Does mandatory disclosure deter insider trading?

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Abstract

This study examines the effect of mandatory disclosure and increased corporate transparency on insider trading. While tempting to conclude that transparency lowers insiders' information advantage and trade profitability, a compelling counter-intuitive theoretical prediction that increased disclosure crowds out private information production and actually increases insiders' trade profitability motivates this study. I exploit the mandatory adoption of SFAS 131 (now ASC 280) – which forced corporate managers to disclose detailed segment information as is internally observed – to document results consistent with causal interpretations. The results show a significant decrease between 5.5 – 6.3 pp (i.e., 79%) in daily alpha for purchase trades of insiders in firms mandated to increase their level of transparency in corporate reports due to SFAS 131 adoption. Consistent with an information channel, such an effect is concentrated among firms with low ex-ante financial reporting quality and high ex-ante investors' uncertainty. I do not find support for governance/monitoring or proprietary cost channels. Overall, this paper documents substantial information benefits of improved segment reporting to outside investors, limiting insiders' information advantage in trading stocks of their own companies.

Keywords: Mandatory disclosure; Segment reporting; SFAS 131; Insider trading; Information asymmetry; Crowding out

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1 Introduction

Does mandatory disclosure deter insider trading? Information disclosure is a centerpiece of well-functioning financial markets. The conventional notion that transparency lowers information asymmetry, disciplines managers, and cures many corporate ills underpins regulators' emphasis on more and detailed corporate disclosures.[1] Mandatory disclosure is aimed at protecting vulnerable investors by setting minimum requirements for information disclosure. It is expected, among other things, to provide disincentives for corporate insiders to extract information rents such as opportunistic trades of their companies' stocks.[2] Despite its intuitive appeal, disclosure regulation is still hotly debated by academics and policymakers. The recent literature (Goldstein & Yang, 2017; Leuz & Wysocki, 2016) highlights nuances in the economic effects of mandatory disclosure and calls for reexaminations of long-held views of mandating corporate disclosure. With a specific focus on insider trading (a top priority area for the SEC[3]), theoretical guidance on the effect of mandatory corporate disclosure is not a priori obvious. On the one hand, increasing disclosure could lower insiders' information advantage, which translates into lower insider trade profits and insider trading is discouraged. Baiman and Verrecchia (1996) is a notable theoretical work in this regard and predicts that more disclosure should decrease insider trading profit.

[1] For example, after a number of corporate scandals in the U.S., the Sarbanes–Oxley Act of 2002 was enacted with sweeping reforms to transparency in corporate operations and governance.

[2] While the legal literature classifies trades based on specific non-public "material" information, the economic literature considers all trades in which one party is asymmetrically informed as insider (informed) trading (Carlton & Fischel, 1983). I view the economic definition of insider trading as more encompassing and therefore adopt the economic definition in this study.

[3] Both anecdotal and empirical academic evidence support the assertion that insiders gain substantially from trading stocks of their companies. See for example, in 2018 the SEC accused insiders at Sagamo BioSciences Inc of earning about $1.5million from illegal trades (https://www.sec.gov/litigation/litreleases/2018/lr24245.htm). This is just one of the multiple insider trade litigations initiated by the SEC in 2018 only. Gibson Dunn provide an excellent summary of some of these litigations (https://www.gibsondunn.com/wp-content/uploads/2019/01/2018-year-end-securities-enforcement-update.pdf). The academic evidence also show that insiders' trades predict future firm performance and this evidence continue to survive regulatory efforts to counter exploitative insider trading (Akbas, Jiang, & Koch, 2020; Ali & Hirshleifer, 2017; Jagolinzer, Larcker, Ormazabal, & Taylor, forthcoming; Lakonishok & Lee, 2001; Seyhun, 1992a, 1992c).

However, a commonly overlooked possibility is that a mandatory increase in public disclosure crowds out private information production efforts of other market participants and lower the equilibrium number of informed traders thereby creating opportunity for corporate insiders to earn bigger profits from stock trades based on their privileged access to firm-specific information(Goldstein & Yang, 2017; Kurlat & Veldkamp, 2015). This view is emphasized by Bushman and Indjejikian (1995), who demonstrate in their theoretical model the counter-intuitive result that more disclosure could actually make insider trades more profitable. Given the above two theoretical arguments, it is clear that the mandatory disclosure affects insider trading but the direction of the effect boils down to be an empirical question. This paper is the first, to the best of my knowledge, which sets out to investigate this question in the literature. Understanding this question is of critical importance to policymakers, as they care about both mandatory disclosure and insider trading, and can set standards to regulate the proper level of mandatory disclosure. For example, the U.S. Securities and Exchange Commission (SEC) continues to push for more disclosure with the belief that mandating more disclosure helps transparent and accurate valuation of firms. On its website, the SEC specifically mentions that "*Only through the steady flow of timely, comprehensive, and accurate information can people make sound investment decisions. The result of this information flow is a far more active, efficient, and transparent capital market that facilitates the capital formation so important to our nation's economy*." (SEC, 2013).[4][5]

To answer the empirical question of how increased disclosure could affect insider trading, this paper exploits the SFAS 131 adoption as a quasi-natural experiment setting. SFAS 131 is the

[4] The European Union has a similar 2014 legislation (REGULATION (EU) No 596/2014 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL) which states in paragraph 49 "*The public disclosure of inside information by an issuer is essential to avoid insider dealing and ensure that investors are not misled.*" https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32014R0596&from=EN#d1e40-1-1

[5] The SEC is currently considering a revamp of its mandatory disclosure requirements aimed at giving managers more flexibility in what they disclose to investors. https://www.sec.gov/news/press-release/2019-148

accounting standard which currently regulates segment reporting in the U.S.[6] Prior to its adoption in 1997, segment information were discretionarily reported as the guiding accounting standard (SFAS 14) based on the so-called "industry approach" provided managers ample discretion over firms' segment reports. The Financial and Accounting Standards Board (FASB) issued SFAS 131 to redefine the basis for segment reporting. SFAS 131 mandates the "management approach" to segment reporting which requires multi-segment firms to define and report operating segments in the same way as is internally reviewed for resource allocations. The first application of SFAS 131 occurred in 1998 for firms with December fiscal year-end. The second and last application occurred in 1999 for firms with non-December fiscal year-end. SFAS 131 was effective in forcing firms to redefine their reported segments (in number and information detail) following its adoption (Herrmann & Thomas, 2000; Street, Nichols, & Gray, 2000)[7] and generally improved the information environment of firms (Akins, 2018; Berger & Hann, 2003; Cho, 2015; Franco, Urcan, & Vasvari, 2015; Jayaraman & Wu, 2019). I also note an increase in analysts' reliance on public information as opposed to production of their own private information after SFAS 131 adoption (Botosan & Stanford, 2005).

I am able to conduct a difference-in-difference (DID) research design that compares the effect of SFAS 131 on the profitability of stock trades by two groups of insiders. The first group which I call the treatment group are insiders in multi-segment firms that mandatorily changed their segment definitions due to SFAS 131 adoption thereby increasing transparency in their segment reports (i.e. treated firms). The second group which constitutes the control group refers to insiders

[6] Statement of Financial Accounting Standards (SFAS) 131 is now codified and referred to as Accounting Standards Codification (ASC) 280.

[7] In their December 2012 post implementation review report, the Financial Accounting Foundation (FAF) also concludes that SFAS 131 has generally being effective and achieved its objectives. https://www.accountingfoundation.org/cs/ContentServer?c=Document_C&cid=1176160621900&d=&pagename=Foundation%2FDocument_C%2FDocumentPage

in firms deemed to be already compliant with the standard's requirement (i.e. control firms). I define the profitability of insider trades as the daily alpha, which is the risk-adjusted return estimated based on the (Carhart, 1997) four-factor model. For each firm, on each insider trading day, alpha is estimated over 90, 120, and 180 days following the trade date (Dai, Parwada, & Zhang, 2015; Gao, Lisic, & Zhang, 2014; Jagolinzer, Larcker, & Taylor, 2011). Regressions are therefore estimated at the firm-day level. A positive alpha (i.e. trade profitability) implies a firm's stock price increased on average after insiders' trade, especially for information-driven trades (Gao et al., 2014). For insiders sale trades, alpha is expected to be negative to imply prices indeed declined on average after insiders' sales, if the sales are information-driven (Dai et al., 2015; Jagolinzer et al., 2011).[8]

More specifically, I generate a final sample of 3,275 unique firms with 70,207 insider trades over the 1996 – 2003 period by matching Compustat firms having segment information around the 1998/1999 SFAS adoption years with insider trading data. I focus on insider trades occurring within three years of SFAS 131 adoption for the sample firms. I also focus on insider purchase trades given that they are more likely to be based on private information unlike insider sale trades which are likely driven by a host of factors such as liquidity and diversification needs (Brochet, 2010; Gao et al., 2014; Ravina & Sapienza, 2010). Also, prior studies show that while insiders purchase trades are information-driven and profitable, insiders sale trades are not (Brochet, 2010; Chung et al., 2019; Frankel & Li, 2004; Gao et al., 2014; Jagolinzer et al., 2011; Ravina &

[8] It is standard in the literature to multiply alpha as well as other risk-adjusted returns of insiders sale trades by -1 and interpret the product as loss avoided (i.e. profitability) by insiders as result of selling earlier than prices falling (Chung, Goh, Lee, & Shevlin, 2019; Dai et al., 2015; Huddart & Ke, 2007; Jagolinzer et al., 2011; Skaife, Veenman, & Wangerin, 2013).

Sapienza, 2010; Veenman, 2011).[9] Insider trades is used in the rest of the paper to mean insiders purchase trades, except where I explicitly mention it to include sales trades.

The findings show a significant reduction in insider trade profitability after SFAS 131 adoption. Specifically, I observe between 5.5 – 6.3 percentage points decrease in daily trade alpha for the group of insiders in treated firms relative the group of insiders in control firms. This decrease is of substantial economic magnitude. For example, comparing a 6.3 percentage points decrease in the 180-days trade alpha to the average 180-days trade alpha of the sample that is 8.0 percentage points, translates into approximately a 79% decrease. I note similar substantial decreases based on 120-days trade alpha (57% decrease) and 90-days trade alpha (52% decrease). I derive these results after controlling for the contrarian nature of insider trades (Lakonishok & Lee, 2001; Piotroski & Roulstone, 2005) and other firm characteristics such as firm performance, size and growth (Akbas et al., 2020; Ali & Hirshleifer, 2017; Dai et al., 2015; Lakonishok & Lee, 2001) as well as the inclusion of firm and year fixed effects in the DID model. In a dynamic analysis, I verify that decrease in insider trade profitability I document occurs after and not before the adoption of SFAS 131, supporting the parallel trends assumption for the DID design. The decreasing effect starts in the first year of SFAS 131 adoption and endures up to the end of the three post-adoption years observed. The results are also robust to using a sample which excludes firms which may have changed their number of reported segments for reasons (e.g. mergers, restructurings, etc.) unrelated to SFAS 131 adoption (Berger & Hann, 2003; Cho, 2015; Jayaraman & Wu, 2019). Further, I verify the results continue to hold in a sample that excludes routine trades, retaining opportunistic trades (Cohen, Malloy, & Pomorski, 2012).

[9] I verify (untabulated) in the sample that insiders sale trades are not profitable. Stock prices do not decline after insider sales. This supports the literature's consensus that insiders sale trades are less likely to be information-driven.

The decrease in profitability of insider trades I document is consistent with Baiman and Verrecchia (1996) prediction that mandatory disclosure will lower insiders trade profitability. The opposite prediction by Bushman and Indjejikian (1995) that mandatory disclosure will increase insider trade profitability is not supported by the data. In order to further understand how a decline in the profitability of insiders' trades following a mandatory increase in disclosure of segment information due to SFAS 131 adoption occurs, I next conduct a battery of cross-section tests to unravel possible channels/mechanisms driving this baseline result. I examine three possible channels: information advantage, external monitoring, and proprietary cost channels. First, the decreased profitability of insider trades could be due to improvement in information environment and reduction in investor uncertainty post-SFAS 131 (Berger & Hann, 2003; Botosan & Stanford, 2005; Ettredge, Kwon, Smith, & Zarowin, 2005) which lowered insiders information advantage (Baiman & Verrecchia, 1996). Second, public scrutiny and external monitoring which increased in the post-SFAS 131 period (Berger & Hann, 2007; Cho, 2015) could have deterred insiders from exploiting their private information. Third, given that firms use insider trading as an alternative disclosure mechanism or signal especially when the cost of full disclosure is high (Carlton & Fischel, 1983; John & Lang, 1991; John & Mishra, 1990), when firms are forced to increase their mandatory disclosure due to SFAS 131, there could be a lower need for insider trading so as to achieve its alternative disclosure or signaling purpose. I conduct a series of tests to check if any of these channels is at work.

The first set of cross-sectional tests which is based on insiders' information advantage channel examines whether the primary result varies with heterogeneity in investors' uncertainty and information acquisition costs. If SFAS 131 adoption presents outside investors with information benefits valuable for more accurate estimations of firm performance (Ettredge et al.,

2005) thereby lowering insiders' information advantage, then investors of firms with higher performance uncertainty should benefit more (Huddart & Ke, 2007) In other words the effect of SFAS 131 should be stronger for firms with higher uncertainty. I categorize firms into high or low uncertainty groups based on two firm uncertainty proxies. That is, the accounting-based standardized unexpected earnings (SUE) of Livnat and Mendenhall (2006) and a market-based stock return volatility (Barth, Landsman, Raval, & Wang, forthcoming). A firm is grouped as high uncertainty firm if its ex-ante SUE (i.e. a firm's median pre-SFAS 131 adoption value) is in the top tercile. Similarly, firms with ex-ante stock return volatility in the top tercile are grouped as high uncertainty firms. Low uncertainty firms are those not in the top terciles. Based on the two ex-ante proxies for investors' uncertainty – SUE and return volatility – I show that the decreasing effect of SFAS 131 on insider trade profitability is concentrated among insiders in firms with higher ex-ante uncertainty. I also document results from a set of tests based on investors' information acquisition costs to further corroborate the information mechanism. I use the extent of disaggregation in firms' annual reports (S. Chen, Miao, & Shevlin, 2015) and outsiders' information acquisition cost estimated based analysts following, forecast error and dispersion (Duchin, Matsusaka, & Ozbas, 2010). These cross-sectional results show a higher decreasing effect of SFAS 131 on trade profitability for insiders in firms with the least ex-ante disaggregation in annual reports (i.e. highly aggregated annual reports). Using outsiders' information acquisition cost proxy, I also document a higher decreasing effect of SFAS 131 on trade profitability for insiders in firms with higher ex-ante information acquisition cost. The ex-ante values of both annual report disaggregation measure and outsiders' information acquisition cost are medians of pre-SFAS 131 adoption values for each firm. The categorization of firms into low/high disaggregation level of annual report as well as high/low information acquisition cost groups is

based on sample terciles as in the uncertainty tests above. I interpret these results as: SFAS 131 lowered insiders' information advantage (and trade profitability) more in firms with higher ex-ante information acquisition costs.

The second set of channel tests derives from the observed improvement in external monitoring following SFAS 131 adoption (Berger & Hann, 2007; Cho, 2015) and prior documented association between insider trade profitability and various corporate governance proxies (Brochet, 2010; Jagolinzer et al., 2011; Ravina & Sapienza, 2010). I use two standard monitoring/governance proxies: institutional ownership rate and Bebchuk, Cohen, and Ferrell (2009) E-Index which captures the managerial entrenchment/governance quality based on a broad set of governance provisions. Firms are grouped into high/low governance quality groups following the same procedure as in the uncertainty and information channels tests. I do not observe any differential effect of SFAS 131 across the high/low groups of ex-ante institutional ownership rate and E-Index[10]. This suggests that even if the governance effect of SFAS 131 is at work here, its role is minimal on average in lowering insider trading and profitability. This is not surprising given that some insiders have been shown to defy various corporate governance arrangements to make profitable trades in their companies' stocks. For example, Jagolinzer et al. (2011) show that restricted trading window periods adopted by various firms are not always effective in reducing insider trading and about one-fourth of their sampled insider trades occur within restricted window periods.

