ECONOMIC CONSEQUENCES OF DISCLOSURE REGULATION: THE CASE OF SEGMENT REPORTING

By

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To my parents, my husband, and our lovely daughter, Leona

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This dissertation consists of two essays on economic consequences of disclosure regulation in the segment reporting setting. In the first essay, I examine whether the change of US segment disclosure rules from SFAS No. 14 to SFAS No. 131 in 1997 have harmed shareholders by forcing companies to reveal proprietary information or benefited them by forcing companies to provide more information for monitoring. I identify firms that lobbied against the regulation and classify them into two groups: one that is likely motivated by proprietary information disclosure cost concerns (PC) and the other group that is likely motivated by hiding low-profitability segments—a behavior that increases the agency cost (AC). Consistent with my proprietary cost hypothesis, PC firms experience negative stock returns around the issuance of the exposure draft of SFAS 131 and deteriorated operating performance after its adoption. In contrast, AC firms experience positive stock returns around the issuance of the exposure draft and improved operating performance after the adoption, consistent with my agency cost hypothesis. The results suggest that firms have different motives for lobbying against proposed accounting standards and that firms are differentially affected by an accounting regulation.

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The second essay investigates whether the mandatory disclosure of proprietary information under SFAS 131 puts US public firms at a competitive disadvantage to private firms. I assume that industries that lobbied against the proposed standard would incur higher proprietary disclosure costs from SFAS 131 than other industries and I identify lobbying industries based on companies' comment letters on the Exposure Draft of the standard. I find that an industry was more likely to lobby against the standard if public firms in that industry as a whole commanded a larger market share, enjoyed more persistent abnormal profits, had higher R&D activities, and faced more private competitors. In my primary test I find that after the adoption of SFAS 131, public firms in a lobbying industry experienced a significant decline in their aggregate product market share relative to those in a non-lobbying industry, confirming companies' concerns about the competitive harm of disclosures required by SFAS 131. My study contributes to the literature by providing evidence on the real market-wide effects, as opposed to the informational firm-specific effects, of a disclosure regulation.

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CHAPTER 1
A LOBBYING APPROACH TO EVALUATING THE ECONOMIC CONSEQUENCES OF SFAS NO. 131

Introduction

Economic consequences of disclosure regulation have been a central theme in accounting research.[1] Recently, researchers have started to examine firms' lobbying efforts to better understand the perceived consequences of the proposed regulation (e.g., Lo 2003; Ramanna 2008; Hochberg et al. 2009). Taken together, this line of accounting research reflects the interplay between firms and regulators over disclosure regulation: firms lobby in the standard setting process for different motives and accordingly the economic consequences of the regulated change vary relative to the firms' early lobbying motivations. In this study I examine how the economic consequences of disclosure regulation vary with firms' lobbying motives in the segment reporting setting.

I use a lobbying approach to examine the economic consequences of segment reporting rule changes from SFAS 14 to SFAS 131. Prior studies compare the segments reported under SFAS 131 with those reported under SFAS 14 and find that managers conceal segment information with two different *motives*.[2] The traditional

[1]Leuz and Wysocki (2008) survey related theoretical and empirical studies. In addition, regulators have been debating the economic consequences of past and future regulatory choices. For instance, on February 16, 2012, the House Financial Services Committee passed the "SEC Regulatory Accountability Act," which would require the Securities and Exchange Commission (SEC) to conduct cost-benefit analyses and periodic reviews on all rulemakings and most of the orders it issues.

[2] Under SFAS 14, the reportable segments of an enterprise are determined by grouping products and services by industry lines, with the industrial classification left to the judgment of the management. The line-of-business information classified by "industry segment" has no specific link to the internal

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motive is that nondisclosure occurs to hide proprietary information from competitors (e.g., Hayes and Lundholm 1996; Harris 1998). Recent studies find an alternative motive—managers withhold information to avoid revealing poorly performing segments (e.g., Berger and Hann 2007; Bens, Berger, and Monahan 2011). If firms withhold segment information due to proprietary disclosure costs, the mandatory disclosure of more disaggregated segment information may harm shareholders because revealing a segment that earns high profits would attract more competition and therefore reduce profits. If firms withhold segment information due to agency problems, the new segment disclosure rule may benefit shareholders because managers would be forced to reveal underperforming segments, attracting monitoring. Thus, I expect that firms lobby against the proposed segment reporting rule under two different motives and that the two different types of lobbying firms experience different market reaction to news during the standard setting process and different changes in operating performances after the adoption of SFAS 131.

I identify proprietary cost and agency cost motive lobbying firms by coding the company's letter commenting on the Exposure Draft (ED) of SFAS 131. I expect that a firm's decision to lobby is driven by its perceived economic consequences of the proposed accounting change (Watts and Zimmerman 1978; Hodder and Hopkins 2013): those that would be most affected by the change are more likely to lobby. I classify firms that express concerns about the disclosure of proprietary information as the "proprietary

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organization of the enterprise. Under SFAS 131, the reportable segments are determined by the way in which management makes operating decisions and assesses performance. This method is referred to as *the management approach*.

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cost motive (PC) sample" and classify the remaining lobbying firms as the "agency cost motive (AC) sample."

I use two complementary approaches to examine the economic consequences of SFAS 131 on lobbying firms. First, I examine stock returns surrounding the key developments of the new segment reporting standard. I find increased return volatility and share turnover around the announcement of the SFAS 131 Exposure Draft, indicating that the potential change of segment disclosure rule was meaningful to investors. Moreover, I find that PC (AC) firms experience negative (positive) abnormal stock returns around the issuance of the ED, suggesting that the perceived consequences of proposed regulation do vary with a firm's motive to withhold segment information.

Second, I use the difference-in-difference method and analyze changes in operating performance for PC and AC firms following the implementation of SFAS 131. I retain the PC and AC firms that report multiple segments under SFAS 131. I use two years before the announcement of the ED (i.e., 1994 and 1995) as the pre-131 period and two years after the implementation of SFAS 131 (i.e., 1999 and 2000) as the post-131 period. Before the issuance of the ED, PC firms have better operating performances than AC firms. The difference is statistically significant, consistent with my expectation that firms with higher proprietary costs (agency costs) are likely to hide information about their more (less) profitable segments. I find that on average PC firms' operating performances decrease by 1.39% from the pre- to the post-131 period, whereas AC firms' operating performances increase by 1.42%. The results are robust to firm- and industry-specific controls.

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In supplementary analysis I examine the "escaped" lobbying firms that remain to be single-segment companies after the adoption of SFAS 131 because the final rule scaled back from the initial proposal. I find that PC firms that remain as single-segment companies maintain their high operating profits after the adoption of SFAS 131, but PC firms that instead report multiple segments under SFAS 131 experience a decline in operating performances.

My study makes two contributions to the literature. First, prior research focuses on the impact of SFAS 131 on firms' information environment (e.g., Botosan and Stanford 2005; Berger and Hann 2003). I extend the segment disclosure literature by providing evidence on the market reaction to news during the standard setting process and changes in operating performances after the adoption of the new standard. Second, although proprietary costs are often discussed in the literature and put forward by managers to explain nondisclosure, there is little empirical evidence on any competitive harm experienced by firms after mandatory disclosure. Berger and Hann (2002) find no evidence that firms revealing more disaggregated information under SFAS 131 experience a significant decline in operating performance. My study find evidence of changes in operating performances after the adoption of SFAS 131 because I identify lobbying firms, which are presumably most affected by the proposed standard, and distinguish firms concerned with proprietary disclosure costs from those concerned with agency problems. I find that the new standard affects PC and AC firms differently. These results suggest that it is important to distinguish firms that would be differentially affected by the proposed regulation.

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The rest of the paper is organized as follows. Section 1.2 reviews related literature and develops hypotheses. Section 1.3 describes the sample and data. Section 1.4 examines market reactions to key events that increased the probability of the passage of SFAS 131 and Section 1.5 examines the impact of SFAS 131 on operating performance. Section 1.6 concludes.

Hypothesis Development

SFAS 14 requires companies to report line-of-business information classified by "industry segment." The Association for Investment Management and Research (AIMR) and the AICPA Special Committee, among others, criticized SFAS 14's loose definition of "industry," arguing that mangers of diversified companies had exploited this weakness in SFAS 14 to suit their own financial reporting purposes by aggregating segment information (AIMR 1993; AICPA 1994). After a long deliberation, on January 19, 1996, the FASB and the Accounting Standards Board (AcSB) of the Canadian Institute of Chartered Accountants jointly issued an Exposure Draft proposing a change in segment reporting rules to an approach of identifying segments based on management's segmentation of the firm for internal decision-making purposes. The expectation was that the new approach would provide financial statement users with a view of the company "through the eyes of management" (FASB 1996). Many firms lobbied against the proposal, arguing that the proposed "management approach" would allow their competitors to see an enterprise "through the eyes of management." Despite of the opposition, the FASB passed the final rule on June 30, 1997, which became effective for fiscal years beginning after December 15, 1997.

Several studies have investigated the effectiveness of SFAS 131 in providing better information on firms' business segments. Street et al. (2000) examine 160 US-

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domiciled Global 1000 companies. They find that the new standard results in more segments being disclosed and has improved the consistency of segment information with information in the MD&A and other sections of the annual report. Herrmann and Thomas (2000) find that upon adopting SFAS 131, over two-thirds of the sample firms redefined their primary operating segments, the number of firms providing segment disclosures increased, and enterprises began reporting more items for each operating segment. Berger and Hann (2003) investigate the effect of SFAS 131 on the information environment and find that the new standard induced firms to reveal previously "hidden" information about their diversification strategies, the mandated disclosure of which altered analyst and market expectations.

Two questions naturally follow: What motivated managers to withhold segment information before SFAS 131? And what are the economic consequences once firms are mandated to disclose this information? Questions about managers' motives have been extensively investigated in the extant segment reporting literature. This study builds on the literature on managerial motives to withhold segment information and tests the corresponding economic consequences.

Proprietary Information Cost Hypothesis

Early studies of segment reporting focus solely on the proprietary cost motive, which posits that managers opt to aggregate information because the revelation of a segment that earns high abnormal profits attracts more competition, puts the disclosing company at a disadvantage in price negotiations with customers and suppliers, and/or draws more attention from regulators, all of which harm existing shareholders. Hayes and Lundholm (1996) model firms' choices of aggregation level in segment disclosures in the presence of a competitor. They note that the decision involves a trade-off

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between the benefits of informing the capital market about firm value and the costs of aiding the rival. They show that under severe competition, firm value is maximized when it discloses that all segments have similar performance, which avoids adverse selection in the capital market yet reveals little to rival firms. Thus, only firms with sufficiently similar results from their different activities will report them as separate segments, whereas firms with operating segments that earn different rates of return will aggregate all activities into one single, very broadly defined segment for reporting purposes. Consistent with Hayes and Lundholm's model, Harris (1998) finds that managers of multi-segment firms avoid reporting operations in less-competitive industries as business segments, which on average earn higher rates of return. The finding suggests that "the competitive harm cited as a disincentive to detailed segment reporting arises from a desire to protect abnormal profits and market share in less competitive industries" (Harris 1998, p. 112). Using retroactive disclosures required by SFAS 131, Botosan and Stanford (2005) identify a group of "change" firms that switched from single-segment to multi-segment upon the adoption of SFAS 131. Similar to Harris (1998), they find that these firms exploited the latitude in SFAS 14 to conceal high profitable segments operating in less-competitive industries.

If the proprietary cost and protection of abnormal profits arguments are valid, we would expect several consequences from the adoption of SFAS 131, which permits relatively less discretion for segment aggregation. First, there would be negative stock market reactions surrounding events that increase the probability of adoption for PC firms, as investors worry that the firm could lose its competitive advantage. Second, firms with abnormally high rates of return in some segments would be more likely to

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lobby against the proposal to protect their competitive advantage. Upon firms' adopting SFAS 131, the mandated disclosure would reveal proprietary information and lower the firms' profits. Formally, the first hypothesis and two predictions in alternative form are as follows:

> **H1**: **Proprietary Information Cost Hypothesis**: The increase in segment disclosures required by SFAS 131 resulted in, or was anticipated to lead to, competitive harm.
>
> > *H1a —Stock performance*: in the period surrounding events that increased the probability that SFAS 131 would be adopted, firms that lobbied against the exposure draft tended to have *negative* market reactions on average.
> >
> > *H1b —Operating performance*: firms that lobbied against the exposure draft tended to have *good* operating performance on average before the regulation change, and their performance *deteriorated* on average after the adoption of SFAS 131.

Agency Cost Hypothesis

In the presence of agency problems, managers have incentive to withhold information on segments that earn abnormally low profits to mask poor performance and avoid sanctions from external monitors. Berger and Hann (2007) identify a sample of firms with inefficient cross-segment transfers and hypothesize that managers from those firms are more likely to face agency cost motives to withhold segment data. Consistent with their predictions, they find that for AC firms, managers tend to withhold information about segments with relatively low abnormal profits. Bens, Berger, and Monahan (2011) use confidential US Census Bureau plant-level data and compare internal firm data (pseudo-segment) with their externally reported segment data. Consistent with the agency cost motive, they find a negative relation between inefficient transfers and the likelihood that a pseudo-segment is separately disclosed and a

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positive relation between the disclosure of a pseudo-segment and the pseudo-segment's industry-adjusted profitability. The findings suggest that managers suppress information about inefficient internal capital transfers as well as information about less-profitable operations.

If firms' segment aggregation decisions are motivated by managerial self-interest, we would expect that the revelation of segments with poor performance under the new reporting regime provides information indicative of unresolved agency problems and, hence, results in improved governance and heightened external monitoring. The improvement in governance and external monitoring would have several consequences. First, there would be positive stock market reactions around key events that led to the adoption of SFAS 131 for AC firms, as investors bid up stock prices in anticipation of governance improvements. Second, firms with poor operating performance would be more likely to lobby against the proposal, although, unlike proprietary cost, agency costs would probably not be put forward as an argument in the comment letters. Upon adoption, improved governance would lead to better discipline of the management team. Increased managerial effort and better alignment of the interest of managers with shareholders would translate into improvements in operating performance, leading to the second hypothesis:

> **H2**: **Agency Cost Hypothesis**: The increase in segment disclosures required by SFAS 131 resulted in, or was anticipated to lead to, governance improvements.
>
> > *H2a —Stock performance*: in the period surrounding events that increased the probability that SFAS 131 would be adopted, firms that lobbied against the exposure draft tended to have *positive* market reactions on average.

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H2b —Operating performance: firms that lobbied against the exposure draft tended to have *poor* operating performance on average before the regulation change, and their performance *improved* on average after the adoption of SFAS 131.

Note that the proprietary information cost hypothesis and agency cost hypothesis are not mutually exclusive. As Berger and Hann (2007) point out, it is important to identify firms with different motives and test them separately.

Sample Selection and Data

My sample of lobbying firms is identified by reviewing the comment letters submitted to the FASB on the Exposure Draft that eventually became SFAS 131 (File Ref. 157-A). Following the release of the detailed proposal on January 19, 1996, the FASB received 221 comment letters.[3] I obtained copies of those comment letters from the Public Record of the FASB and manually read through and coded for the positions of the responses for each of the comment letters. Panel A of Table 1-1 summarizes the sample composition and lobbying position. The majority of industrial firms (93%) opposed the ED, whereas all responding organizations in the securities industry supported it, consistent with their role as users of financial information.[4,5]

[3] In cases where a company submitted more than one letter, the combined information from all letters from the same company is considered as one observation. Seven firms in total submitted more than one letter.

[4] According to the National Association of Manufacturers (NAM)'s summary report (see Comment Letter No. 220), out of 116 comment letters submitted by NAM members, 107 (92%) letters are in opposition. The statistic is largely consistent with my classification that 93% of industrial firms opposed the Exposure Draft. Ettredge et al. (2002) focuses on responses to the ED's *Issue 1* and finds 86% of comment letters from industrial firms were in opposition.

