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WHICH OF THESE IS NOT LIKE THE OTHER?

THE ROLE OF SEGMENT REPORTING DIFFERENTIATION

IN DETERMINING FIRM VALUE

A DISSERTATION

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WHICH OF THESE IS NOT LIKE THE OTHER?
THE ROLE OF SEGMENT REPORTING DIFFERENTIATION
IN DETERMINING FIRM VALUE

A DISSERTATION APPROVED FOR THE
MICHAEL F. PRICE COLLEGE OF BUSINESS

BY

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Dedication

To my wife, Kate Lynn Cobabe, with whom none of this would be possible.

To my parents, Richard and Christine Cobabe, for their love, support, and starting my life long journey of learning.

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Abstract

This study examines a firm's excess value based on segment reporting for the firm and its peer group. Firms often operate in industry segments not reported by peers. When such operating segments are reported separately, the assessed covariance between the focal firm's cash flows and those of its peers is reduced. As a result, I hypothesize that a larger difference in reported operating segments between the focal firm and its peer group increases the focal firm's excess value. Additionally, when a peer group reports greater differences in operating segments, the focal firm will benefit from increased differentiation between firms in the peer group, also increasing focal firm excess value. Using peer groups based on product descriptions from Form 10-K filings, I construct a measure of segment reporting differentiation and find evidence consistent with my expectations. I also find the effects of reporting differentiating segment are more pronounced after an increase in mandatory disclosure precision (ASC 280), suggesting possible externalities due to increased mandatory reporting requirements. Overall, results are consistent with the idea that higher levels of differentiation by the focal firm and by peers reduce correlations between firms, affecting the focal firm's excess value.

Chapter 1: Introduction

This study examines the effects of segment differentiation on a firm's excess value.[1] Segment differentiation is defined as the differences in reported segments either between the firm and its peers or differences among peers themselves. Excess value refers to the difference between the market value of the firm and its implied value.[2] An extensive literature in finance examines how firm operations in multiple, diverse industries impacts excess value.[3] Specifically, research demonstrates firm characteristics or data used when estimating excess value lead to differences in firm valuation. Consistent across all research on operational diversity and excess value is (1) diversified firms, operating in multiple lines of business, are valued differently than their single-segment counter parts and (2) firm characteristics play an important role in determining how diversification affects excess value (positively or negatively). However, little research examines how differences in segment reporting of the firm and its peers affects excess value of the firm.

Bens and Monahan (2004) examines how the firm's segment reporting affects its own excess value (with no comparison to peer firm reporting); more disaggregated line

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[1] I refer to the firm being affected as the "firm" or "focal firm" interchangeably. Peer firms are groups of firms that are similar to or clustered with the focal firm. I define peers in two ways. First, peers are defined using product market peers based on product descriptions to construct my measure of segment reporting differentiation. Second, peers are defined using three-digit SIC codes to examine the effects of peer firms on the focal firm's excess value.

[2] I follow Berger and Ofek (1995) in defining excess value. Excess value compares the actual value of the firm based on the market's price to the implied value of the firm based on the value of its individual subsidiaries/segments. Excess value uses industry multiples for each subsidiary/segment to impute the market value of segments. The sum of estimated subsidiary/segment value is the implied value of the firm. Firms have lower excess value (a discount) if firm excess value is less than the market value. Conversely, firms have higher excess value (a premium) if firm excess value exceeds market value.

[3] SFAS No. 131 (now ASC 280) requires disclosure of operating, often referred to as line of business segments, as well as geographic segments. This paper focuses on operating/line of business segments. Thus, segment reporting differentiation refers to difference between reported operating segments of the focal firm and its peer group.

of business segment reporting improves a firm's excess value. In this study, I examine segment reporting from a different perspective. I examine how the *differences* in the focal firm's reported segments and its peer firms' reported segments affect excess value. Differentiating segment information provides additional insight by breaking down aggregate firm-level performance into more detailed portions of operations that are distinct from peers. As differences in reported segments between the focal firm and its peers increase, segment reporting is more valuable to investors in understanding the covariance of the firm's cash flows with peers' cash flows. Further, I also examine the average level of differentiation within a peer group in determining the impact on the focal firms' excess value; higher levels of differentiation within a peer group will affect the assessed covariance within the peer group, also affecting focal firm cash flows. In summary, I investigate the following two research questions: (1) Are differences between the focal firm's reported segments and its peer group's reported segments associated with focal firm excess value? (2) Is the level of differentiation within a peer group associated with focal firm excess value? I expect larger differences between the focal firm and its peers as well as higher levels of differentiation within a peer group will improve focal firm excess value.

Using a large sample of firms from 1996-2011, I provide empirical evidence of how segment reporting differentiation affects excess value. I find that higher segment reporting differentiation between the firm and its peers increases focal firm excess value. I also find that higher segment differentiation among peers increases focal firm excess value. Peer firms are identified using product-level data disclosed in annual 10-

K filings.[4] Hoberg and Phillips (2010a; 2013) create peer groups based on similarity of product descriptions in annual 10-K filings.

Additionally, I examine whether increases in mandatory segment disclosure precision create reporting externalities. Ettredge et al. (2006) find the correlation between segments of multi-segment firms decreases after ASC 280 implementation, suggesting firms report segments in more detail. Ettredge et al. do not examine how a change in mandatory disclosure requirements affects focal firm value. I find evidence that increases in mandatory disclosure create reporting externalities for peer firms.

Examining the role of segment differentiation on excess value is important for four reasons. First, segment reporting as outlined in ASC 280 (previously SFAS No. 131) remains an area of SEC scrutiny and a topic of debate. Trade publications note segment reporting is one of the highest areas for which firms receive SEC comment letters (Deloitte 2013, PricewaterhouseCoopers 2013, 2014b, a). The majority of SEC staff comments relate to how segments are aggregated when reported externally. A recent Post-Implementation Review of ASC 280 by the Financial Accounting Foundation (hereafter FAF) states the current standard has improved segment reporting on average but may also allow latitude for firms to aggregate segments when reported outside the firm (FAF 2012). Research using plant-level data affirms this supposition; Bens, Berger, and Monahan (2011) find firms with multiple segments aggregate reported segments to limit stakeholders' monitoring ability and to maintain competitive advantages. Little research examines how differentiating segments firms affect firm

[4] I choose to focus on peer firms' core operations due to potential noise caused by segments not common among the peer group. As discussed later, I specify that at least 5 percent of peer firms must disclose an industry code to be included in the core peer operations portfolio. This choice eliminates industry codes that are primarily disclosed by only one firm, often a small portion of total peer firm operations. Varying the cutoff point from no cutoff to 25 percent or above does not impact the results of this study.

value. This study provides evidence that higher focal firm segment differentiation results in higher focal firm excess value.

Second, while several studies examine effects of focal firm segment reporting, limited evidence exists on the role of peer firm segment reporting. Theoretical evidence suggests more precise segment information reduces the perceived systematic correlation between firms' cash flows, reducing the unconditional covariance between focal firm and peer firm segments (Lambert, Leuz, and Verrecchia 2007, Lambert, Leuz, and Verrecchia 2012). Increased differentiation between the focal firm and its peer group will result in higher focal firm excess value. Further, Lambert, Leuz, and Verrecchia (2007) also suggest the average level of information precision within a peer group will also help investors better evaluate future cash flows of the focal firm's segments, improving focal firm value. A peer group's average level of segment differentiation will result in higher focal firm excess value. I test these assertions empirically.

Third, understanding the role of peer segment reporting in focal firm valuation is important to standard setters evaluating the possibility of altering mandatory disclosure requirements. The Post Implementation Review (FAF 2012) suggests that while ASC 280 is meeting goals proposed by standard setters, there is room for improvement. Except for potential competitive harm due to additional disclosure, little discussion references the importance of peer firm segment disclosure. Research examining ASC 280 suggests increases in mandatory segment reporting requirements for the focal firm improve segment reporting informativeness (e.g., Ettredge et al. 2005, Ettredge et al. 2006) and limits managerial ability to aggregate segments (e.g., Berger and Hann 2003, Berger and Hann 2007, Botosan and Stanford 2005); but this research does not address

the role of peer firm segment reporting in evaluating the focal firm. Examining the effects of peer firm segment reporting informs financial statement stakeholders of possible externalities in segment reporting. I address issues of externalities in segment reporting in this study.

