Segment Reporting and Corporate Takeovers: Evidence from SFAS No. 131

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Abstract

Despite an increasing interest in improving the quality of segment reporting, whether and how segment reporting could affect corporate takeovers is an under-studied question. We shed light on this question by exploiting the most recent change in segment reporting from SFAS 14 to SFAS 131 in 1997, which increased segment reporting quality for certain conglomerate firms. Our results show that firms increasing segment reporting quality due to SFAS 131 are more likely to receive takeover bids. Consistent with improved segment reporting reducing information uncertainty in the valuation of the target firm and the merger synergy, such an effect is more salient for firms with ex-ante lower financial reporting quality. We do not find support for the alternative proprietary cost channel or governance channel. We also find that bids for affected target firms are more likely to be completed and take less time to complete. Additionally, deals are more likely to be negotiated and be paid for with cash instead of stocks, again consistent with acquirers' belief of lower information uncertainty. We also find the market perceives deals involving affected targets to be of higher quality. Taken together, our results show segment reporting has a substantial impact on the market for corporate control.

Keywords**:** SFAS 131, segment reporting, information uncertainty, takeover, M&A

JEL Classification: G34; M41.

"The objective of requiring disclosures about segments ... is ... to help users of financial statements: better understand the enterprise's performance; better assess its prospects for future net cash flows; make more informed judgments about the enterprise as a whole."

— FASB 1997, SFAS No. 131

1. Introduction

There is an ever-growing interest among regulatory agencies and practitioners in firms' segment reporting. For example, segment reporting ranks as the fourth common area in SEC comment letters regarding companies' 10-K reports issued in 2017 and 2018 (Ernst and Young, 2018). The U.S. Financial Accounting Standard Board (FASB) is in the process of revising the current segment reporting requirements and has one finished and one on-going study that seeks input from public companies to improve the existing segment reporting (FASB, 2019). Many activist investors have also been requesting increased segment reporting transparency with threats of corporate raids, especially for firms whose operations straddle multiple industries and geographies (Greenwood and Schor, 2009).[1]

Answering the call for more insights into possible costs and benefits of segment reporting, we study the effects of segment reporting on corporate takeovers. Takeovers are economically large corporate investments with rich implications for the general economy.[2] An efficient

[1] Trian Partners provides excellent documentation of recent trends in corporate activism with effects on segment reporting quality. For example, the ex-CEO of American International Group, Peter Hancock, explained how he responded to Carl Icahn's campaign to break up the insurance giant by increasing its segment reporting transparency, as presented in chapter 8 of this document: https://trianpartners.com/content/uploads/2017/01/2.-CG_ebook2016_071416_250p.pdf. Similar feedback from other companies is documented on Trian Partners website: https://trianpartners.com/. Empirical evidence on corporate raids is presented in Greenwood and Schor (2009).

[2] See, for example, Bonaime et al. (2018), who report an estimate of USD1.34 trillion (in 2014 dollars) in annual aggregate spending on mergers and acquisitions. Malmendier et al. (2018) report about USD3 trillion in aggregate deal value during the 1985 – 2012 period.

takeover market relies on the information quality regarding whether corporate assets are efficiently allocated or managed within a firm (Manne, 1965; Jensen and Ruback, 1983; Maksimovic and Phillips, 2001). Inefficient use of corporate assets would elicit bids from potentially better managers for the assets and replace the incumbent management. Precise information about firms' internal use of assets facilitates the discovery of synergistic value stemming from mergers by potential bidders. Therefore, it is important to understand how the disclosure of disaggregated information, notably segment reporting, affects the incidence and characteristics of corporate takeovers.

To this end, we exploit the most recent change in segment reporting regulation from SFAS 14 to SFAS 131 in 1997 (now ASC 280).[3] Under SFAS 14, disclosure requirements allow the so-called "industry approach" and provide managers ample discretion in firms' segment reporting. The adoption of SFAS 131, however, mandates the "management approach" which requires that firms define and report segments in the same way they use in firm internal reports. The literature documents that SFAS 131 led to an improvement in the segment reporting quality by increasing the information disaggregation.[4] It also increased the information precision of analysts and the market, ultimately lowering the uncertainty in the evaluation of the affected firms (Berger and Hann, 2003; Piotroski, 1999).

[3] SFAS 14 is formally known as FASB Statement No. 14, *Financial Reporting for Segments of a Business Enterprise* (FASB, 1976), and SFAS 131 is formally known as FASB Statement No. 131, *Disclosures about Segments of an Enterprise and Related Information* (FASB, 1997). SFAS 131 is now codified and referred to as Accounting Standards Codification (ASC) 280.

[4] More specifically, several studies find an increase in the number of reported segments per firm following the SFAS 131 (Berger and Hann, 2003; Herrmann and Thomas, 2000; Street et al., 2000). In addition, after SFAS 131, the cross-segment variability of segment reported profits increases (Ettredge, Kwon, Smith, and Stone, 2006), analysts' increased their reliance on public data (Botosan and Stanford, 2005), and analysts' predictive power to future earnings increases (Berger and Hann, 2003). Franco et al. (2016) document that firms with higher segment disclosure quality experience lower bond yields, further supporting a positive effect of SFAS 131 on firm information environment.

Potential acquirers in the initial stages of their due diligence process mainly rely on publicly available financial reports of the target firms. Thus, an improvement in segment reporting quality can mitigate information problems inherent in mergers and acquisitions (M&As) and have positive impacts on deal outcomes (Amel-Zadeh and Zhang, 2015; McNichols and Stubben, 2015; Skaife and Wangerin, 2013). Segment reporting provides granular financial information on the economic efficiency and value-generating process of individual operating units of the firm (Berger and Hann, 2003). This enables potential bidders to more accurately predict the firm's future performance and evaluate potential synergies in taking over the firm (Ettredge et al., 2005). As the mandated adoption of SFAS 131 facilitates a more precise valuation by outsiders, we predict an increase in a firm's probability of receiving any takeover bid following the adoption. However, SFAS 131 may also have an opposing effect on firms' propensity to be taken over. Cho (2015) finds that the increased segment reporting allows outsiders to better monitor the firm and results in an improvement in internal capital allocation efficiency. The market for corporate control is an external mechanism to correct governance or agency problems (Fama, 1980). The fact that firms are better monitored by investors due to SFAS 131 could crowd out the alternative correction mechanism from the market for corporate control, and we might as well observe a decrease in the propensity to be taken over. Therefore, it is ultimately an empirical question as to whether and how an improvement in segment reporting could affect corporate takeovers.

We exploit the SFAS 131 adoption to conduct a difference-in-differences (DID) empirical design to identify the effect of enhanced segment reporting on takeovers in the U.S., an approach consistent with the literature (Berger and Hann 2003; Cho 2015; and Jayaraman and Wu 2019). Our treatment firms are a group of conglomerate firms that were mandated to improve their

segment reporting by increasing the number of their reported segments upon adopting SFAS 131. Firms whose segment reporting already conformed to the requirements of SFAS 131 ex-ante (i.e., they reported segments consistent with internal usage) would not have any change in their segment reporting and serve as the control group. Our final sample contains 1,075 treatment firms and 2,761 control firms. We compare the treatment firms with control firms and contrast the difference before and after the implementation of SFAS 131 around 1997, so we can obtain an estimate of the causal effect.

We document a 2.5 percentage points increase in the likelihood of receiving at least one takeover bid for treated firms following the mandatory adoption of SFAS 131. This is of substantial economic magnitude, as the average likelihood of receiving a bid in our sample is 5.2 percentage points. The number of bids received in the post-adoption period also substantially increased for treated firms relative to control firms in our sample. These results are robust to using a propensity score matched sample. Therefore, our finding is consistent with the hypothesis that improved segment reporting facilitates acquirers' takeover decisions and contradicts the alternative hypothesis that the enhanced corporate governance due to SFAS 131 leaves little room for efficiency improvement and thus lowers a firm's takeover likelihood.

Our identification strategy relies on the parallel trend assumption (Angrist and Pischke, 2010): the likelihood of receiving a takeover bid should trend similarly for treated and control firms had the mandatory adoption of SFAS 131 not occurred. We provide support for this assumption by studying the time-specific change in the likelihood of receiving a takeover bid around the adoption of SFAS 131. We show that the increase in the likelihood of receiving a takeover bid appears only after the adoption and not before, supporting the validity of the parallel-trend assumption. The effect also proves to be persistent, rather than a one-time effect.

In light of the literature, three channels could be underlying the increased likelihood of receiving takeover bids following SFAS 131 for the affected firms: information uncertainty, proprietary cost, and agency cost. First, improved segment reporting due to SFAS 131 lowered information uncertainty in evaluating the affected firms, benefiting potential acquirers (Berger and Hann, 2003; Franco et al., 2016). Second, managers' reluctance to provide detailed segment information before SFAS 131 adoption could be associated with the need to protect abnormal profits in less competitive industries (Botosan and Stanford, 2005; Harris, 1998). The revelation of abnormal industry profitability after SFAS 131 could attract competitor entry and potentially result in takeovers (Hoberg and Phillips, 2010; Maksimovic and Phillips, 2008). Third, Berger and Hann (2007) show that firms with higher agency costs hid underperforming segments before SFAS 131, and a revelation of these underperforming segments due to SFAS 131 could naturally attract acquirers that targeted firms with underperforming assets.

We perform cross-sectional tests for each of the three channels. First, the information uncertainty channel implies a stronger effect of SFAS 131 among treated firms with ex-ante lower financial reporting quality, as the literature documents that a lower financial reporting quality is associated with higher information uncertainty (Akins, 2018; Beneish et al., 2008), and the market for corporate control for such firms is adversely affected (Amel-Zadeh and Zhang, 2015; McNichols and Stubben, 2015; Raman et al., 2013). Consistent with this idea, we find that the effect of SFAS 131 was greater for firms with higher absolute abnormal accruals (Dechow & Dichev, 2002), higher opacity of financial reports (Hutton et al., 2009), and higher information acquisition cost (Duchin et al., 2010). These cross-sectional results provide strong evidence supporting the interpretation that the documented increase in takeovers is driven by a decrease in information uncertainty of treated firms due to segment reporting improvement.

Second, the proprietary cost channel suggests that firms with higher ex-ante proprietary costs would hide segments pre-SFAS 131 and are more likely to be targeted post-SFAS 131. Using industry concentration of sales (HHI) and Hoberg and Phillips (2010) product market fluidity measure to proxy for proprietary cost, we, however, do not find any differential effects of SFAS 131 on firms' takeovers. Furthermore, we identify firms that report at least one new segment with abnormally high profitability after SFAS 131 adoption as the high proprietary cost group, in the spirit of Berger and Hann (2007), and conduct cross-sectional tests. We find firms disclosing at least one new highly profitable segment are, in fact, less likely to be targeted post-SFAS 131, contrary to the prediction from the proprietary cost channel. The above set of tests fails to support that the alternative proprietary cost channel could be behind the main finding of increased takeovers after the SFAS 131 adoption.