The third set of channel tests is in light of the view that firms could use insider trading as an alternative disclosure mechanism to substitute formal disclosure especially when the cost of full

[10] I confirm these results with the G-Index (Gompers, Ishii, & Metrick, 2003).

disclosure is high (Carlton & Fischel, 1983; John & Lang, 1991; John & Mishra, 1990). Given that SFAS 131 enhances the level of mandatory disclosure, firms could have reduced insider trading due to a lower need to do so. If this channel is at work, then the effect of SFAS 131 on insider trading should be stronger for firms with high levels of ex-ante proprietary cost, as these firms have stronger incentives to do more insider trading to substitute formal disclosure prior to SFAS 131. To do so I use three proxies for proprietary costs and conduct cross-sectional tests. That is the degree of market concentration (HHI), Li, Lundholm, and Minnis (2013) text-based competition measure constructed based on percentage of competition words in annual reports, and the product fluidity measure of Hoberg, Phillips, and Prabhala (2014). As in the categorization procedures above, I group firms into high/low categories based on ex-ante and tercile values. I find no differential effect of SFAS 131 across the high/low groups of proprietary costs based on all three proxies. This suggests that proprietary costs concern is not a main driver of reduced insiders' ability to profit from their private information. Based on results from the three sets of cross-sectional tests – information, governance, and proprietary cost – I deduce that the major or dominant channel/mechanism through which the decreasing effect of SFAS 131 adoption on insiders' trade profitability occurs is the information channel, that is SFAS 131 lowered insiders' information advantage thereby lowering profitability of insiders' stock trades.

This study makes several contributions. First I present empirical evidence indicating the constraining effect of mandatory disclosure on insider trading. Given the theoretical ambiguity on how mandatory disclosure affects insider trading (Baiman & Verrecchia, 1996; Bushman & Indjejikian, 1995; Carlton & Fischel, 1983; John & Mishra, 1990), this study helps to further our understanding on the desirability of regulating corporate disclosure. Next, prior studies examining the consequences of SFAS 131 adoption have focused on analysts' forecasts (Berger & Hann,

2003; Botosan & Stanford, 2005), investor monitoring and investment efficiency (Berger & Hann, 2003; Cho, 2015), credit risk and cost of debt (Akins, 2018; T. Chen & Liao, 2015; Franco, Urcan, & Vasvari, 2016) and corporate acquisitions (Godigbe et al, 2020). I provide evidence on another equity market consequence of SFAS 131 adoption. I show that insider trading profitability declines following the adoption SFAS 131 and that this effect occurs mainly through an information and uncertainty reduction channel. The results show that SFAS 131 mitigates outside investors information disadvantage relative to insiders, leveling the information field for stock trading. This evidence complements prior finding that SFAS 131 increased investors' ability to predict future firm performance (Ettredge et al., 2005). I also contribute to the insider trading literature examining the source of insiders' information advantage or factors that create opportunities for insiders' trade profitability (Aboody & Lev, 2000; Agrawal & Nasser, 2012; Ali & Hirshleifer, 2017; Cziraki, Lyandres, & Michaely, 2019; Jagolinzer et al., forthcoming; Kahle, 2000; Ryan, Tucker, & Zhou, 2016; Seyhun & Bradley, 1997; Skaife et al., 2013). The results show that insiders' exclusive access to detailed segment-level information and their discretion over disclosing segment information create valuable opportunities for insiders' information rent extraction. The evidence I document show that adoption of SFAS 131 mitigates this information exploitation opportunity of insiders.

The results are useful for policy considerations on insider trading. The regulators' concern about the implications of insider trading on capital markets has led the SEC to invest in sophisticated methods to clamp down on insider trading (SEC, 2016). I show that increasing transparency in corporate segment reporting can help achieve the purpose of ridding the capital markets of insiders' exploitation. The original policy focus for improving segment reporting transparency has been on facilitating investors' valuation mainly through forecast ability of future

performance of firms (FASB, 1997). The results show an additional advantage of improving segment reporting transparency. That is, segment reporting provides a useful information mechanism to mitigate insider trading opportunity.

After completing this draft, I became aware of Park and Shin (2009) dormant working paper which reaches similar primary conclusion as in my study. The following notable differences distinguish my study from theirs. First, unlike their study which seeks to provide empirical evidence for Baiman and Verrechia (1996) theory, my study seeks to discriminate between two theoretical models with contrasting predictions on the relation between increased disclosure and insider trading. While Baiman and Verrechia (1996) predicts a negative relation between disclosure and insider trading, other compelling theoretical work show that increased disclosure can crowd out private information production and actually increase insider trading (Bushman and Indjejikian, 1995; Goldstein & Yang, 2017; Kurlat & Veldkamp, 2015). The baseline results of my tests are also consistent with Baiman and Verrechia (1996) theory. But I also present some evidence to show that insider trading profits is indeed higher for affected firms with higher ex-ante institutional ownership. This evidence is an important contribution to the literature as it attempts to reconcile the two contrasting theories and present a more complete picture of the theory. Compared to individual/retail investors, institutional investors have more resources to commit to private information production (Zhang, 2001) when it is profitable to do so. Given that increased disclosure (SFAS 131) lowers the profitability of private information production (Goldstein & Yang, 2017), the positive relation predicted by Bushman and Indjejikian (1995) can be expected to dominate in the sample with ex-ante high institutional investors. Second, Park and Shin (2009) show their result is concentrated among treated firms with analysts following and bigger size. While these evidence bolters the information story, their study neglects the possible governance

and proprietary cost channels which the SFAS 131 literature shows are important (Botosan & Stanford, 2005; Cho, 2015) and can have implications for insider trading. My study provides a rigorous test for each of the information and uncertainty channels with four alternative proxies capturing different dimensions of SFAS 131 information effect. Further, I also conduct tests and provide evidence that governance and proprietary cost channels are not the dominant mechanisms through which SFAS 131 affects insider trading. These more comprehensive evidence mitigates possibilities for alternative interpretations of the baseline results. Third, my study focuses on insider purchase trades which the extant literature confirms are the information driven trades, not sales (e.g. Brochet, 2010). Aggregating insider sale trades together with purchases as in Park and Shin (2009) risks misestimating the effect of SFAS 131 on insider trades. I show separate test for sales trade and do not find a decrease in profitability of insider sale trades. Finally, unlike Park and Shin (2009), my study provides a dynamic analysis with evidence that the parallel trend assumption of a valid difference-in-difference analysis is not violated. This is critical for causal interpretation of my results.

The remainder of the paper is organized as follows. Section 2 presents a review of insider trading literature and the background as well as suitability of SFAS 131 setting. I present the hypothesis in Section 3. In section 4, I detail the sampling procedure and also present descriptions of the sample. The empirical model and definitions of relevant variables are also presented in this section. Section 5 contains the empirical findings including the baseline as well as cross-sectional results. This section ends with results of additional tests to bolster confidence in the robustness of the main findings. A conclusion of the paper is presented in Section 6.

2 Review of related literature, background of SFAS 131, and hypothesis development

In this section, I provide first, a review of relevant prior insider trading studies; and second, background details of SFAS 131 adoption, followed by reasons for the suitability of the SFAS 131 experimental setting for the study.

2.1 Review of prior insider trading literature

Corporate officers have privileged access to firm-specific information which can be profitably exploited in the form of their stock trading. Various regulatory and corporate governance mechanisms aim at limiting insiders' natural tendency to opportunistically exploit their information advantage. For example, legislations such as the Securities and Exchange Acts of 1933 and 1934, Insider Trading Sanctions Act of 1984, and Insider Trading and Securities Fraud Enforcement Act of 1988 prohibit insiders from trading based on material non-public information in their possession. In addition some firms also have in-house policies such as restricted trading periods and prior trade approvals designed to restrict insider trading (Jagolinzer et al., 2011).

In spite of the regulatory and corporate governance restrictions insider trading is still common and widespread. Seyhun (1992a) provides very compelling evidence suggesting that insider trading frequency and profitability is high despite regulatory or statutory prohibitions. In another study, Seyhun (1992c) showed that insider trades actually predicted future firm performance. He linked this result to future changes in business conditions and deviation of stock prices from firm fundamentals. These evidence corroborate the presumption that insiders are better informed about the future prospects and value of their firms and tend to exploit their knowledge through stock trades. Lakonishok and Lee (2001) also provide evidence showing that insider trades are in general informative, especially trades of insiders at small firms with typically less

transparent information environments. More recent studies show that insiders' trades are still informative and profitable (Akbas et al., 2020; Ali & Hirshleifer, 2017; Jagolinzer et al., forthcoming; Ryan et al., 2016). Noe (1999) showed insiders timed their trades in periods after management forecasts. Information asymmetry is presumed to be relatively low in periods immediately after management forecasts. Therefore insider trades occurring after such voluntary disclosures are less suspected of insider exploitation. However, the concentration of insider trades in periods after management forecasts suggests some self-serving interest of insiders. Indeed, the evidence shows that insider sales occur mainly after "good news" forecasts and insider purchases occur after "bad news" forecasts. The possibility that unlike outside investors, insiders are able to see beyond near-term changes in firm performance and thereby place their trades to reflect this long-term value remains. Consistent with this assertion, Ke, Huddart, and Petroni (2003) evidence show that insiders typically sold stocks as early as nine quarters prior to break in string of consecutive increases in quarterly earnings.

Given that insider trades would less likely be profitable or attractive if information asymmetry between insiders and outside investors is low, the literature has examined insider trading in relation to various proxies of information asymmetry. Aboody and Lev (2000) argues that research and development (R&D) investments are very opaque in nature and are an important source of information asymmetry between insiders and outside investors. They show that insider trade profitability is higher for R&D-intensive firms compared with firms without R&D expenditure. Frankel and Li (2004) studied three proxies of firms' information environment quality – financial statement informativeness, analysts following, and news coverage – in relation to insider trade profitability. They show that financial statement informativeness (the R-square from a price-earnings regression) is negatively associated with insider trade profitability though this

finding is not robust to controlling for variance of returns. They also show that analysts following is inversely related with insider trade profitability but contrary to their prediction, news coverage of their sampled firms is rather positively associated (though weakly) with insider trade profitability. Other studies using accruals, loss reporting frequency, internal control weakness and other proxies of financial reporting quality generally concluded that poor reporting quality is positively associated with insider trade profitability (Aboody, Hughes, & Liu, 2005; Core, Guay, Richardson, & Verdi, 2006; Huddart & Ke, 2007; Park & Park, 2004; Skaife et al., 2013). A related stream of studies examined settings where information asymmetry and investor uncertainty are presumed to be high. These settings include corporate bankruptcy and financial crises, takeover announcements, earnings announcements, stock repurchases, and new security issues (Agrawal & Nasser, 2012; Ali & Hirshleifer, 2017; Cziraki et al., 2019; Jagolinzer et al., forthcoming; Kahle, 2000; Ryan et al., 2016; Seyhun & Bradley, 1997).

The literature has also focused on examining insider-outsider incentives alignment as well as monitoring to constrain insiders opportunism. Gao et al. (2014) show evidence in support of their argument that insiders incur additional reputation costs when their firms are high performers of corporate social responsibility thereby restraining them from opportunistically exploiting their information advantage in stock trades. Similarly, Dai et al. (2015) show that executives who earn high equity compensation are more likely to abstain from exploiting their information advantage (in the form of profitable stock trades) when media coverage of their firms is high. In relation to monitoring, Jagolinzer et al. (2011) show that quality corporate governance in the form of explicit company policy requiring a general counsel approval for insider trades significantly lowered insider trade profitability. Using G-index as a proxy for corporate governance quality, Ravina and Sapienza (2010) show that insiders earn higher profits on their trades when governance is weakest.

Brochet (2010) showed that after Sarbanes-Oxley Act of 2002 (SOX) insiders are less likely to sell stocks before stock price declines consistent with increased monitoring in the post-SOX period.

Overall, the general suggestion in the literature is that increase in corporate transparency and quality monitoring or corporate governance can reduce insider trading or the desirability of insiders to exploit their information advantage. However, in light of evidence that insiders determine the quality of their disclosures together with their insider trades (Billings, 2008; Cheng & Lo, 2006; Niessner, 2015), I contend that this argument remains inconclusive especially given the lack of causal evidence in the literature. I seek to re-examine this question using a disclosure regulatory setting which plausibly caused exogenous increase in corporate transparency unrelated to insider trading.

2.2 Background and suitability of SFAS 131 experimental setting

2.2.1 Background of SFAS 131

The need for detailed segment reports for companies with multiple business segments was highlighted by the investment community at least as early as the late 1960s. In 1969, the U.S. Securities and Exchange Commission (SEC) made disclosure of line-of-business (segment) sales and earnings a mandatory requirement for companies registered with the SEC. The objective of this requirement was to enhance risk assessment and credit decisions by investors. In December 1976, the U.S. Financial and Accounting Standards Board (FASB) issued SFAS 14 *Financial Reporting for Segments of a Business Enterprise* as the authoritative accounting standard to regulate segment reporting in the U.S. The requirements of SFAS 14 were basically similar and consistent with the SEC's line-of-business disclosure requirement. SFAS 14 was based on the industry approach which defined a segment by industry groupings of products and services sold to

external customers. However, the definition of industry and ultimately a reportable segment was left to the discretion of managers (FASB, 1976).

The discretionary definition of industry and segments led to significant dissimilarities between reported segments and actual internal organizations of companies. There were noticeable inconsistencies between the bases of segment information and other explanatory information (e.g. business review, chairman's letter) in other parts of same annual reports (FASB, 1997, para 61). Therefore information about segment performance was often not comparable across different parts of firms' annual reports which limited the usefulness of segment reports prepared under SFAS 14 (Herrmann & Thomas, 2000). These concerns gave birth to calls for a new regulation on segment reporting.

After an extensive debate involving analysts, the SEC and other corporate players, The FASB issued SFAS 131 in June 1997 which became effective and mandatory for all public companies after December 15, 1997. An essential and notable difference SFAS 131 and the predecessor SFAS 14 is the switch from industry approach to management approach of segment reporting.[11] The management approach requires managers to report financial information of operating segments for which resources are allocated and performance is internally reviewed by the Chief Operating Decision Maker (CODM). Essentially, a reportable segment is one that is internally reviewed. An advantage of the management approach is that it provides external users of segment reports the opportunity to evaluate sub-business units and the entire company in a way similar to what management does. It is also important to note that SFAS 131 significantly constrained managerial discretion in segment reporting. Indeed the SEC monitors firms'

[11] Venkataraman (2001) provides an excellent description comparing SFAS 14 and SFAS 131.

compliance by comparing information in periodic reports filed with it and information provided elsewhere (e.g. websites, press releases, investor presentations, etc.) by these filers on. Inconsistencies are flagged and can end up in costly legal settlements (Deloitte, 2019).[12] Despite the lack of perfect compliance with the new segment reporting standard,[13] SFAS 131 is generally believed to have been effective (FAF, 2012).

2.2.2 Suitability of SFAS 131 experimental setting

For the purpose of this study, SFAS 131 adoption provides a suitable setting. Segment reports based on SFAS 131 provide outside investors access to an otherwise private information exclusively known to insiders. Given that insiders' privileged access to valuable non-public company information (in this case segment information) creates an opportunity for them to profitably exploit their information advantage, SFAS 131 levels the information playing field between insiders and outside investors. Also, detailed segment-level performance revealed to investors provide more tangible and direct value-relevant information compared to accruals level, internal control weaknesses and other financial reporting qualities used to proxy information asymmetry in prior studies examining insider trading (Aboody et al., 2005; Huddart & Ke, 2007; Skaife et al., 2013).

