

# The Dollar Profits to Insider Trading

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## Abstract

This paper studies trade quantities and dollar profits to insider trading, to investigate whether corporate insiders can exploit their superior information about the firm. We find that dollar profits are economically small for a typical insider, the median insider earning abnormal profits of \$464 per year. Variables that predict percentage returns fail to predict dollar profits, suggesting that insiders with the largest superior information do not turn this advantage into profits. Insiders who trade infrequently make high returns, while insiders who trade frequently make large dollar profits. We exploit a legally-imposed discontinuity to construct a new measure of insiders' intentions, which predicts both dollar profits and returns. This measure successfully identifies a small subset (0.5%) of insiders whose profits are significantly higher with a median of \$2,500 per year. Finally, we use variation in SEC budgets over time to assess whether monitoring can explain the different distribution of returns and profits. Our work highlights that using dollar profits as opposed to percentage returns offers contrasting evidence on a number of questions about insider trading. We argue that profits are a more precise measure for testing agency theories.

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The notion that corporate insiders possess more information about their firm than outside investors do plays an important role in models of financial markets. Much of the empirical literature uses the abnormal returns to corporate insider trading to measure the extent of insiders' informational advantage and finds that such returns are economically large.<sup>1</sup> However, there has been no research examining how much economic value insiders can extract from their superior information, i.e., insiders' *dollar profits*. In this paper, we provide the first such empirical analysis.<sup>2</sup>

Measuring the economic value extracted by insiders is crucial for testing agency theories. In agency models, the agent (manager) performs an action that does not maximize shareholder value, but yields a private benefit for the agent. To test such theories, it is important to measure private benefits accurately. The unit of measurement for such private benefits is a monetary amount, which, in the context of insider trading, corresponds to dollar profits rather than percentage returns. In principle, high abnormal returns need not lead insiders to make high dollar profits. Abnormal profits are determined by abnormal returns, but also by trade quantities, more specifically trade size and trade frequency. The latter two may vary substantially across insiders, and may also be correlated with abnormal returns.

Our work is also motivated by theoretical models of insider trading (see, e.g., Kyle (1985) for informed trading in general, and Huddart, Hughes, and Levine (2001) or Lenkey (2014) for corporate insider trading). Most existing empirical studies focus on abnormal returns

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<sup>1</sup> See, e.g., Seyhun (1986), and more recently, Lakonishok and Lee (2001), Ravina and Sapienza (2010), Cohen, Malloy, and Pomorski (2012), Alldredge and Cicero (2015), and Biggerstaff, Cicero, and Wintonki (2017). Jeng, Metrick, and Zeckhauser (2003) find that insider purchases earn positive abnormal returns but sales do not, while Eckbo and Smith (1998) find no evidence of superior performance in their sample of Norwegian insiders.

<sup>2</sup> Using a similar logic, Berk and van Binsbergen (2015) point out that mutual funds with the highest percentage abnormal returns (gross alpha) are not the ones that realize the highest economic profits in dollar terms. Their context differs from ours in that fund managers cannot directly choose the size of their fund, while in our analysis insiders can choose the size of their trades.

as the strategic variable of the insider, building on the idea that the timing of her trade is the primary choice variable and treating trade values as exogenously given. However, theoretical models of corporate insider trading typically consider an insider who chooses trade quantities with given private information, while she trades off gains from trading and the costs of exploiting informational advantages, such as litigation risk, reputational costs, or adverse selection costs imposed on other market participants.<sup>3</sup> Based on these theoretical models, we argue that trade quantities, i.e., trade sizes and frequencies, are further important strategic variables that the insider chooses jointly with abnormal returns. We therefore analyze these variables in detail.

Even if conceptually dollar profits are the more precise measure to examine the above theories, empirically returns and profits may be highly correlated, so looking at one or the other may make no difference. We show that this is not the case. Indeed, the main result of our paper is that using dollar profits as opposed to percentage returns offers contrasting evidence on a number of questions about insider trading: (1) dollar profits are typically small; (2) proxies for informed traders and informed trades that are positively correlated with returns are negatively correlated with dollar profits; (3) the sole exception is our new proxy for trading intentions, which predicts both profits and returns; and (4) dollar profits respond differently to monitoring than do returns.

First, we show that dollar profits are small for the typical corporate insider. Our dataset consists of all insider trades reported to the SEC during 1986-2013. The median insider who trades in a given year earns annual abnormal profits of \$464, while the average insider earns \$12,000 per year. The distribution of profits has a long right tail. For insiders whose

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<sup>3</sup> Huddart, Hughes, and Levine (2001) show theoretically that the insider does not choose trading quantities to fully exploit her private information, but adds some noise to her trading quantities. The notion that corporate insiders have an interest in outsiders' participation in the market is formalized in Ausubel (1990). Lenkey (2014) argues that trading too aggressively has an adverse effect on insiders' risk sharing ability in the future.

compensation we can observe, trading profits equal 0.1% of total compensation at the median, 1.1% on average. The main reason that profits are small is that most insiders trade infrequently. The average insider makes 7 trades in our sample, the median insider makes 3. We initially measure abnormal profits over the 20-day window after the trade, following the literature. However, the profits remain small if we extend this period to longer time horizons.

Measuring profits by assuming a fixed hypothetical horizon for all insiders may lead to mismeasurement as, e.g., unprofitable trades are closed earlier, or profitable ones later. To measure the profits that insiders actually realize ex post more accurately, we calculate profits from round-trip trades. Round-trips represent only 8.7% of our sample. It is also possible that this small subset of trades is more likely to be opportunistic and information-based. Round-trip transactions have an average holding period of 2.4 years. Even in this sample, we find that insiders placing such trades realize median (average) abnormal dollar profits of \$5,000 (\$125,000) per year. We present several additional tests to ensure that our results concerning the size of dollar profits are not due to mismeasurement. Our results suggest that only 7% of insiders enjoy trading profits that exceed 10% of their compensation.

Second, we show that high percentage returns do not imply high dollar profits. Aggregating profits at the insider-year level is critical to the measurement and comparison of trading profits, as some insiders trade frequently (see also, e.g., Betzer et al. (2015) or Klein, Maug, and Schneider (2017)). Even if per-trade values are small, in total they may add up. We show that dollar profits to insider trading are small partly because insiders with the most informative trades (earning large abnormal returns) are also the ones who trade infrequently and

in relatively modest amounts. Insiders who trade frequently earn lower percentage returns per trade, but still make higher dollar profits per year than infrequent traders.<sup>4</sup>

The observation that abnormal returns and dollar profits do not go hand in hand is also reflected in the cross-sectional and time-series patterns in dollar profits. We show that while informed trading proxies established by the existing literature indeed are positively correlated with abnormal returns, they are negatively correlated or uncorrelated with yearly dollar profits. In line with prior literature, we confirm that abnormal returns are higher for insider purchases (e.g., Lakonishok and Lee (2001), Jeng, Metrick, and Zeckhauser (2003), Fidrmuc, Goergen, and Renneboog (2006)), for opportunistic traders (Cohen, Malloy, and Pomorski (2012)), CFOs (Wang, Shin, and Francis (2012)), and executives (Ravina and Sapienza (2010)). However, we also show that yearly dollar profits are lower for all of these categories.

Third, exploiting a legally-imposed discontinuity, we propose a new measure capturing insiders' trading intentions. Section 16(b) of the Securities Exchange Act of 1934 defines short-swing profits as profits on round-trip transactions where the offsetting trades (e.g., the initial purchase and the subsequent sale) are less than 6 months apart. The law requires insiders to return these profits to the company. To our knowledge, ours is the first paper to analyze insider trading around this 6-month threshold.<sup>5</sup>

We find that insiders are 104% more likely to close round-trip trades right after the 6-month threshold than they are right before. We also find that round-trip trades completed just

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<sup>4</sup> Cohen, Malloy, and Pomorski (2012) classify insiders as either routine or opportunistic traders based on their past trading history. Our definition of frequent and infrequent traders looks only at the number of trades placed. We confirm that these two definitions provide two different partitions of the sample of insider trades. In fact, 69% of all opportunistic traders are frequent traders.

<sup>5</sup> Insiders who seek to generate profits can use alternative strategies such as tipping, trading in derivatives, or trading in related stocks, which would not be traceable through legal insider trades (e.g., Tookes (2008), Augustin, Brenner, and Subrahmanyam (2015), Augustin, et al. (2015), Mehta, Reeb, and Zhao (2017), Ahern (2017, 2018), Kacperczyk and Pagnotta (2018)). Insiders may also trade illegally, although such cases are rare (e.g., Meulbroek (1992), Bhattacharya and Marshall (2012)).

after the 6-month threshold earn profits more than twice as large as trades closed just before the threshold. Further, insiders who close a trade just after the 6-month threshold trade more frequently, have higher abnormal returns, trade higher dollar values on a yearly basis, and make higher dollar profits. Thus, our novel measure does well in identifying a small set of insiders who make high profits. Even in this small subset, which accounts for only 0.5% of our sample, profits are not very high. The median yearly abnormal profit is \$2,530, and the average is \$54,000, representing 0.3% relative to total compensation at the median, and 1.8% on average, respectively. Further, we show that having closed a trade after 181-200 days in the past predicts higher future returns, trading frequency, trade values, and profits, rejecting the notion that the differences are mechanical. Quantile regressions show that our measure does particularly well in predicting the right tail of the distribution of returns, trade quantities, and profits. The predictive power of our measure increases as we move to higher quantiles of the distribution.

Taken together, our analysis using the short-swing rule indicates that completing a round-trip transaction just after the 6-month threshold is a useful predictor of profit-seeking behavior. Our proposed new measure is positively associated both with profits and with returns, unlike other measures of informed trading suggested by the prior literature. Our findings are consistent with most insiders not trading with the intention generating profits, which may explain why profits are typically small. Insiders may trade for other reasons, e.g., to unwind their equity incentives (Ofek and Yermack (2003)), or to support the stock price (Wu (2018b)).

Fourth, we examine how dollar profits vary with market-wide changes in monitoring using variation in SEC budgets over time (e.g., Del Guercio, Odders-White, and Ready (2017)). Here, we find that different insiders respond differently to the increase in the SEC budget. Strikingly, insiders who trade more frequently actually *increase* their trade frequency even

further and increase their dollar profits. These results highlight that efforts that reduce abnormal returns to insider trades may not reduce profits, as the decrease in returns may be offset by an increase in trade frequency, and a change in the composition of insiders who trade.

Our paper contributes to three main strands of the academic literature. First, our study is related to the literature that investigates which observable characteristics predict the abnormal returns to insider trading (e.g., Jeng, Metrick, and Zeckhauser (2003), Cohen, Malloy, and Pomorski (2012), Alldredge and Cicero (2015), Biggerstaff, Cicero, and Wintoki (2017), Akbas, Jiang, and Koch (2018), Kelly (2018) Wu (2018a)). We add to that by examining the trading quantities that insiders choose, how much they make on their trades as a consequence, and to what extent observable characteristics that predict abnormal returns also predict dollar profits. To the best of our knowledge, this is the first study examining the dollar profits to insider trading.<sup>6</sup>

Second, our paper adds to the literature on insider trading as a source of private benefits. Since some insiders earn high percentage returns on their trades, one could consider insider trading as a form of executive compensation. Theoretical work (Dye (1984), Hu and Noe (2001)) argues that allowing corporate insiders to trade can be desirable for shareholders, because it creates managerial incentives and mitigates agency conflicts by strengthening the relation between the insider's personal wealth and firm value. This mechanism has been tested in several empirical studies (Roulstone (2003), Henderson (2011), Denis and Xu (2013), Cziraki, de Goeij, and Renneboog (2014)). Roulstone (2003) examines the relation between insider trading restrictions and executive pay in the U.S., and finds that firms that restrict insider trading pay higher total compensation. Denis and Xu (2013) study the relation in an international setting. All

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<sup>6</sup> Skaife, Veenman, and Wangerin (2013) analyze a sample of firms with an audit opinion on Internal Controls over Financial Reporting effectiveness under Section 404 of SOX, for the period 2004-2008. They find that insider trading profits relative to the market capitalization of the firm are higher in firms disclosing material weaknesses in internal control, but they do not analyze dollar profits beyond this comparison.

of this literature uses percentage returns to measure private benefits, which is imprecise. Instead, we estimate the economic value extracted by insiders, a measure of private benefits that *a priori* matches the underlying theory more precisely than percentage returns. We show that dollar profits, and hence insiders' private benefits, are small, even though percentage returns may be large. Even insiders who likely view trading profits as compensation extract modest economic value. The average of \$54,000 per year is moderate compared to the average executive compensation of \$3 million per year in our sample. Our findings suggest that using the economic value extracted by insiders paints a very different picture of insiders' private benefits than returns. Hence, future studies interested in measuring private benefits from insider trading should analyze dollar profits.

Third, our paper contributes to the literature studying the relation between corporate governance and insider trading (Roulstone (2003), Ravina and Sapienza (2010), Cziraki, de Goeij, and Renneboog (2014)). Our results suggest that corporate insiders who make large profits do not make high returns on average, but trade frequently. We also show that different insiders respond differently to the increase in the SEC budget. Insiders who trade more frequently increase their trade frequency even further and increase their dollar profits when the SEC budget is higher.

## **2. Data and summary statistics**

### *2.1. Sample*

We use data from Table 1 of the Thomson Reuters insider transaction database, which consists of all transactions filed on Form 4 of the U.S. Securities and Exchange Commission. Our sample period extends from January 1986 to December 2013. Following prior literature, we work with outright buys and sells, identified as transaction codes "P" and "S". When the same insider



makes multiple transactions in the same stock on the same day, we aggregate the total number of shares traded to the daily level. In such cases, we also value-weight transaction prices to obtain the total dollar value of the trade. Finally, we merge with data from CRSP.

We impose the following filters: For transaction price, we drop all trades for which the reported transaction price is outside the daily low-high range reported in CRSP, or more than 20% away from the closing price of the day. For transaction size, we drop transactions for which the number of shares traded is higher than either the trading day's total volume reported in CRSP or half of the total market capitalization of the company.<sup>7</sup> Finally, for trades reported on dates when exchanges are closed, we use data on the first trading day following the reported transaction date. We merge the insider trade sample with financial statement information from Compustat and the number of analysts covering the firm's stock from I/B/E/S. We obtain data on executive compensation from ExecuComp, which reports the compensation of the top 5 highest-paid executives of firms in the S&P 1500, starting in 1993. We winsorize all variables at the 1<sup>st</sup> and 99<sup>th</sup> percentiles.

Table 1 Panel A describes the resulting sample. Overall, we are left with 644,643 transactions, about a quarter of which are purchases.<sup>8</sup> We have data on 92,758 insiders trading across 7,643 unique firms. 22% of insiders only buy shares, 57% only sell shares and 21% trade in both directions. The typical insider makes very few trades (with a median of 3 and an average of 7), although some insiders trade much more and trade the shares of more than one company.

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<sup>7</sup> We obtain very similar results if we do not exclude these trades.

<sup>8</sup> There are approximately 1.3 million insider transactions in the Thomson Reuters database. We exclude transactions of stock with unreasonable book-to-market values that are negative or higher than 100 (approximately 11% of observations), missing return histories (approximately 19% of observations) and missing analyst coverage from I/B/E/S (approximately 22% of observations).

## *2.2. Measuring returns and dollar profits*

We use two complementary approaches to measure the dollar profits to insider trading. Our first approach is to multiply the dollar value by the abnormal return in the 20 days after the trade. This approach follows the one taken in prior studies: given an insider transaction, we evaluate the return over a pre-specified period after the transaction, following the trading horizon choice of Cohen, Malloy, and Pomorski (2012), using the Fama-French 3-factor model as our return benchmark. We estimate factor betas using monthly data for the 36 months preceding the trade. In all of our tests, we multiply returns on insider sales by  $-1$ , to facilitate comparison with insider purchases. The benefit of this approach is that we are able to use all insider transactions. The drawback is that the profits are hypothetical and may not correspond to the dollar gains any particular insider realizes.

Our second approach is to calculate profits from round-trip transactions. For example, if we observe an insider buying 100 shares in January and selling those 100 shares in December, we can calculate the dollar gains or losses on this trade. Because the number of shares bought and sold may not be equal, for each insider with both buys and sells in the sample we compute profits using the value-weighted purchase and sale price. As insiders accumulate a position in a stock, we keep track of the value-weighted purchase price, and compute profits by subtracting that price from the price at which they sold the stock. We adopt the same approach for sale transactions followed by purchases. We track the inventory of both shares purchased and shares sold, and record a round-trip profit of zero if an insider sells (buys), but the inventory indicates that there are no previously bought (sold) shares left to sell (buy). To arrive at abnormal round-trip profits, we subtract profits to a benchmark strategy that earns the returns predicted by the Fama-French 3-factor model. Finally, we set round-trip profits to zero if the two transactions

occur within six months, because the short-swing rule requires that insiders pay back any such profits to the company.

While this approach measures actual instead of hypothetical profits, we are able to apply it only to a subset of insiders who have both buys and sells in our sample. The median insider in the dataset only trades three times in the sample, and these trades are often in the same direction (all buys, or all sells).

### *2.3. Trade quantities, returns, and dollar profits*

Panel B of Table 1 reports the average and median value traded for the overall sample. The value traded is highly skewed. Insiders transact roughly \$129,000 per trade at the median, but the average trade is much larger at \$631,000.<sup>9</sup> On average, corporate insiders generate positive returns of 0.9% (median of 0.6%) within a 20-day window. The distribution of abnormal returns, shown in the top graph of Figure 1, roughly follows a normal distribution, though it has a higher kurtosis. Abnormal dollar profits are small: per trade, insiders generate an average (median) abnormal profit of approximately \$4,000 (\$141). The bottom right graph of Figure 1 confirms that the distribution of abnormal dollar profits has a long right tail.<sup>10</sup>

We examine dollar profits aggregated at the yearly level because certain insiders tend to split up their trades into several smaller parts and trade over several days. Dollar profits at the trade level may therefore underestimate the true profits accruing to these insiders. Yearly abnormal dollar profits are still rather small with a median value of \$464 and a mean of

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<sup>9</sup> We provide time-series information on trade quantities, returns, and profits in the Internet Appendix in Tables A1 and A2.