We conduct a third set of cross-sectional tests to examine the agency cost channel, which predicts that firms with high agency cost would hide nonperforming segments pre-SFAS 131 and are more likely to be targeted in the post-SFAS 131 period. However, we fail to find any differential effects of SFAS 131 for firms with varying levels of agency costs, when we use institutional ownership or G-Index (Gompers, Ishii, & Metrick, 2003) which are standard proxies for monitoring and corporate governance quality. Further, we identify firms that report at least one under-performing new segment after the adoption of SFAS 131 as the high agency cost group (Berger and Hann, 2007) and conduct cross-sectional tests. Again, we do not find these firms attract more takeover bids. While we do not dispute the agency cost as a potential channel through which the SFAS 131 could play a role, the results above do not support the proposition that agency channel affects the interpretation of our findings in the M&A context.

We then examine deal completion probability and the time to complete a deal to shed further light on the ramifications of improved segment reporting on takeovers and the underlying channel behind the increased takeover probability. We find a 5.1 percentage points increase in the likelihood of deal completion for deals targeting treated firms relative to control firms after SFAS 131 (not statistically significant, though). The time from deal initiation to completion has been shortened by 33.7% (relative to the average days from initiation to completion) after SFAS 131, both statistically and economically significant. The due diligence process in M&As starts with acquirers' reliance on publicly available financial reports of targets and followed by negotiations in which both parties agree to exchange confidential information to complete the due diligence process. If the confidential exchange reveals previously unknown information and this new information is unfavorable or uncertain, there are two possibilities – termination of the deal or a prolonged due diligence phase (Amel-Zadeh and Zhang, 2015; Skaife and Wangerin, 2013). Our finding is consistent with the information uncertainty channel: improved segment reports lower the possibility of previously unknown adverse information to be revealed in the due diligence process. Thus, deals are more likely to be completed and deal completions are quicker for the treated firms.

We also examine whether a deal is more likely to be negotiated or auctioned after SFAS 131 adoption for the treated firms. Our results indicate that acquirers are more willing to use the negotiation acquisition method (3.3 percentage points more likely). This analysis again helps support the information uncertainty channel as the literature documents that acquirers facing higher information uncertainty are more likely to engage in auctions rather a negotiation during takeovers (French and McCormick, 1984; Marquardt and Zur, 2015). In addition, we document that deals using all cash payments instead of stock payments increased post-SFAS 131 (16.3

percentage points more likely). This finding is consistent with the argument that cash deals are more likely when acquirers face lower information uncertainty (Hansen, 1987; Officer et al., 2009). Our last test examines deal announcement returns. Since SFAS 131 improves the quality of segment reporting, acquirers are therefore more likely to identify valuable targets or potential synergies, leading to a better acquisition return. We find a 1.6 percentage points higher combined three-day cumulative abnormal return (CAR) around the deal announcement date for deals involving targets affected by SFAS 131. This result is consistent with improved segment reporting mitigating information problems inherent in M&As and enabling acquirers to make better deals.

Our study provides evidence contributing to a policy debate on the desirability of financial-reporting regulation.[5] Proponents argue that regulations of financial reporting are desirable due to potential benefits from standardization, lower processing costs, better enforcement, and positive externalities (Admati and Pfleiderer, 2000; Dye, 1990; Lambert et al., 2007; Minnis and Shroff, 2017; Zingales, 2009). Opponents, however, argue that regulation distorts the optimal level of disclosure firms decide after cost-benefit analysis (Hermalin and Weisbach, 2012). In addition, the possibility of regulatory capture and inefficient implementation can render regulation inefficient (Christensen et al., 2016; Stigler, 1971). Recent evidence suggests that reporting regulation has limited usefulness due to significant users' processing costs (Blankespoor et al., 2019). The evidence we provide in this study supports the enhanced usefulness of quality segment reporting by showing that SFAS 131 facilitated the takeover decisions of firms. More specifically, our work tests and confirms the very objective of the SFAS 131, as stated by the own words of FASB: "*help users of financial statements: better understand the enterprise's*

[5] Leuz and Wysocki (2016) provide an excellent discussion on the economics of financial reporting regulation.

performance; better assess its prospects for future net cash flows; make more informed judgments about the enterprise as a whole." This paper, therefore, provides a valuable piece of evidence for the effectiveness of SFAS 131 in the context of corporate takeovers. This is in line with the predicted positive externalities of regulating financial reporting (Admati and Pfleiderer, 2000) and the documented benefits of SFAS 131 adoption (Berger and Hann, 2003; Cho, 2015; Ettredge et al., 2006; Ettredge et al., 2005; Franco et al., 2015). Given policymakers' inclination to increase net economic benefits of regulations, as well as ensure effectiveness (Leuz and Wysocki, 2016), the evidence we herein present will inform the on-going discussions on reviewing the Financial and Accounting Standards Board (FASB) standard on segment reporting in the U.S.

Our study also contributes to a growing literature on segment reporting. Prior studies examining the consequences of SFAS 131 adoption have focused on analysts' forecasts (Berger and Hann, 2003; Botosan and Stanford, 2005), investor monitoring and investment efficiency (Berger and Hann, 2003; Cho, 2015), and credit risk and cost of debt (Akins, 2018; Chen and Liao, 2015; Franco et al., 2016). The literature, however, lacks evidence on the impact of SFAS 131 on the real economy. Our study provides novel evidence of the effect of SFAS 131 on corporate takeovers.[6] The results show that improved segment reporting due to SFAS 131 adoption mitigates uncertainties and information problems inherent in corporate acquisitions thereby facilitating the market for corporate control.

Finally, our study contributes to the literature examining the role of financial reporting quality in M&As. The prior studies proxy for the information quality of target firms and study its

[6] The dormant working paper of Berger and Hann (2002) also provides some suggestive evidence on the effect of SFAS 131 on M&A. However, they only examine the adoption of golden parachutes and poison pills which are at best indirect proxies for the level of corporate control activities rather than directly examine takeover bids as well as deal characteristics and outcomes as our paper.

associations with M&A incidence and outcomes. These proxies include financial restatement (Amel-Zadeh and Zhang, 2015), earnings quality (Raman et al., 2013), accrual quality (McNichols and Stubben, 2015), audit quality (Kim et al. 2020) and whether the merging parties have a common auditor (Cai et al., 2016; Dhaliwal et al., 2016). While these works focus on the quality of consolidated financial reporting, we deviate by examining the quality of disaggregated financial reporting. More importantly, the SFAS 131 setting we utilize in our study is less susceptible to potential endogenous interpretations. To the best of our knowledge, our study is the first that provides causal evidence on the effects of financial reporting quality in the market for corporate control.

The remainder of this paper is structured as follows. Section 2 presents the background of segment reporting and reviews the related literature. The development of our hypothesis is presented in Section 3. We explain our sample selection and research design as well as the empirical specification in Section 4. Section 5 details the empirical results, including the main findings and results from cross-sectional tests as well as additional analyses. Section 6 concludes the paper.

2. Background of SFAS 131 and review of related literature

2.1. Background of SFAS 131

Discussions about segment reporting in the late 1960s called for sub-entity reporting by conglomerate firms whose businesses transcend a single industry. Back then, such disaggregated information was mainly used to predict the consolidated income of conglomerate firms (Baldwin, 1984; Kinney, 1971). In 1969, the Securities and Exchange Commission (SEC) made disclosure of line-of-business (segment) sales and earnings a mandatory requirement for all companies registered and filed form 10-K with the SEC. The objective of this requirement was to

enhance risk assessment and credit decisions by investors. In December 1976, the FASB issued SFAS 14 *Financial Reporting for Segments of a Business Enterprise* with basically similar and consistent requirements as the SEC's line-of-business disclosure requirement. The mandatory SFAS 14 defined a segment by industry grouping of products and services sold to external customers. However, the definition of industry and ultimately a reportable segment were left at the discretion of managers, succinctly expressed in the following statement from paragraph 12 of SFAS 14:

> "… *determination of an enterprise's industry segments must depend to a considerable extent on the judgment of the management of the enterprise.*"

The discretionary definition of industry groupings led to significant dissimilarities between SFAS 14 reportable segments and the actual internal organization of firms. Additionally, there were inconsistencies between segment information and other explanatory information in other parts of the same annual reports. For example, the business review section and chairman's letter in annual reports were noted to discuss an enterprise's operations differently from that of segment information included in the same annual reports (FASB 1997, paragraph 61). The inconsistency of information about segment performance across different parts of a firm's annual reports limited the usefulness of segment reports prepared under SFAS 14 (Herrmann and Thomas, 2000) and gave birth to calls for a new regulation on segment reporting.

After an extensive debate involving major corporate players, analysts, and the SEC, the FASB issued SFAS 131 in June 1997 that became effective and mandatory for all public companies after December 15, 1997. An essential and notable difference between SFAS 14 and SFAS 131 is the mandated switch from industry approach to management approach for segment

reporting.[7] The management approach requires managers to report financial information of operating segments for which resources are allocated and performance is internally reviewed by the Chief Operating Decision Maker. That is, a business unit qualifies as a reportable segment if it is internally evaluated for operating performance and allocation of resources. An advantage of the management approach of segment reporting is that it provides external users an opportunity to assess business entities and their segments in a way similar to what management does. This is succinctly stated in paragraph 60 of SFAS 131:

> "*…an ability to see an enterprise 'through the eyes of management' enhances a user's ability to predict actions or reactions of management that can significantly affect the enterprise's prospects for future cash flows*."

It is important to note that by switching from the industry approach in SFAS 14 to the management approach in SFAS 131, managerial discretion in segment reporting became largely constrained. The SEC is keen to ensure registrant firms' compliance with the new approach. If an entity's segment disclosures in periodic reports filed with the SEC appear inconsistent with information and representations published elsewhere such as same entity's press releases, websites, and investor presentations, the SEC is likely to take actions including issuing comment letters which can end up in costly litigations (Deloitte, 2019).