The general consensus in the segment reporting literature is that SFAS 131 increased transparency in segment reports and firms' information environment as well as improved external monitoring (Akins, 2018; Berger & Hann, 2003; Cho, 2015; Hann, Kim, Wang, & Zheng, 2019). The adoption of SFAS 131 significantly lowered managers' discretion to aggregate segment

[12] An example is the recent settlement to the SEC by Paccar Inc, a truck and engine maker who also sells truck parts related to its principal business. The SEC maintains that the company's failure to separately report the parts segment is an impropriety and could mislead investors.
[13] Segment reporting ranks among top four of SEC's concern areas in the regulators comment letters in 2017 and 2018.

information by requiring firms to define and report segments as is internally reviewed for resource allocations. The implementation of SFAS 131 induced firms (which hitherto identified as single-segment firms or aggregated multiple segments) to increase the number of reported segments and provide more disaggregated information about their sub-business units (Herrmann & Thomas, 2000; Street et al., 2000). Consistent with increase in the transparency in firms' information environment, Berger and Hann (2003) show that analysts forecast errors significantly decreased after the adoption of SFAS 131. The revelation of previously hidden information enabled analysts to more accurately forecast future performance of firms. In addition, Botosan and Stanford (2005) show that analysts' reliance on public information increased after the implementation of SFAS 131. Ettredge et al. (2005) also show that the ability of the stock market to predict future earnings of firms increased following the adoption of SFAS 131. Consistent findings have been reported in the debt market with lower bond yields and favorable credit ratings for firms with improved quality segment reports after SFAS 131 adoption (Akins, 2018; T. Chen & Liao, 2015; Franco et al., 2016). The increased transparency in corporate information environment has also been shown to facilitate the monitoring roles of outside investors (Berger & Hann, 2003; Cho, 2015).

From an empirical standpoint, the SFAS 131 setting appeals because of the following reasons. First, this accounting standard is mandatory and firms do not elect to adopt it. Some firms remain unaffected (i.e. already compliant) and form the control sample. This comports well with a difference-in-difference (DID) research design which mitigates concerns for causal interpretation of the results I will document. Second, the adoption of SFAS 131 occurred in two waves. The application of the standard starts with firm-years beginning after December 15, 1997. This means that effective year for firms with December year-end is 1998. Firms with non-December year-ends first adopted the standard in 1999. This staggered adoption mitigates concerns that a single market-

wide shock might be driving the results. Third, the rule applies to the whole universe of public firms in the U.S. thus providing a comprehensive sample for the study. I note that as some firms remain unaffected by SFAS 131, the sample is not as random as desired. I conduct a dynamic analysis to mitigate this concern.

3 Hypothesis development: SFAS 131 segment reporting and insider trading

The nature of the modern firm creates an inherent information asymmetry between corporate insiders and outside stakeholders. Further, proprietary and agency costs of disclosure explain the discretion of corporate managers over the quantity, nature and timing of information disclosed resulting in an information gap between parties to the firm (Armstrong, Guay, & Weber, 2010; Beyer, Cohen, Lys, & Walther, 2010; Verrecchia, 1983). Mandatory disclosure has been advocated not without controversy as panacea to the information gap between the various constituents of the firm (Goldstein & Yang, 2017; Leuz & Wysocki, 2016). Recent studies provide evidence in support of the conventional notion that transparency lowers information asymmetry, disciplines managers and cures many corporate ills. Specifically they show decrease in information asymmetry due to an increase in corporate transparency caused by the mandatory adoption of SFAS 131 which constrained insiders' discretion over disclosure level and quality (Berger & Hann, 2003; Cho, 2015; Ettredge et al., 2005; Franco et al., 2016; Jayaraman & Wu, 2019).

The mandatory increase in corporate transparency could also be expected to provide disincentives for corporate insiders to extract information rents in the form of opportunistic trades of their companies' stocks. However, the effect of mandating firms to adopt SFAS 131 in their segment reporting on insider trading is uncertain. I present two notable arguments and contrasting theoretical predictions. Baiman and Verrecchia (1996) theoretically show that increasing

disclosure – in this case through SFAS 131 adoption – could lower insiders' information advantage which translates into lower insider trade profits. This prediction is consistent with the broader theory that insider trade profitability increases in information asymmetry between informed and uninformed investors trading in the firm's stock (Grossman & Stiglitz, 1980; Kyle, 1985). Insiders' privileged access to valuable firm-specific information (e.g. detailed segment information) coupled with the imprecision of outside investors' information about the future performance of the firm creates valuable information advantage for insiders (Huddart & Ke, 2007). This information advantage increases with insiders' discretion over the level of detail they share with outsiders. Further, information produced by outside investors and information intermediaries such as analysts can be less precise compared to insiders (Lambert, Leuz, & Verrecchia, 2007, 2011). The adoption of SFAS 131 constrains insiders' aggregation discretion over segment level information, increases the precision of outside investors' information and lower their investors' uncertainty. Based on these reasoning, the prediction that SFAS 131 could constrain insiders information advantage and lower insider trade profitability seems intuitive. If this bears out in the data, then post-SFAS 131 adoption, insider trade profitability will be lower.

A counter-intuitive yet compelling argument is that mandatory disclosure (e.g. SFAS 131) could actually increase insider trade profitability. Bushman and Indjejikian (1995) in their theoretical model demonstrate that increase in public disclosure crowds out private information production efforts of other market participants and lower the equilibrium number of informed traders thereby creating opportunity for corporate insiders to earn bigger profits from their information based trades. This prediction joins a large literature demonstrating the crowding effect of increased public disclosure (Goldstein & Yang, 2017; Jayaraman & Wu, 2019). The evidence of increased reliance on public information as opposed to private information production by

analysts after the adoption SFAS 131 (Botosan & Stanford, 2005) further gives credence to this prediction.

In summary, despite of our knowledge that the mandatory adoption SFAS 131 increased the amount of public information and corporate transparency (Berger & Hann, 2003; Cho, 2015), the exact direction of SFAS 131 effect on insider trading boils down to be an empirical question given the above two theoretical predictions. I therefore present the hypothesis in the following null and alternate forms:

Null: There is no difference in the change in post-SFAS 131 trading profit of insiders in treated firms relative to insiders in control firms.

Alternate 1: Insiders in treated firms earn lower trading profit post-SFAS 131 period relative to pre-SFAS 131 period than insiders in control firms.

Alternate 2: Insiders in treated firms earn higher trading profit post-SFAS 131 period relative to pre-SFAS 131 period than insiders in control firms.

4 Data and research design

In this section, I provide details of the sample selection and a description of the regression sample. I also specify the regression model and define the variables included in the model.

4.1 Sample selection and description

The final sample combines data from Thomson Reuters Insider Filings, CRSP, Compustat Fundamentals Annual, and Compustat Historical Segment files. I start the sample with Thomson

Reuters Insiders data sourced from Form 4 Filings covering the period 1996 – 2003.[14] This data provides details (including transaction dates, price and quantity) of stock/equity trades of corporate insiders who are subject to disclosure requirements of Section 16 of the Securities Exchange Act of 1934.[15] These corporate insiders include officers, directors, beneficial owners i.e. owners with at least 10% holdings of a firm's stock, and persons with significant access to non-public, material information about the firm. To be included in the final sample, an insider's transaction must be an open market transaction in stocks. I exclude stock option exercises, inaccurate/invalid transactions, and transactions with missing number of stocks and price information.[16] I further exclude beneficial owners and traders with unknown identities. This results in a sample of 929,208 purchase and sale trades by 89,936 insiders in 10,178 unique firms. In order to focus on economically meaningful transactions, I follow the literature to include only transactions with a minimum transaction price of $2 per share and a minimum of 100 shares per transaction as well as transactions with traded shares less than 20% of a firm's total shares outstanding (Aboody & Lev, 2000; Dai et al., 2015; Gao et al., 2014). These data filters altogether drop 87,034 trades. Further, I exclude 164,174 transactions by insiders in financial and utility firms, leaving 678,000 insider transactions comprising both purchase and sale trades.

Next, I match the above resulting sample to CRSP and Compustat for stock return and fundamental information needed for constructing control variables as well as trade profitability. Finally, I match with firms on the Compustat Historical Segment File which I classify into treated and control groups based on the following standard procedure in the literature (Berger & Hann,

[14] The minimum year in the database is 1986 but coverage comprehensively starts from 1996. The sample period ends at 2003 in order to have a balance of 3 years around the SFAS 131 adoption I study.
[15] Trading by insiders are required to be filed with the SEC immediately. Maximum filings period was ten days before August 29, 2002 but changed to two business days since.
[16] The data provider, Thomson Reuters indicates records with Cleanse codes "A" or "S" have low levels of accuracy and mostly invalid. I follow Dai et al. (2015) to delete these observations.

2003; Cho, 2015; Jayaraman & Wu, 2019). First, from the Compustat Historical Segment File, I sample all firms having "BUSSEG" operating segment information in the 1997 – 1999 fiscal years. December year-end firms are first adopters of the SFAS 131 in 1998 with the remainder firms adopting in 1999. Therefore I require firms with December year-end fiscal period to have segment information for both 1997 and 1998. Similarly, firms with non-December year-end fiscal period are required to have segment information for both 1998 and 1999. For each firm, I focus on the originally reported information deleting inter-segment sales or transfers and restricting sample to only firms with less than 1% difference in aggregate segment sales value and Compustat fundamentals annual sales value. Following prior studies (Akins, 2018; Berger & Hann, 2003; Cho, 2015; Jayaraman & Wu, 2019), I define treated firms as those who report more segments (due to the mandatory redefinition of their segments) immediately following the adoption of SFAS 131 compared to their own prior reported number of segments. Control firms are those without changes or with decreases in their reported segments after SFAS 131 became effective.[17]

The final insider trading sample after the above data screens is matched to the treated/control set of firms. For each firm, I restrict the sample to three years around the first adoption of SFAS 131. I then match each firm-year to the following year's insider trading of the firm. The final sample has 297,922 observations consisting both purchase (24%) and sale (76%) transactions of 33,568 insiders in 3,163 unique firms of which 29.5% are treated.

<Insert Table 2 around here>

[17] Approximately 3% of the final sample decreased the number of reported segments immediately after SFAS 131. Jayaraman and Wu (2019) reports a similar percentage 4.4% of their sample.

In Table 2, I present univariate analyses of insider trade profitability. Trade profitability is the daily alpha (α) estimated based on Carhart (1997) four-factor model below using returns and risk factors over 90, 120, and 180 days following an insider trade.

$$Returns_{it} = \alpha + \gamma_1 Mktrf_t + \gamma_2 SMB_t + \gamma_3 HML_t + \gamma_4 UMD_t \ldots\ldots (1)$$

$Returns_{it}$ is firm *i*'s excess stock returns (i.e. returns minus risk-free rate) on day *t*. $Mktrf_t$ is excess market return (i.e. CRSP value-weighted return minus risk-free rate) at day *t*. SMB_t, HML_t, and UMD_t are size, book-to-market, and momentum factors respectively at day *t*. Trade profitability, α from equation (1) measures the potential gains following an insider trade. For purchases, a positive α means increase in stock prices following the purchase. For sales, a negative α means decrease in stock prices following the sale. Selling before actual decrease in stock prices is gain to insider sellers as they have avoided losses by selling before the decline in prices (Gao et al., 2014; Jagolinzer et al., 2011).

Panel A of Table 2 shows the profitability of insider purchases for both the treated and control sample in the period before SFAS 131 became effective as well as in the post-SFAS 131 period. In both time periods, the average profitability of insider purchases at treated firms is lower than that of insider purchases in control firms across all three estimation windows. This difference increased from 0.9 percentage points in the pre-SFAS 131 period to 3.6 percentage points in the post-SFAS 131 period using the profitability estimated over 180 days following an insider trade. This is a 300% increase in the difference between purchase trade profitability of insiders in treated firms compared to insiders in control firms. And this difference is significant at the 1% level. This univariate results suggests that the difference in profitability of insider trades of treated and control firms increased significantly after the SFAS 131 adoption. This gives us confidence to proceed

using a more rigorous difference-in-differences test to document the effect of SFAS 131 on insider purchase profit.

Table 2 presents cross-sectional and inter-temporal distribution of insider trade profitability. This distribution is more detailed than that presented in Table 1. Again, the results in Panel B of Table 2 show that insiders do not gain from their stock sales. That is their sales do not predict price declines. In fact they lose money by selling since stock prices increase (not decrease) after their sales. Daily stock returns (adjusted with Carhart (1997) four-factors) after insider sales is 1.6 (2.4) percentage points for treated (control) firms based on alpha estimated over 180 days following trade. Based on this result as well as that presented in Table 1 and the evidence presented in the extant literature that insider sales are not information-driven (Brochet, 2010; Gao et al., 2014; Ravina & Sapienza, 2010), I proceed with only purchase transactions in all the subsequent tests.

<Insert Table 3 around here>

In Table 3, I present summary statistics of the regression sample based on insider purchase transactions as well as correlations between the variables. From Panel A, the average daily alpha estimated over 90 days following an insider trade is 10.6 percentage points. This translates into approximately 27% per year. The daily alpha for 120 and 180 days are 9.4 percentage points and 7.9 percentage points respectively. These statistics compare well with the literature. For example, Gao et al. (2014) reports 4 – 6 percentage points in their 1992 – 2011 sample for alpha estimated over 180 days following an insider purchase. Jagolinzer et al. (2011) reports a 6 percentage points 180-day alpha for their 2003 -2005 sample period. The average stock return in the month preceding an insider purchase is negative 3.4%. Prior cumulative annual stock returns is 2.5%. The average market capitalization of the sampled firms is USD2.3 billion comparable to the USD2 billion

reported by Piotroski and Roulstone (2005). The book to market ratio averages 0.6 similar to the 0.53 – 0.56 reported by the literature (Brochet, 2010; Gao et al., 2014). On average firms in the sample have negative return on asset. The correlation between the regression variables are generally low with the highest (-0.39) being the correlation between firm size (i.e. log of market capitalization) and book-to-market ratio. All the control variables (except prior 1 month return) correlate significantly with all the measures of insider trade profitability. Prior year (i.e. twelve months) return is inversely correlated with the profitability measure consistent with prior evidence that insiders are contrarian traders (Lakonishok & Lee, 2001; Piotroski & Roulstone, 2005). Also, market capitalization is inversely related to insider purchase profitability measures consistent with prior evidence that trading in smaller firms are more profitable (Lakonishok & Lee, 2001). Finally, firm performance is inversely related insider purchase profit.

4.2 Model specification and variable definitions

The primary hypothesis of this study seeks to examine changes in insider trade profitability following the mandatory increase in corporate transparency (i.e. the number and detail of reported business segments) due to the implementation of SFAS 131. I use the following difference-in-difference (DID) model to test the primary hypothesis;

$$TradeProfit_{it} = \beta_0 + \beta_1 Treat_i * Post_k + \beta_2 Treat_i * Post_k * GEO\_INC_i + \beta_3 Ret1m_{it} + \beta_4 Ret12m_{it} + \beta_5 Liquidity_{it} + \beta_6 Volatility_{it} + \beta_7 FirmSize_{iy} + \beta_8 BTM_{iy} + \beta_9 ROA_{iy} + FirmFE + YearFE + \varepsilon \dots\dots (2)$$

The dependent variable, $TradeProfit_{it}$ is the daily alpha of firm *i* whose insider(s) purchased stock on day *t*. $TradeProfit_{it}$ is estimated over *n* (*n* = 90, 120, 180) days following the date of

an insider trade using the Carhart (1997) four-factor model in equation 1. The main variable of interest, $Treat_i * Post_k$ is an interaction between $Treat_i$(an indicator equal to one if firm i increased the number of its reported segments after SFAS 131 adoption and zero otherwise) and $Post_k$ (an indicator equal to one for periods of SFAS 131 adoption and zero otherwise). GEO_INC_i is an indicator equal to one for firms which increased their number of reported geographic segments following SFAS 131 adoption and zero otherwise. GEO_INC_i is included to control for the simultaneous effect of SFAS 131 on the number of reported geographic segments (Hope et al., 2009). Following the literature, I also include a set of standard controls (Akbas et al., 2020; Ali & Hirshleifer, 2017; Cohen et al., 2012; Frankel & Li, 2004; Jagolinzer et al., forthcoming). Specifically, I include the return of firm *i* in the month immediately preceding that of its insider purchases ($Ret1m_{it}$) as well as the return of firm *i* in twelve preceding months ending two months before the month of its insider purchases ($Ret12m_{it}$) to control for the contrarian nature of insider trades (Lakonishok & Lee, 2001; Piotroski & Roulstone, 2005). The profitability of insiders' trades have been shown to concentrate in small firms (Lakonishok & Lee, 2001) and firm size is known to associate with the quality of a firm's information environment (Duarte, Han, Harford, & Young, 2008) therefore I include the natural log of firm *i*'s market capitalization ($FirmSize_{iy}$) in the year preceding the year of its insider purchases. I also include the natural log of prior year book-to-market ratio (BTM_{iy}) as well as prior year return on assets (ROA_{iy}) to control for firm *i*'s growth opportunities and performance (Gao et al., 2014; Piotroski & Roulstone, 2005). In order to account for time-invariant firm heterogeneities as well as inter-temporal common shocks, I include firm and year fixed effects. The inclusion of firm and year fixed effects subsumes the $Treat$ and $Post$ indicators which I omit from the model in equation (2). $Liquidity_{it}$ and

$Volatility_{it}$ are also included to control for possible diversification and liquidity reasons for insider trades (Brochet, 2010; Gao et al., 2014; Ravina & Sapienza, 2010).

