information conveyed by unscheduled trading restrictions.

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1. Introduction

Trading of company stock by corporate insiders is ubiquitous, which is not surprising given the large proportion of executive and director compensation that is provided in the form of equity grants. At the same time, the term “insider trading” has come to refer to something more nefarious, specifically corporate executives or directors with access to material, nonpublic information earning abnormal returns through trades in their own company’s stock. Recognizing these potential improprieties with respect to insiders’ trades, legal and voluntary restrictions on insider trading are in place to discourage insiders from taking advantage of material, nonpublic information they may possess (Meulbroek, 1992; Ke et al., 2003).¹

In spite of these restrictions, however, evidence of improprieties is widely documented, with many researchers, practitioners, and regulators questioning the integrity of boards and executives with respect to the effectiveness and enforcement of insider trading restrictions (e.g., Lee et al., 2014; Larcker et al., 2021). As a result, insider trading is a topical regulatory issue, with the SEC recently proposing and adopting sweeping changes to existing disclosures and restrictions related to insider trades (e.g., SEC Final Rule Release No. 33-11138).

In this paper, we focus on the determinants and enforcement of voluntary firm-level insider trading restrictions that complement legal requirements and penalties. Specifically, almost all public firms adopt insider trading policies (ITPs) that place restrictions on the timing of insider trading activities. These ITPs establish a pre-specified open trading window each quarter when

¹ For example, the SEC requires various disclosures on insider trades and holdings to monitor insider activities (Veenman, 2012). Namely, an SEC Form 4 must be filed within two business days when there is a change in insiders' holdings. Further, penalties, both civil and criminal, for violating insider trading laws can be substantial. Under the Securities Exchange Act of 1934, the maximum prison sentence for illegal insider trading is 20 years, and the maximum fine is \$5 million.

insiders are allowed to trade, thereby also dictating a corresponding “blackout” period in which they are prohibited from doing so.

Deciding on the appropriate timing and length of quarterly open trading windows is complex. On one hand, boards recognize legal and reputation risk that may stem from an open trading window that is too lax. On the other hand, because the majority of senior executives’ compensation comes in the form of equity, open trading windows that are too strict can impose liquidity costs on executives, and may run the risk of discouraging executives from accepting equity compensation and/or induce turnover. At the same time, information dynamics vary substantially across firms, in particular, with respect to the speed with which information is impounded in stock prices following earnings announcements, and the build up of firm-specific information during a quarter, both of which can be influenced by firm characteristics and the firm’s exposure to information intermediaries (e.g., institutional investor and analyst following)

We expect these factors to drive variation in the timing and length of trading restrictions across firms. Indeed, we find that although the median firm closes down trading three weeks prior to the end of the fiscal quarter, many firms appear to end trading as much as five weeks or more before the quarter end, with others not closing down the window until a week or two before the quarter end (or even after quarter end). Similarly, although the median firm restricts trade until the third day after quarterly earnings are announced, many firms restrict trade for only one day following the earnings announcement, and still others keep the window closed for five days or more following the announcement. The determinants of this variation and its implications are a key focus of our paper.

We predict that firms where information asymmetry typically builds up more quickly during a quarter will close down their trading window sooner.² We also expect that firms with greater litigation risk will have more restrictive trading windows, and that firms that provide executives and employees with greater amounts of equity-based compensation allow longer trading windows to accommodate liquidity needs. We also explore whether external monitoring from various stakeholders pressures firms to close trading windows sooner, or alternatively, whether external monitoring serves as a substitute governance mechanism that allows firms to keep trading windows open for a longer period of time. With respect to the starting point of the allowed trading window, we expect that firms consider how quickly information is impounded in price at the time of the earnings announcement. Specifically, we predict that the faster information asymmetry is typically resolved following an earnings announcement for a given firm, the sooner the trading window will be opened.

A challenge with empirically examining allowed insider trading windows is that disclosure of ITPs is voluntary, and only a small proportion of firms choose to disclose these policies publicly (e.g., Jagolinzer et al., 2011).³ We address this issue by using the empirical distribution of actual insiders' trades to estimate the start and end of each firm's allowed trading window. Our approach builds upon methods in prior studies that use the timing of insiders' trades to infer the presence of a policy restricting insider trading (e.g., Roulstone, 2003; Lee et al., 2014). However, our methodology is designed to estimate the firm-level timing of these trading restrictions and

² We use the word "typically" to describe the various determinants of firms' insider-trading restrictions because boards generally do not make quarter-specific decisions regarding when to open or close the trading window in a given quarter (except in cases where a trading window is adjusted on an ad hoc basis due to undisclosed pending material events). Rather, boards set the parameters of their insider trading restrictions in their ITP (which is quite sticky) based on determinants that they presumably believe will prevail in a typical quarter.

³ The SEC has recently adopted expanded insider trading disclosure rules, including mandatory ITP disclosure, for fiscal years beginning on or after April 1, 2023. This pending mandatory disclosure requirement increases the importance of developing a measure of trading window length during the "pre-period" if researchers are to eventually assess whether the regulation induces causal effects on firms' insider-trading policies.

corresponding allowed trading windows, rather than simply their existence. Because nearly all firms now restrict insider trading activity to some degree (Deloitte, 2020), the effective cross-sectional variation in insider trading restrictions stems from window length and timing as opposed to a window's existence.⁴

To determine each firm's open trading window start- and end-points, we examine observed insider trades over a rolling eight-quarter period (after imposing a requirement for a minimum number of trades) and identify both the earliest trades following each earnings announcement and the latest trades prior to the next earnings announcement. We then set distribution rules to estimate the parameters of the open trading windows (e.g., the date, relative to the prior earnings announcement, at which X% of the quarters' trades have been executed).⁵ This procedure allows us to capture the *effective* allowed trading window, reflecting a combination of the explicit restrictions in the ITP, enforcement of those restrictions, as well as any additional implicit policies or frictions (e.g., Bettis et al., 2000 find that a nontrivial volume of insider trading occurs during explicit blackout periods, in a sample period predating 10b5-1 trading plans).

We validate our open trading window measures using a sample of firms that publicly disclose their ITPs. We first show that our estimates are highly correlated with the starting and ending points of the allowed trading windows specified in these firms' actual ITPs. Second, we

⁴ Similar to Lee et al. (2014), we focus on enforced insider trading restrictions as opposed to the language of the restrictions written in firms' ITPs. We do this for two reasons. First, ITPs are not publicly disclosed by most firms, making an analysis of the actual ITP document infeasible. Second, regardless of the words written in the ITP, the restrictions on actual trades by executives seem most relevant to the economic questions of interest. As in Lee et al. (2014), we therefore focus on the timing of actual executive trades to infer the enforcement of firms' insider trading restrictions.

⁵ As we discuss in more detail below, these distributional trade rules are necessary, in part, because observed trading data available from SEC filings is not expected to map perfectly into allowed trading windows established by firms. There are a number of reasons for this, including: trades executed through an undisclosed 10b5-1 trading plan may be made during a blackout window even though the 10b5-1 trading plan is often required to be adopted during an open trading window, errors in SEC filing data, exceptions to normal trading windows as approved by the general counsel's office, and changes to the insider trading policy over time. We discuss the 10b5-1 trades in more detail in Section 2.

show that our estimation errors (i.e., the difference between our estimate and the stated starting or ending point) are unassociated with factors such as the volume of insider trading, firm size, institutional ownership, or information asymmetry. This latter result helps alleviate the concern that measurement error in our estimated trading windows might result in these estimates primarily capturing variation in insider trading demand rather than the firm's underlying insider trading restrictions.

Consistent with our hypotheses, we find that boards close the trading window sooner when private information builds up more quickly over the course of the quarter. For example, we find that firms where stock price movements are more concentrated around earnings announcement dates—suggesting that earnings announcements resolve substantial uncertainty and, therefore, a significant amount of information asymmetry tends to build up during the quarter—have trading windows that end earlier in the quarter. Firms with greater average bid-ask spreads over the quarter also have trading windows that close earlier, further suggesting that information asymmetry concerns shape trading window policies.

We also find that larger firms, as well as firms with greater analyst following and board independence, have trading windows that end earlier in the quarter. These results suggest that external monitoring disciplines the strictness of ITPs, as opposed to serving as a substitute mechanism for monitoring insider trading that could allow for less restrictive trading windows. With respect to litigation concerns, we find mixed evidence. For example, we find stricter trading windows for more profitable firms and firms in industries with high litigation risk, but more relaxed policies for firms with more growth opportunities and higher stock volatility (although these latter two variables could also be proxying for employees' demand for liquidity). Finally, we find that firms with more frequent insider trades and greater CEO equity holdings have allowed

trading windows that end later in the quarter. These results, along with our findings above regarding stock volatility, suggest that executives' liquidity needs are associated with extended allowed trading windows.

Regarding the starting point of the insider trading window, we find that boards allow insiders to trade more quickly following earnings announcements when a greater proportion of total return variation typically occurs at the earnings announcement date and when these announcements are associated with greater trading volume. These findings suggest that boards place fewer restrictions on insiders' trades when earnings announcements convey more information, and when this information is incorporated into price more rapidly. We also find that boards allow insiders to trade more quickly when bid-ask spreads are smaller on earnings announcement dates, and when the announcements are associated with a greater reduction in bid-ask spreads, again consistent with more relaxed insider trading windows when post-announcement information asymmetry is less of a concern.

We also consider the effectiveness of these restrictions in constraining informed trade. We find that insiders at firms with trading windows that extend unusually late in the quarter (based on residuals from a determinants prediction model) tend to earn greater abnormal profits on their late trades in the quarter. This result emphasizes the importance of considering firms' information dynamics when establishing trading restrictions that are effective in constraining opportunistic trading by insiders.

In addition to regular pre-specified trading windows, firms' ITPs typically note that ad hoc blackout windows may be imposed by the board or the general counsel when there are firm-specific events, such as pending M&A activity, that can expose insiders to material non-public information. These "ad hoc blackout windows" are previously unexplored in prior literature.

Identifying ad hoc blackout windows is challenging as firms, not surprisingly, do not disclose the occurrence or the length of these periods (which may not even be widely known internally beyond those insiders that are involved in the event). Thus, similar to our preceding analyses, we infer the presence of ad hoc blackout windows using actual insider trading data. Specifically, we identify ad hoc blackout windows based on firm quarters with abnormally low levels of insider trades and find that these periods are predictive of future SEC 8-K filings, particularly filings related to material definitive agreements, asset acquisitions/disposals, and turnover of executives/directors. We also find that bid-ask spreads are higher in the ad hoc blackout quarter, which is interesting given that there is markedly *less* insider trading during such quarters.⁶ Consistent with these ad hoc blackout windows providing an early signal of future material events, we find increases in both trading volume and stock returns in the quarters following these ad hoc blackout periods (with a reversal in the increased bid-ask spread relative to the prior quarter). Further, we document that the material events giving rise to the ad hoc blackout windows tend to be positive news, with excess returns approximately 1% higher in the year following an ad hoc blackout window. At the same time, we find cross-sectional variation in these returns (e.g., post-blackout window returns tend to be higher for smaller or more liquid firms).

Collectively, these results provide evidence that firms' ad hoc blackout windows are leading indicators of material corporate event disclosures. These findings also complement prior insider trading literature, which largely focuses on the information content of insider purchase or sale transactions.⁷ Likewise, websites that monitor insider trading (e.g., InsiderTracking, finviz) typically focus on the presence of recent and high-volume insider trading. In contrast, our findings

⁶ This result is also interesting in the context of Bettis et al.'s (2000) finding that bid-ask spreads are significantly *lower* during scheduled quarterly blackout windows.

⁷ E.g., see Seyhun, 1986; John and Lang, 1991; Seyhun, 1992; Johnson et al., 1996; Lakonishok and Lee, 2001; Ke et al., 2003; Piotroski and Roulstone, 2005; Huddart et al., 2007; Veenman, 2012, and Suk and Wang, 2020.

demonstrate that the absence of trading by insiders is also informative about future events and stock price movements.

Our study makes a number of contributions to the literature on the determinants and enforcement of company-imposed insider trading restrictions. First, we document substantial cross-sectional variation in the length and timing of these trading restrictions, and that this variation is consistent with predictions about the evolution of information asymmetry over the quarterly reporting cycle, and the related legal and capital market risks. Second, we document that insider trading restrictions appear to balance other objectives—in particular, liquidity demands of executives who typically receive the majority of their compensation in equity. Third, we find that the strictness of insider trading windows appear to consider other governance mechanisms that help monitor insider trades, such as analyst following, institutional following, and board independence, adding to the evidence in Jagolinzer et al. (2011) that pre-approval of trades by the General Counsel reduces informed trade. Fourth, we document a previously unexplored insider trading restriction—ad hoc blackout windows—and find that these windows are predictive of certain types of 8K disclosures (but not others) as well as future returns. Taken together, these results emphasize the complexity of monitoring insider trades, and the range of considerations weighed by boards in dealing with this important and controversial issue.

Our study should also be beneficial for future research on the effect of recent changes in SEC policies regarding insider trading restrictions and corresponding disclosures. As noted above, although the SEC has historically not required public disclosure of firms' ITPs, these disclosures will be mandated starting in the second quarter of 2024. Our findings regarding how boards design ITPs in a period without mandatory disclosure serve as an important “pre-period” baseline for

future work examining whether or how firms adjust their ITPs (e.g., implement stricter policies) in response to this impending regulatory change.

The remainder of the paper proceeds as follows. Section 2 discusses insider trading policies and restrictions in more detail. Section 3 describes our data and process for estimating pre-specified quarterly allowed trading windows. Section 4 presents results from our analyses regarding how boards determine the length and timing of these pre-specified trading windows. Section 5 examines additional, unscheduled insider trading restrictions (ad hoc blackout windows) and the information they convey, and Section 6 concludes.

2. Background on Insider Trading Policies and Restrictions

Most public companies adopt insider trading policies (ITPs) that place restrictions on insider trading activities. These ITPs can help protect firms from legal and reputational risks associated with illegal or questionable insider trades, and can also provide capital market benefits if outside shareholders believe that ITPs prevent insiders from exploiting private information, and thereby increase liquidity (e.g., Bettis et al., 2000). ITPs generally specify the individuals covered by the policy, a pre-clearance requirement by the General Counsel or other compliance officers, quarterly allowed trading windows, and prohibited transactions (e.g., short sales, derivative transactions, hedging).

Bettis et al. (2000) find that 78% of their sample firms have explicit quarterly insider trading periods, most commonly pre-established windows where insider trading is allowed (and corresponding blackout periods during which insider trading is prohibited). More recently, a 2020 survey by Deloitte Consulting LLP and the National Association of Stock Plan Professionals (NASPP) shows that almost all companies (98%) apply blackout periods to senior executives and

directors. These regularly scheduled quarterly insider trading windows generally start between one and five days after a quarterly earnings announcement and end sometime in the five weeks leading up to the next fiscal quarter-end. Although the average firm has an open trading window of about six-to-seven weeks during a typical quarter, this length varies considerably across firms with an interquartile range of about two-to-three weeks based on our findings.⁸

The effectiveness of firms' ITPs has been questioned due to concerns about shareholders' ability and incentives to regulate insiders' trading (Fishman and Hagerty, 1992). Early research by Bettis et al. (2000) uses survey data to explore whether firm-imposed trading policies are effective at steering insiders' trades into open trading windows, and how these restrictions affect insiders' abnormal trading profits. Specifically, they document that abnormal returns for trades made during restricted windows are lower than during open trading windows, and conclude that insider trading policies help police insiders that wish to trade on private information. However, follow-on work by Jagolinzer et al. (2011) examines a small sample of firms that voluntarily disclose their ITPs, and documents that Bettis et al. (2000)'s findings regarding lower abnormal returns during blackout windows do not hold in later periods, concluding that, "restricted trading windows, by themselves, are not effective at reducing informed trading." Rather, they find that insiders' abnormal returns are only reduced when firms require general counsel approval of trades.⁹ Lee et al. (2014) take a broad sample approach, using the distribution of insider trades to infer which

⁸ The length of the typical open trading window also appears to have changed dramatically over the last few decades. Specifically, Bettis et al. (2000) find that the most common open trading window in 1996 was about ten days in length. Open trading windows of that length would be unusually short today, with longer windows perhaps being used to accommodate the significantly greater intensity with which stock-based compensation is now used for senior executives.

⁹ More specifically, Jagolinzer et al. (2011, p. 1252) state: "In additional analyses, we examine the Bettis, Coles, and Lemmon [2000] time period (and other time periods that precede recent regulatory changes), and effectively replicate their inferences that restricted trade windows are associated with lower insider trading profits. Importantly, this suggests that the primary tool used by firms to mitigate informed trade in prior periods is not especially effective in the current regulatory environment, which is perhaps an unintended consequence of recent regulations and what may be motivating an increased role of the GC in corporate governance."

firms do and do not restrict insiders' trades. They find that trades within restricted periods earn abnormal returns, concluding that the existence of a restricted trading window does not prevent insiders from exploiting their information advantage.¹⁰ In summary, much of the academic literature, as well as many practitioners and regulators, view corporate insider trading restrictions with skepticism, at least with respect to firms' resolve in constraining opportunistic trading.