An example is Paccar Inc.'s settlement in a suit with the SEC in 2013. Paccar Inc. is a truck and engine maker that also sells truck parts related to its principal business. In this suit, SEC maintains that the company's inability to disclose its truck parts business *separately* from its principal operations is an accounting irregularity and could mislead users of its financial

[7] Venkataraman (2001) provides an excellent and more detailed comparison between SFAS 14 and SFAS 131.

reports.[8] The fact that segment reporting ranks among the top four common issues in recent SEC comment letters highlight the critical importance of segment reporting overall.[9]

2.2. Review of related literature

The literature on operational segment reporting dates back to Pacter (1968) and Kinney (1971) with an initial attempt to provide some empirical evidence on whether disaggregated reporting was value-relevant. Albeit with a small sample, Kinney (1971) shows that disaggregated sales and earnings had more predictive power for future firm performance than consolidated sales and earnings, a finding corroborated by Collins (1976). In follow-up studies, much focus was on analysts' forecasting accuracy and general market efficiency using SEC's 1969-1970 line-of-business disclosure requirement, or the authoritative accounting standards by FASB (i.e., 1976 SFAS 14) with evidence consistent with the revelation of new information to the capital market following segment reporting rules (Baldwin, 1984; Greenstein and Sami, 1994).

A concurrent stream of literature focuses on the incentives for firms' voluntary disclosure of segment information prior to a mandatory segment reporting requirement by either the SEC or FASB. The pioneering work of Ronen and Livnat (1981) provides a framework to account for incentives that drive firms' voluntary segment disclosure behavior. Hayes and Lundholm (1996) formalize the proprietary cost argument for non-disclosure by analyzing the value impact of disaggregated disclosure when product market competition is severe. They show that in

[8] The case received substantial media attention, see, for example, https://blogs.wsj.com/cfo/2013/06/04/paccar-settlement-highlights-segment-reporting-issues/

[9] Segment reporting ranked among the top four queries in both 2017 and 2018 SEC comment letters. See trends at https://www.ey.com/publication/vwluassetsdld/secreportingupdate_04322-181us_commentstrends_24september2018/$file/secreportingupdate_04322-181us_commentstrends_24september2018.pdf

equilibrium, aggregated (disaggregated) disclosure is expected when product market competition is severe (low). Harris (1998) provides empirical evidence showing that managers are less likely to disclose segments when the risk of abnormal segment profits being competed away is high. Other empirical studies examining the incentives for segment reporting include works on capital market incentives (Botosan and Harris, 2000; Piotroski, 1999), proprietary cost (Botosan and Stanford, 2005; Harris, 1998) and agency cost (Berger and Hann, 2007).

Evidence on the ex-post effects of segment reporting used to be largely limited to analysts' forecasts (Barron et al., 2017; Berger and Hann, 2003; Ettredge et al., 2005; Venkataraman, 2001). Recent works have turned to examine other consequences of segment reporting changes: Cho (2015) finds SFAS 131 improved corporate transparency and internal capital allocation efficiency while Hann et al. (2019) show that quality segment reporting due to SFAS 131 lowered information frictions and intra-industry resource allocation inefficiencies. Franco et al. (2016) documents that diversified firms with higher quality segment reports due to SFAS 131 have significantly lower bond yields.

Our current work explores the effect of increased quality of segment reports on corporate takeovers and is therefore related to the M&A literature and especially the intersection of accounting and M&A. Some existing papers provide evidence that firms' financial reporting quality plays a vital role in M&As. For example, Amel-Zadeh and Zhang (2015) use financial restatements to proxy for a change in financial reporting quality. They show that firms who restate their financial reports are less likely to receive a takeover bid in the following twelve months. Relatedly, Raman et al. (2013) find evidence consistent with the acquirers' preference for negotiated deals based on the earnings quality of their targets. McNichols and Stubben (2015) argue that target financial reporting quality lowers uncertainty in acquisition outcomes and

presents evidence of positive abnormal gains for acquirers around the announcement of the deal. In a similar framework, Martin and Shalev (2016) also show that acquisition efficiency is related to target firms' financial reporting. While these works relate to the quality of consolidated financial reporting, our paper differs from them by focusing on the quality of disaggregated financial reporting. The quasi-natural experiment empirical design of SFAS 131 also makes our results much less subject to potential endogenous interpretations.

3. Hypothesis development

Segment reporting provides granular financial information on the economic efficiency and value-generating process of individual operating units of firms. It enables existing and potential investors to more accurately predict the future performance of the firm and evaluate potential synergies in taking over the target firm (Ettredge et al., 2005). An improvement in the quality of segment reports could have positive impacts on the outcomes of takeover transactions by mitigating information problems inherent in mergers and acquisitions. More specifically, potential acquirers in the initial stages of their due diligence process mainly rely on publicly available financial reports of target firms (Skaife and Wangerin, 2013). The increase in the detail and the reliability of segment reporting caused by SFAS 131 adoption reveals valuable information about the value-generating process of the target firm, which helps acquirers to more accurately assess potential benefits from the acquisition. Indeed, SFAS 131 adoption has been shown to affect analysts' information environment, manifested in their increased reliance on publicly available data and lower divergence in opinions about future firm performance and a decrease in forecast errors (Berger and Hann, 2003; Botosan and Stanford, 2005). Credit rating agencies' uncertainty about firms' credit risk has also been found to decrease after SFAS 131

adoption (Akins, 2018). Besides, there is a notable increase in investors' ability to predict future firm performance after the mandatory adoption of SFAS 131 (Ettredge et al., 2005). Thus, firms affected by the SFAS 131 segment reporting rules are more transparent to potential bidders, hence are more likely to receive a takeover bid from potential acquirers.

However, it is reasonable to believe that SFAS 131 can have an opposing effect on corporate takeovers. Cho (2015) finds that enhanced external monitoring caused by the new segment reporting rule can improve firms' internal capital allocation. Better monitoring by investors and other stakeholders can potentially crowd out this alternative correction mechanism, i.e., the market for corporate control. We might observe a decrease in the takeover likelihood of firms affected by SFAS 131. Therefore, it is ultimately an empirical question as to how SFAS 131 will affect corporate takeovers.

Given the difficulty in determining how the improved segment reporting due to SFAS 131 will affect corporate takeovers, we present our main hypothesis in the following null form and two alternative hypotheses.

Null hypothesis: Firms affected by SFAS 131 do not observe any change in the likelihood of receiving a takeover bid after mandatory disclosure.

Alternative hypothesis 1: Firms affected by SFAS 131 are more likely to receive a takeover bid in a given year than unaffected firms after mandatory disclosure.

Alternative hypothesis 2: Firms affected by SFAS 131 are less likely to receive a takeover bid in a given year than unaffected firms after mandatory disclosure.

4. Data and research design

4.1. Sample selection

Our sample combines data from Compustat Historical Segment, Compustat Fundamentals Annual, and CRSP files for the period 1993–2003. We start our sample with all firms having business segment ("BUSSEG") information on the Compustat Historical Segment File in the 1997–1999 period. SFAS 131 became effective on December 15, 1997 and applied to fiscal years beginning thereafter (FASB, 1997). Consequently, the adoption of SFAS 131 occurred in two phases. Companies whose fiscal year-end is in December issued their first SFAS 131 segment reports in 1998. The remaining firms (i.e., non-December year-end firms) issued their first SFAS 131 segment reports in 1999. To account for the change in the number of reported segments, we require firms to have segment information for both the year of the first adoption and the year immediately preceding the adoption year. For each firm, we focus on the originally reported information,[10] delete inter-segment sales or transfers[11] and drop observations with missing segment sales or more than 1% difference in aggregate segment sales and Compustat sales. We then match the resulting sample with Compustat and CRSP for financial and stock return information respectively.

[10] The FASB requires that in the first adoption year, comparative information for earlier years be restated. This allows for a direct comparison of the number of segments reported in the pre- and post-SFAS 131 adoption periods. However, for reasons other than SFAS 131 adoption, companies are allowed to restate their original segment fillings. The Compustat database contains both original and restated fillings. For the purpose of our study, the original change in the number of reported segments in the 1997–1999 period is more decision-relevant for users including acquirers. Subsequent restatements of these filings (and the number of segments) may be useful in other contexts.

[11] To compute changes in the number of reported segments due to SFAS 131 adoption, it is important to exclude observations capturing transfers between actual business segments but recorded in the database as independent segments. For example, segments with names such as "elimination", "reconciliation" or "intra-group" are not actual segments. We follow prior studies to exclude these inter-segment transfers (Cho, 2015; Dong et al., 2014). Additionally, as we will need to compare aggregate segment sales with Compustat sales to mitigate possible data errors, it is important to exclude these records.

Following prior studies (Berger and Hann, 2003; Cho, 2015; Jayaraman and Wu, 2019), we define treated firms as those who report more segments immediately after the adoption of SFAS 131 compared to their own prior reported segments. Control firms are those without changes or with decreases in their reported segments after the rule adoption[12]. Our sample after the above data screens has 3,836 unique firms.[13] Using a five-year period around the SFAS 131 effective year, we have a full sample of 32,821 firm-years for the 1993-2003 period. We present the sample selection procedure for the panel data analyses in Appendix B.

Next, we retrieve 51,914 deals with non-missing deal identifiers from the Thomson Reuters SDC database for the 1993–2003 period. We delete 10,992 deals for which the acquirer's ID is the same as that of the target. To be included in the sample, acquirers must seek to own 100% of the target and we also exclude deals in the form of exchange offers, recapitalizations, and buybacks (Chen et al., 2018; Dhaliwal et al., 2016; Officer et al., 2009). After matching with CRSP and Compustat, the final M&A sample has 7,279 deals targeted at 4,882 unique firms. Mergers account for 52%, whereas acquisitions of assets and interests in the target firms account for 48% of the entire sample. This reduces further to 1,545 deals after matching with sampled firms in the treated/control group i.e. firms with segment information around SFAS 131 adoption. Appendix B contains a detailed sample selection process.

Table 1 Panel A provides descriptive statistics for our firm-year regression sample. About 5.2% of our sample received a takeover bid in a given year, similar to the prior literature (Amel-Zadeh and Zhang, 2015; Chen et al., 2018). A typical firm in our sample has about USD 1,337 million in total assets, 7% return on assets, 18% of total assets held in cash and 23% financial

[12] In our sample, 129 firms, or 3% of our final sample decreased the number of reported segments after SFAS 131 adoption. Our results do not change if we drop these firms from our sample.
[13] Our sample of 3,836 unique treated/control firms is similar to 3,732 and 3,814 reported in Berger and Hann (2003) and Jayaraman and Wu (2019), respectively.

leverage. Panel B summarizes the characteristics of our deal-level regression sample. Of the 1,545 sample deals, 85% are eventually completed, and 96% are negotiated rather than through a hostile takeover. More than one-third of these deals are paid for entirely in cash. About 50% of the deals involve firms in high-tech industries (Loughran and Ritter, 2004), and a similar proportion involves firms in the same industry. Cumulative three-day abnormal returns for the target, the acquirer, and the combined firm are, on average positive, suggesting the takeover deals on average create value.