Finally, research examining the effects of peer firm financial reporting quality on the focal firm has largely focused on firm-level disclosures, such as accrual quality (Ma 2013), perceptions of the firm (Welch 2014) or internal control weaknesses (Ashbaugh-Skaife et al. 2009, Ogneva, Subramanyam, and Raghunandan 2007). Segment reporting breaks up firm-level disclosures into more precise, detailed portions of operations. Because diversified firms are constructed of less than perfectly correlated lines of business, the manner in which segment operations are reported externally becomes important when evaluating future cash flows. Segment disclosures provide different signals about firm prospects that aggregate, firm-level disclosures cannot (i.e., Arya, Frimor, and Mittendorf 2010, Chen and Zhang 2003). Given the nature of reported segments, I capture information specific to operations directly reducing perceived correlation between firms within a peer group. This reduced correlation is expected to improve firm value (Lambert, Leuz, and Verrecchia 2007).

This paper proceeds as follows. Section 2 discusses the role of diversification in determining firm value, the role of accounting information in determining firm value, and the effects of peer firm reporting. Section 3 develops hypotheses. Section 4 outlines the research design for empirical analyses. Section 5 provides robustness tests and additional tests. Section 6 concludes.

Chapter 2: Literature and Hypotheses Development

Finance and accounting research provides contradictory predictions for the role of segment reporting differentiation in determining excess value. I discuss each in turn.

Finance Research and Focal Firm Excess Value

Early finance theory predicted firm diversification does not affect value because individual investors can diversify their own portfolios (Samuelson 1967). In practice, however, capital market imperfections create possibilities for firms to enhance or destroy value through diversification strategies.[5] Initial empirical evidence indicates diversified firms receive a significant discount in value (Lang and Stulz 1994, Berger and Ofek 1995). Results demonstrating value-destroying diversification are present across countries (Lins and Servaes 1999, Lins and Servaes 2002, Denis, Denis, and Yost 2002, Lang et al. 1999), across time (Servaes 1996, Klein 2001, Hoechle et al. 2012), and when adjusting for accounting methods used at the time of acquisition (Custodio 2014). This evidence suggests firms revealing additional diversification in the form of differentiating segments will have a lower excess value than firms that do not disclose differentiating segments. Conversely, another stream of finance research asserts the apparent diversification discount is a product of using data other than Compustat (Villalonga 2004a, b, Maksimovic and Phillips 2002, Schoar 2002) or making various adjustments when estimating implied value (Hund, Monk, and Tice 2010). Given that I use the methodology developed by Berger and Ofek, finance research would predict firms that disclose differentiating segments will be valued lower because firms with greater operational diversity will have lower excess value.

[5] See Martin and Sayrak (2003) and Erdorf et al. (2013) for extensive reviews of diversification and excess value.

Focal Firm Segment Differentiation and Excess Value

Focal Firm Segment Reporting and Firm Value

Accounting information plays an important role in evaluating the firm (Watts and Zimmerman 1986), possibly mitigating the diversification discount (Bens and Monahan 2004). Disaggregated segments provide additional information beyond the firm level, such as earnings, that may improve focal firm valuation and reduce the diversification discount (i.e.,Chen and Zhang 2003, Ettredge et al. 2005, Bens and Monahan 2004, Ettredge et al. 2006).

Analytical models suggest reporting more operational diversity in segments will improve focal firm value. Segments provide more precise information only when segment reports demonstrate the firm's operational diversity (Chen and Zhang 2003). Also, firms report more precise segments to verify good investment choices and signal firm quality (Kanodia and Lee 1998). Managers will differentiate themselves from poorly performing firms by providing precise segment information in the form of differentiating segments (i.e., segments disclosed by the focal firm but not peers). Lambert, Leuz, and Verrecchia (2007) suggest more precise disclosures improve estimation of future cash flow, which in turn improves focal firm excess value. Therefore, firms reporting differentiating segments will reduce the unconditional covariance between the focal firm and its peers, improving future cash flow estimation, also improving focal firm excess value.

Limited empirical evidence exists with respect to the role of segment differentiation in firm value. Existent research demonstrates firms benefit when more precise, disaggregated segment information is reported. Higher quality segment

reporting increases the market's ability to reduce agency costs through monitoring (Berger and Hann 2003), to reduce information asymmetries (Greenstein and Sami 1994, Hope, Thomas, and Winterbotham 2009), to limit overinvestment (Hope and Thomas 2008), and to uncover cross-subsidization of poor performing segments (Berger and Hann 2007). More precise segment disclosures also provide information incremental to overall financial reporting quality that increases the firm's excess value (Bens and Monahan 2004) and improves the market's ability to predict earnings (Ettredge et al. 2005). Overall, these results demonstrate more precise segment information improves focal firm value, suggesting higher levels of differentiating segments may also improve focal firm value. None of these studies measures reporting differences between the focal firm and its peers.

Focal Firm Segment Differentiation and Excess Value

Finance research finds disclosure of a greater number of diverse segments will result in lower focal firm excess value (Berger and Ofek 1995). But, accounting research shows more disaggregated segment reporting improves excess value, reducing the diversification discount (Bens and Monahan 2004). Further, Lambert, Leuz, and Verrecchia (2007) suggest more precise information reduces the unconditional covariance between firms, improving firm value. Thus, I expect firms that report more segments that differentiate the focal firm from its peers will have higher excess value.

H_{1a}: Higher levels of segment differentiation between the focal firm and its peers will increase focal firm excess value.

Peer Firm Segment Differentiation and Excess Value

Lambert, Leuz, and Verrecchia (2007) demonstrate how the quality (or precision) of accounting disclosure affects a firm's cost of capital in a multi-firm setting. Using CAPM, Lambert et al. assert more precise accounting information affects not only the focal firm by reducing the variance of the focal firm's expected future cash flows but also peer firms by reducing the assessed covariance of the focal firm's cash flows with correlated peers.[6] Effects of more precise accounting disclosure are undiversifiable in a multi-firm setting because of changes in the systematic correlation.[7] In the present context, firms that disclose differentiating segments reduce not only the variance of focal firm cash flow estimation but also the perceived correlation between the focal firm and its peers, improving future cash flow estimation. Extended to a peer group, firms disclosing differentiating segments will affect all members of the peer group, not only the firm disclosing the differentiating segment.

[6] Effects of peer groups on the focal firm are well established in finance and accounting. Finance research demonstrates peer stocks move in tandem (King 1966, Roll 1992, Lessard 1974, Grinold, Rudd, and Stefek 1989) and that comovement can be attributed to information transfer from one stock to another, (Foster 1981, Baginski 1987, Clinch and Sinclair 1987, Han, Wild, and Ramesh 1989, Han and Wild 1990, Freeman and Tse 1992). Other researchers examine the effects of industry specific events (Bowen, Castanias, and Daley 1983, Sidak 2003) on industry peers, showing the event affected all peers within the industry group. Research examining accounting restatements demonstrates investors reevaluate their investments and make adjustments after a peers' restatement (Xu, Najand, and Ziegenfuss 2006, Gleason, Jenkins, and Johnson 2008, Durnev and Mangen 2009, Kravet and Shevlin 2010). Industry and audit peers of the focal firm are valued at a discount after the restatement, likely due to short-term earnings projection revisions (Xu, Najand, and Ziegenfuss 2006, Gleason, Jenkins, and Johnson 2008). Thus, research suggests investors are continually revising expectations using available information to create expectations.

[7] If the focal firm's cash flows are measured with error and correlated with other firms, then the effect of peers' disclosure is not diversifiable. When information from peers is released, the market receives new information about the measurement error and/or future cash flows of the correlated focal firm. If there is no noise then cash flow disclosures are fully informative and there is no need for peers. If noise is infinite then all peer disclosures provide information about the focal firm. Additional information from peers reduces the unconditional covariance between correlated firms, which in turn reduces the focal firm's cost of capital.

