Mandatory Disclosure, Internal Information Asymmetry, and Insider Trading: Evidence from FAS 131

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Abstract

We examine whether and how mandatory reporting enhancements influence insider trading in the presence of information asymmetry between headquarters executives (HQEXs) and divisional managers (DMs). Stricter reporting mandates prevent HQEXs from overstating firm performance, but then those mandates can promote informed share purchases of DMs who fail to convince HQEXs to disclose positive divisional information. We test this prediction using the adoption of Financial Accounting Standards No. 131 (FAS 131) as a regulatory shock that enhances HQEXs' segment reporting obligations. We find that the adoption of FAS 131 increases purchases of DMs but not those of HQEXs and that the increased purchases of DMs are negatively associated with financial reporting quality. We also examine the changes in management guidance and subsequent analysts' forecast corrections, the timing of DMs' purchases around segment reporting releases, the effect of business concentration within conglomerates and the role of institutional investors. Our study provides novel policy implications for financial reporting and insider trading.

JEL classification: G14, G34, M41

Keywords: internal information asymmetry, insider trading, conglomerates, FAS 131

1. Introduction

Examination of the causes and consequences of corporate insider trading has been a longstanding issue in finance and accounting literature. Insiders' private access to firm information raises a regulatory concern about their trading activities as an instrument to expropriate gains otherwise available to outside investors.[1] Among various efforts to address the information asymmetry involved in this situation, financial reporting mandates have been considered a central policy that aims to improve investors' access to firm information by limiting manipulative disclosures and, in particular, overly optimistic ones. This regulatory effect, however, is heavily influenced by the internal information asymmetry (IIA) within a firm. Specifically, financial reporting prepared by top managers, who have limited knowledge about divisions, may fail to include disclosure of material information held by divisional managers.

We examine whether and how mandatory reporting enhancements affect insider trading in the presence of IIA between headquarters executives (HQEXs) and divisional managers (DMs) of conglomerates. Without IIA, stricter reporting standards reduce insiders' informed trading opportunities by improving reporting transparency. Reduced noise in the report will increase the elasticity and accuracy of stock prices and reduce opportunities for insiders to trade with superior information after the report. However, the prediction may not hold if HQEXs have limited access to divisional information held by DMs. In this circumstance, underperforming DMs may convey inflated information about divisional performance or prospects to HQEXs. Stricter reporting mandates would induce HQEXs to avoid overstating firm performance and to interpret divisional reports more pessimistically by considering the manipulation incentives of

[1] Previous studies (e.g., Lakonishok and Lee 2001) report ample evidence of informed insider trading even in developed financial markets in which insiders are prohibited from trading their firms' securities in the possession of material non-public information.

underperforming DMs. Such disciplined reporting practices can then *promote* share purchases of the DMs who fail to convince the conservative HQEXs of truly positive divisional information. By purchasing shares, these *privately* informed DMs can gain trading profits while sending a signal to HQEXs.

We test this prediction using the adoption of Financial Accounting Standards No. 131 (FAS 131), a new accounting standard for conglomerates' segment disclosures enacted in 1997. The information structure between conglomerates' HQEXs and their segment DMs provides an excellent empirical setting for our tests. Relative to HQEXs, DMs tend to have private information about their own business segments.[2] For instance, Graham et al. (2015) find that DMs have greater knowledge about investment opportunities of their segments than HQEXs. DMs' private information may also include segments' operational details, competitive advantages, or bargaining powers against suppliers. Further, competition for internal capital induces underperforming DMs to convey overly optimistic information about their segments to HQEXs. We thus hypothesize that enhanced mandatory reporting standards increase share purchases of DMs who fail to convince HQEXs to disclose positive segment information.

FAS 131 enhances the business/operational segment reporting mandates substantially. Prior to adoption of FAS 131, headquarters management of conglomerates could classify reported segments based on their industries. Conglomerates, however, define an industry very broadly and combine multiple segments' information to an excessive extent in their reporting. Effective for firms with fiscal years beginning after December 15, 1997, FAS 131 requires financial reporting to define segments as those categorized internally for operating decisions and to disclose segment information used by headquarters management. Thus, FAS 131 enhances

[2] Goldstein and Yang (2015) points out conglomerates' informational complexity that arises from their operations in multiple industries and business lines.

investors' access to segment information held by headquarters management. Notably in this context, FAS 131 improves average reporting quality by inducing HQEXs to disclose segment information more transparently, but it can also promote informed share purchases by DMs in firms where HQEXs fail to accept the truly positive segment information held by DMs.

Using the sample firms in the Compustat Segment database, we first test the effect of FAS 131 on DMs' purchases by estimating a difference-in-differences model. In this model, the treatment group consists of firms that increase the number of reported business/operational segments after FAS 131. To control for the actual changes in business segments, our sample excludes the treatment firms that engage in acquisitions after FAS 131.[3]

We find that the adoption of FAS 131 expands DM's informed purchase opportunities. Specifically, after FAS 131, DMs tend to purchase shares more often and in larger amounts while maintaining the average trading profitability. Further, DMs' cluster purchases, those jointly placed with HQEXs' purchases on the same date or consecutive trading days, do not increase but become significantly less profitable in treated firms. By contrast, non-cluster purchases by DMs become more frequent and maintain similar levels of profitability after FAS 131, suggesting that DMs' increases purchases are unlikely driven by internally shared information.

We then run several falsification tests. First, DMs' sales of shares do not change significantly, suggesting that the increase in purchases is not mechanically driven by the increase in the number of DMs in the treatment firms. Also, FAS 131 changes the previous trends of DMs' purchases in the treated and control firms and, specifically, increases non-cluster purchases of treated firms' DMs more than those of control firms' DMs. Furthermore, as

[3] Our methods for classification of treated and control groups and procedure for sample construction are also used by the literature that studies the effect of FAS 131. See Section 2.1. for discussion of those studies.

opposed to DM's trades, HQEXs' purchases do not change significantly.

DMs' increased purchases may lead to a regulatory concern that FAS 131 may fail to improve financial report quality in firms in which HQEXs have limited access to segment information. We find supportive evidence in two tests. In the first test, following Chen et al. (2018), we use the return difference between DMs' and HQEXs' purchases as a proxy for IIA and do not find evidence of its resolution under FAS 131. Further, following Ettredge et al. (2005), we use the Forward Earnings Response Coefficient (FERC) as a proxy for financial reporting quality and find that the FERC of 10-K filings is enhanced in firms in which DMs do not purchase shares after FAS 131, but not among the firms in which DMs execute non-cluster purchases.

In additional analyses, we test the effect of related economic channels. To begin with, we examine whether the treated firms' HQEXs report earnings more pessimistically after FAS 131 and find supporting evidence. Specifically, the treated firms increase the number of management guidance that leads to downward corrections of analysts' forecast more than the control firms do. That is, before reporting earnings, the treated firms' HQEXs lower analysts' earnings forecast by providing management guidance and reduce risks of failing to meet or beat their consensus.

Next, we study the timing of insiders' purchases around two key corporate disclosure event dates, namely, earning announcement and 10-K filing dates. DMs' purchases increase significantly between earning announcement and 10-K filing dates, a time window during which insiders tend to place informed trading (Huddart and Ke 2007). By contrast, HQEXs' purchases do not change significantly in this window, implying that the DMs' purchases are not driven by the segment information contained in the upcoming 10-K filings. Rather, DMs could use the

stock market mispricing from imprecise segment information disclosed in the earnings announcements.

Third, we examine whether DMs' purchases increase to a greater extent in conglomerates in which IIA is more severe. Fama and Jensen (1983) point out that the business complexity of a firm is a source of information asymmetry between stakeholders. Motivated by this insight, we test whether the adoption of FAS 131 increases DMs' share purchases to a greater extent in the treated firms in which the capital allocation is more dispersed across business segments, and we find supportive empirical evidence for this association.

Finally, we examine whether DMs' increased purchases and poor reporting quality under FAS 131 are mitigated in firms in which institutional investors hold a sufficiently large ownership share. We find that DMs' non-cluster purchases increase after FAS 131 if institutional investors hold less than a majority of ownership. Consistent with the severity of IIA, these firms do not exhibit significant increases in HQEXs' purchases nor substantial reporting quality improvements after FAS 131. On the other hand, firms with large institutional ownership exhibit significant reporting enhancements, but no change in DMs' non-cluster purchases.

This paper contributes to the existing literature in several ways. First, to the best of our knowledge, this study is the first to contribute to the FAS 131 literature by exploring the internal information structure of a firm and its association with trading by insider officer holders in the firm. The findings of prior studies (e.g., Berger and Hann 2003, Botosan and Stanford 2005, Ettredge et al. 2005, Franco et al. 2016) suggest that analysts and investors have access to more segment data after adoption of FAS 131, which leads to an improved information environment by reducing the information asymmetry between insiders and outsiders. Although these studies

have suggested an improved information environment, none has provided direct evidence of the impact of FAS 131 on the internal information structure between DMs and HQEXs. Our findings do not support the premises that enhanced segment reporting requirements under FAS 131 alleviate IIA. FAS 131 has not affected the internal information asymmetry between DMs and HQEXs but has imposed a pressure on HQEXs to provide detailed segment information to external users. Interestingly, the enhanced segment information disclosure can be used as a trading opportunity for DMs with private information unknown to HQEXs.

Second, our findings provide a novel policy implication with respect to the effectiveness of FAS 131. FAS 131 may not improve the transparency of segment information disclosures and rather promote DMs' informed insider trading in conglomerates with severe IIA. Our findings suggest that the regulatory effect of FAS 131 relies crucially on the internal information structure of a firm. Further, DMs' informed trading under FAS 131 provides mixed regulatory implications. On one hand, the informed trading may need to be restrained for the purpose of investor protection. On the other hand, it can contribute to market efficiency when HQEXs fail to incorporate true divisional information in the report despite the enhanced accounting standards. Regulators may need to consider this trade-off when devising new reporting standards if they find it infeasible to resolve IIA within a firm.

The remainder of the paper is structured as follows: in Section 2 we provide the background to FAS 131, review the relevant prior research, and develop our hypotheses. Section 3 provides research design with empirical model. In Section 4, we describe our sample selection and present descriptive statistics and a univariate comparison. Sections 5 and 6 provide the results of our multivariate tests and additional analyses. Section 7 concludes.

2. Literature review and hypothesis development

2.1. The impact of FAS 131

The introduction of FAS 131 was preceded by Financial Accounting Standards 14 (FAS 14), which required firms to provide information about their lines of business and geographic segments separately, with no required disclosure as to how the two types of segment information should be reconciled. FAS 14 also used a loose definition of industry, which allowed managers of diversified firms to report highly aggregated segments. However, FAS 131 that was adopted with effect from December 15, 1997 took the management approach to the defining of a firm's operating segments. As this segment reporting is based on the internal units used by top executives to make operating decisions and evaluate firm performance, the information provided is more consistent with the disclosures made in the other parts of the firm's annual report.

Prior studies on the impact of FAS 131 report a significant improvement in the disclosure of segment information after the standard was implemented. More specifically, these studies document increases in the number of reported segments (Herrmann and Thomas 2000, Berger and Hann 2003), more line items for business segments (Street et al. 2000), improved analyst forecasts (Berger and Hann 2003, Botosan and Stanford 2005), improved stock market ability to anticipate future earnings (Ettredge et al. 2005), improved capital allocation efficiency (Cho 2015), and a stronger impact of industrial diversification on bond yields (Franco et al. 2016).

Herrmann and Thomas (2000) examine the reporting behavior of a sample of firms drawn from the largest of the Fortune 500 group following the introduction of FAS 131. They conclude that FAS 131 improved segment reporting based on an assessment of changes in the number of reportable segments and the consistency between segment disclosures and the rest of the annual report. Street et al. (2000) find similar improvements for a sample of Global 1000 firms. In

addition, 49 percent of the firms in their sample that reported no segment data under FAS 14 initiated segment disclosures under FAS 131. While both studies focus on how FAS 131 affected the segment disclosures firms provide, neither investigates managers' incentives to withhold segment information or the impact of FAS 131 adoption on analysts' information environment.

Berger and Hann (2003) find that newly disclosed segment data provide additional information that improves analyst forecasts of multi-segment firm earnings. Botosan and Stanford (2005) conclude that analysts are more dependent upon public information by considering changes in the weight of the public and private information included in analyst forecasts. This finding implies that more segment information became publicly available after FAS 131 was put in place and that analysts seem to use that information to predict firm earnings.