<Insert Table 1 about here>

4.2. Model specification and variable definitions

Our primary hypothesis seeks to test the probability of receiving a takeover bid after an increase in segment reporting quality due to SFAS 131. Following the prior literature on SFAS 131 (Berger and Hann 2003; Cho 2015; and Jayaraman and Wu 2019), we use the following difference-in-differences model to test this hypothesis:

$$TakeoverBid_{i,t} = \alpha + \beta_1 Treat_i \times Post_t + \sum \beta_k Controls_{i,t-1} + Firm\ FE + Year\ FE \quad (1)$$

where *TakeoverBid* is a dummy variable equal to one if a firm receives at least one takeover bid in a given year and zero otherwise.[14] We also test for the number of takeover bids received by a firm in a year by replacing *TakeoverBid* with *Log(1+No. of Bids)*, which is log transformation of one plus the raw number of takeover bids. *Treat* is an indicator variable equal to one for firms in our segment sample that reported an increased number of segments immediately after the mandatory adoption of SFAS 131 and zero otherwise. *Post* is an indicator variable equal to one for years after 1997 (1998) for firms with December (non-December) fiscal year-end and zero

[14] We use a linear probability model as it produces more robust results relative to nonlinear models due to asymptotic features and flexibility (Angrist and Pischke, 2010). Our results are also robust to applying a logit regression model.

otherwise. *Controls* is a vector of standard control variables that have been shown in the literature to be associated with the likelihood of receiving a takeover bid. Specifically, we include *Firm Size*, *Tobin's Q*, *R&D* and *PE Ratio* to control for firms' growth opportunities (Bena and Li, 2014; Cai et al., 2016; Raman et al., 2013). We include *ROA* and *Fixed Assets* to control for firms' performance and asset structure (Ambrose and Megginson, 1992; Tian and Wang, 2016). We also include *Leverage, Cash*, and *Free Cashflow* to control for creditor monitoring and general agency problems (Cremers et al., 2008; Jensen and Ruback, 1983; Masulis, Wang et al., 2007). All control variables are measured at the prior fiscal year-end. In addition, we include firm and year fixed effects to absorb the effects of time-invariant unobserved firm characteristics and common time trends, respectively. We estimate robust standard errors that cluster at the industry level. The coefficient of interest from model (1) above is β_1, which captures the effect of increased segment reporting quality on the propensity (frequency) of receiving a takeover bid for the treated firms relative to the control firms.

In addition to the firm-level analyses explained above, we also conduct analyses at the deal level using the following model:

$$DealFeature_{ijt} = \alpha + \delta_1 Treat_i \times Post_t + \delta_2 Treat_i + \sum \delta_D DealControls_{ijt} + \sum \delta_T TargetControls_{it} + \sum \delta_A AcquirerControls_{jt} + TargetIndustry \times Year\ FE + AcquirerIndustry \times Year\ FE \quad (2)$$

where *i* indexes target firm *i*, *j* indexes acquirer firm *j*, *t* indexes year *t* and *ijt* indexes a deal between target firm *i* and acquirer firm *j* in year *t.* The dependent variable *DealFeature* represents a given deal-level characteristic or outcome. The first dependent variable is an indicator (*Completed Deal*) equal to one if the deal is ultimately completed and zero otherwise.

We also examine the duration in days between a given deal announcement date and deal completion date (*Deal Completion Time*); and a decile rank of the time to complete a given initiated deal (*Rank Deal Completion Time*). We also study the choice of sales method by using *Negotiated Deal* that equals one if a deal is structured as a friendly negotiation and zero otherwise, and *Auction Deal* that equals one if a deal involves hostile auctions in the bidding process and zero otherwise. We also examine *All Cash Deal,* a dummy that equals one if a deal is paid for entirely by cash and zero otherwise. Finally, we examine the three-day cumulative abnormal returns for the acquirer, the target, and the two parties combined, i.e., *Acquirer CAR[-1,+1]*, *Target CAR[-1,+1]*, and *Combined CAR[-1,+1]*, to understand the market's perception of the announced deals.

5. Empirical results

5.1. Baseline results

We first present our baseline results on whether the treatment firms subject to SFAS 131 are more likely to become a takeover target. Table 2 reports the coefficient estimates from model (1). The dependent variable is either a dummy of whether a given firm becomes a takeover target in year *t* in the first three columns, or the log of one plus the number of takeover bids the firm receives in year *t* in the last three columns.

For *TakeoverBid* dummy, we first conduct a plain-vanilla version of DID by only regressing the dependent variable on the main independent variable, *Treat*×*Post*, *Treat*, and year fixed effects. Column (1) shows a significantly positive coefficient on *Treat*×*Post* (0.026, t = 4.86). We further control for firm fixed effects in column (2), and the result remains highly similar (0.027, t = 4.74). In column (3), we add standard control variables used in the M&A

literature, namely, firm size, Tobin's Q, cash holding, free cash flows, leverage, ROA, fixed assets ratio, PE ratio, and R&D spending of targets. The coefficients stay highly similar in the fully saturated model as the plain-vanilla model (0.025, $t = 4.51$). In particular, relative to control firms, treated firms experience a 2.5 percentage points increase in the probability of receiving at least one takeover bid per year after SFAS 131 adoption. Relative to the average likelihood of being a target per year in our entire sample (i.e., 5.2 percentage points), the documented increase in the likelihood of being targeted is of substantial economic magnitude. Similarly, we also observe a substantial increase in the number of takeover bids received by treated firms in the post-SFAS 131 period, as shown in columns (4)-(6). Overall, the results in Table 2 suggest an increase in the propensity and the number of receiving a takeover bid for firms affected by the mandatory adoption of SFAS 131, supporting our hypothesis (*H1*).

Coefficients on firm characteristics are consistent with the literature. For example, *Firm Size* is positively associated with the likelihood of receiving a bid (Bena and Li, 2014; Cai et al., 2016; Raman et al., 2013; Tian and Wang, 2016). *Fixed Assets* is inversely related to the probability of receiving a bid (Phillips and Zhdanov, 2013; Tian and Wang, 2016). Both our cash flow proxies exhibit a significant negative association with the likelihood of receiving a bid, consistent with the argument that cash-rich firms are often acquirers rather than targets in takeover transactions (Harford, 1999). The insignificant coefficients are also consistent with prior studies, such as the coefficients of *Tobin's Q* and *R&D* (Cai et al., 2016), *Leverage* (Cremers et al., 2008), and *ROA* (Amel-Zadeh and Zhang, 2015; Cremers et al., 2008).

<Insert Table 2 about here>

It is worth noting that since our treatment and control firms are not randomly assigned, the parallel trend assumption is key to our identification (Angrist and Pischke, 2010). We provide

support to this assumption by examining dynamic changes in the likelihood of receiving a takeover bid around the adoption of SFAS 131. In Table 3, we replace *Treat×Post* with ten indicators: *TreatYr_5, TreatYr_4, TreatYr_3, TreatYr_2, TreatYr_1*, corresponding to the *Treat* dummy interacted with an indicator for the 5th, 4th, 3rd, 2nd, 1st year prior to the mandatory passage of SFAS 131, and *TreatYr1, TreatYr2, TreatYr3, TreatYr4, and TreatYr5*, corresponding to the *Treat* dummy interacted with an indicator for the 1st, 2nd, 3rd, 4th, and 5th year after the mandatory passage of SFAS 131. We omit the year of passage as it forms the benchmark year. Results clearly show that the effect of the mandatory adoption of SFAS 131 on takeovers starts only after but not before the adoption year. The effect also appears to be quite persistent. This dynamic result buttresses the baseline results documented in Table 2 and supports the parallel trend assumption of our difference-in-difference design.

<Insert Table 3 about here>

We note that some firms may have changed their number of reported segments due to corporate events (e.g., acquisitions) unrelated to SFAS 131. This could create measurement errors in the treatment status and go against us finding a significant relationship in the empirical test. Following the literature (Berger and Hann, 2003; Cho, 2015; Jayaraman and Wu, 2019), we classify firms as "contaminated" if in the first SFAS 131 adoption year, the difference between their historical and restated sum of segment sales is greater than one percent. We then remove these "contaminated" firms (382 unique firms) from our sample and call the resulting sample "pure sample." We re-run our regression in model (1) using the pure sample to confirm the robustness of our primary results. The results using the pure sample are tabulated in Table OA1 of our online appendix. We further confirm the dynamic analysis result using this pure sample

and tabulate this result in Table OA2 of the online appendix. Again, the effect of SFAS 131 appears only after, not before the adoption of SFAS 131, and is persistent over time.

In additional tests, we use a propensity score matched sample to ensure that our results are not driven by fundamental differences between treated and control firms. The propensity score matching is done using the nearest-neighbor match within a caliper of 0.01 without replacement. This produces 18,628 firm-year matches corresponding to 1,074 treated firms and 2,434 control firms. To check the effectiveness of matching, following Lemmon and Roberts (2010), we report associations of the control variables with the firm treatment indicator before and after the propensity-score matching. Specifically, in column (1) of Table OA3, we present the result from the first-stage logit regression, which shows that the treatment dummy is significantly correlated with Tobins' Q, cash holding, free cash flow, fixed assets, and PE ratio. However, when we estimate the same logit model using the post-match sample in columns (2), none of the covariates has a significant coefficient, suggesting that our propensity score matching performs well in removing fundamental differences between treated and control firms. Next, using this sample, we re-estimate model (1) and report the results in Table OA4 of the online appendix. The result is highly consistent with our baseline results, indicating the robustness of our main finding.

5.2. Cross-sectional tests on the channels

There could be three different channels underlying the positive effect of SFAS 131 on M&A, informed by the existing literature. First, a treated firm could be more likely to receive a takeover bid due to a reduction in the information uncertainty, which is an important determinant in an M&A deal (Marquardt and Zur, 2015; Martin and Shalev, 2016; Raman et al., 2013). This is the information uncertainty channel. Second, firms could have hidden valuable or profitable

segments before SFAS 131 due to a higher proprietary cost (Hayes and Lundholm, 1996; Verrecchia, 1983), and the revelation of these segments could attract potential buyers. We call this the proprietary cost channel. Third, improved segment reporting quality due to SFAS 131 reveals firms with underperforming segments hidden by poorly governed managers, exposing them to the radar of potential buyers. We call this the agency cost channel.[15] In this section, we conduct a battery of cross-sectional tests to shed light on the specific channels underlying an increase in the likelihood of receiving a bid after SFAS 131.