[5]Since coding respondents' positions is subjective, I run robustness tests using a subsample of NAM member firms whose positions were coded by NAM. I find that my results are robust to their coding.

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For data availability reasons, subsequent analyses focus on publicly traded companies. Panel B of Table 1-1 summarizes the results of the sample selection procedure. For each comment letter, I first gather self-disclosed information about the letter writer, including name, address, phone number, and company affiliation. Company names are used to identify the firm's GVKEY, with address/phone number cross-referenced to company profiles when necessary. Of the 221 comment letters, 53 have no matched GVKEY (e.g., associations and individuals) and 24 have a missing historical SIC code or insufficient returns data on CRSP. Subsequent analyses of lobbying activities use the remaining sample of 144 lobbying firms.

Lobbying Activities

I determine a company's stated position regarding the proposed new segment reporting rules from its comment letter. The letters generally have a negative tone, with 128 of 144 firms explicitly opposing the proposal (*Oppose* takes on a value of 1). Unlike prior lobbying studies that compare firms that supported an ED versus firms that opposed an ED (e.g., Lo 2003), the focus of this study is the heterogeneity of the opposing lobbying firms, i.e. firms lobbied *against* the ED for different reasons. Accordingly, I focus on the sample of 128 firms that lobbied against the proposal in the subsequent analyses.

By reviewing the specific issues discussed in the comment letters, I classify objections into nine categories. Nine indicator variables, *Object1-Object9*, identify whether a firm raised a particular objection:

- *Object 1* = 1 if a firm opposed disclosing segment information quarterly.
- *Object 2* = 1 if a firm stated that the compliance costs would be too high.
- *Object 3* = 1 if a firm objected to the management approach.

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- *Object 4* = 1 if a firm disagreed on the disclosure of certain elements of operating profit by segments.
- *Object 5* = 1 if a firm disagreed on the allocation of total liabilities by segments.
- *Object 6* = 1 if a firm wrote that disaggregated information on a non-GAAP basis should not be allowed.
- *Object 7* = 1 if a firm stated that the proposed rules will reduce industry or year-to-year comparability.
- *Object 8* = 1 if a firm said that the proposed rules will force the disclosure of proprietary information and thus put the firm at a competitive disadvantage.
- *Object 9* = 1 if a firm asked the FASB to provide quantitative materiality thresholds for identifying reportable segments

Panel A of Table 1-2 reports the cross-tabulation of objections. The main diagonal shows the nine specific objections and the overall position of the comment letter. The most frequently cited objections are *Object8* on the disclosure of proprietary information (110 firms) and *Object7* on reduced comparability (83 firms). In addition, the off-diagonal entries show the number of instances in which both types of objections were raised by the same firm. For instance, of the 128 letters opposed to the proposal overall, 105 also objected on the ground that disclosing segment information in accordance with the proposed statement will result in competitive harm. Specific competitive harm depends on the nature of competition. Out of these 105 firms, 98 claimed in their comment letters that mandatory disclosure of proprietary segment information would put the firm at a competitive disadvantage to private or foreign competitors that are not required to provide segment reporting. Some (22 firms) argued that among US public firms the opportunity to combine divisions and products to avoid competitively harmful disclosure is more likely to be available to larger companies than to smaller ones, thus putting smaller companies at a disadvantage. Other respondents (29 firms) suggested that information about narrowly defined segments may put them at a disadvantage in price negotiations with customers and suppliers.

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Sample Partition and Financial Statistics

As discussed previously, although I expect lobbying firms to be those most affected by SFAS 131, the proprietary and agency cost hypotheses make opposite predictions about the impact of the new standard. Thus, it is important to partition the sample of lobbying firms such that one motive is likely to dominate the other and then test each hypothesis separately. Accordingly, I classify firms that lobbied against the ED into two groups (see Figure 1-1):

- Proprietary cost (PC) motive sample: firms that lobbied against the Exposure Draft and explicitly raised the concern of proprietary cost in their comment letters
- Agency cost (AC) motive sample: firms that lobbied against the proposal but did not express the concern of competitive harm

While it is intuitive to classify firms based on observable comments, it is possible that lobbying firms use strategic arguments rather than the ones that relate to their true underlying motivations. However, to the extent that firms motivated by agency costs put forward the proprietary cost argument in their comment letters, they will be misclassified, which will reduce the power of my tests to find negative economic consequences predicted by the proprietary cost hypothesis. To the extent that not all non-PC lobbying firms were motivated by agency costs (e.g., firms that lobbied against the ED because of their concerns about the comparability of the management approach are misclassified as agency cost motive firms), such misclassification would reduce the test power in finding positive economic consequences predicted by the agency cost

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hypothesis. Both types of misclassifications should not produce significant results when there are none.

Panel B of Table 1-2 reports the financial statistics for the PC (105 firms) and AC (23 firms) motive samples. AC firms are larger with the median of total assets and book value of equity being $15.4 billion and $3.6 billion – both indicators of size are significantly higher than those for the PC firms. Mean and median of book-to-market ratio are significantly higher for AC firms, suggesting that the AC sample tends to be mature firms whereas the PC sample tends to be growth firms. The higher market valuation for the PC sample is consistent with appreciation among investors that these firms enjoy a competitive advantage because of their proprietary information. The PC firms have better operating performance, with a mean (median) return-on-assets (ROA) of 7.99% (7.12%), whereas the average (median) ROA for the AC firms is 4.59% (3.36%). The significant difference in operating performance is consistent with the findings in prior literature that firms with higher proprietary costs (agency costs) are likely to hide information about their more (less) profitable segments. Taken together, the univariate statistics support the sample partition strategy. The AC sample tends to be large, mature firms with poor operating performance, consistent with managerial empire building, whereas the PC sample tends to be profitable smaller growth firms that favor non-disclosure to maintain their competitive advantage.

The above sample partition is based on the comment letters, which were submitted in response to the initial proposal but before the final standard, SFAS 131 (Figure 1-1). Prior literature suggests that political forces play an important role in shaping accounting standards (e.g., Zeff 2005a; Zeff 2005b; Ramanna 2008; Telberg

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1995). For example, Ramanna (2008) finds evidence consistent with the FASB revising the Exposure Draft before issuing SFAS 142 in response to political pressure over its proposal to abolish pooling accounting. In the case of segment reporting, although the proposal met with strong opposition among lobbying firms, the FASB decided not to provide an exemption for information that management believes could be competitively harmful. Instead, the Board revised its original proposal by modifying the wording of the aggregation criteria and adding quantitative materiality thresholds for identifying reportable segments (FASB 1997).

I examine the number of segments reported by the lobbying firms after they adopted SFAS 131 and find that some lobbying firms managed to remain as single-segment firms under the new reporting regime (i.e., absent regulatory intervention on segment disclosure). Accordingly, I further split PC (AC) firms into multi-segment and single-segment PC (AC) firms (see Figure 1-1).

The fact that some lobbying firms were not induced to report multiple segments by the adoption of SFAS 131 provides a unique research setting. Both multi-segment and single-segment PC firms likely lobbied against the proposal because they were concerned about the disclosure of proprietary information, but eventually only one group of firms was affected by the accounting changes (*treated*), whereas the other group was not (*untreated*).[6] Those single-segment lobbying firms serve as a "counterfactual" outcome for other lobbying firms that were affected by the new standard. Note that a

[6] Only two AC firms remained single-segment firms under the new reporting regime. Therefore the following discussion focuses on multi-segment vs. single-segment PC firms.

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company's decision to submit comment letter(s) reflects the perceived economic consequences of the *proposed* accounting changes. When examining the real economic consequences of *adopted* accounting changes, it is important to separate multi-segment PC firms from single-segment ones, and it is interesting to contrast these two groups' performance.

Market Reaction

Following prior literature (e.g., Leftwich 1981; Dechow et al. 1996; Lo 2003), I investigate investors' perceptions of the economic consequences of the changes in segment reporting by examining stock price reactions to key events that increased the probability of adoption. Two key event dates are identified:

Event 1 — the release of the Exposure Draft on January 19, 1996; and

Event 2 — the adoption of the final rules on June 30, 1997.

These events are critical points in the regulatory process and are thus likely to significantly influence investors' assessment of whether the Board will adopt the new rules. The release of Exposure Drafts, particularly, has been shown in prior studies to trigger significant market reactions (e.g., Lys 1984; Salatka 1989; Espahbodi, Strock, and Tehranian 1991). To the extent that investors had expected these events or the news relating to the regulation was disseminated outside these event dates, the power of the tests to find significant market reactions is reduced.

I examine the market reaction around these events for the stocks of lobbying firms using three distinct event-period response metrics: (1) market-adjusted *absolute* return (ABS_MAR), (2) abnormal share turnover (ABN_TURN), and (3) market-adjusted *directional* return (DIR_MAR), all of which follow prior literature that examines investor

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response to information events (Bushee, Jung, and Miller 2011; Cready and Hurtt 2002). As discussed previously, because the proprietary cost and agency cost hypotheses make opposite predictions about the direction of the stock market response to these information events, the first two *unsigned* response metrics are used to test the overall informativeness of the events for the pooled sample, whereas the third *signed* return measure is used to gauge the market responses to these events for the PC and AC firms separately. The three response metrics are defined as follows:[7]

1) Market-adjusted absolute return (ABS_MAR)

$$ABS\_MAR_{it} = (|R_{it} - R_{mt}| - MEAN_{ARis})/\sigma_{ARis} \quad (1\text{-}1)$$

Where:

R_{it} = return for firm i on day t;
R_{mt} = return for the CRSP value-weighted index on day t;
$MEAN_{ARis}$ = the mean value of the market-adjusted absolute return for firm i, $|R_{it} - R_{mt}|$, over the estimation period s (days -120 to -30 relative to the announcement of the ED);
σ_{ARis} = the standard deviation of the market-adjusted absolute return for firm i, $|R_{it} - R_{mt}|$, over estimation period s.

2) Abnormal share turnover (ABN_TURN)

$$ABN\_TURN_{it} = (TURN_{it} - MEAN_{TURNis})/\sigma_{TURNis} \quad (1\text{-}2)$$

Where:

$TURN_{it}$ = shares traded in firm i's stock on day t divided by the outstanding shares for firm i on day t;
$MEAN_{TURNis}$ = the average turnover over the estimation period s;

[7] Following Cready and Hurtt (2002), I calculate ABS_MAR, DIR_MAR, and ABN_TURN and then sum by day over the multiday event window. Alternatively, I could recalculate them using multi-day returns, expectations, and standard errors. Robustness analyses show that the results using alternative calculation are qualitatively the same.

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σ_{TURNis} = the standard deviation of turnover over the estimation period s.

3) Market-adjusted directional return (DIR_MAR)

$$DIR\_MAR_{it} = (R_{it} - R_{mt})/\sigma_{DRis} \quad (1\text{-}3)$$

Where:

R_{it} = return for firm I on day t;
R_{mt} = return for the CRSP value-weighted index on day t;
σ_{Dris} = the standard deviation of the market-adjusted return for firm I, $(R_{it} – R_{mt})$, over estimation period s.

Table 1-3 reports the abnormal stock market reactions around the announcements of the ED and the final adoption of SFAS 131. *Factiva* news search around the event dates indicates that news articles related to the ED or SFAS 131 adoption were released outside the conventional [-1, +1] three-day event window. Thus I report the results from a [-2, +2] five-day event window as well. Panel A reports market-adjusted *absolute* return (ABS_MAR) for all firms opposing the standard in Columns 1-2 and market-adjusted *directional* return (DIR_MAR) for PC firms and AC firms in Columns 3-4 and 5-6, respectively. The *Difference* column in Panel A reports the results from a test of the hypothesis that the market reaction for PC firms is the same as the market reaction for AC firms. Panel B mirrors Panel A's structure but focuses on abnormal turnover (ABN_TURN).

The results suggest that events changing the probability of the adoption conveyed substantial new information to the market. I find a dramatic increase in return volatility and turnover for sample firms around the two events. The five-day market-adjusted abnormal absolute return around the release of the ED is significantly higher than the average mean during the estimation period (Mean=1.54, t=4.19). Unreported results show that the unadjusted absolute market-adjusted return (AMAR) for the ED

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announcement date is 1.46%, compared to an average of 1.12% during the estimation period with a standard deviation of 0.98%.

Overall, investors of the lobbying firms view the proposed change in segment reporting negatively on average, with an average five-day market-adjusted return of -0.59 around the ED announcement (untabulated). Given opposite predictions of H1a and H2a, I partition the sample into PC and AC firms and report the statistics for each group separately in Columns 3-4 and 5-6. I find that during the short window around the issuance of the Exposure Draft, the PC (AC) firms experienced negative (positive) stock price reactions. The mean five-day abnormal return for the PC group is -0.925 (t = -3.02), whereas the mean for the AC group is +0.964 (t = 1.29).[8] A two-sample t-test shows that the stock market reaction to PC firms is significantly different from that of AC firms (t = -2.55). Tests of difference in medians using the Wilcoxon rank sumtest generate the same inference. Taken together, the opposite directions of market responses for PC and AC firms provide evidence in support of both H1a and H2a and illustrate the importance of considering the heterogeneity of lobbying firms.

Operating Performance

Univariate Analyses

Table 1-4 reports difference-in-difference estimates of the impact of SFAS 131 on PC and AC firms' operating performance. Cells contain mean return-on-assets

[8] Excess stock returns calculated using the market model yield similar results. The mean five-day abnormal return for the PC group is -0.74% with a t-stat of -1.67, whereas the mean for the AC group is +1.88% with a t-stat of 1.81. The mean and median of the difference between the two groups are highly significant.

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(ROA) for the group identified. Standard errors are given in parentheses and sample sizes are given in square brackets. Panel A of Table 1-4 reports results for treatment firms, i.e. lobbying firms that operate as multi-segment companies after adoption. PC firms are those that explicitly raised the issue of proprietary costs in their comment letters whereas AC firms are those that lobbied against the ED but did not explicitly mention the concern of competitive harm. I compare operating performance in the two years before the announcement of the ED (i.e., 1994 and 1995) and the two years after the final adoption of SFAS 131 (i.e., 1999 and 2000) to study the impact of the new standard. Before the issuance of the ED, PC firms have better operating performance, with a mean ROA of 7.59%, whereas the average ROA for AC firms is 3.79%. The difference is statistically significant, consistent with the notion that firms concerned about segment disclosures because of proprietary costs (agency costs) are likely to hide information about their more (less) profitable segments. The mean comparison of pre- and post-ROA indicates that PC firms' operating performances fell by 1.39%, whereas AC firms' operating performances improved by 1.42%. These findings are consistent with both hypothesis H1b, which predicts that the disclosure of proprietary information can erode the competitive advantage enjoyed by some firms, and hypothesis H2b, which predicts that increased segment disclosurescan enhance external monitoring and thus improve operating performance. Based on these results alone, however, I cannot rule out other alternative explanations. For instance, these findings are also consistent with the long-horizon mean reverting character of annual earnings documented by Lipe and Kormendi (1994).

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Panel B of Table 1-4 reports results for the control group, i.e. lobbying firms that remain as single-segment companies after the final adoption of SFAS 131. The final standard was revised and thus differs from the original proposal on which firms commented. As a result, some lobbying firms continued to report as single-segment companies under the new standard. One caveat of this test is the small sample size, which limits the power of my statistical tests. Out of 105 PC firms, there are 10 such single-segment lobbying firms. Nevertheless, this is unique counterfactual data despite the caveat of sample size. Note that unlike multi-segment PC firms, single-segment PC firms were able to maintain their high operating performance under the new standard, which mitigates the concern that the results reported in Panel A are due to earnings reversal.

