

Audit Process, Private Information, and Insider Trading

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Abstract:

Corporate insiders are typically aware of audit findings prior to the general public. We examine whether corporate insiders exploit this information advantage, and trade based on private information about audit findings. We focus our analysis on insider trading around the audit report date. We find a pronounced spike in insider trading in a short window around the audit report date; that audit reports containing a modified opinion trigger intense insider selling; and that abnormal levels of insider trading disappear shortly before the report is publicly disclosed. Highlighting the non-public nature of the audit findings at the time of the audit report date, we find no evidence of a capital market reaction around this date. Collectively, our results suggest insiders at multiple firms exploit features of the audit process for personal gain.

JEL Classification: G34, J33, K31, M52

Keywords: Audit opinions; audit process; audit report; private information; insider trading; opportunism

1. Introduction

Audit reports—and the requirement that public companies file audited financial statements—are a cornerstone of modern financial reporting. The Securities Exchange Act of 1934 requires that all public companies disclose audited financial statements and the associated audit findings. While it is generally accepted that financial statement audits reduce information asymmetry and mitigate agency conflicts, managers and directors (hereafter “corporate insiders”) are typically aware of the contents of the audit report well in advance of the general public. Thus, although a key purpose of financial statement audits is to protect shareholders, an unintended consequence of the audit process is that it endows corporate insiders with a *temporary* information advantage. In this study, we examine whether corporate insiders exploit this advantage for personal gain and trade based on private information about audit findings.

The audit process represents a negotiation between the external auditor, management, and the board of directors. A typical audit entails planning and interim procedures during the year, year-end fieldwork around the earnings announcement, and culminates with the preparation of the final audit report. Throughout the audit process, the auditor is in frequent contact with management and the board, and provides continuous updates regarding preliminary findings, audit adjustments, and potential modifications to a standard unqualified audit report. The auditor formally briefs the board on the contents of the final report close to the date that the audit is finalized, or “audit report date” (PCAOB AS 1301), and subsequently discloses the report to the public as part of the firm’s 10-K filing. Thus, in the intervening period, corporate insiders will be in possession of material non-public information related to the audit findings.

We examine whether corporate insiders trade based on private information about audit findings using a standard short-window event study around the audit report date. The audit report

date signifies the end of the audit, and serves as a reasonable proxy for the latest possible date at which corporate insiders are aware of the final audit findings (PCAOB AS 1301, 3110). Our tests focus on a sample of firms where the audit report date occurs after the earnings announcement and more than ten days prior to the public disclosure of the report.¹ We focus on audit report dates after the earnings announcement in order to cleanly separate insider trading in conjunction with the audit report from insider trading in conjunction with the earnings announcement. We focus on audit report dates more than ten days prior to the public disclosure of the report to ensure that corporate insiders are aware of the audit report and have the opportunity to trade.

By examining insider trading in a tight window around the audit report date, these tests mitigate concerns that our results are attributable to either (a) the audit findings themselves being influenced by insider trading, or (b) omitted firm characteristics correlated with the audit findings. Evidence of a change in insider trading activity in a short window around the audit report date—*when audit findings are known to insiders but not to the market*—suggests insiders are trading based on private information about the contents of the audit report itself.

We find a pronounced spike in insider trading volume around the audit report date, and that audit reports containing a modified opinion trigger intense insider selling. Consistent with senior managers learning about audit-related issues prior to the board, we find that abnormal trading activity by senior managers begins approximately five days prior to the audit report date whereas the abnormal trading activity of independent directors begins in the five days after the audit report date. All abnormal insider trading activity disappears shortly before the public disclosure of the report. Highlighting the non-public nature of the information at the time of the audit report date, we find no evidence of a capital market reaction on the audit report date. The presence of

¹ The audit report date is not observable in real-time and can only be inferred after the audit report is subsequently disclosed. See Section 2 for more details.

significant insider trading activity, coupled with the absence of a capital market reaction, confirms that insiders appear to trade on an internal, non-public, information event in close proximity to the audit report date.

We conduct an extensive battery of sensitivity tests. For example, we repeat our tests focusing exclusively on *within firm-quarter* variation in insider trading (i.e., including firm-quarter fixed effects). These tests should alleviate concerns that our results are attributable to omitted firm-quarter characteristics and/or time trends. To the extent that an omitted variable does not vary *within a given firm-quarter* (e.g., within Firm A's 2009-Q4), this analysis controls for the omitted variable. This design choice is important because it controls for many of the determinants of audit opinions and associated firm-level consequences documented in prior research (e.g., operating performance, accruals, growth opportunities, financial distress, accounting quality, audit quality, innate audit risk, complexity, corporate governance, etc.).² Focusing exclusively on the timing of trades within the firm-quarter, we continue to find that modified audit opinions trigger intense insider selling around the audit report. Although we cannot definitively rule out the possibility of a correlated omitted variable, to explain our collective results, an omitted variable would have to (i) vary with the timing of insider trades within a given firm-quarter, (ii) vary with the timing of the audit report date within the firm-quarter, *and* (iii) vary with the audit opinion.

Next, we repeat our tests focusing on “abnormal” audit outcomes. We expect insider trading to be concentrated in settings where audit outcomes are least likely to be anticipated by the market. Consistent with this, we find that our results continue to hold when using the residual from standard audit prediction models to measure unexpected audit outcomes. Collectively, our results

² See for example DeFond, Raghunandan, and Subramanyam (2002), Butler, Leone, and Willenborg (2004), Ashbaugh-Skaife, Collins, and Kinney (2007), Doyle, McVay, and Ge, (2007a,b), Ashbaugh-Skaife, Collins, Kinney, and Lafond (2009).

are consistent with corporate insiders trading based on private information about audit findings. The results suggest the audit process provides insiders with a temporary information advantage, and that insiders opportunistically time their trades to exploit this advantage.

Our research question and findings should be of interest to academics, boards, and regulators. With respect to academics, our study extends a long line of auditing research. Our results provide novel evidence that corporate insiders exploit features of the audit process for personal gain. In this regard, our findings suggest a more nuanced understanding of the audit process and the extent to which it protects shareholders and mitigates agency conflicts. In addition, our results highlight the importance of the audit report date as an internal information event. While there is an extensive literature on the trading around firm's public disclosures, relatively less is known about the importance of the audit report date.

With respect to boards, our findings underscore the need for meaningful insider trading policies that restrict the trades of key personnel involved in the audit. While most firms have insider trading policies that restrict trading around the earnings announcement, our findings highlight that a detectable mass of insiders trade on material non-public information about audit findings. Boards might want to consider restricting the trade of all officers and directors involved with the audit until the findings are publicly disclosed.

With respect to regulators, the Securities and Exchange Commission (SEC) and Public Company Audit Oversight Board (PCAOB) are charged with protecting the interests of individual investors. Consequently, empirical evidence on how audits affect insider trading represents an important consideration in ongoing deliberations on auditing standards and auditing procedures. Our evidence highlights a potentially unintended consequence of audit standards aimed at improving the informativeness of audit reports—as the audit report becomes more informative, the

incentives for insiders to front-run the report also increase. Our findings are particularly salient in the context of the new auditing standard that takes effect in fiscal 2019 (PCAOB-2017-01) and changes the audit report from a standardized opinion to one that includes detailed engagement-specific disclosures. We encourage auditors, boards, and regulators to scrutinize insider trades placed in conjunction with corporate audits.

The remainder of this paper proceeds as follows. Section 2 discusses institutional features of our setting and related literature. Section 3 describes our sample and measurement choices. Section 4 describes our research design and presents results. Section 5 provides concluding remarks.

2. Institutional Background and Related Literature

2.1 The audit process

Audit reports of most large publicly traded companies contain the auditor's opinion on firm's financial reports as well as the effectiveness of the firm's internal controls. While most publicly traded companies receive an unqualified opinion on their financial reports, auditors occasionally include additional explanatory language to highlight internal control weaknesses, going concern issues, restatements of prior financial statements, and other matters of emphasis (e.g., an unqualified opinion on financial reports paired with an adverse opinion on internal controls). The literature collectively refers to audit opinions that deviate from a standard unqualified opinion as "modified opinions" and examines the relation between such opinions and a variety of firm outcomes (e.g., Butler, Leone, and Willenborg, 2004; Hammersley, Myers, and Shakespeare, 2008; Menon and Williams, 2010; Dhaliwal, Hogan, Trezevant, and Wilkins, 2011;

Czerney, Schmidt, and Thompson, 2014). The general consensus of this literature is that modified opinions have significant negative capital market consequences and portend future restatements.

It takes auditors several months to conduct the audit and issue their opinion. A typical audit begins in the second half of the year with internal control walkthroughs and testing. Interim testing on specific accounts typically occurs in the third quarter, and year-end fieldwork typically starts one month after fiscal year-end when management has completed the closing process for year-end financial statements. The process culminates with the preparation of the audit report, which is usually finalized after the earnings announcement.³

Throughout the audit process, the auditor is in frequent contact with management and the board, and provides continuous updates regarding preliminary findings, audit adjustments, and potential modifications to a standard unqualified audit report. The auditor formally briefs the board on the contents of the audit report close to when the report is finalized, or “audit report date” (PCAOB AS 1301, 3110). After the Board is briefed, the report is disclosed to the public in Item 8 of the firm’s 10-K filing.