5.2.1. Information Uncertainty Channel

The information uncertainty channel predicts a stronger effect of segment reporting change on takeover bids among firms with ex-ante lower financial reporting quality, as the reduction in information uncertainty should be higher for these firms post SFAS 131. We explore this using three standard proxies: absolute abnormal accruals (Dechow and Dichev, 2002), opacity of financial reports (Hutton et al., 2009), and outsiders' information acquisition cost (Duchin et al., 2010). For each proxy, we calculate the ex-ante value as the average value for a firm pre-SFAS 131 adoption. Then, we create a dummy equals one if the pre-SFAS 131 average value is below the sample median (and zero if otherwise) and interact it with the *Treat*×*Post*. We are interested in the coefficient on the resultant triple interaction term. Table 4 presents the results. Consistent with the information uncertainty channel, we find that the effect of SFAS 131 is stronger for firms with lower ex-ante financial reporting quality (absolute abnormal accruals and opacity of financial reports), as indicated by a statistically significant coefficient on the triple interaction term. Results are similar using outsiders' information acquisition cost as an alternative proxy.

[15] Apparently, our result is not consistent with the alternative hypothesis that SFAS 131 facilitates affected firms' corporate governance and lowers the likelihood of being taken over as the room for governance improvement is lower.

Results remain unchanged when using the number of bids received as the dependent variable. These results support the interpretation that the documented increase in takeovers is driven by a decrease in information uncertainty of treated firms due to improvement in segment reporting.

<Insert Table 4 about here>

5.2.2. Proprietary Cost Channel

To test if the proprietary cost could be an underlying channel behind our results, we conduct two sets of analyses. First, we use two ex-ante proxies for a firm's competitive environment and conduct cross-sectional analysis. The idea is that a firm operating in a more competitive environment is likely to face higher proprietary costs in its segment reporting (Botosan and Stanford, 2005). The two proxies are the Herfindahl-Hirschman Index based on market shares of firms' sales (Botosan and Stanford, 2005) and product market fluidity (Hoberg et al., 2014) that assesses the degree of competitive threat and product market change surrounding a firm. For each proxy, we create a dummy equals one if the value of the proxy pre-SFAS 131 is below the sample median (and zero if otherwise) and interact it with the *Treat*×*Post*. In Table 5 columns (1) and (2), the coefficient on the triple interaction term is not significant for either proxy, suggesting no differential effect of improved segment reporting on the likelihood of receiving a takeover bid for firms in a more competitive environment. We also find similar results for the number of bids as the dependent variable, and results are omitted for brevity.

To conduct a further investigation, we identify firms that report at least one new segment *with high abnormal profitability* after SFAS 131 as the high proprietary cost group. This is in a similar spirit to Berger and Hann (2007), who show that firms with high proprietary costs tend to hide segments with higher abnormal profits than other segments. We construct a segment's

abnormal profit following Berger and Hann (2007), i.e., to calculate the return on sales for each segment and subtract it by the industry mean. If a firm disclosed at least one new segment immediately after the SFAS 131 and its abnormal profitability is larger than the average of the firm's abnormal profitability plus a certain threshold value, then we classify this firm as having higher proprietary cost. To avoid the arbitrariness in determining the extent of outperformance, we try different threshold values, including 0.2, 0.5, and 1 that respectively times one standard deviation of the average firm's abnormal profitability. We generate dummy variables *PC_0.2*, *PC_0.5*, and *PC_1* for firms classified as having high proprietary cost according to the three threshold levels and interact the dummy with *Treat*×*Post*. Results are shown in columns (3) to (5) of Table 5. We find a striking result, that these firms that were suspected of a high proprietary cost as they concealed at least one highly profitable segment were much less likely than other firms to receive a takeover bid. Results are similar for the number of bids and are omitted for brevity. This finding is reasonable in that firms with profitable segments are less likely to be run inefficiently, leaving less room for the corrective force from the market for corporate control. It is also likely that firms with highly profitable segments will be so costly to acquire that deters outside takeover bids. Therefore, our main results do not seem to be confounded by the proprietary cost concern that firms fear their profitable segments will be targeted by external acquirers and hide them in the first place.

<Insert Table 5 about here>

5.2.3. Agency Cost Channel

To test the agency cost channel, we check if firms with poorer governance ex-ante would be more affected by SFAS 131 in takeover likelihood. We use common proxies for governance or monitoring: institutional ownership (Cremers and Nair, 2005) and G-index (Gompers et al.

2003). Again, we generate a dummy indicating if a firm has a higher (above-median) level of the governance and monitoring quality and interact the dummy with *Treat*×*Post*. Results in Table 6 columns (1) and (2) show no evidence of a differential effect of segment reporting on the likelihood of takeover bids received for firms with a higher level of corporate governance. We find similar effects for the number of bids as well.

We also use an alternative approach to test the agency cost channel. Berger and Hann (2007) argue that for firms with higher agency cost, the newly disclosed segments should have much lower abnormal profits than the old segments. If the agency cost channel is driving our results, then firms that hid segments with lower abnormal profits should be targeted more by acquirers. We construct a segment's abnormal profitability by calculating the return on sales for each segment and subtracting it by the industry mean. If a firm discloses at least one new segment immediately after the SFAS 131 and its abnormal profitability is much lower than the average of the firm's abnormal profitability minus a certain threshold value, the firm is regarded as having higher agency cost. Again, we use three threshold values to define the extent of underperformance (0.2, 0.5, and 1 respectively times one standard deviation of the average firm's abnormal profitability level). We generate dummy variables *AC_0.2, AC_0.5*, and *AC_1* for firms that are classified as having high agency cost according to the three threshold levels and interact the dummy variables with *Treat*×*Post*. Results are shown in columns (3) to (5) of Table 6. Inconsistent with the prediction from an agency cost channel, we do not find firms with potentially high agency cost are more likely than other firms to receive a takeover bid. If anything, they are less likely to receive a takeover bid. In conclusion, while it is theoretically plausible that acquirers could target more on firms concealing under-performing segments, it does not bear out in the data.

<Insert Table 6 about here>

5.3. Additional tests

We continue to examine deal-level outcomes and characteristics to shed further light on the ramifications of improved segment reporting on takeovers and the underlying channel behind the increase in takeovers. We first examine the probability of deal completion and the time to complete a deal. Since the review of financial statements is considered the "single most important aspect of due diligence" (Lajoux and Elson, 2000; Skaife and Wangerin, 2013), high-quality disaggregated information such as segment reporting can facilitate the due diligence process and thus leads to a more probable and speedier deal completion (Amel-Zadeh and Zhang, 2015; Marquardt and Zur, 2015).

We find this is indeed the case in our setting. In Table 7, the likelihood of a takeover bid being ultimately completed is higher for the treated relative to the control firms in the post-SFAS 131 periods. While the effect is not statistically significant, the economic magnitude is large, with a 5.1 percentage points increase, given that on average 15 percent of deals are ultimately terminated. Also, the time to complete a deal is significantly (at the 1% confidence level) shortened for the treated firms post-SFAS 131. The economic magnitude is also substantial: while it takes on average 83 days from deal announcement to completion, the SFAS 131 shortened it by 28 days. It is worth noting that neither the proprietary cost channel nor the governance channel has a precise prediction about the effect on the deal completion propensity and the time it takes to complete a deal.

<Insert Table 7 about here>

Takeover deals could also vary in terms of the sales method, as a takeover could be a negotiated deal or a deal through auction. The literature suggests that auction is the preferred

sales method when uncertainty about firm fundamentals is high (French and McCormick, 1984), and high financial reporting quality of the target mitigates the information component of this uncertainty and is negatively associated with the likelihood of using an auction (Marquardt and Zur, 2015). We test if this is the case in our context and present the result in the first two columns of Table 8. Treated firms post-SFAS 131 are more likely to be involved in a negotiated deal and less likely to be in an auction deal: there is a 3.3 percentage points increase in the likelihood of being a negotiated deal (the average probability of a deal being a negotiated one is 96%). This is consistent with the notion that increased segment reporting quality mitigates the information uncertainty in valuing takeover deals and leads to more negotiated deals.

We further examine the medium of exchange used by acquirers after the adoption of SFAS 131. The theory argues that acquirers are more likely to use stock rather than cash as the medium of exchange in M&As when facing greater information uncertainty in evaluating the target (Hansen 1987). Officer et al. (2009) and Chemmanur et al. (2009) have empirically confirmed this prediction. In the same vein, if the effect of SFAS 131 on firms' takeover likelihood is mainly driven by the information channel, we expect acquirers targeting affected firms post-SFAS 131 to be more likely to use cash rather than a stock-swap. Table 8 presents regression results consistent with this prediction: all cash payment deals are more likely post-SFAS 131 for the treated firms. The economic magnitude is also non-trivial: there is a 16.3 percentage points increase in all-cash payments (while the average rate of all-cash deals is 36%).

<Insert Table 8 about here>

Finally, we examine the stock market reactions to deal announcements after the adoption of SFAS 131 to shed light on the deal quality or value implications. Information uncertainty (besides fundamental uncertainty) inhibits acquirers' ability to identify profitable targets for

investment (Ferracuti and Stubben, 2019; Goodman et al., 2014), thus hindering the value creation by M&As. The literature shows that information uncertainty associated with financial reports of targets affects acquirers returns around the deal announcement (McNichols and Stubben, 2015) and post-acquisition performance (Chen et al., 2018). Given that SFAS 131 improves the quality of financial reports through information disaggregation, we expect acquirers to better identify synergistic value among firms that adopt SFAS 131, resulting in a higher average acquisition return post-SFAS 131. Following the literature (Bradley et al., 1988; Cai et al., 2016; Kim et al., 2020), we use the combined abnormal announcement returns of both the acquiring and target firms to proxy for the quality of takeover deal.

In column (1) of Table 9, we document a 1.6% higher three-day cumulative abnormal return around the announcement for the combined firm if the deal involves a treated target firm. We also find both the acquiring and the target firms individually earn a higher abnormal announcement return (i.e., 0.6% for acquirers and 0.8% for targets) for deals involving treated targets relative to other deals after SFAS 131 adoption, although not statistically significant. Higher announcement returns for the combined firm is consistent with the notion that SFAS 131 mitigates information problems inherent in takeover deals and improves the average deal quality.

Overall, results from additional tests show that an improved segment reporting not only changes the propensity and frequency of receiving takeover bids, but also affects deal characteristics and outcomes in a way consistent with the information uncertainty channel.