The result is lower estimation risk, improved future cash flow estimation, a lower cost of capital, and therefore improved excess value.[8]

Two studies examine the effects of peer accounting information quality on firm valuation. Welch (2014) examines the effects of fair value reporting on private equity firms' ability to raise funds. Private equity firm peers with better fair value reporting expose previously unknown correlation across private equity firms, decreasing the amount of capital the focal firm can raise. In other words, higher fair value reporting by one firm changes the market's perception of its peers, reducing the ability the focal firm's peers to raise capital. Ma (2013) tests effects of accrual quality of the focal and peer firms on the focal firm's cost of equity capital. Ma shows not only the focal firm's accrual quality but also peer firm accrual quality plays an important role in determining the focal firm's cost of equity capital. I extend Ma by examining the role of segment information. Specifically, differences in reported segment among peers may be important when valuing the focal firm. Consistent with Lambert et al., I expect higher peer firm segment reporting differentiation will reduce the focal firm's covariance with peer firms, increasing focal firm value.

> **H_{1b}:** Higher levels of segment differentiation among the focal firm's peer group will increase focal firm excess value.

[8] Lambert et al. suggest the effects of information quality on cost of capital are both direct through revision in market participants' assessment of the cash flow distribution and indirect through real decisions made by a firm that in turn affect the expected value and covariance of future cash flows. I test the valuation implications of their model, not the effects of increased disclosure on real decisions.

Increases in Mandatory Disclosure and Externalities

Mandatory disclosure arises from management's inability to integrate the full cost of disclosure into the voluntary disclosure decision-making process (Akerlof 1970, Admati and Pfleiderer 2000, Leuz and Wysocki 2008). Rational managers only weigh costs and benefits directly affecting the firm, excluding social costs and benefits generated from externalities of disclosure (Coase 1960). Fischer and Verrecchia (2004) and Arya, Frimor, and Mittendorf (2010) predict diversified firms will aggregate reported segments as much as possible to keep from differentiating low investment outcomes from high investment outcomes. Segment aggregation inhibits monitoring and protects competitive advantages and was the result of lower quality mandatory reporting requirements, SFAS No. 14 (Berger and Hann 2003, Berger and Hann 2007, Botosan and Stanford 2005). Thus, more precise segment disclosure is under produced in the absence of mandatory disclosure requirements.

Prior to implementation of SFAS No. 131 (now ASC 280), managers disclosed limited segment information. Known as the industry approach, SFAS No. 14 required any segment over 10 percent of total sales or assets to be reported as an individual segment. Under SFAS No. 14, managers overly aggregated segments, hiding segments later reported under ASC 280. Research indicates the level of segment reporting precision (Herrmann and Thomas 2000, Street, Nichols, and Gray 2000) and informativeness (Ettredge et al. 2005, Ettredge et al. 2006) increased after ASC 280 implementation. No study has yet to examine potential externalities created by mandatory segment reporting requirements.

Critics of SFAS No. 14 cite low segment disclosure precision and poor segment transparency as reasons for increased mandatory disclosure enacted by ASC 280 (e.g., Herrmann and Thomas 2000, Street, Nichols, and Gray 2000). While segment reporting has improved on average (Ettredge et al. 2005, Botosan and Stanford 2005, Berger and Hann 2003, Berger and Hann 2007, Ettredge et al. 2006), recent research and the Post-Implementation Review suggest some firms still aggregate segments beyond recommendations in ASC 280, impairing segment reporting informativeness (Bens, Berger, and Monahan 2011, FAF 2012). Research has yet to examine possible externalities created by peer firm segment reporting due to increased mandatory segment disclosure that may not necessitate increased segment disclosure by the focal firm, one possible reason for mandating accounting disclosure (Lambert, Leuz, and Verrecchia 2007).

If changes in mandatory requirements improved the precision and informativeness of segment reports, all firms may benefit from increased disclosure, reducing the perceived covariance between firms within a peer group. Firms and peer groups reporting differentiating segments will receive an additional benefit from the differentiating segment information, reducing covariances between firms even more after ASC 280. Thus, reporting differentiating segments may have a larger effect after ASC 280 implementation for both the focal firm and the average level of peer firm differentiation. Lambert et al. (2007) predicts a larger positive effect due to increased mandatory disclosure precision.

Conversely, the increase in mandatory disclosure precision may increase disclosure of less profitable, value destroying segments previously unreported (Berger

and Hann 2003, Berger and Hann 2007). If the increase in differentiation around the standard change is due to additional disclosure of less profitable segments, peer firms will receive an additional decrease in value due to peer firm information. This effect may subsume the prediction of reduced covariance among peer firms predicted by Lambert et al. Given predictions in opposing directions, I state my hypotheses nondirectionally.

H2a: The impact of focal firm segment differentiation on focal firm excess value is affected by ASC 280 implementation.

H2b: The impact of peer firm segment differentiation on focal firm excess value is affected by ASC 280 implementation.

Chapter 3: Data and Research Design

In this section I describe data sources used in empirical analysis. I describe how my segment reporting differentiation measure is constructed from publicly available data (Hoberg and Phillips 2010a, 2013) and the Compustat Segment file. I conclude this section by discussing models used to test my hypotheses.

Data and Sample Selection

Data in this study come from publicly available sources. Data for product market peers based on product descriptions come from Hoberg and Phillips (2010a, 2013).[9] These data are constructed using all available financial statements available on the SEC's EDGAR website. The current version of the data covers financial statements from 1996-2011 for 12,187 different firms.[10] All other data are obtained from Compustat and CRSP. Firms in the sample must have sufficient information to calculate control variables and variables of interests. Firms with segments in the financial sector (SIC codes 6000 to 6999) are eliminated.[11] Total segment sales must be within 1 percent of total firm sales and firms must have more than $20 million in total sales. The combination of data from Hoberg and Phillips, Compustat, CRSP, and control variables yields 29,137 (4,725) firm-year (firm) observations. Of those observations, 16,620 are single segment firms-years and 12,517 are multi-segment firm-

[9] http://alex2.umd.edu/industrydata/industryclass.htm Last downloaded on March 24, 2014, the most recent update. As of January 18, 2015 there have been no updates.

[10] The period covered by Hoberg and Phillips (2010a; 2013) determines the sample period for my tests.

[11] Firms in the financial sector (SIC 6000 to 6999) are excluded due to additional disclosure regulation and previous research design choice when determining excess value (Berger and Ofek 1995)

years. Of the 4,725 firms, 3,561 are single segment firms throughout the sample period, and 2,470 are multi-segment firms at some point during the sample period.[12]

Measure of Segment Differentiation

My measure of segment differentiation focuses on segments reported by the firm and by its peers.[13] I use product descriptions from Form 10-K filings obtained from Hoberg and Phillips (2010a; 2013) to identify product market peers. Hoberg and Phillips extract product descriptions from annual Form 10-K filings to create groups of peers based on the similarity of product descriptions. These groups are referred to as product market competitors or Text-Based Network Industry Classification (hereafter TNIC) peers.[14] TNIC peers cluster firms into local area networks by products. This clustering is like the grouping of colleagues in a department of a college or like a circle of friends in a social networking group. TNIC peers share similar product descriptions/product characteristics. Firms in TNIC groups often share several products in common. Thus, if the focal firm does not share an industry code with its peer group, it is most likely that the segment in which it operates differentiates the focal firm from its peers.

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[12] The sum of single-segment and multi-segment firms exceeds the total number of Compustat firms because the lists are not mutually exclusive. A single-segment firm can expand to become a multi-segment firm or vice versa.

[13] Three approaches to determine segment reporting quality currently exist. First, researchers estimate a firm's operational diversity from plant-level data collected by the U.S. Census Bureau (i.e., Bens, Berger, and Monahan 2011). Second, researchers use data from a source that has verified a firm's operations in more detail than segments reported in financial statements—such as the *Standard & Poor's Register of Corporations, Directors and Executives* (Bens and Monahan 2004, Piotroski 2003). Finally, researchers take segment reports as given, examining the quality of reported information using the number of items reported in above mandatory requirements (Blanco Peláez, García Lara, and Tribó Giné 2013, 2010) or rating the quality of reported segment information (Saini 2010, Saini and Herrmann 2011). While my measure is not directly measuring segment reporting quality, more precise, differentiating segments can be thought of as a form of segment reporting quality.

[14] TNIC refers to the fact that industry classifications are determined using textual analysis of product descriptions.

My measure of segment differentiation, *DIFF*, measures the difference between focal firm's reported segments and the core operations of its peer group. *DIFF* is measured as the percentage segment sales of the focal firm not disclosed by the peer group. *DIFF* is estimated in three steps.[15] First, I identify all segment SIC codes disclosed by at least five percent of TNIC peers.[16, 17] Consider a simplified example. Suppose Firm A has TNIC peers X, Y, and Z as identified by Hoberg and Phillips. Compustat reports that Firm X operates in SIC industry 2; Firm Y operates in SIC industries 2 and 3; and Firm Z operates in SIC industries 2 and 4. The core peer operations portfolio based on TNIC peers X, Y, and Z would be SIC industries 2, 3, and 4 (see Figure 2).