Some insiders will almost certainly be aware of specific elements of the audit prior to the audit report date. Ideally, we would observe the dates at which audit findings were privately communicated to corporate insiders and investigate insider trading around those specific communications. However, this information is not publicly available.⁴ Instead, we rely on the audit report date because auditors are required to brief the board close to this date (PCAOB AS 1301, 3110). We acknowledge the presence of measurement error in this date. Measurement error in

³ Prior to 2004, it was customary for firms to announce fourth quarter earnings after the completion of the audit report (Bamber, Bamber, and Schoderbek, 1993; Schwartz and Soo, 1996). However, since the adoption of PCAOB Auditing Standards No. 2 and 3 in 2004, audits now take approximately 15 days longer. Consequently, recent studies document that most firms (70%) now announce fourth quarter earnings prior to the completion of the audit (Bronson, Hogan, Johnson, and Ramesh, 2011; Schroeder, 2016; Marshall, Schroeder, and Yohn, 2018).

⁴ Firms generally do not disclose the dates of board meetings, and alternative data sources and data vendors that we investigated do not have information on the dates of board meetings throughout the year.

event dates biases against finding results in a short-window event study (Berkman and Truong, 2009). If anything, empirical evidence of a spike in insider trading around the audit report date validates that the date measures (with noise) a significant internal information event.

2.2. Related literature on insider trading

It is illegal for insiders to trade while in possession of material non-public information (Securities and Exchange Acts of 1933 and 1934; Insider Trading Sanctions Act of 1984; Insider Trading and Securities Fraud Enforcement Act of 1988). However, a large body of prior research finds that corporate insiders appear to place, and profit from, trades based on superior information (e.g., Piotroski and Roulstone, 2005; Brochet, 2010; Cohen, Malloy, and Pomorski, 2012). Within this literature, several studies link insider trading to firm characteristics related to poor accounting quality (e.g., Beneish and Vargus, 2002; Aboody, Hughes, and Liu, 2005), or poor governance (e.g., Jagolinzer, Larcker, and Taylor, 2011; Skaife, Veenman, and Wangerin, 2013). These studies examine whether insiders “extract rents” in opaque information environments with weak governance but do not examine the specific source of insiders’ private information in such settings.

Within this broad literature, perhaps the three papers most relevant for our study are Huddart, Ke, and Shi (2004, HKS), Skaife, Veenman, and Wangerin (2013, SVW), and Dhaliwal, Hallman, Kim, and Pereira (2015, DHKP). HKS find that insider trades predict returns around the filing of quarterly financial statements but do not examine what information in quarterly filings insiders are trading on, who is trading on such information, or the relation to the audit process. SVW find that insiders at firms with internal control weaknesses have a greater information advantage, and attribute this to poor governance and weak “tone at the top” but do not examine the source of the information advantage. DHKP find that insider sales rise two years prior to a

going concern opinion and decline steeply in the year of the opinion, and attribute this to insiders seeking to minimize litigation risk.

We contribute to this literature by identifying (i) a novel source of insiders' private information (i.e., the audit process), (ii) the timing of when insiders trade on that information, and (iii) who trades on that information. The notion that insiders trade on private information about audit findings extends prior work that suggests insiders generally front-run public disclosures and is conceptually distinct from the notion that modified audit opinions proxy for opaque information environments or weak corporate governance. Our tests explicitly control for opacity of the information environment and weak corporate governance by exploiting the fact that these characteristics do not vary within a firm-quarter. Our tests examine variation in the timing of insider trades within the firm-quarter in a tight window around the audit report date. In this regard, our study is the first to examine trading around the audit report date, and offer novel evidence that insiders trade based on private information about audit findings.

3. Sample Construction and Variable Measurement

3.1. Sample

We collect data on trades of senior managers and directors from the Thomson Reuters Insider Filings Form 4 database. Consistent with prior literature, we restrict our analyses to open market purchases and sales of common stock and exclude option exercises, option grants, and equity gifts. For each transaction, we require the trade price, the number of shares traded, and the date of the trade.⁵ We merge the Thomson Reuters Insider Filings database with CRSP and

⁵ Section 16(b) of the Securities and Exchange Act of 1934 requires senior managers and directors disclose all trades in the firm's securities on Form 4. The Sarbanes Oxley Act of 2002 requires these disclosure be filed electronically with the SEC within two business days.

Compustat to obtain data on our control variables, and obtain data on audit opinions from Compustat and Audit Analytics.

We collect data on audit report dates from Audit Analytics. Audit reports (and audit report dates) are only observable *ex post*, after the report is publicly disclosed. Prior to that time, the audit report and the audit report date are private information. Audit Analytics collects data on audit report dates by scraping the auditor's report from Item 8 of the 10-K, and extracting the date line of the report. To be included in the sample, we require that the audit report date falls *after* the annual earnings announcement and at least ten days *before* the public disclosure of the report. We focus on audit report dates after the earnings announcement in order to cleanly separate insider trading in conjunction with the audit report from insider trading in conjunction with the earnings announcement. We focus on audit report dates more than ten days prior to the public disclosure of the report to ensure that corporate insiders are aware of the audit report and have the opportunity to trade. An additional advantage of focusing on audit reports during this period, is that prior research suggests that firms' internal restricted trade windows generally end one or two days after the earnings announcement and allow trading during this period (e.g., Jagolinzer, Larcker, and Taylor, 2011).⁶ The resulting sample consists of 1,963 firm-years from 2003 to 2015. See Figure 1 for a diagram of the timing of events for our sample.

We argue that our sample selection criteria facilitates identification of those trades that appear to be opportunistically timed around the audit report and increases the power of our tests to detect opportunistic trading. However, we readily acknowledge that our sample selection criteria is non-random and requires that the earnings announcement pre-date the audit report. Prior work

⁶ Using internal data on actual restricted trade windows at 260 firms, Jagolinzer, Larcker, and Taylor (2011) find the most common restricted trade window starts (ends) 46 days prior to (1 day after) the earnings announcement. See also Bettis, Coles, and Lemmon (2000).

has shown that such firms tend to have worse financial reporting quality (Bronson, Hogan, Johnson, and Ramesh, 2011; Schroeder, 2016; Marshall, Schroeder, and Yohn, 2018). This limits the generalizability of our findings: our findings do not generalize to the “average insider” or “average firm.” However, generalizability is less of a concern given our research question. We do not seek to examine whether the “average” insider opportunistically trades based on private information about audit findings, but rather whether a non-trivial—i.e., detectable—mass of corporate insiders engage in such behavior when given the opportunity.

3.2. Descriptive statistics

Table 1 presents descriptive statistics for variables used in our analysis. Panel A presents descriptive statistics for firm characteristics. The unit of observation in Panel A is the firm-year (sample of 1,963 firm-years). *ARtoEA* is the number of days between the audit report and the earnings announcement. *ARto10K* is the number of days between the audit report and the 10-K filing. *ModifiedAudit* is an indicator variable that equals one if the audit opinion is anything other than a clean unqualified opinion (e.g., unqualified opinion with additional language, going concern, SOX 404b material weaknesses, or SOX 302 material weakness), and zero otherwise. *Size* is the natural log of total assets. *BM* is book value of equity scaled by market value of equity. *Surprise* is the seasonal random walk earnings surprise scaled by total assets. *AbReturn* is the firm’s market-adjusted buy-and-hold return over the fiscal year. *Volatility* is the standard deviation of monthly stock returns over the fiscal year.

Panel A indicates that, on average, firms in our sample provide their annual earnings announcement approximately 20 days before the audit report (mean *ARtoEA* = -20.39) and that audit reports are filed with the SEC approximately 21 days after the audit report (mean *ARto10K* = 21.48). Strikingly, 38% of firm-years in our sample receive a modified audit opinion (mean

ModifiedAudit = 0.38). This statistic confirms the intuition that our sample requirements (i.e., requiring audit report dates after the earnings announcement) tend to select firms with lower financial reporting quality.

Panel B presents descriptive statistics for several common measures of insider trading activity for our sample. We calculate daily measures of insider trading activity for all days in a $[-30, +30]$ window around the audit report for our sample of 1,963 firm-years. This results in a sample of 115,095 unique firm-days within 30 days of the audit report. The unit of observation in Panel B is the firm-day. *InsiderTrade* is an indicator variable equal to one if an insider at the firm traded that day, and zero otherwise. *InsiderSeller* is an indicator variable equal to one if insiders at the firm are net sellers on that day and zero otherwise. *InsiderVolume* is insider trading volume scaled by shares outstanding and normalized using the sample average and standard deviation. *InsiderBSI* is the daily insider buy-sell imbalance, calculated as the number of shares bought by insiders minus the number of shares sold by insiders scaled by insider trading volume. Similar to Jagolinzer, Larcker, and Taylor (2011), *BlackoutPd* measures whether a given day falls within a restricted trade window and is an indicator variable equal to one if the day falls within $[-46, +1]$ days of the firm's earnings announcement, and zero otherwise.