Multivariate Regression Model

To control for firm-specific and industry-level characteristics, I use the following multivariate regression models to test for changes in operating performance around the development and adoption of SFAS 131:

$$ROA_{it} = \alpha_0 + \alpha_1 POST131_{it} + \alpha_2 PC_{it} + \alpha_3 PC_{it} * POST131_{it} + \alpha_4 Size_i + \alpha_5 BTM_i + \alpha_6 Leverage_i + \alpha_7 Con4_i + \alpha_8 Profit\_Adj_i + \alpha_9 AvgInv_i + e \quad (1\text{-}4)$$

$$ROA_{it} = \beta_0 + \beta_1 POST131_{it} + \beta_2 D_{treated} + \beta_3 D_{treated} * POST131_{it} + \beta_4 Size_i + \beta_5 BTM_i + \beta_6 Leverage_i + \beta_7 Con4_i + \beta_8 Profit\_Adj_i + \beta_9 AvgInv_i + e \quad (1\text{-}5)$$

Regression model (4) explores the cross-sectional variations among lobbying firms that were affected by the regulation change (treated group). Thus, lobbying firms that reported as single-segment companies during the post-131 period are excluded. The dependent variable, *ROA*, is return on assets. *POST131* is an indicator variable, which equals 1 for the post-131 period (i.e. 1994-1995) and 0 for the pre-131 period (i.e.

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1999-2000). *PC* equals 1 for multi-segment PC firms and 0 for multi-segment AC firms. The variable of interest is the interaction term *PC***POST131*, and I expect the coefficient α_3 to be negative.

Regression model (5) explores the variations among PC firms.[9] It uses single-segment PC firms (untreated) as controls for the multi-segment ones (treated) in a difference-in-difference analysis. This approach assumes that the lobbying firms that raised concerns about competitive harm in their comment letters would be adversely affected to a similar extent if they were all forced to disclose business segments under the proposed new standard (i.e. the parallel trend assumption). The indicator variable $D_{treated}$ equals 1 for multi-segment PC firms and 0 for single-segment ones. The variable of interest is the interaction term $D_{treated}$**POST131*, and I expect the coefficient β_3 to be negative.

The control variables in Models (4) and (5) are the same. I control for the natural logarithm of the firm's 1995 fiscal year-end market value of equity, denoted *Size*. There is no consensus on the effects of size in the prior literature; hence I have no directional prediction. I control for book-to-market ratio, denoted *BM*. All else being equal, I expect firms with a smaller book-to-market ratio (i.e. higher growth potential perceived by the market) to have better operating performance. The third firm-specific characteristic I control for is *Leverage*, measured as total liabilities divided by total assets.

[9] Parallel tests comparing multi-segment with single-segment AC firms are desirable. As a practical matter, there are insufficient observations (only two AC firms that remained as single-segment companies after the adoption of SFAS 131).

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I then include three industry-level controls. The industry classification is based on firms' two-digit SIC codes. Following prior literature (e.g., Harris 1998), industry concentration can be estimated with m-firm concentration ratios as follows:

$$m\text{-}firm\ concentration\ ratio = \sum_{i=1}^{m}[s_i/S] \quad (1\text{-}6)$$

where:

s_i = firm *i*'s sales;
S = the sum of sales, s_i, for all firms in the industry;
s_i/S = firm *i*'s market share;
m = the largest *m* firms in the industry.

The speed of adjustment for positive abnormal profits within each industry can be estimated as the persistence of return-on-assets above the industry mean through the following equation:

$$X_{ijt} = \beta_{0j} + \beta_{1j}(D_n X_{ijt\text{-}1}) + \beta_{2j}(D_p X_{ijt\text{-}1}) + e_{ijt} \quad (1\text{-}7)$$

Where:

X_{ijt} = firm *i*'s ROA minus the mean ROA for its industry *j* in year *t*;
D_n = 1 if $X_{ijt\text{-}1}$ is negative or zero, 0 otherwise;
D_p = 1 if $X_{ijt\text{-}1}$ is positive, 0 otherwise.

The coefficient, β_{2j}, captures the persistence of positive abnormal ROA in industry *j*. I control for the four-firm concentration ratio, denoted *Con4*, and the slope estimation β_{2j} from Equation (5), denoted as *Profit_Adj*.[10] I expect firms that operate in highly concentrated industries to have higher ROA. The third industry-level control

[10] The results are similar to those reported if I measure industry concentration using the Herfindahl index.

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variable is the average industry investment level, denoted as *AvgInv*, to capture industry-wide growth opportunities.

The first three columns of Table 1-5 report estimations of Equation (4). The interaction term tests whether the impact of SFAS 131 on multi-segment PC firms is the same as the impact on multi-segment AC firms. Column 1 reports the results for the base model. Columns 2 and 3 augment the base model by including firm-specific and industry-specific control variables. Consistent with the univariate results that PC (AC) firms experienced deteriorated (improved) operating performance, the coefficient on the interaction term, *PC*POST131*, is highly significantly negative in all three specifications (t-stat ranges from -9.21 to -9.76).[11] The coefficient on *PC* in Column 1 is highly significantly positive (t = 13.44), implying that, overall, the PC firms tend to have higher ROA. When I control for firm-specific characteristics (*Size*, *BM*, and *Leverage*), the coefficient on *PC* is still significantly positive, but the difference in ROA between PC and AC firms drops from 3.8% to 1.2%. The coefficient on *POST131* is significantly positive after I control for firm- and industry-specific characteristics (t = 7.30), suggesting that treated AC firms experienced better operating performance following the adoption of SFAS 131. The results for the control variables are generally consistent with my expectations: firms with a lower *BM* ratio and firms that operate in high-concentration industries tend to have a higher return on assets.

[11] T-statistics are based on standard errors clustered by year. Note that with the cluster option, the degrees of freedom are greatly reduced; therefore, the p-values calculated using a t-distribution will be larger than the p-values calculated using a normal distribution. Robustness analysis shows that the results are similar if using non-clustered OLS estimation.

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The three remaining columns of Table 1-5 report results from estimations of Equation (5), which investigates the impact of SFAS 131 on multi-segment PC firms using unaffected single-segment PC firms as controls. The tests mirror Panel A's structure and the results for the control variables are generally the same. The coefficient on the interaction term, $D_{treated}$*POST131*, is negative and statistically significant in all three specifications. The magnitude of the coefficient is about -1.8%. Given that the pre-SFAS 131 average ROA for multi-segment PC firms is 7.6%, the decline of operating performance is economically significant as well. In contrast, the coefficient on *POST131* is insignificant with a positive sign, indicating that single-segment PC firms have relative stable operating performance before and after SFAS 131. Taken together, the results suggest that return on assets declined after the implementation of SFAS 131 for treated multi-segment PC firms but not for untreated single-segment PC firms. Hence the results using the subsample of PC firms are consistent with those reported in Columns 1-3 and with hypothesis H1b.

Additional Analyses

The above analyses focus on lobbying firms and the cross-sectional relation between changes in operating performance and lobbying behavior within the lobbying sample. In this section, I compare lobbying firms with a matched sample of non-lobbying firms.

Identifying matched control samples is challenging. First, matching algorithms vary and choosing among them involves subjective judgment. A common approach is to match sample firms to control firms by industry and firm size (e.g., Barber and Lyon 1996; Lo 2003). Propensity score matching is gaining popularity and permits matching along a large number of dimensions (e.g., Rosenbaum and Rubin 1983; also see

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Tucker 2010 for a review). For segment reporting studies in particular, researchers typically use no-change firms as controls, for example, firms reported as single-segment firms before and after the adoption of SFAS 131 (e.g., Botosan and Stanford 2005) or firms that reported the same number of segments under both regimes (e.g., Berger and Hann, 2002; Berger and Hann 2003). These approaches are in the same spirit as my analysis of multi- vs. single-segment PC firms. Note that industry-wide effects, if any, are not controlled using this approach.

Second, my lobbying sample is rather small and the matching process may cause further sample attrition. Note that there is a trade-off between the match accuracy and the possibility of successful matching. The more matching criteria imposed, the less likely one is to find a matched firm. To increase the likelihood of matching, criteria must be relaxed and accuracy will be sacrificed to a certain degree.

Third, the adoption of SFAS 131 may have had an industry-wide impact on firms' operating performance if it influenced the disclosure of proprietary information. As discussed previously, lobbying firms argued in the letters that mandatory disclosure of proprietary segment information will put US *public* firms at a competitive disadvantage to private or foreign competitors. Using a proprietary dataset on private firms, Chapter 2 conducts an industry-level public vs. private analysis and finds that the public firms did, in fact, lose market share to the private firms in lobbying industries, but not in other

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industries.[12] When matching on industry and size using Compustat data, lobbying and matched non-lobbying samples will be public firms and have the same industry membership. Note that the primary goal of including a control sample is to account for changes unrelated to the object of study, the adoption of SFAS 131 in this case. To the extent that public firms from the same industry were all affected by the new standard, a matched sample based on industry does not provide an effective control.

Nevertheless, to mitigate the concern that industry-wide trends unrelated to the adoption of SFAS 131 led to the results in Table 1-5, I report results that use a non-lobbying control sample matched on industry and size in this section. The underlying assumption is that lobbying firms should be, on average, most affected by the new regulation. To the extent that control firms were also affected, it will work against finding the hypothesized results.The matching algorithm strictly follows Lo (2003).[13] Of 128 lobbying firms, three PC firms and two AC firms could not be matched. Unreported

[12] Chapter 1 focuses on the cost of disclosing proprietary information only. A lobbying industry is defined based on the industry membership of opposing lobbying firms that explicitly raised the concern of proprietary cost. AC firms are not considered in that study.

[13] The details of the matching algorithm are summarized as follows:

1. For each comment letter firm *i*, identify the SIC code.
2. Calculate the size distance (*Distance* (*i*,*j*)) between firm *i* and every non-lobbyer *j* with the same four-digit SIC. *Distance* (*i*,*j*) is defined as |ln(*MV*(*i*) – ln(*MV*(*j*))|. Such a definition is insensitive to the ordering of the comparison.
3. Select the j that minimized *Distance* (*i*,*j*). Denote this firm as *j**.
4. If *Distance* (*i*,*j**) ≤ ln(4), then firm *j** is selected as a match and removed from the list of potential match firms.
5. If *Distance* (*i*,*j**) >ln(4), then no matching firm is identified.
6. Within each SIC group, the algorithm begins with the smallest firm so that the best overall match obtains in terms of proximity on a dollar basis.
7. Steps 2–5 are repeated at the three- and two-digit SIC levels for the remaining unmatched comment letter firms.

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results show that the matching procedure was successful at matching firms on size, leverage, and book-to-market ratio.

Table 1-6 reports multivariate regression results. The indicator variable *Lobbyer* equals 1 for the comment letter sample and 0 for the control sample. Berger and Hann (2002) find that firms that were most likely to aggregate segment information under SFAS 14 did not experience a decline in abnormal profits after the adoption of SFAS 131 and conclude that the proprietary information revealed did not result in competitive harm. For comparison purposes, results using the *pooled* sample are reported in Column 1. Similar to Berger and Hann (2002), I find that the coefficient on *Lobbyer*POST131* is insignificant, which seems to imply that SFAS 131 had no impact on lobbying firms' performance; however, when separating firms with different motives and conducting tests for PC and AC firms respectively, the hypothesized opposite impacts appear. Column 2 reports an estimation using PC firms and corresponding control firms. Consistent with hypothesis H1b, the coefficient on *Lobbyer* is significantly positive (t = 26.64), suggesting that relative to their industry peers, PC firms had better operating performance before the regulation change, whereas the coefficient on *Lobbyer*POST131* is significantly negative (t = -4.22), suggesting that the profitability of PC firms declined. Column 3 reports an estimation using AC firms and corresponding control firms. Consistent with hypothesis H2b, the coefficient on *Lobbyer* is significantly negative (t = -4.17), suggesting that relative to their industry peers AC firms had poor operating performance before the regulation change, whereas the coefficient on *Lobbyer*POST131* is significantly positive for the AC sample (t = 2.53), suggesting that their performance was improved afterward. Furthermore, it is noteworthy that matched

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control firms for PC firms (same industry and similar in firm size) also experienced a significant decline in profits after the adoption of SFAS 131 (coefficient on *POST131* = -0.010, t = -13.72). This is consistent with the findings in Chapter 2 that the impact of mandatory disclosure of proprietary information on firms' profits tends to be industry wide.

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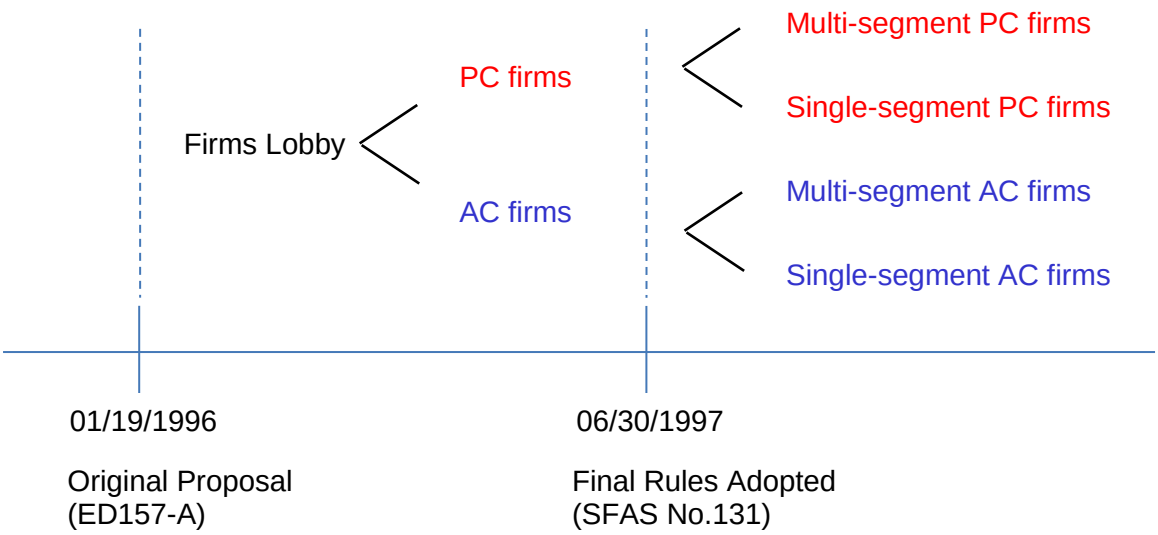

Figure 1-1. Timeline for SFAS No. 131 and Partitioning of Lobbying Firms.
The first step of sample partition is based on lobbying firms' comment letter content. Proprietary cost (PC) motive firms are those that lobbied against the ED and explicitly raised the concern of proprietary cost in their comment letters. Agency cost (AC) motive firms are those that lobbied against the ED but did not express the concern of competitive harm. The second step of sample partition is based on the number of segments reported by the lobbying firms after they adopted SFAS 131. PC (AC) firms are further partitioned into multi-segment and single-segment PC (AC) firms.

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Table 1-1. Descriptive Statistics on Content of Comment Letters and Sample Selection

Panel A: Comment letter sample and their lobbying positions (n=221)

	Lobbying position			
Categories	Against	Comment	Support	Total
Industrials	129	7	2	138
	93.48%	5.07%	1.45%	
Banking, Utilities, and Insurance	28	13	4	45
	62.22%	28.89%	8.89%	
Public Accounting	4	8	6	18
	22.22%	44.44%	33.33%	
Securities industry	0	0	5	5
	0.00%	0.00%	100.00%	
Others	3	7	5	15
	20.00%	46.67%	33.33%	
Total	164	35	22	221
	74.21%	15.84%	9.95%	

Panel B: Sample selection

Total comment letters	221
Comment letters with no matched GVKEY	– 53
Total number of firms that submitted comment letters on the ED	168
Firms not found on CRSP database or have missing SIC code	– 24
Number of comment letter firms	144
Number of comment letter firms that opposed the ED (used in market reaction and operating performance analyses)	128

Panel A of this table summarizes the composition of comment letter sample firms and their lobbying positions. Five firms in the securities industry include S&P, S&P's Compustat, David Norr Inc., AIMR, Lark Research, Inc. Others include academics, government agencies, and individuals. Panel B summarizes the results of the sample selection procedure.

