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Insider Filing Violations and Illegal Information Delay

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Abstract

We document that a significant number of insiders violate the Securities and Exchange Commission (SEC) reporting requirements by filing open market transactions after the legally required deadline. Prior to the Sarbanes–Oxley Act (SOX), 29% of transactions fell outside the required reporting window. Following SOX, 8% are delinquent. Violations cluster in periods of high information asymmetry, incentivizing insiders to keep trades private and earn abnormal returns. Collectively, these findings suggest that a subgroup of insiders personally benefit from violating SEC disclosure requirements. Evidence also suggests that blockholders provide governance for violations. Guilty insiders experience a reduction in board seats and an increased likelihood of turnover.

I. Introduction

Information asymmetry provides managers an opportunity to trade on private knowledge. Once the transaction occurs, insiders can postpone reporting to delay the signal of the trade from reaching market participants (Cheng, Nagar, and Rajan (2007), Brochet (2010), and Betzer, Gider, Metzger, and Theissen (2015)). To inhibit trading on private information and increase market efficiency, the Securities and Exchange Commission (SEC) limits the amount of time an insider can postpone the disclosure of their trade (Securities and Exchange Commission (2002)).[1]

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[1]Prior to the Sarbanes–Oxley Act (SOX), trades were required to be disclosed by the 10th day of the month following the transaction date. During this time, 29% of insiders delayed reporting until the filing deadline, which could be up to 40 days after the trade. In response, SOX reduced the reporting deadline to two business days, which accelerated the information signal to market participants.

In this study, we examine insider trades that violate disclosure deadlines. We find that almost 18% of insider transactions from 1988 to 2020 are filed outside the legal reporting window and are on average 37 business days late. In the post-SOX era alone, almost 8% of filings occur after the mandated deadline. Thus, despite the strict reporting standards imposed by SOX, a significant proportion of trades are filed delinquent. The magnitude and persistence of filing violations raise three important questions: i) Are filing delays purposeful? ii) If so, what is the motivation for the delay? and iii) What are the consequences of such violations?

The notion that insiders hide their trades or trade stealthily is not new. Kyle (1985) provides a theoretical model illustrating that individuals with private information should conceal their advantage to maximize profits. Consistent with this theory, empirical evidence suggests that insiders trade strategically to utilize their informational advantage and delay reporting for as long as legally possible. Seyhun (1986), for example, uses legal insider trading disclosure delays to show that insiders can determine the value of the information they possess and capitalize on it before the trades become public knowledge. Similarly, Cheng, Nagar, and Rajan (2007) provide evidence that insiders utilize Form 5 deferred reporting to delay the information signal of insider sales for as long as legally possible. Additional studies (e.g., Barclay and Warner (1993), Anand and Chakravarty (2007), and Klein, Maug, and Schneider (2017)) focus on the insiders' choice to split large transactions into a series of smaller trades to limit the impact of the information their trades reveal. Betzer et al. (2015) expand on this by showing that insiders split trades and delay reporting until the entire series of transactions is complete, a strategy known as stealth trading. These empirical studies provide evidence that insiders delay reporting to profit from private information.

Our evidence suggests that many insiders take this one step further by reporting outside the legal window. We document that 40% of insiders hide their open market transactions at least once by delaying a trade disclosure longer than legally permitted. Some insiders are particularly prone to violating the reporting requirement. Conditional on the insider previously reporting a transaction late, an insider's current trade is 64% more likely to be filed delinquent. Our evidence also suggests that insiders who repeatedly disregard the deadline do so for longer time periods. Frequent violators report purchases (sales) an additional 76 (45) days later than infrequent violators, providing a longer window to capitalize on private information. We also show that delinquent filings tend to cluster by the firm. Given that one insider files late, the likelihood of a different insider at the same firm filing late increases by 57% relative to a firm with no violators.

Delinquent filings clustering by insider and firm are not direct evidence of purposefully delaying reporting. Many insiders and firms likely have no nefarious intent, but simply lack the attention to detail or organizational discipline to file in a timely manner.[2] However, additional tests reveal that insiders who violate earn significant abnormal returns. During the delinquent period, violating insiders earn a daily average Daniel, Grinblatt, Titman, and Wermers (DGTW) (1997)-adjusted

[2]Consistent with this argument, we find that 50.7% of violations are late by less than four business days. Given the short period of delinquency, we anticipate that these transactions are less likely to be associated with the use of private information. Our empirical evidence supports this conjecture.

abnormal return of 0.03%, or a total of 1.80% when scaled by the average number of days delayed. This return is 0.08% higher (4.8% scaled by the average number of days delayed) than that of non-violators over a comparable period. In addition, delinquent trades from insiders who repeatedly file late significantly outperform trades made by other violators. For purchases, the daily average DGTW-adjusted abnormal return is 0.04% for insiders who violate the filing deadline at least 95% of the time, a return 0.04% higher than all other violators or 4.64% when scaled by the average number of days delayed. In addition, 69% of violations are followed by another violation transaction from the same insider in the same direction as the delinquent transaction.

Next, we explore four scenarios where insiders are incentivized to delay reporting. The first is stealth trading, defined as a series of trades made by the same individual in the same direction, with all trades jointly reported. Reporting after multiple trades limits the price impact of each transaction in the series and camouflages the insider conducting the trades. The second incentivizing event is a round trip, which begins with the insider taking an equity position in the firm and ends with a reversal of the position prior to reporting. The sequence includes a purchase followed by a sell, with both trades reported after the reversal or "round trip" is complete.[3] During the 100-day window between the unreported purchase and reversal, there is an average of 10.7% cumulative abnormal return for trades in the pre-SOX period and 18.4% in the post-SOX period.[4]

For our third and fourth incentivizing events, we examine insider trades preceding earnings announcements and those made during fraudulent restatement periods. Most firms voluntarily restrict insider trading to a short window following the earnings announcement to limit the ability of insiders to trade opportunistically (Jeng (1999), Bettis et al. (2002), and Roulstone (2003)). However, we document 51,316 filing violations where shares were purchased or sold within 60 days before an earnings announcement, but not filed until after the announcement.

Insiders of a firm engaged in fraud can likewise utilize private information to benefit from the event. Ex ante, they can purchase prior to the artificial inflation of stock value, or they can delay the disclosure of a sell until after the public restatement announcement. Both actions avoid alerting market participants to overvaluation and fraudulent activity. Around both earnings announcements and fraudulent restatements, we observe consistent evidence that insiders intentionally time the reporting of their trades to benefit from their information advantage.

Collectively, the evidence we provide suggests that a significant number of insiders camouflage their trades by illegally delaying disclosure. Although several alternatives are offered, the results show that these trades earn significant abnormal returns in excess of trades from insiders adhering to the legal reporting requirements. These delinquent filings are concentrated around events that both the insider

[3]We note that 29.4% of the round-trip transactions are made by insiders who complete both transactions within a 6-month window. Bhide (1993) specifies that the short-swing rule requires these insiders to return any profits realized by purchasing and selling stocks within a 6-month period, or vice versa, to the firm. If an insider fails to do so, criminal sanctions apply.

[4]There is an average 125-day lag between the insider taking an equity position and the reversal.

and the firm are incentivized to keep private, suggesting that delinquent filings are not random occurrences but rather an intentional attempt to inhibit information signals.

Given this evidence, we explore governance mechanisms that mitigate and discipline the behavior. Results suggest that blockholders provide strong firm governance, as their presence significantly decreases the likelihood of a late filing. Marginal effects indicate that for a 1-standard-deviation increase in blockholder ownership, the likelihood of a delinquent filing decreases by 0.57%. Blockholders also impose firm governance through exit, significantly decreasing their presence 6 and 12 months following delinquent reporting.

Late filings impose other consequences on the firm and market participants. In the 6 and 12 months following reporting, firm performance suffers −2.34% and − 4.46%, respectively, and Tobin's Q decreases significantly. Volatility and the bid–ask spread also significantly increase, indicating a loss of liquidity following a delinquent filing. In addition to the market disciplining the firm, delinquent insiders personally experience an increased likelihood of a reduction in board positions held and a higher probability of turnover.

Gaining a better understanding of how insiders behave is meaningful and important to both market participants and regulators. The evidence we provide contributes to this understanding by documenting a continuing breach of insiders violating SEC reporting requirements. In doing so, insiders camouflage their trades and prolong their informational advantage by perpetuating opaque market environments. This lack of transparency not only inhibits price discovery, but has long-term consequences to the firm, insider, and other market participants.

II. Background and Literature Review

Evidence in the literature suggests that insiders earn abnormal returns by exploiting access to firm information (Jaffe (1974), Damodaran and Liu (1993), Niehaus and Roth (1999), Fidrmuc, Goergen, and Renneboog (2006), Cohen, Malloy, and Pomorski (2012), Cline, Gokkaya, and Liu (2017), and Bourveau, Coulomb, and Sangnier (2021)). Many studies analyze insider trades around specific corporate events to identify transactions and disclosures motivated by foreknowledge of the event. These studies document that insiders exploit their informational advantage regarding earnings (Ke, Huddart, and Petroni (2003)), mergers (Seyhun (1990)), seasoned equity offerings (Lee (1997)), stock buybacks (Lee, Mikkelson, and Partch (1992)), stock option exercise (Brooks, Chance, and Cline (2012)), and dividend initiation (John and Lang, 1991).

Market participants on average, however, do not possess private information, but utilize signals from insider trades to infer future corporate disclosures and the general health of the firm. Consistent with this logic, Manne (1966), Carlton and Fischel (1982), Fishman and Hagerty (1992), and Leland (1992) suggest that insider trading benefits society by incorporating private information into security prices, thus increasing market efficiency. Supporting empirical evidence from Seyhun (1986), Meulbroek (1992), and Piotroski and Roulstone (2005) indicates that information from insider trading leads to a more accurate stock price.

Piotroski and Roulstone (2004) go on to show that insider trading facilitates the incorporation of firm information into security prices, measured by the decrease in stock price synchronicity.

An overarching implication from this literature is that valuable firm information is contained in insider transactions and that the market uses this signal for price discovery. Predicated on this fact, along with the litany of cases involving malfeasance and fraud perpetrated in the late 1990s by publicly traded firms, SOX sought to increase the timeliness of the information signal from insider trades by tightening the allowed disclosure window. Prior to its enactment in 2002, insiders were required to report transactions by the 10th day of the subsequent month in which the trade occurred. SOX reduced the reporting deadline to 2 business days following the transaction.[5] The argument made for amplified disclosure burdens was that the increase in transparency and accountability would help restore market confidence for investors losing trust in the information supplied by corporate managers.[6]

Several empirical studies illustrate that a shorter disclosure window allows information contained in trades to be promptly incorporated into the stock price. Using Form 5 filings, Cheng, Nagar, and Rajan (2007) compare market reactions on the trade date to market reactions on the report date. They find an insignificant market reaction for purchases and sales on the trade date, but a significant decline in stock price on the reporting date of sales. Thus, by delaying reporting, insiders extract benefits from information rents. Specifically, insiders avoid personal losses by selling shares ahead of the release of negative information.

Similarly, Brochet (2010) and Betzer et al. (2015) contrast reactions around the trade date and reporting date of open market trades and document a significant market reaction on the reporting date. Brochet (2010) finds significantly higher trading volume and abnormal returns over the 3 days after insider buys are reported. Betzer et al. (2015) focuses on stock price reactions following the reporting of a series of trades and finds a significant price reaction when the trades are reported, regardless of the length of delay. These studies provide evidence that there are valuable information signals contained in the trades of insiders, and that even legal reporting delays distort stock prices between the transaction and reporting dates.

The empirical evidence offered in these studies suggests that trades not reported in a timely manner delay important information from entering the market. Thus, consistent with arguments made for the reduction of the disclosure window, reducing the time insiders have to file can promote market efficiency. A corollary implication, and one that is central to our study, is that when insiders inhibit these

[5]The change in individual reporting is contained in Section 403 of SOX, which amends 16(a) of the "Securities Exchange Act" of 1934, detailing the disclosure requirements for directors, officers, and beneficial owners.

[6]This sentiment is noted in a speech given by the SEC commissioner in the month following the passing of SOX. "I do believe that we can control conflicts of interest that provide temptation to do the wrong thing, and institute the incentives and penalties that encourage people to live up to their public duties… My hope is that the extensive governance reforms we are in the process of implementing will provide an opportunity for companies to engage in real self-examination and learning regarding what it takes to be a good corporate citizen… While there is still a long way to go, I think we are heading in the right direction in terms of restoring public confidence and putting recent events behind us" (Glassman (2002)).

signals by not reporting the transaction by the legal deadline, they prevent efficient price discovery.[7]

The fact that the market reacts on the report date also suggests that insiders are capitalizing on nonpublic information for the duration of the reporting delays. During the time between the transaction and report dates, an insider can surreptitiously trade and avoid a market response. Kyle (1985) provides a theoretical framework that designates insiders with private information as intertemporal monopolistic traders. Under this construct, insiders trade in a way that maximizes profits now, and in the future. Being aware that their trades will impact future prices provides incentives to camouflage transactions. Carter, Mansi, and Reeb (2003) examine this empirically by measuring abnormal returns of insider buys, with varying time lags between the transaction and report dates. The central finding is that insiders who delay reporting the longest realize the largest abnormal returns. This implies that when insiders trade with private information and delay reporting, they benefit while also limiting private information from reaching the market.

Releasing firm information is not a trivial matter. Market participants incorporate releases into the information set used to determine future transactions in the firm's securities. The choices regarding the timing and content of what is reported are instrumental for the market pricing the firm. This point is well illustrated by Aboody and Kasznik (2000), showing that firms rush forward the release of bad news and hold back the release of positive news prior to stock option award dates. Consequently, managers time the release of information to strategically impact firm value. DellaVigna and Pollet (2009) demonstrate that managers time the release of information to occur on days with 8% lower trading volume, which results in an estimated 70% greater delay in stock price reaction. Similarly, Bagnoli, Clement, and Watts (2005) show that firms strategically release 73% of earnings announcements outside of trading hours to manage the change in security value.