The coefficient of interest in equation (2) above is β_1 which captures the effect of mandatory increase in corporate transparency on the profitability of insider purchase trades of treated firms relative to a control group of firms. A positive (negative) $\beta 1$ indicates that increased segment reporting quality increases (reduces) the profitability of insider trading. If insider trading profitability is unaffected by the SFAS 131-induced change in corporate transparency, then β_1 will be statistically indistinguishable from zero. Also, if forces driving a positive or a negative effect of SFAS 131-induced corporate transparency on insider trading are equally offset in the sample, then β_1 will be statistically indistinguishable from zero.

5 Empirical results

5.1 Baseline results

I first present the baseline results on whether insiders at treated firms subject to SFAS 131 adoption experience a decrease/increase in the profitability of their trades. Table 4 reports the coefficient estimates from equation (2) using the firm-day panel data listed in Table 3. The dependent variables are insider trade profitability i.e. alpha estimated over 90, 120, and 180 days following the date of an insider purchase based on the Carhart (1997) four-factor model in equation (1). The estimate of interest is the coefficient of the main interest variable, $Treat_i * Post_k$, which gauges the impact of improved segment reporting on the profitability of insider trading. In all the specifications, I display t-statistics of robust standard errors clustered at the firm level.

The results presented in Table 4 show that in all three columns using alternative measures of insider trade profitability, $Treat_i * Post_k$ is negative and highly significant. These results are robust to the inclusion of firm and year fixed effects as well as standard controls such as prior returns, firm size, book-to-market ratio and return on assets, suggesting that the effect of SFAS 131 on insider trade profitability is likely uncorrelated with effects of standard control variables noted in the literature. I observe between 5.5 – 6.3 percentage points decrease in daily alpha for insiders in treated firms relative to insiders in control firms. Relative to the average sample insider trade profitability of 8.0 percentage points (using 180-days alpha), the 6.3 percentage points decrease in insider trade profitability documented in column 3 of Table 4 is of substantial economic magnitude (i.e. 79% decrease). I note similar substantial decreases based on 120-days alpha (57% decrease) and 90-days alpha (53% decrease).

The estimates of the effects of trade and firm characteristics, while not directly related to the SFAS 131 segment reporting shock I examine, are consistent with the literature. Specifically, prior stock returns (*Prior 1 Month Return* and *Prior 12 Month Return*) are negatively and significantly associated with insider trade profitability corroborating prior evidence that insiders are contrarian traders (Ali & Hirshleifer, 2017; Lakonishok & Lee, 2001; Piotroski & Roulstone, 2005). Firm size proxied by the natural log of market value of equity of insiders firms is negatively and significantly associated with insider trade profitability. This is also consistent with evidence that insiders at small firms profit more from their trades as small firms have less transparent information environments (Akbas et al., 2020; Lakonishok & Lee, 2001). Similar to prior studies (Akbas et al., 2020; Dai et al., 2015; Gao et al., 2014), the associations between insider trade profitability and the growth and performance proxies (book-to-market ratio and ROA) are not statistically significant. From these baseline result, the prediction that SFAS 131 adoption will lower insiders' information advantage and insider trade profitability is supported by the data. The opposite

prediction that SFAS 131 adoption will crowd out private information production and increase insider trade profitability is not supported in the sample.

<Insert Table 4 around here>

I note that since the treatment and control firms are not randomly assigned, the identification critically depends on the parallel trends assumption (Angrist & Pischke, 2010). There should be no difference between the treated and control firms' insiders' trade profitability had the SFAS 131 not occurred. I can provide support for this assumption by examining the dynamic changes in insider trade profitability around the adoption of SFAS 131. In Table 5, I replace the main $Treat_i * Post_k$ variable with three indicators: *Treat*Yr_2; Treat*Yr_1; Treat*Yr1; Treat*Yr2; Treat*Yr3; and Treat*Yr3+* respectively corresponding to two and one years before SFAS 131 is first adopted by treated firms; the first year of SFAS 131 adoption; the second year of SFAS 131 adoption; the third year of SFAS 131 adoption; and thereafter. I omit the third year prior to the adoption of SFAS 131, using it as the benchmark year. The results show that the effect of SFAS 131 on insider trade profit occurs only after and not before the adoption year. The decreasing effect of SFAS 131 on insider trade profit appears to be persistent rather a one-time effect. Results from this dynamic test provides confidence for the baseline results I document in Table 4 and also provides evidence supporting the critical parallel trend assumption of the difference-in-difference design.

<Insert Table 5 around here>

5.2 Cross-sectional tests on the channels

After documenting the results showing that SFAS 131 significantly decreased insider trade profitability, I now conduct a battery of cross-sectional tests to fully tease out the specific channels

underlying this effect. I note three major channels through which increased transparency in corporate reporting due to SFAS 131 adoption can affect insider trade profitability – information and uncertainty resolution channel, the governance channel, and the proprietary cost channel. I discuss these channels and present the results.

5.2.1 Information and uncertainty channel

Huddart and Ke (2007) note that two components necessary for insiders' information advantage over outsiders and thus insider trade profitability are outsiders' uncertainty about firm value and insiders' information precision about future firm performance. If firm performance is unpredictable to outsiders and insiders have a precise information unknown to outsiders, an opportunity is created for insiders to profit from their trades. It remains unclear whether the privately observed segment level information is precise in forecasting future performance however forcing managers to disclose their private information bridges the information gap between insiders and outsiders to an extent. I therefore focus on the outsiders' uncertainty component of insiders' information advantage. Given that after the adoption of SFAS 131, investors are better able to predict future earnings of affected firms (Ettredge et al., 2005), I predict that SFAS 131 helps to resolve investors' uncertainty about firm performance and thereby limiting opportunities for insiders to profit from their trades, all else equal. In other words, the constraining effect of SFAS 131 on insider trade profitability should be higher for firms with higher outside investors' uncertainty about firm performance.

To test this conjecture, I use two proxies for outsiders' uncertainty about future firm performance: standardized unexpected earnings and stock return volatility. I reason that when a firm's actual earnings consistently deviate from expectation, investors are more likely uncertain

about the performance of such a firm. In that light, I condition the first cross-sectional test on ex ante standardized unexpected earnings (*SUE*). *SUE* is calculated as the absolute deviation of actual quarterly earnings from expected earnings, scaled by stock price at the end of the quarter. Expected earnings is the prior quarterly earnings (Livnat & Mendenhall, 2006). For a given firm in each year, the median scaled absolute quarterly deviation is selected as the *SUE*. Ex ante values are calculated as the median annual *SUE* in the three years prior to the adoption SFAS 131 by a firm. Based on the ex ante values, firms are classified into high/low *SUE* firms. A firm is classified as high *SUE* (i.e. high uncertainty) firm if it belongs to the top tercile of calculated ex ante SUE. For the tests I code an indicator variable, *SUE* equal to one for high *SUE* firms and zero otherwise. I then interact the interest variable $Treat_i * Post_k$ with the indicator of high SUE creating a triple interaction term. Results in columns (1), (2) and (3) of Table 6 show that the constraining effect of SFAS 131 on insider purchase profitability is concentrated among firms with higher ex ante outside investor uncertainty as proxied by standardized unexpected earnings.

The second proxy for investor uncertainty, unlike the accounting based SUE, is a market-based volatility measure. Specifically, I use stock return volatility. Following prior studies (Barth et al., forthcoming; Landsman & Maydew, 2002), I calculate stock return volatility as the square of residual stock return. Residual stock return is the realized excess return minus expected return based on Carhart (1997) four-factor model. For each firm-year, I estimate factor (i.e. excess market return, size, growth, and momentum) betas using 60 monthly returns preceding the fiscal-year end date. I then multiply the estimated betas with current fiscal year-end values of excess market return, size, growth, and momentum factors and sum the resulting products together with the intercept term. I refer to this sum as the expected return. Realized excess return is the CRSP monthly return of a firm minus the monthly risk-free interest rate at the end of the fiscal year. I square the

difference between the realized excess return and the expected return (i.e. residual). This firm-year stock return volatility. I calculate ex ante stock return as the median return volatility in the three years prior to SFAS 131 adoption. Based on ex ante values, I classify firms into high/low volatility. A firm is classified as high volatility (i.e. high uncertainty) firm if it belongs to the top tercile of ex ante stock return volatility. For the tests, I code an indicator variable, *VOLA* equal to one for high volatility firms and zero otherwise. I then interact the interest variable $Treat_i * Post_k$ with the indicator of high stock return volatility, *VOLA* creating a triple interaction term. Results in columns (4), (5) and (6) of Table 6 show that the constraining effect of SFAS 131 on insider purchase profitability is concentrated among firms with higher ex ante outside investor uncertainty as proxied by stock return volatility. Together, these results show that outside investors' uncertainty (using either accounting-based or market-based proxies) is a major channel through which SFAS 131 affects insider trade profitability.

The quality of firms' information environment have been shown to associate with insider trade profitability (Dai et al., 2015; Frankel & Li, 2004; Huddart & Ke, 2007; Skaife et al., 2013). A transparent information environment can facilitate and improve the accuracy of outside investors' assessment/valuation of future firm performance. High quality information environment helps to quickly resolve temporal market mispricing, thereby limiting opportunities for insider trade profitability (Chi, Pincus, & Teoh, 2014; Drake, Myers, & Myers, 2009). Based on this reasoning I conjecture that the information benefits (to outside investors) of SFAS 131 adoption (i.e. lowering insider trade profitability) is higher for firms with low quality or opaque information environments. I test this prediction using two information environment quality proxies – disclosure quality and information acquisition cost.

Disclosure quality relates to the level of detail in financial reports. Disaggregated financial reports lowers information asymmetry and raises users predictive ability of future performance (Ertimur, Livnat, & Martikainen, 2003; Fairfield, Sweeney, & Yohn, 1996). Based on count of non-missing Compustat line items, S. Chen et al. (2015) constructed a financial reports disaggregation measure. The more sub-account information (rather than just aggregate amounts) a firm reports the more transparent the firm. And indeed this measure has been shown to vary with various information asymmetry proxies and has been used extensively in the literature (Drake, Roulstone, & Thornock, 2016; Koo, Ramalingegowda, & Yu, 2017; Shroff, Verdi, & Yost, 2017). This annual measure is available for the universe of Compustat firms. For the analysis, I multiply the original S. Chen et al. (2015) disaggregation quality measure by -1 so that higher values can be interpreted as low quality or less transparent financial reports. I calculate the ex ante disaggregation quality for each firm as the median value in the three years prior to the adoption of SFAS 131. Based on the ex ante values I classify firms into high/low quality financial report groups. Firms in the top tercile of the ex ante modified disaggregation quality measure (i.e. multiplied by -1) are classified as having the lowest quality financial reports. I code an indicator variable, *DQ* equal to one for lowest quality financial report firms and zero otherwise. I then interact the interest variable $Treat_i * Post_k$ with the indicator of low financial reporting quality, *DQ* creating a triple interaction term. The results for financial reporting quality cross-sectional test are reported in columns (1), (2) and (3) of Table 7. The strongest result is when I use the 180-day insider trading profitability as the dependent variable. Column (3) of Table 7 shows that the informational benefit (i.e. constraining effect of SFAS 131 on insider purchase profitability) is stronger among firms with the lowest ex ante financial report quality.

I next use Duchin et al. (2010) information acquisition cost measure in the information environment cross-sectional test. This measure combines firms' analysts following, forecast accuracy and dispersion to create a proxy for the level of opacity of firms' information environment. The appeal of this measure is based on the evidence that analysts following is associated insider trade profitability (Frankel & Li, 2004; Huddart & Ke, 2007) and that SFAS 131 adoption improved analysts forecast accuracy (Berger & Hann, 2003). The opacity of a firm's information environment is presumed to be decreasing in analysts following but increasing in analysts forecast error and dispersion. I construct this measure as the normalized annual mean of percentile ranks of number of analysts following multiplied by -1, absolute forecast error and forecast dispersion. Analysts forecast error is the actual earnings per share minus the median analysts' forecast for a fiscal quarter. Analysts' forecast dispersion is the standard deviation of analysts' forecasts per share for a fiscal quarter. I calculate ex ante level of information acquisition cost (opacity) as the median value of the three years prior to SFAS 131 adoption, for each firm. Firms are classified into high/low opaque firms based on their ex ante information acquisition cost. A firm is classified as high opaque firm if its ex ante information acquisition cost belongs to the top tercile. I code an indicator variable, *INFOCOST* equal to one for high opaque firms and zero otherwise. I then interact the interest variable $Treat_i * Post_k$ with the indicator of opaque information environment, *INFOCOST* creating a triple interaction term. Results in columns (4), (5) and (6) of Table 7 show that the constraining effect of SFAS 131 on insider purchase profitability is higher for firms with higher ex ante information environment opacity.

These non-mutually exclusive outside investor uncertainty and information-based cross-sectional results together show that SFAS 131 adoption played an important information role in

outside investors' valuation of firms and thereby limit the opportunity for insiders to profitably exploit outside investors.

5.2.2 Governance channel

Insiders will naturally exploit their information advantage unless significant frictions exist to prevent them from achieving this. Indeed, the level profitability of insider trades is conditional on the effectiveness of various corporate governance mechanisms designed to either align manager-shareholder interests or to limit opportunities for insider trade profitability (Aboody & Lev, 2000; Cohen et al., 2012; Dai et al., 2015; Frankel & Li, 2004; Gao et al., 2014; Jagolinzer et al., forthcoming; Jagolinzer et al., 2011; Ryan et al., 2016; Seyhun, 1992b; Skaife et al., 2013). Prior studies have specifically studied the association between insider trade profitability and proxies of corporate governance quality such as corporate policy requiring general counsel approval for insider trades (Jagolinzer et al., 2011), G-index (Ravina & Sapienza, 2010) and institutional ownership (Hong, Li, & Zhu, 2018).

Meanwhile, the SFAS 131 literature documents a general improvement in investors' monitoring (i.e. corporate governance) following the adoption of the new segment reporting rule which revealed hidden agency problems (Berger & Hann, 2003; Cho, 2015). I conjecture that the constraining effect of SFAS 131 on insider trade profitability is could be through a governance channel. In the cross-sectional tests, I use two governance or monitoring proxies common in the literature: institutional ownership rate as in Cho (2015) and E-index from Bebchuk et al. (2009),

which captures the extent of managerial entrenchment based on a large set of governance provisions.[18]

Similar to the cross-sectional tests above, for each firm, I calculate ex ante values of E-index and institutional ownership rate as the median values in the three years prior the adoption of SFAS 131. I then classify firms into high/low E-index and institutional ownership rate based on ex ante values. Firms are classified as most entrenched if their ex ante E-index belong to the top tercile. I code an indicator, *E-Index* equal to one if a firm is classified as most entrenched and zero otherwise. I then interact the interest variable $Treat_i * Post_k$ with the indicator of managerial entrenchment, *E-Index* creating a triple interaction term. If governance is indeed the main channel for SFAS 131 effect, I will observe a stronger effect for the most entrenched firms. Results in columns (1), (2) and (3) of Table 8 show that the constraining effect of SFAS 131 on insider purchase profitability is not different for firms classified as most entrenched compared to less entrenched firms. For institutional ownership tests, I code an indicator variable, *IOR* equal to one if ex ante institutional ownership of a firm belongs to the top tercile and zero otherwise. Firms with higher institutional ownership (i.e. *IOR*=1) presumably have better governance, therefore the effect of SFAS 131 will be limited if governance is the main mechanism. Results in columns (4), (5) and (6) of Table 8 do not support the prediction that governance is the channel of SFAS 131 constraining effect on insider trade profitability.