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Table 1-2. Classification of PC and AC Firms and Descriptive Statistics

Panel A: Cross-tabulation of objections to proposal (n=144)

	Object1	Object2	Object3	Object4	Object5	Object6	Object7	Object8	Object9	Oppose
Object1	29									
Object2	15	54								
Object3	16	31	61							
Object4	9	17	20	49						
Object5	5	11	10	20	26					
Object6	15	21	31	15	9	45				
Object7	21	40	47	31	15	37	83			
Object8	25	50	50	35	16	37	69	110		
Object9	11	21	27	28	12	24	35	49	65	
Oppose	28	52	61	45	23	44	81	105	61	128

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Table 1-2. Continued

Panel B: Financial statistics for the PC and AC motive firms (for 1995 fiscal year-end)

	N	Mean	STDEV	Q1	Median	Q3
PC motive firms						
Total Assets ($ millions)	105	17,616	44,170	1,757	5,380***	14,413
Book value of equity ($ millions)	105	3,327**	3,955	734	1,657**	4,434
Market value of equity ($ millions)	105	10,732	14,190	2,021	4,161	14,545
Book-to-market equity	105	0.41**	0.24	0.24	0.37**	0.57
Leverage	105	0.62	0.17	0.52	0.60	0.73
Return-on-assets (%)	105	7.99**	7.32	4.01	7.12***	9.72
AC motive firms						
Total Assets ($ millions)	23	33,541	53,628	5,816	15,415	34,330
Book value of equity ($ millions)	23	5,508	5,420	2,398	3,566	7,273
Market value of equity ($ millions)	23	12,962	11,920	4,433	9,092	20,427
Book-to-market equity	23	0.53	0.22	0.35	0.58	0.62
Leverage	23	0.67	0.17	0.56	0.65	0.80
Return-on-assets (%)	23	4.59	3.77	1.89	3.36	7.31

Diagonal cells in Panel A indicate the total number of each type of objection. Off-diagonal entries show the number of instances in which both types of objections were raised by the firm. Panel B presents the descriptive statistics for the PC and AC firms. The PC firms are those that lobbied against the Exposure Draft and explicitly raised the concern of proprietary cost in their comment letters. The AC firms are those that lobbied against the Exposure Draft but did not express concerns about competitive harm. ***, **, * indicate two-tail significance for between sample differences, at the 1%, 5%, and 10% levels, respectively, using two-sample *t*-test (for mean) and two-sample Wilcoxon rank sum test (for median).

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Table 1-3. Abnormal Stock Market Reactions around the Event Window

Panel A: Stock returns

		ABS_MAR		DIR_MAR					
		All firms (n=128)		PC firms (n=105)		AC firms (n=23)		Difference	
		(1)	(2)	(3)	(4)	(5)	(6)		
[-1, +1] three-day event window									
	# Days	Mean	t-stat	Mean	t-stat	Mean	t-stat	Mean	t-stat
ED	3	1.26***	4.60	**-0.74*** **	**-2.78**	0.38	0.76	**-1.11***	**-1.82**
Adoption	3	1.17***	4.84	0.14	0.69	-0.28	-0.54	0.42	0.86
	# Days	Median	z-stat	Median	z-stat	Median	z-stat	Median	z-stat
ED	3	0.67***	4.19	**-0.51*** **	**-3.01**	0.52	0.49	-1.03	-1.56
Adoption	3	0.48***	3.67	0.02	0.64	-0.41	-0.64	0.43	0.86
[-2, +2] five-day event window									
	# Days	Mean	t-stat	Mean	t-stat	Mean	t-stat	Mean	t-stat
ED	5	1.54***	4.19	**-0.93*** **	**-3.02**	0.96	1.29	**-1.89** **	**-2.55**
Adoption	5	1.33***	4.66	0.07	0.34	-0.06	-0.09	0.13	0.24
	# Days	Median	z-stat	Median	z-stat	Median	z-stat	Median	z-stat
ED	5	0.64***	3.36	**-0.92*** **	**-3.21**	0.17	0.88	**-1.09** **	**-2.06**
Adoption	5	0.90***	3.61	-0.17	-0.20	0.38	-0.46	-0.55	0.20

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Table 1-3. Continued

Panel B: Share turnover

		ABN_TURN		ABN_TURN					
		All firms (n=128)		PC firms (n=105)		AC firms (n=23)		Difference	
		(1)	(2)	(3)	(4)	(5)	(6)		
[-1, +1] three-day event window									
	# Days	Mean	t-stat	Mean	t-stat	Mean	t-stat	Mean	t-stat
ED	3	1.59***	5.26	1.54***	4.47	1.84***	2.96	-0.30	-0.38
Adoption	3	3.77***	6.49	3.83***	5.81	3.50***	2.91	0.33	0.22
	# Days	Median	z-stat	Median	z-stat	Median	z-stat	Median	z-stat
ED	3	0.96***	5.17	0.96***	4.49	1.84***	2.49	-0.88	0.80
Adoption	3	1.53***	6.16	1.53***	5.43	1.54***	2.95	-0.02	0.27
[-2, +2] five-day event window									
	# Days	Mean	t-stat	Mean	t-stat	Mean	t-stat	Mean	t-stat
ED	5	2.47***	5.57	2.41***	4.80	2.71***	2.96	-0.30	-0.26
Adoption	5	5.61***	6.47	5.80***	5.80	4.78***	2.98	1.02	0.45
	# Days	Median	z-stat	Median	z-stat	Median	z-stat	Median	z-stat
ED	5	1.41***	5.16	1.39 ***	4.48	2.12***	2.52	-0.73	0.82
Adoption	5	2.22***	5.80	2.25 ***	5.14	1.81***	2.92	0.44	0.23

Panel A reports the market-adjusted *absolute* return (ABS_MAR) for all the opposing firms in Columns 1-2 and the market-adjusted *directional* return (DIR_MAR) for PC firms and AC firms in Columns 3-4 and 5-6, respectively. Panel A Column *Difference* is Column 3 minus Column 5. It reports the results from the test that the market reaction for PC firms is the same as the market reaction for AC firms. Panel B mirrors Panel A's structure but focuses on abnormal turnover (ABN_TURN). ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively.

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Table 1-4. Difference-In-Difference Estimates of the Impact of SFAS No. 131 on PC and AC Firms' Operating Performance

	Before Issuance of ED	After Adoption of SFAS No.131	Time Difference
Panel A: lobbying firms that operate as multi-segment companies after adoption			
PC firms	7.59% (0.006) [190]	6.20% (0.007) [157]	-1.39% (0.009)
AC firms	3.79% (0.008) [42]	5.21% (0.009) [35]	1.42% (0.012)
Group difference at a point in time:	3.79% (0.014)	0.99% (0.015)	
Difference-in-difference		-2.81% (0.021)	

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Table 1-4. Continued

	Before Issuance of ED	After Adoption of SFAS No.131	Time Difference
Panel B: lobbying firms that remain as single-segment companies after adoption			
PC firms	12.56% (0.028) [20]	12.88% (0.020) [20]	0.31% (0.034)
AC firms	10.09% (0.002) [4]	8.54% (0.013) [4]	-1.56% (0.013)
Group difference at a point in time:	2.47% (0.064)	4.34% (0.045)	
Difference-in-difference		1.87% (0.078)	

Cells contain mean return-on-assets for the group identified. Standard errors are given in parentheses; sample sizes (firm-years) are given in square brackets. Panel A reports results on treatment firms, i.e. lobbying firms that operate as multi-segment companies after adoption. PC firms are those that explicitly raised the concern of the proprietary cost in their comment letter, whereas AC firms are those that lobbied against the ED but did not explicitly voice concerns of competitive harm. Panel B reports results on the control group, i.e. lobbying firms that remain as single-segment companies after final adoption of SFAS No. 131.

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Table 1-5. Multivariate Analyses of the Impact of SFAS No. 131 on Lobbying Firms' Operating Performance

	Multi-segment PC vs. AC			Multi- vs. Single-segment PC		
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	0.038***	0.214**	0.198**	0.126***	0.278**	0.280**
	(18.42)	(4.08)	(3.42)	(161.60)	(4.47)	(4.34)
PC	0.038***	0.012*	0.011*			
	(13.44)	(2.55)	(2.36)			
PC*POST131	-0.028***	-0.030***	-0.031***			
	(-9.76)	(-9.42)	(-9.21)			
$D_{treated}$				-0.050***	-0.032***	-0.038***
				(-32.33)	(-7.04)	(-7.00)
$D_{treated}$*POST131				-0.017**	-0.020**	-0.018**
				(-3.19)	(-4.32)	(-3.96)
POST131	0.014***	0.014***	0.016***	0.003	0.003	0.003
	(6.57)	(7.14)	(7.30)	(0.60)	(0.59)	(0.59)
Size		-0.000	-0.001		0.002	0.000
		(-0.24)	(-0.57)		(0.58)	(0.21)
BM		-0.125***	-0.131***		-0.142***	-0.161***
		(-6.39)	(-5.87)		(-6.05)	(-6.08)
Leverage		-0.150**	-0.181**		-0.200**	-0.251**
		(-3.82)	(-4.50)		(-3.65)	(-4.38)
Con4			0.107***			0.149***
			(7.65)			(15.76)
Profit_Adj			-0.010			-0.019**
			(-2.19)			(-3.58)
AvgInv			0.009*			0.012*
			(2.37)			(2.78)
Observations	424	424	424	387	387	387
R-squared	0.021	0.224	0.269	0.043	0.290	0.356

Columns 1-3 report the results of the test that the impact of SFAS No. 131 on multi-segment PC firms is the same as the impact on multi-segment AC firms. Columns 4-6 report the results of the test that investigates the impact of SFAS No. 131 on multi-segment PC firms using the unaffected single-segment PC firms as controls. The dependent variable is return on assets. *PC* equals 1 for multi-segment PC firms and 0 for multi-segment AC firms. $D_{treated}$ equals 1 for multi-segment PC firms and 0 for single-segment PC firms. t-statistics in parentheses are based on standard errors clustered by year. ***, ** and * indicate significance at the 1%, 5%, and 10% -levels, respectively.

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Table 1-6. Additional Analyses on the Impact of SFAS No. 131 on Lobbying Firms' Operating Performance

	All opposing lobbying firms Vs. Control	PC firms Vs. Control	AC firms Vs. Control
Constant	0.126**	0.124**	0.202**
	(4.80)	(3.82)	(5.13)
POST131	-0.012**	-0.010***	-0.031
	(-5.17)	(-13.72)	(-1.75)
Lobbyer	0.009**	0.015***	-0.037**
	(4.21)	(26.64)	(-4.17)
Lobbyer *POST131	0.001	-0.007**	0.043*
	(0.45)	(-4.22)	(2.53)
Size	0.007**	0.008***	-0.003
	(5.56)	(16.62)	(-0.48)
BM	-0.086***	-0.103***	-0.020
	(-22.75)	(-7.84)	(-0.45)
Leverage	-0.153**	-0.151**	-0.163*
	(-3.28)	(-3.64)	(-2.85)
Con4	0.020	0.024*	0.025
	(2.12)	(2.69)	(0.89)
Profit_Adj	-0.003	-0.008	0.014
	(-0.56)	(-1.86)	(0.53)
AvgInv	0.000	0.000	-0.000
	(0.63)	(1.32)	(-0.77)
Observations	787	653	134
R-squared	0.168	0.181	0.235

Column 1 reports the regression result using all the opposing firms, whereas Columns 2 and 3 report the results for PC and AC firms, respectively. *Lobbyer* equals 1 for comment letter sample and 0 for the non-lobbying control sample matched on industry and size. t-statistics in parentheses are based on standard errors clustered by year. ***, ** and * indicate significance at the 1%, 5%, and 10% levels, respectively.

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CHAPTER 2
DISCLOSURE REGULATION AND THE COMPETITION BETWEEN PUBLIC AND PRIVATE FIRMS: THE CASE OF SEGMENT REPORTING

Introduction

This paper is motivated by the broad research question of to what extent financial disclosure should be regulated or left to market forces (Watts and Zimmerman 1986; Easterbrook and Fischel 1991; Ball 2008). Accounting standards have proliferated since the securities regulation in the 1930s. Extensive disclosure regulation and enforcement are often viewed as cornerstones of US capital markets (Levitt 1998). Critics, however, are concerned about the regulatory burden of increasing disclosure requirements on US public companies (Hepp and McRae 1982; AICPA 1983; Seidler 1990).[1] A prominent alleged cost of disclosure regulation is that mandated disclosures may lead to the revelation of proprietary information, which could negatively affect a disclosing firm. Despite decades of debates, this claim is empirically underexplored because of the difficulty of identifying and measuring proprietary disclosure costs.[2] In this study, I use a lobbying approach and data on private firms to empirically test whether mandatory

[1] In 1990, SEC Chairman Richard Breeden proposed an initiative to "reexamine US accounting standards in light of the effect they might have in hampering the international competitiveness of US companies and securities markets" (FASB 1991, 49-58). On February 16, 2012, the House Financial Services Committee passed the "SEC Regulatory Accountability Act," which requires the Securities and Exchange Commission (SEC) to conduct cost-benefit analyses for a new rule to be adopted and periodic reviews on all of its existing regulations.

[2] Prior studies have investigated extensively the impact of proprietary costs on firms' voluntary disclosure decisions (e.g., Harris 1998; Berger and Hann, 2003; Botosan and Stanford 2005; Bens et al. 2011). However, there is little evidence on whether and to what extent mandatory disclosures cause firms to disclose proprietary information.

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disclosure of proprietary information causes competitive harm to US public firms relative to US private firms.

To test whether mandatory disclosure reduces the competitiveness of US public firms, I use the change in US segment disclosure rules from SFAS No. 14 to SFAS No. 131 in 1997 as a natural experiment. The segment disclosure setting provides two appealing features for testing the effect of disclosure regulation on public vs. private competition. First, segment information is commercially sensitive and managers of public firms are reluctant in many cases to disclose such information voluntarily. Prior research finds that managers concealed line-of-business information under SFAS 14 primarily because of proprietary disclosure costs (Harris 1998; Botosan and Stanford 2005). The new segment reporting rules in SFAS 131 induced firms to reveal previously hidden segment information (Street et al. 2000; Herrmann and Thomas 2000; Berger and Hann 2003). Companies lobbied vigorously against the proposed Exposure Draft of SFAS 131 (Ettredge et al. 2002). In letters submitted to the FASB, lobbying firms argued that the proposed *management approach* would put US public firms at a competitive disadvantage to private or foreign competitors who are exempt from this reporting requirement.[3] They insisted that, given the unknown costs and benefits of the regulation, it would be better to give firms the option to use the management approach

[3] Under SFAS 14, reportable segments are determined by grouping products and services by industry lines, with the industrial classification left to the judgment of management. Under SFAS 131, reportable segments are determined based on the way that management disaggregates the firm internally for making operating decisions and assessing performance. This method is referred to as the management approach. FASB expected that this new approach would provide financial statement users with a view of the company "through the eyes of management" (FASB 1996).

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so that the market, rather than regulators, could determine segment disclosure practices.[4] The induced change in disclosure practices, along with the opposition from firms in the standard setting process, makes the change of the segment reporting rules an attractive setting to explore the potential competitive harm imposed by disclosure regulation.

The second appealing feature of the segment reporting setting is that the value of segment information to rival firms, and therefore proprietary disclosure costs, depends on industry-specific competitive environment. Accordingly, I identify lobbying industries based on constituent comment letters on the Exposure Draft and expect them to incur higher proprietary disclosure costs under the new standard relative to non-lobbying industries. Prior studies that use the lobbying approach to identify cross-sectional variation usually compare lobbying firms with a matched non-lobbying control group; however, because lobbying firms are expected to be most affected by the proposed regulatory change, it is unclear from the firm-level tests whether the effects of a regulated change are limited to a small group of lobbying firms.[5] In contrast, I consider all public firms from a given industry as a whole and conduct empirical tests at the

[4] For example, one comment letter submitted to the FASB states that, "If the FASB believe the 'benefit' cited by the analysts for the management approach, then those benefits would be achieved by companies even if the management approach were allowed as an alternative to the FAS 14 […]. If this is the benefit of the management approach, let the market forces determine which is the more meaningful disclosure."