Second, I compare the focal firm's segment SIC industry codes with the peer SIC codes. If a segment SIC of the focal firm matches a peer SIC code, the focal firm's segment is considered common (i.e., no differentiation). If the focal firm's segment SIC code does not match a peer SIC code, the segment differentiates the focal firm from its peers. Continuing with the previous example, if Firm A discloses segments in SIC industries 1 and 2, only segment 1 is included in *DIFF*. Segment 1 differentiates the focal firm from its peers. Segment 2 is reported by (at least five percent of) its peers.

[15] To see a full description of the procedure used to derive my measure of segment reporting differentiation with a detailed example, please refer to Appendix A.

[16] TNIC peer SIC codes are obtained from the Compustat Segment file. To be included in the peer portfolio at least five percent of firms must disclose the same SIC code. This cutoff is made to identify core peer firm operations. Results are the same if this cutoff is not made or the level of similarity between peers is varied below or above 5 percent.

[17] Research has not agreed on how industries should be defined. Bhojraj, Lee, and Oler (2003) provide a comparison of industry classification systems, concluding that GICS codes performed as well if not better than SIC, NAICS, or Fama-French 48 industry classifications. But, GICS codes are not widely available for all firm-years. SIC codes are most widely adopted. Research using plant-level data uses four-digit SIC codes (Bens, Berger, and Monahan 2011) while most other research uses two or three-digit SIC codes. Also, Hoberg and Phillips (2010a; 2013) state the granularity of their data is similar to that of three-digit SIC codes. I use four-digit SIC codes to capture the breadth of focal firm operations but define the peer firm measure at the three-digit SIC code level to avoid issues of granularity.

Third, I divide the sum of sales from focal firm differentiating segments by total sales of the focal firm. From the example above, if segment 1 of Firm A has $35 million in sales, and firm A has total sales of $100 million, *DIFF* will be thirty-five percent ($35 million divided by $100 million).

$$DIFF = \frac{Sales\ of\ Segments\ not\ Disclosed\ by\ Peers}{Total\ Sales\ for\ the\ Focal\ Firm} \quad (1)$$

Higher levels of *DIFF* indicate the focal firm is reporting a larger portion of differentiating sales in its segments. Focal firm segment reporting differentiation (*FFDIFF*) is the natural log of one plus *DIFF*.

$$FFDIFF = ln(1 + DIFF) \quad (2)$$

To measure the impact of peer firm differentiation (*PFDIFF*) on the focal firm, I calculate the market value-weighted average of peer firms' *DIFF*. I define peer groups when calculating the value-weighted *DIFF* using three-digit SIC codes.[18,19] Higher *PFDIFF* indicates the three-digit SIC code group reports higher levels of differentiating segments.

$$PFDIFF = ln\left(1 + \sum_{p=1}^{n} \frac{MV_p}{MV} * DIFF_p\right) \quad (3)$$

[18] If peers are defined at the four-digit SIC code level issues of colinearity arise. Also, defining peer groups at the four-digit level increases the probability that an SIC code group contains only a few peers. Thus, I define peer groups at the three-digit level. The results remain unchanged if peers are defined at any level of SIC codes.

[19] Equal-weighting treats all observations in a given industry-year equally. This does not take into account how the size of a given firm in an industry-year may affect the median or mean value disproportionately. Equal-weighting can overweight smaller firms and underweight large firms. Value-weighting considers the market or book value of the firm when determining the median or mean value. Value-weighting accounts for the disproportionate effect of larger firms on aggregate industry outcomes. Results are robust to equal-weighting *DIFF*.

Where:

MV_p = The market value of peer firm p

MV = Total market value of the industry defined by three-digit SIC codes

$DIFF_p$ = The measure *DIFF* for peer firm p

n = Number of three-digit SIC code peers

Continuing with the previous example, each firm within the peer group will have *FFDIFF* and *PFDIFF* in turn. That is to say that Firm X will be compared to Firms A, Y, and Z. Firm X has no differentiating segments and receives a *DIFF* equal to zero. Firm Y differentiates itself from its peers by reporting segment 3. *DIFF* for firm Y equals the percentage of sales reported for segment 3. Firm Z differentiates itself from its peers by reporting segment 4. *DIFF* for firm Z equals the percentage of sales reported for segment 4. *PFDIFF* for firm A is the market value-weighted average of *DIFF* for firms X, Y, and Z.

Measure of Excess Value of Diversification

I use the methodology developed by Berger and Ofek (1995) to calculate excess value with data from the Compustat Segment file. Excess value captures the difference between the market value of the firm and the implied/estimated value of the firm based on the valuation of its individual segments. Implied value is estimated using the "chop shop" approach: estimating the value for each individual segment as if it were being purchased from the market separately using an industry multiplier, then adding up the value of all individual parts. By comparing the market value to the implied value, we gain insight into the market's valuation of the combined segment portfolio of a multi-segment firm relative to purchasing a similar portfolio of segments on the market.

Firms with market values less than the implied value are valued at a discount, referred to as a diversification discount. Firms with market values greater than the implied value are valued at a premium, referred to as a diversification premium.

I make one deviation from Berger and Ofek's methodology. Berger and Ofek use the median industry multiplier to estimate the value of each segment because their research question asks if multi-segment firms are valued at a discount, or the distance from zero of the difference between the market and implied values. Median values are more appropriate for their research question due to outliers or a skewed distribution of *ExVal*. Any values less than −1.386 or greater than 1.386 are removed to limit the influence of extreme outliers (Berger and Ofek 1995, Bens and Monahan 2004).[20] After comparing median and mean multipliers, I find mean industry multipliers to be better suited for my research question.[21] I estimate excess value, *ExVal*, using the implied value, $ImpVal$, as follows:

$$ImpVal = \sum_{i=1}^{n} AccItem_i \times \left[Ind_i\left({}^{Val}/_{AccItem}\right)_{mean}\right] \quad (4)$$

Where:

$AccItem_i$ = Accounting item of interest, such as sales or assets, for segment i

$Ind_i\left({}^{Val}/_{AccItem}\right)_{mean}$ = The multiple of firm value to the accounting item of interest for the mean single-segment firm in segment *i*'s industry

Val = Actual firm value at the end of the fiscal year defined as the sum of equity market value and book value of debt

n = The total number of segments reported by the firm in the Form 10-K filings

[20] Berger and Ofek (1995) chose 1.386 and -1.386 as cutoff points because actual values above or below these thresholds are less than four times or one-fourth the imputed value, respectively.

[21] Using median industry multipliers provides similar results.

For each segment, the estimated value is the product of the mean industry multiplier, $Ind_i\left(Val/_{AccItem}\right)_{mean}$, and the accounting item of interest, segment sales or assets. Industries are defined for each segment as the narrowest SIC grouping with at least five single-segment firms, sales of $20 million, and sufficient data to calculate the valuation multiple. Industries are defined first by four-digit SIC codes if five or more single-segment firms with the same four-digit SIC code as the segment of interest have sufficient data and meet size requirements. If a segment-industry does not occur at the four-digit SIC code, the industry is defined by three-digit SIC code, then two-digit SIC code.[22] All firms from financial services industries (SIC codes 6000-6999) are excluded.

The ratio of actual value to imputed value is used to determine excess value of the firm by calculating the following ratio:

$$ExVal = ln\left(\frac{Val}{ImpVal}\right) \tag{5}$$

Firms for which the sum of segment sales is not within one percent of total sales are excluded. Firms with segment assets that deviate more than 25 percent are also excluded.[23] In regression analysis, *ExVal* takes one of two values, $ExVal_{Rev}$ or $ExVal_{AT}$. $ExVal_{Rev}$ uses segment sales as $AccItem_i$ where $ExVal_{AT}$ uses segment assets as the accounting item of interest.

[22] Berger and Ofek as well as others using their methodology have found all segments are defined at the two-digit SIC code level, as is the case in this study This makes defining industries by single-digit SIC code unnecessary.

[23] Firms often have a large amount of corporate assets that are unallocated to segments. Enacting a threshold of one percent, similar to the sales threshold, would exclude firms with corporate assets not allocated to operating segments. Thus, the higher threshold of 25 percent of assets is chosen.