Using the FERC, Ettredge et al. (2005) find that the stock market was able to predict the future earnings of treatment firms early on in the post-introduction of FAS 131 era. They predict that if the newly disclosed segment data are useful in predicting future earnings, then current stock prices impound more information about those earnings, and thus the association between current stock prices and the FERC should improve. Their empirical results confirm their prediction and show that the speed with which future earnings information is incorporated into current stock prices increased in the three years after the adoption of FAS 131.

FAS 131 also influences firm value, although findings in relation to this influence vary. Cho (2015) finds that diversified firms that improved segment disclosure transparency by changing segment definitions upon adoption of FAS 131 experienced an improvement in capital allocation efficiency in internal capital markets after that adoption. Jayaraman and Wu (2019), by contrast, report a reduction in corporate investment efficiency after FAS 131. Franco et al. (2016) find that bonds issued by industrially diversified firms with high-quality segment disclosures have

significantly lower yields than bonds issued by diversified firms with low quality segment disclosures. They also find that the negative relation between industrial diversification and bond yields becomes stronger when firms improve segment disclosures as a result of FAS 131.

While the positive impact of FAS 131 on external decision makers (e.g., analysts, stock and bond investors) is well-documented, there is a dearth of academic research as to whether a similar effect can be found on internal decision makers (e.g., HQEXs and DMs). Our study will fill this important research gap in the prior literature.

2.2. Hypothesis development

Previous studies link DMs to overall internal firm information environments, based on the premise that the amount of information managers at different ranks possess varies among firms. For example, Graham et al. (2015) report that CEOs describe the opinion of a DM as one of the most important factors in key business decisions. Duchin and Sosyura (2013) find that divisional information sharing between DMs and the CEO influences investment efficiency of conglomerates.

Divisional information sharing within a conglomerate is hindered by several factors. DMs compete internally for resources (Harris and Raviv 1996), which can affect their incentives for transferring information transparently to the headquarters. HQEXs may find it hard to verify the truthfulness of DMs' reports because it is too costly for them to aggregate divisional information from various sources (Aghion and Tirole 1997) or because the information tends to be soft (Stein 2002). Other factors that can constrain HQEXs' accessibility to divisional information include geographic dispersion, business complexity and inadequate internal control systems (Chen et al. 2018). Alternatively, HQEXs may have superior ability to process aggregate firm information acquired from divisions (Chen et al. 2018).

The "disclose or abstain" rule precludes insiders from trading while in possession of material nonpublic information but does not provide explicit guidelines for disclosure content. As a result, managers wishing to trade have incentives to disclose something but maintain discretion over the quality of their disclosure. Under FAS 131, HQEXs are obliged to report the segment information that they use for operating decisions. As discussed in Section 2.1, enhanced reporting mandates induce the HQEXs to avoid overstating firm performances and, thus, also induce them to interpret DMs' segment reports more pessimistically in response to the potential for manipulation of reports by underperforming DMs. This managerial disciplinary effect, in turn, facilitates share purchases of DMs who fail to convince HQEXs to disclose truly positive divisional information. Based on the discussion above, we formulate the following hypothesis:

Hypothesis 1. *FAS 131 is positively associated with share purchases of DMs but not those of HQEXs.*

FAS 131 is intended to help investors better understand a firm's performance, and better assess future net cash flows, in order to make more informed judgments about the firm as a whole. Cho (2015) argues that FAS 131 improves the transparency of managerial actions in internal capital allocation and that more transparent segment information can help resolve agency conflicts in the internal capital markets of diversified firms. However, if DMs' private information is not accepted by HQEXs and thus leads to DMs' informed trading in the post FAS 131 period, FAS 131 would not meet the standard's intended qualitative effects. Specifically, we hypothesize that FAS 131 enhances the reporting quality only in conglomerates in which the new accounting standard does not lead to DMs' share purchases. The second hypothesis follows in a null form:

Hypothesis 2. *FAS 131 does not improve the segment reporting in conglomerates in which*

DMs' share purchases increase after the adoption of that standard.

3. Research design

3.1. Informed insider trading

Measuring information structure among corporate insiders is a challenging task. Researchers do not observe the information privately held by insiders even ex-post unless the relevant corporate disclosure is enforced by court rulings or regulations. Previous studies attempt to back out the information embedded in insider trades. Lakonishok and Lee (2001) find that insider purchases exhibit significantly positive stock return predictability, suggesting that these trades tend to be driven by inside information. Insider sales, on the other hand, do not predict future stock returns.[4] Following the literature, we use all purchases of insiders as a (noisy) proxy for informed purchases. In the robustness checks, we also consider opportunistic trades proposed by Cohen et al. (2012) as a refined measure of informed insider trades.

We then identify DMs' purchases that are likely to be driven by internally shared information, namely, cluster purchases. Specifically, cluster purchases are defined as the purchases placed by multiple insiders on the same day or in consecutive days. Holden and Subramanyam (1992) show that insiders, who have shared information, must trade more aggressively together in a shorter time horizon to gain trading profits, particularly if the shared information is scheduled to be publicly disclosed soon.[5] As discussed in Section 2.1, FAS 131 enhances the financial reporting about divisional information. We thus expect that cluster

[4] Jeng et al. (2003) points out that high-ranked officers' sales are more likely than their purchases to be driven by non-information reasons, e.g., for liquidity or portfolio diversification purposes, because these insiders tend to have their human capital invested in the firm and receive compensation in the form of stock or stock options.

[5] Foster and Viswanathan (1996) and Back et al. (2000) generalize the analysis of Holden and Subramanyam (1992), who consider a case in which multiple insiders have identical information, to the setting (with discrete and continuous time, respectively) in which insiders have an imperfectly correlated information.

purchases of DMs and HQEXs around corporate financial reporting capture especially well the effect of FAS 131 on their shared information-driven trading. Notably, cluster purchases measure internal information sharing only partially because they are influenced by insiders' trading strategies as well.

As a proxy for internal information asymmetry between DMs and HQEXs, we use the measure proposed by Chen et al. (2018), which is the relative stock return subsequent to DMs' trades when compared to HQEXs' trades. They provide empirical evidence of this return gap as a reliable measure for DMs' informational advantage relative to HQEXs. Using this measure, we test whether FAS 131 changes information sharing within a conglomerate.

3.2. Model specification

We test the hypotheses above by estimating a difference-in-differences model, which identifies the effect of FAS 131 on DMs' trading activities and returns. Following previous studies (e.g., Ettredge et al. 2005), we set the treatment group to include conglomerates that increase the number of reported business segments after FAS 131 and the control group to contain other conglomerates (i.e., those which do not increase the number of business segments after FAS 131).[6] Formally, we estimate the following fixed effect regression model: for firm *i* in year *t*,

$$Y_{it} = \beta_0 + \beta_1 Post_t \times Treat_i + \Gamma(Controls) + \eta_i + \nu_t + \varepsilon_{it}, \quad (1)$$

where the dependent variable includes various insider trading measures, $Post_t$ is a post-FAS 131 period indicator (i.e., equals 1 if year *t* is in the post-adoption of FAS 131 period and 0, otherwise), and $Treat_i$ is a treatment group indicator (i.e., equals 1 if firm *i* is a conglomerate

[6] As a robustness check, we run the analysis after excluding the conglomerates that report fewer business segments under FAS 131 and find qualitatively consistent results.

that increases the number of reported segments under FAS 131 and 0, otherwise). Firm fixed effects η_i and year fixed effects v_t, which subsume the partial effect of $Treat_i$ and $FAS131_t$, respectively, are controlled. Details about the sample construction are provided in Section 4.2 below.

We also test whether FAS 131 fails to improve segment disclosures if DMs hold private segment information not accepted by HQEXs (Hypothesis 2). Following Ettredge et al. (2005), we measure the informativeness of financial reports using the Forward Earnings Response Coefficient (FERC), defined as the coefficient estimate b_2 in the following regression: for firm i and period t,

$$R_{it} = a + b_0 E_{it-1} + b_1 E_{it} + b_2 E_{it+1} + b_3 R_{it+1} + \varepsilon_{it}, \tag{2}$$

where (i) E_{it-1}, E_{it}, and E_{it+1} are EPS scaled by price in the prior, the current and the next period, respectively, and (ii) R_{it} and R_{it+1} are the stock return of the current and the next period, respectively. We expand the regression model to examine the relative change in treatment firms' FERC when compared to that of control firms after FAS 131: for firm i and period t,

$$\begin{aligned} R_{it} = {} & a + b_0 E_{it-1} + b_1 E_{it} + b_2 E_{it+1} + b_3 R_{it+1} \\ & + Post_t \times (c + d_0 E_{it-1} + d_1 E_{it} + d_2 E_{it+1} + d_3 R_{it+1}) \\ & + Post_t \times (e + f_0 E_{it-1} + f_1 E_{it} + f_2 E_{it+1} + f_3 R_{it+1}) \\ & + Post_t \times Treat_i \times (g + h_0 E_{it-1} + h_1 E_{it} + h_2 E_{it+1} + h_3 R_{it+1}) + \varepsilon_{it}, \end{aligned} \tag{3}$$

The key coefficient estimate is h_2. We predict that $h_2 > 0$ (i.e., the financial reporting of treatment firms' financial reporting becomes more informative after adoption of FAS 131) only if DMs do not purchase shares after adoption of FAS 131.

4. Data and sample selection

4.1. Data

We obtain insider trading information for corporate executives from the Thomson-Reuters Insider Filing (TRIF) database. TRIF collects the data in Forms 3, 4, and 5, in which insiders submit ownership of a company stock to the SEC according to Section 16 of the Securities and Exchange Act of 1934. We obtain segment level accounting data from the Compustat Segment database. We only use the business segments (stype = BUSSEG or OPSEG) since the reported geographic segments (which correspond to global regions) decrease substantially during the period. We acquire firm level accounting variables from the Compustat database, stock returns from the Center for Research in Security Prices (CRSP) database, financial analyst information from I/B/E/S, and institutional ownership from the Thomson-Reuters Institutional Holdings (13F) database.

We turn now to a description of the procedure to classify treatment and control groups. FAS 131 is effective from the fiscal year (FY) starting after December 15, 1997. Following the literature (see Section 2.1 above), we exclude the first year after adoption, i.e., the reports of FYs ending in December 1998 through November 1999, because it may take time to fully adopt the new standard. We then compare the number of business/operating segments between the last FY of the pre-adoption of FAS 131 period (FYs ending in December 1997 through November 1998) and the next two FYs of the post-adoption of FAS 131 period (FYs ending in December 1999 through November 2001). FAS 131 allows restatements of previous fiscal years, and Compustat provides up to three restatements for each fiscal year. The restatement ratio increases gradually in 1998 starting from 5% in January to over 40% in October. It remains around 40–45% afterwards. For the pre-adoption of FAS 131 period, we use the original statement since

the restatements may reclassify the segments based on FAS 131. For the post-adoption of FAS 131 period, we consider the largest number of segments among all (re)statements in each FY. Using this information, we define the treatment group as the firms which reported more business segments in both post-adoption of FAS 131 FYs than firms in the pre-adoption of FAS 131 FYs. All other firms in the Compustat segment database are classified as the control group.

Finally, following Chen et al. (2018), we identify DMs from TRIF, if: (i) the relationship code is the divisional officer (relationship code=OX) or the officer of subsidiary company (OS), or (ii) the relationship code is a non-top executive, and mailing address is not in the headquarters state or is at least 500 km away from the headquarters location. Following Kang et al. (2019), we define insider cluster trades as the same directional trades in which multiple insiders trade for the same stock on the same day or over the consecutive trading days.

4.2. Sample selection

Table 1 shows the sample selection process. We begin with 16,711 firms in Compustat from fiscal year 1996 to 2001. We remove the firms without stock return data, leaving 11,847 firms for which stock returns are available in the CRSP database. We drop 1,770 firms for which segment data are not available from the Compustat Segment database. Following Berger and Ofek (1995), we then require that the difference between the sum of sales (assets) in segments of the firm and total sales (assets) at the firm level is less than 1% (25%). This requirement leaves 8,872 firms and 29,034 firm-year observations. We also restrict our sample of firms to fiscal year end of December, leaving 5,939 companies after the screening process. Next, we exclude 800 firms for which insider trading data is not available in TRIF, then delete 176 firms and 951 firm-year observations for which no insider trading exists in the previous three years. At this stage, the sample contains 4,963 firms and observations for 15,423 firm-years. We then

delete 1,536 firms for which acquisitions occur during any year of the sample period. Finally, after excluding firms that operate in financial (SIC 6000–6999) and utility (SIC 4900–4999) sectors or that have missing control variables, we have 2,362 firms and 8,922 firm-year observations.