[5] Similarly, studies on going-private decisions find that small firms seem particularly sensitive to increased disclosure requirements (Bushee and Leuz 2005; Engel et al. 2007). These studies provide evidence on the effects of disclosure regulation on firms that are close to the public/private margin, which may not be generalizable to other firms. Overall, firm-level tests inform us how mandated disclosure differentially affects individual firms but generally cannot provide insights into the aggregate effects of disclosure regulation.

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industry level. I collect public and private firms' annual sales from LexisNexis Corporate Affiliations database, construct a measure for aggregate public firm market share, and examine whether public firms in lobbying industries lose market shares in aggregate relative to those in non-lobbying industries. Thus, unlike prior research that focuses on firm-level effects of disclosure regulation, the industry-level variation of this setting allows me to examine the aggregate effects of regulation.

I examine whether segment reporting regulation affects the competition between public and private firms in two steps. First, I investigate the characteristics of lobbying industries. I find that opposition to SFAS 131 is concentrated in the manufacturing sector (SIC 2000-3999) and that the likelihood of being a lobbying industry is higher if prior to SFAS 131 public firms collectively controlled a larger market share, enjoyed more persistent abnormal profits, but faced more private competitors. Further, consistent with disclosure being more costly for firms with proprietary information, I find that lobbying industries, on average, had higher R&D activities. Overall, these findings suggest that the competitive harm cited in the comment letters as a cost of detailed segment reporting arises in part from public firms' desire to protect their profits and market shares in the product markets.

Second, I examine changes in market share competition following the implementation of SFAS 131. I use two years before the announcement of the Exposure Draft and two years after the implementation of SFAS 131 to study the impact of the new standard. Using the difference-in-difference method, I find that after the adoption of the new standard, public firms did, in fact, lose market shares to private firms in lobbying industries relative to non-lobbying industries. Further, I use two continuous

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variables to capture the lobbying intensity: the number of lobbying firms and the percentage of all Compustat public firms in a given industry that lobbied. I find that the competitive harm to public firms is larger for industries with higher lobbying intensity.

My study makes three contributions. First, it responds to Leuz and Wysocki (2008) and Berger's (2011) calls for an investigation of the real and macro-level economic consequences of disclosure regulation. Leuz and Wysocki (2008) survey the theoretical and empirical literature on the economic consequences of financial reporting and disclosure regulation and find that most studies focus primarily on the economic consequences to firms, but offer little evidence on market-wide effects of disclosure regulation.[6] My study conducts industry-level analyses and provides empirical evidence on the macro-level economic consequences of disclosure regulation.

Second, this study contributes to the segment disclosure literature by providing empirical evidence on a highly controversial yet unexplored consequence of SFAS 131: competitive harm to publicly traded companies. Prior research documents the effects of SFAS 131 on the information environment (e.g., Botosan and Stanford 2005; Berger and Hann 2003). My results suggest that the mandatory disclosure of segment information under the management approach appears to alter the competition between

[6] Leuz and Wysocki (2008) use the term "market-wide effects" to mean "effects that go beyond a single firm." It could be "a group of firms, an entire industry, and/or all firms in the economy."

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public and private firms. This is perhaps an unintended consequence of the change in segment reporting.[7]

Finally, this paper extends the literature on proprietary disclosure costs. Prior studies typically use industry concentration ratios as a proxy for industry competition and, therefore, proprietary disclosure costs. Recent research has raised concerns about the internal validity of these proxies (Ali et al. 2009; Dedman and Lennox 2009). For example, Ali et al. (2009) show that industry concentration measures based on Compustat data, which exclude private companies, are poor proxies for industry competition and may produce erroneous results. My approach, which measures proprietary costs using lobbying activities, is an attractive alternative because the identification is based on the explicitly expressed concerns of competitive harm in the comment letters.

The rest of the paper is organized as follows. Section 2.2 reviews related literature and develops hypotheses. Section 2.3 describes the sample and data. Section 2.4 examines the characteristics of lobbying industries and Section 2.5 examines the impact of SFAS 131 on the market share competition between public and private firms. Section 2.6 is the conclusion.

[7] Note that although an investigation of changes in competition between public and private firms provides evidence on costs and benefits of regulation, this study does not explore the social welfare implication of regulatory changes. For example, while this study focuses on the potential competitive harm to public firms (i.e., the disclosing firms), Badertscher et al. (2013) hypothesize and find that private firms are more responsive to investment opportunities in industries with greater public firm presence, suggesting positive externalities of disclosures provided by public firms.

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Prior Studies and Hypotheses Development

Disclosure Regulation and the Public/Private Tradeoff

The costs and benefits of disclosure regulation are far from clear from both theoretical and empirical perspectives (e.g., Healy and Palepu 2001; Leuz and Wysocki 2008).[8] One stream of literature uses firms' going-private decisions to examine the net costs or benefits of a regulatory change and documents significant "crowding out" effects of disclosure regulation (e.g., Bushee and Leuz 2005; Engel, Hayes, and Wang 2007; Leuz, Triantis, and Wang 2008). For example, Bushee and Leuz (2005) examine a regulatory change that mandated OTCBB firms to comply with SEC disclosure requirements. They document that over 2,600 (76%) of the firms not previously filing with the SEC decided to delist from the OTCBB to avoid compliance. In a similar vein, some studies examine the net costs or benefits of a regulatory change using size-based exemptions provided in the standard. For example, Gao et al. (2009) find that granting postponed compliance of SOX based on a size cutoff provides incentives for firms to take real actions to stay small (e.g., cut investment and forgo profitable growth opportunities). Their findings suggest that the costs of compliance are nontrivial.

Overall, these studies provide evidence on the effect of disclosure regulation on firms for which the net benefits of being public are relatively small and firms that are close to the exemption cutoff. It appears that mandatory disclosure requirements

[8] Healy and Palepu (2001, p.415) point out that "empirical research on the regulation of disclosure is virtually non-existent. This is surprising given the central role regulation plays in disclosure, and the limitations of the economic arguments supporting regulation."

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impose substantial costs on some public firms (usually small firms); however, the aggregate costs and benefits of disclosure regulation on US public firms are largely unknown.

Segment Reporting and Proprietary Disclosure Costs

Responding to the criticism about the loose definition of "industry" under SFAS 14 that allowed for diversified companies to aggregate segment information via manager discretion (AIMR 1993, AICPA 1994), the FASB issued the Exposure Draft in 1996. The draft required segment disclosure to be based on management's segmentation of the firm for internal decision-making purposes, i.e., the management approach. The FASB expected the new approach to provide financial statement users with a view of the company "through the eyes of management" (FASB 1996). Many firms lobbied against the proposal, arguing that the proposed segment disclosures would put them at a competitive disadvantage to private and foreign competitors that do not have to disclose proprietary segment information, i.e., allow their competitors to see them "through the eyes of management." Despite the opposition, SFAS 131 became effective for financial statements issued for fiscal years beginning after December 15, 1997.

The focus of the debate between lobbying firms and the FASB, as well as in the literature, is on the proprietary costs of revealing segment information. Verrecchia (1983) points out that the release of a variety of accounting statistics about a firm is potentially costly because other parties may use public information to the disclosing firm's disadvantage. As a result, it is rational for a firm to withhold sensitive information if the news is not sufficiently good to warrant incurring the proprietary costs. Hayes and Lundholm (1996) model firms' choices of the aggregation level in segment disclosure,

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given that such disclosures would be observed by both competitors and the capital market. They demonstrate that under severe competition, firm value is maximized when the firm discloses that all segments have similar performance, which avoids adverse selection in the capital market yet reveals little to rival firms. Consistent with this theoretical model, Harris (1998) finds that managers are reluctant to provide segment disclosures for operations in less competitive industries, which on average earn higher rates of return. Similarly, Botosan and Stanford (2005) identify a group of "change" firms that switched from single-segment to multi-segment upon adoption of SFAS 131 and find that these firms conceal highly profitable segments operating in less competitive industries. Overall, theories and empirical evidence suggest that proprietary costs are the reason for the nondisclosure of segment information.

Several studies have investigated the effectiveness of SFAS 131 and find that the new standard induced firms to reveal previously hidden segment information: more firms provide segment disclosures, more segments are disclosed, and more items are provided for each segment (Street et al. 2000; Herrmann and Thomas 2000; Berger and Hann 2003). Moreover, prior studies also find improved consistency of segment information with information in other sections of the annual reports and improvement in analyst forecast accuracy with the new segment data (Street et al. 2000; Berger and Hann 2003).

While there is a consensus about the effectiveness of SFAS 131 in increasing segment disclosure, it is unclear whether or not the new information resulted in competitive harm to US public firms. Berger and Hann (2002) find that firms that were most likely to aggregate segment information under SFAS 14 did *not* experience a

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decline in abnormal profits after the adoption of SFAS 131 and conclude that the proprietary information revealed did *not* result in competitive harm. Inspired by the notion that managers may also be motivated to hide segments with poor performance (i.e., agency costs of disclosure), I separate lobbying firms that are likely motivated by proprietary costs from those that are likely motivated by agency costs in Chapter 1. The results show that after the adoption of SFAS 131 proprietary costs motive firms experienced deteriorated operating performance, whereas agency costs motive firms experienced improved operating performance. These findings suggest that the null results in Berger and Hann (2002) might be due to the pooling of firms with different nondisclosure motives. Overall, there is some—albeit limited—evidence that mandatory disclosure of segment information causes competitive harm to some public firms that are forced to adopt SFAS 131; however, whether the new segment reporting standard has an industry-wide impact on US public firms remains an open, empirical question.

Hypotheses Development

To test whether mandatory disclosure of segment information under SFAS 131 reduces the competitiveness of US public firms, a natural test is to (1) view the cross-section of and examine the change in market share competition between all public and private firms before and after the adoption of SFAS 131 and (2) validate that the change in competition, if any, is not due to other contemporaneous events or market-wide trends unrelated to the regulation.[9] I exploit industry-level variation in the degree of

[9] A major difficulty in evaluating a mandated change of accounting standard is that we do not have a natural control group (i.e., all publicly traded firms in the economy are affected by the new regulation).

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proprietary disclosure costs to parse out the effects of SFAS 131 from other confounding events.

Defining and measuring proprietary disclosure costs is a challenge.[10] Most studies use product-market-competition-based proxies, such as industry concentration (Cohen; 2002) or the level of R&D expenditures (Ellis, Fee, and Thomas; 2012) to proxy for proprietary costs. An alternative approach is to identify firms that are affected most by the proposed standard changes through an analysis of constituent comment letters, as in most of the lobbying studies (Watts and Zimmerman 1978; Lo 2003; Hochberg et al. 2009; Hodder and Hopkins 2013). A premise of these studies is that the firm-level decision to lobby is a function of the perceived firm-specific economic consequences of the proposed accounting changes, and thus firms tend to lobby more vigorously when they expect more harm. Accordingly, proprietary costs are expected to be higher for firms that lobbied against the Exposure Draft and explicitly raised the concern of competitive harm in their comment letters.

I combine these two approaches and expect lobbying industries to have higher proprietary disclosure costs. Two potential concerns arise about the lobbying approach. One, lobbying firms may not reveal their true motives. For example, Hodder and

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Hence, it is difficult to separate the effects of a regulatory change from other contemporaneous events. For example, Francis, Nanda, and Wang (2006) highlight the concern that changes in the US information environment attributed by prior literature to the effects of Regulation Fair Disclosure (Reg FD) may reflect concurrent changes that are unrelated to the regulation. To control for concurrent shocks, Francis et al. compare US firms with foreign listed firms that are explicitly exempt from Reg FD. They find that changes in the public information environment are likely due to contemporaneous events, rather than to Reg FD.

[10] For example, the FASB asked constituents for specific evidence of competitive harm from disclosing segment information. One responding letter commented that “it is difficult to assess the extent to which disaggregated information may have harmed an enterprise's competitive position, since many factors contribute to business success or failure. Competitors that use an enterprise's segment disclosures to further their own interests are unlikely to acknowledge this fact, and enterprises that have been harmed may not know the reasons.”

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Hopkins (2013) find that banks' responses to the FASB's 2010 Exposure Draft on fair value measurement seem to be motivated by agency problems rather than by the arguments offered in their comment letters. Two, although proprietary costs are often linked to industry-level product market competition, it is unclear whether the firm-level lobbying activities can be extrapolated to measure the potential competitive harm for a given industry. To mitigate these concerns, it is necessary to examine industry characteristics to validate the assumption that lobbying industries face higher disclosure costs. Thus, I use various proprietary cost proxies and expect them to be positively associated with the lobbying based industry classification.

If lobbying industries indeed face higher disclosure costs, I expect that, at the time of release of the Exposure Draft, lobbying industries had a higher proportion of private firms relative to public firms (i.e., public firms faced stiffer competition from private competitors), public firms in lobbying industries had a larger market share and more persistent abnormal profits that they wanted to protect, and that lobbying industries had more commercially sensitive information. Formally, the first hypothesis in the alternative form is as follows:

> **H1**: The likelihood of being a lobbying industry is higher if before SFAS 131 publicly traded firms faced more private competitors, commanded a larger market share, enjoyed more persistent abnormal profits, and had information that is more commercially sensitive.

Researchers and regulators have long been aware that disclosure regulation may result in competitive harm. For example, UK private firms are required to file their accounts with Companies House and, according to the Department of Trade and Industry (DTI), the UK government acknowledges that the disclosure requirements

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imposed on private firms could be costly because the revelation of commercially valuable information to competitors may put UK private firms at a competitive disadvantage since private firms in some other countries (e.g., the US and Japan) do not have to make their financial statements publicly available (DTI, 1995).[11]

While it is widely acknowledged that the revelation of proprietary information may be a negative consequence of mandatory disclosures, existing evidence is insufficient to determine whether proprietary costs are material. On one hand, because lobbying firms are expected to be, on average, most affected by the new regulation, the effects of SFAS 131 may be limited to a small group of lobbying firms. On the other hand, the adverse impact of SFAS 131 on lobbying firms may be just the tip of the iceberg. Thus, whether the competitive position of public firms in lobbying industries was weakened relative to private firms after the implementation of SFAS 131 is an open, empirical question. This leads to my second hypothesis, which is stated in the alternative form as follows:

> **H2**: After the adoption of SFAS 131, public firms lose market share to private firms in lobbying industries relative to industries that did not lobby.

[11] Relatedly, Flower (2004) notes that the difference in disclosure policies may lead to regulatory competition and may affect the relative competitiveness of capital markets. Given that some European countries require private companies to make their financial statements publicly available, Flower (2004, p. 100) points out that ‘‘The [European] requirement to publish accounts is one of the most important of the obligations imposed by governments on enterprises. In general, enterprises are reluctant to reveal much about their affairs in their published accounts for fear of aiding their competitors […]. Since, in a common market, there should be no restrictions on where enterprises may establish themselves, there would be a tendency for enterprises to set themselves up in a member state that offered the most favorable financial reporting regime; that is, the regime that did not require the publication of much significant information.”

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Sample Selection and Data

Lobbying and Non-Lobbying Industries

From the Public Record of the FASB, I collected 221 comment letters submitted in response to the Exposure Draft of SFAS 131. I read through each comment letter and identified its lobbying position as well as the specific objections. The most frequently cited objections are competitive harm and reduced cross-sectional or year-to-year comparability. To isolate the costs of disclosing proprietary information from other potential effects of SFAS 131, I limit my comment letter sample to 105 firms that lobbied against the Exposure Draft and explicitly raised the concern of proprietary costs in their comment letters (hereafter referred to as “lobbying firms”).

Table 2-1 presents lobbying firms’ distribution by two-digit SIC code and compares it to all firms in Compustat. The first two columns show the frequency and percentage for lobbying firms. Lobbying firms are concentrated in the manufacturing sector (SIC 2000-3999), with chemicals and allied products (SIC code 28) and industrial machinery and equipment (SIC code 35) accounting for more than 10 percent of lobbying firms. The middle two columns contain the industry distribution for all firms in Compustat. The last column reports the percentage of lobbying firms to Compustat firms for each industry.