<Insert Table 9 about here>

6. Conclusion

Given the increased policy and academic interests in segment reporting and the important role that M&A plays in improving resource allocation in the economy, our paper provides a first

comprehensive analysis of the impact of segment reporting on corporate takeovers. Exploiting the mandatory adoption of FASB's SFAS 131, we document an increase in the propensity and frequency of receiving takeover bids for firms with a mandated increase in the quality of their segment reporting. We additionally show that the underlying channel behind the documented effect is information related, not caused by either the proprietary cost or agency problems. We also find an increase in the deal completion propensity, a decrease in the time to complete a deal, a higher incidence of negotiated deals and cash payment for the deal, and a higher abnormal announcement returns for the merged firm in the post-SFAS 131 period. These deal-level results are also consistent with the information channel. Overall, our paper documents a substantial impact of segment reporting on the market for corporate control.

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Table 1: Summary statistics

Panel A	N	Mean	St.D.	25th	Median	75th
TakeoverBid	32,821	0.052	0.223	0.000	0.000	0.000
Log(1+No. of Bids)	32,821	0.036	0.154	0.000	0.000	0.000
Treat	32,821	0.288	0.453	0.000	0.000	1.000
Total Assets (million USD)	32,821	1336.730	4906.720	31.961	123.928	566.593
Number of segments	32,623	1.654	1.119	1.000	1.000	2.000
Firm Size	32,821	4.980	2.050	3.465	4.820	6.340
Tobin's Q	32,821	1.974	2.192	0.823	1.256	2.190
Cash	32,821	0.181	0.219	0.022	0.084	0.266
Free Cashflow	32,821	-0.063	0.265	-0.080	0.016	0.063
Leverage	32,821	0.232	0.233	0.029	0.188	0.359
ROA	32,821	0.069	0.314	0.023	0.125	0.208
Fixed Assets	32,821	0.287	0.232	0.101	0.216	0.415
PE ratio	32,821	-0.252	1.816	-0.076	0.029	0.065
R&D	32,821	0.065	0.188	0.000	0.001	0.067
Panel B						
Target CAR[-1,+1]	1,539	0.081	0.193	-0.014	0.025	0.121
Acquirer CAR[-1,+1]	1,543	0.001	0.086	-0.035	0.000	0.038
Combined CAR[-1,+1]	1,449	0.007	0.066	-0.024	0.004	0.035
Deal Completion Time	1,308	82.659	84.909	22.000	63.000	115.000
Rank Deal Completion Time	1,308	0.385	0.260	0.200	0.300	0.500
Completed Deal	1,545	0.847	0.360	1.000	1.000	1.000
Negotiated Deal	1,545	0.959	0.198	1.000	1.000	1.000
Auction Deal	1,545	0.016	0.124	0.000	0.000	0.000
All Cash Deal	1,545	0.358	0.480	0.000	0.000	1.000
Relative Size	1,545	29.486	116.924	0.090	0.648	8.421
Tender Offer	1,545	0.078	0.268	0.000	0.000	0.000
Hi-Tech Deal	1,545	0.457	0.498	0.000	0.000	1.000
Same Industry	1,545	0.489	0.500	0.000	0.000	1.000

This table presents descriptive statistics of our sample firms. The sample combines data from Compustat Historical Segment, Compustat Fundamentals, CRSP and Thomson Reuters SDC databases for the period between 1993 and 2003. All variables are defined in Appendix A. All continuous variables are winsorized at the 1% and 99% levels each year.

Table 2: Effect of SFAS 131 on takeovers

	(1) TakeoverBid	(2) TakeoverBid	(3) TakeoverBid	(4) Log(1+No. of Bids)	(5) Log(1+No. of Bids)	(6) Log(1+No. of Bids)
Treat×Post	0.026***	0.027***	0.025***	0.018***	0.018***	0.018***
	(4.86)	(4.74)	(4.51)	(4.86)	(4.74)	(4.51)
Treat	0.011**			0.008**		
	(2.40)			(2.40)		
Firm Size			0.018***			0.012***
			(8.13)			(8.13)
Tobin's Q			-0.001			-0.001
			(-1.24)			(-1.24)
Cash			-0.068***			-0.047***
			(-4.60)			(-4.60)
Free Cashflow			-0.016**			-0.011**
			(-2.08)			(-2.08)
Leverage			-0.002			-0.001
			(-0.25)			(-0.25)
ROA			0.004			0.003
			(0.68)			(0.68)
Fixed Assets			-0.030*			-0.021*
			(-1.90)			(-1.90)
PE ratio			0.001***			0.001***
			(3.17)			(3.17)
R&D			0.001			0.001
			(0.32)			(0.32)
Firm FE	No	Yes	Yes	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.007	0.207	0.210	0.007	0.207	0.210
N. of Obs.	32,821	32,821	32,821	32,821	32,821	32,821

This table presents results on the probability of receiving a takeover bid and the number of bids received in a year. *Treat* is equal to one if a firm increased the number of reported segments after mandatory SFAS 131 adoption and zero otherwise. *Post* equals one for years after adoption year and zero otherwise. All other variables are defined in Appendix A. In parentheses are t-statistics based on standard errors clustered at two-digit SIC industries. ***, **, and * correspond to 1%, 5% and 10% significance level.

Table 3: Dynamic effect of SFAS 131 on takeovers

	(1) TakeoverBid	(2) TakeoverBid	(3) Log(1+No. of Bids)	(4) Log(1+No. of Bids)
TreatYr_5	0.009	0.011	0.006	0.007
	(0.81)	(0.96)	(0.81)	(0.96)
TreatYr_4	-0.001	0.001	-0.000	0.001
	(-0.07)	(0.14)	(-0.07)	(0.14)
TreatYr_3	0.012	0.014	0.008	0.009
	(0.92)	(1.05)	(0.92)	(1.05)
TreatYr_2	0.010	0.011	0.007	0.008
	(1.11)	(1.28)	(1.11)	(1.28)
TreatYr_1	-0.009	-0.009	-0.006	-0.006
	(-0.88)	(-0.81)	(-0.88)	(-0.81)
TreatYr1	0.030***	0.029***	0.021***	0.020***
	(3.46)	(3.35)	(3.46)	(3.35)
TreatYr2	0.025**	0.024*	0.017**	0.016*
	(2.16)	(2.00)	(2.16)	(2.00)
TreatYr3	0.021*	0.021*	0.015*	0.015*
	(1.87)	(1.79)	(1.87)	(1.79)
TreatYr4	0.023*	0.024*	0.016*	0.017*
	(1.82)	(1.86)	(1.82)	(1.86)
TreatYr5	0.048***	0.051***	0.033***	0.035***
	(4.36)	(4.56)	(4.36)	(4.56)
Controls	No	Yes	No	Yes
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
R^2	0.208	0.210	0.208	0.210
N. of Obs.	32,821	32,821	32,821	32,821

This table presents dynamic results on the probability of receiving a takeover bid and the number of bids received in a year. *TreatYr_5, TreatYr_4, TreatYr_3, TreatYr_2, and TreatYr_1, (TreatYr1, TreatYr2, TreatYr3, TreatYr4, and TreatYr5)* are indicators of five, four, three, two, and one years before (after) the SFAS 131 adoption year. All other variables are defined in Appendix A. In parentheses are t-statistics based on standard errors clustered at two-digit SIC industries. ***, **, and * correspond to 1%, 5% and 10% significance level.

Table 4: Cross-section tests, information uncertainty channel

	(1) TakeoverBid	(2) Log(1+No. of Bids)	(3) TakeoverBid	(4) Log(1+No. of Bids)	(5) TakeoverBid	(6) Log(1+No. of Bids)
Treat×Post	0.019**	0.013**	0.014	0.010	0.016**	0.011**
	(2.56)	(2.56)	(1.65)	(1.65)	(2.07)	(2.07)
Treat×Post×*Abnormal accruals*	0.016**	0.011**				
	(2.19)	(2.19)				
Treat×Post×*Opacity*			0.026**	0.018**		
			(2.24)	(2.24)		
Treat×Post×*Information cost*					0.019*	0.013*
					(1.82)	(1.82)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Controls Interacted	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.209	0.209	0.199	0.199	0.210	0.210
N. of Obs.	32,637	32,637	26,259	26,259	32,687	32,687

This table presents results of cross-sectional tests of takeover likelihood and number of takeover bids received based on ex-ante information uncertainty proxies. *Abnormal accruals* is an indicator variable equal to one if the pre-SFAS 131 period average absolute abnormal accruals (Dechow and Dichev, 2002) is above the sample median and zero otherwise. *Opacity* is an indicator variable equal to one if the pre-SFAS 131 period average opacity in financial reports (Hutton et al., 2009) is above the sample median and zero otherwise. *Information cost* is an indicator variable equal to one if the pre-SFAS 131 period average cost of acquiring firm information (Duchin et al., 2010) is above the industry median and zero otherwise. All other variables are defined in Appendix A. In parentheses are t-statistics based on standard errors clustered at two-digit SIC industries. ***, **, and * correspond to 1%, 5% and 10% significance level.

Table 5: Cross-section tests, proprietary cost channel

	(1) TakeoverBid	(2) TakeoverBid	(3) TakeoverBid	(4) TakeoverBid	(5) TakeoverBid
Treat×Post	0.028**	0.020**	0.027***	0.027***	0.026***
	(2.56)	(2.34)	(4.72)	(4.56)	(4.49)
Treat×Post×*HHI*	-0.003				
	(-0.15)				
Treat×Post×*Product fluidity*		0.007			
		(0.42)			
Treat×Post×*PC_0.2*			-0.039**		
			(-2.08)		
Treat×Post×*PC_0.5*				-0.076**	
				(-2.60)	
Treat×Post×*PC_1*					-0.027
					(-0.53)
Controls	Yes	Yes	Yes	Yes	Yes
Controls Interacted	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
R^2	0.210	0.202	0.210	0.211	0.210
N. of Obs.	32,760	30,017	32,821	32,821	32,821

This table presents results of cross-sectional tests on the likelihood of receiving takeover bids based on ex-ante proprietary cost proxies. *HHI* is an indicator variable equal to one if the pre-SFAS 131 period average market concentration is above the sample median and zero otherwise. *Product fluidity* is an indicator variable equal to one if the pre-SFAS 131 period average value of Hoberg et al. (2014) competitive threat measure is above the industry median and zero otherwise. *PC*_n is an indicator equal to one if in the first SFAS 131 adoption year, for any given firm, at least one newly disclosed segment earns abnormal profitability higher than the firm's average abnormal profitability plus n (n = 0.2, 0.5 or 1) times one standard deviation of the abnormal profitability in the sample, and zero otherwise. All other variables are defined in Appendix A. In parentheses are t-statistics based on standard errors clustered at two-digit SIC industries. ***, **, and * correspond to 1%, 5% and 10% significance level.