Tests of Segment Reporting Differentiation and Excess Value

Segment Reporting Differentiation and Excess Value

I use the model from Bens and Monahan (2004) to test H_{1a} and H_{1b}, the effects of segment differentiation on excess value, adding controls related to TNIC peers. I estimate the following regression, clustered by firm and year:

$$ExVal = \alpha_0 + \boldsymbol{\alpha_1 FFDIFF} + \boldsymbol{\alpha_2 PFDIFF} + \alpha_3 NumSeg + \alpha_4 Relate + \alpha_5 NumTNICPrs + \alpha_6 HHI + \sum_{c=1}^{9} \alpha_c Control_c + \varepsilon \quad (6)$$

ExVal, *FFDIFF,* and *PFDIFF* are defined previously. The coefficients of interest are α_1 and α_2. H_{1a} predicts that as the difference between the focal firm and its peers increases, the unconditional correlation between the focal firm and its peers will decrease, increasing focal firm excess value; therefore α_1 will be positive. H_{1b} predicts that as the average level of segment reporting differences increases across the peer group, the focal firm will experience reduced systematic correlation, increasing focal firm excess value; thus α_2 will be positive.

I include the number of TNIC peer firms, *NumTNICPrs*, and a Herfindahl index, *HHI*, provided by Hoberg and Phillips (2010b) to control for the number of possible SIC codes and for competition that may drive disclosure aggregation decisions, respectively.[24]

The remaining controls follow Bens and Monahan (2004) and are designed to capture the complexity of the focal firm, its information environment, and firm

[24] I use an HHI index provided by Hoberg and Phillips (2010b) because using an HHI index based on Compustat data alone can lead to incorrect conclusions (Ali, Klasa, and Yeung 2009). Hoberg and Phillips (2010b) have estimated HHIs using publically and privately available information. Compustat is limited to publicly trade firms, omitting private firms, a large portion of competition in many markets.

characteristics that affect value. *NumSeg* is the number of segments reported by the focal firm. *Related* captures the relatedness of the firm's operations and is measured as the total number of reported segments less the number of unique three-digit SIC codes from reported segments. As discussed previously, finance research has found firms receive either a discount or a premium for diversification, based on firm characteristics or the data source. Adding these controls holds constant factors that affect excess value due to diversification and not segment reporting. Firm size, labeled *Size*, relates to many factors that capture the focal firm's information environment (i.e., Lang and Lundholm 1996) and is defined as the natural log of total assets. *Profit* is defined as the return on assets and captures excess value related to firm performance. *Invest* is defined as the ratio of capital expenditures to total assets.

I also control for firm characteristics related to value.[25] *Leverage* measures firm indebtedness and is defined as the book value of debt, long and short-term, divided by total assets. *SalesGrow* captures the current growth of the firm and is measured as the sales in the current period divided by sales in the previous period. *MAR* captures the stock market performance of the firm over the current year and is measured as one plus the market-adjusted stock return for the fiscal year. *StdROE* measures the volatility of the firm's past performance and is computed as the standard deviation of return on equity over the past five years. *Corr5yr* measures the correlation between the annual stock return and earnings per share. *Corr5yr* is defined as the correlation between the

[25] Bens and Monahan also include several variables describing analysts' evaluation of the firm: analyst forecasts, the average monthly following, forecast error, forecast dispersion, and the standard deviation of changes over the fiscal year in the median forecast from the preceding month. I exclude these variables for two reasons. First, one measure of their study uses AMIR scores which are more closely related to analyst forecast, and second, using I/B/E/S data places additional restrictions on data by limiting the number of matches. Analyst control variables in the study have limited explanatory power in most cases.

annual stock return and earnings per share computed over the preceding five years. Finally, *Surprise* captures additional information from current earnings and is measured as the absolute value of the difference between current-year earnings per share and previous-year earnings per share, divided by the stock price at the beginning of the fiscal year.

Changes in Mandatory Disclosure and Excess Value

The change in accounting standard provides an opportunity to test H_{2a} and H_{2b}. Low mandatory segment reporting quality occurred pre-ASC 280; high mandatory segment reporting quality occurs after ASC 280 implementation. *Post* is an indicator variable equal to one if the firm-year observation is after ASC 280 implementation, all firm-year observations after December 1998, and zero otherwise.[26] I estimate the following equation, clustering by firm and year:

$$\begin{aligned} ExVal \;=\; & \beta_0 + \beta_1 Post + \beta_2 FFDIFF + \boldsymbol{\beta_3 FFDIFF \times Post} + \beta_4 PFDIFF \\ & + \boldsymbol{\beta_5 PFDIFF \times Post} + \beta_6 NumSeg + \beta_7 Related \\ & + \beta_8 NumTNICP + \beta_9 HHI + \sum_{c=1}^{9} \beta_c Control_c + \xi \end{aligned} \qquad (7)$$

H_{2a} poses whether higher mandatory disclosure affects the impact of focal firm differentiation on the focal firm's excess value; H_{2b} poses whether higher mandatory disclosure affects the impact of peer firm differentiation on the focal firm's excess value. The coefficients of interest are β_3 and β_5. Coefficients can be either negative or positive depending on whether higher-quality mandatory segment disclosures created positive or negative externalities.

[26] The change in standard occurred for firms filing in December 1998. If a firm filed their annual return in November 1998 they would report segments under SFAS No. 14 unless voluntarily choosing to report under ASC 280. I assume all firms disclosing prior to December 1998 report under SFAS No. 14 and firms disclosing after December 1, 1998 disclose using ASC 280.

Chapter 4: Descriptive Statistics and Results

In this section I provide descriptive statistics for my sample, correlations between variables in equations (6), and estimation of equations (6) and (7). I provide statistics for both single segment and multi-segment firms.

Descriptive Statistics

Table 1 provides the industry composition for single and multi-segment firms.[27] No one industry dominates the sample and the mix of firm and firm-year observations is mostly homogenous across single and multi-segment samples. Only business services comprise a larger portion of the sample for both single and multi-segment firms, 13.27 percent and 12.82 percent of firm-year observations, respectively. Retail (10.10 percent) and Electronic Equipment (10.79 percent) also comprise larger relative portions of the sample for single segment firms.

Table 2 presents descriptive statistics for single and multi-segment firms. Descriptive statistics for $ExVal_{Rev}$ and $ExVal_{AT}$ are generally consistent with previous research.[28] Given that I use mean industry multiplier, I find $ExVal_{Rev}$ and $ExVal_{AT}$ are lower than median values, untabulated. My research question does not make inferences on the proximity of *ExVal* to zero as does previous research establishing the diversification discount; therefore, lower mean values will not impact my results. Overall, descriptive statistics demonstrate *ExVal* is different for single and multi-segment firms with multi-segment firms generally receiving lower excess value.

[27] Industry groups are presented using Fama-French 48 industry classifications for ease of presentation. SIC codes are used in analysis.

[28] As previously noted, I make one deviation from Berger and Ofek. I use mean industry multipliers instead of median industry multipliers (discussed in detail previously). In separate analysis, results are consistent when using median industry multipliers. Results for mean industry multipliers are not reported by Berger and Ofek for comparison.

My measure of segment reporting differentiation suggests firms report a large portion of sales not disclosed by peer firms. To ease interpretation of my measures I include descriptive statistics for $DIFF_{FF}$ and $DIFF_{PF}$, before the log transformation used in regressions labeled *FFDIFF* and *PFDIFF*.[29] For multi-segment firms, the mean (median) percent of segment sales not disclosed by peer firms is 37 percent (16 percent). $DIFF_{FF}$ for single segment firms indicates the focal firm does not operate in the same four-digit SIC code as their product market peers 25 percent of the time.[30] For multi-segment firms, the mean (median) value-weighted peer firm differentiation, $DIFF_{PF,}$ is 20 percent (9 percent). Single segment firms have peers with more similar segments; mean (median) value-weighted $DIFF_{PF}$ is 15 percent (6 percent).

Multi-segment firms are on average larger than single segment firms with mean (median) assets of 2,927.75 (610.14) for multi-segment firms versus 1,214.17 (234.00) for single segment firms. Multi-segment firms have less product market peers with a mean (median) of 46 competitors (23 competitors) than single segment firms with a mean (median) 75 competitors (42 competitors). As previous studies demonstrate, firm performance as measured by *ROA* and *PM* does not vary significantly between single and multi-segment firms.