<sup>10</sup> The bottom left graph of Figure 1 shows the distribution of the entire sample, while the bottom right graph shows the distribution of abnormal profits excluding values between  $-\$30,000$  and  $\$30,000$  to show the longer right tail.

\$12,000.<sup>11</sup> Insider trading profits account for 0.1% of total compensation at the median and 1.1% on average, while at the 90<sup>th</sup> percentile, trading profits are equal to 6.7% of total compensation. Only 7% of insiders make profits that exceed 10% of their compensation (not shown in a table). We conclude that insider trading profits do not represent a meaningful source of compensation for the typical insider, but only for a small subset. Finally, Table 1 Panel C shows summary statistics of the control variables used in our regressions.

Looking at our second measure of insider trading profits, Table 2 Panel A shows that the median (average) round-trip profit of a trade is \$1,000 (\$61,000). Aggregating round-trip profits at the insider-year level yields median (average) profits of \$5,000 (\$125,000). Round-trip profits are higher than 20-day profits for two reasons. First, round-trip profits for a given trade can only be calculated if the insider traded in the opposite direction previously. This is the case for 7.8% of observations, which may represent a non-random subsample of trades. Indeed, Panel B of Table 2 shows that trades for which we are able to construct round-trip profits are substantially smaller, but generate larger abnormal returns. As a result, round-trip profits are available for trades that tend to be more profitable, and therefore represent an upper bound of insider profits. Second, with an median (average) holding period of 579 (882) days, round-trip profits are higher because the holding period is much longer.<sup>12,13</sup>

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<sup>11</sup> Table A2 in the Internet Appendix shows trade-level and yearly abnormal profits for longer trading horizons of 3, 6, and 12 months. The yearly profits range from a median of \$945 for a 3-month horizon to a median profit of \$1,442 for a 12-month horizon. Due to the strong right skew of the distribution, the average values are much larger and range from \$26,000 for a 3-month horizon to \$68,000 for a 12-month horizon.

<sup>12</sup> Panel A of Table A3 in the Internet Appendix provides a breakdown of value traded, abnormal returns, and profits by insider role. In Panel B of Table A3, we aggregate insider trading profits at the firm level to shed light on the value that outside investors may lose when they trade against corporate insiders as their counterparty. The median (average) value of yearly abnormal profits at the firm level is \$3,000 (\$61,000). Panel C of Table A3 contains aggregates over the insiders' lifetime: The median (average) abnormal dollar profit is \$1,000 (\$35,000), and the median (average) abnormal round-trip profit is \$0 (\$43,000).

<sup>13</sup> In Panel D of Table A3, we examine whether insiders make losses, and whether such losses are large. Almost half (47%) of reported all trades make a loss, defined as a negative abnormal dollar profit over the 20-day horizon. Conditional on making a loss, the median yearly loss is \$8,000, and the average loss is \$58,000. These values are

Reporting requirements expire six months after a corporate insider leaves the firm. In Internet Appendix C, we consider the possibility that insiders make profits that are not captured by any of the measures used in the main analysis, which may lead to an underestimation of profits. This would be the case if an insider bought stock that did not appreciate immediately, but did rise in value after a few years, and the insider did not sell this stock before leaving the firm. We estimate these profits and find that they are not large enough to bias our results.

#### *2.4. The relation between trading frequency and dollar profits*

There is substantial heterogeneity in trading frequencies, which determine dollar profits in addition to abnormal returns and transaction volume. In this subsection, we try to understand the relation between trading frequency and dollar profits. To that end, we create deciles based on the number of trades for an insider's lifetime in the sample. The top left graph of Figure 2 shows the mean number of trades for each decile. Deciles 2 and 3 are missing because 25% of all insiders place only one trade in their lifetime. As a result, all insiders with one trade are in the first decile. The growth over deciles is slow and approximately linear for all but the top two deciles: the average number of trades in the bottom decile is 1, increasing to 5 trades for the fifth decile, an average of 10 trades for the ninth decile, and 30 trades for the top decile.

The top right graph shows an inverse relation between trading frequency and average abnormal returns: the more frequently insiders trade, the lower are their average abnormal returns. The most informative trades are placed by insiders who trade infrequently. The bottom left graph shows that there is no significant relation between trading frequency and average trade-level abnormal profits. If anything, trade-level abnormal profits are lower for the upper

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much larger for frequent traders, with a median loss of \$19,000 and an average loss of \$99,000. Losses are slightly larger for insider-years in which an insider only sells.

deciles. However, the bottom right graph reveals a strong positive relation between trading frequency and yearly average dollar profits. Even though abnormal returns are smaller for insiders who trade frequently, overall yearly profits appear to be mainly driven by trade frequency rather than average abnormal returns. This analysis supports the notion that abnormal returns do not line up with dollar profits.

### **3. Do informed trading proxies predict dollar profits?**

In this section, we examine whether informed trading proxies that have been shown by the existing literature to predict abnormal returns also predict abnormal dollar profits. These informed trading proxies are typically associated with the size of the insiders' informational advantage, but they can also be associated with the costs of exploiting private information. Insiders with considerable private information can deliberately choose to trade small quantities. They may do so because their incentives are aligned with those of other shareholders or because they are subject to larger public scrutiny as a top executive in the firm. In line with existing theoretical models, these costs and, accordingly, the informed trading proxies may be inversely associated with insider trading quantities such as value traded, frequency, and yearly profits.

Our first result is that the analysis of dollar profits yields contrasting evidence to the analysis of percentage returns. In situations where the extant literature predicts trades to be informative, dollar profits are not large; in fact, in many cases, they are even smaller. Table 3 shows the results from regressions of abnormal returns, trade quantities, and dollar profits on six different proxies for whether an insider or trade is more likely to be informed, while controlling for firm fixed effects, year fixed effects and, firm-level control variables. Table 3 only reports the

coefficients and standard errors for the respective informed trading proxies for brevity.<sup>14</sup> Because the buy dummy is a trade-level proxy, in columns 2, 4, 6, and 7, we use the mean of the variable for the given insider-year observation (i.e., the percentage of buys) instead of a dummy.

For most proxies of informed trading, we find higher percentage returns in line with prior studies, but lower trading frequency, lower trade value, and, as a result, lower dollar profits. Column 1 of Table 3 shows that abnormal returns are higher for purchases, confirming the results of Lakonishok and Lee (2001), Jeng, Metrick, and Zeckhuser (2003), and Fidrmuc, Goergen, and Renneboog (2006). However, our results also show that more insider buying is associated with significantly less frequent trading (column 2) and trading significantly smaller amounts (columns 3-4). Finally, columns 6 and 7 show that yearly abnormal profits and round-trip profits are lower, or not significantly higher, for insiders who buy.

The regressions in rows 2-5 of Table 3 show a similar pattern for opportunistic traders (Cohen, Malloy, and Pomorski (2012)), infrequent traders using our cutoff value of 20 trades, CFOs (Wang, Shin, and Francis (2012)), and executives (Ravina and Sapienza (2010)). For each of these variables, we confirm that it is associated with higher percentage returns, but also lower yearly abnormal profits. Yearly abnormal profits and round-trip profits are also lower for opportunistic traders, although not significantly so. For insiders who only buy and for executives, the point estimates for abnormal profits (column 5) and yearly abnormal round-trip profits (column 7) are positive, but not statistically significant. Overall, we conclude that insiders who

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<sup>14</sup> Table A4 in the Internet Appendix reports the coefficients for the firm-level control variables. In Panel A, we regress the dependent variables on year fixed effects and firm-level control variables. In Panel B, we add firm fixed effects to the regressions. We include firm fixed effects throughout the regressions in the paper, because there is substantial heterogeneity in the dependent variables across the firms. This heterogeneity is supported by the following analyses: Panel A of Table A5 documents that there is significant persistence in returns, trade frequency, volumes, and dollar profits as shown by the large positive coefficients on their lagged values. In Panel B of Table A5, we test the null hypothesis that the firm fixed effects are jointly equal to zero. We reject this null for all dependent variables, indicating that there is substantial firm-level heterogeneity. The results of Table 3 are similar if we remove firm fixed effects from the regressions, as shown in Table A6 in the Internet Appendix.

are more likely to be informed make lower dollar profits on their insider trading, or do not make higher profits, *despite* making higher percentage returns.

Purchases have higher percentage returns than sales and are smaller on average. It is possible that some of the patterns we document arise mechanically from the differences between purchases and sales, if the informed trading proxies are correlated with the purchase dummy. Table A7 in the Internet Appendix tests this explanation by repeating the analyses in Table 3 separately for purchases and sales. Informed trading proxies are positively associated with percentage returns, but negatively associated with trading quantities, both in the purchase and in the sales subsample, rejecting a mechanical explanation.<sup>15</sup>

If insiders have access to information and are able to generate high percentage returns, why do they not make high dollar profits as a result? Section 4 examines insiders' trading behavior around the short-swing rule, and develops a novel measure related to trading intentions to predict dollar profits. Section 5 examines whether monitoring reduces insiders' trading profits.

#### **4. Evidence on trading intentions from the discontinuity around the short-swing rule**

One potential explanation for the small typical trading profits, and the finding that the most informed insiders do not generate the largest profits, is that insiders are not primarily driven by making profits but by alternative motives. Ideally, we would like to observe trading motives directly to understand whether differences in these intentions drive dollar profits. Observing intentions would allow us to derive a counterfactual distribution for insiders who do not care

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<sup>15</sup> Internet Appendix D compares the role that risk aversion and trading ability play in determining high dollar profits.



about profits. We exploit a legal threshold, the so-called short-swing rule, to investigate whether the *objective* of some insiders is to earn profits from their trades and to identify these insiders.<sup>16</sup>

The short-swing rule is defined under section 16(b) (15 U.S.C. § 78p) of the Securities Exchange Act of 1934. It mandates that insiders who realize profits on round-trip transactions where the offsetting trades (e.g., the initial purchase and the subsequent sale) are less than 6 months apart must return these profits – referred to as short-swing profits – to the company.<sup>17</sup> A clear implication of this law is that if an insider wishes to keep these profits, she needs to wait more than 6 months after a purchase (sale) to make the offsetting sale (purchase).

Section 4.1 analyzes whether the distribution of trades is continuous around the 6-month threshold, and whether trades closed just short of the threshold are different from those closed just after the threshold. Section 4.2 compares insiders who close a trade just after the expiration of the rule with those who do not. Section 4.3 examines whether having closed a trade just after the threshold in the past predicts future trading behavior and outcomes.

#### *4.1. Round-trip trades closed around the short-swing rule threshold*

We are first interested in the continuity of the distribution of trades around this threshold, i.e., whether there is bunching to the right of the threshold. Under the null hypothesis that corporate insiders do not choose to close their trades later to retain the profits, we expect a similar number of round-trip transactions to be closed just short of the threshold (after 170-180 days), compared to just after the threshold. Figure 3 shows the number of round-trip trades closed after 100-260 days across 10-day bins. The vertical line at 180 days indicates the threshold imposed by the short-swing rule. The number of round-trips closed ranges between 329 and 406 in each of the

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<sup>16</sup> See Kleven (2016) for a survey of this empirical strategy and recent applications.

<sup>17</sup> In cases where an insider places multiple purchases and sales within 6 months, the company is entitled to recover the highest profit possible under the sequence of transactions (see e.g., Chin (1997, 2016)).

bins to the left of the threshold. There are 392 round-trips closed just short of the threshold, after 171-180 days. In contrast, there are 1,299 round-trip trades closed just after the threshold, after 181-190 days. The number of round-trips closed after 191-200 days is also high, at 844. Thus, there is obvious bunching to the right of the 6-month threshold set by the short-swing rule: we find a large increase in the number of round-trip trades closed immediately after 6 months.

In Table 4 Panel A, we test whether the difference in the density to the left and to the right of the threshold is significant using the method suggested by McCrary (2008), and the local polynomial density estimator of Cattaneo, Jansson, and Ma (2017), which uses a data-driven bandwidth selector. Table 4 Panel A shows that the estimate of the change in density – the log difference – is 104%. Insiders are 104% more likely to close a round-trip transaction just after the 6-month threshold than just before it. Both the McCrary (2008) test and the robust t-test of Cattaneo, Jansson, and Ma (2017) reject the null hypothesis that the density is continuous around the threshold of 180 days with t-statistics of 24.79 and 10.54 respectively.

An interval of 6 months may vary in length depending on which months it contains. Our results are similar in size and statistical significance when we use a threshold of 181 or 182 days. We also examine the idea that trading around the 6-month threshold reflects a natural time interval for the insider after which they might evaluate their trading position. Against this hypothesis, we show that there is no similar bunching in the density around thresholds of 30, 60, 90, 100, 365, or 730 days, which may be equally (if not more) natural evaluation periods. The differences in log density are negative for 30 and 60 days, suggesting that there are more trades just *before* the threshold. We find a difference of 10.6% around the threshold of 90 days. While this difference is statistically significant according to one test, the economic magnitude is one tenth of the effect we find around the 6-month threshold, and it actually reverses when we look at

the 100-day threshold. Finally, we find no significant bunching around the thresholds of 365 or 730 days. Overall, these tests suggest that insiders are significantly more likely to close a round-trip just after 6 months, when they can retain the proceeds from the round-trip trade, and that the 6-month threshold is unique in this regard.

Next, we investigate how bunching varies across different subsamples of firms, insiders, and trades. Table 4 Panel B examines the number of observations in the 10 days before and 10 days after the expiration of the short swing rule. We sort firm-year observations into quintiles and compare the top and bottom quintiles. We also compare the jump in the density around the 6-month threshold using a  $\chi^2$  test whose null hypothesis is that the percentage of trades closed before vs. after the threshold is the same in the two subsamples.

Signaling motives – as opposed to profit-seeking – are likely to be higher for insiders in small firms and growth firms, as the uncertainty around future firm value is greater for such firms. Hence, we expect that profit-seeking should be more evident for larger and more mature firms. Indeed, we find that the occurrence of short-swing trading is higher in large firms than in small firms. Insiders are 2.2 times more likely to close the trade just after the expiration of the short-swing rule than before it in small firms, but 3.5 times more likely to do so in large firms. The  $\chi^2$ -value indicates that this difference is statistically different from zero at the 1% level. Similarly, we find that closing a trade just after the expiration of the short-swing rule compared to just before is more likely in low-growth than high-growth firms.

Closing a trade after the expiration of the short-swing rule is more likely for more wealthy insiders, indicating that for insiders with low personal financial constraints, profit-seeking motives are more dominant compared to other trading motives. Executives are much more likely to close trades just after the expiration of the short-swing rule compared to

blockholders or other insiders without any active role in managing the firm. Closing trades just after the expiration of the rule seems slightly more likely during periods with a high SEC budget. However, the difference fails to be statistically significant at conventional levels.

Next, we examine whether closing a trade after 180 days is correlated with measures of opportunistic behavior used in the literature, trading frequency, or firm-level governance proxies. First, we do not find any significant difference between trades is classified as opportunistic and routine according to Cohen, Malloy, and Pomorski (2012). Thus, our measure is different from the routine vs. opportunistic classification. Second, following Ali and Hirshleifer (2017), we construct a measure of managerial opportunism that is based on insider trades in the 21 days preceding a quarterly earnings announcement and the corresponding market response to these earnings announcements. There is no difference between insiders with high or low managerial opportunism. Hence, our measure captures an aspect of insiders' behavior that is distinct from the one documented by Ali and Hirshleifer (2017). Third, trading frequency is also not significantly related to closing trades just after the expiration of the short-swing rule. Lastly, we examine potential differences between firms with high and low institutional ownership, and high and low board independence. We find no difference in the bunching between these groups and conclude that trading around the threshold is not related to these two aspects of corporate governance.

Next, we show that trades closed just after the 6-month threshold earn higher profits than those closed just short of the threshold. Figure 4 Panel A shows a significant discontinuity in profits. Round-trip trades closed after 171-180 days earn an average profit of \$44,000 dollars, whereas those closed between 181-190 days earn significantly higher average profits of \$100,000 dollars. To understand the source of these profits in more detail, we ask whether they

are driven by higher returns, larger trade values, or both. We find that trades closed just after 6 months have higher implied abnormal returns (calculated as the ratio of abnormal dollar profits to trade value, shown in Figure 4 Panel B), and are also larger (Figure 4 Panel C). The difference is significant for both variables, and larger for returns.

#### *4.2. Broader comparison of insiders that close a trade after 181-200 days to others*

So far, we have focused on contrasting round-trip trades just after the 6-month reporting threshold with those just before the threshold. We continue by comparing the trades of insiders who complete a round-trip transaction after 181-200 days to the trading of all other insiders in the sample. We denote insiders who completed a round-trip transaction after 181-200 days in a given year using the indicator *Closed 181-200* in Table 5 column 1.

Table 5 compares descriptive statistics of the trades of these insiders to two other groups of insiders: those who do complete a round-trip transaction but not after 181-200 days (column 2) and all insiders who do not complete any round-trip transaction after 181-200 days in a given year (column 3). Panel A shows medians and Panel B shows averages. Insiders closing after 181-200 days earn higher abnormal returns than both comparison groups, both on average and at the median. Columns 4-7 show that the difference is highly statistically significant relative to both comparison groups. Abnormal returns are not the only difference: these insiders also trade more frequently than do insiders in the other two groups. An insider closing after 181-200 days places 3 trades per year at the median (5.18 on average) relative to 2 (3.54) trades for other insiders with round-trip trades, and 1 (2.79) for all other insiders. Hence, these insiders have both higher returns and higher trade frequency than other insiders, even though we show in Figure 2 that trade frequency is generally negatively correlated with abnormal returns.