[Insert Table 1 here]

4.3.Descriptive statistics

Table 2 panel A presents the descriptive statistics and segment classification status of treated and control firms. We divide the time periods into pre-adoption and post-adoption of FAS 131, where the pre-adoption period is from FY 1996 to 1998 and post-adoption period is from FY 1999 to 2001.[7] There are total 1,843 treated firm-years and 7,079 control firm-years. Compared to control companies, the treated companies exhibit smaller size, less growth opportunities, fewer analyst coverage and lower institutional ownership after the adoption of FAS 131.

[Insert Table 2 here]

During the pre- and post-adoption periods, the pattern and amount of DMs' purchases are significantly different between treated firms and control firms. The average number of DMs' trades is 1.097 for treated firms and 1.013 for control firms before adoption of FAS 131, and they become 1.309 and 1.197 after adoption of FAS 131, respectively. The average number of DMs' purchases is 0.221 for treated firms and 0.237 for control firms before adoption of FAS 131, and they become 0.288 and 0.2 after adoption of FAS 131, respectively. In the pre-adoption of FAS 131 period, the observed probability of DMs' purchases in a year is 10.9% and 11.5%,

[7] As Section 404 started after the Sarbanes-Oxley Act of 2002 (see Feng et al. 2009), there is no significant change in internal control systems due to the regulation on disclosures of internal control deficiencies.

respectively. However, in the post-adoption of FAS 131 period, there are more purchases by the DM for the treated firms. Treated firms exhibit higher probability of DM's purchases than control firms by 2.9%. Most of the increase comes from non-cluster purchases. In contrast, HQEXs of treated firms reduce share purchases more than those of control firms. After the adoption of FAS 131, the average number of HQEXs' purchases in a year decreases by 0.133 in treated firms while it increases by 0.143 in control firms.

Panel B shows the segment classification status during the pre- and post-adoption of FAS 131 periods. The 1,589 single segment companies remain standalone after adoption of FAS 131, and 306 have more segments after adoption of FAS 131. For multi-segment firms, 251 are unchanged, while 132 report more segments.

5. Empirical analyses

5.1. FAS 131 and divisional managers' trades

We first test whether FAS 131 provides DMs with more trading opportunities in which they can exploit segment information uncaptured by HQEXs. Specifically, we run the difference-in-differences estimation model (1) for six dependent variables that measure DMs' share purchase patterns. As control variables, we consider logarithm of book asset value (*Log Size*), the book value to market value ratio (*Book-to-Market*), logarithm of number of analysts (*Log Num Analysts*), the fraction of institutional ownership (*Institutional Ownership*), firm fixed effects, and year fixed effects. In all estimations, standard errors are clustered at firm level. Definitions of variables are provided in the Appendix.

[Insert Table 3 here]

Panel A of Table 3 presents the estimation results. In column (1), the dependent variable is

a dummy variable (DM Purchases) which equals 1 if DMs purchase shares during the firm-year and 0 otherwise. After adoption of FAS 131, the treatment conglomerates exhibit a larger increment in the probability of DMs' shares purchases (4.2%) than that of the control firms. The difference between the two groups' probability changes is statistically significant at the 5% level. We then examine whether this result is driven by cluster purchases, which are likely to be driven by information commonly shared with other executives, or by non-cluster purchases. In column (2), the dependent variable is a dummy variable (DM Cluster Purchases) that assigns 1 if the firm year has DMs' cluster purchases and 0 otherwise. The two groups of firms do not exhibit a significant difference in the changes of DMs' cluster purchase probability. In column (3), we use a dummy variable (DMs' Non-cluster Purchases), which assigns 1 if the firm year has DMs' non-cluster purchases and 0 otherwise, as the dependent variable. After adoption of FAS 131, the treatment conglomerates present a larger increase in the probability of DMs' non-cluster purchases (4.9%) than that of the control firms. These results suggest that FAS 131 facilitates the DMs' trades that exploit private segment information uncaptured by other executives.

We then examine the changes in dollar amounts of DMs' purchases after adoption of FAS 131. In columns (4)–(6), dependent variables are the logarithm of 1 plus the dollar amount of DMs' purchases, cluster purchases, and non-cluster purchases, respectively. We find that, after adoption of FAS 131, DMs of treatment conglomerates increase share purchases more than those of control firms. This change in DMs' purchases is entirely driven by their non-cluster purchases. Our findings show that DMs invest more in their firms' shares via non-cluster purchases rather than simply splitting their purchases and trading more frequently after adoption of FAS 131, which supports Hypothesis 1.

We run several falsification tests. First, a potential concern is that DMs' increased purchases result mechanically from changes in the number of insiders reported as DMs. After adoption of FAS 131, the treatment conglomerates report more segments and thus possibly classify more insiders as DMs. This alternative channel however should also increase DMs' sales. We thus exploit the analysis of DMs' sales changes as a falsification test for the alternative explanation.

Panel B of Table 3 presents the estimation results. We run the difference-in-differences regressions in Table 3 by replacing the dependent variables with the corresponding DMs' sales measures. Column (1) shows that the two groups of firms do not exhibit significant differences in the changes of DMs' share sales probability after adoption of FAS 131. Further, columns (2) and (3) present results indicating that the two groups do not differ in cluster and non-cluster sales probabilities, respectively. The estimation results with respect to the dollar amount of DMs' sales, cluster sales, non-cluster sales, presented in columns (4)–(6), respectively, are also consistent. These findings suggest that the increased purchases of DMs are not driven by some mechanical changes in the number of DMs, which would also influence DMs' sales.

Further, we test whether treated and control group firms have parallel trends in their divisional managers' purchases before adopting FAS 131. Using the DMs' purchases in each fiscal year during the period 1993−1998, we estimate the difference-in-differences regression in equation (1) by setting the fiscal year 1996 as the false adoption year. Post dummy therefore equals one for fiscal years 1996−1998 and zero, otherwise. If the two groups of firms have a parallel trend, the estimate of coefficient β_1 should not be significantly different from zero.

Panel C of Table 3 presents the estimation results. The dependent variables of each column are the same as those in Table 3. In all tests, the estimate of β_1 is not statistically significant. Furthermore, the coefficient estimates in the regressions of divisional managers' all purchases

(columns 1 and 4) or their non-cluster purchases (columns 3 and 6) are negative and of much smaller magnitude that those in Table 3. Our results show that FAS 131 changes the previous trends of DMs' purchases in the two groups and increases non-cluster purchases of treated firms' DMs more than those of control firms' DMs.

5.2. FAS 131 and headquarters executives' purchases

Next, we test whether FAS 131 also facilitates HQEXs' purchases. Specifically, we use the same estimation models in Table 3 while replacing dependent variables with the corresponding measures of HQEXs' purchases. The estimation results are presented in Table 4.

[Insert Table 4 here]

Column (1) shows that, after adoption of FAS 131, treatment and control firms do not differ significantly in the changes in their HQEXs' purchase probability. Columns (2) and (3) present results indicating that the similarity between the two groups of firms is observed in both the probability of HQEXs' cluster purchases with other insiders and the probability of their non-cluster purchases. Likewise, columns (4)–(6) show that the two groups do not significantly differ in the changes in HQEXs' share purchase value, for both cluster and non-cluster purchases. Overall, these findings confirm that the increase in DMs' purchases after adoption of FAS 131 is driven by the segment information uncaptured by HQEXs, but not by commonly shared information or unobservable firm characteristics that influence all insiders' trades.

5.3. FAS 131 and returns from insiders' purchases

We then examine how FAS 131 influences returns of DMs' and HQEXs' share purchases, respectively. We predict that, if FAS 131 does not expand trading opportunities of DMs, the increase in their purchase amount after adoption of FAS 131 would reduce the trading returns. To test this prediction, we estimate the difference-in-differences model where the dependent

variable is the mean of 6-month stock returns following DMs' purchases (and their cluster/non-cluster purchases) executed in each firm-year. The stock returns are adjusted for characteristics-based benchmarks proposed by Daniel et al. (1997). We also control for year fixed effect and cluster standard errors at the firm level.[8]

[Insert Table 5 here]

Table 5 presents the estimation results. Column (1) shows that the change in DMs' purchase returns after adoption of FAS 131 is lower by 9.4% in treatment conglomerates, but the difference between the two groups is not statistically significant. The relatively lower return in treatment conglomerates under FAS 131 could be associated with the enhanced transparency of segment information disclosures. We further examine this possibility by testing the changes in DMs' cluster purchase returns after adoption of FAS 131. Column (2) shows that DMs' cluster purchases in treatment firms is reduced more (by 24.6%) and the difference between the two groups is marginally significant at the 10% level. In column (3), we also examine the changes in DMs' non-cluster purchase returns and do not find a significant difference between treatment and control firms. Given that headquarters is responsible for corporate disclosures, the significantly lower return of cluster purchases suggests that the improved corporate disclosure under FAS 131 reduces the profitability of DMs' trades that exploit segment information shared with headquarters.

We run several robustness checks. First, we examine the change in returns of DMs' opportunistic purchases, proposed by Cohen et al. (2012) as an informed insider trading

[8] We do not control for firm fixed effects in the trading return regression because DMs' purchases are rarely placed (10.87% of sample observations). Only 8.36% of sample firms have DMs' purchase returns in both pre- and post-FAS131 periods. Further, the dependent variables are DGTW-adjusted returns, which control for empirical determinants of stock returns.

measure, in order to reduce the effect of non-information driven purchases. Column (4) shows that the change in DMs' opportunistic purchase returns is higher by 8% in treatment conglomerates, though the difference between the two groups is statistically insignificant. Second, we examine the change in HQEXs' purchase returns after adoption of FAS 131. Columns (5)–(7) present results indicating that treatment and control groups do not differ significantly in the return change of HQEXs' purchases, cluster purchases, and non-cluster purchases, respectively. Finally, we test whether the internal information asymmetry (IIA) between HQEXs and DMs changes after adoption of FAS 131. Chen et al. (2018) propose DMs' trading returns less HQEXs' trading returns as a measure for IIA. Column (8) shows that the two groups of firms do not differ significantly in the change of IIA after adoption of FAS 131, suggesting that FAS 131 does not alleviate IIA effectively. This result does not contradict the increases in DMs' purchases after FAS 131. Rather, it implies that FAS 131 fails to address the internal information asymmetry and facilitates DMs' informed purchases by promoting HQEXs' report more pessimistically.

5.4. Analyses of reporting quality (FERC)

Our empirical tests, so far, show that FAS 131 provides DMs with trading opportunities to exploit segment information uncaptured by a headquarters. The findings lead to a regulatory concern about the effectiveness of FAS 131 in conglomerates in which headquarters management suffers severe asymmetric information problems against DMs. We test this prediction by estimating the difference-in-differences regression model (3), which compares the changes in FERC after adoption of FAS 131 between treatment and control conglomerates.

[Insert Table 6 here]

Table 6 presents the estimation results. Column (1) shows that, in the full sample, treatment

conglomerates exhibit a larger increase in FERC after adoption of FAS 131 than that of control firms. The difference-in-differences estimate of FERC (the coefficient of Post×Treat× E_{t+1}) is 0.408, which is statistically significant at the 10% level. This result is consistent with the findings of Ettredge et al. (2005). Column (2) presents results indicating that the reporting quality improvement of treatment firms is more pronounced in the subsample in which DMs do not purchase shares after adoption of FAS 131. The difference-in-differences estimate of FERC is 0.61, which is statistically significant at the 5% level. In column (3), on the other hand, the two groups of firms do not differ in reporting quality enhancement in the subsample in which DMs purchase shares after adoption of FAS 131. The estimate is negative and statistically insignificant. We also run the analysis using the firms that have DMs' non-cluster purchases after adoption of FAS 131. Column (4) shows that, in this subsample, the coefficient estimate is still statistically insignificant. Overall, the results provide an important policy implication in that the mandatory accounting standard improves financial reporting quality only if the internal information asymmetry is well addressed, which supports Hypothesis 2.

6. Additional analyses

6.1. Management guidance and subsequent analysts' forecast corrections

Managers provide voluntary disclosures to influence market participants, such as investors, creditors, and analysts (Skinner, 1994; Healy and Palepu, 2001; Graham et al., 2005; Cotter et al., 2006; Beyer et al., 2010; Feng and Koch, 2010). In this section, we examine whether FAS 131 induces HQEX to report earnings more pessimistically to investors, which is our argument in the development of Hypothesis 1. If HQEXs expect to fail beating or meeting analysts' forecasts, they rather provide management guidance in advance and lead analysts to lower their earnings forecasts (downward corrections, hereafter) before earnings announcement. Using this empirical

stylized fact, we test whether, after FAS 131 the treated conglomerates announce more management guidance that leads to analysts' downward corrections than the control firms.