Table 3 provides correlations between variables in equations (6). As would be expected, *FFDIFF* and *PFDIFF* are strongly and positively correlated with *ExVal* for single segment and multi-segment firms.

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[29] To reconcile the values listed in descriptive statistics with values used in regressions, the reported value is added to one, and then the natural log is taken. For example, the mean (median) *FFDIFF* for multi-segment firms is 0.3148 (0.1484).

[30] Single segment firms that do not operate in the same four-digit SIC code as product market peers operate in SIC codes very similar to product market peers. In this case, product market peers operate in four-digit SIC codes above and/or below the single-segment's four-digit SIC code.

Multivariate Analyses of Excess Value and Segment Reporting Differentiation

Table 4 provides results for estimation of equation (6). Equation (6) is estimated separately for single and multi-segment firms using two-way clustering by firm and year. To address issues related to the standard change from SFAS No. 14 to ASC 280, I estimate equation (6) for the full sample from 1996 to 2011 and then for the post implementation period, December 1998 to 2011, to hold constant the reporting regime.[31]

Multi-Segment Firm Differentiation

Table 4 Panel A provides results for multi-segment firms. The main coefficients of interest are *FFDIFF* and *PFDIFF*, α_1 and α_2 respectivley. As predicted by H_{1a}, *FFDIFF* is positive and significant in all cases (at least p-value <0.10). This result is consistent for the full sample and after ASC 280 implementation. This result is economically significant; using regression (3) as a basis for comparison, for ten percent change in *FFDIFF*, there is a 1.1 percent increase in excess value. While this result may not seem large, small percentage changes in differentiation results in large changes in dollar values. Holding constant mean values, a ten percent increase in *FFDIFF*—equivalent to reporting an additional 3.7 percent of differentiating segment sales—increases implied value by roughly $66.54 million when excess value is estimated using revenues and $57.40 million when excess value is estimated using assets.[32]

H_{1b} predicts the average level of segment differentiation within a peer group, *PFDIFF*, will be positive ($\alpha_2 > 0$). Results for multi-segment firms in panel A are

[31] Estimating equation (6) on the pre-period only also results in similar conclusions.

[32] Median values provide similar intuition. For a ten percent increase in focal firm reporting—an increase of 1.6 percent of differentiating sales—implied value increases by $10.39 million when revenues are used to estimate excess value and $8.80 million when assets are used to estimate excess value.

positive and significant indicating that peer group differentiation provides information associated with higher focal firm excess value (at least p-value < 0.10). *PFDIFF* has an equally important economic significance. For a ten percent change in *PFDIFF* —the average level of differentiating segments within a peer group increases by 2 percent—focal firm excess value is associated with an increase of 1.5 percent for implied value. This result indicates an increase by roughly $90.38 million when excess value is estimated using revenues and $77.97 million when excess value is estimated using assets.[33] It is important to note that *FFDIFF* has incremental explanatory power once *PFDIFF* is included in the model, indicating that the focal firm will benefit from reporting differentiating segments even though peer firm differentiation exists. Overall, these results are consistent with Lambert, Leuz, and Verrecchia (2007): both focal firm and peer firms disclosure precision will positively affect focal firm value.

It is important to note the coefficients for *NumSeg* and *Related* for multi-segment firms. These variables hold constant operational diversity of the firm, often related to the diversification discount. Previous literature is mixed on predictions for *NumSeg* and *Related*. If diversified firms are valued at a discount, then *NumSeg* will be negative and *Related* will be positive. If diversified firms are valued at a premium, *NumSeg* will be positive and *Related* will be negative. Table 4 Panel A indicates that *NumSeg* is negative and *Related* is positive (at least p-values < 0.05), indicating that multi-segment firms receive a discount on average. While reporting differentiating segments improves value, it is insufficient to completely overcome the diversification

[33] Median values provide similar intuition. For a ten percent increase in the average level of segment differentiating sales—peer firms reporting 0.9 percent additional differentiating sales on average—implied value increases by $14.11 million when sales is used to estimate implied value and $11.95 million when assets is used to estimate excess value.

discount on average. Continuing with our previous example from regression (3) of table 4, the average firm would increase implied value by $156.92 million if sales are used to estimate excess value and $135.37 million if assets are used to estimate excess value. The average difference between market value and implied value for multi-segment firms is $1,279.29 million if sales are used to estimate excess value and $439.24 million if assets are used to estimate excess value. Thus, the diversification discount is reduced but not eliminated. The remaining variables are consistent with previous literature.

Single Segment Firm Differentiation

Although single segment firms do not suffer from issues that may create or destroy value due to diversification, Lambert, Leuz, and Verrecchia (2007) suggest that single-segment firms will benefit from increased disclosure precision. Thus, single-segment firms operating in niche areas considerably different from market competitors will benefit from differentiating their operations from competitors, reducing covariances between itself and its peer group. Further, single segment firms will also benefit from the reduced covariance from higher levels of average peer firm differentiation within the peer group.

Table 4 Panel B provides results for single segment firms. *FFDIFF* for single segment firms is positively associated with excess value in all cases and highly significant (at least p-value < 0.01), suggesting differentiating single segment firms are associated with a higher valuation. This result is also economically significant; a single-segment firm that reports with a differentiating SIC code is associated with a

$518.42 million increase when revenues are used to estimate excess value and $503.31 million when assets are used to estimate excess value.

Similarly, *PFDIFF* is positive and significant in regressions (at least p-values < 0.05). This result is also economically significant. If the average level of peer firm differentiation within the peer group increases by ten percent—an increase of 1.5 percent in differentiating sales—focal firm excess value is associated with a $26.52 million increase when sales are used to estimate excess value and a $25.75 million increase when assets are used to estimate excess value.

Multivariate Analyses of Externalities in Segment Reporting

To test for externalities in segment reporting, I use the standard change from SFAS No. 14 to ASC 280. Given the sample period from the previous test is mostly comprised of firm-year observations after ASC 280 implementation, I limit my sample to firm-year observations from 1996 to 2001.

There are three possible reporting groups when examining the change in segment reporting: 1) no change in segment reporting for both single and multi-segment firms; 2) firms that reported a single segment under SFAS No. 14 and multiple segments under ASC 280; and 3) firms that reported multiple segments under SFAS No. 14 and increased the number of reported segments under ASC 280. Firms with no change in the number of reported segments have constant segment reporting quality across the standard change. Firms reporting a single segment under SFAS No. 14 and multiple segments under ASC 280 have been shown to have poor segment reporting quality, often hiding poor performing segments (Berger and Hann 2003, Botosan and

Stanford 2005). Firms with multiple segments that increased the number of segments improve their segment reporting quality.

To test H_2, I create an indicator variable, *Post*, equal to 1 if the firm-year observation is after ASC 280 implementation, zero otherwise. I interact *Post* with my main variables of interest, *FFDIFF* and *PFDIFF*. If increases in segment reporting create externalities, then the effects observed in equation (6) will be stronger post ASC 280 implementation. If the reduced covariance improves excess value more than potential harm due to disclosing poor performing segments, then the interaction between *FFDIFF* and *PFDIFF* and the post indicator will be positive. If disclosure of poor performing segments not previously reported is revealed due to the standard change, then additional disclosure may outweigh the effect due to the reduced covariance between firms.

Table 5 presents results for estimation of equation (7). Panel A provides results for firms with no changes in segment reporting, regressions (1) through (6) for single segment firms and regressions (7) through (12) for multi-segment firms. Only in regression (4), when *FFDIFF* is regressed alone with excess value using assets, do single segment firms with no change receive additional value due to increased differentiation, *Post* * *FFDIFF* > 0 (p-value < 0.1), consistent with the idea that improved mandatory disclosure increased the role of focal firm differentiation, a positive externality. There is no evidence of peer firm differentiation having a larger effect after ASC 280 for single segment firms with no change in segment reporting quality.

For multi-segment firms that did not change segment reporting, regressions (8) and (9) (using revenues to estimate excess value and *PFDIFF*) show peer firm differentiation under higher mandatory reporting precision has a negative effect on excess value (at least p-value < 0.05), consistent with negative externalities.