Table 6: Cross-section tests, governance channel

	(1) TakeoverBid	(2) TakeoverBid	(3) TakeoverBid	(4) TakeoverBid	(5) TakeoverBid
Treat×Post=1	0.024**	0.045***	0.026***	0.026***	0.026***
	(2.38)	(3.39)	(4.31)	(4.15)	(4.42)
Treat×Post×*Institutional ownership*	0.002				
	(0.11)				
Treat×Post×*G-index*		-0.024			
		(-1.33)			
Treat×Post×*AC_0.2*			-0.004		
			(-0.25)		
Treat×Post×*AC_0.5*				-0.012	
				(-0.35)	
Treat×Post×*AC_1*					-0.020
					(-0.46)
Controls	Yes	Yes	Yes	Yes	Yes
Controls Interacted	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
R^2	0.210	0.217	0.210	0.210	0.210
N. of Obs.	32,760	9,660	32,821	32,821	32,821

This table presents results of cross-sectional tests on the likelihood of receiving takeover bids based on ex-ante governance and agency cost proxies. *Institutional ownership* is an indicator variable equal to one if the pre-SFAS 131 period average institutional ownership is above the sample median and zero otherwise. *G-index* is an indicator equal to one if the pre-SFAS 131 G-Index (Gompers et al., 2003) is above the sample median and zero otherwise. *AC_n* is an indicator equal to one if in the first SFAS 131 adoption year, for any given firm, at least one newly disclosed segment earns abnormal profitability lower than the firm's average abnormal profitability minus n (n = 0.2, 0.5 or 1) times one standard deviation of the abnormal profitability in the sample, and zero otherwise. All other variables are defined in Appendix A. In parentheses are t-statistics based on standard errors clustered at two-digit SIC industries. ***, **, and * correspond to 1%, 5% and 10% significance level.

Table 7: Effect of SFAS 131 on deal completion

	(1) Completed Deal	(2) Deal Completion Time	(3) Rank Deal Completion Time
Treat×Post	0.051	-28.254***	-0.073**
	(1.12)	(-2.89)	(-2.38)
Treat	0.011	11.228	0.029
	(0.27)	(0.98)	(0.92)
Relative Size	0.000**	-0.070***	-0.000***
	(2.11)	(-3.55)	(-3.09)
Tender Offer	0.012	-9.252	-0.034
	(0.29)	(-0.89)	(-1.12)
Hi-Tech Deal	0.024	-9.931	-0.052
	(0.70)	(-1.14)	(-1.62)
Same Industry	-0.049*	7.647**	0.012
	(-1.69)	(2.23)	(1.03)
Target Firm Controls	Yes	Yes	Yes
Acquirer Firm Controls	Yes	Yes	Yes
Target Industry×Year FE	Yes	Yes	Yes
Acquirer Industry×Year FE	Yes	Yes	Yes
R^2	0.373	0.499	0.496
N. of Obs.	1,545	1,277	1,277

This table presents results on the probability of deal completion and the time to complete a deal. *Completed Deal* is an indicator equal to one if a deal is completed and zero otherwise. *Deal Completion Time* is the number of days between deal announcement and completion. *Rank Deal Completion Time* is the decile rank of the number of days between deal announcement and completion. *Treat* is equal to one if a firm increased the number of reported segments after mandatory SFAS 131 adoption and zero otherwise. *Post* equals one for years after adoption year and zero otherwise. All variables are defined in Appendix A. Both acquirer and target industries are defined at two-digit SIC industry. In parentheses are t-statistics based on standard errors clustered at two-digit SIC industries. ***, **, and * correspond to 1%, 5% and 10% significance level.

Table 8: Effect of SFAS 131 on deal feature

	(1) Negotiated Deal	(2) Auction Deal	(3) All Cash Deal
Treat×Post	0.033*	-0.026***	0.163***
	(1.69)	(-2.75)	(6.53)
Treat	0.001	-0.004	-0.060
	(0.04)	(-0.58)	(-1.48)
Relative Size	0.000***	-0.000**	0.000*
	(3.22)	(-2.15)	(1.94)
Tender Offer	-0.075**	0.098***	0.461***
	(-2.28)	(3.35)	(9.00)
Hi-Tech Deal	-0.019	-0.008	0.063
	(-1.09)	(-0.65)	(1.37)
Same Industry	-0.015	0.009	-0.043
	(-0.82)	(0.87)	(-1.58)
Target Firm Controls	Yes	Yes	Yes
Acquirer Firm Controls	Yes	Yes	Yes
Target Industry×Year FE	Yes	Yes	Yes
Acquirer Industry×Year FE	Yes	Yes	Yes
R^2	0.289	0.310	0.434
N. of Obs.	1,545	1,545	1,545

This table presents results on the probability of deal being a negotiated or an auction deal and the probability of deal being paid for entirely by cash. *Negotiated Deal* is an indicator variable equal to one for deals structured as friendly negotiations and zero otherwise. *Auction Deal* is an indicator equal to one for deals structured as hostile auctions and zero otherwise. *Treat* is equal to one if a firm increased the number of reported segments after mandatory SFAS 131 adoption and zero otherwise. *Post* equals one for years after adoption year and zero otherwise. All variables are defined in Appendix A. Both acquirer and target industries are defined at two-digit SIC industry. In parentheses are t-statistics based on standard errors clustered at two-digit SIC industries. ***, **, and * correspond to 1%, 5% and 10% significance level.

Table 9: Effect of SFAS 131 on deal quality

	(1) Combined CAR [-1,+1]	(2) Acquirer CAR [-1,+1]	(3) Target CAR [-1,+1]
Treat×Post	0.016**	0.006	0.008
	(2.05)	(0.52)	(0.44)
Treat	-0.004	0.005	-0.008
	(-0.73)	(0.50)	(-0.76)
Relative Size	0.000	0.000**	0.000***
	(0.79)	(2.17)	(3.19)
Tender Offer	0.031***	0.019**	0.178***
	(4.69)	(2.58)	(8.40)
Hi-Tech Deal	-0.007	-0.010	0.010
	(-1.35)	(-1.21)	(0.36)
Same Industry	0.006	-0.002	0.019***
	(1.36)	(-0.54)	(3.58)
Target Firm Controls	Yes	Yes	Yes
Acquirer Firm Controls	Yes	Yes	Yes
Target Industry×Year FE	Yes	Yes	Yes
Acquirer Industry×Year FE	Yes	Yes	Yes
R^2	0.259	0.294	0.362
N. of Obs.	1,444	1,543	1,538

This table presents results on abnormal returns for the combined firm as well as the acquirer and the target separately around deal announcement. *Acquirer CAR* (*Target CAR*) is the cumulative three-day returns to the acquirer (target), net of the return on the value-weighted CRSP index over the same period. *Combined CAR* is the value-weighted CAR for both target and acquirer firms. *Treat* is equal to one if a firm increased the number of reported segments after mandatory SFAS 131 adoption and zero otherwise. *Post* equals one for years after adoption year and zero otherwise. All variables are defined in Appendix A. Both acquirer and target industries are defined at two-digit SIC industry. In parentheses are t-statistics based on standard errors clustered at two-digit SIC industries. ***, **, and * correspond to 1%, 5% and 10% significance level.

Appendix A: Variable definitions

Variable	Definition	Data source
	Dependent variables	
TakeoverBid	An indicator variable equal to one for firm-years with at least one takeover bid.	SDC
Log(1+No. of Bids)	The natural logarithm of one plus count of the number of bids received by a firm in a year.	SDC
Completed Deal	An indicator variable equal to one if deal is completed and zero otherwise.	SDC
Deal Completion Time	The number of days between deal announcement and completion.	SDC
Rank Deal Completion Time	Decile rank of number of days between deal announcement and completion.	SDC
Negotiated Deal	An indicator variable equal to one if a deal is structured as a friendly deal and zero otherwise.	SDC
Auction Deal	An indicator variable equal to one if a deal is structured as a hostile deal and zero otherwise.	SDC
All Cash Deal	An indicator variable equal one if a deal is paid for entirely by cash and zero otherwise.	SDC
Acquirer CAR	The cumulative three-day returns to the acquiring firm, net the return on the value-weighted CRSP index over the same period.	SDC and CRSP
Target CAR	The cumulative three-day returns to the target firm, net the return on the value-weighted CRSP index over the same period.	SDC and CRSP
Combined CAR	The market value weighted average of target and acquirer three-day CAR. Market value is market capitalization at the end of immediate year prior to the deal announcement.	SDC and CRSP
	Independent variables	
Treat	An indicator variable equal to one for a firm reporting more segments in the year after the mandatory adoption of SFAS 131 compared to the prior year and zero otherwise.	Compustat Historical Segment
Post	An indicator variable equal to one for years after the 1998 adoption of the SFAS 131 segment reporting rule and zero otherwise for December year-end firms; and equal to one for years after the 1999 adoption of the SFAS 131 segment reporting rule and zero otherwise for non-December year-end firms.	
TreatYr_#n	Indicators of #n years before the SFAS 131 adoption year.	
TreatYr#n	Indicators of #n years after the SFAS 131 adoption year.	
Firm Size	The natural logarithm of total assets (AT).	Compustat
Tobins Q	Sum of market value of equity, total liabilities, and preferred stock value (PSTKL) divided by total asset. Total liabilities is calculated as total long-term debt (DLTT) plus total current debt (DLC).	Compustat
Cash	The ratio of cash and cash equivalents (CHE) to total asset.	Compustat