Finally, as a result of the higher abnormal returns and higher trading frequency, insiders closing after 181-200 days make significantly higher yearly abnormal profits. Their median (average) yearly abnormal profit is \$2,530 (\$54,210) per year, while if we use yearly abnormal round-trip profits, the median (average) rises to \$10,490 (\$318,580). The large difference between the average and the median indicates, once again, that the distribution has a long right tail. The profits of this small group, which accounts for less than 0.5% of our sample, are still modest at the median, but are economically significant on average, due to the long right tail of the distribution.

#### *4.3. Does closing a trade after 181-200 days predict future trading behavior and outcomes?*

We now examine whether the stark differences between insiders that close a trade after 181-200 days and others may arise mechanically. It is possible that insiders get lucky to experience a large abnormal return after their first trade and they close the transaction after the expiration of the short-swing rule to monetize the gains. In this case, abnormal returns should be higher, as the notion of “getting lucky” implies that some trades will not be profitable and therefore the insider will not close them after 181-200 days. However, this alternative hypothesis cannot explain why trading frequency is greater. To test this alternative explanation further, we examine whether having closed a trade between 181-200 days predicts *future* behavior and outcomes. Under the mechanical explanation, we would not expect any significant relation.

In Table 6 we regress returns, volumes, and dollar profits on an indicator set to 1 if the insider has closed a trade after 181-200 days in the past, and our set of control variables. We find that insiders who completed a round-trip transaction after 181-200 days in the past have higher abnormal returns on their trades, trade more frequently, trade higher dollar values on a yearly

basis, and reap higher dollar profits on their trades in general than do other insiders who have round-trip transactions. All of these correlations are consistent with the notion that insiders who complete a round-trip transaction just after the 6-month threshold care about their trading profits in general. Given that we control for firm fixed effects in all regressions, trading with the apparent goal of maximizing profits seems to be a trait specific to insiders.<sup>18</sup>

As we document in Figure 1, the distribution of abnormal profits has a long right tail. We therefore run quantile regressions using the same specification as in Table 6 to examine the explanatory power of our profit-seeking dummy across the entire distribution. Figure 5 summarizes the regression coefficients of the profit-seeking dummy across these quantile regressions from the 5<sup>th</sup> to the 95<sup>th</sup> percentile and the corresponding 95 percent confidence intervals. The coefficients are positive and statistically significant for all percentiles above the median. Further, they monotonically increase when estimating higher percentiles of all outcome variables. This increase is especially pronounced for yearly trade value, profits, and yearly profits. These results suggest that our measure is more accurate in predicting the right tail of the distribution of returns, frequencies, and profits.

A potential concern with insiders who close a round-trip just before the 6-month threshold is that they may be inattentive or trade for idiosyncratic reasons. In Panel B of Table 6 we therefore exclude observations of insiders who close a round-trip transaction early. The differences between insiders who closed a trade after 181-200 days in the past and others are slightly smaller, but remain substantial. In the case of abnormal profits, the difference is actually larger than before. These findings suggest that the differences are not driven by insiders who

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<sup>18</sup> Trading frequencies and yearly trading profits could also be higher under a different mechanical explanation: if there are 6 months between the first and the second leg of the round-trip, these transactions are more likely to occur in the same year. We rule out this explanation by excluding trades in the first 6 months of the year (which would be closed in the same year). The results from this test are similar to those in Table 6 and are unreported for brevity.

close trades before the expiration of the short-swing period. Panel C compares insiders who have closed their trades after 181-200 days in the past to other insiders with round-trip transactions. The coefficient of the indicator is positive, yet fails to be statistically significant for abnormal returns and trade-level abnormal profits. However, the indicator still predicts substantial differences in terms of trading frequencies, trading values, and yearly abnormal profits.

Summarizing the evidence, Figure 3 and Table 4 show that insiders are more likely to close a round-trip transaction when they are allowed to keep the profits. Figure 4 shows that not only are there more trades closed just after the 6-month threshold, but these are significantly more profitable than those closed just before.

The results in Table 5 indicate that insiders who close a round-trip transaction just after the short-swing threshold in one year trade more frequently *and* have higher returns on their trades in the following year. As a result, they realize significantly higher profits. The results in Table 6 show that having closed a trade after 181-200 days in the past predicts future trading behavior and outcomes. Quantile regressions confirm that the dummy variable *Closed 181-200 in the past* becomes a better predictor of the higher quantiles of returns, trade values, and profits. Collectively, these four pieces of evidence are consistent with the notion that insiders who close trades just after the 6-month threshold are aware of the regulation and trade with the intention of turning a profit.

There may be alternative explanations for insiders closing a trade right after the expiration of the short-swing rule. First, it may be the case that some insiders mechanically make the offsetting trade 6 months after the threshold to fully comply with these regulations. Second, the insider may want to hedge her exposure as early as possible without incurring a loss due to the short-swing rule. However, neither of these alternative stories can explain why the *same*



insiders also trade more frequently and more profitably in the future. Any alternative hypothesis would have to explain simultaneously (i) the bunching of trades after the threshold, (ii) why trades closed right after the threshold are more profitable, (iii) why insiders closing trades right after the threshold also trade more frequently and more profitably in future years, and also (iv) why this relation is more pronounced for higher quantiles of the distribution.

## **5. Monitoring and the dollar profits to insider trading**

The differences between patterns in percentage returns and dollar profits may be ascribed, at least in part, to monitoring. It is possible that insiders who have more information also face a higher degree of scrutiny from regulators, which prevents them from using their superior information to extract profits. In this section we investigate how insider trading returns, frequency, trade size, and profits respond to variation in monitoring. This analysis may help understand why we obtain contrasting evidence for returns and profits. For example, insiders may adjust their trading patterns in response to increased monitoring, and different insiders may respond differently. On the one hand, we expect greater scrutiny from the SEC to increase the cost of exploiting material, non-public information. On the other hand, we expect that greater scrutiny allows more innocent trades to be larger.

In our empirical approach, we continue to use firm fixed effects to isolate variation that is specific to insiders rather than firms. As a result, we rely on sources of time-series variation in monitoring intensity. First, we follow the approach of Del Guercio, Odders-White, and Ready (2017) who use the SEC budget in constant U.S. dollars as a resource-based measure of enforcement intensity. There is substantial variation in the SEC budget over time: in real terms, the budget has increased six-fold over the sample period. The authors argue that the variation in

the SEC budget can be viewed as independent of the severity of actual trading on inside information, as it is primarily determined through idiosyncratic political budgeting processes, which mitigates potential concerns of reverse causality.

Panel A of Table 7 reports the results of regressions of returns, frequency, trade size, and profits on SEC enforcement intensity. For a one-standard-deviation (\$313M) increase in the SEC budget, abnormal returns decrease by 0.13 percentage points (column 1). The negative and statistically significant coefficients of the SEC budget in columns 2 and 3 suggest that both trade frequency and average trade size decrease with higher SEC budgets. Per-trade profits also decrease by \$21 for a one-standard-deviation change in the SEC budget. We find no significant relation between yearly abnormal profits and monitoring intensity. The coefficient is negative but small and not statistically significant. Considering that abnormal returns, trade frequency, and trade values significantly decrease, it may appear puzzling that yearly abnormal profits do not. One potential explanation is that the changes in these variables occur for different insiders: trade frequency decreases for some, while trade value or abnormal returns decrease for others.

To test this explanation, we compare the response of informed and uninformed trades and traders to changes in monitoring. In Panels B-F of Table 7 we interact SEC budgets with our five proxies for informed trading from Table 3. As we are primarily interested in the difference between the (*Group*  $\times$  *SEC budget*) interaction coefficients, we show the F-statistic below each regression. In all of these panels, we find that trades (or insiders who) are more likely to be informed earn lower returns in years when the SEC budget is higher. The only exception is Panel B, where insiders who only buy respond less to changes in the SEC budget. Even if purchases are more likely to be informed, as indicated by the positive coefficient on the buy dummy variable, general litigation concerns are typically higher for insider sales (Chen, Martin, and

Wang (2013)). However, columns 6 and 7 show that when we also take trade size and trade frequency into account, a higher SEC budget is not always associated with lower yearly abnormal profits for informed trade(r)s. With the exception of Panel B, we find that insiders who are more likely to be informed exhibit greater decreases in trading profits for increases in the SEC budget, as shown by the larger coefficients of the interaction term for less informed traders in column 6.

The difference is most striking when we compare the response of frequent vs. infrequent traders. While abnormal returns and trade frequency of infrequent traders (who are more informed, on average) decrease when the SEC budget is higher, trade frequency and yearly trade value of frequent traders increase, and so do their yearly trading profits.

The results in Panel F illustrate the importance of understanding correlations between insider type, trade quantities, and percentage returns. The F-test in column 1 shows that abnormal returns of executives drop significantly more when the SEC budget is high than abnormal returns of non-executives. However, columns 2 and 3 show that trade frequency and trade value decline significantly more for non-executives. Yet, column 6 shows that the net effect of these two patterns is that yearly dollar profits decrease significantly more for executives than for non-executives. What is most intriguing is that the point estimate of the change for non-executives is positive, even though the point estimates in all previous columns (returns and quantities) are negative. The only way that this is possible is, again, if the non-executives who see a decrease in abnormal returns are not the same as the non-executives who decrease their trade frequency or trade volume. Thus, while at first glance, the patterns appear to contradict the hypothesis that insiders who are less afraid of litigation (in this case, non-executives) increase trading frequency and trading profits, upon closer investigation. Overall, this analysis

underscores that different insiders respond differently to changes in monitoring intensity, and that understanding the correlation between returns and trade quantities is crucial to interpreting these responses.

Panel G compares how insiders who have closed their trades after 181-200 days in the past respond to monitoring. Their abnormal profits do not decrease significantly; moreover, their trading frequency, yearly trading volume, and their yearly profits increase. In contrast, for other insiders, returns, frequencies, values, and profits decrease. In sum, insiders who appear to care more about trading profits respond quite differently to monitoring than do other insiders.

The Sarbanes-Oxley Act (SOX) marked a substantial change in the enforcement regime applicable to corporate insider trading. Before SOX, rules governing legal corporate insider trading and the enforcement of these rules were rather lax. Corporate insiders had substantial leeway to report their transactions. By law, they had until the 10<sup>th</sup> of the month following the month of the trade – i.e., potentially up to 42 days – to disclose their transactions. Moreover, even these lax standards were weakly enforced. Post SOX, corporate insiders have to report their trades within two business days. In addition, the post-SOX period is characterized by stricter regulatory monitoring of the actual compliance with existing rules (see e.g., Brochet (2009) or Betzer et al. (2015)). In Table A8 in the Internet Appendix, we use a dummy variable that is set to 1 after the implementation of SOX on August 29, 2002 as an alternative proxy for regulatory monitoring intensity. The results from using the post-SOX dummy as a measure of monitoring are similar to those in Table 7 where we use the SEC budgets.

The tests in Tables 7 and A8 consider the population of all insider trades. We highlight this in Panel B of Table 4 and examine whether insiders are more likely to trade just after, as opposed to just before, the short-swing threshold of 6 months, and in particular whether this

difference changes with the SEC budget. Here, we find that the jump in log density after the 6-month threshold is larger when the SEC budget is in the upper tercile (106% versus 71%). We conclude that increasing SEC budgets does not alter insiders' *intention* to turn a profit, but they seem to reduce insiders' ability to do so.

Overall, the evidence in this section suggests that different insiders respond differently to monitoring. More informed trade(r)s respond strongly to monitoring. In contrast, we find no evidence that the returns or yearly abnormal profits of more likely uninformed trade(r)s decrease with monitoring. The decrease in returns following an increase in monitoring may be offset by an increase in trade frequency and a change in the composition of insiders who trade. Further, we find that insiders who appear to care more about trading profits trade more and seem to make larger profits when monitoring increases. In contrast, trade frequencies, values, and profits of other insiders decline with higher monitoring.

These results are consistent with the explanation that monitoring affects the more risk-averse traders such as CEOs, CFOs, and other executives who, although more informed, also have more to lose if prosecuted. As they decrease their trading activity, there are higher returns from trading for others. Observing these higher returns, the less risk-averse traders increase their trading, leading to our result. Thus, monitoring does not reduce dollar profits, as it may encourage frequent and profit-seeking traders to trade more frequently.

Overall, our results suggest that the contrasting patterns in returns and profits are, in part, due to monitoring. Insiders with the highest informational advantage also face a greater degree of scrutiny and respond more to changes in monitoring. These tests highlight that dollar profits and percentage returns respond differently to commonly used shocks in corporate governance research. Thus, studies of insider trading in a corporate governance context should consider

whether returns or profits are a more appropriate measure for the specific research question they wish to address.

## **6. Conclusion**

It has long been shown that insiders realize significant positive abnormal returns on their transactions. How much insiders make on their trades in dollar terms, and whether trading profits are a meaningful source of private benefits for the average insider, has received less attention. We provide evidence on the dollar profits from legal insider trading, using data for publicly listed U.S. firms for the period 1986-2013.

The main result of our paper is that using dollar profits as opposed to percentage returns offers contrasting evidence in a number of questions about insider trading. First, while percentage returns may be large, dollar profits from trading are small for a typical insider. The median (average) insider earns annual abnormal profits of \$464 (\$12,000). Second, the cross-sectional and time-series patterns in percentage returns and dollar profits are different. Insiders who trade frequently make high dollar profits despite making low abnormal returns per trade.

Third, we identify a new variable that predicts insider-trading profits exploiting the discontinuity imposed by the short-swing profit recovery rule. Closing a round-trip trade just after the short-swing threshold of 6 months predicts higher returns and profits in the future. Quantile regressions show that our new measure is particularly accurate in predicting higher quantiles of returns and dollar profits. Using this strategy, we identify a small subset, 0.5% of our sample, where median (average) yearly abnormal profits reach \$2,530 (\$54,210).

Finally, we ask whether increases in monitoring reduce dollar profits. Using variation in the SEC budget over time, we show that different insiders respond differently to higher

monitoring. While higher monitoring is associated with lower abnormal returns, this effect is partially offset by changes in the composition of trade(r)s and an increase in trading frequency.

Our work shows that percentage returns and dollar profits capture distinct aspects of insider trading. We argue that in the context of insider trading, profits are a more precise measure for testing agency theories. These findings help to inform the debate on insider trading regulation and firm-level insider-trading policies by providing insights for firms and regulators on the extent to which insider trading actually benefits insiders.

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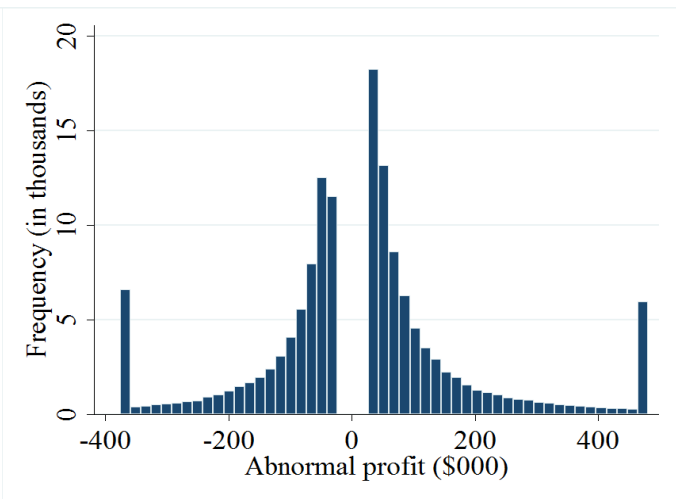
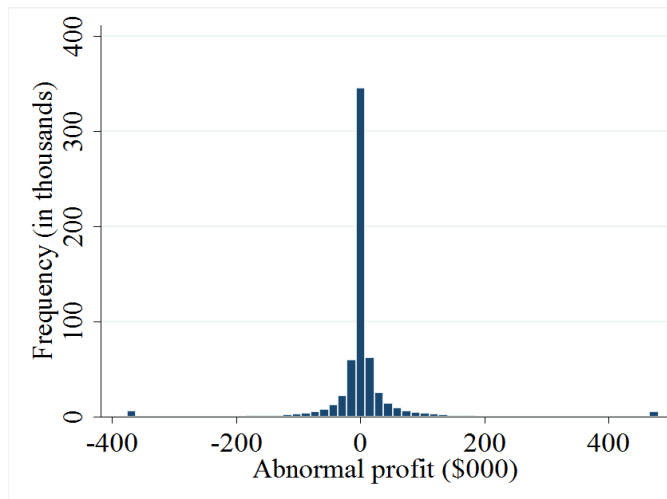
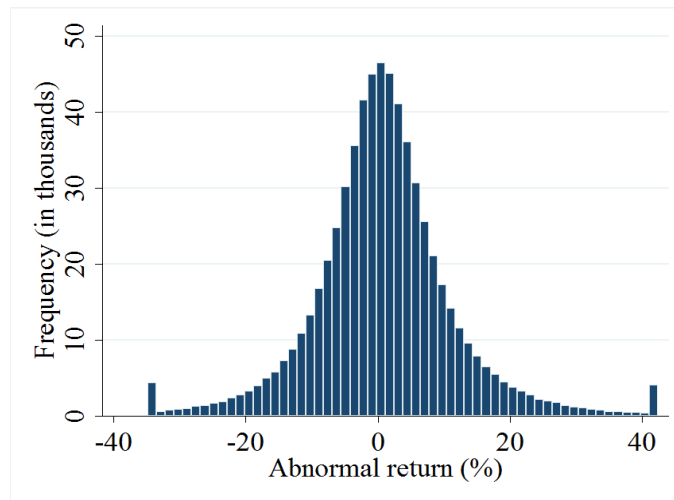