I classify an industry as a lobbying industry if it has at least one lobbying firm and as a non-lobbying industry otherwise. This approach is subject to two limitations. First, lobbying firms are typically multi-segmented entities and have businesses operating across several industries. It is impossible for researchers to determine which segment(s) is (are) the main reason for motivating the firm to lobby against the Exposure Draft. For example, the industry with the two-digit SIC code of 01 has one

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lobbying firm and is classified as a lobbying industry. Close scrutiny of this lobbying firm reveals that it had two segments at the time of lobbying. The first segment has a two-digit SIC code of 01 (agricultural production – crops) and the second segment has a two-digit SIC code of 02 (agricultural production – livestock). If the firm decided to lobby because of its segment operated in industry 02, then my approach misclassifies both industries 01 and 02. Such misclassification adds noise to the tests and works against finding the results. To mitigate the potential misclassification, I include a second measure that requires an industry to have at least two lobbying firms to be classified as a lobbying industry.

The second limitation is that I identify firms that explicitly raised the concern of proprietary costs but cannot observe the specific nature of the competitive harm they anticipate. I examine one specific type of competitive harm: revealing proprietary information to rival private firms. Prior studies, however, suggest that the revelation of a segment that earns high abnormal profits may also put the disclosing firm at a disadvantage in price negotiations with customers and suppliers, and/or draw more attention from regulators. To the extent that not all lobbying firms were motivated by the perceived proprietary costs from private competitors, such misclassification would reduce the power of my tests to find an impact of SFAS 131 on the market competition between public and private firms.

In addition to the dichotomous lobbying variables, I construct two continuous variables to capture the lobbying intensity. The first measure is the number of lobbying firms for a given two-digit SIC industry. As shown in Table 2-1, strong lobbying industries are “28 – chemicals and allied products” and “35 – industrial machinery and

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equipment" with 19 and 12 lobbying firms, respectively. This measure ignores the fact that each two-digit SIC industry has a different number of firms. Accordingly, my second continuous measure, lobbying percentage, scales the number of lobbying firms by the total number of Compustat firms that operate in the same two-digit SIC industry multiplied by 100 (i.e., the last column of Table 2-1). If measured with precision, lobbying percentage is the superior measure for lobbying intensity; however, because of the potential misclassification discussed above, this measure could be a noisy proxy.[12] Thus, analyses in Section 2.5 use both measures.

Private and Public Firms: Data Source and Selection

Privately held firms are an important segment of the US economy and "represent over 99% of all firms and generate over 50% of the private sector GDP in the United States" (Minnis 2011). Despite their obvious importance to the US economy, there is limited research about private firms, primarily due to the lack of data. In this study I obtain the data on private firms from LexisNexis Corporate Affiliations database.[13] The database includes major US public companies traded on NYSE, NASDAQ, and NYSEAMEX, and US private companies with revenue exceeding $1 million, more than

[12] For example, industry "01 – agricultural production crops" has one lobbying firm. The ratio of lobbying firms to Compustat firms is large (5%) because it is a relatively small industry. Industry "28 – chemicals and allied products" has 19 lobbying firms. The percentage is only 3% because it is a large industry. Based on the percentage measure, industry 01 lobbied more intensively than industry 28. Recall, however, that the only lobbying firm from industry 01 has two segments. The first segment has a two-digit SIC code of 01 and the second segment has a two-digit SIC code of 02. If the firm decided to lobby because of its segment operated in industry 02, then industry 01 should be considered as a non-lobbying industry rather than a strong lobbying industry. Due to this potential misclassification, the percentage measure may fail to capture the degree of lobbying.

[13] LexisNexis Corporate Affiliation data is compiled by the LexisNexis Enterprise Entity Management Group. See http://www.corporateaffiliations.com/ for more details.

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300 employees, or substantial assets. The annual coverage updates begin in 1993. It has been used in prior studies to determine private ownership status (Guo, Hotchkiss, and Song 2011; Blouin, Krull, and Robinson 2012) and the parent-subsidiary corporate hierarchy (Ellis, Fee, and Thomas 2012).

I collected companies' financial data for the two years before the announcement of the Exposure Draft (i.e., 1994 and 1995) and the two years after the implementation of SFAS 131 (i.e., 1999 and 2000). Panel A of Table 2-2 reports the sample selection procedure. I start with 123,249 firm-year observations. I limit company type to Parent to avoid double counting. I lose 5,191 observations due to missing the SIC code. Finally, I exclude 7,026 observations with missing annual sales, yielding 45,443 firm-year observations.

Panel B of Table 2-2 reports the descriptive statistics for the available financial measures from LexisNexis. The first (last) four columns report these statistics for private (public) firms. For each variable, the first row is the mean, the second row is the median, and the third row is the number of observations. Except for the number of employees, all measures are in $millions. Using 1995 as an example, the $326 million mean annual sales for the 6,805 private firms equal the combined annual sales of $2.2 trillion. The total number of employees in aggregate amounts to over 7.4 million. Accordingly, the 3,588 public firms have aggregated annual sales of $4.8 trillion and employ over 26.9 million employees.

Determinants of Lobbying

Empirical Model

Hypothesis H1 predicts that public firms from a lobbying industry faced stiffer competition from private competitors at the time of release of the Exposure Draft in

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1996. I measure industry characteristics using 1995 firm-level data and examine the likelihood of being a lobbying industry by estimating the following probit regression:

$$\Pr(Lobby\_Industry_i = 1) = \Phi\,(\beta_0 + \beta_1 PrivPlayer_i + \beta_2 PubMS_i + \beta_3 Con4_i + \beta_4 Profit\_Adj_i + \beta_5 Diversity_i + \beta_6 MB_i + \beta_7 Capital\ Intensity_i + \beta_8 R\&D\ Intensity_i + \beta_9 Intangible_i + e) \quad (2\text{-}1)$$

The dependent variable, *Lobby_Industry*, is a dichotomous variable with a value of 1 if one or more firms in industry *i* lobbied against the Exposure Draft and explicitly raised the concern of competitive harm. Industry classification is based on the two-digit SIC code of the lobbying firms.

The first two explanatory variables measure the competition between publicly traded US firms and privately held US firms in terms of the number of competitors (*PrivPlayer*) and the market share (*PubMS*). For the lobbying determinants analyses, I exclude single-segment public firms in the calculation for these two measures because their lobbying incentives are heterogeneous.[14] The first explanatory variable, *PrivPlayer*, is the number of private firms within industry *i* divided by the total number of multi-segment public firms and private firms within industry *i*. Private firms have no obligation to disclose segment information, thus, I expect that public firms operating in industries with more private competitors have greater incentives to lobby against the proposal.

[14] On one hand, firms that reported single segment under SFAS 14 but expected to initiate segment disclosure mandatorily under the proposed new standard would be motivated to lobby against the Exposure Draft. On the other hand, firms that expected to remain as single-segment companies under the proposed new standard either had no incentive to oppose the proposal or were motivated to support the proposal as they may benefit from the increased segment information disclosed by other firms.

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Accordingly, I predict a positive association between *PrivPlayer* and the likelihood of being a lobbying industry.[15]

The second explanatory variable, *PubMS*, captures the relative public firm market share, measured as the sum of sales of all multi-segment public firms within industry *i* divided by the sum of sales of all multi-segment public firms and all private firms within industry *i*. Prior studies that examine the impact of proprietary costs on voluntary disclosure decisions find that managers are reluctant to provide segment disclosures because they want to protect their market shares (e.g., Harris 1998). Thus, I expect that public firms are more like to lobby against the Exposure Draft if they enjoyed a larger market share before SFAS 131.

Following prior literature (e.g., Harris 1998; Ellis et al. 2012), I construct two measures of industry competition. I use multiple measures of competition to capture different aspects of competition in the industry (Karuna 2007). The first measure is the four-firm concentration ratio, denoted as *Con4*. I include public and private firms in the calculation because prior literature indicates that industry concentration measures based on Compustat public firms are poor proxies for actual industry concentration (Ali et al. 2009). The theoretical literature argues that competition reduces managers' incentive to make proprietary disclosure (e.g., Verrecchia 1990). Consistent with this

[15] Tang (2012) finds that more competitive industries have a higher proportion of private firms relative to public firms, suggesting that higher proprietary costs of mandatory disclosure for firms in more competitive industries deter private firms' decision to access the public market. Thus, an alternative interpretation of *PrivPlayer* is that it is positively related to the proprietary costs of mandatory disclosure. Specifically, a higher proportion of private firms (i.e., a larger ratio of *PrivPlayer*) implies a higher disclosure cost, which motivates the lobbying decision.

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prediction, Verrecchia and Weber (2006) find that firms in less-concentrated industries have a higher propensity to ask the Securities and Exchange Commission (SEC) to withhold proprietary information in material contract filings. Thus, I expect that, in response to the potential increase in segment disclosure requirements, public firms in less-concentrated industries are more likely to lobby against the Exposure Draft.

My second measure of industry competition is based on the speed of adjustment for positive abnormal profits. I follow Harris (1998) and estimate the persistence of return-on-assets (ROA) above the industry mean through the following equation:

$$X_{ijt} = \beta_{0i} + \beta_{1i}(D_n X_{ijt-1}) + \beta_{2i}(D_p X_{ijt-1}) + e_{ijt} \quad (2\text{-}2)$$

Where:

X_{ijt} = firm *j*'s ROA minus the mean ROA for its industry *i* in year *t*;
D_n = 1 if X_{ijt-1} is negative or zero, 0 otherwise;
D_p = 1 if X_{ijt-1} is positive, 0 otherwise.

The coefficient, β_{2i}, captures the persistence of positive abnormal ROA in industry *i*. A significant positive coefficient of β_{2i} suggests that competitors are unable to drive down the profitability to an average level. Thus a larger β_{2i} implies less competition. Negative abnormal ROA is unlikely to persist regardless of competition, so the coefficient of β_{1i} has no implication for product market competition. The regression uses data on public firms only because I lack the necessary financial data to calculate the ROA for private firms. I include in my probit model the slope estimation β_{2i} from Equation (2), denoted as *Profit_Adj*. I predict that public firms that desire to protect their abnormal profits are more likely to lobby against the new regulation.

I control for the degree of firm diversification, measured as the average number of segments for all public firms in each two-digit SIC industry. Naturally, multi-segment

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public firms would be more concerned with the potential competitive harm of SFAS 131. Thus, I expect *Diversity* to be positively related to the likelihood of lobbying.

The next two explanatory variables, *MB* and *Capital Intensity*, are related to the capital market. Public firms gain greater access to capital markets and this "gives them advantages over nonpublic enterprises" (FASB 1996). As a result, a competitive disadvantage arising from proprietary disclosure is less of a concern for firms in capital-intensive industries and firms with high market valuations because these firms have advantages over private firms in raising capital. I expect these two measures to be negatively related to the likelihood of lobbying.

The last two explanatory variables, *R&D Intensity* and *Intangible*, are proxies for proprietary costs. Prior studies posit that property rights associated with innovations are a major source of proprietary costs due to the imperfect enforcement of claims and that innovation is primarily carried out by investing in intangibles (e.g., King, Pownall, and Waymire 1990; Lev 2001). Accordingly, to account for investments in intangibles, my model includes measures for R&D expenditures and the amount of capitalized intangible assets. Along these lines, several studies examine firm-level disclosure choices and document consistent evidence that firms are less likely to disclose when facing high proprietary costs. For example, Wang (2007) uses R&D expenditures to measure firms' proprietary information costs and finds that firms with greater R&D expenditures are more likely to provide private earnings guidance to analysts prior to Regulation Fair Disclosure. Similarly, Ellis, Fee, and Thomas (2012) find that firms with greater expenditures on R&D and larger investments in intangible assets have a higher propensity to withhold information about customers. These studies focus on firm-level

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disclosure decisions and explore the intra-industry variation in proprietary information costs. To construct industry-level measures, I first scale a firm's R&D expenditure by its lagged total assets and then average the firm-level R&D intensity over all public firms with the same two-digit SIC code to generate an aggregate measure, denoted *R&D Intensity*. The level of intangible assets net of goodwill (*Intangible*) is constructed similarly. I expect the aggregated measure of R&D intensity and the investment in intangible assets to capture an important aspect of industry-specific proprietary costs and thus to be positively related to the likelihood of lobbying.

Descriptive Statistics and Test Results

Table 2-3 reports the descriptive statistics for the variables in Equation (1). Panel A reports the statistics for lobbying and non-lobbying industries separately with 27 lobbying industries and 42 non-lobbying industries. *PrivPlayer* averages 0.71 for both lobbying and non-lobbying industries, suggesting that about 71% of my sample firms are private companies and 29% are multi-segment public companies. The mean and median of public firm market share (*PubMS*) for lobbying industries are significantly larger than non-lobbying industries, consistent with lobbying motives arising from a desire to protect market shares. Lobbying industries tend to be less concentrated, with a mean four-firm concentration ratio of 0.39, whereas the ratio for non-lobbying industries averages 0.53. As expected, firms in lobbying industries are more diversified, reporting more segments than firms in non-lobbying industries. Lobbying industries also have higher *R&D Intensity* and *Intangible*, suggesting that firms that operate in these industries generally face higher proprietary information costs.

Panel B of Table 2-3 reports pairwise Pearson and Spearman correlations. The indicator variable, *Lobby_Industry*, is significantly positively correlated with public firm

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market share and R&D intensity, consistent with the descriptive statistics reported in Panel A. This suggests that the perceived adverse impact of the proposed new segment rules on public firms is larger if before SFAS 131 public firms were the market incumbents but faced higher proprietary costs. The relative number of private firms (*PrivPlayer*) is significantly negatively correlated with *MB* and *Capital intensity*, suggesting that firms that operate in growth and capital intensive industries are more likely to be public. *PrivPlayer* is not significantly correlated with *Lobby_Industry*. While this may seem inconsistent with the predicted positive relation, the results could be driven by the fact that *PubMS* is highly significantly correlated with both *PrivPlayer* and *Lobby_Industry*.

Table 2-4 reports probit estimations of Equation (1). The base model reported in Column 1 only includes the two public vs. private competition measures. Consistent with the univariate results that market incumbent public firms are more likely to lobby against the Exposure Draft to protect their market shares, the coefficient on *PubMS* is significantly positive (coefficient=1.947, t=3.02). After controlling for public firm market share, I find a positive relation between *PrivPlayer* and *Lobby_Industry*, which is consistent with my prediction that motives to lobby against the increased segment disclosure are stronger if public firms face more private competitors.

Columns 2 and 3 augment the base model with traditional industry competition measures, firm diversification measures, and capital market-related measures. The coefficients on *PrivPlayer* and *PubMS* remain significantly positive, and the Pseudo R-squared increases to above 20%. Consistent with the univariate results that lobbying industries tend to be less concentrated, the coefficient on *Con4* is significantly negative.

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Recall that *Profit_Adj* measures abnormal profit persistence. Thus a positive coefficient (t=2.37) suggests that public firms have incentives to withhold detailed segment information to protect abnormal profits, consistent with findings documented in the prior literature (e.g., Harris 1998). Neither of the capital market-related measures (i.e., *MB* and *Capital Intensity*) is significantly associated with lobbying, implying that the benefits of greater access to capital markets do not mitigate concerns about proprietary costs. The last column of Table 2-4 reports estimation results that incorporate the two proxies for proprietary costs. Consistent with the proprietary cost argument put forward in the comment letters, I find a significant positive coefficient on *R&D Intensity* (t=2.27) and a substantial increase in Pseudo R-squared.

Taken together, the characteristics of lobbying industries suggest that the perceived adverse impact of the SFAS 131 Exposure Draft is greater when public firms face more private competitors, have a larger market share and more persistent abnormal profits to protect, and have information that is more commercially sensitive. The results seem to corroborate the concerns of competitive harm cited by the lobbying firms.