Panel B indicates that insiders trade on 5% of days in our sample (mean *InsiderTrade* = 0.05), and that insiders are net sellers on 4% of days in our sample (mean *InsiderSeller* = 0.04). These statistics are consistent with prior research that finds a natural tendency among insiders is to sell shares (to diversify their substantial equity holdings in the firm).

Panel C presents average values of insider trading activity in 5-day intervals around the audit report. Panel C indicates that the base rate of insider trading is 4.8% per day (i.e., on any given day there is a 4.8% probability of an insider trade). In the $[0, +5]$ window around the audit

report, the probability of an insider trade increases to 7.7% per day; suggesting that insiders are nearly twice as likely to trade shares in this window. Panel C also indicates that insiders at firms receiving clean (modified) opinions are net sellers on 3% (4%) of days. However, in the $[0, +5]$ window around the audit report, insiders at firms receiving clean (modified) opinions are net sellers on 5% (8%) of days. Thus, in the $[0, +5]$ window around the audit report, the difference in the rate of selling between insiders at firms receiving clean opinions and insiders at firms receiving modified opinions *triples* (difference of 1% versus difference of 3%, respectively).

4. Empirical Tests and Results

4.1. Insider trading around the audit report date

We use a standard short-window event study design to examine insider trading around the audit report date. Figure 2 plots insider trading activity over the $[-30, +30]$ window around the audit report date. Panel A plots the average daily probability of an insider trade (*InsiderTrade*) and Panel B plots average daily insider trading volume (*InsiderVolume*). Both panels indicate a pronounced increase in insider trading activity leading up to the audit report date and declining thereafter. On average, the probability of an insider trade on any given day is 4.8% (see Panel C of Table 1). However on the audit report date (the day after the audit report date), the probability of an insider trade is 8.3% (8.5%).

To test whether this difference is statistically significant and robust to controlling for various firm characteristics known to be associated with insider trading (e.g., Piotroski and Roulstone, 2005), we estimate the following regression, pooling across all firm-days in the $[-30, +30]$ window around the audit report:

$$\text{InsiderTrade or InsiderVolume} = \alpha + \beta_1 \text{Day}[-5, +5] + \theta \text{Controls} + \varepsilon. \quad (1)$$

$Day[-5, +5]$ is an indicator variable equal to one if the day falls within 5 days of the firm's audit report date, and zero otherwise, and $Controls$ is a vector of firm-level controls including $BlackoutPd$, $Size$, BM , $Surprise$, $AbReturn$, and $Volatility$. All variables are defined in Table 1. The coefficient of interest is β_1 . This coefficient represents the *difference* in the level of trading activity between the non-event period (i.e., day $-30, \dots, -6, +6, \dots, +30$) and the event period (i.e., day $-5, \dots, +5$). If insiders trade based on information in the audit report, we predict $\beta_1 > 0$.

We estimate two versions of Eq. (1). We estimate the first version using pooled regressions, and the second version after including firm-quarter fixed effects. The latter specification focuses exclusively on within firm-quarter variation in insider trading. The firm-quarter fixed effects subsume any variables that do not vary over time *within the firm-quarter* (e.g., within Firm A's 2009-Q4). These fixed effects subsume all variables that are measured at either an annual or quarterly frequency. Throughout our analyses, we calculate standard errors clustered by firm and date, which allows for arbitrary correlation across time within a given firm as well as arbitrary correlation across firms within a given date. Table 2 presents results. Across all specifications, we find evidence of a statistically and economically significant jump in both the likelihood and volume of insider trades in the 5-day window around the audit report ($Day[-5, +5]$, t -stats range from 5.85 to 8.26). These results are consistent with insiders trading based on the information contained in the audit report.

Next, we examine the direction of insider trades around the audit report conditional on whether the firm received a modified audit opinion. If insiders trade based on private information gleaned from the audit report, then we expect modified opinions to trigger intense insider *selling* around the audit report date. Panel A of Figure 3 plots the probability that insiders at the firm are net sellers on the respective day ($InsiderSeller$) separately for firms with clean and modified audit

opinions. Panel B of Figure 3 plots the insider buy-sell imbalance (*InsiderBSI*) separately for firms with clean and modified audit opinions. Both panels indicate an increase in insider selling for all firms around the audit report date. For firms with clean opinions, the average probability of an insider sale on any given day is 3.44% (see Panel C of Table 1), and this probability increases to 5.25% on the day of the report. For firms with modified opinions, the average probability of an insider sale on any given day is 4.44% (see Panel C of Table 1), and this probability increases to 8.23% on the day of the report. These figures highlight not only that the base level of insider selling differs between firms with clean and modified opinions ($4.44\% - 3.44\% =$ difference of 1%), but also that the difference between these two groups of firms triples on the day of the audit report ($8.23\% - 5.25\% =$ difference of 2.98%). Thus, the “difference-in-differences” estimate is 1.98%.

To test whether these estimates are statistically significant and robust to controlling for various firm characteristics known to be associated with insider trading, we re-estimate Eq. (1) using *InsiderSeller* and *InsiderBSI* as the dependent variables, and interacting our event window indicator, $Day[-5, +5]$, with an indicator for whether the firm received a modified audit opinion, *ModifiedAudit*. Formally, we estimate:

$$\begin{aligned} \text{InsiderSeller or InsiderBSI} = & \alpha + \beta_1 \text{Day}[-5, +5] * \text{ModifiedAudit} + \beta_2 \text{ModifiedAudit} \\ & + \beta_3 \text{Day}[-5, +5] + \theta \text{Controls} + \varepsilon. \end{aligned} \quad (2)$$

All variables are as previously defined. The coefficient of interest in Eq. (2) is β_1 , which represents the increase in the difference between firms with clean and modified opinions during the event window (i.e., β_1 is analogous to the “difference-in-difference” estimate referred to above). If insiders trade based on information in the audit report, we predict $\beta_1 > 0$ when the dependent variable is the probability of a sale and $\beta_1 < 0$ when the dependent variable is the buy-sell imbalance (as negative buy-sell imbalance represent sales).

Similar to our Eq. (1), we estimate Eq. (2) using both pooled regressions as well as regressions with firm-quarter fixed effects. Table 3 presents results. Across all specifications, we find the difference in insider selling between firms with clean and modified opinions increases substantially in the 5-day window around the audit report date ($Day[-5, +5] * ModifiedAudit$, t -stats 2.82, 3.06, -3.33 , and -3.39 , respectively). These results are consistent with insiders selling based on private information about audit findings.

4.2. Extended windows

Next, we examine insider trading around the audit report date using alternative event windows and differentiating between trades placed before and after the audit report. Specifically, we estimate Eq. (2) after replacing the event window indicator, $Day[-5, +5]$, with the following vector of event window indicators: $Day[-10, -6]$, $Day[-5, -1]$, $Day[0, +5]$, and $Day[+6, +10]$. Each of these variables represents an indicator variable equal to one if the day falls in the respective window relative to the audit report date, and zero otherwise. Table 4 presents results.

Across all specifications and measures of insider selling activity, we find no evidence of abnormal insider trading more than five days prior to the audit report in firms that receive modified opinions ($Day[-10, -6] * ModifiedAudit$, t -stats 1.09, 1.44, -1.25 , and -1.44 , respectively). Instead, we find abnormal trading in such firms appears concentrated shortly before, and predominantly after the audit report. The highest levels of significance occur in the $[0, +5]$ window (t -stats 3.28, 3.48, -3.63 , and -3.65 , respectively). Moreover, insider selling continues to remain elevated during the $Day[+6, +10]$ window (t -stats 1.97, 2.24, -2.08 , -2.17 , respectively). These results suggest the abnormal trading activity is concentrated primarily *after* the audit report date.

4.3. Officers versus independent directors

We examine insider trading activity separately for officers and independent directors around the audit report date using the same extended event windows as in the preceding analysis. For this analysis, we calculate daily *InsiderSeller* and *InsiderBSI* separately for officers and independent directors (i.e., *InsiderSeller_Officer*; *InsiderBSI_Officer* and *InsiderSeller_Director*; *InsiderBSI_Director*, respectively). Table 5 presents results.

Panel A presents results for trades placed by officers. Significant abnormal trading by officers appears to begin during the $[-5, -1]$ window and continue through the $[+6, +10]$ window. The highest levels of significance occur in the $[0, +5]$ window (t -stats 3.10, 3.15, -2.79 , and -2.77 , respectively). Panel B presents results for trades placed by independent directors. In contrast to the results for officers, we find no evidence of abnormal trading by independent directors prior to the audit report date. Instead, we find abnormal trading by independent directors appears almost exclusively on the day of and five days after the audit report ($Day[0, +5]*ModifiedAudit$, t -stats 1.80, 2.10, -2.81 , and -2.90 , respectively). These results are consistent with the notion that senior managers are likely to learn about any issues that arise during the audit prior to the board of directors.

4.4. Unexpected audit opinions

We assess the robustness of our results to measuring “unexpected” audit outcomes. Specifically, we use the residual from standard audit prediction models to measure “unexpected” or “abnormal” audit outcomes. In particular, we estimate the regression:

$$\begin{aligned}
 ModifiedAudit = & \alpha + \beta_1 Size + \beta_2 FirmAge + \beta_3 Beta + \beta_4 IdioVol + \beta_5 Return \\
 & + \beta_6 Leverage + \beta_7 Loss + \beta_8 Financing + \beta_9 BigN + \beta_{10} CashFlow \\
 & + \beta_{11} FYEtoEA + \delta_t Year + \varepsilon
 \end{aligned} \tag{3}$$

on the sample of all firm-years at the intersection of CRSP/Compustat and Audit Analytics from 2003 to 2015 and use the residual to measure the unexpected or abnormal component (*Abn_ModifiedAudit*).