Table 5 panel B provides results for firms with increases in segment reporting after ASC 280 implementation. Regressions (1) through (6) are for firms that changed from single segment firms to multi segment firms, and regressions (7) through (12) are for firms that reported more segments after ASC 280 implementation. For firms reporting a single segment then multiple segments, *Post * FFDIFF* is negative (at least p-value < 0.10). This is consistent with the idea that these firms were actually multi-segment firms and aggregated segments to hide poorly performing, value-destroying segments (Berger and Hann 2003, Berger and Hann 2007). Thus, disclosing differentiating segments has a larger, negative impact after the standard change. For multi-segment firms that increased segment reporting after implementation, regression (8) using revenues to estimate excess value indicates the impact of *PFDIFF* on excess value increases after implementation (p-value < 0.05).

Overall, results indicate segment differentiation create externalities. The direction of the externalities is inconclusive.

Chapter 5: Robustness and Other Tests

Varying the Cutoff of the Core Industry Portfolio

The peer group industry portfolio is constructed by selecting SIC codes disclosed by at least 5 percent of TNIC peers. Varying this cutoff does not alter interpretation of the results. In untabulated results, if no cutoff is made, both *FFDIFF* and *PFDIFF* remain positive and significant for multi-segment firms in all cases (at least p-value < 0.10) except for when *FFDIFF* and *PFDIFF* are included in the same regression and assets are used to estimate excess value. In that case, *FFDIFF* is no longer significant at any level. Also multi-segment firms continue to exhibit a diversification discount; *NumSeg* is negative and *Related* is positive. Results for single segment firms are also positive and significant in all cases; both *FFDIFF* and *PFDIFF* are associated with higher levels of excess value (p-value < 0.001).

On the other extreme, if the cutoff of peer firms disclosing SIC codes is made at 25 percent of TNIC peer firms disclosing the SIC code, results remain consistent. For multi-segment firms, *FFDIFF* is positively associated with excess value in all cases (p-value < 0.001) and *PFDIFF* is positively associated with higher levels of excess value (at least p-value < 0.05) but only when revenues are used to estimate excess value. For single segment firms, *FFDIFF* is positively associated with higher levels of excess value in all cases (p-value < 0.001) and *PFDIFF* is positively associated with higher levels of excess value (at least p-value < 0.05) except for when assets are used to estimate excess value and *FFDIFF* is included in the regression. Using other levels of cutoff provide similar results.

Firms with Line of Business as Primary Segment Type

Under ASC 280, firms are required to select a primary and secondary method of reporting segments. Firms determine whether line of business or geographic segments are primary or secondary segments according to internal structure used for decision making. Firms choosing geographic segments as their primary segment disclosure may not report line of business segments similar to firms that choose line of business as their primary segment disclosure type. I eliminate firms that choose geographic segments as their primary segment type and estimate equation (6).[34]

Table 6, regressions (1) and (2) provide estimations of equation (6). Focal firm segment differentiation is positive and significant only when revenues are used to estimate excess value (p-value < 0.001). Focal firm segment differentiation is positive and significant when regressed without peer firm segment differentiation, results not tabulated. Peer firm segment reporting differentiation is positive and significant in all cases (p-value < 0.05).

Changing the Comparison of Industry Codes

Excess value and peer group industry codes use SIC codes. Using both SIC codes to define single segment peers when calculating excess value and comparing the focal firm to its peer group may create a mechanical relation driving the result. I estimate equation (6) using NAICS codes and Fama-French 48 industry classifications as alternative definitions of industry comparison groups. I require at least 5 percent of peer firms report same industry code to be included in the core peer group industry code

[34] Single segment firms are by definition primary geographic segment reports and are not considered in this analysis.

portfolio.[35] As before, I compare the focal firm's reported segments to the peer group's operations portfolio. Comparisons are made at the six-digit NAICS code level for *FFDIFF* and four-digit NAICS code level for *PFDIFF*.[36] Table 6, regressions (3) through (6) demonstrate that results are robust to using NAICS codes to compare the focal firm to its peer group. Table 6, regressions (7) through (10) demonstrate that the average level of peer firm differentiation is robust to using Fama-French industry classification. But for multi-segment firms, focal firm differentiation is no longer significant. This is due to the effect of focal firm differentiation being subsumed by the peer firm differentiation given the colinearity of both measures.

Differentiating Segments Less Than Ten Percent of Sales

ASC 280 suggests firms disaggregate a segment if sales or assets for that segment are greater than 10 percent of total sales or assets. If a segment has less than 10 percent of sales or assets, the segment may be aggregated with other segments (see ASC 280-10-55 Example 2: Identifying Reportable Segments). Thus, differentiating segments with less than 10 percent of sales may provide information that could have been aggregated into another segment but is disclosed separately. Such segments could be used to signal positive future prospects in industries not currently occupied by peers. To test whether disclosing segments less than 10 percent of total sales provides additional information that improves excess value I create a variable, *SmallSeg*, equal to the percentage of sales of differentiating segments less than 10 percent of total firm sales.

[35] Varying the percentage of peer firms disclosing an industry code (i.e., no cutoff or 1 percent versus 5 percent) does not affect results.

[36] Six-digit NAICS codes are roughly equivalent in specificity to four-digit SIC codes. Four-digit NAICS codes are roughly equivalent to three-digit SIC codes (Hoberg and Phillips 2013). Altering this specification does not change the interpretation of results.

Table 7 provides estimation of equation (6), including *SmallSeg*. Results show that reporting differentiating segments less than 10 percent of sales is incremental to *FFDIFF* and *PFDIFF*. This result suggests disclosing smaller differentiating segments provides an additional signal not captured by focal firm or peer firm differentiation. In all cases, this effect is stronger than either focal firm differentiation or peer firm differentiation. For a ten percent increase in the disclosure of small, differentiating segments, focal firm excess value increases by 10.4 percent if revenues are used to estimate focal firm excess value and 4.87 percent if assets are used to estimate focal firm excess value. Overall, this result is consistent with the idea that providing more precise segments will improve firm value. Also, this result suggests that increased segment differentiation is a potential signal of segment reporting quality.

Competition and Segment Reporting Differentiation

Industry competition may affect the interpretation of differentiating segment information. Firms in highly competitive industries may disclose differentiating segment information in order to attract attention. Firms in more concentrated industries may disclose differentiating segment information to signal future prospects. I examine whether the level of competition or concentration affects the role of segment differentiation in focal firm excess value by creating two indicator variables: *Q1HHI* is equal to one if the firm-year observation is below the first quartile Herfindahl Index (hereafter HHI) for that year, zero otherwise; *Q3HHI* is equal to one if the firm-year observation is above the third quartile HHI for that year, zero otherwise. *Q1HHI* firms operate in more competitive industries, while *Q3HHI* firms operate in more concentrated industries.

Table 8 provides estimation of equation (6) with *Q1HHI*, *Q3HHI*, and interactions of indicator variables with my variables of interest, *FFDIFF* and *PFDIFF*, for multi-segment firms. For firms in more concentrated industries, focal firm differentiation decreases excess value (at least p-value < 0.1) when $ExVal_{Rev}$ is the dependent variable. This is consistent with the idea that firms operating in more concentrated industries that report differentiating segments provide value destroying information. Peer firm differentiation is more significant in more concentrated industries (at least p-value < 0.1) when $ExVal_{Rev}$ and $ExVal_{AT}$ are dependent variables. These results are consistent with the idea that firms operating in more concentrated industries benefit from peer firms reporting differentiating information.

Chapter 6: Conclusion

In this study I examine the effects of segment reporting differentiation on excess value. I calculate a measure of segment reporting differentiation that compares reported segments for the focal firm to its peer group. This measure tests the assertion that increases in the precision of accounting disclosure positively affects firm value (Lambert, Leuz, and Verrecchia 2007, Lambert, Leuz, and Verrecchia 2012). My measure holds constant information shared by peer firms and lets vary the amount of distinct segment information the focal firm reports. I find the level of segment differentiation of the focal firm positively affects focal firm excess value. Further, the average level of peer firm differentiation for the focal firm's peer group also positively affects focal firm excess value. Thus, when not only the focal firm but also when peers provide differentiating segment information, all firms benefit with an increase in excess value. I assert that the improvement in value results from a reduction the perceived correlation between the focal firm's and its peers' cash flows.