Public vs. Private Competition

Empirical Model

Hypothesis H2 predicts that US public firms in lobbying industries lose market shares to private firms after the adoption of SFAS No. 131. I test this hypothesis using Equation (3):

$$\Delta PubMS_{it} = \beta_0 + \beta_1 Lobby\_Industry_i + \beta_2 POST131_{it} + \beta_3 Lobby\_Industry_i * POST131 + \beta_4 PrivPlayer_i + \beta_5 PubMS_i + \beta_6 Con4_i + \beta_7 Profit\_Adj_i + \beta_8 Diversity_i + \beta_9 MB_i + \beta_{10} Capital\ Intensity_i + \beta_{11} R\&D\ Intensity_i + \beta_{12} Intangible_i + e \quad (2\text{-}3)$$

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The dependent variable, $\Delta PubMS_{it}$, denotes the change in public firm market share from year t-1 to year t. To construct the measure, I first calculate the public firm market share, $PubMS_{it}$, as the sum of sales of all public firms within industry *i* divided by the sum of sales of all public and private firms within industry *i*. Then I use the two years before the announcement of the Exposure Draft (i.e., 1994 and 1995) to calculate the pre-131 Δ*PubMS* and the two years after the implementation of SFAS 131 (i.e., 1999 and 2000) to calculate the post-131 Δ*PubMS*. The change in public firm market share is measured as:

$$\text{Measure (1): } \Delta PubMS_{it} = \ln (PubMS_{it}/PubMS_{it-1}) \quad (2\text{-}4)$$

Or

$$\text{Measure (2): } \Delta PubMS_{it} = (PubMS_{it} - PubMS_{it-1})/PubMS_{it-1} \quad (2\text{-}5)$$

I expect the change in public firm market share, i.e., the pre- and post-131 Δ*PubMS*, to capture the status of the competition between public and private firms in a given industry at a given time.

The data on private firms are obtained from LexisNexis Corporate Affiliations database (see Panel B of Table 2-2). Both LexisNexis and Compustat have data on public firms. Compustat provides better coverage of US public firms but LexisNexis database has two advantages that allow for a better match between public and private firms. First, the annual sales data on private firms are obtained from LexisNexis. If the data coverage of LexisNexis varies across years (e.g., coverage increases over time), using private firm data obtained from LexisNexis but public firm data from Compustat

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makes the calculated market share change with the coverage of the LexisNexis database. It is less of a concern for cross-sectional tests (e.g., the determinants of lobbying industries in Section 2.4), but it may cause serious problems for time-series analyses (e.g., the test of the change in market share in this section). Second, LexisNexis records the calendar year in which the data were collected, which is difficult to match perfectly with the fiscal year used by Compustat.[16] As a result, I use LexisNexis as my data source for both private and public firms to calculate the change in market share.

The independent variable, *Lobby_Industry*, measures the lobbying activity. It takes the value of 1 if one or more firms in industry *i* lobbied against the Exposure Draft and explicitly raised the concern of competitive harm. As discussed in Section 2.3.1, the industry membership of the lobbying firms is based on a firm-level SIC code, which may differ from the industry classification of the segment(s) that motivated the lobbying decision. Accordingly, my second dichotomous lobbying measure requires an industry to have at least two lobbying firms to be classified as a lobbying industry. In addition to the indicator variable *Lobby_Industry*, I construct two continuous variables to capture the lobbying intensity. The first measure, *LobbyFreq*, is the number of lobbying firms.

[16] For example, in LexisNexis Corporate Affiliations database, a firm-year observation with "Year = 1996" means LexisNexis collected the firm's financial data in 1996. The annual sales number could be associated with fiscal year 1996 if LexisNexis collected the data after the fiscal year end, or it could be associated with fiscal year 1995 if LexisNexis collected the data before the fiscal year end. When the most recent year's financial data are not available, LexisNexis fills in with the most recently updated financial data, which may come from fiscal year 1994 or earlier. The firm-level data, when aggregated to generate public firm market share, introduce noise to the measure, which will reduce the power of my tests to find the association between the change in public firm market share and lobbying behavior.

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The second measure, *LobbyPerc*, scales the number of lobbying firms by the total number of Compustat firms that operate in the same two-digit SIC industry multiplied by 100.

The indicator variable, *POST131*, takes the value of 1 for the post-131 period and 0 for the pre-131 period. The variable of interest is the interaction term *Lobby_Industry*POST131* and I expect the coefficient β_3 to be negative. I include all the independent variables from Equation (1) as control variables.

Test Results

Panel A of Table 2-5 reports the difference-in-difference estimations of Equation (3). I drop three industries due to the lack of data for year 1994. In the first two columns, *Lobby_Industry* equals 1 if the industry has at least one lobbying firm. In the last two columns, I require an industry to have at least two lobbying firms to be classified as a lobbying industry. The coefficients on the interaction term are significantly negative, consistent with hypothesis H2 that public firms in lobbying industries suffer competitively relative to private firms after the adoption of SFAS No. 131. Note that when I use a higher threshold for the lobbying industry classification, the coefficients become more negative, consistent with my expectation that firm-level classification of industry membership generates noisy measures for segment-orientated analyses.

Panel B of Table 2-5 reports the estimation results using continuous lobbying measures. The first two columns present the test results using the measure of the absolute number of lobbying firms (*LobbyFreq*), whereas the last two columns present the test results using the percentage measure (*LobbyPerc*). Consistent with those reported in Panel A of Table 2-5, the coefficient on the interaction term is significantly

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negative, indicating that the lobbying intensity is positively associated with the competitive harm.

Taken together, the market share competition analyses corroborate the lobbying motivation results reported in Section 2.4. Across all measures of lobbying activities, I find that public firms in lobbying industries, once compelled to adopt SFAS 131, suffered in their competition with private firms; in contrast, public firms in non-lobbying industries did not exhibit the same trend.

Additional Analyses

To mitigate the concern that my results are driven by compliance costs other than proprietary disclosure costs, I repeat the tests in the Section 2.5.2 for other lobbying firms, i.e., firms that lobbied against the Exposure Draft but did not explicitly raise the concern of competitive harm. Finding similar relations between the change in market share competition and lobbying activities would raise questions about the implications of the results in Table 2-5. The results of the falsification tests are reported in Table 2-6. Control variables are omitted to save space. The coefficients on the interaction term, *Lobby_Industry*POST131*, are insignificant in all specifications.

Further, to rule out the possibility that the industry-wide effects reported in Table 2-5 are driven solely by those lobbying firms, I exclude lobbying firms in market share calculation and repeat the tests. My results (untabulated) do not change, indicating that the adverse impact of SFAS 131 on public firms is not limited to a small group of lobbying firms.

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Table 2-1. Lobbying Industry Composition

Two-digit SIC Code	Industry Description	Lobbying Sample		All Compustat		Lobby Percentage
		Frequency	Percentage	Frequency	Percentage	
01	Agricultural production - crops	1	0.95	20	0.20	5.00
02	Agricultural production - livestock			6	0.06	
07	Agricultural services			6	0.06	
08	Forestry			10	0.10	
10	Metal mining			186	1.85	
12	Coalmining			7	0.07	
13	Oil and gas extraction			410	4.07	
14	Nonmetallic minerals, except fuels			28	0.28	
15	General building contractors	1	0.95	61	0.61	1.64
16	Heavy construction contractors			33	0.33	
17	Special trade contractors	1	0.95	28	0.28	3.57
20	Food and kindred products	4	3.81	227	2.25	1.76
21	Tobacco manufactures	1	0.95	14	0.14	7.14
22	Textile mill products			65	0.65	
23	Apparel and other textile products			87	0.86	
24	Lumber and wood products			62	0.62	
25	Furniture and fixtures	1	0.95	54	0.54	1.85
26	Paper and allied products	8	7.62	124	1.23	6.45
27	Printing and publishing	3	2.86	135	1.34	2.22
28	Chemicals and allied products	19	18.10	638	6.33	2.98
29	Petroleum and coal products	1	0.95	60	0.60	1.67
30	Rubber and miscellaneous plastics products	1	0.95	113	1.12	0.88
31	Leather and leather products			26	0.26	
32	Stone, clay, glass, and concrete products	3	2.86	66	0.66	4.55
33	Primary metal industries	7	6.67	144	1.43	4.86
34	Fabricated metal products			145	1.44	
35	Industrial machinery and equipment	12	11.43	660	6.55	1.82
36	Electrical and electronic equipment	6	5.71	670	6.65	0.90
37	Transportation equipment	7	6.67	193	1.92	3.63
38	Instruments and related products	3	2.86	583	5.79	0.51
39	Miscellaneous manufacturing industries			114	1.13	

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Table 2-1. Continued

Two-digit SIC Code	Industry Description	Lobbying Sample Frequency	Lobbying Sample Percentage	All Compustat Frequency	All Compustat Percentage	Lobby Percentage
40	Railroad transportation			27	0.27	
41	Transit & passenger transportation			8	0.08	
42	Motor freight transportation, warehouse			71	0.70	
44	Water transportation	1	0.95	35	0.35	2.86
45	Transportation by air	1	0.95	66	0.66	1.52
46	Pipelines, except natural gas			9	0.09	
47	Transportation services			31	0.31	
48	Communications	6	5.71	372	3.69	1.61
49	Electric, gas, and sanitary services	6	5.71	345	3.42	1.74
50	Wholesale trade - durable goods	1	0.95	290	2.88	0.34
51	Wholesale trade - nondurable goods			162	1.61	
52	Building materials, hardware, garden supply, & mobile			27	0.27	
53	General merchandise stores			67	0.66	
54	Food stores			74	0.73	
55	Automotive dealers and gasoline service stations			33	0.33	
56	Apparel and accessory stores			70	0.69	
57	Furniture, home furnishings, and equipment stores			52	0.52	
58	Restaurants and bars	1	0.95	172	1.71	0.58
59	Miscellaneous retail	1	0.95	177	1.76	0.56
60	Depository institutions (banks)	7	6.67	119	1.18	5.88
61	Non depository credit institutions			155	1.54	
62	Security, commodity brokers, and services			107	1.06	
63	Insurance carriers			293	2.91	
64	Insurance agents, brokers, and service	1	0.95	51	0.51	1.96
65	Real estate			126	1.25	
67	Holding and other investment offices			425	4.22	
70	Hotels and other lodging			57	0.57	
72	Personal services			29	0.29	

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Table 2-1. Continued

Two-digit SIC Code	Industry Description	Lobbying Sample		All Compustat		Lobby
		Frequency	Percentage	Frequency	Percentage	Percentage
73	Business services (software)	1	0.95	942	9.35	0.11
75	Automotive repair, services, and parking			26	0.26	
76	Miscellaneous repair services			9	0.09	
78	Motion pictures			95	0.94	
79	Amusement and recreational services			123	1.22	
80	Health services			213	2.11	
81	Legal services			4	0.04	
82	Educational services			25	0.25	
83	Social services			26	0.26	
87	Engineering and management services			188	1.87	
Total		105	100.00	10,076	100.00	1.04

Table 2-1 compares the industry composition of lobbying firms to that of all Compustat firms. “All Compustat” refers to a sample of 10,076 firms that have non-missing SIC code for fiscal year 1995. “Lobbying Sample” refers to firms that lobbied against the Exposure Draft and explicitly expressed the concern of competitive harm in their comment letters.

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Table 2-2. Sample Selection and Composition

Panel A: Sample Selection Procedure

Firm-year observations obtained from LexisNexis Corporate Affiliations Database for years 1994, 1995, 1999, and 2000	123,249
Exclude firm-year if company type is not Parent	(65,589)
Exclude firm-year with missing SIC code	(5,191)
Exclude firm-year with missing sales	(7,026)
Final sample	45,443
Private firms	28,569
Public firms	16,874
Total	45,443

Panel B: Descriptive Statistics of LexisNexis Corporate Affiliations Database

	Private firms				Public firms			
	1994	1995	1999	2000	1994	1995	1999	2000
Sales	124	326	314	239	1,323	1,324	1,756	1,405
	(30)	(45)	(55)	(50)	(184)	(196)	(261)	(126)
	[2,361]	[6,805]	[7,314]	[12,089]	[3,284]	[3,588]	[4,018]	[5,984]
Assets	1,093	1,598	2,356	2,409	2,861	2,882	4,513	2,942
	(25)	(26)	(37)	(77)	(206)	(221)	(344)	(214)
	[1,014]	[1,064]	[543]	[494]	[3,107]	[3,338]	[2,217]	[4,099]
Liabilities	1,291	1,359	2,022	2,128	2,265	2,383	3,666	2,370
	(14)	(14)	(20)	(38)	(101)	(113)	(182)	(118)
	[956]	[1,004]	[524]	[475]	[3,089]	[3,320]	[2,213]	[4,065]
Net Worth	393	198	432	326	629	588	858	634
	(11)	(11)	(15)	(23)	(82)	(85)	(136)	(75)
	[1,013]	[1,050]	[531]	[466]	[3,087]	[3,318]	[2,214]	[3,847]
Employees	1,025	1,068	1,069	1,020	7,457	7,850	8,146	6,240
	(240)	(250)	(225)	(225)	(1,300)	(1,323)	(1,427)	(640)
	[7,056]	[6,961]	[6,906]	[11,792]	[3,181]	[3,433]	[3,488]	[5,452]

Panel A presents the sample selection procedure. Panel B reports the descriptive statistics for private and public firms. Sales, Assets, Liabilities, and Net Worth are in $millions. For each variable, the first row is the mean, the second row is the median, and the third row is the number of observations.

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Table 2-3. Summary Statistics

Panel A: Descriptive Statistics of Lobbying and Non-lobbying Industries

	Lobbying Industry			*Non-lobbying Industry*		
	N	Mean	Median	N	Mean	Median
PrivPlayer	27	0.709	0.758	42	0.706	0.812
PubMS	27	0.672**	0.719**	42	0.490	0.505
Con4	27	0.391***	0.358***	42	0.528	0.516
Profit_Adj	27	0.554	0.495	42	0.368	0.306
Diversity	27	1.584**	1.537*	42	1.395	1.342
MB	27	3.359	3.118	42	2.966	2.788
Capital intensity	27	0.379	0.325	42	0.422	0.391
R&D intensity	27	0.037***	0.008***	42	0.004	0.001
Intangible	27	0.040	0.030*	42	0.028	0.019

Panel B: Pairwise Correlations (Pearson above diagonal/Spearman below diagonal)

Variables	1	2	3	4	5	6	7	8	9	10
1 Lobby_Industry		0.01	**0.27**	**-0.32**	0.15	**0.25**	0.16	-0.11	**0.37**	0.15
2 PrivPlayer	-0.10		**-0.62**	-0.06	-0.16	**-0.29**	**-0.40**	**-0.32**	-0.02	-0.08
3 PubMS	**0.28**	**-0.69**		**-0.27**	-0.02	**0.40**	**0.25**	**0.27**	0.12	0.02
4 Con4	**-0.34**	-0.07	-0.21		0.02	-0.03	0.01	0.17	**-0.24**	0.04
5 Profit_Adj	0.17	-0.14	0.01	-0.01		-0.11	**0.25**	**-0.26**	**0.25**	0.13
6 Diversity	0.21	**-0.33**	**0.38**	-0.14	-0.07		0.01	0.11	-0.11	0.07
7 MB	0.16	**-0.34**	0.22	0.01	**0.32**	-0.10		-0.12	**0.45**	**0.33**
8 Capital	-0.12	**-0.25**	**0.26**	0.18	-0.20	0.18	-0.15		**-0.26**	-0.13
9 R&D	**0.50**	-0.16	**0.29**	**-0.41**	0.18	0.18	**0.46**	**-0.38**		0.01
10 Intangible	0.23	-0.06	0.08	-0.12	0.19	-0.08	**0.48**	**-0.29**	**0.37**	

Panel A presents the descriptive statistics for lobbying and non-lobbying industries. ***, **, * indicate two-tail significance for between sample differences at the 1%, 5%, and 10% levels, respectively, using two-sample *t*-test for mean and two-sample Wilcoxon rank sums test for median. In Panel B, correlations significant at the 5% level or better are in bold. Variables are defined in the appendix.