However, beyond the mixed evidence on whether the existence of trading restrictions is associated with abnormal returns on insider trades, our understanding of how and why boards select and enforce the parameters of insider trading windows is limited. This is not surprising given that disclosure of ITPs is currently voluntary, and only a small fraction of firms disclose. For example, Jagolinzer et al. (2011) conduct a comprehensive online search among all U.S. companies on CRSP and Compustat, and find fewer than 250 firms that disclose their ITPs. At the same time, the relatively little existing information on ITPs indicates that there is significant variation in both the timing and length of these allowed trading windows (e.g., see Jagolinzer et al., 2011 and Deloitte and NASPP, Domestic Stock Plan Administration Survey, 2020). In addition, although most ITPs indicate that the board or general counsel can impose event-specific ad hoc blackout periods when some/all insiders are not allowed to trade, we are aware of no prior literature that explores ad hoc trading restrictions. We shed light on these issues by providing the first in-depth analysis of the economic factors that boards consider when establishing the length and timing of enforced constraints on insider trading, as well as whether the tightness of these windows constrains abnormal returns to insider trades.

¹⁰ Lee et al. (2014) examine trades between 1986 and 2010, and find that the percentage of firms that restrict trade has increased dramatically during this period, with more than 75% of firms restricting trade by 2010. By 2020, this figure has increased to 99% (Deloitte, 2020), effectively eliminating cross-sectional variation in whether firms take at least some action to restrict insider trades.

As a final point, we note that ITPs remain an important firm-level control mechanism for insider trading despite the growing use in recent years of prescheduled trading plans (Rule 10b5-1 plans), which often allow for trades to be executed during blackout periods. First, nearly half of insider trades occur outside Rule 10b5-1 plans (Shifflett, 2021), and some firms prohibit such plans (e.g., 17% of the sample surveyed by Deloitte, 2020). Second, firms generally only allow employees to initiate 10b5-1 plans during an open trading window, and one-quarter of firms do not allow trades under a new 10b5-1 plan to occur until the subsequent pre-specified open trading window (Deloitte, 2020). Moreover, early termination of, or amendments to, 10b5-1 plans are often only allowed during open trading windows—or, alternatively, do not take effect until the next open window (Morgan Stanley, 2017). Thus, the enforcement of blackout periods imposed by ITPs create substantial constraints even for insiders trading through 10b5-1 plans. Furthermore, the SEC’s recent amendments to Rule 10b5-1 explicitly require similar or stricter restrictions for all trades under this rule. For example, 10b5-1 plans will require a cooling-off period before any trades can be executed.¹¹ These amendments are likely to reduce the attractiveness of trading through 10b5-1 plans, and therefore increase the importance of firms’ insider trading policies.

3. Data and Variable Measurement

3.1. Estimating Allowed Trading Windows

We obtain insider trading data from Thomson Reuters Insiders Data. The data capture insider activities reported in SEC Forms 3, 4, 5, and 144. We include open market and private

¹¹ Specifically, trading under the plan can commence only after the later of i) 90 days after the plan adoption or ii) two business days following the filing of 10-K or 10-Q for the fiscal quarter of the plan adoption, which would generally correspond to the next quarterly allowed trading window. The amendments also limit the number of Rule 10b5-1 plans an insider may have and require additional disclosures by the firms about the plans.

purchases and sales by officers and directors who are not also 10% owners, following prior literature (e.g., Lee et al., 2014).

We exclude trades that are classified as 10b5-1 plan trades by Thomson Reuters. Rule 10b5-1 plans allow insiders to establish pre-determined purchase or sale plans in order to reduce concerns about insiders trading on material non-public information. Although the adoption of these trading plans is generally required to take place during an open trading window (and thus subject to the trading window determinants and constraints that we examine in this paper), the actual trades executed under these plans are often exempt from quarterly blackout periods. Extracting 10b5-1 trades from the data is not straightforward, as disclosure of whether a trade is made pursuant to a 10b5-1 plan (e.g., via a footnote in SEC Form 4) is largely voluntary. Thomson Reuters' coverage for identifying disclosed 10b5-1 trades is incomplete prior to 2012, so we begin our sample period in 2012 and include data through 2020. Of all the insider trades in the time frame, 56% are classified as non-10b5-1 plan trades (i.e., trades that are not pre-planned). We recognize that undisclosed 10b5-1 trades could potentially add noise to our trading window estimation, and for this reason, we use distribution rules when using actual insider trades to estimate firms' trading windows (e.g., excluding the latest 5% of trades, and discussed in more detail below). In total, our sample for estimating allowed trading windows consists of 234,200 insider trades.

To measure the timing of firms' open trading windows, we examine the distribution of actual insider trades. The distribution of actual insider trades reflects the effective window in which insiders are allowed to trade and incorporates a combination of the firm's stated trading policy, the degree of enforcement, and any additional implicit practices or frictions. We believe that this approach best captures the actual restrictions insiders face when trading in their firm's equity.¹²

¹² The extent to which insiders trade outside of the parameters of the company's stated ITP is an interesting question, but beyond the scope of this paper. Although Bettis et. al. (2000) argue that many trades occur outside of

Allowed quarterly trading windows in ITPs are most commonly specified relative to the dates of the quarterly earnings announcement (for the start of the window) and fiscal quarter-end (for the end of the window). Accordingly, we estimate allowed trading windows based on the timing of insider trades relative to these two dates. Specifically, we aggregate insider trades over a rolling eight-quarter window and estimate the starting point and the ending point of allowed trading windows using the distribution of insider trade timings in this window.¹³ After requiring eight-quarter aggregating windows, our sample period is 2014 to 2020.

For each insider trade, we identify the transaction date, the most recent quarterly earnings announcement date prior to the transaction date, and the subsequent fiscal quarter-end date. We then calculate the number of days between the previous quarterly earnings announcement date and the transaction date (*daysFromPrevEA*) and the number of days between the transaction date and the date of the next fiscal quarter-end (*daysToNextFQEnd*). Smaller *daysFromPrevEA* and larger *daysToNextFQEnd* indicate that the insider trade occurred earlier in the quarter. Figure 1 illustrates this timeline, and Figure 2 shows the distribution of *daysFromPrevEA* and *daysToNextFQEnd* at the individual trade level. The median insider trade is approximately 20 days after the previous earnings announcement and approximately 36 days before the next fiscal quarter-end date.

As discussed above, we use the within-firm distribution of these trades on a rolling eight-quarter basis to estimate allowed trading windows. We require at least 10 insider trades over these

trading windows specified in ITPs, monitoring of insider trades has changed substantially since the 1990s. For example, the vast majority of firms now require pre-clearance of insider trades by the general counsel's office (Deloitte, 2020). Many firms also require that restricted stock and options be held in a company-chosen brokerage firm, with transfer or trade execution being subject to company approval. Furthermore, the SEC requires firms to publicly disclose Section 16 filer trades within 2 days (15 U.S. Code § 78p), which is typically handled by the firm's general counsel/compliance office (as compared to disclosure within 10 days after the end of the month in which the trade occurred, which was the requirement in the 1990s).

¹³ The choice of an eight-quarter window reflects a balance between reducing noise in our estimate of the parameters in a given firm's ITP, and recognizing that boards may decide to revise the parameters of their ITP over time. Our results are very similar if we instead aggregate insider trades over rolling four- or twelve-quarter windows.

eight quarters to allow us to reliably infer allowed trading windows.¹⁴ We estimate the ending point of the allowed trading window relative to the upcoming fiscal quarter-end, *WindowEnd15*, as the 15th percentile of *daysToNextFQEnd*. In other words, we assume that the first 85% of insider trades within a given trading period (i.e., the period between two quarterly earnings announcements) occur before the allowed trading window ends. This distribution rule allows us to reduce estimation noise (e.g., due to undisclosed 10b5-1 trades).¹⁵ For robustness, we also estimate two alternative versions of the allowed trading window, *WindowEnd10* and *WindowEnd5*, as the 10th and 5th percentile of *daysToNextFQEnd*, which assume that the first 90% and 95% of insider trades occur before the allowed trading window ends. Larger values of *WindowEnd* indicate that a greater proportion of the insider trades occur earlier in the quarter (i.e., further away from the end of the next fiscal quarter, and closer to the previous quarter's earnings announcement) and reflect more stringent trading restrictions in the ITP. Smaller values indicate that a greater proportion of insider trades occur later in the quarter (i.e., closer to fiscal quarter-end), suggesting less stringent ITPs.

In situations where the 15th (or 10th/5th) percentile of *daysToNextFQEnd* is less than zero (i.e., the trade occurs after the end of the next fiscal quarter), we set *WindowEnd* to 0, as these situations indicate that the firm likely does not have (or does not enforce) blackout periods prior to the end of the fiscal quarter.¹⁶ To help validate this assumption, we observe that this adjustment results in *WindowEnd* equaling 0 for approximately 10% of our sample. This proportion is

¹⁴ In our full sample, on average there are 18.1 insider trades in a given eight-quarter period. After restricting the sample to observations with at least ten trades over the eight-quarter period, these eight-quarter periods have, on average, 32.5 insider trades.

¹⁵ In an untabulated analysis, we find that the trades that we exclude based on these distribution rules (i.e., the last 5th/10th/15th percent of trades in the measurement period) are more likely to represent trades by lower-ranking executives or directors, while trades earlier in the window are more likely to represent trades by the CEO or the board chair.

¹⁶ Our results are robust to different truncation choices. We find very similar results after truncating *WindowEnd* at -5 days, -10 days, and -15 days (i.e., 5, 10, or 15 days after the end of the quarter), and without truncation.

consistent with Bettis et al. (2000), who document that about 8% of their survey respondents did not have voluntary restrictions on insider trading, and survey evidence that 10% of firms allow trading to continue after the end of the fiscal quarter (Deloitte, 2020).

Similar to our procedure for estimating *WindowEnd*, we estimate the starting point of quarterly allowed trading windows (*WindowStart*) as the minimum value of *daysFromPrevEA* during the eight-quarter period. Smaller values suggest allowed trading windows commence shortly after earnings announcements, while larger values indicate that insiders are prohibited from trading after earnings announcements for longer periods of time. We adjust for after-market earnings announcements by subtracting one from *daysFromPrevEA* when the earnings announcement occurs after market close. We set *WindowStart* equal to 10 if the minimum value of *daysFromPrevEA* is greater than 10 (i.e., we cap *WindowStart* at ten days), as we are unaware of any ITPs that restrict trading for a longer period of time following an earnings announcement.

3.2. Descriptive Statistics

Table 1 reports the descriptive statistics for our estimated trading windows measures. We also report descriptive statistics for the other variables used in our analyses, which we obtain from Thomson Reuter Insiders, Compustat, CRSP, NYSE TAQ, IBES, BoardEx, Execucomp, and SEC EDGAR. All variables are defined in Appendix A.

Our sample has a median market capitalization of \$1.6 billion, which is larger than the \$700 million market capitalization of the median firm in the Compustat-CRSP universe. This reflects our requirement for minimum insider trading volume (at least ten trades in an eight-quarter period), which focuses our analyses on larger firms that likely have more liquid stocks.

We estimate that the median company restricts trading from commencing until three days following the quarterly earnings announcement and ends the trading window 17-22 calendar days before the end of the fiscal quarter (depending on which point in the distribution we use to estimate the end date). Figure 3 shows the distribution of our estimated starting and ending points of allowed trading windows. Although the typical trading window that we estimate ends approximately two to three weeks before the end of the quarter, we find considerable cross-sectional variation in these ending dates, as windows that end anywhere between one and six weeks are relatively common. Our estimated starting date for the allowed trading window occurs within 6 days after earnings announcements for most of our sample, and although a three-day no-trade period is the most common restriction, anywhere from two to six days is relatively common.

For descriptive purposes, we also use the ending points of allowed trading windows estimated above to estimate the lengths of allowed trading windows. We estimate the length of allowed trading windows (in days) as $EstWindow15(10,5) = 60 - WindowEnd15(10,5)$.¹⁷ Larger values of $EstWindow$ suggest wider allowed trading windows. Figure 4 shows the distribution of the lengths of estimated allowed trading windows using different percentiles of $daysToNextFQEnd$ as endpoints of allowed trading windows. The median estimated window is approximately 40 days (i.e., insider trading is allowed until approximately 2.9 weeks before the end of the fiscal quarter).

3.3. Comparison with Actual Disclosed Insider Trading Policies

To validate our estimated trading windows, we search online to collect a sample of firms that publicly disclose their insider trading policies. Specifically, we search “insider trading policy”

¹⁷ We assume a constant 60 days between earnings announcements and fiscal quarter ends to avoid introducing noise due to variation in firms’ quarterly earnings announcement dates. Our results are very similar if we use the actual earnings announcements and fiscal quarter end dates.

on Google and collect ITPs that appear in the first 250 results (i.e., up to page 25). This search leads to 159 unique ITPs. We then eliminate ITPs for firms that Compustat and Thomson Reuters do not cover (e.g., investment advisers) as well as ITPs that do not specify quarterly trading windows or blackout periods. Finally, we eliminate ITPs for firms that do not have at least one eight-quarter period with at least 10 insider trades in our data. This process leaves ITPs for 60 firms (or about 2% of our sample firms), for which we can compare our estimated allowed trading windows based on the distribution of insider trades to the restrictions specified in these firms' actual ITPs.¹⁸

Appendix B shows excerpts from two of the insider trading policies (Adobe Inc. and Shake Shack Inc.). The quarterly trading window for Adobe Inc. starts the first trading day after the public disclosure of quarterly earnings and closes four weeks prior to each quarter-end. Based on its policy, the approximate length of Adobe's quarterly trading window is 32 days.¹⁹ Shake Shack Inc. specifies quarterly blackout periods instead. Their blackout period starts the 14th calendar day before the end of fiscal quarters and ends at the end of the first trading day after earnings announcements. The approximate length of Shake Shack's quarterly allowed trading window is 44 days. Thus, the two insider trading policies differ significantly on how early they close quarterly allowed trading windows.

We then calculate the quarterly allowed trading windows based on the actual ITPs and examine their correlation with our estimated allowed trading windows. We do not expect a perfect correlation between the two estimates. Our method using the distribution of insider trades

¹⁸ For comparison, Jagolinzer et al. (2011) web crawl company websites of all firms in CRSP universe to collect ITPs. Their search produced approximately 200 ITPs for firms covered by Compustat and Thomson Insiders.

¹⁹ Specifically, Adobe's ITP states: "The Trading Window opens each quarter at the start of the first trading day that is at least 24 hours following the date of public disclosure of the financial results for the previous fiscal quarter. The Trading Window closes four weeks prior to each quarter end." Assuming that the fiscal quarter ends 60 days after the earnings announcement date, the actual window length is therefore 60 days – 28 days (4 weeks) = 32 days.

measures the “effective allowed trading window,” which, captures not only the quarterly trading windows explicitly specified by the ITP, but also how strictly firms enforce those quarterly allowed trading windows, ad hoc or special blackout periods, and other frictions introduced by ITPs (e.g., delays due to requiring trade pre-approvals). These other factors can create variation in the timing of insider trades that is not reflected in the text of the ITP.

Table 2 shows the correlation between allowed trading windows inferred from actual ITPs and windows estimated using the distribution of insider trades. For this analysis, we take the firm-level mean or median of our estimated trading windows to obtain firm-level estimates. We find that the correlation between our estimates and the values from the actual ITPs is 57% (for firm-level mean) to 61% (for firm-level median) for the ending point of allowed trading windows and 31% to 41% for the starting point of allowed trading windows. Our estimated window length is also highly correlated with the length based on actual ITPs, with a correlation of 57% to 61%.²⁰ Collectively, these results indicate that our estimated allowed trading windows appear to capture the underlying variation in firms’ actual ITPs.

Because our trading windows are inferred from executives’ actual trades, it is possible that measurement error in these estimates may be non-random and associated with some relevant firm characteristic (e.g., our estimates may reflect variation in insider trading demand rather than the restrictions that firms impose on insider trading). To alleviate this concern, for the subsample of firms that publicly disclose their ITPs, we examine the association between the “estimation error” in our inferred ending and starting points and various firm-level characteristics potentially related

²⁰ We find very similar, though slightly smaller correlations with our alternative *EstWindow* measures (e.g., a correlation of about 57% for *EstWindow10* and 56% for *EstWindow5*). In our subsequent empirical tests, we focus on *EstWindow15* (or, equivalently, *WindowEnd15*) given that this measure exhibits the highest correlation with the actual trading windows from publicly disclosed ITPs. Our results are very similar if we use the alternative breakpoints discussed above (i.e., 5th or 10th percentiles).

to insider trading demand or information asymmetry. We calculate the estimation error as the absolute value of the mean-adjusted difference between the stated ending (starting) point of allowed trading windows in the disclosed ITPs and our estimated ending (starting) point. We then regress this estimation error on the number of insider trades, firm size, stock volatility, and analyst following. We apply the same minimum number of trades requirement (at least 10 trades during the eight-quarter estimation window) described in Section 3.1. In Table 3, we show that these estimation errors are not statistically significantly associated with measures of insider trading demand, firm size, or information asymmetry.²¹

4. Determinants of Allowed Trading Windows

In this section, we examine the determinants of allowed trading windows. Specifically, we examine how late into the quarter insiders are allowed to continue trading (i.e., *WindowEnd*), as well as how soon insiders are allowed to trade following a quarterly earnings announcement (i.e., *WindowStart*). We also examine whether insiders benefit from unusually loose trading restrictions through greater trading profits.