Free Cashflow	Operating income before depreciation minus interest expense (XINT), minus income taxes (TXT), minus capital expenditure (CAPX).	Compustat
Leverage	Long term debt (DLTT) plus current debt (DLC) divided by total assets.	Compustat
ROA	Operating income before depreciation (OIBDP) divided by prior year total assets.	Compustat
Fixed Asset	The ratio of property, plant and equipment to total asset.	Compustat
PE Ratio	Earnings per share (EPSPI) divided by end of year share price.	Compustat
R&D	Ratio of research and development expense (XRD) to total asset. Missing values of research and development expense are set to zero.	Compustat
	Cross-sectional variables	
Abnormal accruals	Absolute abnormal accruals estimated based Dechow and Dichev (2002) model. For regressions, we use an indicator variable equal to one if the pre-SFAS 131 period average value is above sample median and zero otherwise.	Compustat
Opacity	Hutton et al. (2009)'s financial report opacity measure calculated as prior three years' moving sum of absolute value of discretionary accruals. For regressions, we use an indicator variable equal to one if the pre-SFAS 131 period average value is above sample median and zero otherwise;	Compustat
Information cost	Information acquisition cost index constructed based on Duchin et al. (2010) using analysts following, forecast error and dispersion. For regressions, we use an indicator variable equal to one if the pre-SFAS 131 period average value is above industry median and zero otherwise.	IBES
Institutional ownership	Institutional ownership rate. For regressions, we use an indicator variable equal to one if the pre-SFAS 131 period average value is above sample median and zero otherwise.	Thomson Reuters.
G-Index	G-Index based on Gompers et al. (2003). For regressions, we use an indicator variable equal to one if the 1995 G-Index is above sample median and zero otherwise.	Gompers et al. (2003)
HHI	Degree of market concentration using firm and industry (four-digit SIC) sales. For regressions, we use an indicator variable equal to one if the pre-SFAS 131 period average value is above sample median and zero otherwise.	Compustat
Product fluidity	Measure of competitive threat by Hoberg et al. (2014). For regressions, we use an indicator variable equal to one if the pre-SFAS 131 period average value is above industry median and zero otherwise	Hoberg et al. (2014)
PC_0.2, PC_0.5, PC_1	An indicator equal to one if in the first SFAS 131 adoption year, for any given firm, at least one newly disclosed segment earns abnormal profitability higher than the firm's average abnormal profitability plus n (n=0.2, 0.5, or 1) times one standard deviation of the abnormal profitability in the sample, and zero otherwise. Segment abnormal profitability is segment return on sales minus the segment's industry mean return on sales. Abnormal firm profitability is average segment abnormal profitability.	Compustat
AC_0.2, AC_0.5, AC_1	An indicator equal to one if in the first SFAS 131 adoption year, for any given firm, at least one newly disclosed segment earns abnormal profitability lower than the firm's average abnormal	Compustat

	profitability minus n (n=0.2, 0.5, or 1) times one standard deviation of the abnormal profitability in the sample, and zero otherwise. Segment abnormal profitability is segment return on sales minus the segment's industry mean return on sales. Abnormal firm profitability is average segment abnormal profitability.	
	Deal characteristics	
Relative Size	The ratio of target market capitalization to acquirer market capitalization in the year prior to deal announcement.	Compustat
Tender Offer	An indicator variable equal to one if the offer for a deal is labeled by Thomson Reuters SDC database as tender offer and zero otherwise.	Compustat
Hi-Tech Deal	An indicator variable equal to one if either target or acquirer operates in high-tech industry following Loughran and Ritter (2004) and zero otherwise.	Compustat
Same industry	An indicator variable equal to one if the acquirer and target firms in a deal operate in same industry and zero otherwise.	Compustat

Appendix B: Sample Selection process

Panel A

	Obs.	Firms
Compustat US firms with non-negative total asset and sales in 1997-1999	32,738	13,111
Less: Observations not matched with CRSP	(9,495)	(3,607)
	23,243	9,504
Less: Observations with missing and data errors on segment information	(7,505)	(2,619)
	15,738	6,885
Less: Firms without data in both pre and post SFAS 131 adoption period		(2,437)
Firms with data in both pre and post SFAS 131 adoption periods [28%(Treated) 72%(Control)]	15,738	4,448
Matched with Compustat NA observations within five years around 1998/1999 SFAS 131 adoption years	42,886	4,448
Less: Financial and utilities firms	(7,342)	(599)
Less: Observations with missing control variables	(2,723)	(13)
Sample for test of likelihood of receiving a bid	**32,821**	**3,836**

Panel B

	Deals	Targets	Acquirers
SDC deals with non-missing deal number and matched CRSP/Compustat in 1993-2003	7,279	4,882	3,167
Less: Observations not matched with SFAS 131 treated/control sample	(4,858)	(3,628)	(1,846)
	2,421	1,254	1,321
Less: Deals involving financial and utility firms	(625)	(182)	(183)
Less: Observations with missing control variables	(251)	(151)	(166)
Sample for deal level tests	***1,545***	***921***	***972***

Online Appendix

Table OA1: Effect of SFAS 131 on takeovers, pure sample

	(1) TakeoverBid	(2) TakeoverBid	(3) TakeoverBid	(4) Log(1+No. of Bids)	(5) Log(1+No. of Bids)	(6) Log(1+No. of Bids)
Treat×Post	0.024***	0.024***	0.023***	0.017***	0.017***	0.016***
	(5.04)	(5.00)	(4.79)	(5.04)	(5.00)	(4.79)
Treat	0.009*			0.006*		
	(1.97)			(1.97)		
Firm Size			0.017***			0.012***
			(7.30)			(7.30)
Tobin's Q			-0.001			-0.001
			(-1.05)			(-1.05)
Cash			-0.064***			-0.044***
			(-4.61)			(-4.61)
Free Cashflow			-0.013*			-0.009*
			(-1.88)			(-1.88)
Leverage			-0.005			-0.004
			(-0.72)			(-0.72)
ROA			0.002			0.001
			(0.31)			(0.31)
Fixed Assets			-0.028			-0.019
			(-1.59)			(-1.59)
PE ratio			0.001**			0.001**
			(2.12)			(2.12)
R&D			0.002			0.001
			(0.36)			(0.36)
Firm FE	No	Yes	Yes	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.007	0.206	0.209	0.007	0.206	0.209
N. of Obs.	29,469	29,469	29,469	29,469	29,469	29,469

This table presents results on the probability of receiving a takeover bid and the number of bids received in a year using a pure sample of firms. That is, we follow the literature (Berger and Hann, 2003; Jayaraman and Wu, 2019) and drop from the baseline sample those firms whose difference between their historical and restated sum of segment sales is greater than one percent (382 unique firms), and the resulting sample is the so-called "pure sample." All variables are defined in Appendix A. In parentheses are t-statistics based on standard errors clustered at two-digit SIC industries. ***, **, and * correspond to 1%, 5% and 10% significance level.

Table OA2: Dynamic effect of SFAS 131, pure sample

	(1) TakeoverBid	(2) TakeoverBid	(3) Log(1+No. of Bids)	(4) Log(1+No. of Bids)
TreatYr_5	0.013	0.015	0.009	0.010
	(1.16)	(1.28)	(1.16)	(1.28)
TreatYr_4	-0.003	-0.000	-0.002	-0.000
	(-0.24)	(-0.03)	(-0.24)	(-0.03)
TreatYr_3	0.009	0.011	0.006	0.008
	(0.73)	(0.86)	(0.73)	(0.86)
TreatYr_2	0.008	0.009	0.006	0.006
	(0.80)	(0.93)	(0.80)	(0.93)
TreatYr_1	-0.007	-0.006	-0.005	-0.005
	(-0.80)	(-0.76)	(-0.80)	(-0.76)
TreatYr1	0.029***	0.028***	0.020***	0.019***
	(2.74)	(2.67)	(2.74)	(2.67)
TreatYr2	0.021*	0.020	0.015*	0.014
	(1.69)	(1.60)	(1.69)	(1.60)
TreatYr3	0.015	0.016	0.011	0.011
	(1.28)	(1.26)	(1.28)	(1.26)
TreatYr4	0.022*	0.024*	0.015*	0.016*
	(1.90)	(1.94)	(1.90)	(1.94)
TreatYr5	0.046***	0.049***	0.032***	0.034***
	(3.92)	(4.27)	(3.92)	(4.27)
Controls	No	Yes	No	Yes
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
R^2	0.206	0.209	0.206	0.209
N. of Obs.	29,469	29,469	29,469	29,469

This table presents dynamic results on the probability of receiving a takeover bid and the number of bids received in a year using a pure sample of firms. That is, we follow the literature (Berger and Hann, 2003; Jayaraman and Wu, 2019) and drop from the baseline sample those firms whose difference between their historical and restated sum of segment sales is greater than one percent (382 unique firms), and the resulting sample is the so-called "pure sample." All variables are defined in Appendix A. In parentheses are t-statistics based on standard errors clustered at two-digit SIC industries. ***, **, and * correspond to 1%, 5% and 10% significance level.

Table OA3: Before and after propensity score matching

	(1) Treat	(2) Treat
Firm Size	0.139***	0.002
	(8.86)	(0.12)
Tobin's Q	-0.041*	-0.015
	(-1.73)	(-0.54)
Cash	-1.356***	0.035
	(-6.59)	(0.17)
Free Cashflow	0.343**	-0.024
	(2.55)	(-0.15)
Leverage	0.019	0.035
	(0.13)	(0.21)
ROA	0.103	-0.031
	(1.13)	(-0.27)
Fixed Assets	-0.570*	0.095
	(-1.86)	(0.31)
PE ratio	-0.034***	-0.002
	(-3.63)	(-0.16)
R&D	-0.089	-0.022
	(-0.30)	(-0.08)
Industry FE	Yes	Yes
Year FE	Yes	Yes
Pseudo R^2	0.060	0.001
N. of Obs.	32,672	18,628

This table presents covariates balance between treated and control firms. The treatment dummy is regressed on all covariates using a logit model. Model 1 (Model 2) presents results before (after) a propensity score matching performed with nearest neighbor match within a caliper of 1% without replacement. All variables are defined in Appendix A. In parentheses are t-statistics based on standard errors clustered at two-digit SIC industries. ***, **, and * correspond to 1%, 5% and 10% significance level.

Table OA4: Effect of mandatory disclosure on takeovers, matched sample

	(1) TakeoverBid	(2) TakeoverBid	(3) TakeoverBid	(4) Log(1+No. of Bids)	(5) Log(1+No. of Bids)	(6) Log(1+No. of Bids)
Treat×Post	0.032***	0.037***	0.033***	0.022***	0.025***	0.023***
	(5.86)	(5.75)	(5.15)	(5.86)	(5.75)	(5.15)
Treat	-0.006			-0.004		
	(-1.07)			(-1.07)		
Firm Size			0.023***			0.016***
			(8.84)			(8.84)
Tobin's Q			-0.002			-0.001
			(-1.10)			(-1.10)
Cash			-0.088***			-0.061***
			(-4.05)			(-4.05)
Free Cashflow			-0.027*			-0.018*
			(-1.68)			(-1.68)
Leverage			0.003			0.002
			(0.30)			(0.30)
ROA			0.009			0.006
			(0.72)			(0.72)
Fixed Assets			-0.039			-0.027
			(-1.61)			(-1.61)
PE ratio			0.002***			0.002***
			(3.12)			(3.12)
R&D			0.008			0.006
			(0.82)			(0.82)
Firm FE	No	Yes	Yes	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.006	0.242	0.246	0.006	0.242	0.246
N. of Obs.	18,628	18,185	18,185	18,628	18,185	18,185

This table presents results on the probability of receiving a takeover bid and the number of bids received in a year, using a propensity score matched sample. All variables are defined in Appendix A. In parentheses are t-statistics based on standard errors clustered at two-digit SIC industries. ***, **, and * correspond to 1%, 5% and 10% significance level.