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Table 2-4. The Determinants of Lobbying Industries in Probit Regressions

$$\Pr(Lobby\_Industry_i = 1) = \Phi(\beta_0 + \beta_1 PrivPlayer_i + \beta_2 PubMS_i + \beta_3 Con4_i + \beta_4 Profit\_Adj_i + \beta_5 Diversity_i + \beta_6 MB_i + \beta_7 Capital\ Intensity_i + \beta_8 R\&D\ Intensity_i + \beta_9 Intangible_i + e) \quad (1)$$

	Lobby_Industry			
	(1)	(2)	(3)	(4)
Constant	-0.903***	-1.498*	-2.211**	-2.352**
	(-2.61)	(-1.85)	(-2.31)	(-2.57)
PrivPlayer	1.717**	1.858**	2.422**	2.207**
	(2.11)	(2.05)	(2.39)	(2.32)
PubMS	1.947***	1.468**	1.437*	1.499*
	(3.02)	(2.06)	(1.96)	(1.79)
Con4		-1.717*	-2.009**	-1.620*
		(-1.89)	(-2.16)	(-1.68)
Profit_Adj		0.584**	0.529**	0.467*
		(2.37)	(2.09)	(1.81)
Diversity		0.969*	1.092**	1.107**
		(1.95)	(2.29)	(2.28)
MB			0.258	-0.003
			(1.64)	(-0.02)
Capital intensity			0.111	0.623
			(0.11)	(0.61)
R&D intensity				20.790**
				(2.27)
Intangible				6.697
				(1.38)
Observations	69	69	69	69
Pseudo R-squared	9.9%	20.7%	23.7%	32.4%

The dependent variable, *Lobby_Industry*, takes the value of 1 for the 27 industries that have at least one lobbying firm and 0 otherwise. Z statistics in parentheses are based on robust standard errors. ***, **, and * indicate significance (two-tailed) at the 1%, 5%, and 10% levels, respectively.

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Table 2-5. Market Share Competition between Public and Private Firms

Panel A: Using Dichotomous Lobbying Measures

$\Delta PubMS_{it} = \beta_0 + \beta_1 Lobby\_Industry_i + \beta_2 POST131 + \beta_3 Lobby\_Industry_i * POST131 + \Sigma$ Controls + e

	Lobby_Industry = 1 if #Lobbying firm ≥ 1		Lobby_Industry = 1 if #Lobbying firm ≥ 2	
	ΔPubMS Measure (1)	ΔPubMS Measure (2)	ΔPubMS Measure (1)	ΔPubMS Measure (2)
Constant	-0.203	-0.210	-0.115	-0.201
	(-1.38)	(-1.59)	(-0.91)	(-1.63)
Lobby_Industry	0.050	0.061	0.083*	0.093*
	(1.11)	(1.50)	(1.70)	(1.95)
POST131	0.207***	0.199***	0.174***	0.182***
	(5.78)	(6.20)	(6.50)	(6.95)
Lobby_Industry *POST131	-0.084	-0.088*	-0.115*	-0.125**
	(-1.51)	(-1.76)	(-1.89)	(-2.11)
PrivPlayer	-0.074	-0.056	-0.115	-0.059
	(-0.83)	(-0.70)	(-1.47)	(-0.77)
PubMS	0.120*	0.126**	0.060	0.103*
	(1.82)	(2.12)	(1.01)	(1.79)
Con4	0.180**	0.149**	0.131*	0.164**
	(2.19)	(2.02)	(1.83)	(2.36)
Profit_Adj	0.008	0.023	-0.000	0.017
	(0.31)	(1.03)	(-0.01)	(0.80)
Diversity	-0.053	-0.061	-0.031	-0.053
	(-1.17)	(-1.51)	(-0.82)	(-1.44)
MB	-0.019	-0.014	-0.013	-0.012
	(-1.11)	(-0.92)	(-0.87)	(-0.79)
Capital	-0.019	-0.004	-0.052	-0.011
	(-0.22)	(-0.05)	(-0.70)	(-0.15)
R&D	0.391	0.223	0.274	0.208
	(0.92)	(0.58)	(0.71)	(0.55)
Intangible	0.577	0.461	0.348	0.409
	(1.01)	(0.90)	(0.70)	(0.84)
Observations	132	132	132	132
Adj-R^2	24.8%	28.5%	24.8%	29.7%

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Table 2-5. Continued

Panel B: Using Continuous Lobbying Measures

$\Delta PubMS_{it} = \beta_0 + \beta_1 Lobby\_Intensity_i + \beta_2 POST131 + \beta_3 Lobby\_Intensity_i * POST131 + \Sigma$ Controls + e

	Lobby_Intensity = LobbyFreq		Lobby_Intensity = LobbyPerc	
	ΔPubMS Measure (1)	ΔPubMS Measure (2)	ΔPubMS Measure (1)	ΔPubMS Measure (2)
Constant	-0.114	-0.192	-0.175	-0.177
	(-0.88)	(-1.53)	(-1.17)	(-1.30)
Lobby_Intensity	0.010	0.012*	0.018	0.022**
	(1.48)	(1.93)	(1.51)	(2.02)
POST131	0.173***	0.181***	0.198***	0.191***
	(6.31)	(6.83)	(6.30)	(6.69)
Lobby_Intensity *POST131	-0.013*	-0.014**	-0.027*	-0.027*
	(-1.68)	(-1.98)	(-1.73)	(-1.96)
PrivPlayer	-0.113	-0.061	-0.082	-0.060
	(-1.43)	(-0.80)	(-0.92)	(-0.75)
PubMS	0.068	0.109*	0.120*	0.135**
	(1.15)	(1.90)	(1.87)	(2.30)
Con4	0.137*	0.160**	0.167**	0.128*
	(1.87)	(2.26)	(2.08)	(1.76)
Profit_Adj	0.001	0.023	0.009	0.030
	(0.04)	(1.08)	(0.39)	(1.35)
Diversity	-0.035	-0.059	-0.063	-0.081*
	(-0.90)	(-1.56)	(-1.31)	(-1.87)
MB	-0.015	-0.012	-0.019	-0.015
	(-0.95)	(-0.83)	(-1.17)	(-0.98)
Capital	-0.054	-0.015	-0.017	0.002
	(-0.70)	(-0.20)	(-0.21)	(0.02)
R&D	0.221	0.065	0.361	0.180
	(0.47)	(0.14)	(0.91)	(0.50)
Intangible	0.410	0.432	0.582	0.483
	(0.82)	(0.89)	(1.07)	(0.98)
Observations	132	132	132	132
Adj-R^2	24.0%	29.6%	25.6%	29.9%

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Table 2-5. Continued

Panel A (Panel B) reports the estimation results using dichotomous (continuous) lobbying measures. Lobbying measures are constructed using firms that lobbied against the Exposure Draft and explicitly raised the concern of proprietary costs in their comment letters. Data on private and public firms are obtained from LexisNexis Corporate Affiliations database. The regressions are estimated using robust regression, which iteratively reweights observations until the estimated coefficients converge. The dependent variable, change in public firm market share, is measured as $\Delta PubMS_{it}$ = ln ($PubMS_{it}/PubMS_{it-1}$), denoted Measure (1), or measured as $\Delta PubMS_{it}$ = ($PubMS_{it}$ - $PubMS_{it-1}$)/$PubMS_{it-1}$, denoted Measure (2). t statistics are in parentheses. ***, **, and * indicate significance (two-tailed) at the 1%, 5%, and 10% levels, respectively.

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Table 2-6. Falsification Tests Using Other Lobbying Firms

Panel A: Using Dichotomous Lobbying Measures

	Lobby_Industry = 1 if #Lobbying firm ≥ 1		Lobby_Industry = 1 if #Lobbying firm ≥ 2	
	ΔPubMS Measure (1)	ΔPubMS Measure (2)	ΔPubMS Measure (1)	ΔPubMS Measure (2)
Constant	-0.118	-0.189	-0.104	-0.177
	(-0.88)	(-1.48)	(-0.80)	(-1.38)
Lobby_Industry	0.099**	0.082*	0.144*	0.092
	(2.25)	(1.96)	(1.85)	(1.19)
POST131	0.175***	0.171***	0.152***	0.154***
	(6.11)	(6.25)	(5.93)	(6.09)
Lobby_Industry *POST131	-0.095	-0.075	-0.068	-0.008
	(-1.63)	(-1.36)	(-0.73)	(-0.09)
Observations	132	132	132	132
Adj-R^2	24.8%	27.7%	22.9%	26.7%

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Table 2-6. Continued

Panel B: Using Continuous Lobbying Measures

	Lobby_Intensity = LobbyFreq		Lobby_Intensity = LobbyPerc	
	ΔPubMS Measure (1)	ΔPubMS Measure (2)	ΔPubMS Measure (1)	ΔPubMS Measure (2)
Constant	-0.114	-0.178	-0.132	-0.203
	(-0.85)	(-1.40)	(-0.97)	(-1.58)
Lobby_Intensity	0.061**	0.050*	0.066*	0.063*
	(2.11)	(1.82)	(1.92)	(1.97)
POST131	0.170***	0.165***	0.168***	0.164***
	(6.07)	(6.21)	(6.01)	(6.20)
Lobby_Intensity *POST131	-0.048	-0.036	-0.047	-0.036
	(-1.35)	(-1.06)	(-1.05)	(-0.86)
Observations	132	132	132	132
Adj-R^2	24.5%	27.6%	23.7%	27.8%

Panel A (Panel B) reports the estimation results using dichotomous (continuous) lobbying measures. Lobbying measures are constructed using firms that lobbied against the Exposure Draft but did not explicitly raise the concern of proprietary costs. Data on private and public firms are obtained from LexisNexis Corporate Affiliations database. The regressions are estimated using robust regression, which iteratively reweights observations until the estimated coefficients converge. The dependent variable, change in public firm market share, is measured as $\Delta PubMS_{it}$ = ln ($PubMS_{it}/PubMS_{it-1}$), denoted Measure (1), or measured as $\Delta PubMS_{it}$ = ($PubMS_{it}$ - $PubMS_{it-1}$)/$PubMS_{it-1}$, denoted Measure (2). Results on control variables are omitted. t statistics are in parentheses. ***, **, and * indicate significance (two-tailed) at the 1%, 5%, and 10% levels, respectively.

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CHAPTER 3
CONCLUDING REMARKS

In Chapter 1, I examine the consequences of SFAS 131 using a unique set of firms that lobbied against the standard. I hypothesize that firms that decided to submit comment letters for different reasons would be affected by the regulation change differently. Accordingly, I split lobbying firms into a proprietary cost motive (PC) group and an agency cost motive (AC) group. I find that PC firms tend to have good operating performance under SFAS 14; they experienced negative market reaction around the announcement of the Exposure Draft; and their profitability declined upon the adoption of SFAS 131. In contrast, I find that AC firms tend to have poor performance under SFAS 14; they experienced positive market reaction around the release of the Exposure Draft; and their performance improved following the adoption. Taken as a whole, these results are consistent with both the proprietary information cost hypothesis and the agency cost hypothesis.

The tests in Chapter 1 largely explore the variation in outcomes *within* the lobbying firms. My finding that the new segment disclosure rules impacted lobbying firms differently and predictably based on their likely motives for lobbying have a few implications. First, for studies that examine changes in regulation, it is important to recognize the heterogeneity of lobbying firms. Second, the evidence suggests that the disclosure regulation is a double-edged sword. Third, standard setters should consider the incentives of participants in their due process, especially when it comes to managerial self-interest motives such as agency costs. My results are consistent with Hodder and Hopkins' (2013) finding that banks' responses to FASB's 2010 Exposure

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Draft seem to be motivated by agency problems rather than the conceptual arguments they offered in their letters.

In Chapter 2, I examine whether segment disclosure mandated by SFAS 131 has an industry wide impact on the market share competition between public and private firms. I use the lobbying behavior as a way to identify industries that are more likely to be affected by SFAS 131. I find that public firms in lobbying industries have higher disclosure costs. First, lobbying industries have a higher proportion of private firms relative to public firms, suggesting that public firms in those industries face more competition from private rival firms. Second, public firms in lobbying industries are more likely to have a large market share and excess profits protected by nondisclosure. Third, lobbying industries have higher proprietary costs proxied by R&D expenditures. In my primary test I examine whether mandatory disclosure of proprietary segment information under SFAS 131 causes competitive harm to US public firms relative US private firms. Using a difference-in-difference method, I find that after the adoption of SFAS 131, public firms did, in fact, lose in the market share competition with private firms in lobbying industries relative to non-lobbying industries. Further, I find that the competitive harm to public firms increases with the lobbying intensity.

The results in Chapter 2 show that the *ex-ante* lobbying activities corroborate the *ex-post* change in market share competition. This study responds to calls for more investigation of the real and macro-economic outcomes of regulation by Berger (2011) and Leuz and Wysocki (2008). My findings suggest that mandatory disclosure of proprietary information can impose substantial costs on public firms when they compete with firms that do not have to comply with disclosure requirements (e.g., private and

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foreign firms). These results have implications for US standard setters, who must consider how mandated disclosure can differentially affect domestic firms, and for all policy makers around the world, who must consider the issue of regulatory competition and its impact on the relative competitiveness of capital markets.

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APPENDIX
VARIABLE DEFINITIONS

ROA	net income scaled by lagged total assets
POST131	1 for the post-131 period (i.e., 1999 and 2000) and 0 for the pre-131 period (i.e., 1994 and 1995)
PC	1 for multi-segment PC firms and 0 for multi-segment AC firms
$D_{treated}$	1 for multi-segment PC firms and 0 for single-segment PC firms
Size	the log of market value at the end of 1995
BTM	the book-to-market ratio at the end of 1995
Leverage	total liabilities divided by total assets at the end of 1995
Con4	four-firm concentration ratio
Profit_Adj	the partial correlation coefficient resulting from a pooled time series regression (one for each industry) of current abnormal profits regressed on lagged abnormal profits
AvgInv	the average industry investment level, measured as the sum of R&D, capital expenditure, and acquisition expenditure, minus cash receipts from the sale of PPE, scaled by lagged total assets, averaged over all firms operating in the same two-digit industry
Lobby_Industry	1 if the industry has at least one lobbying firm and 0 otherwise
LobbyFreq	the number of lobbying firms for the two-digit SIC industry
LobbyPerc	the number of lobbying firms divided by the total number of Compustat firms for the two-digit SIC industry, multiplied by 100
PrivPlayer	the number of private firms divided by the sum of multi-segment public firms and private firms
PubMS	public firm market share for the two-digit SIC industry
ΔPubMS	change in *PubMS* from year t-1to year t, measured as ln ($PubMS_{it}/PubMS_{it-1}$) or ($PubMS_{it}$ - $PubMS_{it-1}$)/$PubMS_{it-1}$
Con4	four-firm concentration ratio
Profit_Adj	the partial correlation coefficient resulting from a pooled time series regression (one for each industry) of current abnormal profits regressed on lagged abnormal profits
Diversity	the average number of segments measured as the number of segments averaged over all firms operated in the same two-digit SIC industry
MB	the industry average market-to-book ratio measured as market value divided by book value of equity, winsorized at the 1% and 99%, and then averaged over all public firms operated in the same two-digit SIC industry
Capital Intensity	the industry average capital investment measured as net property, plant, and equipment divided by lagged total assets, winsorized at the 1% and 99%, and then averaged over all public firms operated in the same two-digit SIC industry
R&D Intensity	the industry average research and development intensity measured as R&D expense divided by lagged total assets, winsorized at the 1% and 99%, and then averaged over all public firms operated in the same two-

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	digit SIC industry (missing values of R&D are set to zero before aggregation)
Intangible	the industry average net intangibles to asset ratio measured as intangible assets net of goodwill, scaled by lagged total assets, winsorized at the 1% and 99%, and then averaged over all public firms operated in the same two-digit SIC industry (missing values of intangibles are set to zero before aggregation)

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BIOGRAPHICAL SKETCH

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