Comparable to firm-level announcements, insiders can time the release of their trade to control information flow and maximize personal utility. By delaying transaction reporting, insiders create a window to extract information rent. While many studies focus on delinquent corporate filings, there exists little research examining delinquent personal filings, and even less examining the incentives to delay. Cheng, Nagar, and Rajan (2007) examine Form 5 reporting and do not consider open market transactions. Brochet (2010) focuses on the information in trades around the reporting date and does not consider delinquent filings. Carter, Mansi, and Reeb (2003) focus on the pre-SOX period and note that delinquent filings exist but only use this subset to test longer information delays. Betzer et al. (2015) also focus on the pre-SOX period and use filing delays to construct an independent variable as a determinant of stealth trading. Neither of these studies attempt to examine the incentives for delinquent insider filings.

We extend these studies by documenting that insiders prolong their informational advantage by perpetuating opaque market environments through illegal reporting delays. We posit that the motivation to delay reporting is driven by incentives to conceal private information. By purchasing or selling securities in

[7]Meulbroek (1992) proves this argument empirically by using illegal insider trades to demonstrate that once the market is made aware of the trades, the information is incorporated into the stock price.

stealth, the insider profits from a pricing discrepancy without drawing attention to themselves or the firm. Because outside investors are able to react only after these trades are reported, the prices of securities are distorted, providing an opportunity for insiders to capitalize on private knowledge while investors make trades with incomplete information.

III. Data and Descriptive Statistics

Data on Form 4 open market transactions are collected from the Thomson Reuters Insider Filing Database from Jan. 1988 to Dec. 2020.[8] Amended transactions are removed, and only trades with cleanse codes R, H, C, L, and I are kept, corresponding to the highest levels of data validity (Otto (2014), Liu and Swanson (2016)).[9] Form 4 transaction data are then merged with daily stock return data from CRSP.[10] We exclude reported trades that exceed total shares outstanding and those with reporting dates preceding the transaction date. The remaining transactions are aggregated per day, per insider, for both purchases and sales (Carter, Mansi, and Reeb (2003), Brochet (2010), and Betzer et al. (2015)) and merged with quarterly firm financial and earnings announcement data from Compustat. All accounting variables are lagged and winsorized at the 1st and 99th percentile. The resulting sample includes 1,234,516 aggregated trades.

Figure 1 shows the percentage of trades filed delinquent by year. From 1988 to 2002, the violation percentages for purchases and sales follow a general decline. The large drop from 1990 to 1993 correlates with the Securities Remedies and Penny Stock Reform Act of 1990, in which Congress granted the SEC greater enforcement authority. This included the ability to seek monetary penalties, block firm officers and directors from serving on the board of a publicly listed firm for any amount of time, and make violators return any profits (Securities Remedies and Penny Stock Reform Act of 1990 (1990)). SOX also appears to impact the decision to violate, as the percentage drops to an average of 7.42% in the years following the enactment.[11]

Table 1 presents summary statistics for insider trades and firm characteristics. Panel A contains statistics on the propensity of insiders to violate the filing deadline. For the 1,234,516 reported insider trades, 17.40% are filed after the required deadline. For purchases (sales), 20.46% (15.47%) are delinquent. A higher

[8]Following Cohen, Malloy, and Pomorski (2012) and Cline, Gokkay, and Liu (2017), Table 2 derivative transactions, and stock transactions resulting from option exercises, are excluded from the sample.

[9]In separate analysis, we examine whether insiders report an erroneous filing on time to mask the late filing. In this test, the filing dates of amended transactions are compared to late trades made by the same insider. We find that 91.3% of amended transactions filed during the reporting lag of the insider's late filings are also filed delinquent.

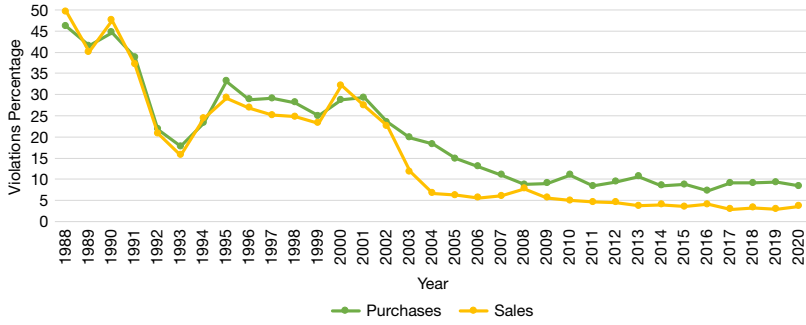
[10]Following Lakonishok and Lee (2001), we exclude trades where the reported trade price is more than 20% above or below the closing CRSP price. For robustness, we remove the 20% restriction and re-estimate all tests excluding only trades that are outside of the daily high and low. The results are qualitatively unchanged.

[11]The mean business days between the insider trade date and the report date for trades that violate is 50, with a standard deviation of 132. Thus, delinquent filings are understated in the last years of the sample.

FIGURE 1

Filing Violations Percentage by Year

Figure 1 shows the percentage of insider trades that are filed past the legal reporting deadline each year from 1988 to 2020. The violation percentage is calculated by aggregating all insider violations per year separately for purchases and sales and comparing the number of violations to the total insider purchases and sales for the corresponding year. The *x*-axis shows the years of the reported transactions, and the *y*-axis is the percentage of trades in violation.



percentage of delinquent purchases relative to sales is consistent with filing delays being incentivized by an insider's concealment of potentially informative trades. While sale transactions occur for a variety of reasons, including liquidity and diversification (Jaffe (1974), Seyhun (1986), Lin and Howe (1990), Lakonishok and Lee (2001), Jeng, Metrick, and Zeckhauser (2003), Jenter (2005), and Cohen, Malloy, and Pomorski (2012)), insider purchases are shown to be informative (Lakonishok and Lee (2001), Jeng, Metrick, and Zeckhauser (2003), and Piotroski and Roulstone (2005)).

Prior to SOX, 28.87% are in violation; post-SOX, 7.42% of trades violate the reporting requirement. The decline from pre-SOX to post-SOX suggests that the more stringent regulation incentivized many insiders to file on time. Regardless, in the post-SOX period, delinquent filings remain a significant proportion of the total trades.

Panel B of Table 1 presents characteristics for firms with insider filing violations and those without. There are 13,564 firms in the sample, 11,031 of which have an insider that violates the reporting requirement at least once. The mean B/M ratio for firms with violations (non-violations) is 0.67 (0.56), and market capitalization (in millions) is $1,822 ($3,973). Interestingly, firms with violating insiders tend to be smaller relative to non-violator firms. This could be the result of smaller firms not being as closely monitored, resulting in a lower expectation of detection. Alternately, smaller firms may simply lack the legal protocols or governance necessary to effectively deter filing violations.

Return on assets is negative on average at −0.01 (−0.02), and the mean leverage is 0.53 (0.51). The average number of board members is 9.60 (9.09), whether at least 50% of the directors are independent is 0.65 (0.39), and duality is 0.17 (0.07), for firms with violations (non-violations). This provides some evidence that violations are not driven by poor internal governance.[12] However, firms with filing violations

[12]Untabulated univariate tests comparing governance variables for firms above and below the mean market capitalization of $4.3 billion reveal that the number of board members, board independence, and duality each are significantly higher at the 1% level for larger firms. Thus, evidence is mixed since

TABLE 1

Summary Statistics

Panel A of Table 1 reports statistics for all observations. The first column contains total trades, the second column contains the number of respective trades that violate the filing requirement, and the third column contains the violations as a percentage of total trades. Panel B reports firm characteristics. Firms that have at least one violation and firms that have no violations are listed separately in columns 1 and 2, respectively. Panel C presents insider characteristics. Totals are in the first column, and the second column contains individuals that have at least one violation. Panel D reports transaction statistics and compares violation and non-violation trades. The *p*-value from a difference-in-means test is reported for Panels B and D. All variable descriptions are provided in the Appendix and in the text.

Panel A. Totals

	Total	Violations	Violation %
All transactions	1,234,516	214,816	17.40%
Purchases	477,748	97,748	20.46%
Sales	756,768	117,068	15.47%
Pre-Sox	574,363	165,817	28.87%
Post-Sox	660,153	48,999	7.42%

Panel B. Firm Characteristics

	Violations	Non-Violations	*p*-Value
No. of firms	11,031	2,533	
BOOK_TO_MARKET	0.67	0.56	0.00
TOBINS_Q	1.59	2.06	0.00
Firm size (in millions)	1,821.52	3,972.81	0.00
ROA	(0.01)	(0.02)	0.00
LEVERAGE	0.53	0.51	0.00
Board size	9.60	9.09	0.00
Independent	0.65	0.39	0.00
Duality	0.17	0.07	0.00
NO_OF_BLOCKHOLDERS	1.61	2.49	0.00
BLOCKHOLDER_RATIO	0.17	0.24	0.00
HERFINDAHL–HIRSCHMAN_INDEX (HHI)	0.22	0.17	0.00
FIRM_RATIO	0.48	0.00	0.00
CASH_TO_ASSETS	0.16	0.27	0.00
R&D_TO_ASSETS	0.01	0.02	0.00
ln(AGE)	2.33	1.72	0.00
ln(DISTANCE)	4.14	3.64	0.00

Panel C. Insider Characteristics

	Total	Violations	Violation %
No. of insiders	148,945	60,289	40.48%
Average total trades by insider	8.31		
Average total violations by insider	1.46		
Transactions by role			
CEO	128,435	13,976	10.88%
CORPORATE_SUITE	214,155	22,775	10.63%
BENEFICIAL_OWNER	184,019	40,931	22.24%
OTHER_INSIDER	84,723	14,057	16.59%

Panel D. Transaction Characteristics

	Violations	Non-Violations	*p*-Value
Purchases: shares traded	42,744	45,956	0.72
Total value traded	$457,485	$466,933	0.94
Scaled value traded	0.19%	0.14%	0.00
Sales: shares traded	56,148	76,016	0.00
Total value traded	$1,364,581	$2,135,493	0.00
Scaled value traded	0.27%	0.18%	0.00

have an average of 1.61 blockholders, significantly fewer than the 2.49 for non-violation firms, and the ratio of blockholder shares as a percentage of total shares outstanding is significantly lower for violation firms. This provides some preliminary evidence of the benefits of external firm monitors as a deterrent to delinquent filings.

duality should be lower to support the alternative hypothesis. However, in untabulated multivariate specifications, none of the governance measures are significant. This comparison provides some evidence that violations are not driven by poor internal governance at smaller firms.

A firm characteristic unique to our study is the ratio of violations per firm. This ratio is updated daily throughout the sample period and calculated as the number of violations per firm scaled by the total number of insider trades per firm. The average ratio of violations by firm is 0.48 for firms that have at least one violator. CASH_TO_ASSETS and R&D_TO_ASSETS are significantly less for firms with violations. ln(AGE) and ln(DISTANCE) are higher for firms with violations.

Panel C of Table 1 presents insider characteristics for the full sample. There are 148,945 insiders, of which 60,289 (40.48%) violate the filing requirement at least once. The average number of trades per insider is 8.31, and the average number of total violations is 1.46. CEOs make 128,435 trades, with violations accounting for 10.88%. Members of the CORPORATE_SUITE (CEO, CFO, CI, CO, and CT) file 214,155 trades, with a delinquency rate of 10.63%, and 184,019 trades are made by Beneficial Owners, with 22.24% in violation. Other Insiders made 84,723 trades, with a delinquency rate of 16.59%. Interestingly, individuals that are not as closely monitored tend to violate more frequently.[13]

Panel D of Table 1 reports information regarding trade size and the dollar amount traded. The average number of shares purchased per transaction for filing violations is 42,744. The average number of shares sold for trades in violation is 56,148, which is significantly different from non-violation sales transactions but not purchases. The average value of transactions per purchase (sale) for trades in violation is $457,485 ($1,364,581), which is insignificantly different from non-violation purchases, but significantly lower than non-violation sales. Scaling the transaction value by market capitalization reveals that trade violations are significantly larger for both purchases and sales. The average delinquently filed purchase accounts for 0.19% of the total value of the firm compared with 0.14% for non-violations. Similarly, the average delinquent sale accounts for 0.27% of the total value of the firm, compared with 0.18% for non-violations. Both types of transactions are significantly different at the 1% level, indicating that delinquent filings are significantly larger than those filed by the deadline.

A. Classifying Insiders

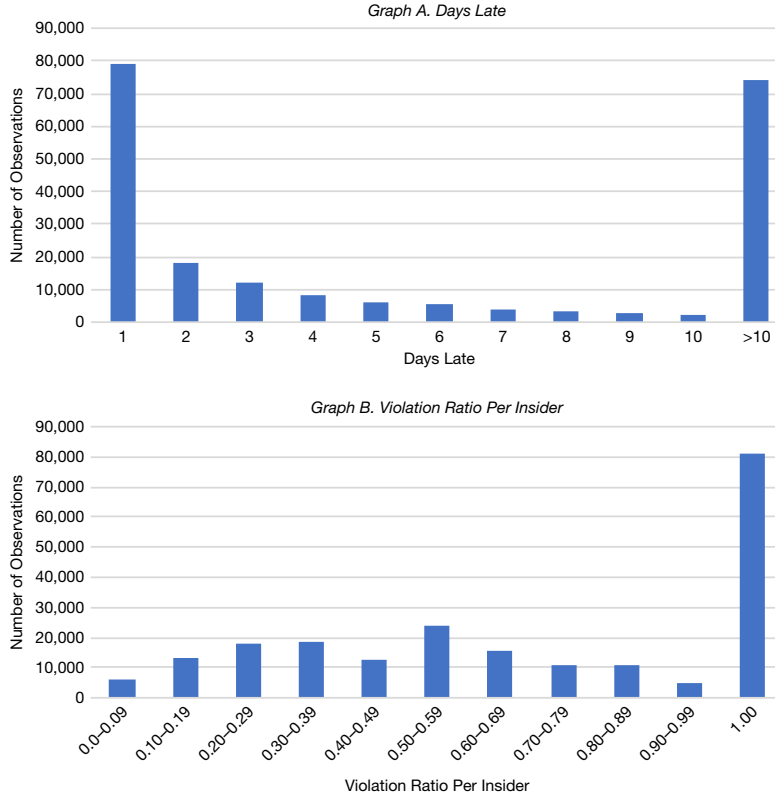
Presumably, some insiders are delinquent due to simple mistakes, whereas others intentionally violate. Figure 2 shows the number of violations according to two metrics: the length of the reporting delay and the historical frequency of offenses per insider. These categorizations provide a way to separate violations based on the likelihood of purposefully delaying reporting to take advantage of the distorted stock price.