Similar to DeFond Raghunandan, and Subramanyam (2002) and Butler, Leone, and Willenborg (2004), we include the following firm characteristics when estimating Eq. (3). *Size* is the natural log of total assets. *FirmAge* is the natural log of the number of years the firm appears on Compustat. *Beta* is the firm's market-model beta estimated using monthly stock returns over the fiscal year. *Return* is the buy-and-hold return over the fiscal year. *IdioVol* is the standard deviation of the residual from a market model of monthly returns estimated over the fiscal year. *Leverage* is total liabilities scaled by total assets. *Loss* is an indicator variable equal to one if net income is negative and zero otherwise. *Financing* is an indicator variable equal to one if the firm issues debt or equity during the current fiscal year. *BigN* is an indicator for whether the firm is audited by a "Big-N" auditor. *CashFlow* is operating cash flows scaled by total assets. *FYEtoEA* is the number of days between fiscal year-end and the firm's earnings announcement. *Year* is a vector of year fixed effects. Standard errors are clustered by firm and filing date.

Panel A of Table 6 presents results from estimating Eq. (3). Results are generally consistent with prior research and suggest modified opinions are more likely for larger firms (*Size*, *t*-stat 14.66), riskier firms (*Beta* and *IdioVol*, *t*-stats 5.35 and 7.26, respectively), poorly performing firms (*Return* and *Loss*, *t*-stats -6.79 and 6.62, respectively), firms that issued debt or equity (*Financing*, *t*-stat 3.47), firms with low cash flows (*CashFlow*, *t*-stat -2.56), and firms that delay the earnings announcement (*FYEtoEA*, *t*-stat 21.98). We use the residual from estimating Eq. (3) to measure abnormal audit outcome, *Abn_ModifiedAudit*.

Panel B of Table 6 presents results from estimating Eq. (2) using *Abn_ModifiedAudit*. For parsimony, we do not report coefficients on control variables or main effects. Panel B shows that focusing on abnormal audit outcomes (relative to a commonly used set of firm characteristics) does not alter the sign or significance of our findings. Coefficients and *t*-statistics are very similar to those in Table 3. This is consistent with the intuition that our event study tests focus on the *change* in insider trading around the audit report date, whereas firm characteristics are more likely to be correlated with the *level* (or base rate) of insider trading.

4.5. Insider trading around the public disclosure of the audit report

Our findings suggest that insiders time their trades in close proximity to the audit report date rather than spread them out over the period between the audit report date and the public disclosure of the report. One reason to avoid abnormal trading activity immediately prior to a public disclosure is that such trades are subject to considerable legal scrutiny (e.g., Huddart, Ke, and Shi, 2007). Consequently, if insiders trade strategically, we would not expect to find evidence of opportunistic trading on audit findings shortly before the report is publicly disclosed.

We repeat our earlier short-window event study tests focusing on insider trading around the public disclosure of the report rather than the audit report date. These tests can be viewed as falsification tests—we expect to observe the null hypothesis of no abnormal trading. Figure 4 plots insider trading activity over the $[-30, +30]$ window around the public filing date, where day 0 corresponds to the public filing date. To ensure that any trading around the public filing is not confounded by trading around the audit report date, we require the audit report date falls outside the $[-30, +30]$ window. This results in a sample of 20,415 unique firm-days. Figure 4 suggests that there is no discernible difference in trading activity between insiders at firms with clean opinions and insiders at firms with modified opinions immediately prior to the public disclosure of the

report. If anything, Figure 4 suggests the trading activity of both groups declines in tandem immediately prior to the public filing.

Table 7 presents results from estimating Eq. (2) over the $[-30, +30]$ window around the public disclosure of the report, where day 0 corresponds to the public filing date, and $Day[-5, +5]$ is an indicator variable equal to one if the day falls within 5 days of the public filing date, and zero otherwise. All other variables are as previously defined. Similar to Figure 4, we do not find any detectable evidence of elevated abnormal insider trading around the public disclosure of the audit report. If anything, consistent with the notion that insiders seek to avoid trading shortly before the public filing, we find weak evidence of a decrease in insider trading activity shortly before the audit report is publicly disclosed. Collectively, our results suggest that insiders do not appear to trade immediately prior to the public disclosure of the report, but rather trade in close proximity to when the report is finalized (and not yet publicly available).

4.6. Stock market reaction around the audit report date

Our analysis presupposes that audit related information is privately communicated to insiders around the audit report date, and that this *non-public* information motivates their trades. Consequently, because the audit report is known only to insiders, we do not expect a capital market reaction (i.e., changes in price or public trading volume) on the audit report date. However, an alternative explanation for our results is that other *public* events systematically occur in the 5-day window around the audit report date and that insiders are trading in response to these other, *public* events. Under this alternative explanation, we would expect to observe changes in stock price and trading volume in the 5-day window around the audit report date.

We test for a capital market reaction to the audit report date by estimating the short-window event study design in Eq. (1) after replacing our measures of insider trading volume with public trading volume (*PublicVolume*) and absolute value of returns ($|Ret_{i,t}|$). Specifically, we estimate:

$$PublicVolume \text{ or } |Ret_{i,t}| = \alpha + \beta_1 Day[-5, +5] + \theta Controls + \varepsilon, \quad (4)$$

where *PublicVolume* is daily CRSP trading volume less daily insider trading volume, scaled by shares outstanding, and normalized using the sample average and standard deviation; $|Ret_{i,t}|$ is the absolute value of the daily buy-and-hold returns listed on CRSP (inclusive of dividends); and *Day*[-5, +5] is an indicator variable equal to one if the day falls within 5 days of the firm's audit report date, and zero otherwise. All other variables are as previously defined. To maximize comparability with our earlier results, we estimate Eq. (4) on the same sample used to estimate Eqs. (1) and (2) (i.e., 115,095 unique firm-days in the [-30, +30] window around the audit report date).

Table 8 presents results. Consistent with the *non-public* nature of the information in the audit report, we find no evidence of a capital market reaction around the audit report date. In particular, across all specifications, and regardless of our whether we use public trading volume or unsigned price changes to measure information content, the coefficient on *Day*[-5, +5] is not significantly different from zero at conventional levels (*t*-stat range from -0.58 to 1.58). Moreover, the coefficients on normalized public trading volume are appreciably lower than the coefficients on normalized insider trading volume in Table 2, suggesting the absence of a capital market reaction is not attributable to lack of power. The results in Table 8 suggest that abnormal trading activity around the audit report date is unique to corporate insiders—there is no discernable reaction by the broader public. These results highlight the non-public nature of the audit findings at the time of the audit report date.

5. Conclusion

Although a key purpose of financial statement audits is to protect shareholders, an unintended consequence of the audit process is that it endows corporate insiders with a temporary information advantage. In this study, we examine whether corporate insiders exploit this temporary information advantage and trade based on private information about audit findings. We focus our analysis on insider trading in a short window around the audit report date. By examining insider trading in a short window around the audit report date, our tests mitigate concerns that our results are attributable to either (a) audit findings being influenced by insider trading, or (b) omitted firm-quarter characteristics correlated with the audit findings. Evidence of elevated insider trading in a short window around the audit report date—*when audit findings are known to insiders but not to the market*—suggests insiders are trading based on private information about the contents of the audit report itself.

We find a pronounced spike in insider trading volume around the audit report date, and that audit reports containing a modified opinion trigger intense insider selling. Evidence of abnormal trading activity by officers first appears five days prior to the audit report date, and abnormal trading activity by independent directors first appears on the day of, and five days following the audit report date. Abnormal trading activity disappears shortly before the public disclosure of the report. Consistent with the non-public nature of insiders' information at the time of the audit report date, we find no evidence of a capital market reaction around the audit report date. The absence of a capital market reaction in conjunction with a spike in insider trading activity is consistent with a significant internal information event occurring around the audit report date, and insiders trading

based on this event. Collectively, our results suggest insiders trade based on private information about audit findings.