We identify management guidance leading to analysts' downward correction as follows: First, for each management forecast on quarterly earnings, we count the number of analysts' subsequent downward and upward corrections on the same earnings, respectively; We then classify a management guidance as a downward (upward) correcting management guidance if the subsequent analysts' downward corrections are (not) more than upward corrections. Because our empirical tests use firm-year level data, we aggregate the number of downward and upward correcting management guidance at the firm-year level, respectively, and include them as dependent variables in our estimation models.

[Insert Table 7 here]

Table 7 presents the estimation results. In columns (1) and (2), the dependent variable is the number of downward correcting management guidance and upward one, respectively. As predicted, the treated firms increase downward correcting management forecast more than the control firms do after FAS 131. The two groups of firms, however, do not differ in the changes in the number of upward correcting management guidance after FAS 131. In column (3), we use the number of downward correcting management guidance net of the number of upward ones as the dependent variable and confirm the difference between the two groups of firms in the net changes of the number of downward correcting management guidance is statistically significant at 1% level. In column (4), the dependent variable is the number of analysts' downward corrections following management guidance, net of the number of upward corrections following management guidance. The treated firms experience more downward corrections, net of upward corrections, than the control firms do after FAS 131. Overall, our findings suggest that after

FAS 131, HQEX are induced to report earnings more pessimistically and, thus, strive to protect their career by providing management guidance that lowers analysts' forecasts before earnings announcements.

6.2. The timing of trades around corporate disclosure dates

We next examine the timing of DMs' purchases around financial reporting dates. Insiders often strategically choose disclosure policies and the timing of trades jointly to utilize their inside trading, which makes it difficult to test the impact of increased disclosure on DMs' trading activities. Huddart and Ke (2007) find that informed insider trading tends to occur between earnings announcement dates and 10-K filing release dates because insiders can use foreknowledge of financial reporting while avoiding litigation risks. This period could also be the optimal trading timing for DMs if HQEXs disclose imprecise segment information during the earning announcement which thus leads to mispricing in the stock market. We thus test whether DMs' purchases increase in this period after adoption of FAS 131. As falsification tests, we also examine DMs' trades after 10-K filings and HQEXs' trades in both periods.[9]

[Insert Table 8 here]

Table 8 presents the estimation results. In panel A, we estimate the difference-in-differences model reported in Table 3 except that the dependent variables are constructed based on DMs' purchases between the earnings announcement and the 10-K filing dates. Column (1) shows that treatment firms exhibit a larger increase in the probability of DMs' purchases after adoption of

[9] For brevity, we report only the estimation results for the dummies of DMs' purchases over the three months after 10K filings and those of HQEXs' purchases between earnings announcement and 10K filing dates in text (panel B of Table 8) and report the full sets of estimation results (including those for the dollar amount of each group's purchases) in Tables A1–A3. Specifically, we present the estimation results for DMs' purchases over the three months after 10K filings in Table A1, those for HQEXs' purchases between earnings announcements and 10K filings in Table A2, and those for HQEXs' purchases over three months after 10K filings in Table A3.

FAS 131 than that of control firms during this period. The difference between the two groups' probability changes, 2.2%, is statistically significant at the 5% level. Columns (2) and (3) show that this difference is pronounced only in DMs' non-cluster purchases. Specifically, the difference-in-differences coefficient estimates of DMs' cluster and non-cluster purchases are 0.5% and 1.9%, respectively, and only the latter is statistically significant at the 5% level. Columns (4)–(6) report results indicating that treatment firms also exhibit a larger increase in the dollar amount of DMs' purchases and, in particular, their non-cluster purchases during this period after adoption of FAS 131 than that of control firms.

In Panel B, columns (1)–(3), we also test whether FAS 131 increases probabilities of DMs' share purchases, cluster purchases, and non-cluster purchases after the 10-K filing dates, respectively. Treatment and control firms do not differ in DMs' purchases, both cluster and non-cluster purchases, during this period after adoption of FAS 131. These results, together with the findings in Panel A, may be interpreted as evidence about an alternative source of DMs' informed trading, namely, the foreknowledge about segments contained in 10-K filings. If this alternative explanation is correct, HQEXs' purchases before 10-K filings should increase under FAS 131 because 10-K filings include the segment information that headquarters uses for operational and management decision making. To test this prediction, we examine whether treatment firms exhibit larger increases in HQEXs' purchases placed before 10-K filing dates than those of control firms. Columns (4)–(6) show that, after adoption of FAS 131, the two groups of firms do not differ significantly in the probability changes of their HQEXs' purchases, cluster purchases, and non-cluster purchases placed between earnings announcement and 10-K filing dates. Overall, our findings suggest that, after adoption of FAS 131, DMs are more likely to purchase shares between earnings announcement and 10-K filing dates, to exploit the private

information undisclosed or misreported in the earnings announcement and the upcoming 10-K segment filing.

6.3. The effect of business concentration

We now study the effect of business concentration within conglomerates. We predict that FAS 131 is less influential in the treated firms in which businesses are more concentrated in a segment. To illustrate the intuition, consider two conglomerates which have the same business types of segments but differ in their internal capital allocation. Specifically, the first firm allocates 99% of capital to one segment while the other firm distributes evenly to all segments. If both firms report combined segment information before adoption of FAS 131, investors would find that FAS 131 improved the reporting quality of the second firm more substantially than for the first because the first firm's combined report already discloses its dominant segment's information quite closely (i.e., the small segment's information is not material). Further, in the first firm, HQEXs will give more attention to the dominant segment and reduce the potential information asymmetry against its DM. Even though the small segment's DM has private information, the associated stock mispricing would be small in proportion to the segment's relative size within a firm. From these insights, we examine whether DMs' share purchases increase more after adoption of FAS 131 as its capital allocation is more dispersed across segments.

In each firm year, we measure the concentration of resource allocations across segments by the Herfindahl-Hirschman Index (HHI) of segments' net sales: for firm *i* and year *t*,

$$HHI_{i,t} = \sum_{k=1}^{K} s_{k,\{i,t\}}^2, \tag{4}$$

where $s_{k,\{i,t\}} = \frac{\text{Net sales of segment k of the firm year}}{\text{Total net sales of all segments of the firm year}}$ and K is the total number of reported segments of the firm year.

A higher HHI implies greater business concentration among segments. The treated firms, which report more business segments after adoption of FAS 131, are more likely to exhibit decreases in HHI after adoption of FAS 131 than control firms (77% vs. 32%). As discussed above, FAS 131 may not be influential in the treated firms in which HHI rises after its adoption because the increase in HHI implies that the business becomes more focused to an extent that more than offsets the effect of the increased number of reported segments. We thus test whether the DMs' purchases increase more in the treated firms in which HHI decreases after the adoption of FAS 131. HHI in the pre-adoption of FAS 131 (post-adoption of FAS 131) period is calculated in 1997 (as an average of 1999 and 2000), to be consistent with the definition of treated firms.

[Insert Table 9 here]

Table 9, Panel A (Panel B), presents the estimation results of the subsample firms in which HHI decreases (does not decrease) after the adoption of FAS 131. In each panel, we estimate the difference-in-differences models presented in Table 3. Panel A, column (1), shows that DMs of treated firms become more likely to purchase shares after the adoption of FAS 131 than those of control firms. All else being equal, the difference in probability of DMs' purchases between the two groups increases by 6.7%, which is significant at the 5% level. Columns (2) and (3) present results indicating that this difference in changes is almost entirely driven by DMs' non-cluster purchases. Likewise, columns (4)–(6) show that the dollar amounts of DMs' purchases of treated firms and, in particular, non-cluster purchases, increase more than those of control firms in this subsample.

The results in Panel B show that the two groups do not exhibit a significant difference in the changes of DMs' purchases in the subsample in which HHI does not decrease after the adoption of FAS 131. The magnitude of coefficient estimates of *FAS131* × *Treat* is also much smaller than those in Panel A above. Overall, our results confirm that FAS 131 is less effective and, thus, leads to lesser increases in DMs' purchases in the conglomerates in which the businesses are more focused.

6.4. The role of institutional investors

Finally, we examine the management disciplinary role of institutional investors in the circumstance in which firms may suffer internal information asymmetry. Previous studies show that institutional investors have strong incentives and capacity to monitor managerial performance (e.g., Shleifer and Vishny 1986, Chung et al. 2002, Hartzell and Starks 2003, Desai and Dharmapala 2009, Kang et al. 2018). Institutional investors can put pressure on management and board of directors to enhance the internal corporate governance structure including the information sharing between headquarters and divisions. Further, institutional investors can reduce informed trading opportunities of insiders by obtaining firm information quickly and trading shares efficiently.

[Insert Table 10 here]

Panel A of Table 10 presents results in relation to how the effect of FAS 131 on DMs' informed trading is associated with institutional ownership of a firm. Using subsamples sorted by institutional ownership, we estimate the difference-in-differences model in which the dependent variable is an indicator of DMs' non-cluster purchases (i.e., 1 if the firm year has

DMs' non-cluster purchases and 0, otherwise).[10] The explanatory variables are the same as those in Table 3. Column (1) shows that, in the subsample of firm-years in which the total institutional investors hold less than 50% of total outstanding shares, treatment conglomerates exhibit significantly larger increases in DM's non-cluster purchases after adoption of FAS 131 than those of control firms. The difference-in-difference coefficient estimate is 7.2% which is statistically significant at the 1% level. Column (2) shows that, in the other subsample in which institutional investors hold more than or equal to 50% of total outstanding shares, the two groups do not significantly differ in the changes of DMs' non-cluster purchases after adoption of FAS 131. In columns (3) and (4), we define each subsample as the firm-years in which institutional ownership is below and above (or equal to) the sample median, respectively. The significantly larger increase in DMs' non-cluster purchases of treatment conglomerates is only observed in the subsample in which institutional ownership is below the sample median. For comparison, we also test whether the effect of FAS 131 on HQEXs' purchases varies with institutional ownership and do not find supportive evidence.[11] Overall, our findings show that institutional investors restrain the DMs' informed trading after adoption of FAS 131.

Panel B of Table 10 reports how the segment reporting improvement under FAS 131 is influenced by institutional ownership. We estimate the difference-in-differences model of FERC using subsamples sorted by institutional ownership and DMs' non-cluster purchases. The results in column (1) show that, in the subsample in which institutional ownership is less than 50%, treatment and control firms do not differ in the changes in FERC after adoption of FAS 131. The difference-in-differences estimate is 0.119, which is statistically insignificant. Treatment

[10] Institutional ownership is defined as the proportion of outstanding shares held by institutional investors at the end of the fiscal year.
[11] For brevity, we report the estimation results in Table A4.

firms, however, exhibit substantial reporting quality improvement relative to control firms in the other subsample in which institutional investors hold more than or equal to 50% of outstanding shares. In column (2), the difference-in-differences coefficient estimate is 1.746, which is statistically significant at the 10% level. Columns (3) and (4) present the estimation results for the subsample in which institutional ownership is below and above the sample median, respectively. The difference-in-differences coefficient estimates of FERC are larger in the above-median subsample though both estimates are not statistically significant. The weaker result suggests that institutional investors are able or incentivized to address the internal information asymmetry and put pressure on management to implement mandatory accounting standards effectively only if they have sufficiently large ownership.

7. Conclusion

In this paper, we examine how insider trading is influenced by mandatory financial reporting in the presence of information asymmetry between HQEXs and DMs. Financial reporting prepared by HQEXs may fail to disclose the divisional information that DMs do not share with HQEXs. The stock market mispricing that occurs in response to the low quality reporting about divisions could provide DMs with informed trading opportunities. Using a difference-in-differences estimation method, we test whether DMs have more trading opportunities to exploit divisional information uncaptured by HQEXs after the adoption of FAS 131, which enhances the mandatory segment reporting of conglomerates.

Our key findings are summarized as follows: First, under FAS 131, treatment firms exhibit larger an increase in DMs' purchases (i.e., informed trades), but not in their sales, than that of control firms. Next, the two groups of firms do not differ in the changes of HQEXs' purchases, suggesting that DMs' increased purchases are driven by information uncaptured by HQEXs.

Third, DMs' increased purchases are negatively associated with the reporting quality improvement under FAS 131 and, furthermore, they are placed optimally before 10-K filings dates. Fourth, FAS 131 is less associated with DMs' purchases for the conglomerates in which the businesses are more focused. Finally, institutional investors alleviate internal information asymmetry and, thus, reduce informed trading opportunities of DMs.