[13]Separating the propensity to violate by insider role both pre- and post-SOX provides additional insight. Pre- (post-) SOX violation rates are: CEOs 24.80% (4.52%), members of the Corporate Suite 23.82% (4.50%), Beneficial Owners 35.10% (11.73%), and Other Insiders 29.64% (6.03%). SOX increased the burden of compliance for top managers and promotes stronger firm governance at every level (Akhigbe and Martin, 2006). Consistent with this evidence, we document a sharp decline in the proportion of violations for all roles, and particularly for top managers who are impacted the most by SOX.

FIGURE 2

Filing Violation Characteristics

Graph A of Figure 2 shows the number of delinquent fillings according to the number of business days the transaction is filed past the required deadline. The number of days late is shown on the *x*-axis, and the number of transactions is shown on the *y*-axis. Over one third of the violations are late by only 1 business day. All violations that are late by less than 4 business days are designated as oversight violations. Violations late by at least 4 business days fulfill the first of two requirements to be classified as intentional. Graph B shows the historical ratio of violations per insider. The ratio is recalculated daily per insider and measures an insider's historical propensity to violate by scaling the total violations per insider by the insider's total historic trades. The violation ratio is shown on the *x*-axis, and the number of transactions is shown on the *y*-axis. All violations made by an insider that violates at least 95% of the time and is delinquent for longer than 3 days are classified as intentional.



Graph A of Figure 2 shows the frequency of delinquent filings according to the number of days delinquent. There are 214,816 total violations in the sample, averaging 37 business days overdue. Many of these delinquent filings may simply be due to negligence by the insider or firm. Consistent with this sentiment, 78,805 (37%) violations are late by only 1 business day, and the frequency of late filings declines with each additional day. In total, 108,942 filings are overdue by 1–3 days, providing little time for the insider to capitalize on withholding the signal contained in the trade. The remaining 105,874 violations are at least 4 days late, with 18,626 trades reported more than 100 days overdue.

In Graph B of Figure 2, the frequency of violations per insider is presented. As shown, many individuals display a blatant disregard for the filing requirement. The average ratio of violations to overall transactions for all insiders is 21%. Reducing

TABLE 2

Classifying Filing Violations

In Table 2, insider trades are classified according to proxies for intentionality of the filing violation. Non-violations are trades filed by the legal deadline. Oversight violations are categorized as trades filed late by 3 days (the median) or less and by insiders who historically violate less than 95% of the time. Intentional violations are trades made by insiders who violate the reporting requirement at least 95% of the time and who report more than 3 days late. The reporting delay for each subgroup measures the number of business days between the transaction date and the reporting date. Intentional violations are compared to other classifications of opportunistic and routine classifications. Opportunistic Trades follow the methodology in Cohen, Malloy, and Pomorski (2012) and identify trades as opportunistic if the trade does not take place within the same month each year for at least 3 years. Prescheduled 10b5-1 trades are those that are publicly disclosed before the transaction date on a 10b5-1 form. Textual oversight proxy trades are coded from DirectEDGAR filings as oversight if oversight language is used in the firm reports; otherwise, they are categorized as intentional. The matching rate between these categorizations of intent and our classifications of trades are reported in percentage form.

	Total	Mean (Days)	Median (Days)
Non-violations	1,019,700		
Reporting delay for non-violations			
Purchases	380,000	6.94	2
Sales	639,700	6.42	2
Oversight violations: Late ≤ 3 and Frequency < 0.95	165,301		
Reporting delay for oversight violations			
Purchases	72,440	39.97	19
Sales	92,861	32.46	18
Intentional violations: Late > 3 and Frequency > =0.95	49,515		
Reporting delay for intentional violations			
Purchases	25,308	116.21	43
Sales	24,207	77.48	35
	Intentional	Non-Intentional	
Opportunistic trades (Cohen et al. (2012))	97.0%	3.0%	
Prescheduled 10b5-1 trades	0.7%	99.3%	
Textual oversight proxy trades	3.4%	96.6%	

the sample of insiders to those who violate at least once over the sample period increases the ratio to 67%. This significant increase suggests that disregard for the filing deadline clusters by insider. Once the decision to violate has been made by an insider in the past, another violation is likely to occur.

Table 2 reports statistics for categorizations by transaction subgroup. To identify the number of violations per individual, we track each insider throughout the sample period, even when an insider switches firm. Transactions that do not violate the filing requirement total 1,019,700, and they have an average (median) reporting delay of 7 (2) business days. We classify violations as "Oversight Violations" if the insider violates infrequently (defined as less than 95% of the time) and the reporting delay is short (defined as 3 days or less). There are 165,301 oversight transactions within our sample. Oversight purchase (sale) violations have an average reporting delay of 40 (32) business days, and a median of 19 (18) business days. All violations made by an insider that violates at least 95% of the time and does so for longer periods of time (at least 4 days) are classified as intentional.[14] This accounts for 49,515 (23.05%) of the violations in the sample. Intentional violators have a lengthier reporting delay, averaging 116 business days for

[14]This exceeds the median number of days late for the full sample, which is 3 days. We set the benchmark at 90% and 99% and find similar results. For additional robustness, we also relax both benchmarks. On average, a 1-day increase in the benchmark results in 0.91% fewer violations labeled intentional, and a 1% increase in the percentage an insider violated results in 0.42% fewer violations being categorized as intentional.

purchases and 77 business days for sales. The median delay is also substantially longer at 43 days for purchases and 35 days for sales.

We compare our classification of intentionality to other popular measures in the literature. Following Cohen, Malloy, and Pomorski (2012), we classify each trade as routine or opportunistic and find that 97% of the trades we classify as intentional violations match the opportunistic trade classification. Next, we examine self-reported prescheduled trades on a 10b5-1 plan. Only 0.7% of the trades we classify as intentional violations are prescheduled trades.[15] Finally, we check whether firms mention filing violations in their public filings and compare to our methodology. To do this, we utilize the DirectEDGAR database to conduct textual analysis. The DirectEDGAR parameters search for instances where the words "Form 4" and "Late" appear together in a firm report. There are 29,568 documents that match these parameters. Within these documents, the word oversight, and the phrases "one late filing," "one day late," "two days late," "three days late," or relevant synonymous phrases serve as a textual proxy for oversight violations.

Of the original 29,568 firm documents identified, 20,578 insider violations from our sample match by firm and year. A total of 25,277 documents contain one of the textual proxies for oversight violations in the sentences surrounding the words "Form 4" and "Late."[16] Of these documents, the textual proxy for oversight violations parallels our definition of oversight violations for 96.6% of the trades. Only 3.4% of the textual proxies for oversight violations correspond to violations identified by our method as intentional. In addition, since only 9.5% of the total violations have a matching firm document in DirectEDGAR, we conclude that firms do not mention late filings in their documents often, and when they do, it is almost exclusively oversight violations. This implies that firms avoid drawing attention to the filing violations that we have identified as intentional.

B. Classifying Stealth Trading

We also identify sequenced trades from a single insider. Following Betzer et al. (2015) and Klein, Maug, and Schneider (2017), we define a sequence as stealth if the trades are in the same direction and the filing date occurs after all the transactions have been made. Trading multiple times before reporting limits unfavorable price impact for subsequent trades, allowing insiders to delay the pricing signal contained in their transaction from entering the market until all trades are executed. As reported in Panel A of Table 3, there are 190,578 unique series of stealth trades contained in our sample, which account for 561,941 of the total 1,234,516 trades. On average, a stealth series contain 3.06 (2.89) purchases (sales) per series. The range of days from the first transaction to the last spans an average of 17.78 (10.30) days for purchases (sales).

For transactions contained in a series of stealth trades, 133,061 (24%) violate the reporting requirement, and 31,998 (6%) are classified as intentional violations. Comparing this group of intentional trades to all intentional violations reveals that

[15]We remove prescheduled and routine trades as a robustness check, and our results are qualitatively unchanged.

[16]Eighty-eight percentage of the documents are DEF14A, which contains the information from the annual stockholder meeting. The remaining 12% are 10Ks and 10Qs.

TABLE 3

High Information Asymmetry Events

Table 3 presents statistics on insider transactions occurring around four high information asymmetry events. Panel A reports transactions in a stealth trading series, defined as a series of trades made by the same individual in the same direction, with all trades jointly reported. The number of series and the trades per series are given. Transaction range is the average number of business days between the first and last trades of the series. Individual transactions that make up the stealth trading series are grouped into non-violations, oversight violations, and intentional violations. Panel B reports the number of round-trip series, which begins with an insider purchase and ends with a reversal of the position prior to all the transactions being reported. The total transactions are given. Purchase to reversal is the average delay in business days between the initial purchase and final sell date, and reversal to reporting is the average delay in business days from the final sell date to the report date. Panel C reports trades made in the 2 months before an earnings announcement that remain unreported until after the announcement. These transactions are grouped into non-violations, oversight violations, and intentional violations, and the average reporting delay between the transaction and reporting date for each group is given. Panel D reports trades that delay reporting during fraudulent restatement periods and report after the restatement is publicly announced. Trades that are non-violations, oversight violations, and intentional violations are reported, along with the average reporting delay between the transaction and reporting date for each type of transaction.

	Total	Purchases	Sales
Panel A. Stealth Trading			
No. of series	190,578	67,035	123,543
Trades per series	2.95	3.06	2.89
Transaction range	12.93	17.78	10.30
Non-violations	428,880	148,212	280,668
Non-violations delay (days)	8.67	8.87	8.57
Oversight violations	101,063	41,040	60,023
Oversight violations delay (days)	40.59	49.66	34.39
Intentional violations	31,998	15,777	16,221
Intentional violations delay (days)	114.42	147.11	82.62
Panel B. Round-Trip Trading			
No. of series	2,249	–	–
Total transactions	6,971	2,249	4,722
Purchase to reversal (days)	2,249	124.96	–
Reversal to reporting (days)	2,249	–	188.81
Panel C. Earnings Announcement Trading			
Non-violations	43,631	20,788	22,843
Non-violations delay (days)	17.95	18.09	17.82
Oversight violations	32,076	16,385	15,691
Oversight violations delay (days)	77.23	83.56	70.63
Intentional violations	19,240	10,381	8,859
Intentional violations delay (days)	129.09	151.94	102.32
Panel D. Fraudulent Restatement Trading			
Non-violations	68	34	34
Non-violations delay (days)	13.90	12.94	14.85
Oversight violations	100	55	45
Oversight violations delay (days)	576.62	450.08	722.84
Intentional violations	39	13	26
Intentional violations delay (days)	665.00	1,210.17	413.39

65% of intentional violations are made within a stealth trading series. Partitioning individual trades from all stealth trades into non-violations, oversight violations, and intentional violations, we observe that the average reporting delay increases for purchases (sales) from 8.87 (8.57), 49.66 (34.39) to 147.11 (82.62) days, respectively. All three groups are stealth, but intentional violators delay reporting for much longer, providing an extended window to trade multiple times without an adverse price impact.

C. Round-Trip Trading

The next categorization of insider transactions is similar to stealth trading but motivated by a different incentive to conceal the transaction. While stealth trades must be in the same direction, round trips identify sequenced trades from a single

insider that begin with a purchase and end with one or more sells that reverse the initial purchase position. The commonality is that the reporting of all the trades occurs once the reversal is complete.[17,18] This allows the insider to trade undetected, potentially capitalizing on private information and capturing a rise in stock value. Panel B of Table 3 reports that there are 2,249 round trips, comprised of a total of 6,971 individual transactions (2,249 purchases and 4,722 sales). The average time between the initial purchase and the reversal is 125 days, and there is an average of 189 days from the reversal to the reporting date of the series. Interestingly, 58% of purchases and 57% of the sells in private round trips are initiated by intentional violators. Thus, insiders that violate frequently and for long periods of time are more likely to utilize the reporting delay to maximize the benefits of trading with private information.

The abnormal returns for all private round-trip transactions are shown in Figure 3. Unless otherwise noted, the abnormal returns in all tests are calculated using DGTW-adjusted returns. Panel A of Table 3 reports the cumulative abnormal returns in the −100 to +100-day window surrounding the reversal date. If the insider is trading on private information, we expect the timing of the sale to effectively capture an appreciation of the stock. Insiders privately capture an average gain of 14.92% between the unreported purchase and the reversal. Once the insider reverses their position, the stock value on average underperforms over the next 100 days by −2.0%. The returns before and after the final sell (day 0) provide evidence that this subgroup of insiders optimally time transactions and reporting to profit during the reporting delay.

Round trips executed by insiders within a 6-month period are subject to the short-swing profit rule, and failure to return profits made can result in criminal sanctions (Bhide (1993)).[19] However, an insider reversing position within 6 months while delaying reporting could avoid detection. To consider the impact of the short-swing rule, insiders subject to the rule that purchase and sell their position within 6 months are removed from the sample. The abnormal returns for the remaining 481 round trips are plotted in Graph B of Figure 3. From day −100 to day 0, the cumulative abnormal return is 16.58%. Once the reversal takes place, the stock depreciates initially and then stays relatively stable over the next 100 days. Insiders in this subset not only avoid the short-swing rule, but they also earn higher abnormal returns between the purchase and the reversal.

D. Earnings Announcement Trading

Next, we identify two firm events that incentivize reporting delays. For both events, insiders are motivated to trade on private information and remain

[17]To be considered a round trip, the reversal is required to be less than or equal to the number of shares purchased.