5.2.3 Proprietary cost channel

In light of the view that firms could use insider trading as an alternative disclosure mechanism to substitute formal disclosure especially when the cost of full disclosure is high

[18] I also use G-index from Gompers et al. (2003) and confirm that the results are similar to using the E-index.

(Carlton & Fischel, 1983; John & Lang, 1991; John & Mishra, 1990), firms could simply have decreased their insider trades as they no longer need to because SFAS 131 increased the level of mandatory disclosure. Insider trading provides an effective communication mechanism which impounds private information of insiders into stock prices (Fernandes & Ferreira, 2009) without necessarily revealing proprietary information to rivals. Insider trading gives credibility to publicly disclosed information (John & Mishra, 1990) therefore firms can choose to avoid insider trading to mitigate the competitive harm created by the mandatory increase in corporate reporting transparency in the post-SFAS 131 period (Botosan & Stanford, 2005). Based on this reasoning, it is possible that the documented decrease in insider trade profitability after SFAS 131 adoption is driven by an increase in proprietary cost of treated firms. If this is true in the sample, then the effect of SFAS 131 on insider trading should be stronger for firms with high levels of ex-ante proprietary cost, as these firms have stronger incentives to do more insider trading to substitute formal disclosure prior to SFAS 131.

I examine the possibility of increased proprietary cost been the channel of SFAS 131 effect on insider trade profitability using three proxies for proprietary costs. That is the degree of market concentration (HHI), Li et al. (2013) text-based competition measure constructed based on percentage of competition words in annual reports, and the product fluidity measure of Hoberg et al. (2014). Again similar to cross-sectional tests above, for each firm, I calculate ex-ante values of the three proprietary cost proxies as their median values in the three years prior to the adoption of SFAS 131. I classify firms into high/low proprietary cost groups based on ex-ante values of each of the three proprietary cost proxies. Using degree of industry concentration, firms are classified into the high proprietary cost group if their industry concentration measure is in the top tercile. I code an indicator, *HHI* equal to one if a firm is classified in the top tercile of HHI and zero

otherwise. I then interact the interest variable $Treat_i * Post_k$ with the indicator of high proprietary cost *HHI* creating a triple interaction term. If proprietary cost is the main channel of SFAS 131 effect, I will observe a stronger effect for firms with *HHI* equal to one. Results in columns (1), (2) and (3) of Table 9 show that the constraining effect of SFAS 131 on insider trade profitability is not different for insiders of firms classified into higher proprietary cost group compared to those in the lower proprietary cost group. Using the Li et al. (2013) text-based competition measure as proxy for proprietary cost, I code an indicator variable, *LI* equal to one if the firm's ex-ante value is in the top tercile and zero otherwise. Firms with *LI*=1 presumably have higher proprietary cost therefore SFAS 131 is expected to have a stronger effect if proprietary cost is the main driver of SFAS 131 effect on insider trading. Results in columns (4), (5) and (6) of Table 9 do not support the prediction that proprietary cost is the channel of SFAS 131 constraining effect on insider trade profitability. Using Hoberg et al. (2014) product fluidity measure as proxy for proprietary cost, I code an indicator variable, *Fluid* equal to one if the firm's ex-ante value is in the top tercile and zero otherwise. Firms with *Fluid* =1 presumably have higher proprietary cost therefore SFAS 131 is expected to have a stronger effect if proprietary cost is the main driver of SFAS 131 effect on insider trading. Again, results in columns (7), (8) and (9) of Table 9 do not support the prediction that proprietary cost is the channel of SFAS 131 constraining effect on insider trade profitability. Altogether, the proprietary cost channel test results suggests that proprietary costs concern is not a main driver of reduced insiders' ability to profit from their private information in the post-SFAS 131 period.

Based on results from the three sets of cross-sectional tests – information/uncertainty, governance, and proprietary cost channels – I deduce that the major or dominant channel/mechanism through which the decreasing effect of SFAS 131 adoption on insiders' trade

profitability occurs is the information channel, that is SFAS 131 lowered insiders' information advantage and outside investors' uncertainty thereby lowering profitability of insiders' stock trades.

5.3 Robustness and additional tests

It is possible that some firms may have changed their number of reported segments due to corporate events (e.g. acquisitions, restructurings, etc.) unrelated to SFAS 131 adoption. These group of firms could potentially create measurement errors in the treatment status and go against finding any significant relationships in the empirical tests. Following the literature (Berger & Hann, 2003; Cho, 2015; Jayaraman & Wu, 2019), I classify sampled firms as "contaminated" if in the first SFAS 131 adoption year, the difference between their historical and restated sum of segment sales is greater than one percent of the historical value. I delete from the regression sample, 316 unique firms which I suspect are contaminated and call the resulting sample the "pure sample". I then re-run the regression in equation (2) using the "pure sample" and confirm that the results are robust to using this pure sample. The results using the pure sample are tabulated in Table OA1 of the online appendix. I continue to observe a negative and significant coefficient on $Treat_i * Post_k$ variable ranging between 3.4 – 4.1 percentage points. The coefficients of the control variables are similar to those reported in Table 4.

I note that though insider purchases (not sales) are generally informative (Ali & Hirshleifer, 2017; Gao et al., 2014; Ravina & Sapienza, 2010), the literature contends that some insider trades are routine and not opportunistic (Akbas et al., 2020; Ali & Hirshleifer, 2017; Cohen et al., 2012). Such trades are not made to exploit the information advantage of insiders. Therefore, I follow Cohen et al. (2012) to classify insider trades into routine and non-routine trades. Approximately 2% (823) of the sampled 51,749 insider purchase trades were classified as "routine" trades based

on the (Cohen et al., 2012) algorithm. I re-run the regressions in equation (2) excluding these routine trades and confirm that the results are robust to using only non-routine trades. The result using the non-routine sample is tabulated in Table OA2 of the online appendix. I continue to observe significant negative coefficients on the $Treat_i * Post_k$ variable for all three measures of insider trade profitability ranging between 3.4 – 4.2 percentage points. The coefficients of the control variables also remain similar to those recorded in Table 4.

6 Conclusion

In this paper, I examine how profitability of stock trades of corporate insiders are affected by the adoption of FASB's SFAS 131 (now ASC 280) segment reporting in 1997 which mandatorily increased the level of corporate disclosure. The "management approach" of the new accounting standard bridged the information gap between insiders and outsiders as managers are required to define and report segment information in the same way as used in internal reports. Corporate managers are forced to disclose their otherwise private information about detailed segment performance to users of financial reports. Given two contrasting theoretical predictions on the effect of increased corporate transparency/disclosure due to the mandatory adoption of SFAS 131 I seek to examine which prediction bears out in the data.

I document a decrease in the profitability of purchase trades of insiders in firms mandated to increase their level of transparency (i.e. number and details of their reported operating business segments) due to SFAS 131 adoption. This result is robust to various estimations of insider trade profitability. I also find that this effect occurs only after and not before the adoption giving credence to the identification and supporting a causal interpretation of the results. In addition, the cross-sectional tests show that the underlying channel for the baseline result is information related

which mitigates outside investor uncertainty. I do not find support for the governance/monitoring, and proprietary cost channels. Overall, this paper documents substantial information benefits of increased transparency in corporate reporting to outside investors, limiting insiders' information advantage in trading stocks of their own companies.

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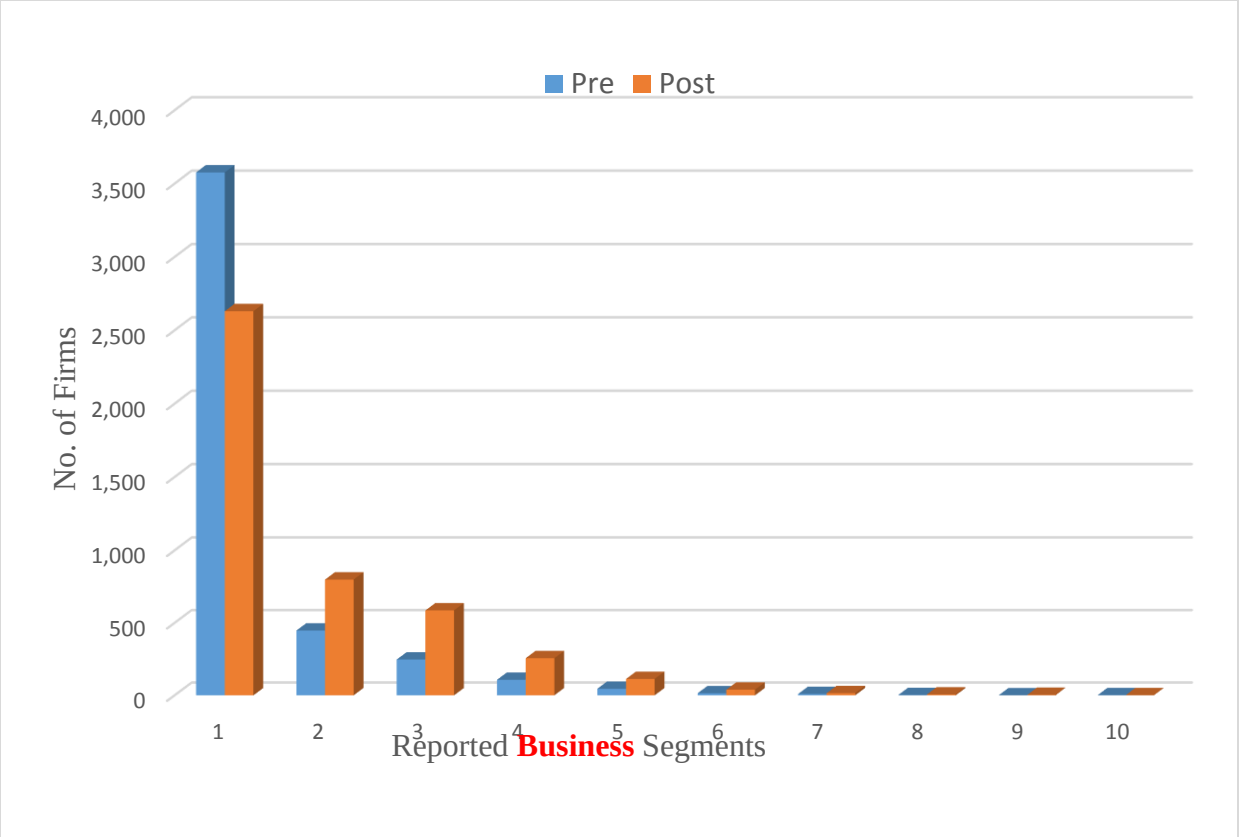

Figure 1: Reported business segments around SFAS 131 adoption

This figure shows the number of sampled firms (vertical axis) reporting *n* business segments (horizontal axis) around the adoption of SFAS 131 accounting standard which became effective after December 15, 1997. December year-end firms first adopted in 1998 while the remainder firms first adopted in 1999. *Pre* corresponds to the year immediately before the first adoption year of SFAS 131. *Post* corresponds to the first year of SFAS 131 adoption.

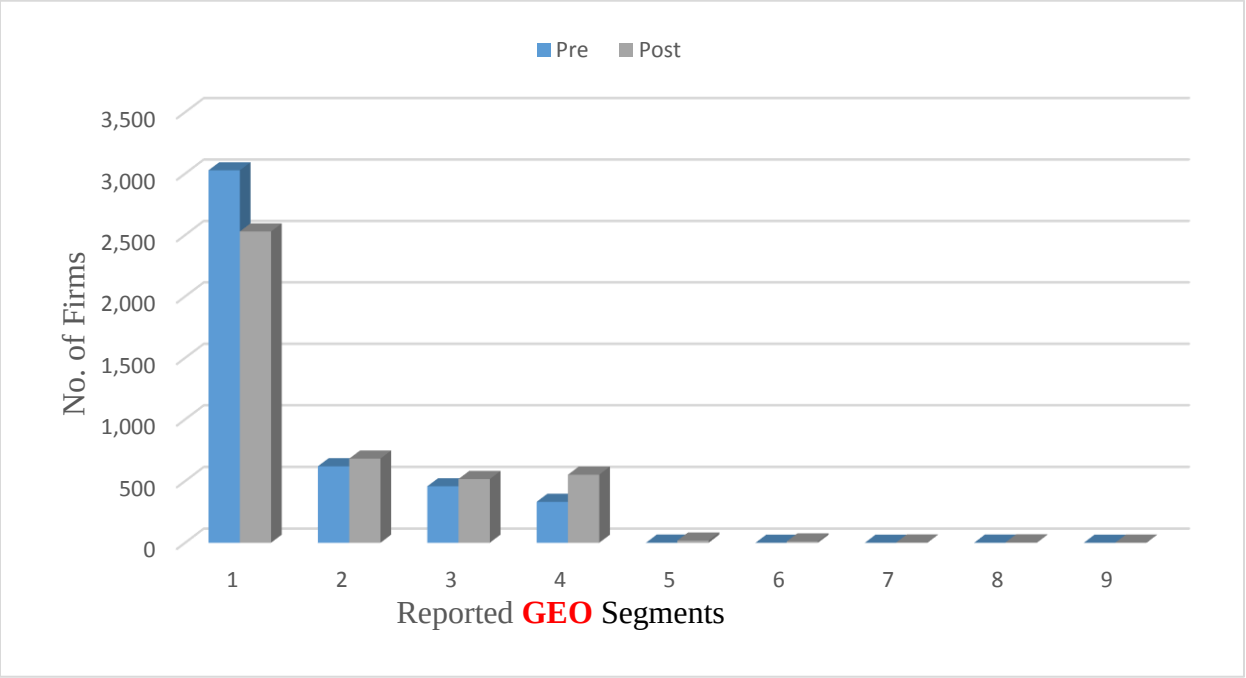

Figure 2: Reported geographic segments around SFAS 131 adoption

This figure shows the number of sampled firms (vertical axis) reporting *n* geographic segments (horizontal axis) around the adoption of SFAS 131 accounting standard which became effective after December 15, 1997. December year-end firms first adopted in 1998 while the remainder firms first adopted in 1999. *Pre* corresponds to the year immediately before the first adoption year of SFAS 131. *Post* corresponds to the first year of SFAS 131 adoption.

Table 1: Descriptive statistics of sample

Panel A

	Business Segments		Geographic Segments	
Change in No. of Segments	Firms	Percent	Firms	Percent
-4	-	-	2	0.04
-3	4	0.09	8	0.18
-2	16	0.36	23	0.52
-1	109	2.45	248	5.58
0	3,077	69.18	3,424	76.98
1	667	15	439	9.87
2	377	8.48	178	4
3	134	3.01	113	2.54
4	39	0.88	5	0.11
5	17	0.38	5	0.11
6	6	0.13	1	0.02
7	1	0.02	2	0.04
8	1	0.02	-	-
	4,448	100	4,448	100

Panel B

Change in No. of Segments	Firms	Percent
-2	9	0.27
-1	76	2.32
0	2,225	67.94
1	525	16.03
2	299	9.13
3	102	3.11
4	26	0.79
5	10	0.31
6	3	0.09
Total	**3,275**	100

This table presents descriptive statistics of sampled firms subjected by the mandatory adoption of SFAS 131 accounting standard which became effective after December 15, 1997. December year-end firms first adopted in 1998 while the remainder firms first adopted in 1999. SFAS 131 applies to the segments defined based on operating/business units (i.e. products/services) as well as geographic units. *Change in No. of Segments* is the change in the number of reported segments calculated as number of reported segments in the first adoption year minus the number of reported segments in the year immediately before the adoption of SFAS 131. *Firms* is the number of firms. *Percent* is the percentage of total sampled reporting firms. *Panel A* presents descriptive statistics for full sample of firms subjected to SFAS 131. Panel B presents descriptive statistics of reported business segments for firms with successful match to the insider trading sample.