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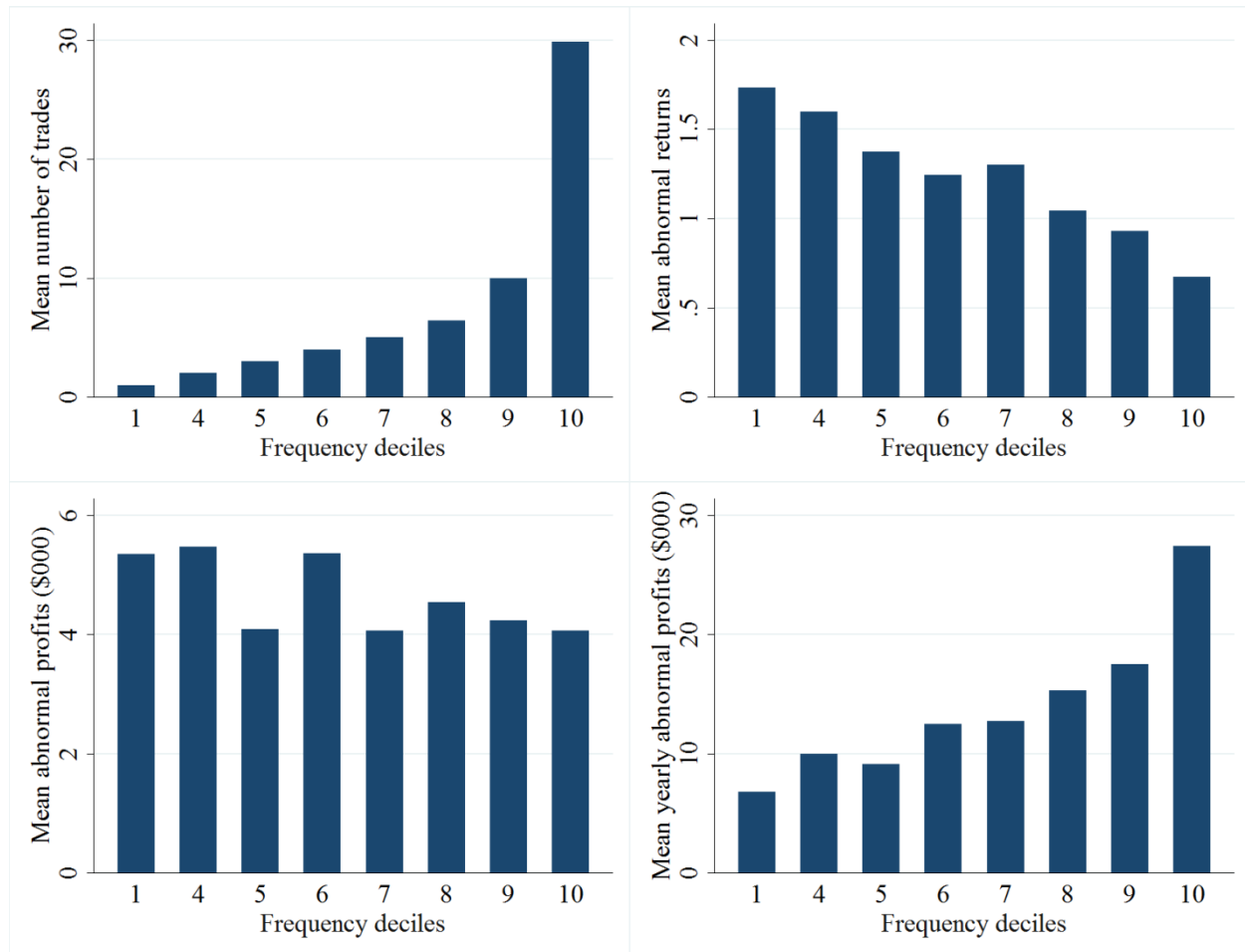
### Figure 1: Distribution of abnormal returns and dollar profits

The top figure shows a histogram of abnormal returns. The bottom left graph shows the distribution of trade-level abnormal profits for all sample observations. The bottom right graph shows the distribution of trade-level abnormal profits excluding abnormal profits greater than  $-\$30,000$  and smaller than  $\$30,000$ . Variable definitions are provided in Appendix A.



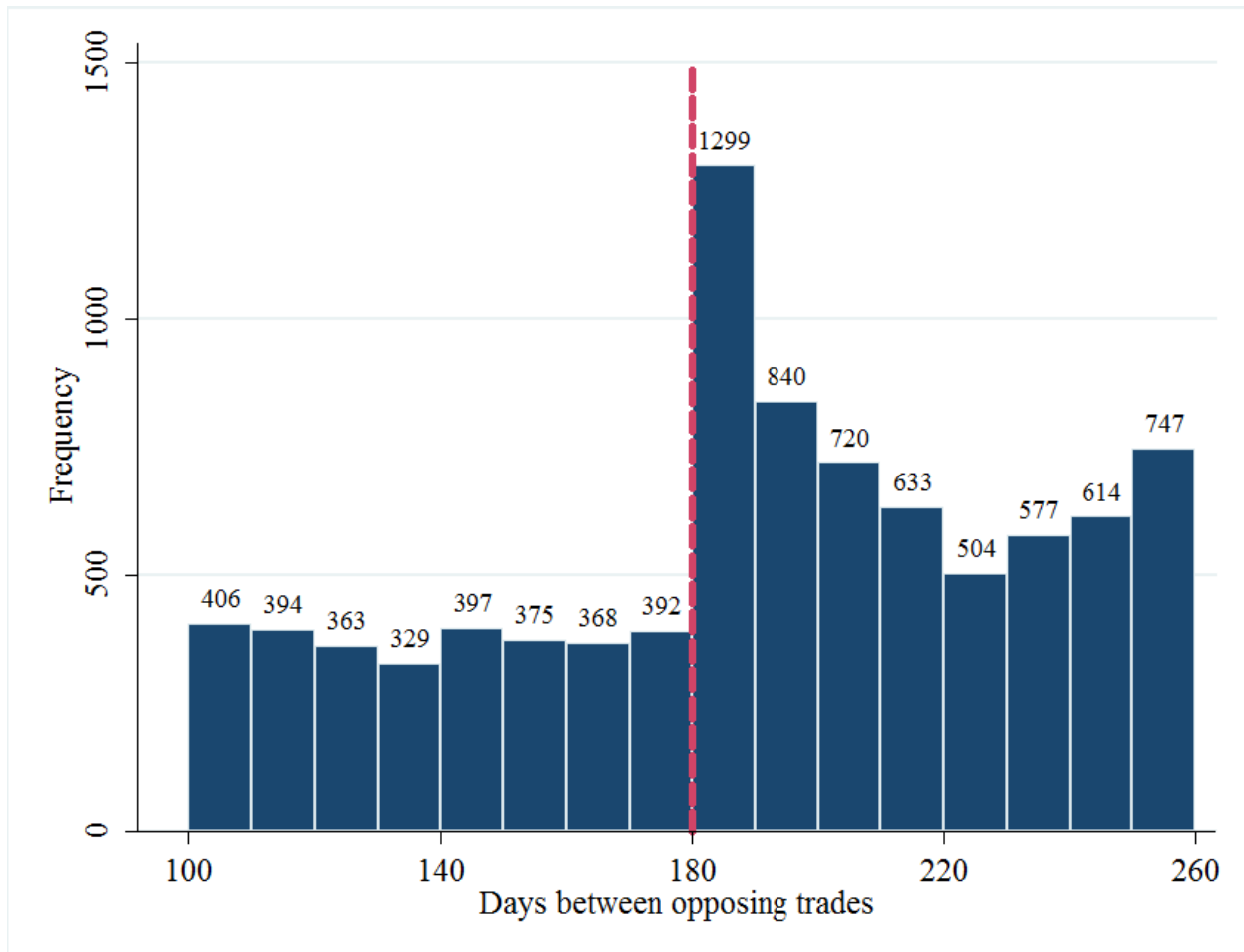
## Figure 2: Abnormal returns, volume, and dollar profits by frequency deciles

The top left graph shows the mean number of trades over frequency deciles. Frequency deciles are constructed over the number of trades over an insider's lifetime in the sample. Deciles 2 and 3 are missing because 25% of all insiders place only one trade in their lifetime. As a result, all insiders with one trade are in the first decile, which contains 25% of insiders in the population. The top right graph shows mean abnormal returns over frequency deciles. The bottom left graph shows the mean abnormal profits over frequency deciles, while the bottom right graph shows mean yearly abnormal profits. Decile 1 is the decile with the lowest trading frequency, decile 10 is the one with the highest frequency.



**Figure 3: Frequency of round-trip transactions closed around the short-swing threshold of 6 months**

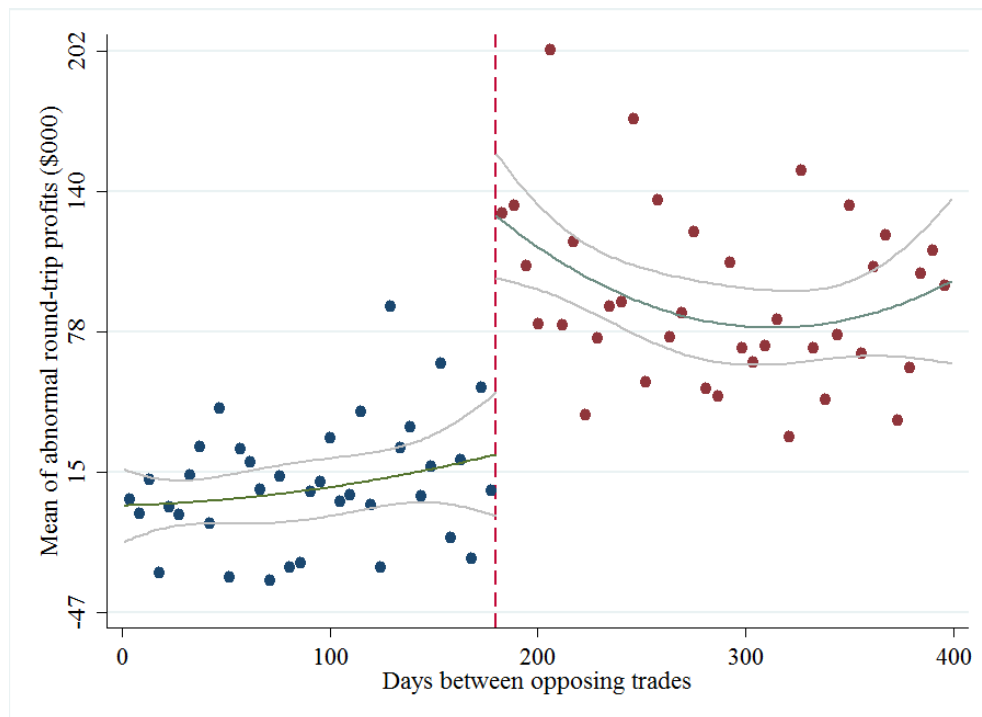
This histogram shows the number of round-trip transactions closed as a function of the distance between the two offsetting transactions. A round-trip is defined as a purchase followed by a sale, or a sale followed by a purchase. Each bar shows the number of round-trip transactions closed in the corresponding 10-day bin, 101-110 days, 111-120 days, etc. The dashed vertical line at 180 days indicates the cutoff of 6 months imposed by the short-swing profit recovery rule in section 16(b) (15 U.S.C. § 78p) of the Securities Exchange Act of 1934.



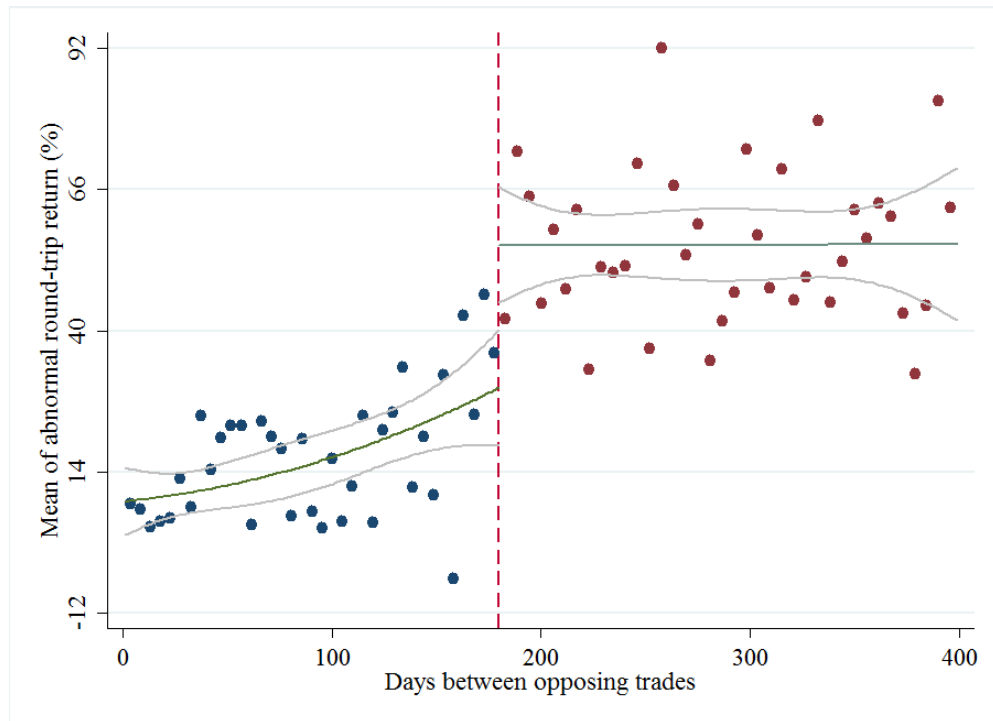
#### Figure 4: Differences between round-trip transactions closed before vs. after the short-swing threshold of 6 months

The outcome variable is abnormal round-trip dollar profits in Panel A, the implied abnormal return in Panel B, and trade value in Panel C. Abnormal dollar profit and trade value are measured in thousands of dollars. We calculate implied abnormal returns as the ratio of abnormal dollar profits to trade value. A round-trip is defined as a purchase followed by a sale, or a sale followed by a purchase. The dashed vertical line at 180 days indicates the cutoff of 6 months imposed by the short-swing profit recovery rule in section 16(b) (15 U.S.C. § 78p) of the Securities Exchange Act of 1934. The solid lines show polynomial of order 4 fit to the data, separately to the left and to the right of the threshold, and the corresponding 95% confidence intervals.

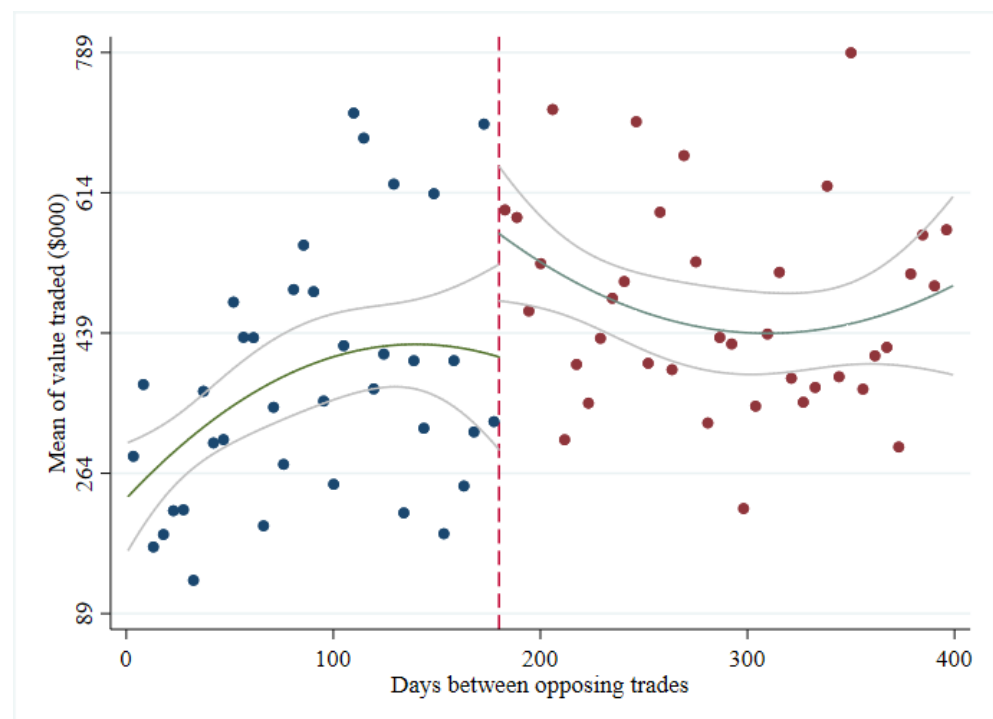
Panel A: Abnormal round-trip dollar profits