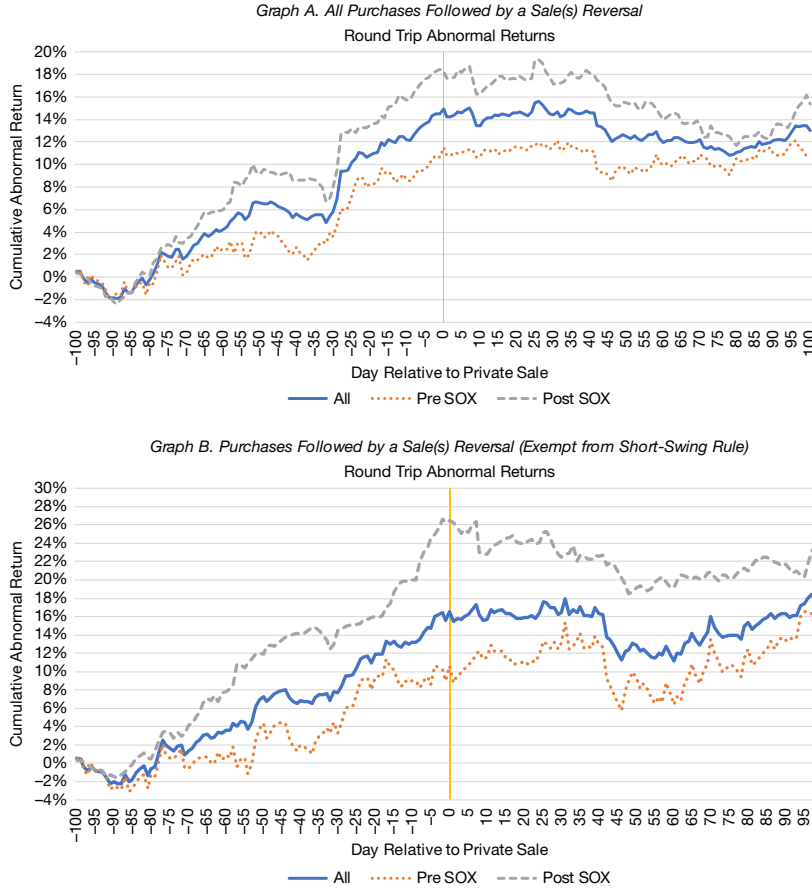
[18]Some round trips (41.4%) have multiple sells before the reporting date. The average number of sells per round trip is 2.6. These sells are tightly grouped together with a 16-day median between the first sell and the last sell. For these cases, the last sell in the series is considered the reversal date.

[19]Ten classifications of beneficial owners are exempt from the short-swing rule: broker/dealers, banks, insurance companies, investment companies, investment advisors, employee benefit plans, a parent holding company or control person, savings associations, churches, and non-U.S. institutions that are functional equivalents to these examples (Electronic Code of Federal Regulations (2011)).

FIGURE 3

Cumulative Abnormal Returns for Round-Trip Transactions

Figure 3 plots cumulative daily abnormal returns for all cases where an insider initially purchases and then sells a similar magnitude of shares before reporting any of the delinquent transactions. This sequence of transactions is defined as a private round trip. The data of the final sale are defined as the reversal date. Daily abnormal returns are calculated for each trade and cumulated for the (−100, +100) business day window around the reversal date. Graph A contains all cases where the insider purchased and subsequently sold shares before reporting the transactions. Graph B contains a subset where the short-swing rule does not apply. This occurs when insiders purchased and held shares longer than 6 months before selling the shares.



anonymous for a period to camouflage the signal contained in the trade and reduce the likelihood of detection.

Earnings announcements are quarterly firm events with a large amount of asymmetric information leading up to the public release. Insiders are often aware of key financial data before market participants, and as a result, many firms voluntarily restrict trading in the months prior to the announcement (Jeng (1999), Bettis et al. (2002), and Roulstone (2003)). However, insiders may utilize private information to trade before the public release and capture future profits or avoid losses. To camouflage their actions, the insider would postpone reporting until after the earnings announcement is released or blackout restriction is removed.

To determine if there are certain months that insiders report delinquent filings, we compile violations by the calendar month in which the trade is reported. Interestingly, the months containing the highest percentage of reporting violations occur in the months following the end of each calendar quarter (January, April, July, and October). Reporting clustering after the end of the quarter could be related to quarterly earnings announcements.[20]

To further examine this timing phenomenon, we identify transactions taking place within the 2 months preceding an earnings announcement.[21] Panel C of Table 3 reports that there are 20,788 (22,843) purchase (sell) non-violation trades taking place around earnings announcements. For comparison, oversight filing violations from insiders who delay reporting the trade until after the earnings release total 16,385 (15,691) for purchases (sells), whereas intentional violations total 10,381 (8,859) for purchases (sells). The filing delays for non-violations, oversight violations, and intentional violations increase for purchases (sales) from 18.09 (17.82), 83.56 (70.63) to 151.94 (102.32) days, respectively.

Pre-earnings announcement DGTW abnormal returns are calculated from the transaction date to the earnings announcement release. Untabulated results reveal that violations have significantly higher returns of 2.10% for purchases than the 1.75% for non-violations. Post-earnings announcement DGTW abnormal returns are not significantly different.

E. Fraudulent Restatement Trading

Fraudulent restatement periods indicate manipulation of financial data, which distorts the perception of the firm held by market participants (Bergstresser and Philippon (2006)). Agrawal and Cooper (2015) show that restatements provide insiders the opportunity to profit on private information. Insiders can "double down" on the nefarious behavior and trade on the artificially inflated stock while masking what is happening at the firm (Burns and Kedia (2006), Efendi, Srivastava, and Swanson (2007)). For sales, Summers and Sweeney (1998) show that insiders sell significant portions of their position during fraudulent accounting periods to limit losses. After trading, insiders are incentivized to delay reporting to limit the possibility of their trades being tied to the restatement.

We collect data on restatements from Audit Analytics, which provides information on the restatement period, the restatement file date, the reason for the restatement, and if the restatement resulted from fraud or triggered an SEC investigation. Following Summers and Sweeney (1998), we retain only restatements resulting from fraudulent earnings management or those warranting an SEC investigation. These events are merged with insider transactions, and any fraudulent restatement containing at least one transaction is retained. We find 70 fraudulent restatements that have insider trading within the restatement period that remain unreported until after the restatement is publicly announced. There are 207 transactions made up of 102 purchases and 105 sales that occur an average of 286 days before the public restatement filing date. On average, these insiders delay reporting

[20]In our sample, 69.53% of firms have fiscal quarters that mirror the calendar quarters.

[21]A 1-month window before the earnings announcement was also used, and the results were qualitatively unchanged.

for 303 days after the restatement is made public. Panel D of Table 3 reports that the filing delay for non-violations, oversight violations, and intentional violations increases for purchases (sales) from 12.94 (14.85), 450.08 (722.84) to 1,210.17 (413.39) days, respectively.[22]

IV. Determinates Analysis

The results above suggest that high information asymmetry events (such as stealth trading, round trips, earnings announcements, and earnings restatements) provide incentives to defer filing and can entice insiders to delay information from reaching the market.[23] To better understand the factors driving filing violations, we use a set of linear probability models that include past filing behavior, high information asymmetry events, trade value, and insider roles. All models contain firm and year fixed effects; firm-clustered robust standard errors are reported in parentheses.

Table 4 reports determinant models, where the dependent variable is an indicator equal to 1 if the trade violates the reporting requirement, and 0 otherwise. Past filing behavior is measured on an insider and firm basis. The INSIDER_RATIO is recalculated daily per insider and measures an insider's historical propensity to violate by scaling the total violations per insider by the insider's total trades. For example, if an insider enters our data set in 2002 and files their first 9 out of 10 trades late, it will result in a violation ratio of 0.90. On the following day, if the same insider filed a trade on time, their violation ratio for that day would be 0.82. If over the next month they filed 9 additional trades on time, their violation ratio would be lowered to 0.45. The FIRM_RATIO is recalculated daily in the same way, but measures total violations per firm, scaled by total trades per firm. Both past filing behavior variables measure historic filing tendencies.

The next set of variables identifies whether violations are made during one of the designated periods of high information asymmetry: Stealth Trading, Round Trip, Earnings Announcement, or Restatement. Separate dummy variables indicate trades made during one of these events. Positive and significant coefficients indicate a higher propensity to violate during these periods. TRADE_VALUE is the amount (in millions) of the transaction scaled by market capitalization in the year of the trade. A positive and significant coefficient indicates that violation propensity is increasing in trade size. Identifiers are included in models 3 and 7 for the insider being a member of the CORPORATE_SUITE (CEO, CFO, CI, CO, and CT), Board of Directors, a BENEFICIAL_OWNER, or a lower-level insider not holding an officer position.[24]

[22]Untabulated analysis reveals that between the transaction date and trade report date, 68 purchase violations earn an average DGTW-adjusted abnormal return of 30.05%, whereas non-violations earn 4.07%. The difference between the two groups is significant at the 1% level. In addition, the 71 sales violations avoid a loss of −26.92%, whereas non-violations avoid a loss of only −3.76%.

[23]Seventy-seven percentage of all violations labeled as intentional fall within a high information asymmetry event in our study.

[24]Insiders not holding an officer or board position are labeled Other Insider. They are on a committee, an affiliate, or hold other similar positions at the firm. Thompson Reuters identifies these roles as: "AC," "CC," "EC," "FC," "MC," "SC," "AF," "AI," "GC," "IA," "C," "CP," "DS," "F," "FO," "GM," "GP," "LP," "M," "MD," "OE," "R," "SH," "T," "TR," "UT," "VT," and "X."

TABLE 4

Filing Violation Determinants

Table 4 presents linear probability models with the dependent variable taking a value of 1 if the trade is a filing violation, and 0 otherwise. INSIDER_RATIO (FIRM_RATIO) is recalculated daily as the total violations per insider (firm), scaled by total trades per insider (firm). STEALTH_TRADING, ROUND_TRIP, EARNINGS_ANNOUNCEMENT, and RESTATEMENT identify all trades made within the corresponding period. TRADE_VALUE is the dollar value traded scaled by market capitalization. CORPORATE_SUITE, DIRECTORS, BENEFICIAL_OWNER, and OTHER_INSIDER indicate the insider classification. BLOCKHOLDER_RATIO is the number of shares held by blockholders scaled by shares outstanding. NASDAQ indicates firms on the Nasdaq, and OTHER_EXCHANGES firms trading on the NYSE Market, Arca, or BATS. NYSE firms are the base comparison. ROA, LEVERAGE, ln(SIZE), BOOK_TO_MARKET, CASH_TO_ASSETS, R&D_TO_ASSETS, ln(AGE), and ln(DISTANCE) are firm controls. All models contain firm and year fixed effects. Firm-clustered robust standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	Purchases				Sells			
	1	2	3	4	5	6	7	8
INSIDER_RATIO	0.861***			0.824***	0.838***			0.817***
	(0.004)			(0.004)	(0.003)			(0.003)
FIRM_RATIO	0.237***			0.237***	0.165***			0.161***
	(0.009)			(0.009)	(0.008)			(0.008)
STEALTH_TRADING		0.073***		0.030***		0.035***		0.017***
		(0.004)		(0.002)		(0.002)		(0.001)
ROUND_TRIP		0.518***		0.220***		0.448***		0.126***
		(0.021)		(0.023)		(0.024)		(0.016)
EARNINGS_ANNOUNCEMENT		0.265***		0.138***		0.243***		0.136***
		(0.007)		(0.006)		(0.006)		(0.005)
RESTATEMENT		0.261**		0.221***		0.280***		0.182***
		(0.115)		(0.075)		(0.091)		(0.071)
TRADE_VALUE		0.157**		0.026		0.031		−0.001
		(0.070)		(0.040)		(0.054)		(0.033)
CORPORATE_SUITE			−0.035***	−0.005**			−0.016***	−0.001
			(0.003)	(0.002)			(0.002)	(0.002)
DIRECTORS			0.003	−0.015***			0.008***	−0.015***
			(0.003)	(0.002)			(0.002)	(0.001)
BENEFICIAL_OWNER			0.064***	−0.017***			0.047***	−0.012***
			(0.009)	(0.005)			(0.006)	(0.003)
OTHER_INSIDER			0.015	−0.001			0.014***	0.003
			(0.015)	(0.006)			(0.004)	(0.002)
BLOCKHOLDER_RATIO	−0.027***	−0.044***	−0.045***	−0.030***	0.001	−0.016*	−0.016*	−0.001
	(0.009)	(0.013)	(0.014)	(0.009)	(0.008)	(0.010)	(0.010)	(0.007)
NASDAQ	−0.004	−0.013	−0.014	−0.004	−0.001	0.006	−0.002	0.006
	(0.017)	(0.036)	(0.039)	(0.018)	(0.029)	(0.028)	(0.031)	(0.027)
OTHER_EXCHANGES	−0.060	−0.091	−0.103	−0.060	−0.090***	−0.119	−0.119	−0.092***
	(0.041)	(0.084)	(0.074)	(0.047)	(0.029)	(0.097)	(0.090)	(0.032)
ROA	−0.027	−0.107**	−0.074	−0.044	−0.043	−0.111**	−0.118**	−0.038
	(0.037)	(0.051)	(0.052)	(0.037)	(0.028)	(0.044)	(0.046)	(0.028)
LEVERAGE	0.019*	0.030	0.033	0.019*	0.003	0.006	0.007	0.001
	(0.011)	(0.024)	(0.025)	(0.010)	(0.007)	(0.011)	(0.012)	(0.007)
ln(SIZE)	0.003	0.004	0.001	0.005**	0.001	−0.000	−0.000	0.002
	(0.002)	(0.004)	(0.004)	(0.002)	(0.002)	(0.003)	(0.003)	(0.002)
BOOK_TO_MARKET	−0.004	−0.008*	−0.009*	−0.003	0.009***	0.023***	0.024***	0.009***
	(0.003)	(0.004)	(0.005)	(0.003)	(0.003)	(0.005)	(0.005)	(0.003)
CASH_TO_ASSETS	0.015	0.004	0.002	0.014	−0.006	−0.032***	−0.032**	−0.006
	(0.013)	(0.018)	(0.019)	(0.012)	(0.008)	(0.012)	(0.012)	(0.008)
R&D_TO_ASSETS	−0.043	−0.113	−0.144	−0.041	−0.019	0.056	0.062	−0.023
	(0.057)	(0.096)	(0.106)	(0.058)	(0.055)	(0.088)	(0.089)	(0.056)
ln(AGE)	−0.020***	−0.036***	−0.034***	−0.022***	−0.026***	−0.032***	−0.030***	−0.027***
	(0.004)	(0.009)	(0.010)	(0.004)	(0.003)	(0.005)	(0.005)	(0.003)
ln(DISTANCE)	0.001	0.052	0.070	−0.006	−0.009	0.008	0.014	−0.011**
	(0.015)	(0.032)	(0.043)	(0.013)	(0.006)	(0.009)	(0.010)	(0.006)
No. of obs.	434,614	434,614	434,614	434,614	717,123	717,123	717,123	717,123
R^2	43%	10%	4%	44%	40%	9%	6%	41%
Firm and year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Holderness (2009) and Edmans and Holderness (2017) illustrate that due to their large ownership stake and incentive to monitor, blockholders play a critical role in corporate governance. This market form of governance likely mitigates negative behaviors, such as filling violations. Exchange listing requirements may

also serve as an effective form of external governance. We therefore control for the ratio of blockholder holdings and listing exchange in all specifications. BLOCKHOLDER_RATIO is the number of firm shares held by blockholders scaled by the total number of shares outstanding. Indicator variables based on CRSP index codes are included to control for exchange. NASDAQ is an indicator set to 1 for firms trading on the Nasdaq exchange. OTHER_EXCHANGES is a variable set to 1 if the firm is listed on the NYSE Market, Arca, or BATS. NYSE dummy is excluded to use as the base comparison.