Table 2: Univariate analysis

		Treated Sample (Treat=1)			Control Sample (Treat=0)			Difference-in-Means
		N	Mean	Median	N	Mean	Median	
Panel A: Purchase Sample								
Pre-SFAS 131	Alpha_90	6,158	0.093	0.0600	14,557	0.106	0.0711	-0.014*
	Alpha_120	6,158	0.072	0.0455	14,557	0.097	0.0684	-0.024***
	Alpha_180	6,158	0.063	0.0377	14,557	0.072	0.0527	-0.009*
Post-SFAS 131	Alpha_90	6,672	0.095	0.0747	14,184	0.115	0.0915	-0.020**
	Alpha_120	6,672	0.079	0.0650	14,184	0.107	0.0889	-0.027***
	Alpha_180	6,672	0.064	0.0569	14,184	0.100	0.0844	-0.036***
Difference-in-Means	Alpha_90		-0.003			-0.009		-0.006
	Alpha_120		-0.007			-0.010*		-0.003
	Alpha_180		-0.001			-0.028***		-0.027***
Panel B: Sales Sample								
Pre-SFAS 131	Alpha_90	13,765	0.013	0.0009	30,016	0.014	0.0038	-0.001
	Alpha_120	13,765	0.018	0.0054	30,016	0.019	0.0099	-0.000
	Alpha_180	13,765	0.016	0.0050	30,016	0.024	0.0157	-0.008**
Post-SFAS 131	Alpha_90	16,162	0.020	0.0164	41,620	0.015	0.0150	0.005
	Alpha_120	16,162	0.028	0.0261	41,620	0.020	0.0217	0.008**
	Alpha_180	16,162	0.035	0.0282	41,620	0.028	0.0263	0.007*
Difference-in-Means	Alpha_90		-0.007			-0.001		0.006
	Alpha_120		-0.010**			-0.001		0.009*
	Alpha_180		-0.019***			-0.004*		0.015***

This table shows univariate analysis of profitability of insider trading for 3,275 non-financial/non-utility U.S. firms subjected to SFAS 131 adoption. SFAS 131 became effective after December 15, 1997. December year-end firms are the first adopters in 1998 and the remainder firms first adopted in 1999. The sample covers three years around the first adoption of SFAS 131. For each firm, multiple insider trades in a day are aggregated (separately for purchases and sales) to the firm-day level. Trades for beneficial owners (i.e. outsiders with at least 10% ownership) are excluded. Panel A presents the analysis for insiders' purchases and Panel B presents the analysis for insiders' sales. *Treated Sample* is the group of firms which increased the number of reported segments following the mandatory adoption of SFAS 131 in 1998/1999. *Control Sample* is the group of firms which were already compliant with the reporting requirements of SFAS 131. *Pre-SFAS 131 (Post-SFAS 131)* corresponds to periods prior to (following) the adoption of SFAS 131. *Alpha_n* is daily alpha (i.e. profitability of trade) estimated using the Carhart (1997) four-factor model over *n (n=90, 120, 180)* days starting from the day after an insider trade expressed in percentage. *Difference-in-Means* is the difference in sample means for the *Treated/Control* samples and the *Pre/Post-SFAS 131* samples. *, **, *** correspond to 10%, 5%, and 1% significance levels of difference between sample means.

Table 3: Descriptive statistics (Purchase sample)

Panel A

	N	Mean	St.D.	25th	Median	75th
Alpha_90	39,251	0.107	0.427	-0.123	0.077	0.309
Alpha_120	39,251	0.096	0.366	-0.100	0.071	0.272
Alpha_180	39,251	0.080	0.301	-0.080	0.062	0.228
Prior 1 Month Return	20,928	-2.211	18.021	-12.450	-2.863	6.250
Prior 12 Month Return	20,928	9.064	68.548	-30.435	-4.273	28.571
Liquidity	20,928	0.031	0.030	0.010	0.021	0.041
Volatility	9,329	0.040	0.019	0.026	0.037	0.051
Market Value of Equity	9,329	2324.761	12832.006	52.430	174.677	691.117
Log(Market Value of Equity)	9,329	5.362	1.915	3.959	5.163	6.538
Book-to-Market Ratio	9,329	0.604	0.496	0.263	0.461	0.787
ROA	9,329	-0.018	0.271	-0.027	0.042	0.095
Treat	9,329	0.311	0.463	0.000	0.000	1.000
Post	9,329	0.492	0.500	0.000	0.000	1.000

Panel B: Correlation Matrix

	1	2	3	4	5	6	7	8	9	10
1. Alpha_90	1.000									
2. Alpha_120	0.829	1.000								
	(0.000)									
3. Alpha_180	0.665	0.783	1.000							
	(0.000)	(0.000)								
4. Prior 1 Month Return	-0.001	0.005	0.002	1.000						
	(0.798)	(0.341)	(0.633)							
5. Prior 12 Month Return	-0.022	-0.026	-0.038	-0.002	1.000					
	(0.000)	(0.000)	(0.000)	(0.644)						
6. Prior 1 Month Liquidity	0.056	0.071	0.080	-0.021	-0.163	1.000				
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)					
7. Volatility	0.132	0.150	0.158	0.044	0.073	0.222	1.000			
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)				
8. Log(Market Value of Equity)	-0.131	-0.150	-0.158	-0.111	-0.009	-0.497	-0.489	1.000		
	(0.000)	(0.000)	(0.000)	(0.000)	(0.089)	(0.000)	(0.000)			
9. Log(Book-to-Market ratio)	0.059	0.074	0.093	0.104	-0.133	0.229	0.012	-0.381	1.000	
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.017)	(0.000)		
10. ROA	-0.051	-0.069	-0.062	0.036	-0.008	-0.059	-0.290	0.151	0.176	1.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.115)	(0.000)	(0.000)	(0.000)	(0.000)	

This table presents descriptive statistics (Panel A) and correlation matrix (Panel B) of variables for 3,275 non-financial/non-utility U.S. firms subjected to SFAS 131 adoption, and with insider purchase data. SFAS 131 became effective after December 15, 1997. December year-end firms are the first adopters in 1998 and the remainder firms first adopted in 1999. The sample covers three years around the first adoption of SFAS 131. For each firm, multiple insider purchase trades in a day are aggregated to the firm-day level. Trades for beneficial owners (i.e. outsiders with at least 10% ownership) are excluded. *Alpha_n* is daily alpha (i.e. profitability of trade) estimated using the Carhart (1997) four-factor model over *n (n=90, 120, 180)* days starting from the day after an insider purchase expressed in percentage. *Prior n Month Return* is the *n (n=1, 12)* month(s) firm stock return prior to an insider purchase. *Liquidity* is the stock liquidity of an insider's firm in the month immediately preceding the month of insider purchase. Stock liquidity is calculated as the bid-ask spread divided by the average of bid and ask prices. *Volatility* is the stock volatility of an insider's firm in the year immediately preceding the year of the insider purchase. Stock volatility is calculated as the firm's annual standard deviation of daily stock returns. *Market Value of Equity* is the firm's market capitalization, calculated as end of year stock price multiplied by number of shares outstanding. *Book-to-Market Ratio* is the ratio of a firm's book value of equity (CEQ) to market capitalization. *ROA* is the firm's return on asset, calculated as profit (IB) divided by total assets at the beginning of the year. All firm-level variables are calculated in the year immediately preceding the year of insider purchase. *Treat* is an indicator equal to one for firms who increased the number of reported segments after the mandatory adoption of SFAS 131 and zero otherwise. *Post* is an indicator equal to one for periods after the mandatory adoption of SFAS 131 and zero otherwise.

Table 4: Effect of SFAS 131 on insider profit

Panel A

	(1) Alpha_90	(2) Alpha_120	(3) Alpha_180
Treat*Post	-0.056***	-0.055***	-0.063***
	(-2.87)	(-3.20)	(-4.41)
Treat*Post*GEO_INC	0.018	0.041*	0.052**
	(0.65)	(1.68)	(2.36)
Prior 1 Month Return	-0.001***	-0.001***	-0.001***
	(-5.66)	(-5.79)	(-7.37)
Prior 12 Month Return	-0.000***	-0.000***	-0.000***
	(-4.49)	(-4.67)	(-5.86)
Liquidity	0.337*	0.505***	0.479***
	(1.71)	(3.21)	(3.82)
Volatility	-0.626	-0.574	-0.418
	(-1.05)	(-1.10)	(-0.86)
Log(Market Value of Equity)	-0.158***	-0.142***	-0.128***
	(-13.14)	(-11.69)	(-8.91)
Log(Book-to-Market ratio)	0.017	0.018	0.021
	(1.26)	(1.13)	(0.97)
ROA	-0.027	-0.053*	-0.002
	(-0.86)	(-1.94)	(-0.08)
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
R^2	0.337	0.382	0.436
N. of Obs.	39,251	39,251	39,251

This table presents results of a difference-in-difference regression analysis of the effect of the mandatory SFAS 131 accounting standard adoption on the profitability of insider purchase trades in 3,275 non-financial/non-utility U.S firms subjected to the accounting standard. SFAS 131 became effective after December 15, 1997. December year-end firms are the first adopters in 1998 and the remainder firms first adopted in 1999. The sample covers three years around the first adoption of SFAS 131. For each firm, multiple insider purchase trades in a day are aggregated to the firm-day level. Trades for beneficial owners (i.e. outsiders with at least 10% ownership) are excluded. For firm-level fundamentals, insider trade information are matched to the fiscal year immediately preceding the year of trade. *Alpha_n* is daily alpha (profitability of trade) estimated using the Carhart (1997) four-factor model over *n (n=90, 120, 180)* days starting from the day after an insider purchase expressed in percentage. *Treat* is an indicator equal to one for firms who increased the number of reported segments after the mandatory adoption of SFAS 131 and zero otherwise. *Post* is an indicator equal to one for periods after the mandatory adoption of SFAS 131 and zero otherwise. *Treat*Post* is the interaction of *Treat* and *Post* indicators. *GEO_INC* is an indicator equal to one for firms which increased their number of reported geographic segments following SFAS 131 adoption and zero otherwise. *Prior n Month Return* is the *n (n=1, 12)* month(s) firm stock return prior to an insider purchase. *Liquidity* is the stock liquidity of an insider's firm in the month immediately preceding the month of insider purchase. Stock liquidity is calculated as the bid-ask spread divided by the average of bid and ask prices. *Volatility* is the stock volatility of an insider's firm in the year immediately preceding the year of the insider purchase. Stock volatility is calculated as the firm's annual standard deviation of daily stock returns. *Market Value of Equity* is the firm's market capitalization, calculated as end of year stock price multiplied by number of shares outstanding. *Book-to-Market Ratio* is the ratio of a firm's book value of equity (CEQ) to market capitalization. *ROA* is the firm's return on asset, calculated as profit (IB) divided by beginning total assets. All firm-level variables are calculated in the year immediately preceding the year of insider purchase. All continuous control variables are winsorized at the 1% and 99% levels. In parentheses are t-statistics of standard errors clustered at the firm level. *, **, *** correspond to 10%, 5%, and 1% significance levels of two-tailed tests.

Table 4: Effect of SFAS 131 on insider profit, crowd-out subsample
Panel B

	(1) Alpha_90	(2) Alpha_120	(3) Alpha_180
Treat*Post	-0.061***	-0.063***	-0.068***
	(-2.93)	(-3.39)	(-4.44)
Treat*Post* HDIOR	0.039	0.058**	0.043**
	(1.35)	(2.30)	(2.00)
Treat*Post*GEO_INC	0.018	0.040	0.051**
	(0.64)	(1.64)	(2.30)
Prior 1 Month Return	-0.001***	-0.001***	-0.001***
	(-5.65)	(-5.79)	(-7.44)
Prior 12 Month Return	-0.000***	-0.000***	-0.000***
	(-4.62)	(-4.80)	(-5.97)
Liquidity	0.363*	0.523***	0.492***
	(1.84)	(3.32)	(3.90)
Volatility	-0.595	-0.542	-0.408
	(-0.99)	(-1.03)	(-0.84)
Log(Market Value of Equity)	-0.157***	-0.141***	-0.127***
	(-12.97)	(-11.54)	(-8.80)
Log(Book-to-Market ratio)	0.019	0.020	0.022
	(1.42)	(1.24)	(1.02)
ROA	-0.027	-0.053*	-0.002
	(-0.86)	(-1.94)	(-0.07)
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
R^2	0.336	0.381	0.434
N. of Obs.	38,702	38,702	38,702

This table presents results of a difference-in-difference regression analysis of the effect of the mandatory SFAS 131 accounting standard adoption on the profitability of insider purchase trades in 3,275 non-financial/non-utility U.S firms subjected to the accounting standard. SFAS 131 became effective after December 15, 1997. December year-end firms are the first adopters in 1998 and the remainder firms first adopted in 1999. The sample covers three years around the first adoption of SFAS 131. For each firm, multiple insider purchase trades in a day are aggregated to the firm-day level. Trades for beneficial owners (i.e. outsiders with at least 10% ownership) are excluded. For firm-level fundamentals, insider trade information are matched to the fiscal year immediately preceding the year of trade. *Alpha_n* is daily alpha (profitability of trade) estimated using the Carhart (1997) four-factor model over *n (n=90, 120, 180)* days starting from the day after an insider purchase expressed in percentage. *Treat* is an indicator equal to one for firms who increased the number of reported segments after the mandatory adoption of SFAS 131 and zero otherwise. *Post* is an indicator equal to one for periods after the mandatory adoption of SFAS 131 and zero otherwise. *Treat*Post* is the interaction of *Treat* and *Post* indicators. *HDIOR* is an indicator equal one for firms in the top decile of ex-ante institutional ownership rate and zero otherwise. Ex-ante institutional ownership rate is the number of shares held by institutional owners divided by the number of shares outstanding in the quarter immediately preceding the year of first SFAS 131 adoption. *GEO_INC* is an indicator equal to one for firms which increased their number of reported geographic segments following SFAS 131 adoption and zero otherwise. *Prior n Month Return* is the *n (n=1, 12)* month(s) firm stock return prior to an insider purchase. *Liquidity* is the stock liquidity of an insider's firm in the month immediately preceding the month of insider purchase. Stock liquidity is calculated as the bid-ask spread divided by the average of bid and ask prices. *Volatility* is the stock volatility of an insider's firm in the year immediately preceding the year of the insider purchase. Stock volatility is calculated as the firm's annual standard deviation of daily stock returns. *Market Value of Equity* is the firm's market capitalization, calculated as end of year stock price multiplied by number of shares outstanding. *Book-to-Market Ratio* is the ratio of a firm's book value of equity (CEQ) to market capitalization. *ROA* is the firm's return on asset, calculated as profit (IB) divided by beginning total assets. All firm-level variables are calculated in the year immediately preceding the year of insider purchase. All continuous control variables are winsorized at the 1% and 99% levels. In parentheses are t-statistics of standard errors clustered at the firm level. *, **, *** correspond to 10%, 5%, and 1% significance levels of two-tailed tests.

Table 5: Dynamic analysis, effect of SFAS 131 on insider profit

	(1) Alpha_90	(2) Alpha_120	(3) Alpha_180
TreatYr_2	-0.038	-0.035	-0.020
	(-1.48)	(-1.51)	(-1.04)
TreatYr_1	-0.028	-0.027	0.001
	(-1.04)	(-1.14)	(0.05)
TreatYr1	-0.098***	-0.090***	-0.072***
	(-3.33)	(-3.47)	(-3.28)
TreatYr2	-0.060*	-0.068**	-0.070***
	(-1.78)	(-2.33)	(-2.85)
TreatYr3	-0.073**	-0.067**	-0.065**
	(-2.01)	(-2.03)	(-2.21)
TreatYr3+	-0.072**	-0.074**	-0.056**
	(-2.05)	(-2.35)	(-2.02)
Controls Included	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
R^2	0.337	0.382	0.436
N. of Obs.	39,251	39,251	39,251

This table presents results of a dynamic regression analysis of the effect of the mandatory SFAS 131 accounting standard adoption on the profitability of insider sale trades in 3,275 non-financial/non-utility U.S firms subjected to the accounting standard. SFAS 131 became effective after December 15, 1997. December year-end firms are the first adopters in 1998 and the remainder firms first adopted in 1999. The sample covers three years around the first adoption of SFAS 131. For each firm, multiple insider sale trades in a day are aggregated to the firm-day level. Trades for beneficial owners (i.e. outsiders with at least 10% ownership) are excluded. *Alpha_n* is daily alpha (profitability of trade) estimated using the Carhart (1997) four-factor model over *n (n=90, 120, 180)* days starting from the day after an insider purchase expressed in percentage. *Treat*Yr_2, and Treat*Yr_1* are indicators equal to one for two years and one year prior to SFAS 131 adoption respectively and zero otherwise. *Treat*Yr1, Treat*Yr2, Treat*Yr3, and Treat*Yr3+* are indicators equal to one for first, second, third and thereafter years of SFAS 131 adoption respectively and zero otherwise. All continuous control variables are winsorized at the 1% and 99% levels. In parentheses are t-statistics of standard errors clustered at the firm level. *, **, *** correspond to 10%, 5%, and 1% significance levels of two-tailed tests.