Panel B: Implied abnormal returns

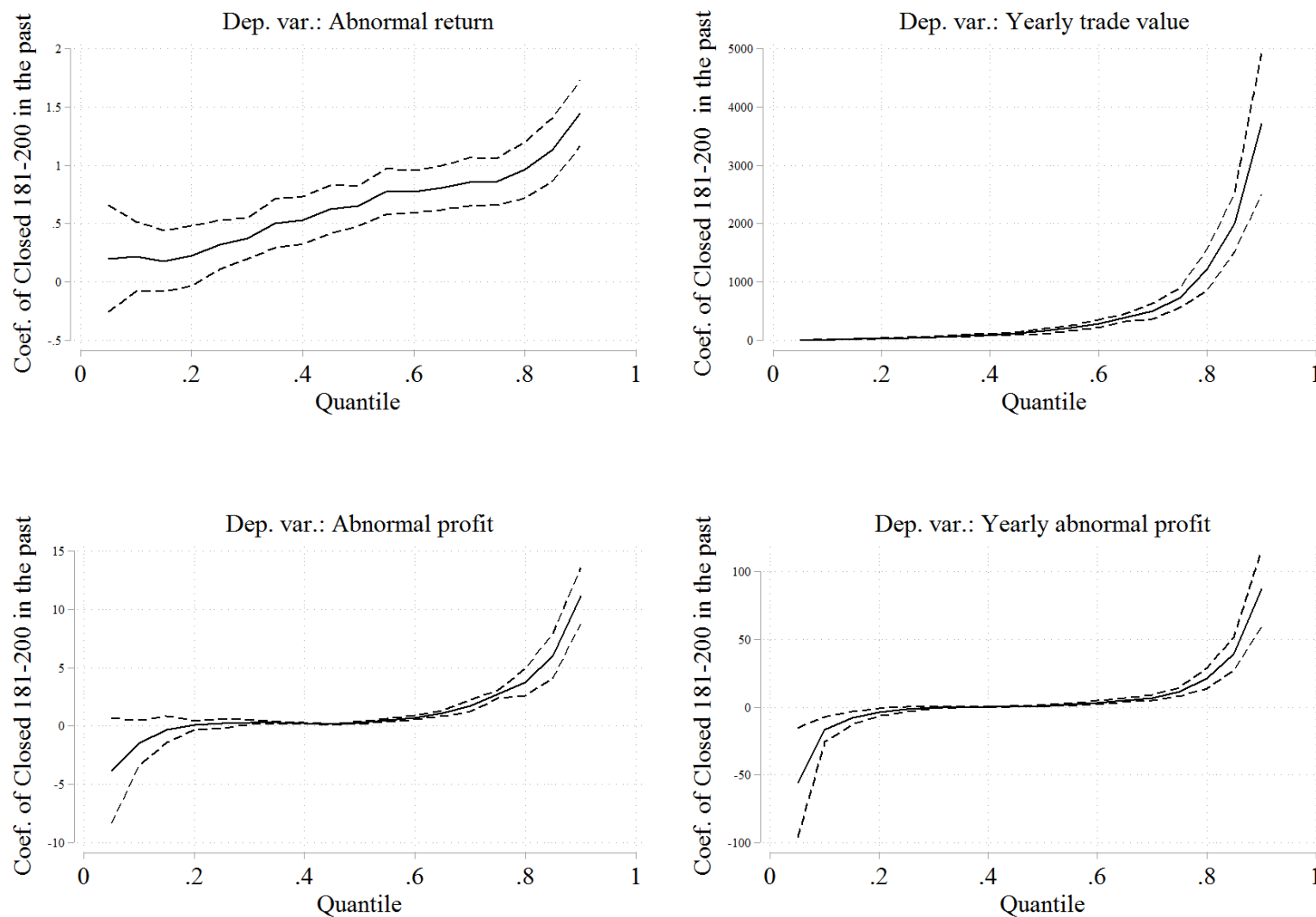


Panel C: Trade value



### Figure 5: Quantile regressions

This figure summarizes the results of quantile regressions for the quantiles starting from the 0.05 quantile to the 0.95 quantile, using increments of 0.05. We regress returns, yearly trade value, per-trade and yearly dollar profits on an indicator variable for having closed a round-trip between 181-200 days in the past (excluding the first such trade, or year, respectively), control variables, year fixed effects, and firm fixed effects as in Table 6. Variable definitions are provided in Appendix A. Standard errors are clustered at the firm level. The figure shows the coefficient estimates for the given quantile (solid line) and the upper and lower limits of the 95% confidence intervals.





### Table 1: Sample summary statistics

This table shows summary statistics of the sample of corporate insider transactions. Panel A shows summary statistics of transaction frequency and size. Panel B reports summary statistics of abnormal returns, trade frequencies, value traded, and dollar profits. Frequencies, yearly value traded, and yearly abnormal profits are summarized at the insider-year level. Panel C shows summary statistics of the control variables used in our regressions. Variable definitions are provided in Appendix A. Our data span 1986-2013.

#### Panel A: Sample description

Observations	Number
Transactions	644,643
Buys	148,363
Sells	496,280
Insiders who only buy	20,178
Insiders who only sell	52,817
Insiders trading in both directions	19,763
Unique insiders	92,758
Unique firms	7,643
Insider-years	263,413
Firm-years	52,602

#### Panel B: Values traded, frequencies, returns, and dollar profits

Variable	Obs.	Mean	St. dev.	10th	25th	Median	75th	90th
Firms per insider	92,758	1.19	0.63	1	1	1	1	2
Insiders per firm	7,643	14.46	13.57	2	5	11	20	32
Transactions per insider	92,758	6.95	14.67	1	1	3	7	15
thereof buys	92,758	1.60	5.92	0	0	0	1	4
thereof sells	92,758	5.35	13.28	0	1	2	6	13
Value traded (\$000)	644,643	631	1,586	8	32	129	471	1,445
thereof buys	148,363	261	1,095	2	7	25	96	380
thereof sells	496,280	741	1,690	19	58	189	605	1,728
Frequency	263,413	2.80	5.42	1.00	1.00	1.00	3.00	5.00
Yearly value traded (\$000)	263,413	1,845	8,984	14	50	232	995	3,483
Abnormal return (%)	644,643	0.89	10.76	-10.90	-4.60	0.64	6.04	12.85
Abnormal profit	644,643	4.22	84.93	-31.24	-4.60	0.14	7.59	40.97
Yearly abnormal profit	263,413	12.25	182.49	-45.57	-5.16	0.46	13.40	75.62
Profits/salary (%)	45,668	3.47	38.44	-18.21	-2.88	0.37	6.67	27.52
Profits/compensation (%)	42,680	1.16	11.11	-4.12	-0.77	0.11	1.79	6.66

Panel C: Summary statistics of independent variables

Variable	Obs.	Mean	St. dev.	10th	25th	Median	75th	90th
Market capitalization (in \$ million)	644,643	5,283	21,198	79	224	729	2,543	9,734
Book-to-market	644,643	0.6	0.6	0.1	0.3	0.4	0.7	1.0
Number of analysts	644,643	9.4	8.1	2.0	3.0	7.0	13.0	21.0
Idiosyncratic volatility	644,643	2.5	1.4	1.2	1.6	2.2	3.1	4.2
Salary (in \$000)	45,743	523	300	245	317	438	639	938
Total compensation (in \$000)	42,697	3,103	4,357	522	878	1,662	3,409	6,877
SEC budget	606,711	769	322	362	436	876	1,007	1,154
Closed 181-200	644,643	0.01	0.08	0.00	0.00	0.00	0.00	0.00
Closed 181-200 in the past	643,558	0.02	0.14	0.00	0.00	0.00	0.00	0.00

**Table 2: Round-trip profits**

This table shows summary statistics for round-trip transactions. A round-trip is defined as a purchase followed by a sale, or a sale followed by a purchase. Panel A shows summary statistics of transaction volume, frequency and profits. Panel B reports summary statistics for trades for which round-trip profits can be calculated, and for trades for which round-trip profits cannot be calculated. The last three columns report difference between the means of the insider trading variables across the two subsamples, and test whether this difference is statistically significant using a two-sample t-test. Variable definitions are provided in Appendix A.

**Panel A: Summary statistics of round-trip profits**

Variable	Obs.	Mean	St. dev.	10th	25th	Median	75th	90th
Value traded (\$000)	50,451	441	1,317	4	18	74	283	909
Frequency	22,767	2	5	1	1	1	2	4
Yearly value traded (\$000)	22,767	1,190	7,267	10	37	138	510	1,765
Implied abnormal return (%)	50,451	0.6	2.5	-0.6	-0.1	0.0	0.6	2.0
Abnormal round-trip profit (\$000)	50,451	61	477	-74	-4	1	44	238
Yearly abnormal round-trip profit (\$000)	22,767	125	981	-106	-9	5	70	354

**Panel B: Summary statistics of trades with and without round-trip profits**

Variable	With round-trip			Without round-trip			Dif	t-stat	p-value
	Median	Mean	SD	Median	Mean	SD			
Trade value	73	427	1,234	133	629	1,515	-202	-33.7	0.00
Frequency	3	6	12	4	10	22	-4	-47.0	0.00
Abnormal return	1.1	1.7	12.0	0.6	0.8	10.7	0.9	14.6	0.00
Abnormal profit	0.1	5	75	0.1	4	86	1.2	2.7	0.01
Observations	50,451			594,192					
# unique firms	4,617			3,026					
# unique insiders	17,580			75,178					

**Table 3: Regressions of returns, trade frequency, trade value, and dollar profits on a proxy for informed trading**

This table shows the results of regressions of returns, frequency, value, and dollar profits on a proxy for informed trading, control variables, year fixed effects, and firm fixed effects. The table only reports the coefficient of the proxy for informed trading. For regressions that are based on insider-year observations, i.e., columns 2, 4, 6, 7 and 8, we replace the buy indicator with a percentage calculated as the mean over all trades for the given insider in a given year. Variable definitions are provided in Appendix A. Standard errors are clustered at the firm level. The table reports coefficients and standard errors in parentheses. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level.

Dep. var.:	Abnormal return	Trade frequency	Trade value	Yearly trade value	Abnormal profit	Yearly abnormal profit	Yearly abnormal round-trip profit
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Buy only	0.920*** (0.10)	-0.479*** (0.05)	-83.712*** (15.05)	-308.902*** (64.92)	0.405 (0.58)	-3.402*** (1.01)	68.041 (44.59)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE, Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Opportunistic	0.507*** (0.10)	-5.657*** (0.32)	26.220 (47.37)	-3798.037*** (679.50)	2.083*** (0.74)	-2.396 (3.80)	-74.232 (86.68)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE, Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Infrequent	0.333*** (0.06)	-4.322*** (0.10)	-286.435*** (23.73)	-4214.903*** (192.72)	-1.135** (0.48)	-21.834*** (1.88)	-246.999*** (29.69)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE, Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CFO	0.353*** (0.08)	-0.698*** (0.04)	-163.598*** (18.75)	-957.192*** (59.00)	0.220 (0.49)	-3.813*** (1.15)	-73.347*** (19.19)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE, Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Executive	0.197*** (0.05)	-0.770*** (0.04)	-54.086*** (18.79)	-858.378*** (90.17)	0.644 (0.41)	-2.588*** (0.99)	22.985 (16.88)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE, Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

**Table 4: Bunching around the short-swing threshold of 6-months**

Panels A and B show the log densities of the McCrary test for round-trip transactions placed by insiders. A round-trip is defined as a purchase followed by a sale, or a sale followed by a purchase. The threshold of 6 months is imposed by the short-swing profit recovery rule in section 16(b) (15 U.S.C. § 78p) of the Securities Exchange Act of 1934. The local linear regression is estimated using the bandwidth suggested by McCrary (2008). The fourth column shows an alternative, robust t-test based on the nonparametric, data-driven bandwidth selector method proposed by Cattaneo, Jansson, and Ma (2017). Panel A shows results for the full sample and contains results for placebo thresholds of 1, 2, 3 months, 100 days, and 1-2 years. Panel B shows results in subsamples of firms, insiders, and trades. Subsamples are defined by splitting firm-year observations into quintiles and taking the highest and the lowest quintile. Panel B also compares the jump in the density around the 6-month threshold using a  $\chi^2$  test whose null hypothesis is that the percentage of trades closed before vs. after the threshold is the same in the two subsamples. Variable definitions are provided in Appendix A.

Panel A: Bunching around the 6-month threshold and various placebo thresholds

Threshold (days)	McCrary (2008)			Cattaneo, Jansson, and Ma (2017)
	Log density	s.e.	t	t
<i>Short-swing rule</i>				
180	1.042	0.042	24.789	10.537
181	1.029	0.042	24.470	12.139
182	1.011	0.042	24.179	12.479
<i>Placebo thresholds</i>				
30	-0.650	0.033	-19.442	-2.999
60	-0.337	0.039	-8.638	-1.920
90	0.106	0.050	2.136	1.678
100	-0.120	0.053	-2.238	-0.641
365	-0.004	0.042	-0.097	-0.411
730	0.070	0.061	1.147	0.437

Panel B: Subsample comparisons of the bunching around the 6-month threshold

	McCrary (2008)			Cattaneo, Jansson, and Ma (2017)		$\chi^2$ test			
Subsample	Log density	s.e.	t	t	Before	After	Factor	$\chi^2$	p- value
<i>Firm size</i>									
Small firms	0.781	0.096	8.125	3.794	84	186	2.2	6.33	0.01
Large firms	0.930	0.091	10.221	6.768	72	255	3.5		
<i>Market-to-book value</i>									
Low market-to-book	1.144	0.096	11.862	8.277	74	265	3.6	3.69	0.03
High market-to-book	0.955	0.090	10.563	5.430	93	236	2.5		
<i>Insider wealth</i>									
Low wealth	0.602	0.225	2.671	1.954	13	31	2.4	3.10	0.05
High wealth	1.867	0.439	4.253	3.102	4	28	7.0		
<i>Insider type</i>									
Other insiders	0.973	0.067	14.536	8.848	181	451	2.5	8.89	0.00
Executives	1.036	0.054	19.326	13.199	219	772	3.5		
<i>SEC budget</i>									
Low SEC budget	0.705	0.114	6.185	5.759	52	129	2.5	1.83	0.12
High SEC budget	1.056	0.045	23.447	12.178	348	1094	3.1		
<i>Opportunistic / routine</i>									
Routine	1.044	0.224	4.666	2.024	16	44	2.8	0.30	0.63
Opportunistic	1.010	0.127	7.952	7.005	42	139	3.3		
<i>Managerial opportunism</i>									
Low opportunism	1.299	0.280	4.634	2.475	8	34	4.3	0.26	0.69
High opportunism	0.889	0.256	3.472	2.984	9	29	3.2		
<i>Trading frequency</i>									
Low frequency	0.977	0.071	13.731	9.146	127	400	3.1	0.09	1.26
High frequency	1.231	0.160	7.706	4.327	28	82	2.9		
<i>Institutional ownership</i>									
Low ownership	1.028	0.104	9.891	7.134	65	197	3.0	0.47	0.46
High ownership	1.020	0.128	7.951	7.492	38	135	3.6		
<i>Board independence</i>									
Low independence	0.996	0.087	11.388	7.763	97	276	2.8	0.05	1.78
High independence	0.981	0.091	10.725	7.382	87	257	3.0		

**Table 5: Comparing insiders that close after 181-200 days to other insiders**

This table compares descriptive statistics of returns, frequency, value, and dollar profits for insiders who close a round-trip transaction after 181-200 days in a given year (*Closed 181-200*, column 1), insiders who close a round-trip trade in a given year but do not close after 181-200 days (column 2), and all other insiders (column 3). Panel A reports medians and Panel B reports means. In Panel A, columns 5 and 7 report  $\chi^2$  values for a non-parametric test of the equality of the medians, testing the null that both samples were drawn from the population with the same median. In Panel B, columns 5 and 7 report the t-values for a two-sample means comparison test. Variable definitions are provided in Appendix A. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level.

**Panel A: Medians**

Variable	Closed 181-200	Round-trips not closed 181-200	All not closed 181-200	Dif (1)-(2)	X <sup>2</sup> -value	Dif (1)-(3)	X <sup>2</sup> -value
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Abnormal return	2.21	1.02	0.63	1.18	47.86***	1.58	85.45***
Frequency	3.00	2.00	1.00	1.00	171.93***	2.00	570.06***
Trade value	112.09	99.06	129.00	13.03	12.08***	-16.90	15.17***
Yearly trade value	416.69	232.84	231.13	183.85	43.22***	185.57	47.24***
Abnormal profit	0.69	0.18	0.14	0.51	48.31***	0.55	61.66***
Yearly abnormal profit	2.53	0.93	0.46	1.60	11.10***	2.07	32.97***
Round-trip profits	10.49	3.73	4.54	6.76	30.95***	5.95	22.39***
Trade obs.	4,213	59,707	640,430				
Insider-year obs.	1,256	23,693	262,158				

**Panel B: Means**

Variable	Closed 181-200	Round-trips not closed 181-200	All not closed 181-200	Dif (1)-(2)	t-value	Dif (1)-(3)	t-value
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Abnormal return	3.01	1.44	0.87	1.57	8.14***	2.13	12.83***
Frequency	5.18	3.54	2.79	1.64	7.36***	2.39	15.58***
Trade value	644.98	528.37	630.50	116.60	5.00***	14.48	0.59
Yearly trade value	3,946.01	2,201.64	1,834.48	1,744.36	5.21***	2,111.53	8.31***
Abnormal profit	12.20	5.79	4.17	6.41	4.69***	8.04	6.12***
Yearly abnormal profit	54.21	20.25	12.05	33.96	5.28***	42.17	8.17***
Round-trip profits	318.58	109.31	120.61	209.27	6.74***	197.97	6.11***
Trade obs.	4,213	59,707	640,430				
Insider-year obs.	1,256	23,693	262,158				

**Table 6: Closing a trade after 181-200 days and future trading behavior and outcomes**

This table shows the results of a regression of returns, frequency, value, and dollar profits on an indicator variable *Closed 181-200 in the past* which is equal to 1 if the insider closed a round-trip transaction after 181-200 days in the past, control variables, year fixed effects, and firm fixed effects. We define an insider as profit-seeking in a given year  $t$  if they completed a round-trip transaction just after the short-swing threshold of 6 months, after 181-200 days in the past. In columns 1, 3, and 5 we exclude the first round-trip transaction that the insider closed between 181 and 200 days. In columns 2, 4, 6, and 7 we exclude all observations from the year in which the insider closed her first round-trip transaction between 181-200 days. Panel A compares the trading of insiders who have closed their trades between 181 and 200 days in the past to all other insiders in the sample. Panel B performs the same comparison, while excluding observations where the insider has closed a round-trip trade prior to 180 days. Panel C restricts the sample to insiders with round-trip transactions. Variable definitions are provided in Appendix A. Standard errors are clustered at the firm level. The table reports coefficients and standard errors in parentheses. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level.