Seyhun (1986), Rozeff and Zaman (1998), Lakonishok and Lee (2001), and Jeng, Metrick, and Zeckhauser (2003) show that there is a difference in insider transactions between different types of firms. Informed insider purchases are more common at small and value firms. To control for differences across firms, logarithm-adjusted firm size, BOOK_TO_MARKET, ROA, LEVERAGE, and R&D expense scaled by total assets are included as controls.[25] To capture financial slack at the firm, cash scaled by total assets is included. Firm age is also included since it is shown by Holderness (2009), (2016) and Edmans and Holderness (2017) to be tied to ownership concentration. Ease of monitoring by market participants may also impact the likelihood of violation. Following Loughran (2007), Loughran and Schultz (2005), and John, Knyazeva, and Knyazeva (2011), we calculate the number of miles between the city center where the firm is located, and the nearest city center of the top 10 largest metropolitan areas.[26] The distance between the two points is calculated using the Haversine equation (Kifana and Abdurohman (2012)) and enters the models as the natural logarithm of 1 plus the number of miles.

The results reported in columns 1 and 5 of Table 4 indicate that the propensity to violate increases significantly with the historic rate of insider and firm violations. Point estimates imply that for purchases at the insider (firm) level, a 0.10 unit increase in the violation ratio increases the likelihood of violation by 8.6% (2.4%). For sales, a 0.10 unit increase in the violation ratio increases the likelihood of violation by 8.4% (1.7%). The regression estimates reported in columns 2 and 6 indicate that purchases (sales) made during a sequence of STEALTH_TRADING are 7.3% (3.5%) more likely to violate. Likewise, insider purchases (sales) that are part of a ROUND_TRIP are 51.8% (44.8%) more likely to violate, and purchases (sales) during an EARNINGS_ANNOUNCEMENT period or a fraudulent RESTATEMENT period are 26.5% (24.3%) and 26.1% (28.0%) more likely to violate, respectively. The implication is that when strong incentives to delay filing exist, there is a significant increase in violations. A 0.10 unit increase in the TRADE_VALUE ratio for purchases increases the probability of violation by 1.6% for purchases but is insignificant for sells. Therefore, the size of the transaction does not appear to be a strong motivation for delaying reporting for sells.

[25]For robustness, logit and probit models are utilized and produce similar results in our determinant analysis. The linear probability models are reported for ease of coefficient interpretation and for consistency with prior studies (Betzer et al. (2015)).

[26]The top 10 largest metropolitan areas (New York, Los Angeles, Chicago, Washington, San Francisco, Philadelphia, Boston, Detroit, Dallas, or Houston) are selected according to populations reported in the 2000 census. For robustness, 2020 census data are also used. Only one of the 10 largest metropolitan areas changed (Atlanta replaced Detroit), and the results using the distance calculation were qualitatively unchanged.

Where an insider sits in the firm's hierarchy has a significant effect on their decision to violate. In column 3 of Table 4 for purchases and column 7 for sells, we see that members of the CORPORATE_SUITE are 3.5% and 1.6% less likely to violate for purchases and sales, respectively. The coefficient on DIRECTORS is insignificant for purchases, but 0.8% more likely to violate for sells. A BENEFICIAL_OWNER is 6.4% and 4.7% more likely to violate for purchases and sells, both of which are significant at the 1% level. Other Insiders are 1.4% more likely to violate for sells, but the coefficient is insignificant for purchases. Collectively, the results in columns 3 and 7 suggest a higher propensity for violations at the bottom of the firm's hierarchy. Although top-level managers have more access to private information, they are also more heavily monitored, especially after SOX. Top management is impacted most by SOX, with an increased burden of compliance (Akhigbe and Martin (2006)), making violations riskier. Lower-level managers do not face the same level of scrutiny, resulting in a low marginal cost to violate the reporting regulations.

The proportion of shares outstanding held by blockholders is negative and significant in 6 of the 8 regressions reported in Table 4. Marginal effects for column 1 indicate that a 1-standard-deviation increase in the BLOCKHOLDER_RATIO decreases the likelihood of violation by 0.57%. Firm age is negative and significant in all models, indicating that younger firms are more likely to violate reporting requirements. In regressions not tabulated, we also test the effect of internal governance mechanisms (such as board size, independence, and duality).[27] Interestingly, the effects of these forms of governance have little impact in deterring delinquent filings. Combined, these findings suggest that the external governance imposed by blockholders is more critical for deterring filing violations.[28]

V. Abnormal Returns

A. Univariate Abnormal Returns

Panel A of Table 5 reports stock performance for the delinquency period. To examine how stock value is changing, DGTW-adjusted daily average abnormal returns are calculated for the mean number of days delinquent leading up to the report date for each sample. During the delay period, for purchases (sells), we expect a positive (negative) and significant difference between violations and non-violations.

The results show that the DGTW-adjusted daily average abnormal returns for purchase (sell) violations are significantly higher (lower) than non-violations, with a difference of 0.08% (−0.04%). Thus, insiders choosing to report late privately

[27]We caution the reader that the sample is significantly reduced when including the additional governance variables and thus the samples are not directly comparable.

[28]In untabulated analysis, we examine whether person-specific variables influence the decision to file delinquent. These include total directorships held, executive tenure, executive age, director age, female, number of positions held, number of firms employed, and the number of insiders per firm. Our findings indicate that the likelihood of violation is significantly decreasing in the number of positions held by an insider and the number of insiders at a firm. The likelihood of violation is increasing in number of firms associated with an insider and for female insiders.

TABLE 5

Daily Average Abnormal Returns During the Reporting Lag

DGTW-adjusted daily average abnormal returns during the average reporting delinquency are reported. For purchases (sells), the average delinquency is 47 (28) trading days. Panel A of Table 5 reports the daily abnormal returns of violation transactions compared to non-violations. Panel B presents the abnormal returns for intentional filing violations compared to oversight violations. The difference in returns between the two groups are compared in the last column. Standard deviations are reported in parentheses. *t*-Statistics are reported within brackets. The asterisks reported in the second and fourth columns indicate the significant difference of the returns from zero. The asterisks reported in the fifth column indicate the significance of the difference in abnormal returns between the two groups. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A. Violations Versus Non-Violations

	Violations		Non-Violations		Difference
	N	Abnormal Return	*N*	Abnormal Return	Abnormal Return
Purchases	97,748	0.03%*** (0.52)	380,000	−0.05%*** (0.52)	0.08%*** [35.42]
Sales	117,068	0.08%*** (0.82)	639,700	0.12%*** (0.62)	−0.04%*** [−13.97]

Panel B. Intentional Violations Versus Oversight Violations

	Intentional Violations		Oversight Violations		Difference
	N	Abnormal Return	*N*	Abnormal Return	Abnormal Return
Purchases	25,308	0.04%*** (0.54)	72,440	0.00%** (0.51)	0.04%*** [9.96]
Sales	24,207	0.04%*** (0.86)	92,861	0.10%*** (0.81)	−0.06%*** [−9.68]

earn significant abnormal returns for purchases and sales. Scaling the daily average abnormal returns by the average number of days delayed for purchases (sales) shows that the difference for violations compared to non-violations is 4.8% (−1.68%). This provides evidence that an informational advantage was utilized around the transaction and reporting dates to optimally time the trade and reporting.

Using the classification described in Section III.A, Panel B of Table 5 compares the daily average DGTW-adjusted abnormal returns of intentional and oversight violations. Purchase (sell) violations made intentionally are significantly higher (lower) at the 1% level, with a difference of 0.04% (−0.06%). Scaling the daily average abnormal returns by the average number of days delayed for purchases (sales) reveals that the difference for intentional violations compared to oversight violations is 4.64% (−4.62%). All results signify a tangible benefit to those intentionally delaying reporting.

B. Multivariate Abnormal Returns

To control for other potential effects, we set the DGTW-adjusted daily average abnormal returns for the mean number of days delinquent leading up to the report date as the dependent variable and estimate OLS regressions. The results are reported in Table 6.

FILING_VIOLATION and INTENTIONAL are included as indicator variables. INSIDER_RATIO and FIRM_RATIO are as previously described, capturing the historical filing tendencies of insiders both individually and at the firm level. To capture the effect of trades made by insiders that violate the reporting requirements during periods of high information asymmetry, STEALTH_TRADING (V),

TABLE 6

Daily Average Abnormal Returns During the Reporting Lag

Table 6 presents linear regressions on DGTW-adjusted daily average abnormal returns during the average reporting delinquency. Purchases (sells) average delinquency is 47 (28) trading days. STEALTH_TRADING (V), ROUND_TRIP (V), EARNINGS_ANNOUNCEMENT (V), and RESTATEMENT (V) identify filing violations made in the corresponding period. CORPORATE_SUITE (V), DIRECTORS (V), BENEFICIAL_OWNER (V), and OTHER_INSIDER (V) indicate the respective classification of the insider interacted with FILING_VIOLATION. All other variables are described in the Appendix. Firm-clustered robust standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	Purchases					Sells				
	1	2	3	4	5	6	7	8	9	10
FILING_VIOLATION	0.046***				0.038***	−0.048***				−0.035***
	(0.006)				(0.010)	(0.007)				(0.009)
INTENTIONAL		0.027**			0.020*		−0.075***			−0.064***
		(0.012)			(0.012)		(0.016)			(0.016)
INSIDER_RATIO		0.051***			0.013		−0.023**			0.005
		(0.008)			(0.010)		(0.010)			(0.011)
FIRM_RATIO		−0.023			−0.028		−0.040			−0.035
		(0.023)			(0.023)		(0.025)			(0.025)
STEALTH_TRADING (V)			0.032***		0.010			−0.034***		−0.001
			(0.009)		(0.008)			(0.009)		(0.008)
ROUND_TRIP (V)			0.020		0.010			−0.077**		−0.056
			(0.053)		(0.052)			(0.038)		(0.038)
EARNINGS_ANN. (V)			0.039***		0.022***			−0.046***		−0.023*
			(0.008)		(0.008)			(0.013)		(0.013)
RESTATEMENT (V)			0.281		0.279			−0.134		−0.128
			(0.191)		(0.189)			(0.363)		(0.360)
TRADE_VALUE			0.864***		0.772***			1.201***		1.246***
			(0.166)		(0.160)			(0.317)		(0.324)
CORPORATE_SUITE (V)				0.046***	0.047***				0.017	0.011
				(0.013)	(0.013)				(0.019)	(0.019)
DIRECTORS (V)				−0.015*	−0.012				−0.003	−0.004
				(0.009)	(0.009)				(0.010)	(0.010)
BENEFICIAL_OWNER (V)				−0.065***	−0.068***				0.004	0.012
				(0.019)	(0.020)				(0.026)	(0.025)
OTHER_INSIDER (V)				0.035	0.033				0.055**	0.055**
				(0.029)	(0.029)				(0.023)	(0.023)
BLOCKHOLDER_RATIO	−0.029	−0.030	−0.030	−0.042**	−0.041**	−0.046**	−0.048**	−0.045**	−0.043*	−0.044*
	(0.020)	(0.020)	(0.020)	(0.021)	(0.021)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)
NASDAQ	0.012	0.011	0.012	0.007	0.007	−0.144	−0.143	−0.152	−0.144	−0.150
	(0.082)	(0.082)	(0.082)	(0.082)	(0.082)	(0.100)	(0.101)	(0.100)	(0.100)	(0.100)
OTHER_EXCHANGES	−0.084	−0.082	−0.082	−0.090	−0.087	−0.499*	−0.485	−0.501*	−0.498*	−0.491*
	(0.134)	(0.134)	(0.134)	(0.131)	(0.130)	(0.292)	(0.297)	(0.289)	(0.293)	(0.294)
ROA	0.679***	0.677***	0.678***	0.679***	0.678***	1.038***	1.038***	1.034***	1.039***	1.031***
	(0.139)	(0.139)	(0.139)	(0.138)	(0.138)	(0.130)	(0.130)	(0.130)	(0.131)	(0.131)
LEVERAGE	0.082**	0.084***	0.081**	0.085***	0.084***	0.046	0.047*	0.045	0.045	0.045
	(0.032)	(0.032)	(0.032)	(0.032)	(0.032)	(0.028)	(0.028)	(0.028)	(0.028)	(0.028)
ln(SIZE)	−0.144***	−0.144***	−0.143***	−0.143***	−0.142***	−0.131***	−0.132***	−0.130***	−0.132***	−0.131***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
BOOK_TO_MARKET	0.054***	0.054***	0.054***	0.056***	0.056***	0.025*	0.025*	0.024	0.025	0.025
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
CASH_TO_ASSETS	0.106***	0.107***	0.108***	0.104***	0.106***	0.051	0.050	0.053	0.052	0.052
	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)
R&D_TO_ASSETS	1.243***	1.239***	1.229***	1.226***	1.212***	0.717***	0.721***	0.712***	0.715***	0.715***
	(0.321)	(0.320)	(0.320)	(0.320)	(0.319)	(0.241)	(0.241)	(0.241)	(0.241)	(0.241)
ln(AGE)	0.002	0.002	0.002	0.000	0.001	−0.010	−0.010	−0.008	−0.010	−0.009
	(0.011)	(0.011)	(0.011)	(0.012)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
ln(DISTANCE)	−0.001	−0.001	−0.003	−0.001	−0.002	0.092	0.093	0.089	0.092	0.090
	(0.021)	(0.022)	(0.021)	(0.020)	(0.020)	(0.072)	(0.072)	(0.071)	(0.072)	(0.072)
No. of obs.	434,614	434,614	434,614	434,614	434,614	717,123	717,123	717,123	717,123	717,123
R^2	5%	5%	5%	5%	5%	2%	2%	2%	2%	2%
Firm and year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

ROUND_TRIP (V), EARNINGS_ANNOUNCEMENT (V), and RESTATEMENT (V) are included as indicator variables for filing violations occurring during one of the corresponding event periods. Similar interactions are also included for the rank of the insider.