The results provide several policy implications. First, our analysis sheds light on a new economic channel through which IIA impairs the investor protection function of mandatory financial reporting. Previous studies (e.g., Chen et al. 2018) show that IIA lowers financial reporting quality. We find conversely that, under IIA, mandatory reporting expands informed trading opportunities of some insiders. Next, our findings show that, to achieve their regulatory goals, mandatory accounting standards must be accompanied with proper information sharing among corporate insiders. While FAS 131 improves the segment reporting quality on average, it fails to do so in conglomerates in which the segment information is not fully captured by the headquarters. Extending Section 302 of the Sarbanes-Oxley Act of 2002, the Securities and Exchange Commission (SEC) may need to establish and maintain adequate internal controls for public disclosure of segment reporting to minimize the trading opportunities of DMs.[12] Finally, we show that institutional investors can complement mandatory financial reporting by mitigating the internal information asymmetry and insiders' informed trading opportunities. We suggest that future research could explore further the role of organizational structures or other governance mechanisms in addressing the internal information asymmetry for conglomerates.

[12] The main purpose behind Section 302 of the Sarbanes-Oxley Act of 2002 is to ensure that CEOs and CFOs take a proactive role in their firms' public disclosure and to give investors more confidence in the accuracy, quality and reliability of SEC periodic reports of their firms.

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Appendix: Definition of variables

Variables	Definition
Log Size	The natural log of market capital
Book-to-Market	Book to Market ratio
Log Num Analysts	Ln(1+number of analysts following)
Institutional Ownership	Percentage of market capitalization held by institutional investors
DIFRET	the difference between the insider purchase profitability of managers of the specific division and the average insider purchase profitability of headquarters managers.
E_{t-1}	prior period EPS (last year) scaled by the share price at the beginning of the current year
E_t	current period EPS (this year) scaled by the share price at the beginning of the current year
E_{t+1}	realized next period EPS (next year) scaled by the share price at the beginning of the current year
Cluster purchases	Share purchases that multiple insiders within a firm place on the same date or consecutive trading dates
Treat	A dummy variable for the treatment group, which indicates whether reported business segments increase after FAS 131
Post	A dummy variable for Post-131 period, from the fiscal year-ends of December 1998
No. of DMs' Trades	Total number of divisional managers' trades for the firm and year
No. of DMs' Purchases	Total number of divisional managers' purchases for the firm and year
DMs' Purchase Dummy	A dummy variable set to one if divisional managers' insider purchases exist for the firm and year, zero otherwise
DMs' Cluster Purchase Dummy	A dummy variable set to one if divisional managers' insider cluster purchases exist for the firm and year, zero otherwise
DMs' Non-cluster Purchase Dummy	A dummy variable set to one if divisional managers' insider non-cluster purchases exist for the firm and year, zero otherwise
No. of HQEXs' Trades	Total number of headquarters executives' trades for the firm and year
No. of HQEXs' Purchases	Total number of headquarters executives' purchases for the firm and year
HQEXs' Purchase Dummy	A dummy variable set to one if headquarters executives' insider purchases exist for the firm and year, zero otherwise
HQEXs' Cluster Purchase Dummy	A dummy variable set to one if headquarters executives' insider cluster purchases exist for the firm and year, zero otherwise
HQEXs' Non-cluster Purchase Dummy	A dummy variable set to one if headquarters executives' insider non-cluster purchases exist for the firm and year, zero otherwise

Table 1: Sample Selection

Sample Selection Criteria	Number of Firms	Number of Firm-Years
Listed firms available from Compustat (1996-2001)	16,711	73,825
Return data available from CRSP	11,847	48,866
Segment data available	10,077	41,117
Sales and assets of segment data are matched with those of 10K filings	8,872	29,034
December fiscal year end	5,939	18,624
Insider trading data available	5,139	16,374
Insider trading in the previous three years	4,963	15,423
No acquisitions during any year of the sample period	3,427	12,637
Non-Financial/Utility firms with all control variables (Final sample)	2,362	8,922

The table shows the sample selection process. The numbers in each row represent the number of firms and the number of firm-year observations after the corresponding selection criteria are applied.

Table 2: Descriptive Statistics in the Pre- and Post-Adoption of FAS 131 Periods

Panel A. Descriptive statistics				
	Pre-Adoption of FAS 131 Period		Post-Adoption of FAS 131 Period	
	Treated Firms	Control Firms	Treated Firms	Control Firms
	Mean	Mean	Mean	Mean
Log Size	5.289	5.059	5.190	5.232
Book-to-Market	0.597	0.518	0.866	0.741
Log Num Analysts	1.330	1.268	1.283	1.354
Institutional Ownership	0.351	0.341	0.349	0.375
No. of DMs' Trades	1.097	1.013	1.309	1.197
No. of DMs' Purchases	0.221	0.237	0.288	0.200
DMs' Purchase Dummy	0.109	0.115	0.127	0.098
DMs' Cluster Purchase Dummy	0.043	0.039	0.044	0.040
DMs' Non-cluster Purchase Dummy	0.081	0.092	0.102	0.071
No. of HQEXs' Trades	3.408	3.655	3.662	4.836
No. of HQEXs' Purchases	1.288	1.379	1.155	1.522
HQEXs' Purchase Dummy	0.386	0.398	0.357	0.375
HQEXs' Cluster Purchase Dummy	0.153	0.165	0.141	0.161
HQEXs' Non-cluster Purchase Dummy	0.324	0.329	0.296	0.310
No. of Observations	916	3461	927	3618

Panel B. Segment Classified Status			
	Post-131		
Pre-131	No Change	Increase	Decrease
Single-segment	1,598	306	0
Multi-segment	251	132	75
2 Segments	78	78	42
3 Segments	85	40	13
4 Segments	45	10	10
5 or more	43	4	10

The table presents the descriptive statistics and segment classified status of sample firms. "Treated firms" refers the firms whose number of segments has increased after adoption of FAS 131, and "Control firms" refers the firms whose number of segments has been equal or decreased since adoption of FAS 131. Panel A shows the annual mean and mean differences of firm characteristics and firm insider trading between "Treated firms" and "Control firms". All variables are defined at firm-year level. The detail of the variables is reported in the appendix. Panel B presents a shift in segment reporting in accordance with FAS 131 for different groups of firms sorted by number of segments. The table shows the number of firms corresponding to the classification.

Table 3: Pattern of Divisional Managers' Share Trade
Panel A: Divisional Managers' Share Purchases

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	DMs' Purchases Dummy	DMs' Cluster Purchases Dummy	DMs' Non-cluster Purchases Dummy	DMs' Purchases Total Amount	DMs' Cluster Purchases Total Amount	DMs' Non-cluster Purchases Total Amount
Post × Treat	0.042**	0.003	0.049**	0.379*	0.013	0.439**
	(1.99)	(0.25)	(2.53)	(1.80)	(0.10)	(2.27)
Log Size	0.014	0.003	0.012	0.143*	0.027	0.126*
	(1.63)	(0.52)	(1.53)	(1.75)	(0.53)	(1.67)
Book-to-Market	0.006	0.000	0.007	0.032	-0.005	0.049
	(0.62)	(0.06)	(0.75)	(0.35)	(-0.10)	(0.55)
Log Num Analysts	0.006	0.012	-0.002	0.014	0.096	-0.050
	(0.42)	(1.25)	(-0.13)	(0.10)	(1.11)	(-0.38)
Institutional Ownership	-0.078**	-0.021	-0.072**	-0.726**	-0.192	-0.681**
	(-2.19)	(-0.96)	(-2.24)	(-2.07)	(-0.93)	(-2.14)
Constant	0.076*	0.014	0.068*	0.777*	0.154	0.680*
	(1.78)	(0.51)	(1.75)	(1.88)	(0.62)	(1.79)
Num. Obs.	8922	8922	8922	8922	8922	8922
Adj. R^2	0.132	0.101	0.101	0.122	0.098	0.088
Fixed effects	Firm & Year	Firm & Year	Firm & Year	Firm & Year	Firm & Year	Firm & Year

The table presents results for difference-in-difference regressions to examine the impact of FAS 131 on the pattern of divisional managers' share purchases. Our total sample period is 6 years, the pre-adoption of FAS 131 period spans the fiscal year-ends of December 1995 through November 1998, and post-adoption of FAS 131 period spans the fiscal year-ends of December 1998 through November 2001. The pre-adoption of FAS 131 period for insider trading is April 1996 through March 1999 and post-adoption of FAS 131 period is April 1999 through March 2002. We do not include the firms that merge with other companies and whose fiscal year end is not December. The dependent variables are a dummy for divisional managers' insider purchases (column 1), a dummy for divisional managers' insider cluster purchases (column 2), a dummy for divisional managers' insider non-cluster purchases (column 3), total value of divisional managers' insider purchases (column 4), total value of divisional managers' insider cluster purchases (column 5), and total value of divisional managers' insider non-cluster purchases (column 6). We aggregate trading at the firm and annual level. Cluster insider purchases are defined as purchases placed by multiple insiders on the same day or consecutive trading days. Treat is a dummy variable for the treatment group, which indicates whether reported business segments increase after adoption of FAS 131. Post is a dummy variable for Post-adoption of FAS 131 period. See Appendix for variable definitions. Firm- and year-fixed effects are included, and standard errors are clustered at the firm level. The t-statistics are shown in parentheses. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

Panel B: Divisional Managers' Share Sales

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	DMs' Sales Dummy	DMs' Cluster Sales Dummy	DMs' Non-cluster Sales Dummy	DMs' Sales Total Amount	DMs' Cluster Sales Total Amount	DMs' Non-cluster Sales Total Amount
Post × Treat	0.027	0.004	0.024	0.257	0.013	0.241
	(1.12)	(0.23)	(0.99)	(0.88)	(0.05)	(0.87)
Log Size	0.028	0.012	0.028	0.400	0.171	0.386
	(1.50)	(0.82)	(1.66)	(1.56)	(0.87)	(1.70)
Book-to-Market	-0.018**	-0.013	-0.011*	-0.182*	-0.158	-0.095
	(-2.64)	(-1.75)	(-2.07)	(-2.15)	(-1.74)	(-1.56)
Log Num Analysts	-0.021	-0.019	-0.017	-0.327*	-0.255*	-0.253
	(-1.65)	(-1.81)	(-1.03)	(-2.10)	(-2.04)	(-1.09)
Institutional Ownership	0.252***	0.264***	0.206***	3.789***	3.592***	2.911***
	(5.22)	(4.42)	(4.56)	(5.68)	(4.76)	(5.06)
Constant	0.104	0.022	0.059	0.881	0.125	0.401
	(0.91)	(0.21)	(0.63)	(0.56)	(0.09)	(0.33)
Num. Obs.	8922	8922	8922	8922	8922	8922
Adj. R^2	0.255	0.197	0.219	0.279	0.211	0.236
Fixed effects	Firm & Year	Firm & Year	Firm & Year	Firm & Year	Firm & Year	Firm & Year

The table presents results for difference-in-difference regressions to examine the impact of FAS 131 on the pattern of divisional managers' insider sales. Our total sample period is 6 years, the pre-adoption of FAS 131 period spans the fiscal year-ends of December 1995 through November 1998, and post-adoption of FAS 131 period spans the fiscal year-ends of December 1998 through November 2001. The pre-adoption of FAS 131 period for insider trading is April 1996 through March 1999 and post-adoption of FAS 131 period is April 1999 through March 2002. We do not include the firms that merge with other companies and whose fiscal year end is not December. The dependent variables are a dummy for divisional managers' insider sales (column 1), a dummy for divisional managers' insider cluster sales (column 2), a dummy for divisional managers' insider non-cluster sales (column 3), total value of divisional managers' insider sales (column 4), total value of divisional managers' insider cluster sales (column 5), and total value of divisional managers' insider non-cluster sales (column 6). We aggregate trading at the firm and annual level. Cluster insider sales are defined as sales placed by multiple insiders on the same day or consecutive trading days. Treat is a dummy variable for the treatment group, which indicates whether reported business segments increase after adoption of FAS 131. Post is a dummy variable for Post-adoption of FAS 131 period. Other control variables are available in Appendix. Firm- and year-fixed effects are included, and standard errors are clustered at the firm level. The t-statistics are shown in parentheses. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

Panel C: Parallel Trend in Divisional Managers' Share Purchases

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	DMs' Purchases Dummy	DMs' Cluster Purchases Dummy	DMs' Non-cluster Purchases Dummy	DMs' Purchases Total Amount	DMs' Cluster Purchases Total Amount	DMs' Non-cluster Purchases Total Amount
Post × Treat	-0.018	0.001	-0.028	-0.160	0.014	-0.265
	(-0.71)	(0.08)	(-1.19)	(-0.63)	(0.11)	(-1.11)
Log Size	-0.019	-0.010	-0.012	-0.136	-0.075	-0.091
	(-1.49)	(-1.40)	(-1.06)	(-1.12)	(-1.10)	(-0.82)
Book-to-Market	0.013	0.010	0.003	0.127	0.089	0.031
	(0.69)	(0.78)	(0.18)	(0.67)	(0.77)	(0.18)
Log Num Analysts	0.024	0.011	0.020	0.222	0.071	0.198
	(1.39)	(1.04)	(1.25)	(1.28)	(0.67)	(1.31)
Institutional Ownership	-0.009	0.011	-0.003	-0.051	0.135	-0.037
	(-0.22)	(0.46)	(-0.07)	(-0.13)	(0.57)	(-0.10)
Constant	0.171***	0.055	0.129**	1.436**	0.450	1.092*
	(2.67)	(1.50)	(2.18)	(2.32)	(1.34)	(1.93)
Num. Obs.	6442	6442	6442	6442	6442	6442
Adj. R^2	0.120	0.092	0.109	0.116	0.083	0.106
Fixed effects	Firm & Year	Firm & Year	Firm & Year	Firm & Year	Firm & Year	Firm & Year