Table 6: Cross-sectional tests, uncertainty channel

	(1) Alpha_90	(2) Alpha_120	(3) Alpha_180	(4) Alpha_90	(5) Alpha_120	(6) Alpha_180
Treat*Post	-0.038*	-0.039**	-0.041***	-0.029	-0.035*	-0.047***
	(-1.75)	(-2.05)	(-2.74)	(-1.39)	(-1.87)	(-3.03)
Treat*Post*SUE	-0.054	-0.070**	-0.075**			
	(-1.40)	(-1.98)	(-2.47)			
Treat*Post*VOLA				-0.098***	-0.078***	-0.060**
				(-2.89)	(-2.62)	(-2.25)
Treat*Post*GEO_INC	-0.000	0.031	0.046**	0.013	0.044*	0.057**
	(-0.00)	(1.19)	(2.00)	(0.49)	(1.78)	(2.55)
Prior 1 Month Return	-0.001**	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(-2.44)	(-2.78)	(-4.33)	(-3.29)	(-2.95)	(-3.66)
Prior 12 Month Return	-0.000***	-0.000***	-0.000***	-0.001***	-0.000**	-0.000***
	(-4.19)	(-4.10)	(-5.04)	(-3.44)	(-2.44)	(-2.75)
Liquidity	0.569**	0.556***	0.713***	0.165	0.392	0.545**
	(2.26)	(2.84)	(4.27)	(0.48)	(1.42)	(2.50)
Volatility	-1.393*	-1.532**	-1.421***	-0.648	-0.689	-0.353
	(-1.78)	(-2.23)	(-2.58)	(-0.79)	(-1.02)	(-0.58)
Log(Market Value of Equity)	-0.147***	-0.138***	-0.128***	-0.160***	-0.151***	-0.143***
	(-10.82)	(-11.44)	(-12.84)	(-10.96)	(-12.35)	(-13.20)
Log(Book-to-Market ratio)	0.035	0.039	0.055	0.047**	0.057**	0.067*
	(1.53)	(1.34)	(1.35)	(2.43)	(2.31)	(1.78)
ROA	-0.030	-0.058	-0.002	0.005	-0.064*	-0.025
	(-0.61)	(-1.40)	(-0.06)	(0.14)	(-1.84)	(-0.82)
Controls Interacted	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.315	0.358	0.420	0.320	0.363	0.425
N. of Obs.	33,539	33,539	33,539	36,441	36,441	36,441

This table presents results of cross-sectional analysis of the effect of the effect of the mandatory SFAS 131 accounting standard adoption on the profitability of insider purchase trades in non-financial/non-utility U.S firms subjected to the accounting standard. SFAS 131 became effective after December 15, 1997. December year-end firms are the first adopters in 1998 and the remainder firms first adopted in 1999. The sample covers three years around the first adoption of SFAS 131.

For each firm, multiple insider purchase trades in a day are aggregated to the firm-day level. Trades for beneficial owners (i.e. outsiders with at least 10% ownership) are excluded. For firm-level fundamentals, insider trade information are matched to the fiscal year immediately preceding the year of trade. *Alpha_n* is daily alpha (profitability of trade) estimated using the Carhart (1997) four-factor model over *n (n=90, 120, 180)* days starting from the day after an insider purchase expressed in percentage. *Treat* is an indicator equal to one for firms who increased the number of reported segments after the mandatory adoption of SFAS 131 and zero otherwise. *Post* is an indicator equal to one for periods after the mandatory adoption of SFAS 131 and zero otherwise. *Treat*Post* is the interaction of *Treat* and *Post* indicators. *SUE* is an indicator equal to one for firms in the top tercile of ex ante standardized unexpected earnings and zero otherwise. Standardized unexpected earnings is the annual median value of the difference between quarterly actual earnings per share minus expected earnings scaled by stock price (Livnat & Mendenhall, 2006). *VOLA* is an indicator equal to one for firms in the top tercile of ex ante return volatility and zero otherwise. Return volatility is the square of monthly residual stock return. Monthly residual stock return is the excess of monthly realized return over expected return calculated based on Carhart (1997) four-factor loadings using prior 60 months returns. All ex ante cross-sectional variables are the median values of the three years prior to SFAS 131 adoption. *GEO_INC* is an indicator equal to one for firms which increased their number of reported geographic segments following SFAS 131 adoption and zero otherwise. *Prior n Month Return* is the *n (n=1, 12)* month(s) firm stock return prior to an insider purchase. *Liquidity* is the stock liquidity of an insider's firm in the month immediately preceding the month of insider purchase. Stock liquidity is calculated as the bid-ask spread divided by the average of bid and ask prices. *Volatility* is the stock volatility of an insider's firm in the year immediately preceding the year of the insider purchase. Stock volatility is calculated as the firm's annual standard deviation of daily stock returns. *Market Value of Equity* is the firm's market capitalization, calculated as end of year stock price multiplied by number of shares outstanding. *Book-to-Market Ratio* is the ratio of a firm's book value of equity (CEQ) to market capitalization. *ROA* is the firm's return on asset, calculated as profit (IB) divided by beginning total assets. All firm-level variables are calculated in the year immediately preceding the year of insider purchase. All continuous control variables are winsorized at the 1% and 99% levels. In parentheses are t-statistics of standard errors clustered at the firm level. *, **, *** correspond to 10%, 5%, and 1% significance levels of two-tailed tests.

Table 7: Cross-sectional tests, information channel

	(1) Alpha_90	(2) Alpha_120	(3) Alpha_180	(4) Alpha_90	(5) Alpha_120	(6) Alpha_180
Treat*Post	-0.057**	-0.051**	-0.047***	-0.036*	-0.026	-0.042***
	(-2.35)	(-2.43)	(-2.77)	(-1.76)	(-1.44)	(-2.80)
Treat*Post*DQ	-0.003	-0.020	-0.044*			
	(-0.08)	(-0.67)	(-1.73)			
Treat*Post*INFOCOST				-0.071**	-0.104***	-0.081***
				(-2.02)	(-3.30)	(-2.94)
Treat*Post*GEO_INC	0.008	0.034	0.053**	0.017	0.040*	0.052**
	(0.28)	(1.32)	(2.29)	(0.62)	(1.65)	(2.41)
Prior 1 Month Return	-0.001**	-0.001**	-0.001***	-0.001***	-0.001***	-0.001***
	(-2.37)	(-2.57)	(-3.99)	(-4.22)	(-3.94)	(-5.52)
Prior 12 Month Return	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(-3.57)	(-4.14)	(-5.75)	(-2.63)	(-2.82)	(-3.04)
Liquidity	0.045	0.222	0.280*	0.603*	0.723***	0.729***
	(0.17)	(1.04)	(1.82)	(1.92)	(2.82)	(3.46)
Volatility	-0.470	-0.502	-0.494	-1.064	-0.983	-1.041
	(-0.64)	(-0.81)	(-1.01)	(-1.24)	(-1.24)	(-1.40)
Log(Market Value of Equity)	-0.142***	-0.122***	-0.099***	-0.157***	-0.147***	-0.136***
	(-7.31)	(-6.40)	(-4.43)	(-12.07)	(-12.93)	(-14.12)
Log(Book-to-Market ratio)	-0.005	-0.014	-0.016	0.015	0.009	-0.003
	(-0.34)	(-1.11)	(-1.63)	(0.99)	(0.71)	(-0.29)
ROA	-0.059	-0.037	0.022	-0.059	-0.081*	-0.024
	(-1.13)	(-0.80)	(0.51)	(-1.10)	(-1.68)	(-0.63)
Controls Interacted	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.317	0.361	0.422	0.320	0.362	0.424
N. of Obs.	32,706	32,706	32,706	37,072	37,072	37,072

This table presents results of cross-sectional analysis of the effect of the effect of the mandatory SFAS 131 accounting standard adoption on the profitability of insider purchase trades in non-financial/non-utility U.S firms subjected to the accounting standard. SFAS 131 became effective after December 15, 1997. December year-end firms are the first adopters in 1998 and the remainder firms first adopted in 1999. The sample covers three years around the first adoption of SFAS 131.

For each firm, multiple insider purchase trades in a day are aggregated to the firm-day level. Trades for beneficial owners (i.e. outsiders with at least 10% ownership) are excluded. For firm-level fundamentals, insider trade information are matched to the fiscal year immediately preceding the year of trade. *Alpha_n* is daily alpha (profitability of trade) estimated using the Carhart (1997) four-factor model over *n (n=90, 120, 180)* days starting from the day after an insider purchase expressed in percentage. *Treat* is an indicator equal to one for firms who increased the number of reported segments after the mandatory adoption of SFAS 131 and zero otherwise. *Post* is an indicator equal to one for periods after the mandatory adoption of SFAS 131 and zero otherwise. *Treat*Post* is the interaction of *Treat* and *Post* indicators. *DQ* is an indicator equal to one for firms in the top tercile of ex ante disclosure quality and zero otherwise. Disclosure quality is level of financial report disaggregation constructed based on non-missing Compustat items (S. Chen et al., 2015). *INFOCOST* is an indicator equal to one for firms in the top tercile of ex ante information acquisition cost and zero otherwise. Information acquisition cost is constructed based on analysts following, forecast errors and forecasts dispersion (Duchin et al., 2010). All ex ante cross-sectional variables are the median values of the three years prior to SFAS 131 adoption. *GEO_INC* is an indicator equal to one for firms which increased their number of reported geographic segments following SFAS 131 adoption and zero otherwise. *Prior n Month Return* is the *n (n=1, 12)* month(s) firm stock return prior to an insider purchase. *Liquidity* is the stock liquidity of an insider's firm in the month immediately preceding the month of insider purchase. Stock liquidity is calculated as the bid-ask spread divided by the average of bid and ask prices. *Volatility* is the stock volatility of an insider's firm in the year immediately preceding the year of the insider purchase. Stock volatility is calculated as the firm's annual standard deviation of daily stock returns. *Market Value of Equity* is the firm's market capitalization, calculated as end of year stock price multiplied by number of shares outstanding. *Book-to-Market Ratio* is the ratio of a firm's book value of equity (CEQ) to market capitalization. *ROA* is the firm's return on asset, calculated as profit (IB) divided by beginning total assets. All firm-level variables are calculated in the year immediately preceding the year of insider purchase. All continuous control variables are winsorized at the 1% and 99% levels. In parentheses are t-statistics of standard errors clustered at the firm level. *, **, *** correspond to 10%, 5%, and 1% significance levels of two-tailed tests.

Table 8: Cross-sectional tests, governance channel

	(1) Alpha_90	(2) Alpha_120	(3) Alpha_180	(4) Alpha_90	(5) Alpha_120	(6) Alpha_180
Treat*Post	-0.104***	-0.094***	-0.079***	-0.071***	-0.071***	-0.073***
	(-3.18)	(-3.14)	(-3.29)	(-2.73)	(-3.07)	(-3.85)
Treat*Post*E-Index	0.065	0.062	0.034			
	(1.42)	(1.41)	(0.76)			
Treat*Post*IOR				0.042	0.040	0.024
				(1.50)	(1.58)	(1.08)
Treat*Post*GEO_INC	0.000	0.035	0.052*	0.015	0.039	0.050**
	(0.01)	(1.07)	(1.81)	(0.55)	(1.58)	(2.27)
Prior 1 Month Return	-0.002***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(-4.40)	(-3.30)	(-3.92)	(-4.09)	(-4.62)	(-5.39)
Prior 12 Month Return	-0.000	0.000	0.000	-0.000**	-0.000***	-0.000***
	(-0.12)	(0.15)	(0.58)	(-2.40)	(-2.93)	(-3.42)
Liquidity	-0.264	0.080	0.445	0.205	0.358**	0.368**
	(-0.49)	(0.17)	(1.11)	(0.91)	(2.00)	(2.53)
Volatility	-6.263*	-5.575	-5.364	-0.553	-0.744	-0.923
	(-1.75)	(-1.48)	(-1.24)	(-0.78)	(-1.22)	(-1.63)
Log(Market Value of Equity)	-0.150***	-0.121***	-0.118***	-0.173***	-0.152***	-0.133***
	(-5.98)	(-5.69)	(-6.51)	(-11.10)	(-9.67)	(-7.08)
Log(Book-to-Market ratio)	0.013	0.010	0.072*	0.018	0.020	0.026
	(0.31)	(0.25)	(1.79)	(1.00)	(0.94)	(0.89)
ROA	0.022	-0.132	-0.056	-0.028	-0.040	0.017
	(0.19)	(-1.08)	(-0.46)	(-0.34)	(-0.56)	(0.26)
Controls Interacted	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.266	0.297	0.372	0.320	0.362	0.422
N. of Obs.	6,819	6,819	6,819	37,072	37,072	37,072

This table presents results of cross-sectional analysis of the effect of the effect of the mandatory SFAS 131 accounting standard adoption on the profitability of insider purchase trades in non-financial/non-utility U.S firms subjected to the accounting standard. SFAS 131 became effective after December 15, 1997. December year-end firms are the first adopters in 1998 and the remainder firms first adopted in 1999. The sample covers three years around the first adoption of SFAS 131.

For each firm, multiple insider purchase trades in a day are aggregated to the firm-day level. Trades for beneficial owners (i.e. outsiders with at least 10% ownership) are excluded. For firm-level fundamentals, insider trade information are matched to the fiscal year immediately preceding the year of trade. *Alpha_n* is daily alpha (profitability of trade) estimated using the Carhart (1997) four-factor model over *n (n=90, 120, 180)* days starting from the day after an insider purchase expressed in percentage. *Treat* is an indicator equal to one for firms who increased the number of reported segments after the mandatory adoption of SFAS 131 and zero otherwise. *Post* is an indicator equal to one for periods after the mandatory adoption of SFAS 131 and zero otherwise. *Treat*Post* is the interaction of *Treat* and *Post* indicators. *E-Index* is an indicator equal to one for firms in the top tercile of ex ante entrenchment index and zero otherwise. Entrenchment index is the Bebchuk et al. (2009) index governance quality index. *IOR* is an indicator equal to one for firms in the top tercile of ex ante institutional ownership rate and zero otherwise. All ex ante cross-sectional variables are the median values of the three years prior to SFAS 131 adoption. *GEO_INC* is an indicator equal to one for firms which increased their number of reported geographic segments following SFAS 131 adoption and zero otherwise. *Prior n Month Return* is the *n (n=1, 12)* month(s) firm stock return prior to an insider purchase. *Liquidity* is the stock liquidity of an insider's firm in the month immediately preceding the month of insider purchase. Stock liquidity is calculated as the bid-ask spread divided by the average of bid and ask prices. *Volatility* is the stock volatility of an insider's firm in the year immediately preceding the year of the insider purchase. Stock volatility is calculated as the firm's annual standard deviation of daily stock returns. *Market Value of Equity* is the firm's market capitalization, calculated as end of year stock price multiplied by number of shares outstanding. *Book-to-Market Ratio* is the ratio of a firm's book value of equity (CEQ) to market capitalization. *ROA* is the firm's return on asset, calculated as profit (IB) divided by beginning total assets. All firm-level variables are calculated in the year immediately preceding the year of insider purchase. All continuous control variables are winsorized at the 1% and 99% levels. In parentheses are t-statistics of standard errors clustered at the firm level. *, **, *** correspond to 10%, 5%, and 1% significance levels of two-tailed tests.