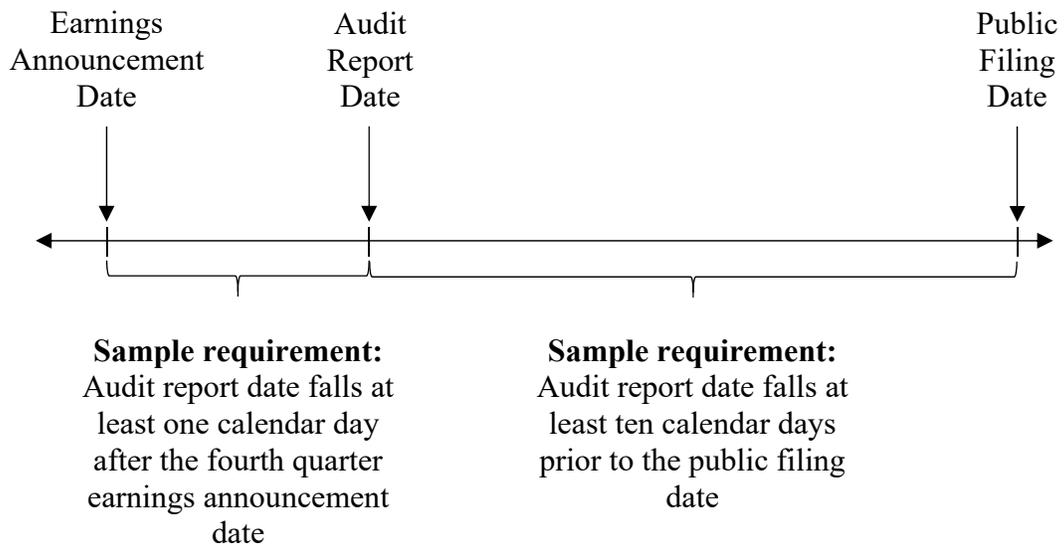
Our results should be of interest to academics, boards, and regulators. With respect to academics, our findings suggests a more nuanced understanding of the audit process and the extent to which it protects shareholders and mitigates agency conflicts. With respect to boards, our findings underscore the need to limit the trading of key personnel involved with the audit until the audit findings are publicly disclosed. With respect to regulators, empirical evidence on how audits affect insider trading potentially represents an important missing piece in deliberations on auditing standards. We encourage auditors, boards, and regulators to scrutinize insider trades placed in conjunction with corporate audits.

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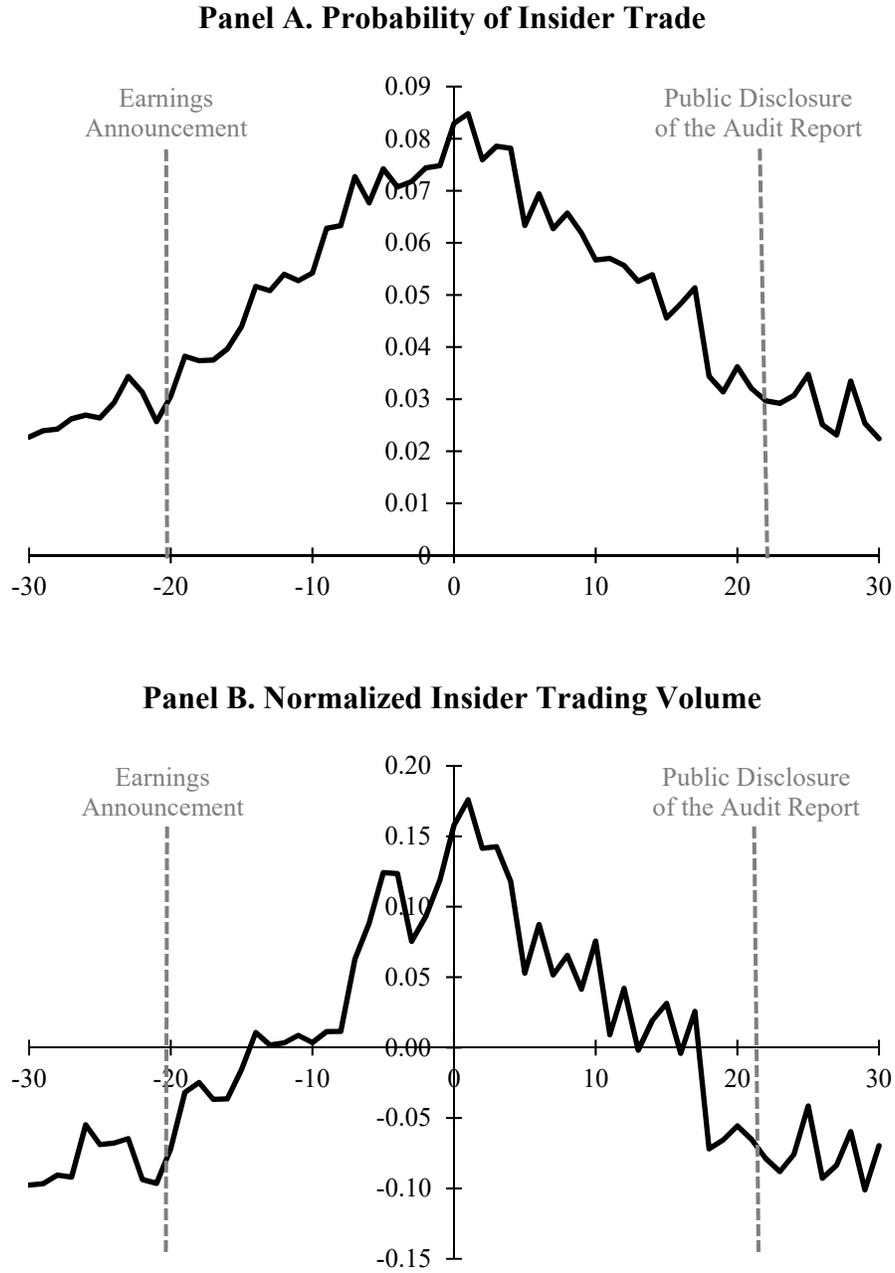
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Figure 1. Event Study Timeline



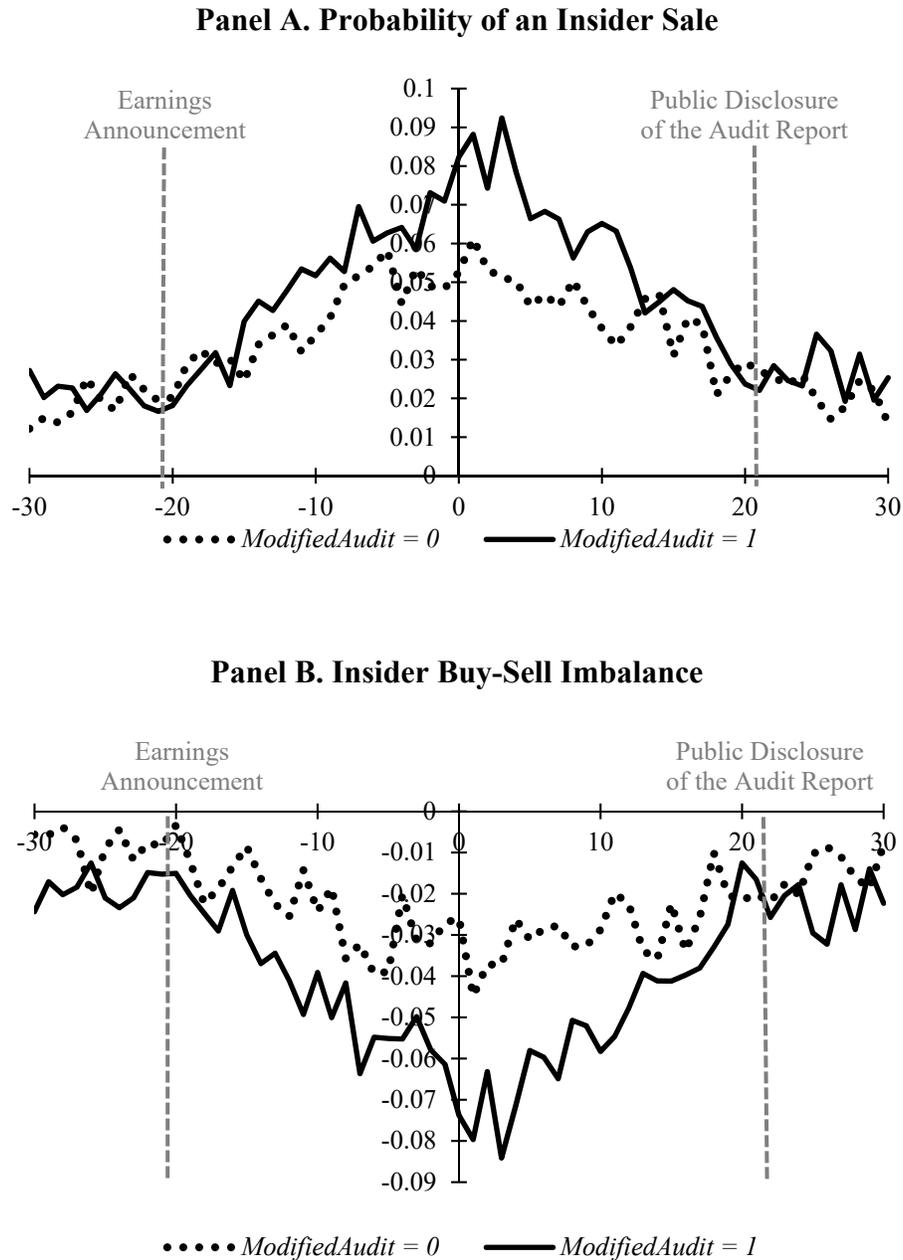
This figure illustrates the timing of the earnings announcement, audit report, and the public filing of the report in the firm's 10-K for observations in our sample. In our sample, the average audit report date occurs 20 days after the earnings announcement and 21 days before the report is filed with the SEC. See Table 1 for more details.