The table presents results for difference-in-difference regressions to examine the parallel trend of treated and control groups in their divisional managers' share purchases before FAS 131. Our total sample period is 6 years, the false pre-adoption period spans from fiscal year 1993 to 1995 while the false post-period spans from fiscal year 1996 to 1998. The sample excludes the firms that merge with other companies and the firms whose fiscal year end is not December. The dependent variables are a dummy for divisional managers' insider purchases (column 1), a dummy for divisional managers' insider cluster purchases (column 2), a dummy for divisional managers' insider non-cluster purchases (column 3), total value of divisional managers' insider purchases (column 4), total value of divisional managers' insider cluster purchases (column 5), and total value of divisional managers' insider non-cluster purchases (column 6). We aggregate trading at the firm and fiscal year level. Cluster insider purchases are defined as purchases placed by multiple insiders on the same day or consecutive trading days. Treat is a dummy variable for the treatment group, which indicates whether reported business segments increase after adoption of FAS 131. Post is a dummy variable for the false post-adoption period. See Appendix for variable definitions. Firm- and year-fixed effects are included, and standard errors are clustered at the firm level. The t-statistics are shown in parentheses. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

Table 4: Pattern of Headquarters Executives' Share Purchases

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	HQEXs' Purchases Dummy	HQEXs' Cluster Purchases Dummy	HQEXs' Non-cluster Purchases Dummy	HQEXs' Purchases Total Amount	HQEXs' Cluster Purchases Total Amount	HQEXs' Non-cluster Purchases Total Amount
Post × Treat	0.011	-0.002	0.003	0.109	-0.046	0.048
	(0.36)	(-0.10)	(0.09)	(0.31)	(-0.18)	(0.14)
Log Size	0.001	0.008	-0.004	0.131	0.119	0.073
	(0.05)	(0.75)	(-0.31)	(0.92)	(1.14)	(0.53)
Book-to-Market	0.006	-0.000	0.005	0.106	0.008	0.099
	(0.46)	(-0.02)	(0.35)	(0.70)	(0.07)	(0.67)
Log Num Analysts	0.034	0.031*	0.021	0.342	0.324*	0.183
	(1.63)	(1.82)	(1.07)	(1.46)	(1.78)	(0.82)
Institutional Ownership	-0.160***	-0.109**	-0.118**	-1.789**	-1.083**	-1.319**
	(-2.60)	(-2.47)	(-2.13)	(-2.57)	(-2.33)	(-2.09)
Constant	0.347***	0.092*	0.316***	3.173***	0.726	2.865***
	(5.53)	(1.89)	(5.17)	(4.57)	(1.45)	(4.27)
Num. Obs.	8922	8922	8922	8922	8922	8922
Adj. R^2	0.219	0.166	0.193	0.212	0.164	0.186
Fixed effects	Firm & Year	Firm & Year	Firm & Year	Firm & Year	Firm & Year	Firm & Year

The table presents placebo test results for difference-in-difference regressions to examine the impact of FAS 131 on the pattern of headquarters executives' insider purchases. Our total sample period is 6 years, the pre-adoption of FAS 131 period spans the fiscal year-ends of December 1995 through November 1998, and post-adoption of FAS 131 period spans the fiscal year-ends of December 1998 through November 2001. The pre-adoption of FAS 131 period for insider trading is April 1996 through March 1999 and post-adoption of FAS 131 period is April 1999 through March 2002. We do not include the firms that merge with other companies and whose fiscal year end is not December. The dependent variables are a dummy for headquarters executives' insider purchases (column 1), a dummy for headquarters executives' insider cluster purchases (column 2), a dummy for headquarters executives' insider non-cluster purchases (column 3), total value of headquarters executives' insider purchases (column 4), total value of headquarters executives' insider cluster purchases (column 5), and total value of headquarters executives' insider non-cluster purchases (column 6). We aggregate trading at the firm and annual level. Cluster insider purchases are defined as purchases placed by multiple insiders on the same day or consecutive trading days. Treat is a dummy variable for the treatment group, which indicates whether reported business segments increase after adoption of FAS 131. Post is a dummy variable for Post-adoption of FAS 131 period. See Appendix for variable definitions. Firm- and year-fixed effects are included, and standard errors are clustered at the firm level. The t-statistics are shown in parentheses. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

Table 5: Profit of Divisional Managers' and Headquarters Executives' Share Purchases

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent Variable	Return of DMs' Purchases	Return of DMs' Cluster Purchases	Return of DMs' Non-cluster Purchases	Return of DMs' Opportunistic Purchases	Return of HQEXs' Purchases	Return of HQEXs' Cluster Purchases	Return of HQEXs' Non-cluster Purchases	DIFRET
Treat	0.028	0.083	0.003	-0.073	-0.002	-0.084*	0.036	0.099
	(0.45)	(0.76)	(0.04)	(-0.62)	(-0.07)	(-1.94)	(1.11)	(1.04)
Post × Treat	-0.094	-0.246*	-0.050	0.088	-0.010	0.033	-0.043	0.044
	(-1.08)	(-1.69)	(-0.48)	(0.58)	(-0.20)	(0.37)	(-0.80)	(0.43)
Constant	0.086***	0.102***	0.076**	0.095**	0.089***	0.128***	0.066***	-0.072**
	(3.34)	(2.76)	(2.42)	(2.54)	(6.23)	(5.36)	(4.48)	(-1.99)
Num. Obs.	857	327	642	247	3054	1310	2482	545
Adj. R^2	0.005	0.019	0.001	0.000	0.007	0.007	0.008	0.009
Fixed effects	Year	Year	Year	Year	Year	Year	Year	Period

The table presents results for difference-in-difference regressions to examine the impact of FAS 131 on the profit of divisional managers' and headquarters executives' insider purchases. Our total sample period is 6 years, the pre-adoption of FAS 131 period spans the fiscal year-ends of December 1995 through November 1998, and post-adoption of FAS 131 period spans the fiscal year-ends of December 1998 through November 2001. The pre-adoption of FAS 131 period for insider trading is April 1996 through March 1999 and post-adoption of FAS 131 period is April 1999 through March 2002. We do not include the firms that merge with other companies and whose fiscal year end is not December. We measure insider purchase performance by DGTW-adjusted returns (Daniel et al. 1997) over 6 months from the trading day and then compute the annual average of adjusted returns of each type of insider purchases. Specifically, the dependent variables are annual mean return of divisional managers' insider purchases (column 1), mean return of divisional managers' insider cluster purchases (column 2), mean return of divisional managers' insider non-cluster purchases (column 3), mean return of divisional managers' insider opportunistic purchases (column 4), mean return of headquarters executives' insider purchases (column 5), mean return of headquarters executives' insider cluster purchases (column 6), mean return of headquarters executives' insider non-cluster purchases (column 7), and the difference between the insider purchase profitability of divisional managers and headquarters managers (column 8). We average the trading profits at the firm and annual level. For column 8, we average the trading profits at the firm and pre-and post-adoption of FAS 131 period level. Cluster insider purchases are defined as purchases placed by multiple insiders on the same day or consecutive trading days. Opportunistic insider trading is defined following Cohen et al. (2012). Treat is a dummy variable for the treatment group, which indicates whether reported business segments increase after adoption of FAS 131. Post is a dummy variable for Post-adoption of FAS 131 period. Year-fixed effect is included, and standard errors are clustered at the firm level. The t-statistics are shown in parentheses. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

Table 6: Forward Earnings Response Coefficient (FERC)

	(1)	(2)	(3)	(4)
Sample	Full	Firms without DMs' Purchases after adoption of FAS 131	Firms with DMs' Purchases after adoption of FAS 131	Firms with DMs' Non-cluster Purchases after adoption of FAS 131
E_{t-1}	-0.150	-0.146	-0.331	-0.400
	(-1.60)	(-1.45)	(-1.11)	(-1.24)
E_t	0.054	0.234**	0.040	-0.001
	(0.79)	(2.01)	(0.60)	(-0.02)
E_{t+1}	0.941***	1.121***	0.321	0.541**
	(6.30)	(6.24)	(1.47)	(2.20)
R_{t+1}	-0.006	-0.002	-0.042	-0.042
	(-0.42)	(-0.10)	(-1.14)	(-1.00)
Post	0.239***	0.252***	0.176**	0.130
	(5.71)	(5.31)	(2.30)	(1.56)
Post×E_{t-1}	-0.675***	-0.635***	-1.210***	-1.083***
	(-5.80)	(-5.04)	(-3.51)	(-2.77)
Post×E_t	-0.288**	-0.513***	1.086***	1.038**
	(-2.45)	(-3.31)	(3.30)	(2.42)
Post×E_{t+1}	-0.384**	-0.579***	0.165	-0.305
	(-2.14)	(-2.72)	(0.54)	(-0.82)
Post×R_{t+1}	-0.591***	-0.623***	-0.379***	-0.417***
	(-13.87)	(-12.59)	(-5.07)	(-4.51)
Post×Treat	-0.109	-0.152	0.129	0.213
	(-1.31)	(-1.58)	(0.93)	(1.42)
Post×Treat×E_{t-1}	0.200	0.124	0.964	0.825
	(1.07)	(0.61)	(1.60)	(1.31)
Post×Treat×E_t	-0.060	0.201	-2.355**	-2.262**
	(-0.22)	(0.66)	(-2.47)	(-2.24)
Post×Treat×E_{t+1}	0.408*	0.610**	-0.287	0.258
	(1.74)	(2.29)	(-0.29)	(0.25)
Post×Treat×R_{t+1}	0.019	-0.023	-0.153	-0.164
	(0.20)	(-0.20)	(-1.03)	(-1.00)
Treat	-0.024	-0.016	-0.077	-0.055
	(-0.41)	(-0.23)	(-0.77)	(-0.51)
Treat ×E_{t-1}	0.146	0.143	0.294	0.370
	(1.56)	(1.42)	(0.69)	(0.83)
Treat ×E_t	0.292	0.076	0.617	0.575
	(1.15)	(0.26)	(0.81)	(0.75)
Treat ×E_{t+1}	-0.966***	-1.153***	1.169	0.822
	(-4.55)	(-4.80)	(1.32)	(0.90)
Treat ×R_{t+1}	-0.011	-0.009	-0.020	-0.024
	(-0.30)	(-0.21)	(-0.27)	(-0.31)
Constant	0.227***	0.230***	0.199***	0.180***
	(7.63)	(6.82)	(3.54)	(2.95)
Num. Obs.	6241	5218	1023	850
Adj. R^2	0.082	0.081	0.139	0.125

The table presents results for difference-in-difference regressions to examine the impact of FAS 131 on stock price informativeness. Following Ettredge et al. (2005), we measure stock price informativeness about the firms' earnings by the following regression:

$$R_t = a + b_0 E_{t-1} + b_1 E_t + b_2 E_{t+1} + b_3 R_{t+1} + \varepsilon_t,$$

where $E_{t-1}$is prior period EPS scaled by price, E_t is current period EPS scaled by price, $E_{t+1}$is realized next period EPS scaled by price. b_2 is the forward earnings response coefficient (FERC), which proxies for informativeness. Our total sample period is 6 years, the pre-adoption of FAS 131 period spans the fiscal year-ends of December 1995 through November 1998, and post-adoption of FAS 131 period spans the fiscal year-ends of December 1998 through November 2001. The pre-adoption of FAS 131 period for insider trading is April 1996 through March 1999 and post-adoption of FAS 131 period is April 1999 through March 2002. We do not include the firms that merge with other companies and whose fiscal year end is not December. The samples for each model are a full sample (column 1), the firms without divisional managers' purchases after adoption of FAS 131 (column 2), the firms with divisional managers' purchases after adoption of FAS 131 (column 3), and the firms with divisional managers' non-cluster purchases after adoption of FAS 131 (column 4). Cluster insider purchases are defined as purchases placed by multiple insiders on the same day or consecutive trading days. Treat is a dummy variable for the treatment group, which indicates whether reported business segments increase after adoption of FAS 131. Post is a dummy variable for Post-adoption of FAS 131 period. See Appendix for variable definitions. The t-statistics are shown in parentheses. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