Table 9: Cross-sectional tests, proprietary cost channel

	(1) Alpha_90	(2) Alpha_120	(3) Alpha_180	(4) Alpha_90	(5) Alpha_120	(6) Alpha_180	(7) Alpha_90	(8) Alpha_120	(9) Alpha_180
Treat*Post	-0.063***	-0.053***	-0.061***	-0.037	-0.057**	-0.057***	-0.055**	-0.052**	-0.049***
	(-2.82)	(-2.61)	(-3.52)	(-1.48)	(-2.55)	(-3.14)	(-2.35)	(-2.47)	(-2.92)
Treat*Post*HHI	0.021	-0.004	-0.000						
	(0.70)	(-0.15)	(-0.02)						
Treat*Post*LI				-0.027	-0.001	-0.019			
				(-0.66)	(-0.02)	(-0.61)			
Treat*Post*Fluid							-0.005	-0.014	-0.031
							(-0.14)	(-0.43)	(-1.17)
Treat*Post*GEO_INC	0.015	0.040	0.050**	0.010	0.047	0.042	0.027	0.048*	0.055**
	(0.55)	(1.62)	(2.27)	(0.30)	(1.56)	(1.56)	(0.89)	(1.77)	(2.25)
Prior 1 Month Return	-0.001***	-0.001***	-0.001***	-0.001**	-0.001***	-0.001***	-0.001**	-0.001***	-0.001**
	(-3.69)	(-3.99)	(-4.94)	(-2.08)	(-2.66)	(-3.19)	(-2.06)	(-2.72)	(-2.20)
Prior 12 Month Return	-0.000***	-0.000***	-0.000***	-0.000**	-0.000***	-0.000***	-0.001***	-0.001***	-0.001***
	(-3.80)	(-3.35)	(-3.76)	(-2.23)	(-2.84)	(-4.31)	(-4.26)	(-4.48)	(-6.53)
Liquidity	0.447	0.485*	0.696***	0.179	0.485**	0.575***	0.588	0.670**	0.722**
	(1.29)	(1.69)	(3.25)	(0.62)	(2.07)	(3.15)	(1.57)	(2.23)	(2.50)
Volatility	-0.563	-0.794	-0.604	-2.070**	-2.145**	-1.573**	-0.605	-1.463*	-1.246
	(-0.76)	(-1.22)	(-0.93)	(-1.98)	(-2.44)	(-2.08)	(-0.66)	(-1.74)	(-1.44)
Log(Market Value of Equity)	-0.159***	-0.140***	-0.122***	-0.152***	-0.123***	-0.098***	-0.179***	-0.153***	-0.123***
	(-11.23)	(-9.72)	(-6.96)	(-7.77)	(-6.26)	(-4.43)	(-9.63)	(-8.36)	(-5.47)
Log(Book-to-Market ratio)	0.032*	0.030	0.035	0.023	0.038	0.067*	-0.008	-0.019	-0.023*
	(1.95)	(1.55)	(1.27)	(1.14)	(1.50)	(1.93)	(-0.47)	(-1.21)	(-1.73)
ROA	-0.167**	-0.212***	-0.162***	-0.074	-0.097*	-0.067	-0.073	-0.130**	-0.065
	(-1.98)	(-2.87)	(-2.94)	(-1.06)	(-1.71)	(-1.38)	(-1.10)	(-2.29)	(-1.44)
Controls Interacted	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.321	0.362	0.423	0.306	0.352	0.414	0.318	0.360	0.419
N. of Obs.	37,034	37,034	37,034	23,669	23,669	23,669	32,225	32,225	32,225

This table presents results of cross-sectional analysis of the effect of the effect of the mandatory SFAS 131 accounting standard adoption on the profitability of insider purchase trades in non-financial/non-utility U.S firms subjected to the accounting standard. SFAS 131 became effective after December 15, 1997. December year-end firms are the first adopters in 1998 and the remainder firms first adopted in 1999. The sample covers three years around the first adoption of SFAS 131. For each firm, multiple insider purchase trades in a day are aggregated to the firm-day level. Trades for beneficial owners (i.e. outsiders with at least 10% ownership) are excluded. For firm-level fundamentals, insider trade information are matched to the fiscal year immediately preceding the year of trade. *Alpha_n* is daily alpha (profitability of trade) estimated using the Carhart (1997) four-factor model over *n (n=90, 120, 180)* days starting from the day after an insider purchase expressed

in percentage. *Treat* is an indicator equal to one for firms who increased the number of reported segments after the mandatory adoption of SFAS 131 and zero otherwise. *Post* is an indicator equal to one for periods after the mandatory adoption of SFAS 131 and zero otherwise. *Treat*Post* is the interaction of *Treat* and *Post* indicators. *HHI* is an indicator equal to one for firms in the top tercile of ex ante industry concentration, Herfindahl-Hirschman Index (HHI) and zero otherwise. *LI* is an indicator equal to one for firms in the top tercile of ex ante Li et al. (2013) percentage of competition words measure and zero otherwise. *Fluid* is an indicator equal to one for firms in the top tercile of ex ante Hoberg et al. (2014) product fluidity measure and zero otherwise. All ex ante cross-sectional variables are the median values of the three years prior to SFAS 131 adoption. *GEO_INC* is an indicator equal to one for firms which increased their number of reported geographic segments following SFAS 131 adoption and zero otherwise. *Prior n Month Return* is the *n (n=1, 12)* month(s) firm stock return prior to an insider purchase. *Liquidity* is the stock liquidity of an insider's firm in the month immediately preceding the month of insider purchase. Stock liquidity is calculated as the bid-ask spread divided by the average of bid and ask prices. *Volatility* is the stock volatility of an insider's firm in the year immediately preceding the year of the insider purchase. Stock volatility is calculated as the firm's annual standard deviation of daily stock returns. *Market Value of Equity* is the firm's market capitalization, calculated as end of year stock price multiplied by number of shares outstanding. *Book-to-Market Ratio* is the ratio of a firm's book value of equity (CEQ) to market capitalization. *ROA* is the firm's return on asset, calculated as profit (IB) divided by beginning total assets. All firm-level variables are calculated in the year immediately preceding the year of insider purchase. All continuous control variables are winsorized at the 1% and 99% levels. In parentheses are t-statistics of standard errors clustered at the firm level. *, **, *** correspond to 10%, 5%, and 1% significance levels of two-tailed tests.

Online Appendix

Table OA1: Effect of SFAS 131 on insider profit, pure sample

	(1) Alpha_90	(2) Alpha_120	(3) Alpha_180
Treat*Post	-0.054**	-0.047**	-0.053***
	(-2.51)	(-2.48)	(-3.39)
Treat*Post*GEO_INC	0.015	0.023	0.037
	(0.46)	(0.82)	(1.44)
Prior 1 Month Return	-0.001***	-0.001***	-0.001***
	(-5.75)	(-5.84)	(-6.84)
Prior 12 Month Return	-0.000***	-0.000***	-0.000***
	(-4.21)	(-4.28)	(-5.36)
Liquidity	0.342*	0.505***	0.477***
	(1.69)	(3.08)	(3.60)
Volatility	-0.613	-0.636	-0.531
	(-0.97)	(-1.15)	(-1.02)
Log(Market Value of Equity)	-0.151***	-0.137***	-0.125***
	(-11.86)	(-10.53)	(-7.97)
Log(Book-to-Market ratio)	0.025*	0.025	0.029
	(1.73)	(1.44)	(1.20)
ROA	-0.034	-0.063**	-0.008
	(-1.07)	(-2.21)	(-0.32)
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
R^2	0.338	0.385	0.441
N. of Obs.	34,977	34,977	34,977

This table presents results of a difference-in-difference regression analysis of the effect of SFAS 131 adoption on insider purchase profitability using a pure sample (i.e. sample not contaminated with firms with increased number of reported segments unrelated to SFAS 131 adoption). The sample covers three years around the first adoption of SFAS 131. For each firm, multiple insider purchase trades in a day are aggregated to the firm-day level. Trades for beneficial owners (i.e. outsiders with at least 10% ownership) are excluded. For firm-level fundamentals, insider trade information are matched to the fiscal year immediately preceding the year of trade. *Alpha_n* is daily alpha (profitability of trade) estimated using the Carhart (1997) four-factor model over *n (n=90, 120, 180)* days starting from the day after an insider purchase expressed in percentage. *Treat* is an indicator equal to one for firms who increased the number of reported segments after the mandatory adoption of SFAS 131 and zero otherwise. *Post* is an indicator equal to one for periods after the mandatory adoption of SFAS 131 and zero otherwise. *Treat*Post* is the interaction of *Treat* and *Post* indicators. *GEO_INC* is an indicator equal to one for firms which increased their number of reported geographic segments following SFAS 131 adoption and zero otherwise. *Prior n Month Return* is the *n (n=1, 12)* month(s) firm stock return prior to an insider purchase. *Liquidity* is the stock liquidity of an insider's firm in the month immediately preceding the month of insider purchase. Stock liquidity is calculated as the bid-ask spread divided by the average of bid and ask prices. *Volatility* is the stock volatility of an insider's firm in the year immediately preceding the year of the insider purchase. Stock volatility is calculated as the firm's annual standard deviation of daily stock returns. *Market Value of Equity* is the firm's market capitalization, calculated as end of year stock price multiplied by number of shares outstanding. *Book-to-Market Ratio* is the ratio of a firm's book value of equity (CEQ) to market capitalization. *ROA* is the firm's return on asset, calculated as profit (IB) divided by beginning total assets. All firm-level variables are

calculated in the year immediately preceding the year of insider purchase. All continuous control variables are winsorized at the 1% and 99% levels. In parentheses are t-statistics of standard errors clustered at the firm level. *, **, *** correspond to 10%, 5%, and 1% significance levels of two-tailed tests.

Table OA2: Effect of SFAS 131 on insider profit, non-routine sample

	(1) Alpha_90	(2) Alpha_120	(3) Alpha_180
Treat*Post	-0.052***	-0.053***	-0.061***
	(-2.66)	(-3.02)	(-4.18)
Treat*Post*GEO_INC	0.012	0.037	0.049**
	(0.44)	(1.48)	(2.19)
Prior 1 Month Return	-0.001***	-0.001***	-0.001***
	(-5.80)	(-5.88)	(-7.52)
Prior 12 Month Return	-0.000***	-0.000***	-0.000***
	(-4.69)	(-4.76)	(-6.11)
Liquidity	0.368**	0.506***	0.467***
	(1.98)	(3.45)	(4.00)
Volatility	-0.728	-0.667	-0.490
	(-1.22)	(-1.27)	(-1.00)
Log(Market Value of Equity)	-0.163***	-0.145***	-0.131***
	(-13.41)	(-11.82)	(-8.89)
Log(Book-to-Market ratio)	0.015	0.017	0.020
	(1.09)	(1.03)	(0.92)
ROA	-0.021	-0.048*	0.001
	(-0.68)	(-1.80)	(0.02)
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
R^2	0.339	0.384	0.438
N. of Obs.	38,718	38,718	38,718

This table presents results of a difference-in-difference regression analysis of the effect of SFAS 131 adoption on insider purchase profitability using a clean opportunistic sample (i.e. excluding routine trades (Cohen et al., 2012)). The sample covers three years around the first adoption of SFAS 131. For each firm, multiple insider purchase trades in a day are aggregated to the firm-day level. Trades for beneficial owners (i.e. outsiders with at least 10% ownership) are excluded. For firm-level fundamentals, insider trade information are matched to the fiscal year immediately preceding the year of trade. *Alpha_n* is daily alpha (profitability of trade) estimated using the Carhart (1997) four-factor model over *n (n=90, 120, 180)* days starting from the day after an insider purchase expressed in percentage. *Treat* is an indicator equal to one for firms who increased the number of reported segments after the mandatory adoption of SFAS 131 and zero otherwise. *Post* is an indicator equal to one for periods after the mandatory adoption of SFAS 131 and zero otherwise. *Treat*Post* is the interaction of *Treat* and *Post* indicators. *GEO_INC* is an indicator equal to one for firms which increased their number of reported geographic segments following SFAS 131 adoption and zero otherwise. *Prior n Month Return* is the *n (n=1, 12)* month(s) firm stock return prior to an insider purchase. *Liquidity* is the stock liquidity of an insider's firm in the month immediately preceding the month of insider purchase. Stock liquidity is calculated as the bid-ask spread divided by the average of bid and ask prices. *Volatility* is the stock volatility of an insider's firm in the year immediately preceding the year of the insider purchase. Stock volatility is calculated as the firm's annual standard deviation of daily stock returns. *Market Value of Equity* is the firm's market capitalization, calculated as end of year stock price multiplied by number of shares outstanding. *Book-to-Market Ratio* is the ratio of a firm's book value of equity (CEQ) to market capitalization. *ROA* is the firm's return on asset, calculated as profit (IB) divided by beginning total assets. All firm-level variables are calculated in the year immediately preceding the year of insider purchase. All continuous control variables are winsorized at the 1% and 99% levels. In parentheses are t-statistics of standard errors clustered at the firm level. *, **, *** correspond to 10%, 5%, and 1% significance levels of two-tailed tests.

Table OA3: Effect of SFAS 131 on insider profit (Sale sample)

	(1) Alpha_90	(2) Alpha_120	(3) Alpha_180
Treat*Post	0.041**	0.029*	0.021
	(2.49)	(1.87)	(1.56)
Treat*Post*GEO_INC	-0.017	-0.015	-0.025
	(-0.71)	(-0.70)	(-1.29)
Prior 1 Month Return	0.000***	0.001***	0.001***
	(2.79)	(4.10)	(4.67)
Prior 12 Month Return	0.000***	0.000***	0.000***
	(3.34)	(2.94)	(3.65)
Liquidity	-0.922***	-0.683***	-0.697***
	(-4.00)	(-3.48)	(-4.49)
Volatility	3.134***	3.046***	2.760***
	(6.08)	(6.58)	(6.94)
Log(Market Value of Equity)	0.154***	0.145***	0.127***
	(14.96)	(15.55)	(15.55)
Log(Book-to-Market ratio)	0.026**	0.020*	0.016
	(2.25)	(1.92)	(1.64)
ROA	0.018	0.009	0.005
	(0.50)	(0.29)	(0.21)
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
R^2	0.251	0.300	0.362
N. of Obs.	97,199	97,199	97,199

This table presents results of a difference-in-difference regression analysis of the effect of the mandatory SFAS 131 accounting standard adoption on the profitability of insider sale trades in 3,275 non-financial/non-utility U.S firms subjected to the accounting standard. SFAS 131 became effective after December 15, 1997. December year-end firms are the first adopters in 1998 and the remainder firms first adopted in 1999. The sample covers three years around the first adoption of SFAS 131. For each firm, multiple insider sale trades in a day are aggregated to the firm-day level. Trades for beneficial owners (i.e. outsiders with at least 10% ownership) are excluded. For firm-level fundamentals, insider trade information are matched to the fiscal year immediately preceding the year of trade. *Alpha_n* is daily alpha (profitability of trade) estimated using the Carhart (1997) four-factor model over *n (n=90, 120, 180)* days starting from the day after an insider sale expressed in percentage. *Treat* is an indicator equal to one for firms who increased the number of reported segments after the mandatory adoption of SFAS 131 and zero otherwise. *Post* is an indicator equal to one for periods after the mandatory adoption of SFAS 131 and zero otherwise. *Treat*Post* is the interaction of *Treat* and *Post* indicators. *GEO_INC* is an indicator equal to one for firms which increased their number of reported geographic segments following SFAS 131 adoption and zero otherwise. *Prior n Month Return* is the *n (n=1, 12)* month(s) firm stock return prior to an insider sale. *Liquidity* is the stock liquidity of an insider's firm in the month immediately preceding the month of insider sale. Stock liquidity is calculated as the bid-ask spread divided by the average of bid and ask prices. *Volatility* is the stock volatility of an insider's firm in the year immediately preceding the year of the insider sale. Stock volatility is calculated as the firm's annual standard deviation of daily stock returns. *Market Value of Equity* is the firm's market capitalization, calculated as end of year stock price multiplied by number of shares outstanding. *Book-to-Market Ratio* is the ratio of a firm's book value of equity (CEQ) to market capitalization. *ROA* is the firm's return on asset, calculated as profit (IB) divided by beginning total assets. All firm-level variables are calculated in the year immediately preceding the year of insider sale. All continuous control variables are winsorized at the 1% and 99% levels. In parentheses are t-statistics of standard errors clustered at the firm level. *, **, *** correspond to 10%, 5%, and 1% significance levels of two-tailed tests.