Figure 2. Insider Trading around the Audit Report Date: Unsigned Trading



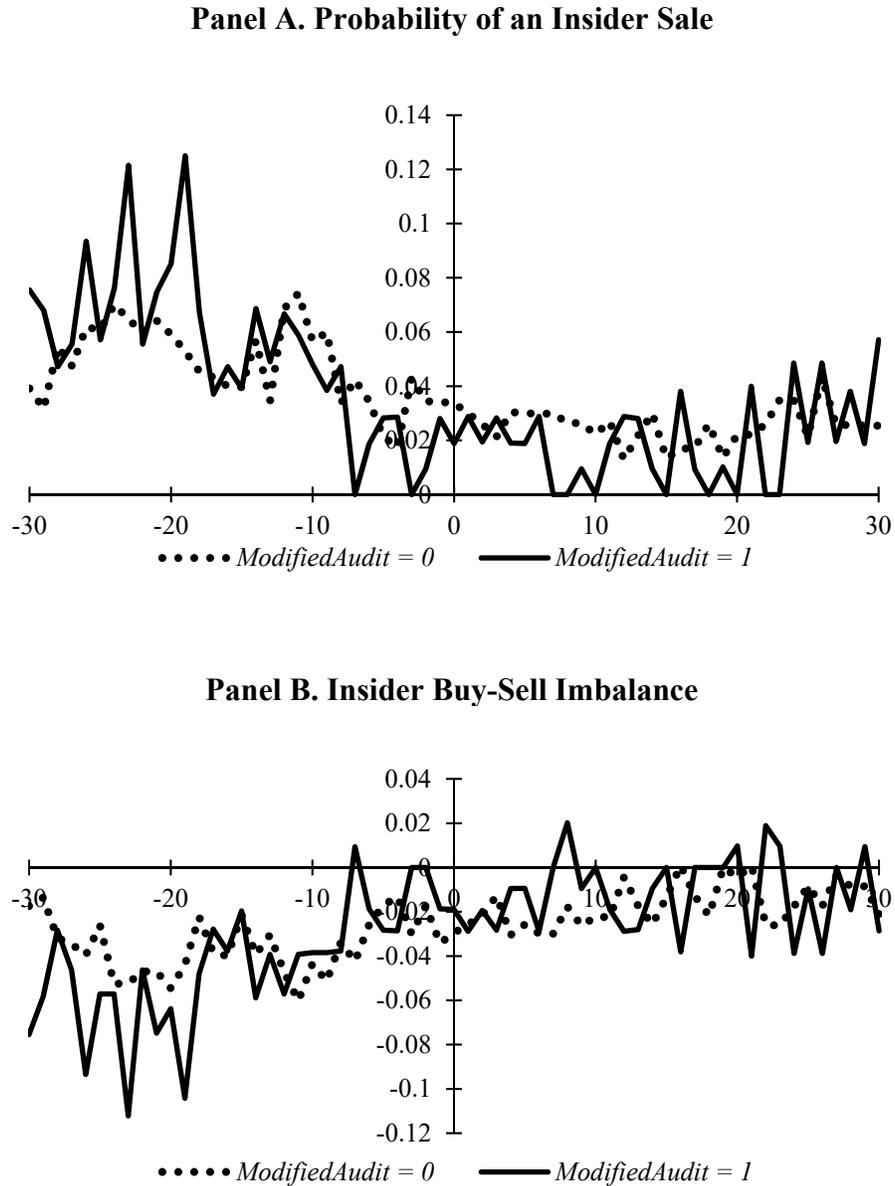
This figure plots average unsigned insider trading activity in the $[-30, +30]$ window around the audit report date. Day 0 represents the audit report date, and the vertical dashes represent the average firm's earnings announcement (Day -20) and public disclosure of the report (Day +21). Panel A presents the daily probability of an insider trade (*InsiderTrade*). Panel B presents daily normalized insider trading volume (*InsiderVolume*). All variables are as defined in Table 1. Sample of 115,095 unique firm-days in the $[-30, +30]$ window around the audit report date.

Figure 3. Insider Trading around the Audit Report Date: Signed Trading



This figure plots average signed insider trading activity in the $[-30, +30]$ window around the audit report date separately for firms with clean audit opinions ($ModifiedAudit = 0$) and modified audit opinions ($ModifiedAudit = 1$). Day 0 represents the audit report date, and the vertical dashes represent the average firm's earnings announcement (Day -20) and public disclosure of the report (Day +21). Panel A presents the daily probability that insiders are net sellers ($InsiderSeller$). Panel B presents daily insider buy-sell imbalance ($InsiderBSI$). All variables are as defined in Table 1. Sample of 115,095 unique firm-days in the $[-30, +30]$ window around the audit report date.

Figure 4. Insider Trading around Public Disclosure of the Audit Report



This figure plots average signed insider trading activity in the $[-30, +30]$ window around the public disclosure of the audit report separately for firms with clean audit opinions ($ModifiedAudit = 0$) and modified audit opinions ($ModifiedAudit = 1$). Day 0 represents the public filing date. Panel A presents the daily probability that insiders are net sellers (*InsiderSeller*). Panel B presents daily insider buy-sell imbalance (*InsiderBSI*). All variables are as defined in Table 1. Sample of 20,415 unique firm-days in the $[-30, +30]$ window around the public disclosure of the report, after excluding observations where the audit report date falls within this window.

Table 1. Descriptive Statistics**Panel A. Firm Characteristics**

Variable	Mean	Median	Std	N-obs
<i>ARtoEA</i>	-20.392	-19.000	13.387	1,963
<i>ARto10K</i>	21.477	18.000	10.876	1,963
<i>ModifiedAudit</i>	0.381	0.000	0.486	1,963
<i>Size</i>	6.090	5.902	2.038	1,963
<i>BM</i>	0.573	0.495	0.462	1,963
<i>Surprise</i>	0.010	0.000	0.116	1,963
<i>AbReturn</i>	0.130	-0.012	0.616	1,963
<i>Volatility</i>	0.106	0.083	0.078	1,963

Panel B. Daily Insider Trading Activity

Variable	Mean	Median	Std	N-obs
<i>InsiderTrade</i>	0.048	0.000	0.214	115,095
<i>InsiderSeller</i>	0.038	0.000	0.191	115,095
<i>InsiderVolume</i>	0.000	-0.166	1.000	115,095
<i>InsiderBSI</i>	-0.028	0.000	0.217	115,095
<i>BlackoutPd</i>	0.284	0.000	0.451	115,095

Panel C. Univariate Differences in Insider Trading Activity around the Audit Report Date

Event Period	Average	Average		Difference
	$\Pr(\text{InsiderTrade})$	$\Pr(\text{InsiderSeller})$		
		<i>ModifiedAudit</i>		
		= 0	= 1	
-30 to +30	0.048	0.034	0.044	0.010***
-30 to -16	0.030	0.022	0.023	0.001
-15 to -11	0.051	0.033	0.046	0.013***
-10 to -6	0.064	0.047	0.058	0.012**
-5 to -1	0.073	0.051	0.066	0.015***
0 to +5	0.077	0.052	0.080	0.028***
+6 to +10	0.063	0.045	0.064	0.019***
+11 to +15	0.053	0.039	0.050	0.011***
+16 to +30	0.033	0.025	0.029	0.005**

This table presents descriptive statistics for the variables used in our analysis. Panel A presents the distribution of firm characteristics. Panel B presents the distribution of common measures of insider trading activity. Panel C presents average insider trading activity around the audit report and the difference between firms with clean audit opinions and modified audit opinions. The unit of analysis in panel A is the firm-year, and the unit of analysis in panels B and C is the firm-day.

Sample of 1,963 unique firm-years from 2003 to 2015, and 115,095 unique firm-days within 30 days of the audit report date. *, **, *** indicate statistical significance (two-sided) at the 0.1, 0.05, and 0.01 levels, respectively.

ARtoEA is the number of days between the audit report and the earnings announcement. *ARto10K* is the number of days between the audit report and the 10-K filing. *ModifiedAudit* is an indicator variable that equals one if the audit opinion is anything other than a clean unqualified opinion (e.g., unqualified with additional language, going concern, SOX 404b material weaknesses, and SOX 302 material weakness) and zero otherwise. *Size* is the natural log of total assets. *BM* is book value of equity scaled by market value of equity. *Surprise* is the seasonal random walk earnings surprise scaled by total assets. *AbReturn* is the firm's market-adjusted buy-and-hold return over the fiscal year. *Volatility* is the standard deviation of monthly stock returns over the fiscal year. *InsiderTrade* is an indicator variable equal to one if an insider at the firm traded that day and zero otherwise. *InsiderSeller* is an indicator variable equal to one if insiders at the firm are net sellers on that day and zero otherwise. *InsiderVolume* is insider trading volume scaled by shares outstanding and normalized using the sample average and standard deviation. *InsiderBSI* is the daily insider buy-sell imbalance, calculated as the number of shares bought by insiders minus the number of shares sold by insiders scaled by insider trading volume. *BlackoutPd* is an indicator variable equal to one if the day falls within $[-46, +1]$ days of the firm's earnings announcement and zero otherwise. All continuous variables are winsorized at the 1st and 99th percentiles.