The coefficient on FILING_VIOLATION is positive and significant for purchases and negative and significant for sales, suggesting that trades not reported on time earn significant abnormal returns. Trades made by insiders categorized as INTENTIONAL earn significantly greater average daily abnormal returns of 0.03% for purchases and avoid significantly greater losses of −0.08% for sales relative to insiders with oversight violations or non-violations. DGTW-adjusted daily average abnormal returns for purchases (sales) increase (decrease) by 0.005% (−0.002%) for a 0.10 unit change in the INSIDER_RATIO. A purchase violation that is a part of a STEALTH_TRADING series earns 0.03% higher daily abnormal returns and avoids −0.03% more losses for sells. ROUND_TRIP violation purchases are not significantly higher for purchases, but sells are associated with a daily performance, that is, −0.08% lower. Violations made during an EARNINGS_ANNOUNCEMENT period earn a 0.04% higher abnormal return for purchases and avoid a −0.05% lower return for sells. Violations during RESTATEMENT periods do not earn significantly different abnormal returns. A 0.10 unit increase in the TRADE_VALUE ratio is associated with 0.09% higher daily abnormal returns for purchases, indicating that larger purchases are associated with higher positive abnormal returns. For sell violations, TRADE_VALUE is 0.12% higher, indicating that larger sell amounts do not avoid abnormal losses. We would not expect this direction for sales, but sales are regularly made for a variety of liquidity and diversification purposes, making sells noisier.

Purchase violations made by members of the CORPORATE_SUITE have 0.05% higher daily abnormal returns, whereas those made by DIRECTORS or a BENEFICIAL_OWNER are associated with −0.02% and − 0.07% lower returns, respectively. Sell violations made by Other Insiders are significant but positive, indicating that lower-ranked insiders are not profiting from the trades. With the CORPORATE_SUITE at the top of the information hierarchy, this finding suggests that the decision to purchase shares and violate is likely information-driven. The coefficients from Table 4 report that the members of the CORPORATE_SUITE do not violate often, but the results from Table 6 indicate that when they do, the returns are positive and significant. Overall, the DGTW-adjusted daily average abnormal returns indicate that filing violations benefit intentional violators, insiders who violate during high information asymmetry events, and top-ranking insiders.

VI. Consequences of Insider Filing Violations

The results to this point suggest that the likelihood of insider filing violations is highest during periods of high information asymmetry, when insiders are incentivized to utilize their information for the purpose of capturing abnormal returns. In this section, we turn our attention to examine the consequences of filing violations to investors, the firm, and the insiders themselves.

A. Market Implications from Insider Reporting Violations

Since the market is unaware of delinquent filings until the report date, it is important to investigate any market reaction to the insider's behavior following the disclosure of the delinquent trade. Preliminary univariate analysis reveals that

TABLE 7

Market Implications from Insider Reporting Violations

Table 7 presents analysis of market outcomes from filing violations. Panel A reports the cumulative abnormal returns for the 6- and 12-month period following reporting, along with *p*-values from testing the differences from 0 for the mean and the median. Panel B presents TOBINS_Q and liquidity measures in the period prior to the reporting of a violation and compares them 6 and 12 months after reporting. TOBINS_Q is calculated as the market value of the firm divided by total assets. VOLATILITY is measured as the standard deviation of raw returns over the 120 trading days prior to the respective date. SPREAD is the average relative daily spread, calculated over the (−30, −1) trading days prior to the respective date by subtracting the daily CRSP bid from the ask price and dividing by the closing stock price. *p*-Values from a difference-in-means test between the groups are provided.

Panel A. Returns After Reporting

Violations	*N*	Mean	*p*-Value	Median	*p*-Value
6-MONTH_CAR	214,816	−2.34%	0.00	−3.02%	0.00
12-MONTH_CAR	214,816	−4.46%	0.00	−5.98%	0.00

Panel B. Implications

		Reporting		+6 Months		+12 Months		+6 Months vs. Reporting		+12 Months vs. Reporting	
	N	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Diff	*p*-Value	Diff	*p*-Value
Violations											
TOBINS_Q	207,201	1.57	2.38	1.42	2.03	1.37	2.00	−0.15	0.00	−0.20	0.00
VOLATILITY (RAW)	214,816	3.91	2.70	3.93	2.94	3.95	3.15	0.02	0.00	0.04	0.00
SPREAD (−30, −1)	187,137	3.11	4.28	3.20	4.85	3.26	5.36	0.09	0.00	0.15	0.00
Intentional violations											
TOBINS_Q	47,095	1.40	2.17	1.31	2.03	1.26	1.99	−0.09	0.00	−0.14	0.00
VOLATILITY (RAW)	49,515	4.15	2.92	4.20	3.54	4.17	3.40	0.05	0.00	0.02	0.00
SPREAD (−30, −1)	40,032	3.69	4.88	3.87	5.81	3.91	6.21	0.18	0.00	0.22	0.00

the (−1, +1) day DGTW-adjusted cumulative abnormal returns for intentional violation purchases are significant 53 basis points lower than non-violation purchases. Based on market capitalization, the day prior to reporting, this equates to an average dollar difference of negative $1,326,385 for purchases. The average dollar difference between an intentional sell violation and non-violation is negative $1,329,694.

Panel A of Table 7 reports a long-run analysis of the abnormal performance following the report date. The mean (median) CAR over the 6 months following reporting is a significant −2.34% (−3.02%), and the mean abnormal return over the 12 months following reporting is a significant −4.46% (−5.98%). Thus, the market appears to punish violating firms with lower long-run performance. TOBINS_Q is calculated in the period prior to reporting and recalculated both 6 and 12 months following reporting. The results reported in Panel B of Table 7 report that TOBINS_Q significantly declines for all violations and for the subset of intentional violations, suggesting that the market value of the firm declines following the reporting of delinquent trades.

In addition to the impact of trading violations on firm value, the revealed presence of informed traders is likely to negatively impact stock liquidity (Heflin and Shaw (2000), Easley, Hvidkjaer, and O'Hara (2002), and Cao, Field, and Hanka (2004)). Cumming, Johan, and Li (2011) document that detailed insider trading rules increase trading activity through a reduction in market volatility and bid–ask spread. In light of this finding, we anticipate that the liquidity cost to investors trading in firms with identified delinquent filings will increase following reporting.

To measure volatility, we follow Core and Guay (1999) and calculate the average daily standard deviation of returns over the 120 trading days prior to the reporting date and at 6 and 12 months following the report date. The results reported in Panel B of Table 7 indicate significantly higher levels of daily raw return volatility for violations (intentional violations), with an increase of 2 (5) basis points 6 months after reporting and an increase of 4 (2) basis points 12 months following reporting.

Following Miller and McConnell (1995), for each transaction, we also calculate the relative daily spread by subtracting the bid from the ask price and dividing by the closing price for the day. We average the relative daily spread $(-30, -1)$ trading days leading up to the report date and compare it to the daily spread 6 and 12 months after reporting. The results presented in Panel B of Table 7 indicate that the bid–ask spread significantly increases following the reporting of a delinquent transaction. For the full sample of violations, the average daily spread increases from 3.11% on the report date to 3.20% and 3.26% 6 and 12 months after. For intentional violations, the increase is even greater, increasing from 3.69% to 3.87% and 3.91% 6 and 12 months after the reporting, respectively. This evidence implies that other market participants desiring to trade the stock of a firm with an intentional trading violation can on average expect to pay 22 basis points more in transaction costs 12 months following reporting.

The significant increase in volatility and the bid–ask spread suggests a significant decrease in liquidity once the evidence of the violation is priced by market participants. This represents not only a cost to the firm, but also a long-term cost to all investors.

B. Blockholder "Voice" and "Exit"

Next, we examine the presence of blockholders ex ante, and their reaction ex post, to the reporting of a delinquent transaction. Holderness (2009) documents the large presence of blockholders in U.S. companies and provides evidence that stockholders are not as diffuse as previously thought. This translates into an integrated stockholder base that provides governance through direct engagement with management. Edmans and Holderness (2017) also document the critical governance role of these investors through both engagement with the firm (voice) and by voting with their feet and selling shares (exit).

Recall that the determinant analysis presented in Table 4 suggests that the likelihood of a violation is significantly decreasing as the percentage of shares held by blockholders increases. In Panel A of Table 8, we further examine blockholders' "voice" by comparing the concentration of blockholders in violation, intentional violation, and non-violation firms. If blockholders do engage directly with managers as Holderness (2009) suggests, we anticipate a greater blockholder presence in non-violation firms and fewer blockholders at firms where filing violations occur.

Our first measure of blockholder presence is the BLOCKHOLDER_RATIO, which is the number of total shares held by blockholders scaled by the total number of shares outstanding. This provides a measure of the magnitude of blockholder

TABLE 8

Blockholder Voice and Exit

Panel A of Table 8 compares the presence of blockholders for violators (intentional violators) to non-violators at the time of the transaction. In Panel B, Blockholder Exit is presented. To be included in Panel B, at least one blockholder must be present at the firm at the time of the transaction. BLOCKHOLDER_RATIO is the shares held by blockholders scaled by total shares outstanding. HERFINDAHL–HIRSCHMAN_INDEX (HHI) is ownership concentration. NO_OF_BLOCKHOLDERS, NO_OF_MAJORITY_BLOCKHOLDERS, and NO_OF_MINORITY_BLOCKHOLDERS count the number of blockholders for each group per firm. A difference in means between the transaction date relative to the 6 months and 12 months after reporting are compared and provided in the last 4 columns.

Panel A. Blockholders' Voice

	Violations			Non-Violations			Violation vs. Non-Violation	
	N	Mean	Std. Dev.	*N*	Mean	Std. Dev.	Diff	*p*-Value
BLOCKHOLDER_RATIO	202,469	16.5%	19.4%	949,268	21.8%	21.1%	−5.3%	0.00
HERFINDAHL–HIRSCHMAN_INDEX (HHI)	202,393	0.22	0.23	949,153	0.16	0.19	0.06	0.00
NO_OF_BLOCKHOLDERS	202,469	1.61	1.93	949,268	2.71	5.27	−1.10	0.00
NO_OF_MAJORITY_BLOCKHOLDERS	202,469	0.02	0.13	949,268	0.03	0.16	−0.01	0.00
NO_OF_MINORITY_BLOCKHOLDERS	202,469	1.59	1.92	949,268	2.68	5.17	−1.09	0.00
	Intentional Violations			Non-Violations			Intentional vs. Non-Violation	
	N	Mean	Std. Dev.	*N*	Mean	Std. Dev.	Diff	*p*-Value
BLOCKHOLDER_RATIO	45,871	14.4%	18.3%	949,268	21.8%	21.1%	−7.4%	0.00
HERFINDAHL–HIRSCHMAN_INDEX (HHI)	45,850	0.26	0.25	949,153	0.16	0.19	0.10	0.00
NO_OF_BLOCKHOLDERS	45,871	1.39	1.55	949,268	2.71	5.27	−1.32	0.00
NO_OF_MAJORITY_BLOCKHOLDERS	45,871	0.01	0.10	949,268	0.03	0.16	−0.02	0.00
NO_OF_MINORITY_BLOCKHOLDERS	45,871	1.39	1.55	949,268	2.68	5.17	−1.29	0.00

Panel B. Blockholders' Exit

	Transaction Date			+6 Months After Reporting		+12 Months After Reporting		+6 Months vs. Transaction Date		+12 Months vs. Transaction Date	
	N	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Diff	*p*-Value	Diff	*p*-Value
Violations											
BLOCKHOLDER_RATIO	143,138	23.4%	19.3%	19.7%	18.3%	18.9%	17.8%	−3.7%	0.00	−4.5%	0.00
HERFINDAHL–HIRSCHMAN_INDEX (HHI)	143,137	0.21	0.21	0.19	0.20	0.19	0.20	−0.02	0.00	−0.02	0.00
NO_OF_BLOCKHOLDERS	143,138	2.27	1.94	2.01	2.00	1.97	2.01	−0.26	0.00	−0.30	0.00
NO_OF_MAJORITY_BLOCKHOLDERS	143,138	0.02	0.15	0.02	0.13	0.02	0.12	−0.00	0.00	−0.00	0.00
NO_OF_MINORITY_BLOCKHOLDERS	143,138	2.25	1.94	2.00	1.98	1.96	2.00	−0.25	0.00	−0.29	0.00
Intentional violations											
BLOCKHOLDER_RATIO	29,937	22.2%	18.6%	18.4%	17.5%	17.6%	16.9%	−3.8%	0.00	−4.6%	0.00
HERFINDAHL–HIRSCHMAN_INDEX (HHI)	29,937	0.23	0.22	0.21	0.20	0.21	0.21	−0.02	0.00	−0.02	0.00
NO_OF_BLOCKHOLDERS	29,937	2.14	1.45	1.89	1.49	1.82	1.46	−0.25	0.00	−0.32	0.00
NO_OF_MAJORITY_BLOCKHOLDERS	29,937	0.01	0.12	0.01	0.11	0.01	0.11	−0.00	0.00	−0.00	0.08
NO_OF_MINORITY_BLOCKHOLDERS	29,937	2.12	1.45	1.88	1.49	1.81	1.46	−0.25	0.00	−0.31	0.00

voice within the firm. We also collect the total NO_OF_BLOCKHOLDERS, along with NO_OF_MAJORITY_BLOCKHOLDERS and NO_OF_MINORITY_BLOCKHOLDERS.[29] Lastly, we calculate the Herfindahl–Hirschman Index (HHI). Following Bednarek and Moszoro (2014), we take each observable shareholder of a firm and divide their holdings by the total shares held by observable owners. This provides the percentage ownership for each individual within the subset of observable owners. We then square the percentage and sum all observable ownership to arrive at the ownership concentration of the firm.