4.1. Determinants of the Ending Point of Allowed Trading Windows

We examine four potential forces that could shape how long firms allow insiders to trade during a typical open trading window (relative to the end of the current fiscal quarter). First, firms may implement shorter allowed trading windows to reduce concerns stemming from information asymmetry between insiders and investors. For example, when faced with greater information

²¹ As discussed in Section 4.3, to provide further evidence that our results are not simply capturing variation in insider trading demand, we also re-estimate our primary analyses separately for firms with relatively high levels of insider trading activity and find consistent results in this subsample.

asymmetry, shareholders may demand greater protections against insiders extracting private benefits through insider trading, resulting in shorter allowed trading windows. Second, external monitoring may influence how boards shape voluntary restrictions on insider trades. Stronger external monitoring may create pressure for firms to implement stricter ITPs, or alternatively, function as a substitute mechanism to monitor insiders. Thus, stronger external monitoring could be associated with either shorter or longer open trading windows. Third, firms that use equity-based compensation more intensively, or where insiders otherwise have greater liquidity needs, may allow longer open trading windows to facilitate this trading demand. Finally, firms subject to greater litigation risk may opt for shorter open trading windows to help mitigate this exposure.

We estimate a model to explain firms' allowed trading windows based on these economic considerations. Specifically, we estimate the following model:²²

$$\begin{aligned}
& \text{WindowEnd15}_{i,t} \\
& = \alpha + \beta_1 \text{EffectiveSpread}_{i,t-1} + \beta_2 \text{EA AbsRetProp}_{i,t-1} \\
& + \beta_3 \ln \text{MktVal}_{i,t-1} + \beta_4 \ln \text{Analysts}_{i,t-1} + \beta_5 \text{InstOwnPct}_{i,t-1} \\
& + \beta_6 \text{IndDirectorPct}_{i,t-1} + \beta_7 \text{CEODuality}_{i,t-1} \tag{1} \\
& + \beta_8 \ln \text{StockCompensation}_{i,t-1} + \beta_9 \text{NumInsiderTrade}_{i,t-1} \\
& + \beta_{10} \text{Volatility}_{i,t-1} + \beta_{11} \text{Return}_{i,t-1} + \beta_{12} \text{ROA}_{i,t-1} + \beta_{13} \text{BtoM}_{i,t-1} \\
& + \beta_{14} \text{Leverage}_{i,t-1} + \text{Industry} \times \text{YearFE}_{i,t} + \epsilon_{i,t}
\end{aligned}$$

²² As discussed in Section 3.3, we tabulate the results using *WindowEnd15* as this measure has the highest correlation with the actual ITPs we are able to collect. Our results are very similar using *WindowEnd10* and *WindowEnd5*. Also, as noted above, we present results from OLS models and find very similar results using Poisson regression (untabulated).

$WindowEnd15_{i,t}$ is the estimated end of the allowed trading window, in number of days to the upcoming fiscal quarter-end, as described in Section 3.1. The trading window end is estimated using insider trades in quarter t to $t+7$. Higher values indicate a greater proportion of insider trades occur earlier in the quarter (further in advance of the next fiscal quarter-end) and, therefore, stricter ITPs.

We measure concerns about information asymmetry using the average bid-ask spread over the prior year (*EffectiveSpread*) and the absolute price movement on the earnings announcement date scaled by the cumulative absolute market-adjusted return over the entire quarter (*EA AbsRetProp*) (Bushee et al., 2010; Blankespoor et al., 2014). We measure the proportion of absolute price movement on earnings announcement dates over the prior four quarters and use the average. Greater absolute price movement on earnings announcement dates signal greater information asymmetry before earnings announcements and that there are fewer information events other than earnings announcements during the quarters. We include several measures of external monitoring, including firm size (*lnMktVal*), analyst coverage (*lnAnalysts*), institutional ownership (*InstOwnPct*), the proportion of independent directors (*IndDirectorPct*), and an indicator for whether the CEO is also chair of the board (*CEODuality*) (Carter et al., 2009; Linck et al., 2008). We measure liquidity concerns using firm-level stock-based compensation expense (*lnStockCompensation*), the average number of insider trades over the prior four quarters (*NumInsiderTrade*), and stock volatility (*Volatility*). Firms with greater stock-based compensation, higher level of previous insider trades, and more volatile stock prices are expected to have greater liquidity concerns from executives and employees. We predict that such firms will set more relaxed ITPs to cater to the heightened liquidity needs. For litigation risk, we consider recent performance (measured as *ROA* and *Return*) and (inverse) growth opportunities (*BtoM*), as well as the firm size

and stock volatility measures discussed above, similar to Kim and Skinner (2012).²³ All independent variables are measured with a one-period lag. We include industry-year fixed effects to control for the time and industry effects on firms' ITPs. We use these industry-year fixed effects rather than firm fixed effects because firms' ITP designs tend to be very sticky over time, and therefore variation is largely cross-sectional (Bettis et al., 2000; Jagolinzer et al., 2011).²⁴ We define industries based on two-digit SIC codes. Standard errors are clustered by firm and year.

Table 4 column (1) presents the results from estimating Eq. (1). Consistent with firms responding to information asymmetry concerns by implementing stricter ITPs, firms with greater bid-ask spreads have allowed trading windows that end earlier in the quarter. Specifically, we find that a one standard deviation increase in average daily effective percentage spread is associated with the allowed trading windows ending approximately 0.72 days earlier. We also find that firms with greater stock price movement at earnings announcement dates have quarterly allowed trading windows that end earlier, providing additional evidence that firms at which information asymmetry (particularly surrounding earnings announcements) is a greater concern close down insider trading earlier in the quarter.

The results also support a positive relation between external monitoring and stricter ITPs. In particular, larger firms and firms with greater analyst following tend to end allowed trading windows earlier. For example, a one standard deviation increase in analyst coverage is associated with an allowed trading window that ends approximately 1.2 days earlier. We also find some evidence that greater board independence is associated with stricter trading windows. For example,

²³ Another common measure of litigation risk is an indicator for firms operating in high-risk industries (Francis et al., 1994). We do not include this measure in our primary analyses as it is subsumed by our industry-year fixed effects. In untabulated tests excluding industry fixed effects, we find shorter allowed trading windows for firms operating in these high litigation risk industries.

²⁴ 72% of the total variation in the allowed trading windows is between-firm (cross-sectional) variation.

firms that separate the CEO and board chair roles tend to have allowed trading windows that end earlier, as do firms with a greater proportion of independent directors (although this latter result is not statistically significant at conventional levels).

We also provide evidence that insiders' liquidity needs shape insider trading policies. Specifically, trading windows end later at firms where insiders trade more frequently and where stock price volatility is higher. To further explore the role of liquidity needs, in column (2) of Table 4, we include top executives' equity holdings as an additional proxy for insider liquidity demand. Including this additional measure of liquidity restricts our analysis to a smaller sample of Execucomp firms (about 2/3 of our full sample). We find that allowed trading windows end later for firms with greater executive equity holdings, providing additional evidence that firms establish more relaxed insider trading policies when executives' liquidity needs are higher. However, in both columns (1) and (2), firm-wide equity-based compensation is not related to the ending point of allowed trading windows, suggesting that the liquidity needs of the firm's employee base as a whole are also not a major consideration when boards establish these restrictions.

Our results are mixed on the influence of litigation concerns. Specifically, although more profitable firms (a proxy for "deep pockets") tend to implement trading windows that end earlier in the quarter, we find no relation between past stock returns and trading window ending points. Moreover, we find that firms with more growth opportunities tend to have later ending points, suggesting that the greater litigation risk among such firms is not the boards' primary concern when establishing allowed trading windows. Lastly, our findings above on firm size and stock volatility provide similarly mixed evidence: trading windows tend to end earlier at larger firms (which tend to have higher litigation risk), but also for firms with lower stock volatility (which tend to have lower litigation risk).

4.2. Determinants of the Starting Point of Allowed Trading Windows

We predict that the information environment around the earnings announcement influences how soon after the earnings announcement insider trading is allowed to begin. Specifically, we hypothesize that when earnings announcements better convey insiders' private information, and when the information in the earnings announcements is priced more quickly, firms are more likely to allow insiders to commence trading soon after earnings announcements as information asymmetry will be less of a concern. Empirically, we predict that trades will be observed sooner after the earnings announcement for firms with greater trading volumes and smaller bid-ask spreads at earnings announcement dates. Similarly, when earnings announcements have greater information content and therefore resolve more information asymmetry, the reduction in bid-ask spreads and the absolute price movement at the earnings announcement dates is expected to be larger. Therefore, we also predict that firms with greater reduction in bid-ask spreads and higher absolute price movement at earnings announcement dates (relative to the cumulative absolute price movement over the quarter) allow insiders to trade more quickly after earnings announcements. Finally, prior studies and practitioner surveys alike point to the role of financial analysts in improving price efficiency (e.g., Zhang 2008; Ellul and Panayides, 2018).²⁵ We predict that information in earnings announcements will be priced more quickly for firms with greater analyst following and, therefore, that firms with greater analyst following allow insiders to trade sooner following earnings announcements.

²⁵ In a survey by TheCorporateCounsel.net, 23.2% of the respondents said that the number of analysts providing coverage on the company is the most important factor in deciding when to end blackout period after earnings release (i.e., when to start the allowed trading window).

Based on the above predictions, we estimate the following linear model:²⁶

$WindowStart_{i,t}$

$$= \alpha + \beta Ind.Var_{i,t} + \gamma_1 lnMktVal_{i,t-1} + \gamma_2 ROA_{i,t-1} + \gamma_3 BtoM_{i,t-1} \quad (2)$$

$$+ \gamma_4 Leverage_{i,t-1} + Industry \times YearFE_{i,t} + \epsilon_{i,t}$$

where $WindowStart_{i,t}$ is the estimated start of the allowed trading window, in number of days from the previous earnings announcement, as described in Section 3.1. The starting point is estimated using insider trades in quarter t to $t+7$. The main independent variable ($Ind.Var_{i,t}$) is one of the following: earnings announcement date trading volume ($EA TradingVolume$), earnings announcement date effective spreads ($EA EffectiveSpread$), change in effective spreads around earnings announcement date ($EA \Delta EffectiveSpread$), earnings announcement date absolute stock price movement scaled by the cumulative absolute stock price movement over the entire quarter ($EA AbsRetProp$), or the log number of analysts following the firm ($lnAnalysts$). As discussed above, these measures capture the significance of information contained in earnings announcements and the speed in which the information is priced. The earnings announcement date variables are measured at time t . As discussed in Section 3, we adjust both the starting point of allowed trading window and earnings announcement date variables for after-market earnings announcements. As in Eq. (1), we include lagged firm size, return on assets, book-to-market ratio, and leverage as controls, and also include industry-year fixed effects for industry-year specific

²⁶ In our primary tests, we estimate Eq. (1) and (2) using OLS. In untabulated analyses, we instead estimate these models using Poisson regression and find very similar results.

factors that can affect firms' ITPs. We define industries based on two-digit SIC codes. Standard errors are clustered by firm and year.

We report the results from estimating Eq. (2) in Table 5. In columns (1) and (2), we find that firms with lower trading volume and greater bid-ask spreads at earnings announcement dates require insiders to wait longer to trade after earnings announcements. For example, a one standard deviation increase in the earnings announcement date trading volume is associated with allowed trading windows starting approximately 0.24 days earlier. Results in column (3) show that firms allow insiders to trade earlier following earnings announcements when earnings announcements are associated with greater reduction in bid-ask spread. In column (4), we find that larger absolute price movements at earnings announcement dates (i.e., announcements that provide more information or resolve greater information asymmetry) are associated with quarterly allowed trading windows that start earlier. Lastly, in column (5), we find that firms with greater analyst following tend to open allowed trading windows earlier after earnings announcements, although this result is not statistically significant at conventional levels. Among our control variables, we find that larger firms tend to start allowed trading windows sooner following earnings announcements. Together with our findings in Table 4, this result suggests that larger firms appear to be less concerned about information asymmetry around earnings announcements (e.g., because prices quickly reflect information in earnings announcements), but more concerned about insiders' private information build-up over the quarter. Collectively, the results in Table 5 suggest that firms set voluntary insider trading restrictions in response to concerns related to information asymmetry surrounding earnings announcements and how quickly capital markets incorporate the information provided by these announcements.

4.3. Variation in Insider Trading Demand

As we discuss in Section 3.3, one concern with our estimated ending and starting points is that they may contain greater measurement error when there are fewer insider trades, and that this measurement error may be correlated with other firm characteristics. To help address this concern, we estimate Eqs. (1) and (2) in subsamples with higher insider trading volume (above median). To the extent that measurement error linked to the level of insider trading activity is driving our results, this should be less of a concern for firms with higher insider trades. As shown in Table 6, our determinants results are consistent with our previous findings in the subsample with greater insider trading, alleviating this concern.²⁷ For the determinants of the end point of allowed trading windows, the relation between our estimated ending point and our measures of information asymmetry, external monitoring, and liquidity needs still hold for firms with greater insider trades. Similarly, our results on the determinants of the starting point are also not significantly different from our previous results, with the exception of earnings announcement date bid-ask spreads and number of analysts following, where we find an attenuated relations. Overall, these results suggest that measurement error in our estimates of ending and starting points are not a primary factor driving our results.

4.4. Do Insiders Exploit “Loose” Trading Windows?

The preceding analyses provide evidence that boards consider a number of factors, such as information asymmetry and liquidity needs, when determining insider trading windows. Next, we examine the importance of establishing appropriate trading windows by evaluating if insiders can exploit insider trading policies that are excessively loose. Specifically, based on the determinants

²⁷ We also find similar inferences in the subsample of low insider trading activity (untabulated).

models for the ending point and the starting point of allowed trading windows described in Sections 4.1 and 4.2, we examine whether unexpectedly loose trading restrictions are associated with greater insider trading profits.

For the ending point of allowed trading windows, we use the residual from Eq. (1) as our measure of unexpectedly early closing dates for insider trading windows (*AbnEarlyWindowEnd*). For the starting point, we estimate a model that includes all five determinants in Table 5 (*EA TradingVolume*, *EA EffectiveSpread*, *EA dEffectiveSpread*, *EA AbsRetProp*, and *lnAnalysts*) and industry-year fixed effect. Then, we use the residual from the estimated model as our measure of unexpectedly late window opening dates (*AbnLateWindowStart*). For both measures, negative values indicate unexpectedly relaxed ITPs (i.e., the window opens earlier or closes later than our model would predict). Thus, if insiders with unusually loose ITPs are able to exploit these policies to generate trading profits, we should observe a negative relation between these profits and either *AbnEarlyWindowEnd* or *AbnLateWindowStart*.

We measure insider trading profits as the value-weighted average profit from insider trades during the eight-quarter period over which we estimate the allowed insider trading windows, where profit is computed using six-month buy-and-hold Fama-French three-factor excess log returns. When we focus on window end dates, we compute profits based only on insider trades that occurred during either (a) the latter two-thirds of the period between subsequent earnings announcements (i.e., we exclude trades in the month immediately after the earnings announcement); or (b) the latest 15% of the trades (relative to fiscal quarter-end dates) in the eight-quarter measurement period. These restrictions allow us to focus on trading profits from trades later in the potential trading window, when the trading window closing date is most relevant. When we focus on window start dates, we only include insider trades that occurred within 10 days of the

preceding earnings announcement, which allows us to focus on trades when the opening date of the trading window is most relevant.

Table 7 reports the association between abnormal allowed trading windows and insider trading profits. Columns (1) and (2) examine the abnormal ending point of allowed trading windows and insider trading profits based on restrictions (a) and (b) above, respectively. In both columns, we find that the profitability of late insider trades is higher when allowed trading windows end abnormally late (i.e., more relaxed ITPs). The results are consistent with insiders exploiting more relaxed allowed trading windows for their private benefits. Column (3) examines the association between the abnormal starting point of allowed trading windows and the profitability of early trades. We do not find evidence that the abnormal starting point of allowed trading windows is associated with the profitability of early trades. Overall, the results suggest that insiders may exploit ineffective ITPs for their benefits, and such behavior is concentrated among trades that occur later in the quarter (i.e., close to the fiscal quarter-end, rather than immediately following the earnings announcement).

5. Ad Hoc Blackout Periods

5.1. Identifying Ad Hoc Blackout Windows

In addition to regularly scheduled quarterly blackout periods, many firms implement ad hoc blackout periods when they believe insiders possess material event-specific information that is not available to outside investors. Examples of events that could trigger ad hoc blackout periods include ongoing merger negotiations, pending removal or retirement of the CEO, major product announcements, etc. Identifying ad hoc blackout windows is challenging because, similar to ITP

restrictions more generally, firms generally do not disclose when they impose these ad hoc blackout periods.

As with our estimates of regularly scheduled blackout periods, we estimate ad hoc blackout windows using observed insider trading data. We first estimate a normal level of insider trading for each quarter using a model including firm and time fixed effects and prior quarter stock performance. We then identify firm-quarters with the lowest (most negative) model residuals as ad hoc blackout windows. In other words, we identify ad hoc blackout windows as firm-quarters with abnormally small numbers of insider trades based on within-firm and within-time variation.

Specifically, we estimate the model:

$$\log(\text{NumTrade}_{i,t}) = \alpha + \sum_{i=1}^I \beta_i 1_i + \sum_{t=1}^T \gamma_t 1_t + \delta \text{adjRET}_{i,t-1} + \varepsilon_{i,t} \quad (3)$$

where $\text{NumTrade}_{i,t}$ is the number of insider trades for firm i in quarter t , 1_i is an indicator for firm i observations, and 1_t is an indicator for year-quarter t observations. The model also includes prior stock performance to control for the effect of price movement on insider trading activities (Seyhun, 1986; Lakonishok and Lee, 2001; Bettis et al., 2005; Piotroski and Roulstone, 2005). $\varepsilon_{i,t}$, the residual from the model, estimates the abnormal level of insider trades.