**Panel A: Comparison to all other insiders in the population**

Dep. var.:	Abnormal return	Trade frequency	Trade value	Yearly trade value	Abnormal profit	Yearly abnormal profit	Yearly abnormal round-trip profits
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Closed 181-200 in the past	0.372* (0.20)	1.966*** (0.24)	130.477*** (43.75)	1203.594*** (247.73)	3.932** (1.66)	22.442*** (5.59)	120.908** (48.41)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE, Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs	643,558	262,218	643,558	262,218	643,558	262,218	30,002
R-squared	7.4%	14.1%	25.4%	11.3%	4.2%	6.1%	27.0%
Adj. R-squared	6.3%	11.5%	24.5%	8.7%	3.0%	3.3%	13.2%

**Panel B: Comparison to all other insiders excluding insiders that close prior to 180 days**

Dep. var.:	Abnormal return	Trade frequency	Trade value	Yearly trade value	Abnormal profit	Yearly abnormal profit	Yearly abnormal round-trip profits
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Closed 181-200 in the past	0.369* (0.20)	1.547*** (0.19)	126.590*** (46.28)	892.799*** (214.55)	4.165** (1.69)	19.818*** (5.28)	89.981* (46.52)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE, Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs	625,154	258,034	625,154	258,034	625,154	258,034	27,539
R-squared	7.6%	14.0%	25.8%	11.7%	4.2%	6.1%	28.4%
Adj. R-squared	6.5%	11.3%	24.9%	9.0%	3.0%	3.2%	13.9%



Panel C: Comparison to all other insiders that complete round-trip transactions

Dep. var.:	Abnormal return	Trade frequency	Trade value	Yearly trade value	Abnormal profit	Yearly abnormal profit	Yearly abnormal round-trip profits
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Closed 181-200 in the past	0.297 (0.41)	3.039*** (0.65)	164.634*** (55.65)	1200.367* (618.25)	2.443 (2.74)	33.035* (17.06)	305.330** (136.91)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE, Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	58,174	23,526	58,174	23,526	58,174	23,526	7,781
R-squared	18.9%	46.0%	32.7%	27.0%	15.0%	28.5%	48.3%
Adj. R-squared	12.2%	33.6%	27.1%	10.2%	7.9%	12.1%	17.6%

**Table 7: Regressions of returns, trade frequency, trade value, and dollar profits on a proxy for informed trading and the SEC budget**

This table shows the results of regressions of returns, frequency, value, and dollar profits on a proxy for informed trading, the SEC budget as a measure of monitoring intensity, an interaction between the informed trading proxy and the SEC budget, control variables, and firm fixed effects. The number of observations is reduced since the SEC figures are only available up to and including 2012. The panels of the table only report the coefficient of the SEC budget, the proxy for informed trading, and the interaction term. The SEC budget is indicated in \$ billions. Each panel also reports the difference between the two interaction terms, and the result of the F-test of the difference between the interaction terms. For regressions that are based on insider-year observations, i.e., columns 2, 4, 6, 7, and 8, and that use a trade-level indicator of informed trading (Panel A and Panel C), the informed trading proxy is calculated as the mean over all trades for the given insider and the given year. Variable definitions are provided in Appendix A. Standard errors are clustered at the firm level. The table reports coefficients and standard errors in parentheses. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level.

	Abnormal return	Trade frequency	Trade value	Yearly trade value	Abnormal profit	Yearly abnormal profit	Yearly abnormal round-trip profits
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Panel A: No interactions</i>							
SEC budget	-0.430** (0.21)	-0.180* (0.10)	-191.795*** (50.64)	-598.664*** (166.54)	-5.599*** (1.83)	-2.339 (3.80)	25.120 (47.71)
<i>Panel B: Buys vs. sells</i>							
Buy only	0.59*** (0.21)	-0.27*** (0.10)	-0.26 (35.68)	122.80 (137.69)	-0.63 (1.22)	-3.84* (2.03)	64.36 (99.36)
SEC budget × buy	0.03 (0.33)	-0.45*** (0.16)	-306.86*** (69.39)	-1172.32*** (269.02)	-4.34* (2.35)	-2.03 (3.94)	34.52 (123.51)
SEC budget × nonbuy	-0.43** (0.21)	-0.16 (0.10)	-179.76*** (50.96)	-513.79*** (164.24)	-5.72*** (1.90)	-2.70 (3.97)	27.06 (47.94)
Dif (nonbuy-buy)	-0.46	0.29**	127.1**	658.53***	-1.38	-0.67	-7.46
F-value	(2.53)	(3.88)	(5.64)	(9.05)	(0.46)	(0.05)	(0.00)
<i>Panel C: Opportunistic vs. routine trades</i>							
Opportunistic	0.91*** (0.28)	-7.89*** (0.85)	-140.67* (83.13)	-4269.43*** (1193.79)	7.12** (2.87)	14.61 (12.39)	107.12 (205.49)
SEC budget × opportunistic	-0.44** (0.21)	-0.24** (0.09)	-177.67*** (50.21)	-675.76*** (170.93)	-5.85*** (1.79)	-3.08 (3.76)	20.81 (47.59)
SEC budget × routine	0.00 (0.37)	-2.81*** (0.85)	-375.67*** (104.42)	-1257.44 (1067.89)	-0.31 (3.93)	16.73 (14.22)	216.76 (228.27)
Dif (routine-opportunistic)	0.44	-2.57***	-198.00**	-581.63	5.54*	19.81	195.9
F-value	(1.85)	(9.09)	(5.6)	(0.31)	(2.73)	(2.14)	(0.76)

**Table 7 – continued***Panel D: Infrequent traders*

Infrequent	0.47*** (0.16)	-2.98*** (0.18)	-35.34 (38.41)	-924.27*** (255.99)	2.92** (1.26)	-0.42 (4.22)	-87.93 (68.07)
SEC budget × infrequent	-0.49** (0.21)	-0.43*** (0.09)	-310.67*** (52.23)	-1337.94*** (179.22)	-7.42*** (1.69)	-7.41** (3.48)	-23.89 (41.11)
SEC budget × frequent	-0.29 (0.25)	1.32*** (0.23)	-3.70 (65.15)	2910.58*** (364.08)	-2.33 (2.40)	20.78*** (7.11)	190.36* (98.51)
Dif (frequent - infrequent)	0.20	1.75***	306.97***	4248.52***	5.09***	28.19***	214.25**
F-value	(1.22)	(60.45)	(32.40)	(114.54)	(9.99)	(24.36)	(5.67)

*Panel E: Chief Financial Officers (CFOs)*

CFO	0.68** (0.27)	-0.76*** (0.09)	-177.53*** (33.31)	-820.26*** (111.88)	2.65 (1.74)	4.52 (3.53)	-34.46 (50.37)
SEC budget × CFO	-0.78** (0.34)	-0.11 (0.13)	-184.47*** (55.42)	-777.64*** (186.29)	-8.36*** (2.49)	-12.03** (5.26)	-18.85 (64.71)
SEC budget × non CFO	-0.41* (0.21)	-0.17* (0.10)	-190.09*** (51.36)	-569.63*** (168.79)	-5.39*** (1.83)	-1.74 (3.82)	27.14 (48.58)
Dif (non CFO - CFO)	0.37	-0.06	-5.62	207.97	2.97	10.28***	45.99
F-value	(1.22)	(60.45)	(32.4)	(114.54)	(9.99)	(24.36)	(5.67)

*Panel F: Executives*

Executive	0.49*** (0.13)	-1.06*** (0.08)	-162.49*** (28.28)	-857.09*** (109.84)	2.48*** (0.93)	2.45 (2.02)	62.45 (43.43)
SEC budget × executive	-0.58*** (0.22)	-0.07 (0.10)	-137.97*** (52.84)	-653.42*** (178.50)	-6.50*** (1.82)	-5.39 (3.85)	-0.36 (50.80)
SEC budget × non-executive	-0.19 (0.23)	-0.43*** (0.13)	-276.21*** (58.21)	-605.01*** (202.83)	-4.10** (2.07)	1.95 (4.30)	53.16 (58.06)
Dif (non-executive - executive)	0.39***	-0.36***	-138.24***	-48.40	2.40*	7.34***	53.53
F-value	(1.85)	(0.34)	(0.02)	(2.1)	(2.55)	(6.68)	(1.00)

*Panel G: Closed 181-200 in the past*

Closed 181-200 in the past	0.402 (0.53)	-0.555 (0.41)	-36.528 (77.37)	-1452.775*** (419.55)	-3.764 (3.90)	-13.728 (12.44)	151.082 (113.25)
SEC budget × closed 181-200 in the past	-0.426 (0.66)	2.688*** (0.63)	-17.417 (107.55)	2380.208*** (669.13)	2.592 (4.73)	36.433** (17.35)	7.450 (136.56)
SEC budget × not closed 181-200 in the past	-0.448** (0.21)	-0.280*** (0.10)	-199.227*** (50.91)	-676.806*** (167.43)	-5.795*** (1.84)	-3.246 (3.80)	32.701 (48.93)
Dif (not closed - closed 181-200 in the past)	-0.02	-2.97***	-181.81*	-3057.01***	-8.387*	-39.68**	25.25
F-value	(0.00)	(22.95)	(3.28)	(21.77)	(3.41)	(5.43)	(0.04)

## Appendix A: Variable definitions

<b>Variable</b>	<b>Definition</b>
<b><i>Insider trading characteristics and outcomes</i></b>	
(Year) trade value	Volume of insider transaction in thousands of constant 2013 U.S. dollars (aggregated at the insider-year level).
Trade frequency	Number of transactions aggregated at the insider-year level.
Return	Actual stock return of the insider stock over the 20 trading days after the insider trade.
Abnormal return	Actual stock return of the insider stock over the 20 trading days after the insider trade minus the market return over this period.
Dollar profit	Actual stock return of the insider stock over the 20 trading days after the insider trade multiplied the trade value.
Abnormal dollar profit	Abnormal return of the insider stock over the 20 trading days after the insider trade multiplied the trade value.
Round-trip profit	Profits to sales (purchases) are computed by subtracting the share-weighted purchase (sale) price from the actual price of the sale (purchase).
Abnormal round-trip profit	Round-trip profit minus market return multiplied with same transaction volume.
Yearly dollar profit	Dollar profit aggregated at the insider-year level.
Yearly abnormal dollar profit	Abnormal dollar profit aggregated at the insider-year level.
Yearly round-trip profit	Round-trip profit aggregated at the insider-year level.
Yearly abnormal round-trip profit	Abnormal round-trip profit aggregated at the insider-year level.
Salary	Salary in thousands of constant 2013 U.S. dollars.
Total compensation	Total compensation (TDC1) in thousands of constant 2013 U.S. dollars.
Profit to salary	Abnormal profit scaled by salary.
Profit to total compensation	Abnormal profit scaled by total compensation.
<b><i>Main independent variables</i></b>	
SEC budget	The enforcement budget of the Securities and Exchange Commission in billions of constant 2013 U.S. dollars (see Del Guercio, Odders-White, and Ready (2017)). Available for the period 1986-2012.
Post SOX	This dummy variable is set to 1 if the insider trade occurs after the implementation of the Sarbanes-Oxley Act on August 29, 2002, and to 0 otherwise.
Closed 181-200 (in the past)	This dummy variable is set to 1 if the insider has closed a trade after 181-200 days (in the past), and to 0 otherwise.
CEO	This dummy variable is set to 1 if the insider is the chief executive officer (CEO), and to 0 otherwise.
CFO	This dummy variable is set to 1 if the insider is the chief financial officer (CFO), and to 0 otherwise.

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Routine	This dummy variable is constructed at the trade-level. The dummy variable is set to 1 if the same insider has placed trades in the same month in the three years preceding the trade.
Opportunistic	This dummy variable is set to 1 if the trade is not routine, that is if the insider has not placed a trade in the same month in the past three years.
Executive	This dummy variable is set to 1 if the insider is an executive of the firm, 0 otherwise.
Blockholder	This dummy variable is set to 1 if the insider is a director of the firm, 0 otherwise.
Infrequent trader	This dummy variable is set to 1 if the insider has less than 20 trades over the entire sample period, 0 otherwise.
Blackout	This dummy variable is set to 1 if the trade occurs in the months prior to the next quarterly earnings announcements, 0 otherwise. These earnings announcement dates are from the Compustat quarterly files.
Trade restriction	This dummy variable is set to 1 if at least 75% of transactions in the past year occurred outside the period of one month prior to the next earnings announcement, 0 otherwise. This variable is set to missing if there are less than 10 trades in the given firm-year.
CEO post retirement	This variable is set to 1 for trades by the former CEOs of the firm, 0 for trades by the current CEO.
Low (high) tenure	This variable is set to 1 for insiders in the bottom (top) quintile in terms of tenure as an executive, 0 otherwise.
Low (high) wealth	This variable is set to 1 for insiders in the bottom (top) quintile in terms of accumulated executive compensation reported in Execucomp in the past, 0 otherwise.
Low (high) insider stake	This variable is set to 1 for insiders in the bottom (top) quintile in terms of the number of shares held by the insider divided by the total number of shares outstanding, 0 otherwise.
Low (high) institutional ownership	This variable is set to 1 for firms in the bottom (top) quintile in terms of number of shares held by institutional shareholders, 0 otherwise.
Low (high) managerial opportunism	This variable is set to 1 for firms in the bottom (top) quintile in terms of managerial opportunism as in Hirshleifer and Ali (2017), 0 otherwise.
Low (high) board independence	This variable is set to 1 for firms in the bottom (top) quintile in terms of the share of independent directors from BoardEx, 0 otherwise.

***Control variables***

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Market capitalization (in \$ million)	The number of shares outstanding multiplied by the end-of-fiscal year stock price.
Book-to-market	Book value of equity scaled by the market value of equity as in Fama and French (1993).
Number of analysts	Number of equity research analysts according to I/B/E/S.
Idiosyncratic volatility	Standard deviation of return residuals from the Fama-French 3factor model based on daily observations.

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## **Internet Appendix to “The Dollar Profits to Insider Trading”**

This Internet Appendix provides additional analyses and results to supplement the analyses in the main body of the paper.

The tables in the Internet Appendix are referred to as A#, where # is the table number in the Appendix.

## Internet Appendix B: Supplementary figures and tables referenced in the paper

**Table A1: Summary statistics of returns and profits over time**

This table shows summary statistics of trade values, abnormal returns, and abnormal profits over time. Variable definitions are provided in Appendix A.

Variable	Statistics	All years	1990-1999	2000-2009	2010-2013
	#trades	644,643	165,433	317,643	134,010
	#companies	7,643	4,096	4,430	3,107
	#insiders	92,758	39,803	49,369	26,793
Valued traded (\$000)	5th percentile	8	6	10	13
	25th percentile	32	21	41	49
	50th percentile	129	77	161	182
	75th percentile	471	275	581	605
	90th percentile	1,445	831	1,747	1,771
	Mean	631	392	733	771
	Standard deviation	1,586	1,146	1,723	1,790
Frequency	5th percentile	1	1	1	1
	25th percentile	2	1	2	2
	50th percentile	4	3	4	4
	75th percentile	9	6	11	10
	90th percentile	24	14	32	25
	Mean	11	6	13	11
	Standard deviation	22	11	26	24
Yearly value traded (\$000)	5th percentile	14	9	19	27
	25th percentile	50	29	76	100
	50th percentile	232	120	343	393
	75th percentile	995	495	1,374	1,485
	90th percentile	3,483	1,770	4,593	4,721
	Mean	1,845	1,014	2,363	2,315
	Standard deviation	8,984	5,203	10,872	9,536
Abnormal return (%)	5th percentile	-10.90	-11.80	-11.36	-8.55
	25th percentile	-4.60	-5.18	-4.71	-3.68
	50th percentile	0.64	0.59	0.73	0.46
	75th percentile	6.04	6.57	6.32	4.71
	90th percentile	12.85	13.82	13.47	9.88
	Mean	0.89	0.88	0.97	0.60
	Standard deviation	10.76	11.32	11.17	8.57

**Table A1 – continued**

Variable	Statistics	All years	1990-1999	2000-2009	2010-2013
Abnormal profit (\$000)	5th percentile	-31	-21	-39	-33
	25th percentile	-5	-3	-6	-5
	50th percentile	0.141	0.081	0.203	0.144
	75th percentile	8	5	10	8
	90th percentile	41	28	52	40
	Mean	4	3	5	4
	Standard deviation	85	71	94	82
Yearly abnormal profit (\$000)	5th percentile	-46	-26	-64	-53
	25th percentile	-5	-3	-8	-7
	50th percentile	0.464	0.243	0.813	0.667
	75th percentile	13	8	20	16
	90th percentile	76	47	104	80
	Mean	12	8	16	12
	Standard deviation	182	144	212	178
Round-trip profits (\$000)	5th percentile	-9	-11	-8	-11
	25th percentile	0.000	-0.002	0.000	0.000
	50th percentile	8	4	9	12
	75th percentile	65	43	75	74
	90th percentile	265	189	315	286
	Mean	108	83	120	118
	Standard deviation	361	315	378	388
Abnormal round-trip profits (\$000)	5th percentile	-67	-54	-79	-62
	25th percentile	-3	-4	-3	-2
	50th percentile	0.634	0.040	0.602	3.254
	75th percentile	39	30	42	47
	90th percentile	220	173	246	229
	Mean	58	56	57	69
	Standard deviation	466	432	483	475
Year abnormal round- trip profits (\$000)	5th percentile	-129	-102	-156	-101
	25th percentile	-12	-11	-15	-8
	50th percentile	5	4	5	7
	75th percentile	69	59	72	79
	90th percentile	368	300	417	372
	Mean	128	112	135	135
	Standard deviation	1,063	860	1,167	1,036



**Table A2: Summary statistics of longer-term profits**

This table shows summary statistics of longer-term profits over 3 months, 6 months, and 12 months. Variable definitions are provided in Appendix A.