The results in Panel A of Table 8 report blockholder variables at the time of the trade. Blockholders on average own 16.5% of violation firms and 14.4% of intentional violation firms, compared to owning 21.8% of firms without a delinquent trade. The differences in the BLOCKHOLDER_RATIO between non-violation firms and firms with violations and intentional violations are significant at the 1% level. Non-violation firms on average have 2.71 blockholders, compared to violation (intentional) firms, which have on average only 1.61 (1.39). Both differences with respect to non-violation firms are significant at the 1% level. NO_OF_MAJORITY_BLOCKHOLDERS and NO_OF_MINORITY_BLOCKHOLDERS are also statistically less for firms with violations and intentional violations relative to non-violation firms.[30] This evidence indicates that blockholder voice at firms where violating transactions occur is significantly less relative to non-violation firms. Consistent with the determinant analysis presented in Table 4, this suggests that the presence of blockholders provides a deterrent to delinquent filings.

In Panel B of Table 8, we expand the cross-sectional comparison in Panel A and compare blockholder presence across time for violation firms. In doing so, we examine another governance tool blockholders have at their disposal, which is to vote with their feet, also known as "exit" (Edmans and Holderness (2017)). McCahery, Sautner, and Starks (2016) illustrate that blockholders use exit as an effective form of firm governance.

We condition our sample of firms with filing violations to those having at least one blockholder at the time of the transaction and calculate each blockholder variable on the transaction date and compare it 6 and 12 months following reporting. Panel B of Table 8 documents a strong exit response following a violation. For example, for the full sample of violations (intentional violations), the BLOCKHOLDER_RATIO is 23.4% (22.2%) prior to the trade date and it significantly decreases to 19.7% (18.4%) 6 months after reporting; it decreases to 18.9% (17.6%) 12 months following reporting. Similarly, HHI and NO_OF_BLOCKHOLDERS significantly decrease both 6 and 12 months after reporting. This strong reaction by blockholders provides evidence that they govern the disregard for reporting requirements through exit.

[29]Following Holderness (2009) and Edmans and Holderness (2017), blockholders are defined as a shareholder owning at least 5% of the firm's common stock. Institutional blockholder data are collected from Form 13F filings. In addition, we collect insider holdings from Thomson Reuters to identify insider blockholders.

[30]Ownership concentration, captured by the HHI, is significantly higher at firms with violations (intentional violations) than non-violations. Coupled with evidence from Table 1, that violations occur at significantly smaller firms, this finding is consistent with Holderness (2009), who finds an inverse relation between ownership concentration and firm size.

C. Consequences to Violation Insiders

As a final analysis, we examine consequences to the insiders that violate reporting requirements. We collect insider-level data at the time of the transaction and examine changes beginning 12 months after the report date. Binary variables are created identifying whether the insider experiences a reduction in board seats and if they changed firms. REDUCTION_IN_BOARDS captures disciplinary measures taken by other firms. CHANGED_FIRM captures disciplining measures taken by the firm. Conditional on an insider changing firms, we also compare the insider's previous firm size with that of the new employer.[31]

Linear regressions similar to those reported in Table 4 are estimated using the three disciplining measures as dependent variables. Table 9 reports the results. The standard set of controls is included in all models but not tabulated to conserve space. The coefficient on filing violation reported in column 1 suggests that insiders who violate are 2.9% more likely to experience a reduction in board seats relative to those who do not. The positive and significant coefficient on INSIDER_RATIO in column 3 suggests that insiders with a historical propensity to violate face a higher likelihood of being disciplined. Marginal effects imply that a 1-standard-deviation increase in the INSIDER_RATIO increased the probability of losing board seats by 1.6%.

The results reported in columns 4–6 of Table 9 also indicate an increased likelihood of departure for guilty insiders. For example, column 4 reports that an

TABLE 9

Consequences of Filing Violations to Insiders

Table 9 presents OLS estimates for the consequences to insiders who report delinquent filings. Three measures of disciplining are used as the dependent variable, each taking on the value of 1 if discipline is observed beginning 12 months following the report date, and 0 otherwise. REDUCTION_IN_BOARDS is 1 if the insider presides on fewer boards 12 months following the reporting of a trade, and 0 otherwise. CHANGED_FIRM is estimated from Thomson Reuters Insider Filing Database and is 1 if the insider is identified with a different firm 12–24 months after the reporting of a trade, and 0 otherwise. Conditional on the insider changing jobs, we examine whether they moved to a larger of smaller firm. CHANGED_TO_SMALLER_FIRM is 1 if the departing insider is identified with a firm that has a market capitalization less than that of their previous employer, and 0 otherwise. FILING_VIOLATION is a dummy variable set to 1 if the filing is delinquent. INTENTIONAL is a dummy variable identifying trades classified as intentional. The INSIDER_RATIO (FIRM_RATIO) is recalculated daily as the total violations per insider (firm), scaled by total trades per insider (firm). All controls used in prior models are included, but not reported in the table to conserve space. All models contain firm and year fixed effects. Firm-clustered robust standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	REDUCTION_IN_BOARDS			CHANGED_FIRM			CHANGED_TO_SMALLER_FIRM		
	1	2	3	4	5	6	7	8	9
FILING_VIOLATION	0.029*** (0.009)			0.016*** (0.003)			0.026* (0.014)		
INTENTIONAL		0.035 (0.033)			0.004 (0.011)			0.061 (0.042)	
INSIDER_RATIO			0.054*** (0.020)			0.044*** (0.008)			0.074** (0.030)
FIRM_RATIO			−0.072 (0.102)			−0.048*** (0.013)			−0.017 (0.053)
No. of obs.	119,097	119,097	119,097	466,274	466,274	466,274	44,334	44,334	44,334
R^2	5%	4%	5%	2%	2%	2%	7%	7%	7%
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control vars	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

[31]Detailed descriptions of these variables are provided in the Appendix. We also test for changes in insider rank and compensation. No significant difference is detected for these additional variables.

insider who violates is 1.6% more likely to be employed by a different firm 12–24 months following the violation. Furthermore, a 1-standard-deviation increase in INSIDER_RATIO increases the likelihood of departure by 1.3%. Conditional on departure, column 7 reports that a violating insider is 2.6% more likely to move to a smaller firm following reporting. A 1-standard-deviation increase in the INSIDER_RATIO increases the probability of the insider landing at a smaller firm by 2.2%. Interestingly, the significant negative coefficient on FIRM_RATIO in column 6 suggests that when others at the firm are engaged in the same behavior, it is less likely that the offending insider will face departure. A 1-standard-deviation increase in the firm violation ratio reduces the likelihood of departure by 1.2%. This provides some evidence that when the culture of the firm is to engage in delinquent filing, they do not punish the insider. Overall, the three proxies for insider disciplining indicate a significantly higher likelihood of being disciplined as the insider's rate of violation increases. Collectively, Table 9 provides some evidence of a disciplining effect for insiders with trading violations.

VII. Other Tests and Robustness

Based on optimal timing, as insiders extract the maximum information rent from their knowledge base, there should be greater abnormal returns leading up to the reporting date. In addition, optimal timing would dictate that reporting takes place once there is little information left to extract. Thus, optimal timing should translate into significant abnormal returns for violators leading up to the reporting date but not after. In untabulated analysis, regressions are estimated separately on the DGTW-adjusted CARs 30 days before and 30 days after the report date. The results indicate significant positive (negative) coefficients on FILING_VIOLATION for purchases (sales) for the pre-report date regressions. However, in the 30 days following the report date, the coefficients on FILING_VIOLATION flip signs. This provides some evidence of a reversal in returns for filing violations around the report date and suggests good timing on the part of violation insiders.

Recall from Section III.A that to be labeled an intentional violator, the insider must violate the reporting requirements at least 95% of the time. Different thresholds of 50%, 90%, and 99% are considered as alternate cutoffs, and we obtain similar results. We also use an alternative classification of intentional violations by defining past violations in absolute terms and use previous violations equal to at least 4, 5, 10, and so forth as our breakpoints, and our results hold.

We also create a proxy to capture the intentionality of violation based on historical filing behavior. Consistent with the findings of Brochet (2010), we find that pre-SOX reporting clustered around the final disclosure date (10th day of each month), with an average of 1.5 insiders at a firm reporting together. Filing multiple transactions at the same time implies that the filings are filed by the firm's compliance department. In the post-SOX period, we find that filings continue to cluster, with transactions for 1.3 insiders per firm on average reported together. In contrast, we infer that when a filing is not grouped with others, there is a higher likelihood that an insider is filing individually and not through a compliance department. We therefore mark a violation as intentional when it is the only filing for a firm on a

given day. We find that when there is one filing per firm, per day, it is more likely to be identified as an intentional violation.[32]

To rule out the possibility that significant abnormal returns accruing to filing violators are driven by transactions in the pre-SOX period, we recalculate all models in Table 6 using only transactions made post-SOX. All variables of interest continue to be significant, and the variables denoting filing violation transactions and intentional violation transactions increase in magnitude. This provides evidence that while regulatory intensity increased during the post-SOX period, significant abnormal returns persist for delinquent filings.

Finally, for robustness, we calculate arithmetic and geometric abnormal returns using the CRSP value-weighted and equal-weighted indices as benchmarks. The results are qualitatively unchanged using each type of abnormal return methodology.[33]

VIII. Conclusion

Insider trading laws have evolved since their creation in the Securities and Exchange Act of 1934. SOX contributed to this development by updating the reporting laws for firms and managers. The goal was to increase transparency and foster market efficiency by mandating the accurate and timely dissemination of firm and insider information. For insiders, the enactment increased reporting burdens by shortening the legal reporting delay for their transactions. Despite the intended outcomes of SOX, we document a continuing breach of insiders violating SEC reporting requirements by filing transactions delinquent.

While most violations are considered to be an oversight, we find evidence that a subgroup of insiders time reporting and intentionally violate disclosure law. Intentional violators have longer reporting delays that render transactions unobservable for extended periods, thereby distorting security prices and preventing efficient price discovery. These delinquent filings are shown to have long-term consequences to the firm, other market participants, and the insider who files late.

This research contributes to our understanding of insider behavior by highlighting a consistent disregard for SEC reporting requirements. This knowledge can be useful to shareholders, regulators, and researchers for the identification of other forms of malfeasance, as well as providing a basis for regulators to adjust statutory laws. Interestingly, the number of infractions remains stable over time despite disciplinary actions from the market. While our evidence of market disciplining is encouraging, the persistence of insider filing violations suggests more work needs to be done for the sake of transparency and market efficiency.

[32]We caution the reader of the likely bias from identifying multiple transactions from a firm on the same day as one going through a compliance department. Namely, larger firms with more employees are likely to have multiple filing at random; however, larger firms are also more likely to have compliance departments.

[33]All models are also re-estimated using both year and industry fixed effects, as well as year and index fixed effects. The sign and significance of all coefficients of interest remain unchanged.

Appendix. Data Description

Primary Variables

FILING_VIOLATION: Indicator for insider transaction reported after the legally required date. Determination of a violation depends on the regulation in place at the time of the trade. For example, for the Jan. 1988 to Aug. 2002 portion of the sample period (pre-SOX), the filing deadline was the 10th day of the month subsequent to the trade. Post-SOX, the filing deadline is 2 business days following the date of the trade.

INTENTIONAL: Filing violations made by an insider that violates at least 95% of the time and files the transaction late by more than the median number of days delinquent (great than 3 days).

INSIDER_RATIO: Measures an insider's historical propensity to violate by scaling the total violations per insider by the insider's total trades, recalculated daily per insider.

FIRM_RATIO: Measures a firm's historical propensity to violate by scaling the total violations per firm by the firm's total transactions, recalculated daily per firm.

STEALTH_TRADING: A series of trades made by the same individual in the same direction, with all trades jointly reported.

ROUND_TRIP: A sequence of trades that consists of a purchase followed by a sell, with both trades reported after the reversal or "round trip," is complete.

EARNINGS_ANNOUNCEMENT: A transaction made within the 2 months preceding an earnings announcement, but not reported until after the earnings announcement.

RESTATEMENT: Insider transaction made during the restatement period but left unreported until after the restatement announcement. Only restatements resulting from fraudulent earnings management or those warranting an SEC investigation are considered.

TRADE_VALUE: Dollar amount of a transaction scaled by the market capitalization of the firm.

Ownership Structure Variables

BLOCKHOLDER: A shareholder owning at least 5% of the firm's shares outstanding. Institutional blockholder data are collected from Form 13F filings. Insiders' holdings are collected from Thomson Reuters.

BLOCKHOLDER_RATIO: Number of total firm shares held by blockholders scaled by the total number of shares outstanding.

HERFINDAHL–HIRSCHMAN_INDEX (HHI): Ownership concentration, calculated by taking each observable owner and dividing their holdings by the total shares held by all observable owners. This provides the percentage ownership for each owner within the subset of observable owners. Percentage ownership is then squared, and all observable ownership is summed.

NO_OF_BLOCKHOLDERS: Total number of blockholders present at the firm.

NO_OF_MAJORITY_BLOCKHOLDERS: Total number of blockholders owning at least 51% of the firm's shares outstanding.

NO_OF_MINORITY_BLOCKHOLDERS: Total number of blockholders owning between 5% and 51% of the firm's shares outstanding.

Market Outcome Measures

6-MONTH_CAR: Cumulative abnormal return for the 6-month period following the reporting of a delinquent transaction.

12-MONTH_CAR: Cumulative abnormal return for the 12-month period following the reporting of a delinquent transaction.

TOBINS_Q: Market value of the firm divided by the firm's total assets.

VOLATILITY(RAW): Average daily standard deviation of raw returns over the 120 trading days prior to the respective date.

SPREAD(−30,−1): Average relative daily spread calculated (−30, −1) days leading up to the respective date by subtracting the bid from the ask and dividing by the closing price for the day.

Insider Consequence Variables

REDUCTION_IN_BOARDS: Indicator variable set to 1 if the insider presides on fewer boards 12 months following the reporting of a trade, and 0 otherwise.

CHANGED_FIRM: Indicator variable set to 1 if the insider is identified with a different firm 12–24 months after the reporting of a trade, and 0 otherwise. The variable is estimated from Thomson Reuters insider filings database.

CHANGED_TO_SMALLER_FIRM: Indicator variable set to 1 if the departing insider is identified with a firm that has a market capitalization less than that of their previous employer, and 0 otherwise.