Table 8: 10K Filings and Insider Purchases

Panel A. Divisional managers' purchases between earnings announcements and 10K Filings

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	DMs' Purchases Dummy	DMs' Cluster Purchases Dummy	DMs' Non-cluster Purchases Dummy	DMs' Purchases Total Amount	DMs' Cluster Purchases Total Amount	DMs' Non-cluster Purchases Total Amount
Post×Treat	0.022**	0.005	0.019**	0.214**	0.039	0.188**
	(2.40)	(0.97)	(2.37)	(2.32)	(0.81)	(2.30)
Log Size	0.009**	0.002	0.007**	0.078**	0.017	0.060*
	(2.31)	(0.73)	(2.24)	(2.05)	(0.69)	(1.96)
Book-to-Market	0.003	-0.002	0.005	0.025	-0.017	0.039
	(0.72)	(-0.82)	(1.16)	(0.60)	(-0.86)	(1.04)
Log Num Analysts	-0.007	0.003	-0.011*	-0.077	0.020	-0.104*
	(-1.01)	(0.75)	(-1.84)	(-1.20)	(0.63)	(-1.85)
Institutional Ownership	0.005	0.003	0.008	0.087	0.031	0.110
	(0.26)	(0.33)	(0.57)	(0.51)	(0.34)	(0.76)
Constant	-0.018	-0.009	-0.008	-0.132	-0.071	-0.048
	(-0.99)	(-0.67)	(-0.56)	(-0.75)	(-0.58)	(-0.34)
Num. Obs.	8922	8922	8922	8922	8922	8922
Adj. R^2	0.027	0.039	0.002	0.019	0.031	-0.003
Fixed effects	Firm & Year	Firm & Year	Firm & Year	Firm & Year	Firm & Year	Firm & Year

Panel B. Divisional managers' purchases after 10K filings and headquarters executives' purchases after 10K filings

	After 10K filings			Between earnings announcements and 10K filings		
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	DMs' Purchases Dummy	DMs' Cluster Purchases Dummy	DMs' Non-cluster Purchases Dummy	HQEXs' Purchases Dummy	HQEXs' Cluster Purchases Dummy	HQEXs' Non-cluster Purchases Dummy
Post×Treat	0.004	-0.005	0.009	-0.002	-0.000	-0.000
	(0.36)	(-0.70)	(0.99)	(-0.15)	(-0.02)	(-0.03)
Log Size	0.010**	0.001	0.009**	-0.019***	-0.004	-0.015***
	(2.20)	(0.39)	(2.54)	(-3.14)	(-1.26)	(-2.71)
Book-to-Market	0.000	0.001	-0.001	0.004	0.000	0.007
	(0.10)	(0.31)	(-0.37)	(0.53)	(0.04)	(0.86)
Log Num Analysts	0.005	0.004	0.000	0.018*	0.009	0.014
	(0.65)	(1.03)	(0.02)	(1.70)	(1.41)	(1.47)
Institutional Ownership	0.025	0.018	0.007	-0.054**	-0.050***	-0.025
	(1.16)	(1.19)	(0.47)	(-2.01)	(-3.01)	(-1.07)
Constant	-0.036	-0.010	-0.027	0.110***	0.032*	0.083***
	(-1.54)	(-0.78)	(-1.35)	(3.76)	(1.95)	(3.07)
Num. Obs.	8922	8922	8922	8922	8922	8922
Adj. R^2	0.008	0.015	-0.011	0.076	0.025	0.053
Fixed effects	Firm & Year	Firm & Year	Firm & Year	Firm & Year	Firm & Year	Firm & Year

In this table, we examine the impact of FAS 131 on the pattern of divisional managers' and headquarters executives' insider purchases around earnings announcement and 10K filing dates. The difference-in-difference regression results for divisional managers' insider purchases between earnings announcements and 10K filings are displayed in panel A, and those for divisional managers' insider purchases over three months after 10K filings and those for headquarters executives' insider purchases between earnings announcements and 10K filings are presented in panel B. The pre-adoption of FAS 131 period for 10K filing is fiscal year of 1996 through 1998 and post-adoption of FAS 131 period is fiscal year of 1999 through 2001. We do not include the firms that merge with other companies and whose fiscal year end is not December. In panel A, the dependent variables are a dummy for insider purchases (column 1), a dummy for insider cluster purchases (column 2), a dummy for insider non-cluster purchases (column 3), total value of insider purchases (column 4), total value of insider cluster purchases (column 5), and total value of insider non-cluster purchases (column 6). In panel B, the dependent variables are a dummy for insider purchases (columns 1 and 4), a dummy for insider cluster purchases (columns 2 and 5), a dummy for insider non-cluster purchases (columns 3 and 6). We aggregate trading at the firm and annual level. Cluster insider purchases are defined as purchases placed

by multiple insiders on the same day or consecutive trading days. We aggregate trading at the firm and annual level. Treat is a dummy variable for the treatment group, which indicates whether reported business segments increase after adoption of FAS 131. Post is a dummy variable for Post-adoption of FAS 131 period. See Appendix for variable definitions. Firm- and year-fixed effects are included, and standard errors are clustered at the firm level. The t-statistics are shown in parentheses. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

Table 9: Sales Concentration Changes and Divisional Managers' Purchases

Panel A. Subsample of Firms with Decreased Sales Concentration after Adoption of FAS 131

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	DMs' Purchases Dummy	DMs' Cluster Purchases Dummy	DMs' Non-cluster Purchases Dummy	DMs' Purchases Total Amount	DMs' Cluster Purchases Total Amount	DMs' Non-cluster Purchases Total Amount
Post×Treat	0.067**	0.009	0.068***	0.581**	0.043	0.600**
	(2.39)	(0.48)	(2.62)	(2.09)	(0.25)	(2.33)
Log Size	0.013	0.009	0.006	0.139	0.087	0.081
	(0.93)	(1.01)	(0.49)	(1.02)	(1.00)	(0.64)
Book-to-Market	-0.006	0.001	-0.005	-0.082	0.006	-0.080
	(-0.36)	(0.07)	(-0.34)	(-0.58)	(0.07)	(-0.61)
Log Num Analysts	-0.004	0.006	-0.006	-0.099	0.035	-0.108
	(-0.19)	(0.41)	(-0.31)	(-0.43)	(0.25)	(-0.52)
Institutional Ownership	-0.018	0.012	-0.033	-0.131	0.123	-0.303
	(-0.30)	(0.34)	(-0.57)	(-0.21)	(0.37)	(-0.54)
Constant	0.086	-0.016	0.105	0.868	-0.153	1.039*
	(1.25)	(-0.34)	(1.62)	(1.28)	(-0.35)	(1.66)
Num. Obs.	3565	3565	3565	3565	3565	3565
Adj. R^2	0.107	0.069	0.081	0.109	0.080	0.076
Fixed effects	Firm & Year	Firm & Year	Firm & Year	Firm & Year	Firm & Year	Firm & Year

Panel B. Subsample of Firms with Increased or Equal Sales Concentration after Adoption of FAS 131

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	DMs' Purchases Dummy	DMs' Cluster Purchases Dummy	DMs' Non-cluster Purchases Dummy	DMs' Purchases Total Amount	DMs' Cluster Purchases Total Amount	DMs' Non-cluster Purchases Total Amount
Post×Treat	0.011	0.004	0.020	0.078	0.008	0.190
	(0.29)	(0.22)	(0.59)	(0.20)	(0.04)	(0.54)
Log Size	0.013	-0.001	0.014	0.134	-0.016	0.145
	(1.26)	(-0.21)	(1.55)	(1.35)	(-0.27)	(1.58)
Book-to-Market	0.011	-0.001	0.013	0.078	-0.016	0.104
	(0.88)	(-0.07)	(1.07)	(0.68)	(-0.26)	(0.97)
Log Num Analysts	0.014	0.016	0.002	0.104	0.146	-0.001
	(0.77)	(1.38)	(0.12)	(0.57)	(1.38)	(-0.01)
Institutional Ownership	-0.117***	-0.041	-0.099**	-1.106***	-0.379	-0.938**
	(-2.69)	(-1.42)	(-2.56)	(-2.60)	(-1.42)	(-2.44)
Constant	0.075	0.034	0.049	0.766	0.356	0.499
	(1.40)	(0.99)	(1.03)	(1.50)	(1.18)	(1.07)
Num. Obs.	5357	5357	5357	5357	5357	5357
Adj. R^2	0.149	0.123	0.115	0.132	0.110	0.097
Fixed effects	Firm & Year	Firm & Year	Firm & Year	Firm & Year	Firm & Year	Firm & Year

This table shows a sub-sample analysis to examine the heterogeneous effect of FAS 131 on the pattern of divisional managers' insider purchases conditional on sales concentration changes among business segments. The sales concentration is measured by the Herfindahl-Hirschman Index (HHI) of segment sales. Panel A presents the results of a subsample of firms whose sales concentration fall after adoption of FAS 131 and Panel B shows the results of the other firms. We do not include the firms that merge with other companies and whose fiscal year end is not December. The dependent variables are a dummy for divisional managers' insider purchases (column 1), a dummy for divisional managers' insider cluster purchases (column 2), a dummy for divisional managers' insider non-cluster purchases (column 3), total value of divisional managers' insider purchases (column 4), total value of divisional managers' insider cluster purchases (column 5), and total value of divisional managers' insider non-cluster purchases (column 6). We aggregate trading at the firm and annual level. Cluster insider purchases are defined as purchases placed by multiple insiders on the same day or consecutive trading days. Treat is a dummy variable for the treatment group, which indicates whether reported business segments increase after adoption of FAS 131. Post is a dummy variable for Post-adoption of FAS 131 period. See Appendix for variable definitions. Firm- and year-fixed effects are included, and standard errors are clustered at the firm level. The t-statistics are shown in parentheses. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

Table 10: The Role of Institutional Ownership

Panel A: Divisional Managers' Purchases

	(1)	(2)	(3)	(4)
Sample	Inst. Own. < 50%	Inst. Own. ≥ 50%	Inst. Own. < Median	Inst. Own. ≥ Median
Post×Treat	0.072***	-0.015	0.064**	0.033
	(2.88)	(-0.39)	(2.05)	(1.19)
Log Size	0.006	0.033*	0.023*	0.013
	(0.66)	(1.74)	(1.94)	(0.85)
Book-to-Market	0.002	0.028	0.011	0.007
	(0.17)	(1.11)	(0.83)	(0.34)
Log Num Analysts	0.011	-0.050	0.018	-0.030
	(0.72)	(-1.51)	(0.93)	(-1.26)
Institutional Ownership	-0.034	-0.071	-0.143	-0.064
	(-0.42)	(-1.23)	(-1.17)	(-1.44)
Constant	0.066	0.033	-0.002	0.119
	(1.49)	(0.28)	(-0.03)	(1.35)
Num. Obs.	6179	2743	4422	4500
Adj. R^2	0.114	0.066	0.129	0.119
Fixed effects	Firm & Year	Firm & Year	Firm & Year	Firm & Year

Panel A of Table 10 shows a sub-sample analysis to examine the heterogeneous effect of FAS 131 on the pattern of divisional managers' insider purchases by institutional ownership. Firms are divided using majority (50% of institutional ownership) as the threshold in columns 1-2 and the median of institutional ownership as the threshold in columns 3-4. The pre-adoption of FAS 131 period for insider trading is April 1996 through March 1999 and post-adoption of FAS 131 period is April 1999 through March 2002. We do not include the firms that merge with other companies and whose fiscal year end is not December. The samples for each model are the firms with institutional ownership less than the threshold (columns 1 and 3) and the firms with institutional ownership more than the threshold (columns 2 and 4). The dependent variables are a dummy for divisional managers' insider non-cluster purchases. Cluster insider purchases are defined as purchases placed by multiple insiders on the same day or consecutive trading days. We aggregate trading at the firm and annual level. Treat is a dummy variable for the treatment group, which indicates whether reported business segments increase after adoption of FAS 131. Post is a dummy variable for Post-adoption of FAS 131 period. See Appendix for variable definitions. Firm- and year-fixed effects are included, and standard errors are clustered at the firm level. The t-statistics are shown in parentheses. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