We identify firm-quarters in the lowest quintile (alternatively, decile or quartile) based on the residual values from Eq. (3) as ad hoc blackout windows. Out of 117,166 firm-quarter observations, 22,762 (alternatively, 11,381 or 28,452) observations are classified as having ad hoc blackout windows during the quarter based on this model. The average number of insider trades in non-blackout quarters is 2.471, while insider trading activity in our estimated ad hoc blackout

windows is significantly lower – 0.073 trades per quarter. In other words, the insider trading activity in ad hoc blackout windows is only 3% of that of non-blackout periods, and these ad hoc blackout windows almost entirely reflect periods of zero insider trading activity at firms that otherwise exhibit insider trading regularly.

5.2. Determinants of Ad Hoc Blackout Windows

After identifying firm-quarters with ad hoc blackout periods, we begin by exploring whether the existence of these ad hoc blackout windows predicts material future corporate events. Specifically, we examine whether ad hoc blackout windows are more likely to be followed by quarters with a greater number of Form 8-K filings. Firms are required to file a current report on Form 8-K with the SEC to announce major corporate events. We estimate the following regression:

$$\ln Num8K_{i,t+1} = \alpha + \beta AdhocBlackout_{i,t} + FirmFE_i + YearFE_t + \varepsilon_{i,t} \quad (4)$$

where $\ln Num8K_{i,t+1}$ is the natural logarithm of the number of 8-K filings during the following quarter, and $AdhocBlackout_{i,t}$ is an indicator for firm-quarters classified as ad hoc blackout windows based on our model. As discussed above, we consider three variations of $AdhocBlackout_{i,t}$, based on either the lowest quintile, decile, or quartile of model residuals from Eq. (3) as the cutoff to identify ad hoc blackout windows. In this model, we include firm and year fixed effects because our focus is on the within-firm relation between insider trading activity and subsequent disclosure.

Column (1) in Table 8 reports the results from estimating Eq. (4). The ad hoc blackout windows are identified as firm-quarters with the Eq. (3) model residuals in the lowest quintile. We

find that ad hoc blackout windows, on average, tend to be followed by quarters with a greater number of 8-K filings. Specifically, quarters immediately following ad hoc blackout windows have approximately 3-5% more 8-K filings compared to all other quarters. The results are robust to using the lowest decile or the lowest quartile as the cutoffs for the ad hoc blackout windows. Figure 5 shows the trend of 8-K filings during and after ad hoc blackout periods compared to other quarters. We also find that the increase in 8-K filings is concentrated one quarter following the ad hoc blackout window.

Next, we shed light on the specific types of firm-specific events that prompt an ad hoc blackout window by examining the specific types of 8-K that follow these periods of abnormally low trades. Figure 6 shows that the increase in 8-K filings is concentrated in Section 1 (Registrant's business and operations), Section 2 (Financial Information) and Section 5 (Corporate Governance and Management).²⁸ Items under Section 1 include disclosures related to firms' entry into and termination of material definitive agreements and bankruptcy. Examples of events that trigger Section 2 8-K filings are completion of acquisition or disposal of assets, and the creation of a direct financial obligation or an obligation under an off-balance sheet arrangement. Changes in management and changes in bylaws are some of the events that trigger Section 5 8-K filings. In Table 8, columns (2) through (4), we examine the association between ad hoc blackout windows and future 8-K filings for these sections and find significant increases in the filing of 8-Ks related to firms' business and operations, financial information, and corporate governance matters. These findings provide additional evidence that ad hoc blackout windows signal future material corporate events.

²⁸ We also find a significant increase in filings incorporating Section 9 (Financial Statements and Exhibits) following ad hoc blackout periods. These Section 9 disclosures represent supplementary information related to other sections in the 8-K filing, such as financial statements or projections, rather than distinct disclosures (i.e., there are no 8-K filings in our sample with only Section 9). Thus, we do not consider Section 9 as a separate type of filing.

5.3. Capital Market Response to Ad Hoc Blackout Windows

We also consider capital market responses following ad hoc blackout windows. Although investors have been shown to respond to insider trades, it is less clear whether and how they respond to the absence of insider trades.²⁹ If ad hoc blackout windows are followed by the disclosure of material information, we may observe that ad hoc blackout windows predict future capital market activity. Specifically, we estimate variations of the following model:

$$Outcome_{i,t+1} = \alpha + \beta AdhocBlackout_{i,t} + FirmFE_i + YearFE_t + \varepsilon_{i,t} \quad (5)$$

We consider three measures for *Outcome*: bid-ask spreads (*EffectiveSpread*), the natural log of dollar trading volume (*TradingVolume*), and excess stock return based on a Fama-French three-factor model (*adjRET*). If investors view an unexpected lack of insider trading in a period as a signal of an impending material event (and hence greater potential information asymmetry), we expect to find higher spreads and lower trading volume in the ad hoc blackout period, possibly followed by a reversal in subsequent periods as more information becomes available. In addition, if investors do not (on average) fully incorporate the future information conveyed by blackout windows, we may observe that these windows also predict future stock returns.

Table 9 and Figure 7 report the results from estimating Eq. (5) with *EffectiveSpread* (and the change in *EffectiveSpread*) as the dependent variable to examine information asymmetry during and after ad hoc blackout windows. In column (1), we observe significantly higher bid-ask

²⁹ Most insider trading tracking websites (e.g., InsiderTracking, finviz) provide information on recent insider trades, the largest recent insider trades, and firms with the largest recent insider buys/sells. We are not aware of any insider trading tracking website that provides information on firms with abnormally low insider trading activities.

spreads during ad hoc blackout windows, which, as shown in column (2), promptly reverse in the following quarter. In Table 9, columns (3) and (4), we report results from estimating Eq. (5) with the trading volume and the change in the trading volume as the dependent variables. We find that trading volume is significantly lower in the ad hoc blackout windows. We also find a significant increase in trading volume in the quarter following these windows, consistent with investors reacting to the more prevalent material disclosures following ad hoc blackout windows. Overall, these findings suggest that investors, at least to some extent, recognize that an absence of insider trading is indicative of an undisclosed potential material event (as reflected by higher spreads and lower trading volume in period t), and that these effects are temporary, with spreads decreasing and trading volume increasing in the following quarter as uncertainty about the material event is resolved.

We next examine abnormal stock returns in periods t and $t+1$ to assess whether investors fully impound information conveyed by ad hoc blackout windows. Table 10 and Figure 8 report results from estimating Eq. (5) with *adjRET* as the dependent variable. We find that abnormal stock returns during the ad hoc blackout window are negative, while returns following the ad hoc blackout window are significantly positive. The one-year Fama-French three-factor adjusted return following ad hoc blackout windows is approximately 1% higher than corresponding returns following non-blackout quarters.³⁰ These results indicate that, in addition to predicting the level of future trading activity, periods with abnormally low levels of insider trading also predict future stock performance. Thus, capital markets may not fully incorporate the information contained in these ad hoc blackout windows.

³⁰ We find very similar results using alternative measures of excess return (e.g. market-adjusted or Fama-French four-factor models).

In our final analysis, we explore whether the return patterns that we observe in Table 10 vary predictably with firm characteristics. In particular, as we discuss above, one major cause of firms implementing ad hoc blackout windows is pending M&A negotiations or other similar activities. Accordingly, given the finding above that investors may not fully appreciate the information contained in low-trading windows, we examine whether post-blackout window returns tend to be more positive for firms that are more likely to be subject to an acquisition or takeover, which tend to be good news for the target firm (Graham et al., 2002; Cremers et al., 2009). Specifically, we estimate modified specifications of Eq. (5) that include an interaction between *AdhocBlackout* and the firm's book-to-market ratio (*BtoM*), total assets (*Size*), or liquidity (*Cash*), three measures that are commonly associated with takeover likelihood (e.g., Palepu, 1986; Ambrose and Megginson, 1992; Powell, 2001; Gorton et al., 2009; Danbolt et al., 2016).

Table 11 reports the results. For each measure, we find significant cross-sectional variation in post-blackout window returns, although the results suggest that these patterns do not purely reflect ex-ante takeover likelihood. In columns (2) and (3), we find ad hoc blackout windows predict higher future returns for smaller and more liquid firms, which tend to be acquired more frequently (Palepu, 1986; Ambrose and Megginson, 1992; Powell, 2001; Gorton et al., 2009). However, in column (1), we find higher returns for low book-to-market ratios (i.e., growth firms), which tend to be acquired less frequently than value firms (Palepu, 1986; Danbolt et al., 2016). Thus, while we find that post-blackout window returns are significantly higher among certain types of firms, predicted M&A-related activity may be only part of the explanation for this cross-sectional variation.

6. Conclusion

We use observed trading data by corporate insiders to estimate the length and timing of voluntary corporate restrictions on insider trading. We show that boards appear to design regularly scheduled quarterly blackout periods to address concerns regarding information asymmetry. In particular, we find that boards prohibit trading for a longer period of time both following quarterly earnings announcements (i.e., allowed trading windows begin later) and prior to the subsequent quarter-end (i.e., allowed trading windows end earlier) when potential information asymmetry between insiders and investors is greater. We also find that boards allow more relaxed trading windows when the firm is subject to greater external monitoring and when executives have greater liquidity concerns. These allowed trading windows appear to be important mechanisms constraining insider trading activity, as we find that insiders generate larger trading profits when boards set trading policies that are abnormally loose (e.g., close trading windows unusually late in the quarter).

In addition to these regular blackout periods, we present evidence that boards impose additional ad hoc blackout periods (as measured by a lack of trading by insiders during a given quarter) prior to the disclosure of material corporate events, such as M&A activity or major personnel changes. These ad hoc blackout windows are associated with greater information asymmetry and lower trading volume, and are followed by higher trading volume and a reduction in information asymmetry in the following quarters. We also show that investors do not appear to fully incorporate information contained in these blackout windows, with abnormal stock returns being higher in the quarters following an absence of insider trade. Collectively, our results provide insight into the nature of insider trading restrictions and the purposes that boards intend for them to serve.

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Appendix A. Variable Definitions

Insider trade-level variables (Sources: Thomson Reuters Insider Data, Compustat)

Variable	Definition
<i>TRANDATE</i>	The transaction date of the insider trade.
<i>rdq_previous</i>	The most recent quarterly earnings announcement date prior to the insider trade.
<i>rdq</i>	The next quarterly earnings announcement date following the insider trade.
<i>datadate</i>	The subsequent fiscal quarter-end date following the insider trade.
<i>daysFromPrevEA</i>	The number of days between the previous quarterly earnings announcement date and the transaction date (the number of days between <i>rdq_previous</i> and <i>TRANDATE</i>).
<i>daysToNextFQEnd</i>	The number of days between the transaction date and the subsequent fiscal quarter-end (the number of days between <i>TRANDATE</i> and <i>datadate</i>)

Estimated allowed trading window variables

Variable	Definition
<i>EstWindow15</i>	The number of days in which the first 85% of the insider trades occur within a quarter, assuming 60 days between earnings announcement and subsequent fiscal quarter-end. Insider trading activities during the past eight quarters are aggregated to calculate the estimated allowed trading windows. The values are winsorized at 60 days. $EstWindow15 = 60 - 15\text{th percentile of } daysToNextFQEnd$
<i>EstWindow10</i>	The number of days in which the first 90% of the insider trades occur within a quarter, assuming 60 days between earnings announcement and subsequent fiscal quarter-end. Insider trading activities during the past eight quarters are aggregated to calculate the estimated allowed trading windows. The values are winsorized at 60 days. $EstWindow10 = 60 - 10\text{th percentile of } daysToNextFQEnd$

<i>EstWindow5</i>	The number of days in which the first 95% of the insider trades occur within a quarter, assuming 60 days between earnings announcement and subsequent fiscal quarter-end. Insider trading activities during the past eight quarters are aggregated to calculate the estimated allowed trading windows. The values are winsorized at 60 days. $EstWindow5 = 60 - 5\text{th percentile of } daysToNextFQEnd$
<i>WindowEnd15</i>	The 15 th percentile of <i>daysToNextFQEnd</i> based on insider trades aggregated over the past eight quarters. <i>daysToNextFQEnd</i> is the number of days between the insider trade and the following fiscal quarter-end. The value of <i>x</i> indicates that the latest 15% of trades occurred within <i>x</i> days before fiscal quarter-end. The values are winsorized at 0.
<i>WindowStart</i>	The minimum value of <i>daysFromPrevEA</i> for insider trades that occurred during the past eight quarters winsorized at 10 days. The previous earnings announcement dates are adjusted for after-market earnings announcements
<i>AbnEarlyWindowEnd</i>	The difference between the actual estimated <i>WindowEnd15</i> and the predicted trading window end based on the determinants model (Eq. (1) and Table 4). It is the residual $\epsilon_{i,t}$ from Eq. (1): $WindowEnd15(10,5)_{i,t} = \alpha + \beta_1 EffectiveSpread_{i,t-1} + \beta_2 EA AbsRetProp_{i,t-1} + \beta_3 lnMktVal_{i,t-1} + \beta_4 lnAnalysts_{i,t-1} + \beta_5 InstOwnPct_{i,t-1} + \beta_6 IndDirectorPct_{i,t-1} + \beta_7 CEODuality_{i,t-1} + \beta_8 lnStockCompensation_{i,t-1} + \beta_9 NumInsiderTrade_{i,t-1} + \beta_{10} Volatility_{i,t-1} + \beta_{11} Return_{i,t-1} + \beta_{12} ROA_{i,t-1} + \beta_{13} BtoM_{i,t-1} + \beta_{14} Leverage_{i,t-1} + Industry \times YearFE_{i,t} + \epsilon_{i,t}$. Negative values indicate trading windows that closes abnormally late (i.e., unexpectedly loose insider trading policies).
<i>AbnLateWindowStart</i>	The difference between the actual estimated <i>WindowStart</i> and the predicted trading window start based on the determinants model

	including all five determinants in Table 5. It is the residual $\epsilon_{i,t}$ from: $WindowStart_{i,t} = \alpha + \beta_1 EA TradingVolume_{i,t} + \beta_2 EA EffectiveSpread_{i,t} + \beta_3 EA dEffectiveSpread_{i,t} + \beta_4 EA AbsRetProp_{i,t} + \beta_5 lnAnalysts_{i,t} + \gamma_1 lnMktVal_{i,t-1} + \gamma_2 ROA_{i,t-1} + \gamma_3 BtoM_{i,t-1} + \gamma_4 Leverage_{i,t-1} + Industry \times YearFE_{i,t} + \epsilon_{i,t}$. Negative values indicate trading windows that starts abnormally early after EAs (i.e., unexpectedly loose insider trading policies).
<i>EA TradingVolume</i>	The natural algorithm of the dollar trading volume of the earnings announcement date (<i>rdq_previous</i>). To adjust for after-hour earnings announcements, dollar trading volume of the trading day following earnings announcement date is used if trading volume of the EA date is smaller than that of one trading day after EA. (Source: TAQ)
<i>EA EffectiveSpread</i>	The effective percentage spread (dollar-weighted) of the earnings announcement date (<i>rdq_previous</i>). To adjust for after-hour earnings announcements, effective spread of the trading day following earnings announcement date is used if trading volume of the EA date is smaller than that of one trading day after EA. (Source: TAQ)
<i>EA dEffectiveSpread</i>	The difference between the effective percentage spread (dollar-weighted) two days after earnings announcement and two days before earnings announcement scaled by the spread two days before EA. (Source: TAQ)
<i>EA AbsRetProp</i>	The absolute market-adjusted returns at the earnings announcement date scaled by the cumulative absolute market-adjusted return over the entire quarter (EA date to the day before the next EA date). Returns are in log. Earnings announcement dates are adjusted for after-market earnings announcements. (Source: CRSP)
<i>lnAnalysts</i>	The natural logarithm of the number of analysts following. (Source: IBES)

<i>lnMktVal</i>	The natural logarithm of the firm market capitalization (in millions). (Source: Compustat)
<i>ROA</i>	Income before extraordinary items scaled by total assets multiplied by 100. (Source: Compustat)
<i>BtoM</i>	Book value of assets scaled by the sum of the book value of debt and the market value of equity. (Source: Compustat)
<i>Leverage</i>	Long term debt plus debt in current liabilities scaled by total assets. (Source: Compustat)
<i>EffectiveSpread</i>	The average daily effective percentage spread (dollar-weighted) of the firm's stock measured during 252 trading days prior to the insider trades aggregating period. For each trading day, dollar-weighted average percentage effective spread is calculated. Then the average is taken over 252 trading days. (Source: TAQ)
<i>InstOwnPct</i>	The proportion of the firm's shares owned by institutional investors. (Source: Thomson Reuters 13F Data)
<i>IndDirectorPct</i>	The proportion of independent directors in board of directors. (Source: BoardEx)
<i>CEODuality</i>	Indicator variable that equals one for firm-years with CEOs who are also the chairs of the boards. (Source: BoardEx)
<i>lnStockCompensation</i>	The natural logarithm of stock compensation expense (in millions). (Source: Compustat)
<i>NumInsiderTrade</i>	The average quarterly number of insider trades during four quarters before the insider trades aggregating period.
<i>Volatility</i>	The standard deviation of daily stock returns measured during 252 trading days prior to the insider trades aggregating period. (Source: TAQ)
<i>lnExecEquity</i>	The natural logarithm of the average dollar value of the Top 5 executives' equity holding on the firm (in millions). (Source: Execucomp)