Controls

CORPORATE_SUITE: Indicator variable set to 1 for transactions made by members of the corporate suite, defined as CEO, CFO, CI, CO, and CT.

DIRECTORS: Indicator variable set to 1 for transactions made by a member of the board of directors.

BENEFICIAL_OWNER: Indicator variable set to 1 for transactions made by a beneficial owner.

OTHER_INSIDER: Indicator variable set to 1 for transactions made by a low-level insider that holds a committee, affiliate, or other position at the firm as classified by Thomson Reuters.

NASDAQ: Indicator variable set to 1 for firms listed on the Nasdaq exchange.

OTHER_EXCHANGES: Indicator variable set to 1 for firms listed on the NYSE Market, Arca, or BATS exchange.

ROA: Return on assets, defined as quarter-end net income divided by total assets. Lagged and winsorized at the 1st and 99th percentile.

LEVERAGE: Quarter-end total liabilities divided by total assets. Lagged and winsorized at the 1st and 99th percentile.

ln(SIZE): The logarithm-adjusted market capitalization of the firm at fiscal quarter end. Lagged and winsorized at the 1st and 99th percentile.

BOOK_TO_MARKET: Quarter-end book value divided by quarter-end market capitalization. Lagged and winsorized at the 1st and 99th percentile.

ln(DISTANCE): Number of miles between the firm's city center and the nearest city center of the top 10 largest metropolitan areas (New York, Los Angeles, Chicago, Washington, San Francisco, Philadelphia, Boston, Detroit, Dallas, or Houston). Distance is calculated using the Haversine equation following Kifana and Abdurohman (2012) and winsorized at the 1st and 99th percentile.

ln(AGE): Age of the firm takes a value of 1 in the year of the first stock price appearance on CRSP or Compustat. One year is added each year thereafter.

R&D_TO_ASSETS: Quarter-end research and development expense divided by quarter-end total assets. Any missing values for R&D are replaced with 0. Lagged and winsorized at the 1st and 99th percentile.

CASH_TO_ASSETS: Quarter-end cash and short-term Investments accounts divided by quarter-end Total Assets. All missing values are replaced with 0. Lagged and winsorized at the 1st and 99th percentile.

References

Aboody, D., and R. Kasznik. "CEO Stock Option Awards and the Timing of Corporate Voluntary Disclosures." *Journal of Accounting and Economics*, 29 (2000), 73–100.

Agrawal, A., and T. Cooper. "Insider Trading Before Accounting Scandals." *Journal of Corporate Finance*, 34 (2015), 169–190.

Akhigbe, A., and A. D. Martin. "Valuation Impact of Sarbanes–Oxley: Evidence from Disclosure and Governance Within the Financial Services Industry." *Journal of Banking & Finance*, 30 (2006), 989–1006.

Anand, A., and S. Chakravarty. "Stealth Trading in Options Markets." *Journal of Financial and Quantitative Analysis*, 42 (2007), 167–187.

Bagnoli, M.; M. Clement; and S. Watts. "Around-the-Clock Media Coverage and the Timing of Earnings Announcements." McCombs Research Paper Series No. ACC-02-06 (2005).

Barclay, M., and J. Warner. "Stealth Trading and Volatility: Which Trades Move Prices?" *Journal of Financial Economics*, 34 (1993), 281–305.

Bednarek, Z., and M. Moszoro. "The Arrow–Lind Theorem Revisited: Ownership Concentration and Valuation." *Applied Financial Economics*, 24 (2014), 357–375.

Bergstresser, D., and T. Philippon. "CEO Incentives and Earnings Management." *Journal of Financial Economics*, 80 (2006), 511–529.

Bettis, J.; J. Coles; and M. Lemmon. "Corporate Policies Restricting Trading by Insiders." *Journal of Financial Economics*, 57 (2002), 191–220.

Betzer, A.; J. Gider; D. Metzger; and E. Theissen. "Stealth Trading and Trade Reporting by Corporate Insiders." *Review of Finance*, 19 (2015), 865–905.

Bhide, A. "The Hidden Costs of Stock Market Liquidity." *Journal of Financial Economics*, 34 (1993), 31–51.

Bourveau, T.; C. Coulomb; and M. Sangnier. "Political Connections and White-Collar Crime: Evidence from Insider Trading in France." *Journal of the European Economic Association*, 19 (2021), 2543–2576.

Brochet, F. "Information Content of Insider Trades Before and After the Sarbanes–Oxley Act." *Accounting Review*, 85 (2010), 419–446.
Brooks, R.; D. Chance; and B. Cline. "Private Information and the Exercise of Executive Stock Options." *Financial Management*, 41 (2012), 733–764.
Burns, N., and S. Kedia. "The Impact of Performance-Based Compensation on Misreporting." *Journal of Financial Economics*, 79 (2006), 35–67. doi:10.1016/j.jfineco.2004.12.003.
Cao, C.; L. C. Field; and G. Hanka. "Does Insider Trading Impair Market Liquidity? Evidence from IPO Lockup Expirations." *Journal of Financial and Quantitative Analysis*, 39 (2004), 25–46.
Carlton, D., and D. Fischel. "The Regulation of Insider Trading." *Stanford Law Review*, 35 (1982) 857–895.
Carter, M.; A. Mansi; and D. Reeb. "Quasi-Private Information and Insider Trading." *Financial Analysts Journal*, 59 (2003), 60–67.
Cheng, S.; V. Nagar; and M. Rajan. "Insider Trades and Private Information: The Case of Delayed-Disclosure Trades." *Review of Financial Studies*, 20 (2007), 1833–1864.
Cline, B. N.; S. Gokkaya; and X. Liu. "The Persistence of Opportunistic Insider Trading." *Financial Management*, 46 (2017), 919–964.
Cohen, L.; C. Malloy; and L. Pomorski. "Decoding Inside Information." *Journal of Finance*, 67 (2012), 1009–1043. doi:10.1111/j.1540–6261.2012.01740.x.
Core, J., and W. Guay. "The Use of Equity Grants to Manage Optimal Equity Incentive Levels." *Journal of Accounting and Economics*, 28 (1999), 151–184.
Cumming, D.; S. Johan; and D. Li. "Exchange Trading Rules and Stock Market Liquidity." *Journal of Financial Economics*, 99 (2011), 651–671.
Damodaran, A., and C. Liu. "Insider Trading as a Signal of Private Information." *Review of Financial Studies*, 6 (1993), 79–119.
Daniel, K.; M. Grinblatt; S. Titman; and R. Wermers. "Measuring Mutual Fund Performance with Characteristic-Based Benchmarks." *Journal of Finance*, 52 (1997), 1035–1058.
DellaVigna, S., and J. Pollet. "Investor Inattention and Friday Earnings Announcements." *Journal of Finance*, 64 (2009), 709–749.
Easley, D.; S. Hvidkjaer; and M. O'Hara. "Is Information Risk a Determinant of Asset Returns?" *Journal of Finance*, 57 (2002), 2185–2221.
Edmans, A., and C. G. Holderness. "Blockholders: A Survey of Theory and Evidence." In *Handbook of the Economics of Corporate Governance*, Vol. 1. Amsterdam: North-Holland (2017), 541–636.
Efendi, J.; A. Srivastava; and E. Swanson. "Why Do Corporate Managers Misstate Financial Statements? The Role of Option Compensation and Other Factors." *Journal of Financial Economics*, 85 (2007), 667–708.
Electronic Code of Federal Regulations. "Title 17 – Commodity and Securities Exchanges, C.F.R. §240.16a-1(a)(1)(i-x)" (2011). Retrieved from https://www.govinfo.gov/content/pkg/CFR-2012-title17-vol3/pdf/CFR-2012-title17-vol3-sec240-16a-1.pdf.
Fidrmuc, J.; M. Goergen; and L. Renneboog. "Insider Trading, News Releases, and Ownership Concentration." *Journal of Finance*, 61 (2006), 2931–2973.
Fishman, M., and K. M. Hagerty. "Insider Trading and the Efficiency of Stock Prices." *RAND Journal of Economics*, 23 (1992), 106–122.
Glassman, C. "Sarbanes–Oxley and the Idea of 'Good' Governance." Speech. Washington, DC: American Society of Corporate Secretaries (2002). Retrieved from www.sec.gov/news/speech/spch586.htm.
Heflin, F., and K. W. Shaw. "Blockholder Ownership and Market Liquidity." *Journal of Financial and Quantitative Analysis*, 35 (2000), 621–633.
Holderness, C. G. "The Myth of Diffuse Ownership in the United States." *Review of Financial Studies*, 22 (2009), 1377–1408.
Holderness, C. G. "Problems Using Aggregate Data to Infer Individual Behavior: Evidence from Law, Finance, and Ownership Concentration." *Critical Finance Review*, 5 (2016), 1–40.
Jaffe, J. "Special Information and Insider Trading." *Journal of Business*, 47 (1974), 410–428.
Jeng, L. A. "Corporate Insiders and the Window of Opportunity." Working Paper, Boston University (1999).
Jeng, L. A.; A. Metrick; and R. Zeckhauser. "Estimating the Returns to Insider Trading: A Performance-Evaluation Perspective." *Review of Economics and Statistics*, 85 (2003), 453–471.
Jenter, D. "Market Timing and Managerial Portfolio Decisions." *Journal of Finance*, 60 (2005), 1903–1949.
John, K.; A. Knyazeva; and D. Knyazeva. "Does Geography Matter? Firm Location and Corporate Payout Policy." *Journal of Financial Economics*, 101 (2011), 533–551.
John, K., and L. H. Lang. "Insider Trading Around Dividend Announcements: Theory and Evidence." *Journal of Finance*, 46 (1991), 1361–1389.

Ke, B.; S. Huddart; and K. Petroni. "What Insiders Know About Future Earnings and How They Use It: Evidence from Insider Trades." *Journal of Accounting and Economics*, 35 (2003), 315–346.
Kifana, B. D., and M. Abdurohman. "Great Circle Distance Method for Improving Operational Control System Based on GPS Tracking System." *International Journal on Computer Science and Engineering*, 4 (2012), 647–662.
Klein, O.; E. Maug; and C. Schneider. "Trading Strategies of Corporate Insiders." *Journal of Financial Markets*, 34 (2017), 48–68.
Kyle, A. "Continuous Auctions and Insider Trading." *Econometrica*, 53 (1985), 1315–1335. doi:10.2307/1913210.
Lakonishok, J., and I. Lee. "Are Insider Trades Informative?" *Review of Financial Studies*, 14 (2001), 79–111.
Lee, D. S.; W. H. Mikkelson; and M. M. Partch. "Managers' Trading Around Stock Repurchases." *Journal of Finance*, 47 (1992), 1947–1961.
Lee, I. "Do Firms Knowingly Sell Overvalued Equity?" *Journal of Finance*, 52 (1997), 1439–1466.
Leland, H. "Insider Trading: Should It Be Prohibited?" *Journal of Political Economy*, 100 (1992), 859–887.
Lin, J. C., and J. S. Howe. "Insider Trading in the OTC Market." *Journal of Finance*, 45 (1990), 1273–1284.
Liu, H., and E. Swanson. "Is Price Support a Motive for Increasing Share Repurchases?" *Journal of Corporate Finance*, 38 (2016), 77–91.
Loughran, T. "Geographic Dissemination of Information." *Journal of Corporate Finance*, 13 (2007), 675–694.
Loughran, T., and P. Schultz. "Liquidity: Urban Versus Rural Firms." *Journal of Financial Economics*, 78 (2005), 341–374.
Manne, H., *Insider Trading and the Stock Market*. New York: Free Press (1966).
McCahery, J. A.; Z. Sautner; and L. T. Starks. "Behind the Scenes: The Corporate Governance Preferences of Institutional Investors." *Journal of Finance*, 71 (2016), 2905–2932.
Meulbroek, L. "An Empirical Analysis of Illegal Insider Trading." *Journal of Finance*, 47 (1992), 1661–1699.
Miller, J. M., and J. J. McConnell. "Open-Market Share Repurchase Programs and Bid–Ask Spreads on the NYSE: Implications for Corporate Payout Policy." *Journal of Financial and Quantitative Analysis*, 30 (1995), 365–382.
Niehaus, G., and G. Roth. "Insider Trading, Equity Issues, and CEO Turnover in Firms Subject to Securities Class Action." *Financial Management*, 28 (1999), 52–72.
Otto, C. "CEO Optimism and Incentive Compensation." *Journal of Financial Economics*, 114 (2014), 366–404. doi:10.1016/j.jfineco.2014.06.006.
Piotroski, J. D., and D. T. Roulstone. "The Influence of Analysts, Institutional Investors, and Insiders on the Incorporation of Market, Industry, and Firm-Specific Information into Stock Prices." *Accounting Review*, 79 (2004), 1119–1151.
Piotroski, J. D., and D. T. Roulstone. "Do Insider Trades Reflect Both Contrarian Beliefs and Superior Knowledge About Future Cash Flow Realizations?" *Journal of Accounting and Economics*, 39 (2005), 55–81.
Roulstone, D. "The Relation Between Insider-Trading Restrictions and Executive Compensation." *Journal of Accounting Research*, 41 (2003), 525–551.
Rozeff, M., and M. Zaman. "Overreaction and Insider Trading: Evidence from Growth and Value Portfolios." *Journal of Finance*, 53 (1998), 701–716.
Securities and Exchange Commission. "Ownership Reports and Trading by Officers, Directors and Principal Security Holders [Final Rule]." Release number 34-46421 (2002). Retrieved Aug. 13, 2017, from https://www.sec.gov/rules/final/34-46421.htm.
Securities Remedies and Penny Stock Reform Act of 1990. 15 U.S.C. §101 (1990). Retrieved from https://www.govinfo.gov/content/pkg/STATUTE-104/pdf/STATUTE-104-Pg931.pdf.
Seyhun, H. "Insiders' Profits, Costs of Trading, and Market Efficiency." *Journal of Financial Economics*, 16 (1986), 189–212.
Seyhun, H. "Do Bidder Managers Knowingly Pay Too Much for Target Firms?" *Journal of Business*, 63 (1990) 439–464.
Summers, S., and J. Sweeney. "Fraudulently Misstated Financial Statements and Insider Trading: An Empirical Analysis." *Accounting Review*, 73 (1998), 131–146.