Panel B: FERC

	(1)	(2)	(3)	(4)
Sample	Inst. Own. < 50%	Inst. Own. ≥ 50%	Inst. Own. < Median	Inst. Own. ≥ Median
Post×Treat×E_{t-1}	0.444	-0.010	0.613	-0.655
	(1.32)	(-0.01)	(1.39)	(-1.10)
Post×Treat×E_t	0.334	-0.715	0.315	0.919
	(0.57)	(-0.51)	(0.35)	(1.20)
Post×Treat×E_{t+1}	0.119	1.746*	0.352	0.806
	(0.19)	(1.82)	(0.46)	(1.22)
Post×Treat×R_{t+1}	0.146	0.239	0.056	0.215
	(0.93)	(1.21)	(0.27)	(1.50)
Num. Obs.	2971	1379	2175	2175
Adj. R^2	0.099	0.142	0.100	0.106

Panel B of Table 10 shows a sub-sample analysis to examine the heterogeneous effect of FAS 131 on stock price informativeness by institutional ownership. Firms are divided using (50% of institutional ownership) as the threshold in columns 1-2 and the median of institutional ownership as the threshold in columns 3-4. The forward earnings response coefficient (FERC) proxies for stock price informativeness. The pre-adoption of FAS 131 period for insider trading is April 1996 through March 1999 and post-adoption of FAS 131 period is April 1999 through March 2002. We do not include the firms that merge with other companies and whose fiscal year end is not December. The samples for each model are the firms with institutional ownership less than the threshold (columns 1 and 3) and the firms with institutional ownership more than the threshold (columns 2 and 4). Cluster insider purchases are defined as purchases placed by multiple insiders on the same day or consecutive trading days. Treat is a dummy variable for the treatment group, which indicates whether reported business segments increase after adoption of FAS 131. Post is a dummy variable for Post-adoption of FAS 131 period. See Appendix for variable definitions. The t-statistics are shown in parentheses. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

Table A1: Divisional Managers' Purchases After 10K Filings

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	DMs' Purchases Dummy	DMs' Cluster Purchases Dummy	DMs' Non-cluster Purchases Dummy	DMs' Purchases Total Amount	DMs' Cluster Purchases Total Amount	DMs' Non-cluster Purchases Total Amount
Post×Treat	0.004	-0.005	0.009	0.035	-0.051	0.083
	(0.36)	(-0.70)	(0.99)	(0.31)	(-0.72)	(0.92)
Log Size	0.010**	0.001	0.009**	0.103**	0.018	0.091***
	(2.20)	(0.39)	(2.54)	(2.48)	(0.64)	(2.70)
Book-to-Market	0.000	0.001	-0.001	0.012	0.012	-0.006
	(0.10)	(0.31)	(-0.37)	(0.35)	(0.52)	(-0.21)
Log Num Analysts	0.005	0.004	0.000	0.040	0.039	-0.003
	(0.65)	(1.03)	(0.02)	(0.52)	(0.95)	(-0.05)
Institutional Ownership	0.025	0.018	0.007	0.255	0.182	0.074
	(1.16)	(1.19)	(0.47)	(1.19)	(1.28)	(0.45)
Constant	-0.036	-0.010	-0.027	-0.400*	-0.134	-0.288
	(-1.54)	(-0.78)	(-1.35)	(-1.77)	(-1.04)	(-1.47)
Num. Obs.	8922	8922	8922	8922	8922	8922
Adj. R^2	0.008	0.015	-0.011	0.002	0.020	-0.017
Fixed effects	Firm & Year	Firm & Year	Firm & Year	Firm & Year	Firm & Year	Firm & Year

In this table, we examine the impact of FAS 131 on the pattern of divisional managers' insider purchases over three months after 10K filing dates, respectively. The pre-adoption of FAS 131 period for 10K filing is fiscal year of 1996 through 1998 and post-adoption of FAS 131 period is fiscal year of 1999 through 2001. We do not include the firms that merge with other companies and whose fiscal year end is not December. The dependent variables are a dummy for divisional managers' insider purchases (column 1), a dummy for divisional managers' insider cluster purchases (column 2), a dummy for divisional managers' insider non-cluster purchases (column 3), total value of divisional managers' insider purchases (column 4), total value of divisional managers' insider cluster purchases (column 5), and total value of divisional managers' insider non-cluster purchases (column 6). We aggregate trading at the firm and annual level. Cluster insider purchases are defined as purchases placed by multiple insiders on the same day or consecutive trading days. We aggregate trading at the firm and annual level. Treat is a dummy variable for the treatment group, which indicates whether reported business segments increase after adoption of FAS 131. Post is a dummy variable for Post-adoption of FAS 131 period. See Appendix for variable definitions. Firm- and year-fixed effects are included, and standard errors are clustered at the firm level. The t-statistics are shown in parentheses. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

Table A2: **Headquarters Executives' Purchases Between Earnings Announcement and 10K Filings**

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	HQEXs' Purchases Dummy	HQEXs' Cluster Purchases Dummy	HQEXs' Non-cluster Purchases Dummy	HQEXs' Purchases Total Amount	HQEXs' Cluster Purchases Total Amount	HQEXs' Non-cluster Purchases Total Amount
Post×Treat	-0.002	-0.000	-0.000	-0.005	0.022	-0.008
	(-0.15)	(-0.02)	(-0.03)	(-0.03)	(0.27)	(-0.05)
Log Size	-0.019***	-0.004	-0.015***	-0.167**	-0.032	-0.137**
	(-3.14)	(-1.26)	(-2.71)	(-2.54)	(-0.93)	(-2.22)
Book-to-Market	0.004	0.000	0.007	0.072	0.014	0.087
	(0.53)	(0.04)	(0.86)	(0.81)	(0.32)	(1.02)
Log Num Analysts	0.018*	0.009	0.014	0.211*	0.114*	0.152
	(1.70)	(1.41)	(1.47)	(1.85)	(1.67)	(1.49)
Institutional Ownership	-0.054**	-0.050***	-0.025	-0.672**	-0.519***	-0.362
	(-2.01)	(-3.01)	(-1.07)	(-2.23)	(-2.93)	(-1.38)
Constant	0.110***	0.032*	0.083***	1.015***	0.251	0.790***
	(3.76)	(1.95)	(3.07)	(3.16)	(1.51)	(2.65)
Num. Obs.	8922	8922	8922	8922	8922	8922
Adj. R^2	0.076	0.025	0.053	0.069	0.017	0.047
Fixed effects	Firm & Year	Firm & Year	Firm & Year	Firm & Year	Firm & Year	Firm & Year

In this table, we examine the impact of FAS 131 on the pattern of headquarters executives' insider purchases between before earnings announcement dates and 10K filing dates. The difference-in-difference regression results for divisional managers' insider purchases is displayed in panel A and those for headquarters executives' insider purchases is presented in panel B. The pre-adoption of FAS 131 period for 10K filing is fiscal year of 1996 through 1998 and post-adoption of FAS 131 period is fiscal year of 1999 through 2001. We do not include the firms that merge with other companies and whose fiscal year end is not December. The dependent variables are a dummy for insider purchases (column 1), a dummy for headquarters executives' insider cluster purchases (column 2), a dummy for headquarters executives' insider non-cluster purchases (column 3), total value of headquarters executives' insider purchases (column 4), total value of headquarters executives' insider cluster purchases (column 5), and total value of headquarters executives' insider non-cluster purchases (column 6). We aggregate trading at the firm and annual level. Cluster insider purchases are defined as purchases placed by multiple insiders on the same day or consecutive trading days. Treat is a dummy variable for the treatment group, which indicates whether reported business segments increase after adoption of FAS 131. Post is a dummy variable for Post-adoption of FAS 131 period. See Appendix for variable definitions. Firm- and year-fixed effects are included, and standard errors are clustered at the firm level. The t-statistics are shown in parentheses. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

Table A3: Headquarters Executives' Purchases After 10K Filings

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	HQEXs' Purchases Dummy	HQEXs' Cluster Purchases Dummy	HQEXs' Non-cluster Purchases Dummy	HQEXs' Purchases Total Amount	HQEXs' Cluster Purchases Total Amount	HQEXs' Non-cluster Purchases Total Amount
Post×Treat	0.032	0.013	0.019	0.296	0.119	0.197
	(1.46)	(1.06)	(0.99)	(1.29)	(0.95)	(0.96)
Log Size	0.018**	0.010*	0.011	0.220**	0.119**	0.132*
	(2.22)	(1.77)	(1.51)	(2.56)	(2.22)	(1.74)
Book-to-Market	0.002	-0.002	-0.003	0.012	-0.013	-0.035
	(0.17)	(-0.25)	(-0.33)	(0.12)	(-0.19)	(-0.38)
Log Num Analysts	0.009	-0.006	0.011	0.077	-0.066	0.096
	(0.68)	(-0.72)	(0.89)	(0.53)	(-0.74)	(0.72)
Institutional Ownership	0.005	0.002	-0.005	0.111	0.027	-0.000
	(0.15)	(0.09)	(-0.16)	(0.28)	(0.11)	(-0.00)
Constant	0.019	-0.000	0.032	0.043	-0.110	0.241
	(0.47)	(-0.01)	(0.89)	(0.10)	(-0.40)	(0.64)
Num. Obs.	8922	8922	8922	8922	8922	8922
Adj. R^2	0.089	0.038	0.065	0.079	0.025	0.055
Fixed effects	Firm & Year	Firm & Year	Firm & Year	Firm & Year	Firm & Year	Firm & Year

In this table, we examine the impact of FAS 131 on the pattern of headquarters executives' insider purchases over three months after 10K filing dates, respectively. The pre-adoption of FAS 131 period for 10K filing is fiscal year of 1996 through 1998 and post-adoption of FAS 131 period is fiscal year of 1999 through 2001. We do not include the firms that merge with other companies and whose fiscal year end is not December. The dependent variables are a dummy for headquarters executives' insider purchases (column 1), a dummy for headquarters executives' insider cluster purchases (column 2), a dummy for headquarters executives' insider non-cluster purchases (column 3), total value of headquarters executives' insider purchases (column 4), total value of headquarters executives' insider cluster purchases (column 5), and total value of headquarters executives' insider non-cluster purchases (column 6). We aggregate trading at the firm and annual level. Cluster insider purchases are defined as purchases placed by multiple insiders on the same day or consecutive trading days. We aggregate trading at the firm and annual level. Treat is a dummy variable for the treatment group, which indicates whether reported business segments increase after adoption of FAS 131. Post is a dummy variable for Post-adoption of FAS 131 period. See Appendix for variable definitions. Firm- and year-fixed effects are included, and standard errors are clustered at the firm level. The t-statistics are shown in parentheses. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

Table A4: Institutional Ownership and Headquarters Executives' Purchases

	(1)	(2)	(3)	(4)
Sample	Inst. Own. < 50%	Inst. Own. ≥ 50%	Inst. Own. < Median	Inst. Own. ≥ Median
Post×Treat	0.008	-0.003	0.004	0.003
	(0.20)	(-0.06)	(0.09)	(0.07)
Log Size	-0.001	0.007	-0.002	0.013
	(-0.04)	(0.25)	(-0.08)	(0.65)
Book-to-Market	-0.009	0.060*	-0.005	0.041*
	(-0.48)	(1.90)	(-0.24)	(1.95)
Log Num Analysts	0.009	0.055	0.005	0.020
	(0.38)	(1.26)	(0.16)	(0.60)
Institutional Ownership	-0.217*	-0.095	-0.101	-0.090
	(-1.73)	(-0.85)	(-0.50)	(-1.15)
Constant	0.354***	0.120	0.333***	0.171
	(4.76)	(0.63)	(3.87)	(1.45)
Num. Obs.	6179	2743	4422	4500
Adj. R^2	0.186	0.179	0.203	0.178
Fixed effects	Firm & Year	Firm & Year	Firm & Year	Firm & Year

This table shows a sub-sample analysis to examine the heterogeneous effect of FAS 131 on the pattern of headquarters executives' insider purchases by institutional ownership. Firms are divided using majority (50% of institutional ownership) as the threshold in columns 1-2 and the median of institutional ownership as the threshold in columns 3-4. The pre-adoption of FAS 131 period for insider trading is April 1996 through March 1999 and post-adoption of FAS 131 period is April 1999 through March 2002. We do not include the firms that merge with other companies and whose fiscal year end is not December. The samples for each model are the firms with institutional ownership less than the threshold (columns 1 and 3) and the firms with institutional ownership more than the threshold (columns 2 and 4). The dependent variables are a dummy for headquarters executives' insider non-cluster purchases. Cluster insider purchases are defined as purchases placed by multiple insiders on the same day or consecutive trading days. We aggregate trading at the firm and annual level. Treat is a dummy variable for the treatment group, which indicates whether reported business segments increase after adoption of FAS 131. Post is a dummy variable for Post-adoption of FAS 131 period. See Appendix for variable definitions. Firm- and year-fixed effects are included, and standard errors are clustered at the firm level. The t-statistics are shown in parentheses. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.