Table 2. Insider Trading around the Audit Report Date: Unsigned Trading

Variable	Dependent Variable: $Pr(InsiderTrade_{i,t})$		Dependent Variable: $InsiderVolume_{i,t}$	
	Pooled	Within firm-quarter	Pooled	Within firm-quarter
	(1)	(2)	(3)	(4)
<i>Day</i> [-5, +5]	0.024*** (8.26)	0.018*** (5.85)	0.114*** (8.17)	0.085*** (6.11)
Controls				
<i>BlackoutPd</i>	-0.038*** (-14.52)	-0.049*** (-15.82)	-0.132*** (-11.34)	-0.189*** (-12.57)
<i>Size</i>	0.005*** (4.84)	.	-0.003 (-0.68)	.
<i>BM</i>	-0.009** (-2.00)	.	-0.052*** (-2.67)	.
<i>Surprise</i>	0.011 (0.54)	.	-0.025 (-0.37)	.
<i>AbReturn</i>	0.009** (2.37)	.	0.050*** (3.55)	.
<i>Volatility</i>	-0.048** (-2.02)	.	-0.095 (-0.98)	.
Fixed Effects	none	firm-quarter	none	firm-quarter
<i>F</i>	46.62	160.10	29.73	100.10
<i>N-obs</i>	115,095	115,095	115,095	115,095

This table presents results from estimating Eq. (1) using both pooled and within-firm-quarter designs. Columns (1) and (2) present results when the dependent variable is the probability of insider trade (*InsiderTrade*). Columns (3) and (4) present results when the dependent variable is insider trading volume (*InsiderVolume*). Columns (2) and (4) present results from including firm-quarter fixed effects. *Day*[-5, +5] is an indicator variable equal to one if the day falls within [-5, +5] of the firm's audit report date and zero otherwise. All other variables are as defined in Table 1. Firm-quarter fixed effects subsume the coefficients on all of our control variables except for *BlackoutPd*. *t*-statistics appear in parentheses and are clustered by firm and date. *, **, *** indicate statistical significance (two-sided) at the 0.1, 0.05, and 0.01 levels, respectively. Sample of 115,095 unique firm-days in the [-30, +30] window around the audit report date.

Table 3. Insider Trading around the Audit Report Date: Signed Trading

Variable	Dependent Variable: $Pr(InsiderSeller_{i,t})$		Dependent Variable: $InsiderBSI_{i,t}$	
	Pooled (1)	Within firm-quarter (2)	Pooled (3)	Within firm-quarter (4)
$Day[-5, +5]*ModifiedAudit$	0.015*** (2.82)	0.016*** (3.06)	-0.018*** (-3.33)	-0.019*** (-3.39)
Controls				
$ModifiedAudit$	-0.003 (-1.01)	.	0.001 (0.16)	.
$Day[-5, +5]$	-0.002 (-0.43)	0.009*** (2.87)	-0.001 (-0.32)	-0.005 (-1.39)
$BlackoutPd$	0.014*** (4.74)	-0.039*** (-13.50)	-0.008** (-2.39)	0.029*** (9.19)
$Size$	-0.029*** (-12.04)	.	0.020*** (7.70)	.
BM	0.007*** (6.60)	.	-0.009*** (-7.60)	.
$Surprise$	-0.014*** (-4.53)	.	0.020*** (5.12)	.
$AbReturn$	0.014 (0.68)	.	-0.017 (-0.82)	.
$Volatility$	0.010** (2.53)	.	-0.010*** (-2.63)	.
Fixed Effects	none	firm-quarter	none	firm-quarter
F	29.49	75.96	25.22	36.55
$N-obs$	115,095	115,095	115,095	115,095

This table presents results from estimating Eq. (2) using both pooled and within-firm-quarter designs. Columns (1) and (2) present results when the dependent variable is the probability that insiders are net sellers (*InsiderSeller*). Columns (3) and (4) present results when the dependent variable is the insider buy-sell imbalance (*InsiderBSI*). Columns (2) and (4) present results from including firm-quarter fixed effects. $Day[-5, +5]$ is an indicator variable equal to one if the day falls within $[-5, +5]$ of the firm's audit report date and zero otherwise. *ModifiedAudit* is an indicator variable that equals one if the audit opinion is anything other than a clean unqualified opinion and zero otherwise. All other variables are as defined in Table 1. Firm-quarter fixed effects subsume the coefficients on all of our control variables except for *BlackoutPd* and $Day[-5, +5]$. t -statistics appear in parentheses and are clustered by firm and date. *, **, *** indicate statistical

significance (two-sided) at the 0.1, 0.05, and 0.01 levels, respectively. Sample of 115,095 unique firm-days in the $[-30, +30]$ window around the audit report date.

Table 4. Insider Trading around the Audit Report Date: Alternative Windows

Variable	Dependent Variable: $Pr(InsiderSeller_{i,t})$		Dependent Variable: $InsiderBSI_{i,t}$	
	Pooled	Within firm-quarter	Pooled	Within firm-quarter
	(1)	(2)	(3)	(4)
$Day[-10, -6]*ModifiedAudit$	0.007 (1.09)	0.010 (1.44)	-0.009 (-1.25)	-0.010 (-1.44)
$Day[-5, -1]*ModifiedAudit$	0.010 (1.57)	0.012* (1.90)	-0.015** (-2.08)	-0.016** (-2.22)
$Day[0, +5]*ModifiedAudit$	0.022*** (3.28)	0.025*** (3.48)	-0.026*** (-3.63)	-0.027*** (-3.65)
$Day[+6, +10]*ModifiedAudit$	0.013** (1.97)	0.015** (2.24)	-0.015** (-2.08)	-0.016** (-2.17)
Controls	yes	yes	yes	yes
Fixed Effects	none	firm-quarter	none	firm-quarter
F	18.73	28.50	15.94	13.77
N -obs	115,095	115,095	115,095	115,095

This table presents results from estimating Eq. (2) using alternative event windows and differentiating between trades placed before and after the audit report date. Columns (1) and (2) present results when the dependent variable is the probability that insiders are net sellers (*InsiderSeller*). Columns (3) and (4) present results when the dependent variable is the insider buy-sell imbalance (*InsiderBSI*). Columns (2) and (4) present results from including firm-quarter fixed effects. $Day[-10, -6]$, $Day[-5, -1]$, $Day[0, +5]$, and $Day[+6, +10]$ are indicator variables equal to one if the day falls in the respective window relative to the audit report date, and zero otherwise. *ModifiedAudit* is an indicator variable that equals one if the audit opinion is anything other than a clean unqualified opinion, and zero otherwise. All other variables are as defined in Table 1. For parsimony, we do not tabulate coefficients on control variables or main effects. t -statistics appear in parentheses and are clustered by firm and date. *, **, *** indicate statistical significance (two-sided) at the 0.1, 0.05, and 0.01 levels, respectively. Sample of 115,095 unique firm-days in the $[-30, +30]$ window around the audit report date.

Table 5. Insider Trading around the Audit Report Date: Officers versus Independent Directors

Panel A. Officer Trades Only				
	Dependent Variable: $Pr(InsiderSeller_Officer_{i,t})$		Dependent Variable: $InsiderBSI_Officer_{i,t}$	
	Pooled	Within firm-quarter	Pooled	Within firm-quarter
Variable	(1)	(2)	(3)	(4)
<i>Day[-10, -6]*ModifiedAudit</i>	0.005 (0.92)	0.006 (1.06)	-0.004 (-0.69)	-0.005 (-0.78)
<i>Day[-5, -1]*ModifiedAudit</i>	0.014** (2.45)	0.015*** (2.59)	-0.016*** (-2.70)	-0.017*** (-2.77)
<i>Day[0, +5]*ModifiedAudit</i>	0.018*** (3.10)	0.018*** (3.15)	-0.016*** (-2.79)	-0.017*** (-2.77)
<i>Day[+6, +10]*ModifiedAudit</i>	0.011* (1.90)	0.012** (2.08)	-0.011* (-1.92)	-0.012** (-2.03)
Controls	yes	yes	yes	yes
Fixed Effects	none	firm-quarter	none	firm-quarter
<i>F</i>	16.05	23.96	14.62	16.69
<i>N-obs</i>	115,095	115,095	115,095	115,095

Table 5. Insider Trading around the Audit Report Date: Officers versus Independent Directors (cont'd)

Panel B. Director Trades Only				
Variable	Dependent Variable: $Pr(InsiderSeller_Director_{i,t})$		Dependent Variable: $InsiderBSI_Director_{i,t}$	
	Pooled	Within firm-quarter	Pooled	Within firm-quarter
	(1)	(2)	(3)	(4)
$Day[-10, -6]*ModifiedAudit$	0.002 (0.67)	0.004 (1.13)	-0.004 (-0.96)	-0.005 (-1.16)
$Day[-5, -1]*ModifiedAudit$	-0.005 (-1.51)	-0.003 (-1.03)	0.002 (0.52)	0.001 (0.33)
$Day[0, +5]*ModifiedAudit$	0.007* (1.80)	0.009** (2.10)	-0.013*** (-2.81)	-0.014*** (-2.90)
$Day[+6, +10]*ModifiedAudit$	0.006 (1.59)	0.007* (1.79)	-0.007* (-1.65)	-0.007 (-1.64)
Controls	yes	yes	yes	yes
Fixed Effects	none	firm-quarter	none	firm-quarter
F	8.28	11.26	6.68	3.40
$N-obs$	115,095	115,095	115,095	115,095