<i>Return</i>	The average daily log returns (in percentage points) of the firm's stock measured during 252 trading days prior to the insider trades aggregating period. (Source: CRSP)
<i>TradingProfits</i>	The value-weighted average six-month buy-and-hold returns (in percentage points) of insider trades. Returns are Fama-French three-factor model excess log returns. (Source: CRSP, Kenneth R. French Data Library)

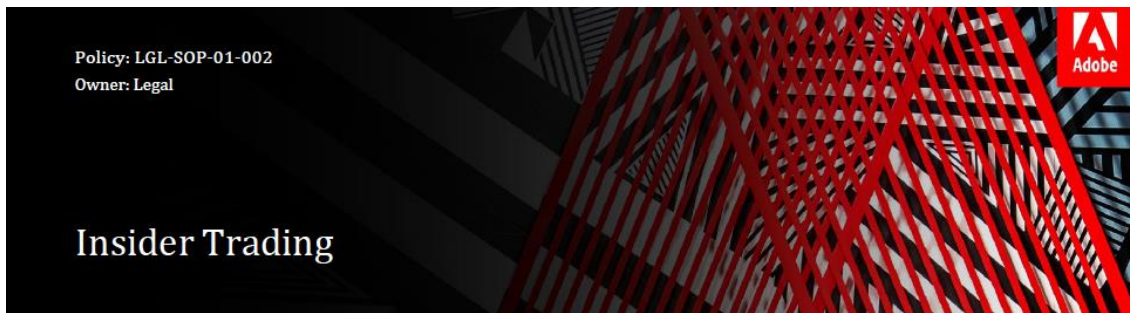
Ad hoc blackout period variables

Variable	Definition
<i>NumTrade</i>	The number of insider trades during the firm-quarter. (Source: Thomson Reuters Insiders Data)
<i>AdhocBlackout</i>	<p>Indicator variables for firm-quarters estimated to include ad hoc blackout periods. Indicator variable that equals one for firm-quarters in the lowest decile (or quintile or quartile) of ε_{it}, where ε_{it} is the residual from estimating the model:</p> $\log(\text{NumTrade}_{it}) = \alpha + \sum_{i=1}^I \beta_i 1_i + \sum_{t=1}^T \gamma_t 1_t + \delta \text{adjRET}_{it-1} + \varepsilon_{it}$ <p>. 1_i and 1_t are indicators for firm i and time t observations, respectively. adjRET_{it-1} is the prior quarter's CRSP market-adjusted returns.</p>
<i>lnNum8K</i>	The natural logarithm of the number of 8-K filings during the next 90 days. (Source: SEC EDGAR)
<i>lnNum8K (Section X)</i>	The natural logarithm of the number of Section X 8-K filings during the next 90 days. 8-K Sections are 1. Registrant's business and operations, 2. Financial information, 3. Securities and trading markets, 4. Matters related to accountants and financial statements, 5. Corporate governance and management, 6. Asset-backed securities,

	7. Regulation FD, 8. Other events, 9. Financial statements and exhibits. (Source: SEC EDGAR)
<i>EffectiveSpread</i>	The average daily effective percentage spread (dollar-weighted) of the firm's stock measured during the quarter. For each trading day, dollar-weighted average percentage effective spread is calculated. Then the average is taken over all trading days in the quarter. (Source: TAQ)
<i>TradingVolume</i>	The average of the log daily dollar trading volume during the quarter. (Source: TAQ)
<i>adjRET</i>	The daily Fama-French three-factor model excess log returns in percentage points accumulated over a specified period. The daily abnormal return is the residual from estimating $r_{i,t} - r_{f,t} = \alpha_i + \beta_{i,mkt}mkt_{f,t} + \beta_{i,SMB}SMB_t + \beta_{i,HML}HML_t + \epsilon_{i,t}$ using a rolling 252-trading day window (Fama and French, 1993). (Source: CRSP, Kenneth R. French Data Library)
<i>Size</i>	The natural logarithm of the firm total assets (in millions). (Source: Compustat)
<i>Cash</i>	Cash and short-term investments over total assets (Source: Compustat)

Appendix B. Examples of Insider Trading Policies

B1. Excerpts from Adobe Inc. Insider Trading Policy



1. Overview

This Insider Trading Policy (the "Policy") provides guidelines with respect to transactions in the securities of Adobe Inc. (the "Company" or "Adobe") and the handling of confidential information about Adobe and the companies with which Adobe does business. Adobe has adopted this Policy to promote compliance by all Adobe employees, consultants and other service providers with federal, state, and foreign securities laws that prohibit certain persons who are aware of material, nonpublic information ("Insider Information," further defined below) about a company from: (i) trading in securities of that company; or (ii) providing Insider Information to other persons who may trade on the basis of that information. Employees or consultants who trade on Insider Information (or tip such Insider Information to others) can be personally liable for damages totaling up to three times the profits made or the loss avoided by the individual trading with inside information. Insider trading is also a crime that can result in a criminal fine (no matter how small the profit) of up to five million dollars and a jail term of up to twenty years, as well as penalties described below under the heading "Consequences of Violations."

The Securities and Exchange Commission ("SEC") is the federal agency charged with enforcing insider trading laws in the United States. The SEC vigorously pursues insider trading violations and can detect violations using advanced technologies. The SEC's authority to initiate insider trading investigations includes the ability to obtain Adobe's employee and consultant records, to access individual's bank accounts and phone records, to obtain broker's records, etc. An SEC investigation can be triggered through a variety of actions, including by an individual's unusual trading activity, trading volume, the timing of trades that coincide with important company changes, or simply an anonymous tip to the SEC.

Adobe has worked hard to establish a reputation as a leader for its ethical conduct and business practices, and violations or perceived violations of insider trading laws could subject the Company to reputational harm, as well as civil or criminal liability if it does not implement reasonable measures to prevent insider trading.

2. Policy

If you are aware of Insider Information related to Adobe, you may not directly, or indirectly through Family Members or other persons or entities:

1. Engage in transactions in Adobe securities, except as otherwise specified in this Policy under the headings "Transactions Under Company Plans," "Transactions Not Involving a Purchase or Sale" and "Rules and Guidelines for Rule 10b5-1 Trading Plans";
2. Recommend the purchase or sale of any Adobe securities;
3. Disclose Insider Information (e.g. "tipping") to persons within the Company whose jobs do not require them to have that information, or outside of the Company to other persons, including, but not limited to, family, friends, business associates, investors, and expert consulting firms, unless any such disclosure is made in accordance with the Company's policies regarding the protection and authorized external disclosure of information regarding the Company; or
4. Assist anyone engaged in the above activities.

Insider Information means information that is both material and nonpublic (as explained in section 6). These prohibitions apply even if the transaction in question was planned or initiated before you learned of Insider Information. Note that bona fide gifts of Adobe securities are considered transactions subject to the restrictions in this Policy.

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3.1. Trading Window

You may only conduct transactions involving Adobe securities (other than as specified in section 4) when the Company trading window is open. Whether or not the trading window is open, you are always subject to the prohibitions on trading on the basis of Insider Information and any other applicable restrictions in this Policy.

- (A) **Company-Wide Trading Window.** All employees, executive officers, directors, and other employees and agents of Adobe, as well as their Family Members and Controlled Entities, are prohibited from engaging in transactions involving Adobe securities when the Company-wide trading window (the "Trading Window") is closed each quarter. The Trading Window opens each quarter at the start of the first trading day that is at least 24 hours following the date of public disclosure of the financial results for the previous fiscal quarter. The Trading Window closes four weeks prior to each quarter end. The period following the closure of the Trading Window is a particularly sensitive time for transactions involving Adobe due to the fact that, during this period, individuals may often possess or have access to Insider Information relevant to the expected financial results for the quarter.
- For example, if in 2018 Adobe were to issue its earnings release for the fourth quarter of FY2018 after the stock market closes on Thursday, December 13, the Trading Window would open at the start of trading on Monday, December 17, 2018. Assuming you were not in possession of Insider Information, you would be able to trade in Adobe securities again beginning on December 17, 2018. For purposes of this hypothetical, the Trading Window would have closed on November 1, 2018 at close of market (4pm Eastern Time) —four weeks prior to Q4 FY2018 quarter end.
- (B) **Special Trading Restrictions.** From time to time, an event may occur that is material to Adobe and is known by only a few directors, officers, or employees. So long as the event remains material and nonpublic, the persons designated by the Trading Compliance Officer may not trade Adobe securities. The existence of an event-specific trading restriction will not be announced to the Company as a whole and should not be communicated to any other individuals. Even if the Trading Compliance Officer has not explicitly designated you as a person who is prohibited from trading due to an event-specific restriction, you may not trade while aware of Insider Information.
- (C) **No "Safe Harbors."** There are no unconditional "safe harbors" for trades made at particular times, and all persons subject to this Policy should exercise good judgment at all times. Even when the Trading Window is open, you may be prohibited from engaging in transactions involving the Company's securities if you possess Insider Information, are subject to a special trading restriction, or are otherwise restricted under this Policy.

3.2. Rules and Guidelines for Rule 10b5-1 Trading Plans

Certain executives designated by the Trading Compliance Officer are eligible to establish qualified Rule 10b5-1 trading plans for transactions in Adobe securities that meet certain conditions specified in the Rule (a "Rule 10b5-1 Plan"). Rule 10b5-1 provides an affirmative defense from liability for trades executed pursuant to a valid Rule 10b5-1 Plan. Adobe's Rules and Guidelines for Rule 10b5-1 Trading Plans, as well as additional information on eligibility, are provided in Adobe's [Trading Compliance Center](#).

4. Exceptions

The quarterly Trading Window closures and event-driven trading restrictions do not apply to those transactions described below. Further, the requirement for pre-clearance, the quarterly Trading Window closures and event-driven trading restrictions do not apply to transactions conducted pursuant to an approved Rule 10b5-1 Plan (although such requirements are applicable to the establishment of the plan itself).

4.1. Transactions under Company Plans

The prohibitions described in this Policy do not apply in the case of the following transactions, except as specifically noted:

- (A) **Stock Option Exercises for Cash.** This Policy does not restrict the exercise for cash of an employee stock option acquired pursuant to Adobe's plans (including assumed plans of companies acquired by Adobe). It does, however, restrict any sale of stock as part of a broker-assisted cashless exercise of an option, any other market sale for the purpose of generating the cash needed to pay the exercise price of an option, or any sale of shares acquired upon the exercise of an option.
- (B) **Restricted Stock Units and Performance Shares.** This Policy does not restrict the vesting of restricted stock units ("RSUs"), performance shares, or other similar equity instruments, or the related forfeiture of shares of stock to satisfy tax withholding or other regulatory requirements upon the vesting of any such equity instruments. The Policy does, however, restrict any market sale of the shares of Adobe common stock that are issued upon the vesting of such RSUs, performance shares, or other similar equity instruments.
- (C) **Employee Stock Purchase Plan.** This Policy does not restrict purchases of stock under Adobe's Employee Stock Purchase Plan, as amended (the "ESPP"), resulting from contributions of money to the ESPP pursuant to the election you make at the time of any enrollment in the plan. It does, however, apply to your sales of Adobe securities purchased pursuant to the ESPP. Additionally, you should not base your decision to participate in the ESPP, or your decision to change your election under the ESPP, on Insider Information.

4.2. Transactions Not Involving a Purchase or Sale

Transactions that involve merely a change in the form in which you own securities are permitted during a period when you are aware of Insider Information or during a company-enforced Trading Window closure. For example, you may transfer shares to an *inter vivos* trust of which you are the sole beneficiary during your lifetime. Further, transactions in mutual funds that are invested in Adobe securities are not transactions subject to this Policy.

The trading restrictions under this Policy also do not apply to a change in the number of securities held as a result of a stock split or stock dividend applying equally to all securities of a class, or similar transactions.

2.6. Prohibited Transactions

Because there is a heightened legal risk, the appearance of improper or inappropriate conduct, or both, in any of the following transactions, you may not engage in any of these:

- (A) **Short Sales.** You may not engage in short sales of Adobe securities. Short sales of Adobe securities (i.e., the sale of a security that the seller does not own) may evidence an expectation on the part of the seller that the securities will decline in value, and therefore have the potential to signal to the market that the seller lacks confidence in the Company's prospects. Short sales may reduce a seller's incentive to seek to improve the Company's performance. In addition, Section 16(c) of the Exchange Act prohibits officers and directors from engaging in short sales. (Short sales arising from certain types of hedging transactions are addressed by the "Hedging Transactions" paragraph)
- (B) **Publicly Traded Options.** You may not engage in transactions in put options, call options or other Adobe derivative securities, on an exchange or in any other organized market. (Option positions arising from certain types of hedging transactions are addressed by the "Hedging Transactions" paragraph.) Given the relatively short term of publicly traded options, transactions in options may create the appearance that you are trading based on Insider Information and may also focus your attention on short-term performance at the expense of the Company's long-term objectives.
- (C) **Hedging Transactions.** You may not engage in hedging transactions of any type involving Adobe securities. Hedging or monetization transactions can be accomplished through a number of possible mechanisms, including through the use of financial instruments such as prepaid variable forwards, equity swaps, exchange funds, and collars. Such hedging transactions may permit you to continue to own Adobe securities obtained through employee benefit plans or otherwise, but without the full risks and rewards of ownership. When that occurs, you may no longer have the same objectives as the Company's other shareholders.
- (D) **Margin Accounts and Pledged Securities.** You may not hold Adobe securities in a margin account or otherwise pledge Adobe securities as collateral for a loan, because a margin sale or foreclosure sale may occur at a time you are aware of Insider Information or otherwise are not permitted to trade in Adobe securities. Securities held in a margin account as collateral for a margin loan might be sold by the broker without your consent if you fail to meet a margin call. Similarly, securities pledged (or hypothecated) as collateral for a loan might be sold in foreclosure if you default on the loan. (Pledges of Adobe securities arising from certain types of hedging transactions are governed by the "Hedging Transactions" paragraph)

2.7. Placing Open Orders with Brokers

When placing an open order with a broker you should inform the broker that you are subject to this Policy and its Trading Window procedures (and Pre-Clearance Procedures, if applicable) to assure that all open orders are cancelled prior to the closure of any Trading Window. Exercise caution when placing open orders, such as limit orders or particularly where the order is likely to remain outstanding for an extended period of time, except in accordance with an approved 10b5-1 Plan (as discussed below). Open orders may result in the execution of a trade at a time when you are aware of Insider Information or otherwise are not permitted to trade in Adobe securities, which may result in inadvertent insider trading violations, Section 16 violations (for officers and directors), violations of this Policy, and unfavorable publicity for you and the Company.

2.8. Post-Termination Transactions

This Policy continues to apply to transactions in Adobe securities even after termination of your service (whether as an employee, consultant or other service provider) to the Company. If you are in possession of Insider Information when your service terminates, you may not trade in Adobe securities until that information has become public or is no longer material. In addition, if the Trading Window is closed or you are subject to a special trading restriction under this Policy at the time you cease to be affiliated with the Company are expected to abide by the applicable trading restrictions until at least the end of the applicable trading restriction.

3. Procedures

Adobe has established procedures in order to assist in the administration of this Policy, to facilitate compliance with the laws prohibiting insider trading, and to avoid the appearance of any impropriety. Additional information regarding these procedures is available on Adobe's [Trading Compliance Center](#). All persons subject to this Policy are encouraged to routinely check the Trading Compliance Center for the latest information applicable to them.

- (A) **Company Assistance.** If you have any concerns about whether you are in possession of Insider Information or if you are in a sensitive position within Adobe, you should contact the Trading Compliance Office (trading@adobe.com) before you buy or sell Adobe securities. This will help ensure that even employees and consultants unaware of a particular piece of information do not give the appearance of improperly trading Adobe stock. Any person who has a question about this Policy or its application to any proposed transaction may obtain additional guidance from the Trading Compliance Officer.
- (B) **Pre-Clearance Procedures.** The executives designated by the Trading Compliance Officer as being subject to Pre-Clearance Procedures, as well as the Family Members and Controlled Entities of such persons, may not engage in any transaction in Adobe securities without first obtaining pre-clearance of the transaction from the Trading Compliance Officer. Additional information regarding Pre-Clearance Procedures and the individuals to whom such procedures apply is available on Adobe's [Trading Compliance Center](#).

B2. Excerpts from Shake Shack Inc. Insider Trading Policy



SHAKE SHACK INC.

INSIDER TRADING COMPLIANCE POLICY

This Insider Trading Compliance Policy (this “*Policy*”) consists of seven sections:

- Section I provides an overview;
- Section II sets forth the policies of Shake Shack Inc. prohibiting insider trading;
- Section III explains insider trading;
- Section IV consists of procedures that have been put in place by Shake Shack Inc. to prevent insider trading;
- Section V sets forth additional transactions that are prohibited by this Policy;
- Section VI explains Rule 10b5-1 trading plans and provides information about Section 16 and Rule 144; and
- Section VII refers to the execution and return of a certificate of compliance.

I. SUMMARY

Preventing insider trading is necessary to comply with securities laws and to preserve the reputation and integrity of Shake Shack Inc. (the “*Company*”) as well as that of all persons affiliated with the Company. “Insider trading” occurs when any person purchases or sells a security while in possession of inside information relating to the security. As explained in Section III below, “inside information” is information that is both “material” and “non-public.” Insider trading is a crime. The penalties for violating insider trading laws include imprisonment, disgorgement of profits, civil fines, and criminal fines of up to \$5 million for individuals and \$25 million for corporations. Insider trading is also prohibited by this Policy, and violation of this Policy may result in Company-imposed sanctions, including removal or dismissal for cause.