Variable	Statistics	All years	1990-1999	2000-2009	2010-2013
3m-abnormal profit	10th percentile	-60	-36	-77	-65
	25th percentile	-9	-5	-12	-11
	50th percentile	0.255	0.252	0.248	0.266
	75th percentile	15	11	18	16
	90th percentile	81	62	95	83
	Mean	10	12	9	9
	Standard deviation	163	141	178	161
Yearly 3m-abnormal profit	10th percentile	-89	-44	-133	-109
	25th percentile	-10	-5	-16	-14
	50th percentile	0.946	0.646	1.344	1.593
	75th percentile	28	17	39	35
	90th percentile	159	107	206	175
	Mean	26	26	28	25
	Standard deviation	399	324	457	401
6m-abnormal profit	10th percentile	-86	-52	-109	-98
	25th percentile	-13	-7	-17	-16
	50th percentile	0.372	0.320	0.367	0.471
	75th percentile	22	17	26	25
	90th percentile	120	98	137	124
	Mean	14	20	13	13
	Standard deviation	237	211	254	240
Yearly 6m-abnormal profit	10th percentile	-134	-68	-195	-171
	25th percentile	-14	-7	-23	-23
	50th percentile	1.252	0.806	1.760	2.255
	75th percentile	42	26	57	53
	90th percentile	241	170	306	270
	Mean	39	43	39	37
	Standard deviation	645	525	731	673

**Table A2 – continued**

Variable	Statistics	All years	1990-1999	2000-2009	2010-2013
12m-abnormal profit	10th percentile	-121	-75	-150	-146
	25th percentile	-17	-10	-23	-23
	50th percentile	0.704	0.667	0.638	1.144
	75th percentile	35	29	39	40
	90th percentile	182	163	198	198
	Mean	25	35	21	24
	Standard deviation	347	318	365	365
Yearly 12m-abnormal profit	10th percentile	-196	-100	-280	-268
	25th percentile	-21	-11	-33	-34
	50th percentile	1.442	0.985	1.818	3.360
	75th percentile	62	43	80	84
	90th percentile	369	279	445	443
	Mean	68	77	67	67
	Standard deviation	1,015	857	1,119	1,110

**Table A3: Summary statistics by role, firm-year, and insider-level aggregation and insider losses**

Panel A of this table shows summary statistics by insider role. Panel B aggregates summary statistics of transaction volume and profits at the firm-year level. Panel C shows summary statistics of transaction volume and profits at the insider level, i.e., we sum up volume and profits for the entire time that the insider is in the data set. Panel D shows summary statistics for insider losses. All trade values and profits are reported in thousands of constant 2013 dollars. Variable definitions are provided in Appendix A.

Panel A: Summary statistics of returns and profits by insider role

Variable	Group	Obs.	Mean	St. dev.	10th	25th	Median	75th	90th
<i>Yearly value traded</i>									
	Executive	159,549	1,558	6,507	15	59	269	1,095	3,484
	CEO	17,960	4,221	14,494	32	148	913	3,895	11,167
	CFO	14,821	1,229	2,884	15	60	301	1,156	3,199
	Other exec.	126,874	1,220	4,627	14	53	233	898	2,704
	Blockholder	8,476	11,461	30,494	54	274	1,686	9,104	27,581
	Other	95,388	1,469	7,806	11	37	158	671	2,407
<i>Abnormal return</i>									
	Executive	380,215	0.9	10.5	-10.6	-4.5	0.7	6.0	12.7
	CEO	68,930	1.1	11.3	-11.5	-4.8	0.7	6.5	14.0
	CFO	34,215	1.2	11.0	-10.9	-4.5	0.9	6.4	13.6
	Other exec.	277,411	0.8	10.3	-10.4	-4.4	0.7	5.8	12.2
	Blockholder	50,895	1.0	12.5	-13.4	-5.6	0.8	7.2	15.6
	Other	213,533	0.8	10.7	-10.8	-4.6	0.5	5.9	12.6
<i>Abnormal profit</i>									
	Executive	380,215	5	84	-33	-5	0.192	8	43
	CEO	68,930	8	116	-64	-10	0.332	16	83
	CFO	34,215	4	73	-29	-5	0.228	8	40
	Other exec.	277,411	4	75	-28	-4	0.168	7	36
	Blockholder	50,895	7	128	-72	-10	0.298	16	94
	Other	213,533	3	74	-22	-3	0.074	5	29
<i>Yearly abnormal profit</i>									
	Executive	159,549	11	160	-49	-6	0.616	15	79
	CEO	17,960	31	291	-158	-17	2.054	54	258
	CFO	14,821	11	132	-49	-6	0.984	18	82
	Other exec.	126,874	8	135	-41	-5	0.505	13	63
	Blockholder	8,476	76	505	-331	-33	2.878	120	579
	Other	95,388	9	161	-32	-4	0.243	9	53

Panel B: Firm-year level aggregation

Variable	Obs.	Mean	St. dev.	10th	25th	Median	75th	90th
Value traded (\$000)	52,602	2,911	6,676	30	121	556	2,443	8,007
Abnormal profits (\$000)	52,602	61	621	-189	-15	3	71	397
Abnormal round-trip profits (\$000)	52,602	76	1,205	-15	0	0	0	85
3m-abnormal profits (\$000)	52,602	130	1,448	-397	-28	7	157	875
6m-abnormal profits (\$000)	52,602	195	2,440	-628	-47	9	229	1,366
12m-abnormal profits (\$000)	52,602	342	3,999	-1,013	-76	11	341	2,141

Panel C: Insider-level aggregation

Variable	Obs.	Mean	St. dev.	10th	25th	Median	75th	90th
Value traded (\$000)	92,758	1,651	4,769	14	54	267	1,179	3,908
Abnormal profits (\$000)	92,758	35	413	-72	-7	1	27	157
Annualized round-trip profits (\$000)	92,758	43	1,340	0	0	0	0	3
3m-abnormal profits (\$000)	92,758	74	836	-132	-11	3	60	336
6m-abnormal profits (\$000)	92,758	110	1,398	-196	-16	4	92	512
12m-abnormal profits (\$000)	92,758	194	2,306	-280	-21	6	145	811

Panel D: Losses to insider trading

Variable	All	Trading frequency		Trade direction	
		Infrequent	Frequent	Only sell	Others
Percentage of trades	100.0%	28.4%	71.6%	51.4%	48.6%
Percentage of insider-years	100.0%	56.4%	43.6%	49.6%	50.4%
Trades with losses	46.5%	44.7%	47.3%	47.0%	46.0%
Insider years with losses	44.1%	44.1%	44.1%	44.5%	43.7%
Insiders with no profitable trade	4.4%	12.9%	1.0%	5.2%	3.5%
Insiders with no profitable year	11.3%	16.3%	4.8%	13.6%	9.0%
Average year loss conditional on loss	-58	-27	-99	-64	-52
Median year loss conditional on loss	-8	-4	-19	-13	-4

**Table A4: Regression of insider trading returns, volumes and dollar profits**

Panel A of this table reports the results of regressions of abnormal returns and abnormal profits on the control variables used in Tables 3, 6, and 7 of the paper and year fixed effects. Panel B reports the results of the same regressions with firm fixed effects. Variable definitions are provided in Appendix A. Standard errors are clustered at the firm level. The table reports coefficients and standard errors in parentheses. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level.

Panel A: Without firm fixed effects

Dep. var.:	Abnormal return	Trade frequency	Trade value	Yearly trade value	Abnormal profit	Yearly abnormal profit	Yearly abnormal round-trip profits
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Log market capitalization	0.063 (0.04)	-0.086*** (0.02)	326.569*** (14.36)	737.322*** (43.80)	2.979*** (0.28)	4.052*** (0.59)	-8.993 (7.97)
Book-to-market	0.660*** (0.11)	-0.311*** (0.04)	-14.923 (12.00)	-252.975*** (45.16)	2.781*** (0.45)	2.938*** (0.78)	1.400 (10.76)
Number of analysts	-0.013* (0.01)	0.001 (0.00)	2.583 (3.03)	14.038 (8.97)	-0.229*** (0.06)	-0.129 (0.12)	7.641*** (1.63)
Idiosyncratic volatility	0.394*** (0.06)	0.290*** (0.02)	94.264*** (7.90)	455.944*** (30.16)	2.151*** (0.31)	6.319*** (0.74)	66.834*** (7.95)
Firm FE	No	No	No	No	No	No	No
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	644,643	263,413	644,643	263,413	644,643	263,413	30,809
Adj. R-squared	0.50%	1.10%	13.40%	2.80%	0.30%	0.40%	1.20%

Panel B: With firm fixed effects

Dep. var.:	Abnormal return	Trade frequency	Trade value	Yearly trade value	Abnormal profit	Yearly abnormal profit	Yearly abnormal round-trip profits
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Log market capitalization	0.351*** (0.06)	0.033 (0.03)	414.314*** (26.67)	961.643*** (97.91)	6.017*** (0.49)	6.271*** (1.03)	-43.711*** (14.67)
Book-to-market	0.810*** (0.16)	-0.096*** (0.03)	30.861* (15.98)	125.706* (64.49)	3.724*** (0.72)	4.055*** (1.19)	10.036 (17.14)
Number of analysts	0.052*** (0.01)	-0.017*** (0.00)	-11.335*** (3.92)	-31.588** (13.34)	0.057 (0.11)	0.682*** (0.23)	10.933*** (3.01)
Idiosyncratic volatility	0.352*** (0.07)	0.033 (0.03)	38.099*** (7.17)	88.647*** (31.03)	2.014*** (0.42)	4.250*** (1.13)	31.299** (14.21)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	644,643	263,413	644,643	263,413	644,643	263,413	30,809
R-squared	7.40%	13.90%	25.40%	11.10%	4.20%	6.10%	26.40%
Adj. R-squared	6.30%	11.30%	24.50%	8.40%	3.00%	3.20%	12.70%

**Table A5: Persistence of trading profits**

Panel A of this table shows the results of a linear regression of returns and profits on their lagged values from the last period aggregated at the firm level. Variable definitions are provided in Appendix A. Standard errors are clustered at the firm level. The table reports coefficients and standard errors in parentheses. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level. Panel B reports the F-value, p-value, degrees of freedom, and the R-squared and adjusted R-squared of a linear regression of returns and profits on firm fixed effects, while controlling for the standard set of control variables and year fixed effects. The F-test investigates the null hypothesis that the coefficients of firm fixed effects are jointly equal to zero. Columns 7 and 8 show the contribution to the (adjusted) R-squared, when firm fixed effects are added to the regression model.

Panel A: Regression of returns and profits on lagged values

Dependent variable	Abnormal return	Trade frequency	Trade value	Yearly trade value	Abnormal profit	Yearly abnormal profit	Yearly abnormal round-trip profits
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Lag abnormal return	1.000*** (0.00)						
Lag trade frequency		0.324*** (0.01)					
Lag trade value			0.993*** (0.00)				
Lag yearly trade value				0.265*** (0.03)			
Lag abnormal profit					0.998*** (0.00)		
Lag yearly abnormal profit						0.482*** (0.01)	
Lag yearly abnormal round-trip profits							0.800*** (0.02)
Log market capitalization	0.116*** (0.01)	-0.049*** (0.01)	16.508*** (0.77)	369.694*** (42.16)	0.986*** (0.05)	1.756*** (0.30)	-3.858* (2.28)
Book-to-market	0.053*** (0.01)	-0.066*** (0.02)	5.922*** (0.58)	-111.913*** (26.69)	0.453*** (0.04)	0.704* (0.41)	-3.129 (3.29)
Number of analysts	-0.016*** (0.00)	-0.005** (0.00)	-2.113*** (0.12)	-7.875** (3.65)	-0.136*** (0.01)	-0.187*** (0.06)	1.503*** (0.53)
Idiosyncratic volatility	0.039*** (0.00)	0.115*** (0.01)	5.404*** (0.44)	238.498*** (25.40)	0.337*** (0.02)	2.477*** (0.34)	5.127 (3.14)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	644,643	263,414	644,643	263,414	644,643	263,414	30,809
Adj. R-squared	27.70%	22.80%	39.80%	17.20%	19.90%	23.30%	64.20%



Panel B: F-tests of the joint significance of firm fixed effects and contribution in (adjusted) R<sup>2</sup>

Dependent variable	F-value	P-value	Df.	Obs.	R <sup>2</sup>	Adj. R <sup>2</sup>	R <sup>2</sup> contrib.	Adj. R <sup>2</sup> contrib.
Abnormal returns	6.134	0.000	7,642	644,643	7.37%	6.25%	6.82%	5.71%
Trade frequency	4.976	0.000	7,640	263,413	4.15%	3.00%	3.85%	2.70%
Trade value	13.453	0.000	7,642	644,643	6.06%	3.25%	5.70%	2.90%
Yearly trade value	3.138	0.000	7,640	263,413	26.38%	12.74%	25.05%	11.50%
Profits	3.352	0.000	7,642	644,643	12.53%	6.43%	11.79%	5.75%
Yearly profits	2.032	0.000	7,640	263,413	6.06%	3.25%	5.70%	2.90%
Yearly abnormal round-trip profits	1.848	0.000	4,785	30,809	26.38%	12.74%	25.05%	11.50%

**Table A6: Regressions of returns, trade frequency, trade value, and dollar profits on a proxy for informed trading without firm FE**

This table shows the results of a regression of returns, frequency, value, and dollar profits on a proxy for informed trading, control variables, and year fixed effects. The table only reports the coefficient of the proxy for informed trading. For regressions that are based on insider-year observations, i.e., columns 2, 4, 6, 7 and 8, we replace the buy indicator with a percentage calculated as the mean over all trades for the given insider in a given year. Variable definitions are provided in Appendix A. Standard errors are clustered at the firm level. The table reports coefficients and standard errors in parentheses. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level.

Dep. var.:	Abnormal return	Trade frequency	Trade value	Yearly trade value	Abnormal profit	Yearly abnormal profit	Yearly abnormal round-trip profits
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Buy	0.750*** (0.10)	-0.512*** (0.05)	-63.520*** (19.14)	-388.022*** (60.53)	-0.044 (0.62)	-3.737*** (0.90)	8.658 (34.57)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Opportunistic	0.963*** (0.10)	-6.431*** (0.36)	84.996 (57.52)	-3933.305*** (700.23)	4.001*** (0.62)	1.918 (3.60)	-24.172 (73.19)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Infrequent	0.562*** (0.06)	-4.468*** (0.11)	-206.016*** (26.64)	-4062.314*** (194.02)	-0.063 (0.46)	-20.430*** (1.91)	-243.608*** (27.83)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CFO	0.347*** (0.09)	-0.642*** (0.04)	-162.153*** (18.91)	-838.580*** (51.70)	0.031 (0.49)	-3.486*** (1.12)	-92.143*** (16.25)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Executive	0.193*** (0.06)	-0.842*** (0.05)	-112.308*** (21.72)	-986.259*** (84.33)	0.380 (0.48)	-3.916*** (1.07)	10.900 (16.74)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

**Table A7: Regressions of returns, trade frequency, trade value, and dollar profits on a proxy for informed trading for buys and sells**

This table shows the results of a regression of returns, frequency, value, and dollar profits on a proxy for informed trading, control variables, year fixed effects and firm fixed effects. Panel A and B report the results for purchases and sales only. The table only reports the coefficient of the proxy for informed trading. For regressions that are based on insider-year observations, i.e., columns 2, 4, 6, 7 and 8, we replace the buy indicator with a percentage calculated as the mean over all trades for the given insider in a given year. Variable definitions are provided in Appendix A. Standard errors are clustered at the firm level. The table reports coefficients and standard errors in parentheses. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level.

## Panel A: Purchases only

Dep. var.:	Abnormal return	Trade frequency	Trade value	Yearly trade value	Abnormal profit	Yearly abnormal profit	Yearly abnormal round-trip profit
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Opportunistic (d)	0.700*** (0.23)	-5.466*** (0.48)	-31.497 (23.62)	-2246.435*** (392.63)	2.619** (1.19)	-16.620 (11.76)	43.085 (71.54)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE, Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Infrequent (d)	0.336** (0.14)	-3.221*** (0.13)	-262.290*** (25.84)	-2537.454*** (209.44)	-3.926*** (0.81)	-38.647*** (5.25)	-347.667*** (51.98)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE, Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CFO (d)	0.849*** (0.20)	-0.531*** (0.05)	-138.143*** (15.00)	-584.669*** (83.79)	-1.197** (0.51)	-8.052*** (2.05)	-219.934*** (56.40)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE, Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Executive (d)	0.414*** (0.11)	-0.613*** (0.05)	-100.668*** (11.60)	-624.717*** (62.70)	-0.851** (0.42)	-7.464*** (1.54)	20.842 (34.59)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE, Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Panel B: Sales only

Dep. var.:	Abnormal return	Trade frequency	Trade value	Yearly trade value	Abnormal profit	Yearly abnormal profit	Yearly abnormal round-trip profit
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Opportunistic (d)	0.320*** (0.10)	-4.486*** (0.35)	48.049 (58.50)	-3570.608*** (839.99)	1.817** (0.91)	0.370 (5.84)	-135.569 (136.98)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE, Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Infrequent (d)	0.255*** (0.06)	-3.425*** (0.10)	-272.887*** (28.02)	-3599.466*** (213.33)	-0.580 (0.54)	-13.833*** (2.55)	-122.657*** (46.80)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE, Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CFO (d)	0.227*** (0.08)	-0.424*** (0.05)	-161.850*** (22.53)	-789.008*** (70.15)	0.663 (0.61)	-1.508 (1.57)	13.769 (21.71)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE, Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Executive (d)	0.250*** (0.06)	-0.337*** (0.05)	-62.846** (24.42)	-499.850*** (119.96)	1.249** (0.52)	0.866 (1.61)	18.860 (22.83)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE, Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

**Table A8: Regressions of returns, trade frequency, trade value, and dollar profits on a proxy for informed trading and monitoring**

This table shows the results of a regression of returns, frequency, value, and dollar profits on a proxy for informed trading, the post SOX dummy as a measure of monitoring intensity, an interaction between the informed trading proxy and the post SOX dummy, control variables, and firm fixed effects. The panels of the table only report the coefficients of the post SOX dummy, the proxy for informed trading, and the interaction term. Each panel also reports the difference between the two interaction terms, and the result of the F-test of the difference between the interaction terms. For regressions that are based on insider-year observations, i.e., columns 2, 4, 6, 7, and 8, and that use a trade-level indicator of informed trading (Panels A and C), the informed trading proxy is calculated as the mean over all trades for the given insider and the given year. Variable definitions are provided in Appendix A. Standard errors are clustered at the firm level. The table reports coefficients and standard errors in parentheses. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% level.