This table presents results from estimating Eq. (2) using alternative event windows and differentiating between trades placed by officers and independent directors. Panel A presents results for trades placed by officers. Panel B presents results for trades placed by independent directors. Columns (1) and (2) of each panel present results when the dependent variable is the probability that officers are net sellers and independent directors are net sellers, respectively. Columns (3) and (4) of each panel presents results when the dependent variable is the officer buy-sell imbalance and independent director buy-sell imbalance, respectively. Columns (2) and (4) of each panel present results from including firm-quarter fixed effects. $Day[-10, -6]$, $Day[-5, -1]$, $Day[0, +5]$, and $Day[+6, +10]$ are indicator variables equal to one if the day falls in the respective window relative to the audit report date, and zero otherwise. $ModifiedAudit$ is an indicator variable that equals one if the audit opinion is anything other than a clean unqualified opinion, and zero otherwise. All other variables are as defined in Table 1. For parsimony, we do not tabulate coefficients on control variables or main effects. t -statistics appear in parentheses and are clustered by firm and date. *, **, *** indicate statistical significance (two-sided) at the 0.1, 0.05, and 0.01 levels, respectively. Sample of 115,095 unique firm-days in the $[-30, +30]$ window around the audit report date.

Table 6. Insider Trading around the Audit Report Date: Unexpected Audit Opinions

Panel A. Audit Prediction Model		
	Dependent Variable: <i>ModifiedAudit</i>	
Variable	coeff.	<i>t</i> -stat
<i>Size</i>	0.039***	(14.66)
<i>FirmAge</i>	-0.005	(-1.09)
<i>Beta</i>	0.010***	(5.35)
<i>IdioVol</i>	0.300***	(7.26)
<i>Return</i>	-0.030***	(-6.79)
<i>Leverage</i>	0.001	(0.06)
<i>Loss</i>	0.044***	(6.62)
<i>Financing</i>	0.031***	(3.47)
<i>BigN</i>	0.109***	(11.81)
<i>CashFlow</i>	-0.050**	(-2.56)
<i>FYEtoEA</i>	0.004***	(21.98)
Fixed Effects	year	
<i>F</i>	98.68	
<i>N-obs</i>	53,009	

Variable	Dependent Variable: <i>Pr(InsiderSeller_{i,t})</i>		Dependent Variable: <i>InsiderBSI_{i,t}</i>	
	Pooled	Within firm-quarter	Pooled	Within firm-quarter
	(1)	(2)	(3)	(4)
<i>Day[-5, +5]*Abn_ModifiedAudit</i>	0.015*** (2.66)	0.017*** (2.95)	-0.018*** (-2.96)	-0.018*** (-3.07)
Controls	yes	yes	yes	yes
Fixed Effects	none	firm-quarter	none	firm-quarter
<i>F</i>	29.62	75.75	25.57	36.11
<i>N-obs</i>	115,095	115,095	115,095	115,095

This table presents results from using the unexpected component of the audit opinion to measure audit outcomes.

Panel A presents results from estimating Eq. (3) on the sample of all firm-years at the intersection of CRSP/Compustat and Audit Analytics during our sample period, 2003-2015. *Size* is the natural

log of total assets. *FirmAge* is the natural log of the number of years the firm appears on Compustat. *Beta* is the firm's market-model beta estimated using monthly stock returns over the fiscal year. *Return* is the buy-and-hold return over the fiscal year. *IdioVol* is the standard deviation of the residual from a market model of monthly returns estimated over the fiscal year. *Leverage* is total liabilities scaled by total assets. *Loss* is an indicator variable equal to one if net income is negative and zero otherwise. *Financing* is an indicator variable equal to one if the firm issues debt or equity during the current fiscal year. *BigN* is an indicator for whether the firm is audited by a "Big-N" auditor. *CashFlow* is operating cash flows scaled by total assets. *FYEtoEA* is the number of days between fiscal year-end and the firm's earnings announcement.

Panel B presents results from estimating Eq. (2) using the residual from the audit prediction model in panel A to measure audit outcomes. Columns (1) and (2) present results when the dependent variable is the probability that insiders are net sellers (*InsiderSeller*). Columns (3) and (4) present results when the dependent variable is the insider buy-sell imbalance (*InsiderBSI*). Columns (2) and (4) present results from including firm-quarter fixed effects. *Day[-5, +5]* is an indicator variable equal to one if the day falls within [-5, +5] of the firm's audit report date and *Abn_ModifiedAudit* is the residual from the prediction model estimated in panel A. All other variables are as defined in Table 1. For parsimony, we do not tabulate coefficients on control variables or main effects.

t-statistics appear in parentheses and are clustered by firm and date. *, **, *** indicate statistical significance (two-sided) at the 0.1, 0.05, and 0.01 levels, respectively. Sample of 53,009 unique firm-years in panel A, and 115,095 unique firm-days in panel B.

Table 7. Insider Trading around Public Disclosure of the Audit Report

Variable	Dependent Variable: $Pr(InsiderSeller_{i,t})$		Dependent Variable: $InsiderBSI_{i,t}$	
	Pooled	Within firm-quarter	Pooled	Within firm-quarter
	(1)	(2)	(3)	(4)
$Day[-5, +5]*ModifiedAudit$	-0.010 (-1.19)	-0.017* (-1.64)	0.010 (1.12)	0.015 (1.36)
Controls	yes	yes	yes	yes
Fixed Effects	none	firm-quarter	none	firm-quarter
F	2.69	7.51	3.40	3.20
N -obs	20,415	20,415	20,415	20,415

This table presents results from estimating Eq. (2) over the $[-30, +30]$ window around the public disclosure of the audit report. Day 0 corresponds to the public filing date. Columns (1) and (2) present results when the dependent variable is the probability that insiders are net sellers (*InsiderSeller*). Columns (3) and (4) present results when the dependent variable is the insider buy-sell imbalance (*InsiderBSI*). Columns (2) and (4) present results from including firm-quarter fixed effects. $Day[-5, +5]$ is an indicator variable equal to one if the day falls within $[-5, +5]$ of the public filing date and zero otherwise. *ModifiedAudit* is an indicator variable that equals one if the audit opinion is anything other than a clean unqualified opinion and zero otherwise. All other variables are as defined in Table 1. For parsimony, we do not tabulate coefficients on control variables or main effects. t -statistics appear in parentheses and are clustered by firm and date. *, **, *** indicate statistical significance (two-sided) at the 0.1, 0.05, and 0.01 levels, respectively. Sample of 20,415 unique firm-days in the $[-30, +30]$ window around the public disclosure of the report, after excluding observations where the audit report date falls within this window.

Table 8. Stock Market Reaction around the Audit Report Date

Variable	Dependent Variable: <i>PublicVolume</i> _{i,t}		Dependent Variable: <i> Ret</i> _{i,t}	
	Pooled (1)	Within firm-quarter (2)	Pooled (3)	Within firm-quarter (4)
<i>Day</i> [-5, +5]	-0.009 (-0.58)	0.003 (0.46)	0.000 (0.79)	0.000 (1.58)
Controls				
<i>BlackoutPd</i>	-0.013 (-0.52)	0.014** (2.05)	0.001*** (4.50)	0.002*** (6.58)
<i>Size</i>	0.022** (2.03)	.	-0.001*** (-6.58)	.
<i>BM</i>	-0.033 (-1.31)	.	0.005*** (4.70)	.
<i>Surprise</i>	-0.075 (-0.80)	.	0.001 (0.31)	.
<i>AbReturn</i>	0.061** (2.07)	.	-0.000 (-0.45)	.
<i>Volatility</i>	1.294*** (5.01)	.	0.072*** (17.39)	.
Fixed Effects	none	firm-quarter	none	firm-quarter
<i>F</i>	37.05	2.19	105.80	22.03
<i>N-obs</i>	115,095	115,095	115,095	115,095

This table presents results from estimating Eq. (4) using both pooled and within-firm-quarter designs. Columns (1) and (2) present results when the dependent variable is public trading volume (*PublicVolume*). Columns (3) and (4) present results when the dependent variable is absolute value of daily returns (*|Ret*_{i,t}). Columns (2) and (4) present results from including firm-quarter fixed effects. *PublicVolume* is daily CRSP trading volume less daily insider trading volume, scaled by shares outstanding, and normalized using the sample average and standard deviation. *|Ret*_{i,t} is the absolute value of the daily buy-and-hold returns listed on CRSP (inclusive of dividends). *Day*[-5, +5] is an indicator variable equal to one if the day falls within [-5, +5] of the firm's audit report date and zero otherwise. All other variables are as defined in Table 1. Firm-quarter fixed effects subsume the coefficients on all of our control variables except for *BlackoutPd*. *t*-statistics appear in parentheses and are clustered by firm and date. *, **, *** indicate statistical significance (two-

sided) at the 0.1, 0.05, and 0.01 levels, respectively. Sample of 115,095 unique firm-days in the [-30, +30] window around the audit report date.