This Policy applies to all corporate officers (“*officers*”), members of the board of directors (“*directors*”) and employees of the Company. Individuals subject to this Policy are responsible for ensuring that members of their households also comply with this Policy. This Policy also applies to any entities controlled by individuals subject to the Policy, including any corporations, partnerships or trusts, and transactions by these entities should be treated for the purposes of this Policy and applicable securities laws as if they were for the individual’s own account. This Policy extends to all activities within and outside an individual’s Company duties.

IV. STATEMENT OF PROCEDURES PREVENTING INSIDER TRADING

The following procedures have been established, and will be maintained and enforced, by the Company to prevent insider trading. Every officer, director and employee is required to follow these procedures.

A. Pre-Clearance of All Trades by All Officers, Directors and Certain Employees

To provide assistance in preventing inadvertent violations of applicable securities laws and to avoid the appearance of impropriety in connection with the purchase and sale of the Company's securities, all transactions in the Company's securities (including without limitation, acquisitions and dispositions of Company stock, the exercise of stock options and the sale of Company stock issued upon exercise of stock options) by officers and directors and such other employees as are designated from time to time by the Board of Directors, the Chief Executive Officer, the Chief Financial Officer or the General Counsel as being subject to this pre-clearance process (a "Pre-Clearance Person") must be pre-cleared by the Company's General Counsel. Pre-clearance does not relieve anyone of his or her responsibility under SEC rules.

A request for pre-clearance may be oral or in writing (including without limitation by e-mail), should be made at least two business days in advance of the proposed transaction and should include the identity of the Pre-Clearance Person, the type of proposed transaction (for example, an open market purchase, a privately negotiated sale, an option exercise, etc.), the proposed date of the transaction and the number of shares or options to be involved. In addition, the Pre-Clearance Person must execute a certification (in the form approved by the General Counsel) that he, she or it is not aware of material, nonpublic information about the Company. The General Counsel shall have sole discretion to decide whether to clear any contemplated transaction (The Chief Executive Officer shall have sole discretion to decide whether to clear transactions by the General Counsel or persons or entities subject to this policy as a result of their relationship with the General Counsel). All trades that are pre-cleared must be effected within five business days of receipt of the pre-clearance unless a specific exception has been granted by the General Counsel (or the Chief Executive Officer, in the case of the General Counsel or persons or entities subject to this policy as a result of their relationship with the General Counsel). A pre-cleared trade (or any portion of a pre-cleared trade) that has not been effected during the five business day period must be pre-cleared again prior to execution. Notwithstanding receipt of pre-clearance, if the Pre-Clearance Person becomes aware of material, non-public information or becomes subject to a black-out period before the transaction is effected, the transaction may not be completed.

B. Black-Out Periods

Additionally, no officer, director or employee listed on Schedule I shall purchase or sell any security of the Company during the period beginning on the 14th calendar day before the end of any fiscal quarter of the Company and ending upon the completion of the first full trading day after the public release of earnings data for such fiscal quarter or during any other trading suspension period declared by the Company, except for purchases and sales made pursuant to the permitted transactions described in Section II.

Exceptions to the black-out period policy may be approved only by the Company's General Counsel (or, in the case of an exception for the General Counsel or persons or entities subject to this policy as a result of their relationship with the General Counsel, the Chief Executive Officer or, in the case of exceptions for directors or persons or entities subject to this policy as a result of their relationship with a director, the Board of Directors).

From time to time, the Company, through the Board of Directors, the Company's disclosure committee or the General Counsel, may recommend that officers, directors, employees or others suspend trading in the Company's securities because of developments that have not yet been disclosed to the public. Subject to the exceptions noted above, all of those affected should not trade in the Company's securities while the suspension is in effect, and should not disclose to others that the Company has suspended trading.

If the Company is required to impose a "pension fund black-out period" under Regulation BTR, each director and executive officer shall not, directly or indirectly sell, purchase or otherwise transfer during such black-out period any equity securities of the Company acquired in connection with his or her service as a director or officer of the Company, except as permitted by Regulation BTR.

C. Post-Termination Transactions

With the exception of the pre-clearance requirement, this Policy continues to apply to transactions in the Company's securities even after termination of service to the Company. If an individual is in possession of material, non-public information when his or her service terminates, that individual may not trade in the Company's securities until that information has become public or is no longer material.

D. Information Relating to the Company

1. Access to Information

Access to material, non-public information about the Company, including the Company's business, earnings or prospects, should be limited to officers, directors and employees of the Company on a need-to-know basis. In addition, such information should not be communicated to anyone outside the Company under any circumstances (except in accordance with the Company's policies regarding the protection or authorized external disclosure of Company information) or to anyone within the Company on an other than need-to-know basis.

In communicating material, non-public information to employees of the Company, all officers, directors and employees must take care to emphasize the need for confidential treatment of such information and adherence to the Company's policies with regard to confidential information.

All officers, directors and employees should take all steps and precautions necessary to restrict access to, and secure, material, non-public information by, among other things:

- maintaining the confidentiality of Company-related transactions;

Figure 1: Timeline of Insider Trades

This figure shows the timeline of insider trades relative to quarterly earnings announcements and fiscal quarter-ends. For each period between two earnings announcements ($rdq_previous$ and rdq), we collect insider trades. Then, for each trade, we calculate the number of days between earnings announcement and transaction date ($daysFromPrevEA$) and the number of days between the transaction date and upcoming fiscal quarter-end ($daysToNextFQEnd$). These variables measure how early or late the insider trades occurred relative to previous earnings announcement and subsequent fiscal quarter-end.

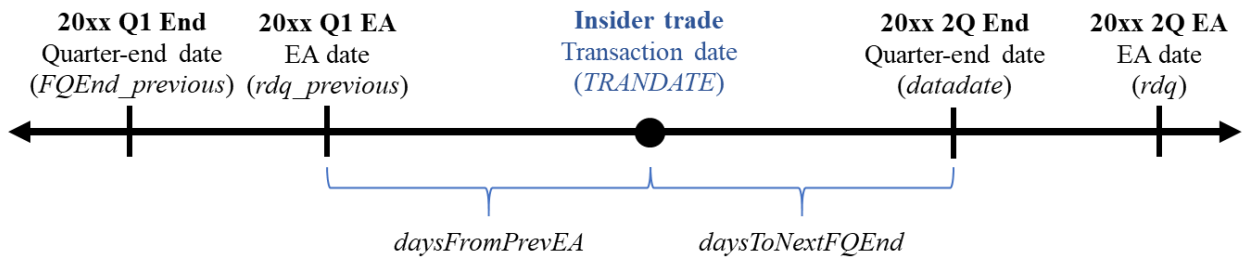
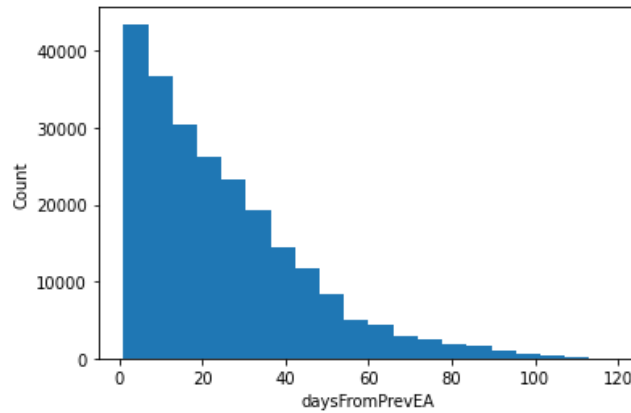
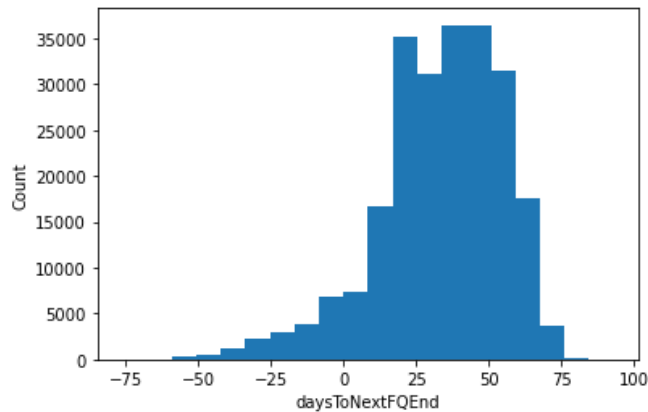


Figure 2: Distribution of Insider Trade Timing

The figure displays the distribution of insider trade timing at the individual insider trade level. Panel (a) shows the distribution of the number of days between the previous earnings announcement and transaction date (*daysFromPrevEA*). Insider trades are concentrated right after earnings announcements and become less frequent over the quarter. Panel (b) shows the distribution of the number of days between the transaction date and the upcoming fiscal quarter-end (*daysToNextFQEnd*). A greater value indicates that the insider trade occurred earlier in the quarter (far before the next fiscal quarter-end).



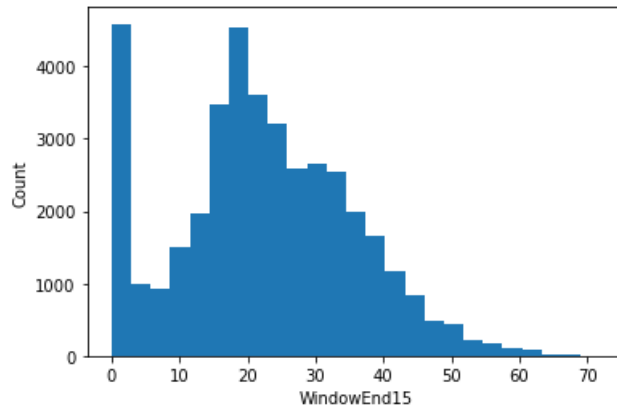
(a) Histogram of the number of days between the previous earnings announcement and insider transaction date



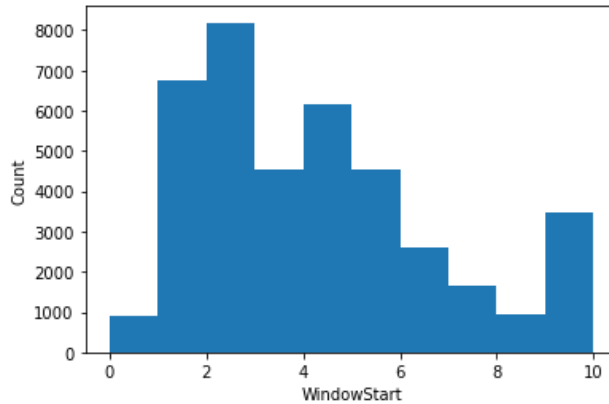
(a) Histogram of the number of days between the insider transaction date and the upcoming fiscal quarter-end

Figure 3: Distribution of the End and the Start of Estimated Allowed Trading Windows

This figure shows the distribution of the ending point and the starting point of estimated allowed trading windows. Insider trading activities from the past eight quarters are aggregated to estimate the allowed trading windows. We require at least ten insider trades during the eight-quarter period. The end of the allowed trading window (*WindowEnd15*) is estimated as the 15th percentile of the number of days between the insider transaction date and the upcoming fiscal quarter-end (*daysToNextFQEnd*). The starting point (*WindowStart*) is estimated as the minimum value of the number of days between the previous earnings announcement and the insider trade transaction date (*daysFromPrevEA*). Therefore, *WindowStart* reflects the timing of the earliest insider trade over the past eight quarters.



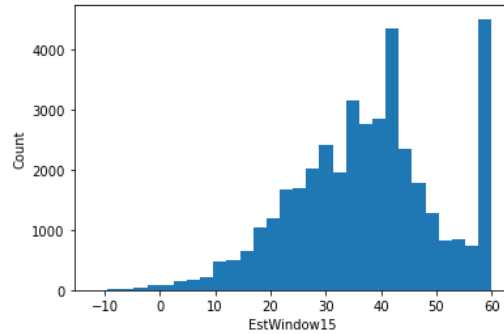
(a) The estimated ending point of allowed trading windows (in number of days to the upcoming fiscal quarter-end)



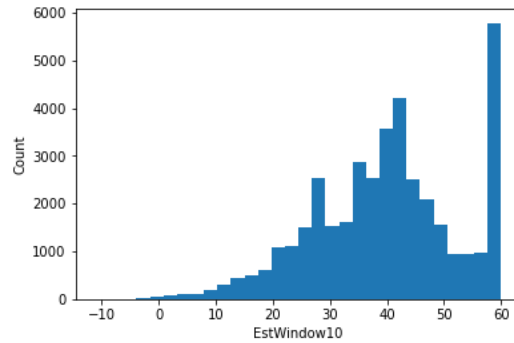
(b) The estimated starting point of allowed trading windows (in number of days from the earnings announcement)

Figure 4: Distribution of Estimated Allowed Trading Windows

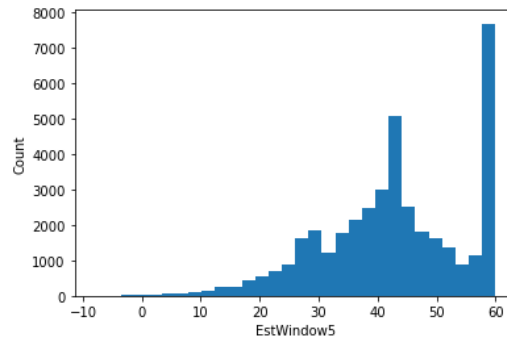
This figure shows the distribution of estimated allowed trading windows. Allowed trading windows are estimated using the distribution of actual insider trades. Insider trading activities from the past eight quarters are aggregated to estimate the allowed trading window. *EstWindow15* (10, 5) is the period (in days) including the earliest 85% (90%, 95%) of insider trades. Estimated windows are winsorized at 60 days. A wider estimated window indicates that more insider trades occurred later in the quarter (close to fiscal quarter-end) and suggests more relaxed insider trading policies.



(a) *EstWindow15* (the number of days including the earliest 85% of trades)



(b) *EstWindow10* (the number of days including the earliest 90% of trades)



(c) *EstWindow5* (the number of days including the earliest 95% of trades)

Figure 5: Trend in 8-K Filings at and after Ad Hoc Blackout Periods

This figure shows the trend in 8-K filings during and after our estimated ad hoc blackout periods relative to non-blackout quarters. The y-axis is the coefficient β from estimating $Dep.Var. = \alpha + \beta AdhocBlackout_{i,t} + FirmFE_i + YearFE_t + \varepsilon_{i,t}$, where $Dep.Var.$ is the natural logarithm of the number of 8-K filings during the quarter, 90 days after the quarter, 90-180 days after the quarter, 180-270 days after the quarter, and 270-365 days after the quarter. Ad hoc blackout periods are identified by estimating the model: $\log(NumTrade_{i,t}) = \alpha + \sum_{i=1}^I \beta_i 1_i + \sum_{t=1}^T \gamma_t 1_t + \delta adjRET_{i,t-1} + \varepsilon_{i,t}$. Firm-quarters in the lowest quintile of the model residual $\varepsilon_{i,t}$ are classified as ad hoc blackout periods.

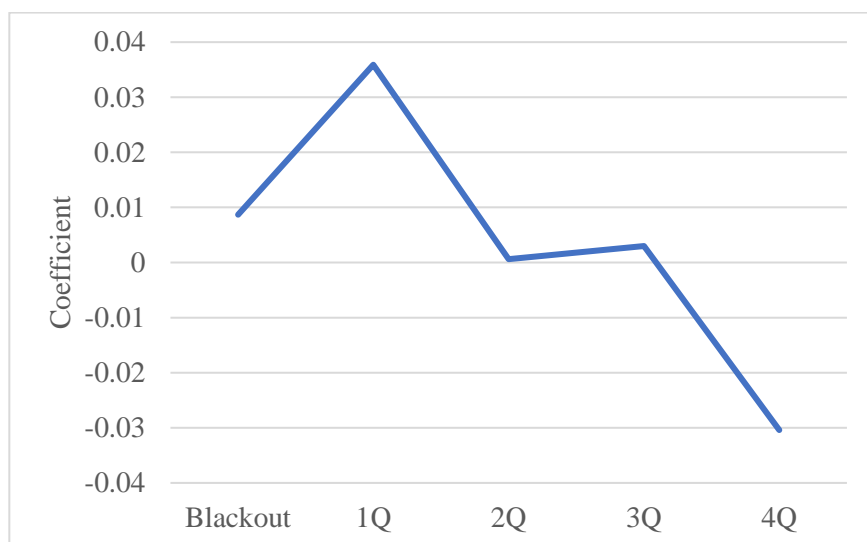


Figure 6: Frequencies of Future 8-K Filings following Ad Hoc Blackout Periods by 8-K Sections

This figure shows the frequencies of 8-K filings by sections during 90 days following the ad hoc blackout period relative to periods following non-blackout quarters. The y-axis is the coefficient β from estimating $\ln Num8K_{i,t+1} = \alpha + \beta AdhocBlackout_{i,t} + FirmFE_i + YearFE_t + \varepsilon_{i,t}$ for each 8-K Section. 8-K Section descriptions are as follows: Section 1: Registrant's business and operations; Section 2: Financial information; Section 3: Securities and trading markets; Section 4: Matters related to accountants and financial statements; Section 5: Corporate governance and management; Section 6: Asset-backed securities; Section 7: Regulation FD; Section 8: Other events; Section 9: Financial statements and exhibits. Ad hoc blackout periods are identified by estimating the model: $\log(NumTrade_{i,t}) = \alpha + \sum_{i=1}^I \beta_i 1_i + \sum_{t=1}^T \gamma_t 1_t + \delta adjRET_{i,t-1} + \varepsilon_{i,t}$. Firm-quarters in the lowest quintile of the model residual $\varepsilon_{i,t}$ are classified as ad hoc blackout periods.