	Abnormal return	Trade frequency	Trade value	Yearly trade value	Abnormal profit	Yearly abnormal profit	Yearly abnormal round-trip profits
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Panel A: No interactions</i>							
Post SOX	-0.15 (0.12)	0.23*** (0.06)	-46.96** (23.21)	-22.30 (85.16)	-1.91* (1.03)	-1.20 (2.23)	23.96 (29.52)
<i>Panel B: Buys vs. sells</i>							
Buy only	0.75*** (0.12)	-0.36*** (0.06)	-58.22*** (18.37)	-138.81* (71.44)	-0.25 (0.62)	-4.22*** (1.24)	83.20 (64.57)
Post SOX × buy	0.25 (0.20)	0.01 (0.09)	-89.76*** (33.13)	-330.44** (140.50)	-0.56 (1.23)	0.66 (2.22)	23.93 (79.11)
Post SOX × nonbuy	-0.18 (0.13)	0.26*** (0.06)	-42.20* (24.19)	34.13 (87.03)	-2.11* (1.11)	-1.75 (2.40)	24.64 (29.74)
Dif (nonbuy-buy)	-0.43** (5.21)	0.25*** (7.29)	47.56 (2.32)	364.57*** (7.86)	-1.55 (1.54)	-2.41 (1.34)	0.71 (0.00)
<i>Panel C: Opportunistic vs. routine trades</i>							
Opportunistic	0.76*** (0.17)	-5.98*** (0.49)	-75.99 (48.36)	-3682.98*** (758.35)	4.69*** (1.55)	6.78 (7.81)	-5.13 (136.19)
Post SOX × opportunistic	-0.16 (0.12)	0.17*** (0.05)	-36.71 (23.27)	-72.33 (88.32)	-2.11** (1.02)	-1.59 (2.20)	21.10 (29.51)
Post SOX × routine	0.19 (0.23)	-0.33 (0.60)	-185.54*** (47.86)	31.43 (609.74)	1.44 (2.28)	11.07 (9.77)	131.71 (172.32)
Dif (routine-opportunistic)	0.35* (1.27)	-0.50 (85.95)	-148.83*** (32.1)	103.76*** (105.6)	3.55* (11.86)	12.66*** (16.98)	110.61 (6.2)

**Table A8 – continued**

<i>Panel D: Infrequent traders</i>							
Infrequent	0.40*** (0.10)	-3.51*** (0.11)	-174.69*** (23.64)	-2689.38*** (168.75)	0.98 (0.70)	-12.93*** (2.57)	-167.51*** (39.05)
Post SOX × infrequent	-0.19 (0.13)	-0.09* (0.05)	-125.00*** (24.30)	-599.78*** (87.44)	-3.31*** (0.94)	-4.66** (1.96)	-18.82 (24.04)
Post SOX × frequent	-0.06 (0.15)	1.33*** (0.16)	56.71* (33.26)	2046.04*** (240.50)	0.17 (1.39)	11.02** (4.54)	121.19** (60.99)
Dif (frequent - infrequent)	0.13	1.42***	181.71***	2645.82***	3.48***	15.68***	140.01**
F-value	(1.27)	(85.95)	(32.10)	(105.6)	(11.86)	(16.98)	(6.20)
<i>Panel E: Chief Financial Officers (CFOs)</i>							
CFO	0.52*** (0.16)	-0.66*** (0.05)	-164.86*** (18.88)	-839.89*** (62.45)	1.33 (1.04)	0.06 (2.03)	-58.57* (31.48)
Post SOX × CFO	-0.38* (0.22)	0.18** (0.07)	-54.01 (33.37)	-208.54** (101.97)	-3.63** (1.47)	-6.79** (3.04)	2.89 (41.81)
Post SOX × non CFO	-0.13 (0.12)	0.24*** (0.06)	-45.98** (23.38)	-3.74 (86.62)	-1.80* (1.04)	-0.86 (2.25)	25.20 (30.18)
Dif (non CFO - CFO)	0.25	0.06	8.03	204.8**	1.83	5.93**	-22.31
F-value	(3.02)	(0.71)	(12.26)	(0.03)	(3.12)	(1.84)	(0.42)
<i>Panel F: Executives</i>							
Executive	0.34*** (0.08)	-0.85*** (0.05)	-98.10*** (17.36)	-828.51*** (78.79)	1.55*** (0.56)	-0.25 (1.32)	33.35 (25.52)
Post SOX × executive	-0.25* (0.13)	0.28*** (0.06)	-15.39 (25.12)	-53.41 (87.00)	-2.51** (1.05)	-2.98 (2.22)	13.85 (29.25)
Post SOX × non-executive	0.01 (0.14)	0.12 (0.09)	-94.18*** (29.01)	-8.49 (125.62)	-0.99 (1.20)	1.39 (2.72)	35.45 (38.82)
Dif (non-exec - exec)	0.26**	-0.16**	-78.79***	44.92	1.52*	4.37**	21.60
F-value	(1.85)	(0.56)	(0.08)	(5.71)	(2.37)	(5.82)	(0.31)
<i>Panel G: Closed 181-200</i>							
Closed 181-200 in the past	0.246 (0.31)	0.643*** (0.20)	32.597 (49.24)	-166.720 (202.42)	-0.317 (2.79)	5.675 (6.65)	88.879 (74.13)
Post SOX × Closed 181-200 in the past	0.044 (0.41)	2.093*** (0.39)	72.305 (70.73)	1892.779*** (388.80)	3.977 (3.41)	23.006** (10.25)	81.852 (102.63)
Post SOX × not closed 181-200 in the past	-0.161 (0.12)	0.171*** (0.06)	-50.564** (23.35)	-56.944 (85.39)	-2.038* (1.04)	-1.800 (2.24)	27.797 (29.68)
Dif (not closed - closed 181-200 in the past)	-0.21	-1.92***	-122.87*	-1949.72***	-6.02*	-24.81**	-54.06
F-value	(0.26)	(25.42)	(3.15)	(25.35)	(3.20)	(6.05)	(0.31)

### **Internet Appendix C: Insiders' dollar profits from not trading**

While our two measures capture both hypothetical and actual dollar profits that insiders make on their trades, we now consider the possibility that insiders gain not by trading, but by choosing *not* to trade, and holding on to the stock instead. Consider an insider who purchases shares and holds them for several years, before leaving the firm and ceasing to be an insider. In this case, the short-term profit measure may underestimate the true gains to holding the position, whereas we would record no round-trip profit.

To tackle the issue of non-trading systematically, we use the information on holdings that insiders disclose to the SEC on Form 4. We track the holdings of each insider and measure the profits to holding shares in years where the insider holds the same number of shares as the year before. As before, we compare the dollar profits to holding the shares (and benefiting from the price appreciation) to holding an identical dollar position in a benchmark (risk-free, market, FF3, or DGTW). By definition, this yields a set of observations different from our main sample. Our main analysis focuses on insider purchases and sales, whereas this additional analysis considers years in which insider ownership does not change. We find 419,324 insider-firm-year observations with no change in insider ownership – note that some insiders may trade in multiple firms – and are able to estimate Fama-French factor betas and calculate abnormal profits for 317,040 of these. Table A8 provides summary statistics for the profits to holding shares.

The median (average) appreciation in portfolio value for insiders who hold the same number of shares from one year to the next is \$660 (\$46,150). However, comparing the profit from holding the asset to potential profit of holding the Fama-French 3-factor benchmark, insiders make a loss both at the median, and on average. Similar to our baseline analysis, we also find that the top 10% of insiders do make large profits. For example, at the 90<sup>th</sup> percentile, the abnormal dollar profit to holding the insider's position constant is \$116,270.

Lack of trading by insiders can be explained by a strategic decision to hold the shares, or by lack of trading acumen, willingness, or ability to exploit private information. The relative symmetry of the distribution of abnormal profits, coupled with the observation that the mean and median abnormal profits are typically negative, suggests that in the majority of cases, lack of trading is not a strategic decision that leads to a profit.

We also use a second, complementary method to investigate whether insiders make large profits by holding stock and refraining from trading towards the end of their tenure. Here, we first measure the number of years the insider spends at the firm without trading, before eventually leaving, and then analyze long-term profits on each insider's last transaction, matching the length of the event window to the length of this gap.

First, Table A9 shows the length of the gap between the insider's last trade and their departure from the firm.<sup>19</sup> We define the departure year as the last year in which the insider is listed in the Thomson Reuters Insider Trading database. Note that insiders may report many transactions other than purchases and sales, such as receiving restricted stock or options. The median (average) time between an insider's last purchase in the sample and their departure is 2 (3.24) years, while the median (average) time between the last sale and the insider's departure is 1 (1.68) years. This is consistent with the idea that insiders buy shares early on, possibly to meet minimum ownership requirements, and sell for diversification purposes later on, also as they accumulate more stock and options as part of their compensation. Based on the gap times reported in the table, we conclude that calculating abnormal profits for a period of two years is sufficient to capture the profits from the last trade of the majority of insiders in our sample.

Looking at insiders who both buy and sell during their spell at a firm, they typically make their last sale in a later year than their last purchase (69%). Only 20% of insiders finish their

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<sup>19</sup> For this table, the unit of observation is an insider-firm pair, as some insiders in our sample report trades at multiple firms.



trading with a purchase transaction, with the remaining 11% placing both at least one purchase and one sale in their last trading year. We conclude that capturing potential profits from a purchase that is only offset after an insider leaves affects only 31% of our sample insiders.

To capture more accurately the profits to insiders' last trades that may be offset only after the insider leaves and has no further reporting requirements, we analyze long-term profits on each insider's last transaction, matching the length of the event window to the number of years the insider spends at the firm without trading, before eventually leaving. Effectively, this corresponds to "cashing the insider out" at the time of their departure from the firm, and assigning the accrued profits to her last transaction.

Table A10 shows the results. Because by definition, abnormal profits between the last transaction and the insider's departure may be measured over a time horizon of several years (1.77 on average), we divide the abnormal profit by the number of years to obtain an annualized measure. Doing so facilitates comparison with the rest of the numbers in our paper.

There are two main takeaways from Table A10. First, the annualized abnormal profit from holding the insider's position between their last trade and their departure is \$47,640. This is less than the average yearly abnormal profit of \$68,000 (Table A2), or the yearly abnormal round-trip profit conditional on trading (Table 2, Panel A). The median profit is \$1,160. Second, the profits clearly come from insiders whose last transaction is a *sale*. This is possible only if the share price declines, or underperforms its FF3 benchmark. In such cases, it is unlikely that the insider, after departing and no longer having to report, buys any shares, thereby creating a round-trip whose second leg we cannot observe. Holding shares after *purchases* until departure is not a profitable strategy: in fact, it loses \$10,200 on an annual basis. Even if insiders sell shares after their departure, on average, these transactions do not appear profitable. We conclude that the dollar profits to holding shares (as opposed to trading) are no greater than the dollar profits we measure in our main analysis, and therefore cannot be a source of bias.

**Table A8: The profits to holding shares (non-trading) in a given year**

This table shows summary statistics of the yearly raw and abnormal profits of insiders who hold their position unchanged from one year to the next. We obtain information on the number of shares held by insiders from Thomson Reuters and calculate the change in share price from one year to the next. Abnormal profits are calculated relative to the Fama-French 3-factor model. Variables are defined in Table A1 of the appendix.

	Obs.	Mean	St. dev.	P10	P25	P50	P75	P90
Yearly raw profit	317,040	64.18	4,012.61	-153.14	-14.67	0.66	28.75	224.68
Yearly abnormal profit	317,040	-220.05	2,303.77	-298.78	-39.95	-1.89	9.39	116.27

**Table A9: Last transactions of insiders before leaving**

This table presents summary statistics of the gap between the last trade of an insider and their departure from the firm, and the sequence of the last purchase and sale transactions. We define an insider to have left the sample in the year when they last appear in the Thomson Reuters Insider Trading database (with any transaction, not necessarily a purchase or sale). Our unit of observation is an insider-firm pair, as certain people are insiders at multiple firms.

	Obs.	Mean	St. dev.	10th	25th	Median	75th	90th
<i>Gap in years between...</i>								
last purchase and leaving	100,894	3.24	3.79	0	0	2	5	8
last sale and leaving	131,653	1.68	2.42	0	0	1	2	5
last transaction and leaving	197,461	1.77	2.48	0	0	1	2	5
<i>Insiders who have both buys and sales</i>								
Last buy and sale in the same year	35,086	0.11	0.31	0	0	0	0	1
Last sale is after last buy	35,086	0.69	0.46	0	0	1	1	1
Last buy is after last sale	35,086	0.20	0.40	0	0	0	0	1

**Table A10: The profits to insiders' last transactions**

This table shows summary statistics of the yearly abnormal profits on the last trade for each insider-firm pair in the sample. We define an insider to have left the sample in the year when they last appear in the Thomson Reuters Insider Trading database (with any transaction, not necessarily a purchase or sale). Our unit of observation is an insider-firm pair, as certain people are insiders at multiple firms. We then calculate abnormal profits for the period between the insider's last trade and their departure from the sample, and scale the total abnormal profit by the number of years to obtain a yearly value.

<b>Yearly abnormal profits</b>	Obs.	Mean	St. Dev	10th	25th	Median	75th	90th
Last transaction is a purchase	20,130	-10.20	159.07	-37.97	-8.07	-0.65	2.32	16.72
Last transaction is a sale	31,553	84.54	358.38	-61.27	-4.43	9.07	75.75	311.09
All transactions	51,683	47.64	300.67	-50.02	-6.39	1.16	29.77	174.63

## **Internet Appendix D: Trading ability or risk-taking behavior?**

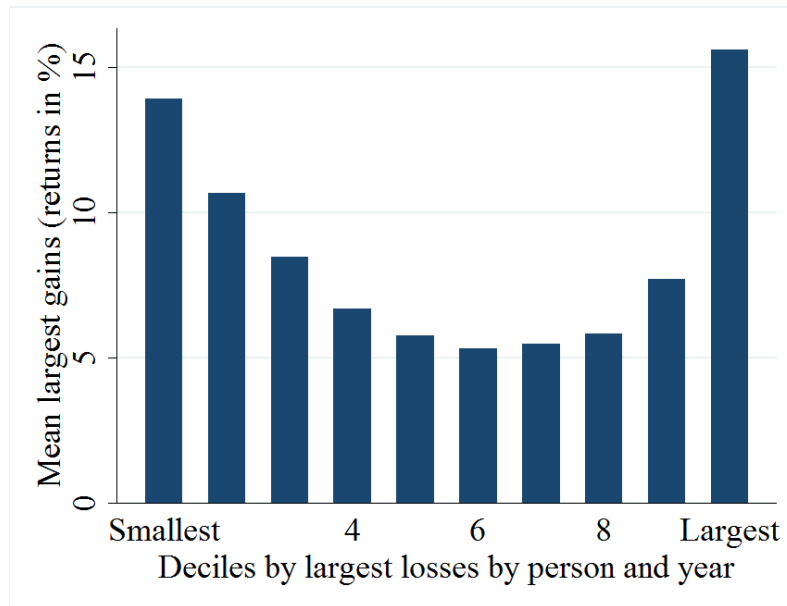
What are the potential sources of insider gains? Do insiders generate higher profits because they have superior ability in identifying the most profitable trading opportunities? Or do they generate higher profits because they are willing to take more risk? To assess both of these explanations, we examine whether the insiders that make the largest losses are also the ones to make the largest profits. Panel A of Figure A1 shows the mean largest gain of an insider in a given year over deciles sorted by the largest loss by insider and year. Under the risk-taking hypothesis, we expect that the individuals with the largest gains are also the ones with the highest losses. For the graph, this would imply a U-shaped pattern. Under the skill hypothesis, we expect that the individuals with the largest losses are those with the smallest gains. We would hence expect a declining relationship. The graph in Panel A of Figure A1 exhibits a U-shaped relationship, which supports the notion that – at the trade level – differences in the ability and willingness to take risk affects abnormal returns. Observations in the decile with the largest losses actually generate the largest abnormal gain.

Given that insiders choose different transaction sizes and trade with different frequencies, we analyze the relationship between largest and smallest gains at the yearly abnormal dollar profit level in Panel B of Figure A1. Here, we find little evidence for the risk-absorption hypothesis. The mean largest gains decline with largest losses by person for all but the last decile, where we observe a slight increase in largest gains from the ninth to the tenth decile. On balance, the empirical evidence provides more support for the idea that differences in trading profits are, at least in part, related to trading ability, and provides less support for the notion that large yearly profits accrue to corporate insiders who take risky gambles.

### Figure A1: Mean abnormal returns and abnormal profits over losses

This figure plots the mean largest gains over deciles sorted by the largest losses. Panel A shows the mean value of the maximum return for each insider-year for sorted by loss decile. The deciles are constructed based on the minimum trade-level return for each insider-year. Decile 1 (10) consists of insider-years with the smallest (largest) loss in terms returns. Panel B shows the mean value of the maximum profit of an insider for deciles sorted by losses. The deciles are constructed based on the minimum year profit of each insider over their entire trading history. Decile 1 (10) consists of insiders with the smallest (largest) loss in terms of year profits. Variable definitions are provided in Table A1 of the Appendix.

Panel A: Mean largest abnormal return over loss deciles



Panel B: Mean largest dollar profit over loss deciles