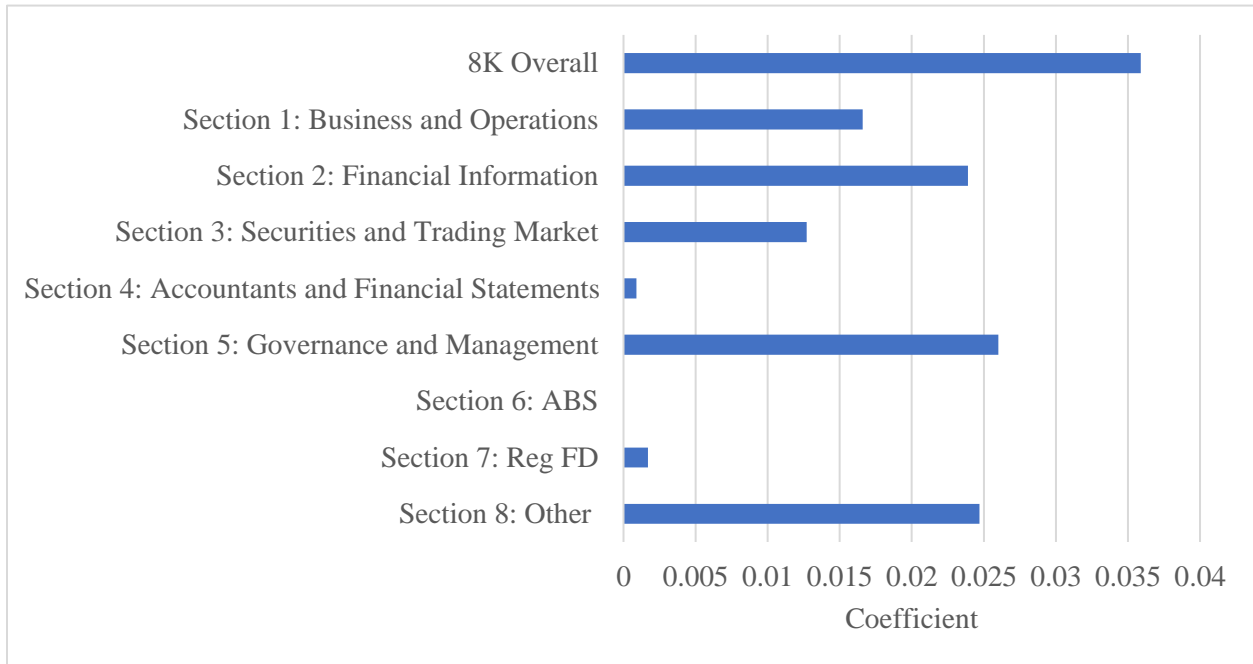


Figure 7: Trend in Bid-Ask Spreads during and after Ad Hoc Blackout Periods

This figure shows the trend in bid-ask spreads during and after our estimated ad hoc blackout periods relative to non-blackout quarters. The y-axis is the coefficient β from estimating $Dep.Var. = \alpha + \beta AdhocBlackout_{i,t} + FirmFE_i + YearFE_t + \varepsilon_{i,t}$, where $Dep.Var.$ is the average daily effective percentage spread during the quarter, the 90 days after the quarter, the 90-180 days after the quarter, the 180-270 days after the quarter, and the 270-365 days after the quarter. Ad hoc blackout periods are identified by estimating the model: $\log(NumTrade_{i,t}) = \alpha + \sum_{i=1}^I \beta_i 1_i + \sum_{t=1}^T \gamma_t 1_t + \delta adjRET_{i,t-1} + \varepsilon_{i,t}$. Firm-quarters in the lowest quintile of the model residual $\varepsilon_{i,t}$ are classified as ad hoc blackout periods.

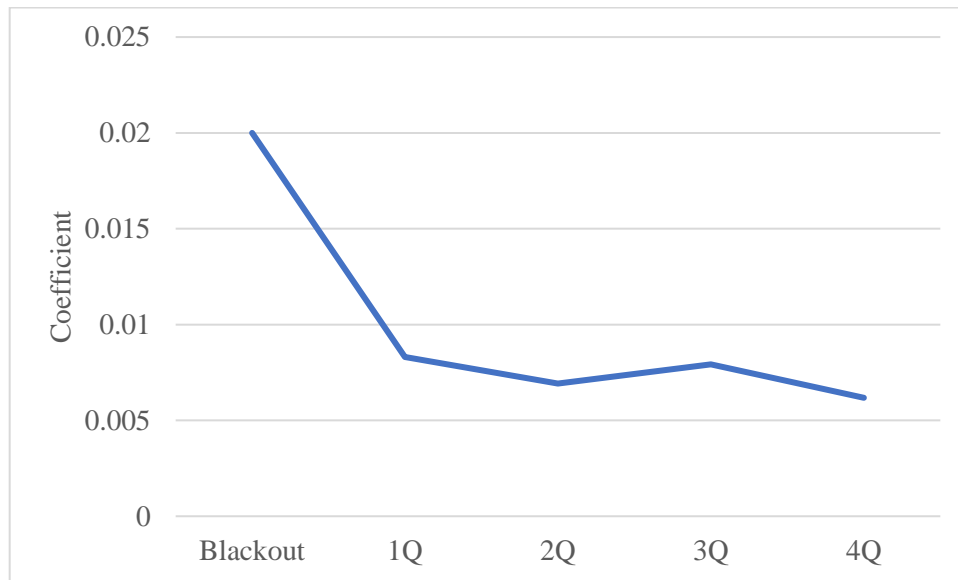


Figure 8: Returns during and after Ad Hoc Blackout Periods

This figure shows the trend in abnormal returns during and after our estimated ad hoc blackout periods relative to non-blackout quarters. The y-axis is the coefficient β from estimating $Dep.Var. = \alpha + \beta AdhocBlackout_{i,t} + FirmFE_i + YearFE_t + \varepsilon_{i,t}$, where $Dep.Var$ is the Fama-French three-factor excess returns cumulated over the quarter, over the 90 days after the quarter, over the 90-180 days after the quarter, over the 180-270 days after the quarter, and over the 270-365 days after the quarter. Ad hoc blackout periods are identified by estimating the model: $\log(NumTrade_{i,t}) = \alpha + \sum_{i=1}^I \beta_i 1_i + \sum_{t=1}^T \gamma_t 1_t + \delta adjRET_{i,t-1} + \varepsilon_{i,t}$. Firm-quarters in the lowest quintile of the model residual $\varepsilon_{i,t}$ are classified as ad hoc blackout periods.

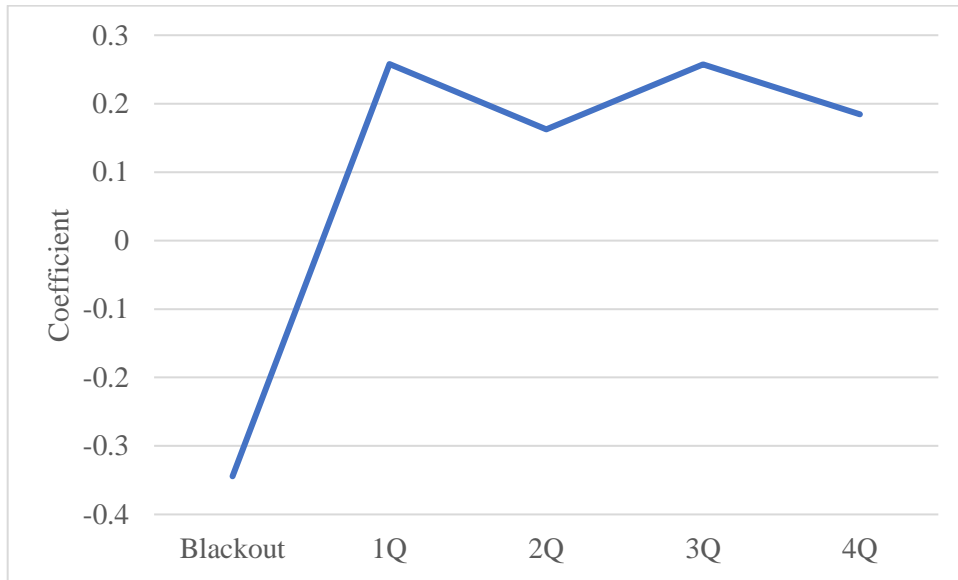


Table 1: Summary Statistics

This table presents the descriptive statistics for the variables used in the analyses. See Appendix A for variable definitions. Panel A includes variables related to the starting point and the ending point of allowed trading windows. Panel B reports the summary statistics of variables related to the ad hoc blackout periods. All continuous variables are winsorized at 1% and 99%.

Panel A. Variables related to the timing and length of allowed trading windows						
	Mean	Std.Dev.	25%	Median	75%	Obs.
<i>WindowStart (in days from Prev EA)</i>	3.8540	2.6424	2.0000	3.0000	5.0000	39699
<i>WindowEnd15 (in days to Next FQE)</i>	22.3073	13.2569	14.3000	22.0000	31.2500	39699
<i>WindowEnd10 (in days to Next FQE)</i>	19.9458	12.9143	11.4000	19.2000	29.0000	39699
<i>WindowEnd5 (in days to Next FQE)</i>	17.1472	12.3515	7.0000	17.0000	25.0000	39699
<i>EA TradingVolume</i>	16.7776	2.6333	15.0954	17.2041	18.7950	37109
<i>EA EffectiveSpread</i>	0.3980	0.6955	0.0729	0.1560	0.3729	37079
<i>EA dEffectiveSpread</i>	0.1537	0.7573	-0.2550	-0.0074	0.3087	35225
<i>EA AbsRetProp</i>	0.0533	0.0477	0.0162	0.0390	0.0772	39464
<i>EffectiveSpread</i>	0.4154	0.7479	0.0603	0.1358	0.3693	37385
<i>MktVal</i>	8390.91	20500.42	403.43	1642.32	5979.35	39699
<i>Analysts</i>	8.6284	8.3678	2.0000	6.0000	13.0000	39699
<i>InstOwnPct</i>	0.7019	0.2736	0.5339	0.7760	0.9065	36521
<i>IndDirectorPct</i>	0.7794	0.1287	0.6667	0.8333	0.8889	36557
<i>CEODuality</i>	0.4013	0.4902	0.0000	0.0000	1.0000	39699
<i>StockCompensation</i>	8.6536	20.2666	0.3820	2.0000	6.8040	39699
<i>NumInsiderTrade</i>	2.6230	3.4641	0.2500	1.5000	3.5000	39181
<i>Volatility</i>	0.0207	0.0103	0.0138	0.0178	0.0246	39647
<i>lnExecEquity</i>	2.4715	1.2600	1.5540	2.3187	3.1990	24696
<i>TradingProfits</i>	2.4071	14.9561	-5.0706	1.3211	9.1163	39181
<i>Return</i>	0.0483	0.1299	-0.0089	0.0539	0.1171	39647
<i>ROA</i>	0.4491	3.5868	0.1598	0.6972	1.8011	39699
<i>BtoM</i>	0.6644	0.2828	0.4357	0.6692	0.9315	39699
<i>Leverage</i>	0.2342	0.2112	0.0558	0.1899	0.3631	39699
Panel B. Variables related to the ad hoc blackout periods						
	Mean	Std.Dev.	25%	Median	75%	Obs.
<i>Num8K</i>	2.3323	2.1499	1.0000	2.0000	3.0000	117166
<i>EffectiveSpread</i>	0.4914	0.8348	0.0719	0.1625	0.4628	106419
<i>dTradingVolume</i>	0.0413	0.4539	-0.1995	0.0075	0.2384	101924
<i>adjRET</i>	-1.6800	17.5875	-9.0920	-0.2380	7.2981	115906
<i>Size</i>	8558.68	24404.43	357.73	1422.09	5194.67	117152
<i>Cash</i>	0.1803	0.2289	0.0287	0.0818	0.2314	117106

Table 2: Estimated Allowed Trading Windows vs. Actual ITPs

This table compares our estimated allowed trading windows with allowed trading windows specified in actual disclosed insider trading policies for a small sample of firms. Actual ITPs of 60 companies are collected via web search. These actual ITPs are snapshots of firms' insider trading policies. We were not able to observe time-series variation of ITPs as firms do not disclose historical ITPs. For each ITP, the quarterly allowed trading window's approximate length, the starting point, and the ending point are calculated based on the policy's descriptions of quarterly allowed trading windows or blackout periods. We assume 60 days between earnings announcement dates and subsequent fiscal quarter-ends. Then, we estimate the allowed trading window for each firm-quarter using the distribution of insider trades. The insider trades are aggregated over an eight-quarter period, and we require at least ten trades during the period. We take the firm-level mean or median of the estimated windows to obtain a firm-level summary. The end of the allowed trading window (*WindowEnd15*) is estimated as the 15th percentile of the number of days between the insider transaction date and the upcoming fiscal quarter-end (*daysToNextFQEnd*). *WindowStart* is the estimated start of allowed trading window, in number of days from the previous earnings announcement. *EstWindow15* is the period (in days) including the earliest 85% of insider trades.

	<i>Firm-level mean</i>	<i>Firm-level median</i>
<i>Correlation between actual and estimated window length (WindowEnd15)</i>	0.570	0.608
	<i>Firm-level mean</i>	<i>Firm-level median</i>
<i>Correlation between actual and estimated window start (WindowStart)</i>	0.408	0.311
	<i>Firm-level mean</i>	<i>Firm-level median</i>
<i>Correlation between actual and estimated window end (EstWindow15)</i>	0.570	0.610

Table 3: Estimation Error of Allowed Trading Windows – Actual ITP Subsample

This table shows the correlation between the estimation error of our estimated allowed trading windows and various firm characteristics for the sample of firms with disclosed insider trading policies. The estimation errors are calculated by comparing our estimated allowed trading windows and the stated insider trading policies. The estimation error of the ending point (*Error_End*) is defined as the absolute value of demeaned difference between the ending point from the actual ITP and our estimated window end. The estimation error of the starting point (*Error_Start*) is defined as the absolute value of demeaned difference between the starting point from the actual ITP and our estimated window start. Panel A (Panel B) shows the results related to the estimation error of the ending (starting) point of allowed trading windows. Variables are specified in Appendix A. All continuous variables are winsorized at 1% and 99% levels. Standard errors are heteroscedasticity robust. ***, **, * indicate significance levels for two-tailed tests at the 1%, 5%, and 10% levels, respectively.

Panel A. Estimation error of the ending point of allowed trading windows

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	<i>Error_End</i>	<i>Error_End</i>	<i>Error_End</i>	<i>Error_End</i>	<i>Error_End</i>	<i>Error_End</i>	<i>Error_End</i>	<i>Error_End</i>
<i>NumInsiderTrade</i>	-0.094 (-0.222)	-	-	-	-	-	-	-0.195 (-0.405)
<i>lnMktVal</i>	-	-0.562 (-0.999)	-	-	-	-	-	-2.076 (-1.647)
<i>Volatility</i>	-	-	54.33 (0.440)	-	-	-	-	-100.79 (-0.742)
<i>InstOwnPct</i>	-	-	-	-2.728 (-0.494)	-	-	-	-5.451 (-0.594)
<i>lnAnalysts</i>	-	-	-	-	-0.468 (-0.405)	-	-	2.266 (0.850)
<i>EffectiveSpread</i>	-	-	-	-	-	1.195 (0.229)	-	-6.207 (-1.089)
<i>EA AbsRetProp</i>	-	-	-	-	-	-	-24.14 (-0.620)	-15.590 (-0.363)
N	60	60	60	60	60	60	60	60
R ²	0.001	0.025	0.005	0.011	0.004	0.003	0.009	0.080

Panel B. Estimation error of the starting point of allowed trading windows

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	<i>Error_Start</i>	<i>Error_Start</i>	<i>Error_Start</i>	<i>Error_Start</i>	<i>Error_Start</i>	<i>Error_Start</i>	<i>Error_Start</i>	<i>Error_Start</i>
<i>NumInsiderTrade</i>	-0.047 (-0.622)	-	-	-	-	-	-	-0.062 (-0.637)
<i>lnMktVal</i>	-	-0.135 (-1.413)	-	-	-	-	-	-0.253 (-1.071)
<i>Volatility</i>	-	-	4.613 (0.150)	-	-	-	-	-23.657 (-0.744)
<i>InstOwnPct</i>	-	-	-	-0.799 (-0.682)	-	-	-	-0.796 (-0.381)
<i>lnAnalysts</i>	-	-	-	-	-0.261 (-1.264)	-	-	0.156 (0.326)
<i>EffectiveSpread</i>	-	-	-	-	-	0.757 (1.146)	-	-0.342 (-0.190)
<i>EA AbsRetProp</i>	-	-	-	-	-	-	-5.395 (-0.670)	-0.696 (-0.080)
N	60	60	60	60	60	60	60	60
R²	0.009	0.039	0.001	0.022	0.032	0.025	0.012	0.074

Table 4: Determinants of the End of Allowed Trading Windows

This table reports the results from estimating a determinants model of the end point of allowed trading windows. The dependent variable, *WindowEnd15* is the estimated end of allowed trading window using the distribution of insider trades aggregated over eight quarters, in number of days to the upcoming fiscal quarter-end. For *WindowEnd15*, we assume that the earliest 85% of insider trades occur within allowed trading window. Variables are specified in Appendix A. All continuous variables are winsorized at 1% and 99% levels. Industry-year fixed effects are included. Standard errors are clustered on firm and year. ***, **, * indicate significance levels for two-tailed tests at the 1%, 5%, and 10% levels, respectively.

	<i>Pred. sign</i>	(1) <i>WindowEnd15</i>	(2) <i>WindowEnd15</i>
<i>EffectiveSpread</i>	(+)	0.9639** (2.1902)	0.7938 (0.7119)
<i>EA AbsRetProp</i>	(+)	27.052*** (4.6529)	19.724*** (3.0621)
<i>lnMktVal</i>	(+,-)	1.2766*** (5.0069)	1.7927*** (5.0904)
<i>lnAnalysts</i>	(+,-)	1.1699*** (3.1695)	1.3153*** (2.5789)
<i>InstOwnPct</i>	(+,-)	1.2819 (1.2646)	-1.7933 (-1.1379)
<i>IndDirectorPct</i>	(+,-)	2.7712 (1.5724)	4.3911* (1.7064)
<i>CEODuality</i>	(-,+)	-0.7224* (-1.8888)	-0.0859 (-0.165)
<i>lnStockCompensation</i>	(-)	0.1294 (0.4876)	0.0091 (0.0307)
<i>NumInsiderTrade</i>	(-)	-0.2106*** (-3.4359)	-0.0925 (-1.4461)
<i>Volatility</i>	(-)	-89.42*** (-2.8202)	-137.09*** (-3.6524)
<i>lnExecEquity</i>	(-)	- -	-0.9446*** (-3.6322)
<i>Return</i>		-0.5935 (-0.4438)	0.5808 (0.3133)
<i>ROA</i>		0.1701*** (3.381)	0.1372* (1.6747)
<i>BtoM</i>		2.3201** (2.0993)	2.6095* (1.8222)
<i>Leverage</i>		-2.2375* (-1.7992)	-1.5819 (-0.8898)
Fixed Effects		Industry×Year	Industry×Year
Standard Errors		Clustered by firm and year	Clustered by firm and year
N		32,562	20,709
R²		0.1702	0.1779

Table 5: Determinants of the Start of Allowed Trading Windows

This table reports the results from estimating a determinants model of the starting point of allowed trading windows. The dependent variable, *WindowStart* is the estimated start of allowed trading window using the distribution of insider trades aggregated over eight quarters, in number of days from the previous earnings announcement. The starting point of a trading window is estimated as the minimum value of the number of days between the earnings announcement date and the insider trade transaction dates. Smaller values suggest that more insider trades occurred soon after earnings announcements, signaling more relaxed ITPs. Variables are specified in Appendix A. All continuous variables are winsorized at 1% and 99% levels. Industry-year fixed effects are included. Standard errors are clustered on firm and year. ***, **, * indicate significance levels for

	<i>Pred. sign</i>	(1) <i>WindowStart</i>	(2) <i>WindowStart</i>	(3) <i>WindowStart</i>	(4) <i>WindowStart</i>	(5) <i>WindowStart</i>
<i>EA TradingVolume</i>	(-)	-0.0905*** (-2.8100)	-	-	-	-
<i>EA EffectiveSpread</i>	(+)	-	0.2110*** (4.2086)	-	-	-
<i>EA dEffectiveSpread</i>	(+)	-	-	0.0406** (1.9874)	-	-
<i>EA AbsRetProp</i>	(-)	-	-	-	-1.5921*** (-3.0774)	-
<i>lnAnalysts</i>	(-)	-	-	-	-	-0.0565 (-1.0207)
<i>lnMktVal</i>		-0.1375*** (-2.9612)	-0.1977*** (-8.7550)	-0.2430*** (-10.472)	-0.2287*** (-10.550)	-0.2152*** (-6.8495)
<i>ROA</i>		-0.0396*** (-4.8430)	-0.0383*** (-4.6064)	-0.0387*** (-4.6200)	-0.0356*** (-4.3298)	-0.0376*** (-4.601)
<i>BtoM</i>		-0.2301 (-1.4373)	-0.2137 (-1.3298)	-0.209 (-1.2829)	-0.1691 (-1.0713)	-0.1936 (-1.233)
<i>Leverage</i>		-0.2577 (-1.4021)	-0.2734 (-1.4904)	-0.2572 (-1.3660)	-0.3115* (-1.8348)	-0.273 (-1.6081)
Fixed Effects		Industry×Year	Industry×Year	Industry×Year	Industry×Year	Industry×Year
Standard Errors		Clustered by firm and year	Clustered by firm and year	Clustered by firm and year	Clustered by firm and year	Clustered by firm and year
N		36847	36817	34981	39441	39141
R²		0.1185	0.1190	0.1155	0.1137	0.1139

Table 6: Variation in Insider Trading Demands

The tables report the results from estimating the determinants models of the end point and start point of allowed trading windows for firms with high insider trading demands. We take the firm-level average of the number of insider trades and create subsample of firms with above average insider trades. Panel A shows the results from estimating the determinants model of the end point of allowed trading window for the large insider trade subsample. Panel B shows the results from estimating the determinants model of the start point of allowed trading window for the large insider trade subsample. Variables are specified in Appendix A. All continuous variables are winsorized at 1% and 99% levels. Industry-year fixed effects are included. Standard errors are clustered on firm and year. ***, **, * indicate significance levels for two-tailed tests at the 1%, 5%, and 10% levels, respectively.

Panel A: Determinants of the end of allowed trading windows: High insider trade sample

	(1)
	<i>WindowEnd15</i>
<i>EffectiveSpread</i>	1.2439** (2.0042)
<i>EA AbsRetProp</i>	22.741*** (2.8459)
<i>lnMktVal</i>	1.5445*** (4.0151)
<i>lnAnalysts</i>	1.4813*** (2.6707)
<i>InstOwnPct</i>	2.3513 (1.5253)
<i>IndDirectorPct</i>	2.4965 (0.8718)
<i>CEODuality</i>	-0.6566 (-1.1461)
<i>lnStockCompensation</i>	-0.0399 (-0.1234)
<i>NumInsiderTrade</i>	-0.1555** (-2.0201)
<i>Volatility</i>	-118.56*** (-2.6733)
<i>Return</i>	0.6147 (0.3181)
<i>ROA</i>	0.2272*** (2.6439)
<i>BtoM</i>	2.6606* (1.8116)
<i>Leverage</i>	-5.142*** (-2.6401)
Fixed Effects	Industry×Year
Standard Errors	Clustered by firm and year
N	18,533
R²	0.2192

Panel B: Determinants of the start of allowed trading windows: High insider trade sample

	(1)	(2)	(3)	(4)	(5)
	<i>WindowStart</i>	<i>WindowStart</i>	<i>WindowStart</i>	<i>WindowStart</i>	<i>WindowStart</i>
<i>EA TradingVolume</i>	-0.0896** (-2.0134)	-	-	-	-
<i>EA EffectiveSpread</i>	-	0.094 (1.1743)	-	-	-
<i>EA dEffectiveSpread</i>	-	-	0.042** (2.1602)	-	-
<i>EA AbsRetProp</i>	-	-	-	-1.0135* (-1.8978)	-
<i>lnAnalysts</i>	-	-	-	-	-0.0763 (-1.0306)
Controls	<i>lnMktVal, ROA, BtoM, Leverage</i>	<i>lnMktVal, ROA, BtoM, Leverage</i>	<i>lnMktVal, ROA, BtoM, Leverage</i>	<i>lnMktVal, ROA, BtoM, Leverage</i>	<i>lnMktVal, ROA, BtoM, Leverage</i>
Fixed Effects	Industry×Year	Industry×Year	Industry×Year	Industry×Year	Industry×Year
Standard Errors	Clustered by firm and year	Clustered by firm and year	Clustered by firm and year	Clustered by firm and year	Clustered by firm and year
N	20392	20378	19352	21382	21267
R²	0.1407	0.1397	0.1400	0.1359	0.1347

Table 7: Abnormal Allowed Trading Windows and Insider Trading Profits

The table shows the association between abnormal allowed trading windows and insider trading profits. Insider trading profits, *TradingProfits*, is the value-weighted average six-month buy-and-hold returns of insider trades during the eight-quarter period over which we estimate insider trading windows, where returns are Fama-French three-factor excess log returns. For columns (1) and (2), we average the returns of late trades (i.e., those closer to fiscal quarter-ends). For column (1), we split each period between subsequent earnings announcements into three equal-length sub-intervals and consider trades that occur in the latter two of these intervals. For column (2), we average the returns of the latest 15% of trades in each eight-quarter measurement period. In column (3), we average the trading returns of insider trades that occurred within 10 days after the earnings announcement (early trades). *AbnEarlyWindowEnd* is the difference between the estimated *WindowEnd15* and the predicted *WindowEnd15* (the residual from the model (1) in Table 4). *AbnLateWindowStart* is the difference between actual *WindowStart* and predicted *WindowStart* using all five determinants in Table 5. Negative values of *AbnEarlyWindowEnd* and *AbnLateWindowStart* indicate abnormally loose insider trading policies. Variables are specified in Appendix A. All continuous variables are winsorized at 1% and 99% levels. Industry-year fixed effects are included. Standard errors are clustered on firm and year. ***, **, * indicate significance levels for two-tailed tests at the 1%, 5%, and 10% levels, respectively.

	<i>Pred.</i>	(1)	(2)	(3)
	<i>sign</i>	<i>TradingProfits_LateTrades</i>	<i>TradingProfits_LateTrades</i>	<i>TradingProfits_EarlyTrades</i>
<i>AbnEarlyWindowEnd</i>	(-)	-0.0562** (-2.4855)	-0.0589*** (-3.0135)	- -
<i>AbnLateWindowStart</i>	(-)	- -	- -	0.1341 (1.3689)
<i>lnMktVal</i>		-0.300** (-2.2229)	-0.2775* (-1.7578)	-0.1213 (-0.8154)
<i>ROA</i>		-0.2598** (-2.5589)	-0.2212** (-2.0077)	-0.0610 (-0.5441)
<i>BtoM</i>		-3.3935** (-2.1795)	-0.0914 (-0.0514)	1.0567 (0.9753)
<i>Leverage</i>		2.1895 (1.171)	-0.3098 (-0.2115)	0.3238 (0.2343)
Fixed Effects		Industry×Year	Industry×Year	Industry×Year
Standard Errors		Clustered by firm and year	Clustered by firm and year	Clustered by firm and year
N		28,067	27,329	32,003
R²		0.0808	0.0671	0.0497

Table 8: Ad Hoc Blackout Periods and Future 8-K Disclosures

This table reports results from regressing the natural logarithm of the number of 8-K filings over the next 90 days on the indicator for ad hoc blackout periods. Ad hoc blackout periods are identified by estimating the model: $\log(\text{NumTrade}_{i,t}) = \alpha + \sum_{i=1}^I \beta_i 1_i + \sum_{t=1}^T \gamma_t 1_t + \delta \text{adjRET}_{i,t-1} + \varepsilon_{i,t}$. Firm-quarters in the lowest quintile of the model residual $\varepsilon_{i,t}$ are classified as ad hoc blackout periods. These firm-quarters are those with abnormally small numbers of insider trades after controlling for firm fixed effect, time fixed effect, and prior quarter stock performance. The dependent variable, $\ln\text{Num8K}$, is the natural logarithm of the number of 8-K filings during 90 days following the end of the quarter. 8-K Section descriptions are as follows: Section 1: Registrant's business and operations; Section 2: Financial information; Section 5: Corporate governance and management. Variables are specified in Appendix A. All continuous variables are winsorized at 1% and 99% levels. Firm and year fixed effects are included. Standard errors are clustered on firm and year. ***, **, * indicate significance levels for two-tailed tests at the 1%, 5%, and 10% levels, respectively.

<i>8-K sections:</i>	(1) <i>Overall</i> <i>lnNum8K</i>	(2) <i>Section 1</i> <i>lnNum8K</i>	(3) <i>Section 2</i> <i>lnNum8K</i>	(4) <i>Section 5</i> <i>lnNum8K</i>
<i>AdhocBlackout</i>	0.0359*** (4.5206)	0.0166*** (4.9495)	0.0239*** (3.3697)	0.0260*** (2.9669)
Fixed Effects	Firm, Year	Firm, Year	Firm, Year	Firm, Year
Standard Errors	Clustered by firm and year	Clustered by firm and year	Clustered by firm and year	Clustered by firm and year
N	115502	115502	115502	115502
R²	0.3390	0.1874	0.2200	0.1260

Table 9: Bid-Ask Spreads and Trading Volume during and after Ad Hoc Blackout Periods

This table reports the bid-ask spreads and trading volume during ad hoc blackout periods and the changes following ad hoc blackout periods. The dependent variables are the effective percentage spread during the quarter, the change in effective percentage spread from the focal quarter to the next, the natural logarithm of average daily dollar trading volume during the quarter, and the change in the trading volume from the focal quarter to the next. Ad hoc blackout periods are identified by estimating the model:

$\log(\text{NumTrade}_{i,t}) = \alpha + \sum_{i=1}^I \beta_i 1_i + \sum_{t=1}^T \gamma_t 1_t + \delta \text{adjRET}_{i,t-1} + \varepsilon_{i,t}$. Firm-quarters in the lowest quintile of the model residual $\varepsilon_{i,t}$ are classified as ad hoc blackout periods. Variables are specified in Appendix A. All continuous variables are winsorized at 1% and 99% levels. Firm and year fixed effects are included. Standard errors are clustered on firm and year. ***, **, * indicate significance levels for two-tailed tests at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
	<i>EffectiveSpread_t</i>	Δ <i>EffectiveSpread_{t+1}</i>	<i>TradingVolume_t</i>	Δ <i>TradingVolume_{t+1}</i>
AdhocBlackout	0.0213** (2.3462)	-0.0767** (-2.0723)	-0.0726*** (-5.2188)	0.0244*** (4.3357)
Fixed Effects	Firm, Year	Firm, Year	Firm, Year	Firm, Year
Standard Errors	Clustered by firm and year	Clustered by firm and year	Clustered by firm and year	Clustered by firm and year
N	105696	101921	105696	101921
R²	0.7888	0.0353	0.9259	0.0378

Table 10: Cumulative Returns during and after Ad Hoc Blackout Periods

This table reports the cumulative abnormal returns during and after ad hoc blackout periods relative to non-blackout quarters. The dependent variables are Fama-French three-factor excess returns (in percentage points) cumulated over the quarter, over 90 days following the end of the quarter, and over 365 days following the end of the quarter. Ad hoc blackout periods are identified by estimating the model: $\log(\text{NumTrade}_{i,t}) = \alpha + \sum_{i=1}^I \beta_i 1_i + \sum_{t=1}^T \gamma_t 1_t + \delta \text{adjRET}_{i,t-1} + \varepsilon_{i,t}$. Firm-quarters in the lowest quintile of the model residual $\varepsilon_{i,t}$ are classified as ad hoc blackout periods. Variables are specified in Appendix A. All continuous variables are winsorized at 1% and 99% levels. Firm and year fixed effects are included. Standard errors are clustered on firm and year. ***, **, * indicate significance levels for two-tailed tests at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)
	<i>adjRET</i>	<i>adjRET_1Q</i>	<i>adjRET_1Yr</i>
<i>AdhocBlackout</i>	-0.3443** (-2.1577)	0.2579* (1.8456)	0.9800** (2.3521)
Fixed Effects	Firm, Year	Firm, Year	Firm, Year
Standard Errors	Clustered by firm and year	Clustered by firm and year	Clustered by firm and year
N	115823	116376	115462
R²	0.0887	0.0962	0.2555

Table 11: Returns following Ad Hoc Blackout Periods: Cross-sectional Analyses

This table shows how the cumulative abnormal returns following ad hoc blackout periods differ with firm characteristics. The dependent variables are Fama-French three-factor excess returns (in percentage points) cumulated over 365 days following the end of the quarter. Ad hoc blackout periods are identified by estimating the model: $\log(\text{NumTrade}_{i,t}) = \alpha + \sum_{i=1}^I \beta_i 1_i + \sum_{t=1}^T \gamma_t 1_t + \delta \text{adjRET}_{i,t-1} + \varepsilon_{i,t}$. Firm-quarters in the lowest quintile of the model residual $\varepsilon_{i,t}$ are classified as ad hoc blackout periods. Variables are specified in Appendix A. All continuous variables are winsorized at 1% and 99% levels. Industry-year fixed effects are included. Standard errors are clustered on firm and year. ***, **, * indicate significance levels for two-tailed tests at the 1%, 5%, and 10% levels, respectively.

	(1) <i>adjRET_1Yr</i>	(2) <i>adjRET_1Yr</i>	(3) <i>adjRET_1Yr</i>
<i>AdhocBlackout</i> × <i>BtoM</i>	-5.6540*** (-3.0392)	- -	- -
<i>AdhocBlackout</i> × <i>Size</i>	- -	-0.7767*** (-3.1016)	- -
<i>AdhocBlackout</i> × <i>Cash</i>	- -	- -	8.6992** (2.4964)
<i>AdhocBlackout</i>	7.0703*** (4.0112)	8.6734*** (3.7075)	1.6337** (2.4650)
<i>BtoM</i>	2.2545 (0.7991)	- -	- -
<i>Size</i>	- -	1.5498*** (4.8814)	- -
<i>Cash</i>	- -	- -	-15.219*** (-6.2265)
Fixed Effects	Industry-Year	Industry-Year	Industry-Year
Standard Errors	Clustered by firm and year	Clustered by firm and year	Clustered by firm and year
N	115211	115467	115457
R²	0.1153	0.1189	0.1189