I also demonstrate that segment reporting has both positive and negative reporting externalities. Using the change in accounting standard associated with segment reporting as an exogenous shock to the reporting environment, I show the market's assessment of differentiating segment information depends on the manner in which segments were reported prior to ASC 280 implementation. When firms remained single segment firms across reporting regimes, increased focal firm differentiation created a positive externality. When firms reported the same number of multiple segments, peer firm differentiation created a negative externality. Firms that changed from single segment reporters under SFAS No. 14 to multi-segment reporters under

ASC 280 received an additional reduction in excess value associated with focal firm segment differentiation. Finally, firms that reported more segments after ASC 280 demonstrate a potential positive externality associated with peer firm segment differentiation.

My results suggest that segment reporting within an industry is an important consideration when determining how segment information affects firm value. While the Post Implementation Review finds no major faults with the standard, standard setters may wish to think about how additional segment reporting requirements will affect the amount of segment information available as an industry, ultimately affecting the focal firm. Further, standard setters and investors may want to examine how firms of interest differentiate their firm from peers using reported segments. Results indicate that not only the focal firm, but also the effect of peer firms should be taken into account when discussing segment reporting.

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Appendix A: Construction of *DIFF*

In this appendix I provide a brief summary of how Hoberg and Phillips (2010a; 2013) construct their product market peer dataset, how I construct the peer firm core operations portfolio using product market peer data provided by Hoberg and Phillips, and how I use the peer firm operations portfolio to construct a measure of segment reporting differentiation. I also provide an example using reported segments from Abbott Labs in 2008.

Hoberg and Phillips Data

Firms are required by Regulation S-K to accurately describe all significant products in annual Form 10-K filings. Hoberg and Phillips use web crawling algorithms to collect product descriptions from Form 10-K filings and create product market/industry groupings from these product descriptions. Their sample includes all Form 10-K filings on the EDGAR website from 1996-2011, covering 12,187 firms with 87,369 firm-year observations.[37]

Texted-Based Network Industry Classifications (hereafter TNIC) provide a better representation of industry clustering than current industry classification schemes (SIC codes, NAICS codes, GICS codes) and are flexible over time.[38] TNICs are based on firms with the most proximate or closest product network (See figure A.1). Figure A.1 demonstrates how TNIC peers are grouped using two examples, General Dynamics and Antheon. Dotted circles represent TNIC peer group for each focal firm highlighted

[37] Of all Form 10-K filings, roughly 100 firms did not provide product descriptions compatible with the measurement of *Product Cosine Similarity*. These firms are not expected to impact the results.

[38] While Hoberg and Phillips assert and provide some evidence that their TNICs provide a more accurate representation of industry clustering, I compare SIC codes because of their ubiquitous use in research and the fact that segment industries are defined in Compustat by SIC codes and have only recently started disclosing NAICS codes.

in green. Also provided are ranks of peer firms where G denotes General Dynamic's TNIC peers and A denotes Antheon's TNIC peers. For example, G1 is the first most similar TNIC peer to General Dynamics; A5 is the fifth most similar TNIC peer to Antheon. Three-digit primary SIC codes—in parentheses under the firm's name in each small circle—indicate the proximity of TNIC peers by SIC codes.

Creating TNIC peer groups requires extremely common or non-descriptive words be eliminated from product descriptions. Common words eliminated include words used by more than 25 percent of the population of EDGAR filers' product descriptions, geographic words such as countries, states, or major cities, as well as articles, conjunctions, personal pronouns, abbreviations, and legal jargon. The elimination procedure focuses attention on nouns and pronouns, words most unique in product descriptions. Typical firms use roughly 200 unique words to describe their product portfolio.

Product similarity is estimated by examining the cosine similarity of product descriptions between firms. Cosine similarity measures the angle between two word vectors on a unit sphere. This is done by first constructing a vector containing all unique words disclosed by all firms in sample. This vector, *N*, is a vector of length *n*, where *n* is the number of unique words disclosed by all firms in the sample. For each firm-year Form 10-K filing, vector P_i is populated from vector *N* with a one if firm *i* uses a word in describing its products and a zero if it does not. Cosine similarity is the dot product of normalized vectors for firm *i* and *j*, defined as:

$$Product\ Cosine\ Similarity_{i,j} = \left(V_i \cdot V_j\right) \text{ where: } V_i = \frac{P_i}{\sqrt{P_i \cdot P_i}}\ \forall i,j \qquad \text{(A.1)}$$

The dot product is higher when firms share more of the same elements between vectors P_i and P_j (i.e., share words in product descriptions).[39] *Product Cosine Similarity*$_{i,j}$ is bounded by [0, 1].

TNIC classifications are constructed using a minimum similarity threshold. Firms with a *Product Cosine Similarity* above a certain threshold are assigned to the same TNIC group. Higher thresholds result in fewer product market rivals, lower thresholds result in more rivals. Firms likely share more than one product in common given the minimum similarity threshold. To achieve industry groups similar to three-digit SIC codes, the minimum similarity threshold is set at 21.32 percent similarity.[40] TNIC peers are used in the next step to create a core industry operations portfolio.

Construction of Peer Firm Segment Portfolio

TNIC peers from Hoberg and Phillips data are matched by Compustat GVKEYs. $GVKEY_1$ refers to the focal firm; $GVKEY_2$ refers to TNIC peer firms. I match TNIC peer firms using $GVKEY_2$ to the Compustat Segment file to obtain all peer firm operations/reported segments. I then combine the list of TNIC peer SIC codes with the original data provided by Hoberg and Phillips, eliminating any duplicate SIC codes. To focus on the core operations of the industry, eliminating tangential operations of peer firms, 5 percent of peer firms must disclose an SIC code to be included in the peer portfolio. Cutoffs at varying levels provide the same tenor of results.

[39] The construction of the vector P_i assigns equal weights to all words in the vector. Hoberg and Phillips also discuss weighting the words in vector P_i by the frequency of use in the product description, a value-weighted approach. They find no difference in this alternative definition of vector P_i. Thus, they conclude "a firm's decision to use a given word to describe a product is more important than how frequently it is used (Hoberg and Phillips 2013, 11)."

[40] See Hoberg and Phillips (2010a; 2013) for tests that validate the improved explanatory power of TNIC groups.

Segment Reporting Differentiation (*DIFF*)

My measure of segment reporting differentiation captures to what extent the focal firm discloses segments not correlated with its peer group. Firms with lower segment reporting differentiation share more operations in common with their industry group and will therefore have a lower covariance between the focal firm and its peer group. Firms with higher segment reporting differentiation will share fewer operations in common with their industry group, reducing the covariance between the focal firm and its peer group. Thus, to measure segment differentiation I match SIC codes reported in the segment file by the focal firm with SIC codes disclosed by TNIC peers. I then sum the sales of segments not disclosed by peers (non-matches) and divide by the focal firm's total sales. My measure of differentiation is the percentage of sales for segments disclosed by the focal firm, but not disclosed by the peer group.

$$DIFF = \frac{Sales\ of\ Segments\ not\ Disclosed\ by\ Peers}{Total\ Sales\ for\ the\ Focal\ Firm} \quad \text{(A.2)}$$

Segment reporting differentiation at the focal firm level is calculated by taking the natural log of one plus *DIFF*. It is important to note that measuring focal firm segment reporting differentiation value-weights the segments not disclosed by peer firms.[41] While the firm may have few segments not reported by peers, if those segments make a larger portion of sales, *FFDIFF* will be higher.

$$FFDIFF = \ln(1 + DIFF) \quad \text{(A.3)}$$

Peer firm segment reporting quality is measured by value-weighting *DIFF* for peer firm *p* by the market value of each peer.

[41] In robustness test, I equally-equally weight my measure of segment reporting differentiation. That is to say, I divide the number of unmatched segments by the total number of segments. The results remain the same.

$$PFDIFF = ln\left(1 + \sum_{p=1}^{p} \frac{MV_p}{MV} * DIFF_p\right) \quad \text{(A.4)}$$

An Example: Abbott Labs

To illustrate how *FFDIFF* is constructed I provide an example using Abbott Labs in 2008. Table A.1 presents segments disclosed by Abbott Labs in the Compustat Segment file. Abbott Labs has labeled one segment as "Other" with no indication of which SIC code or SIC codes the Other segment identifies. Although the Other segment consists seven percent of sales, it may contain information relevant to valuing future prospects of the firm. Further, because there is no industry code for comparison, Other is eliminated. The remaining four segments are then compared to their product-market peer group.

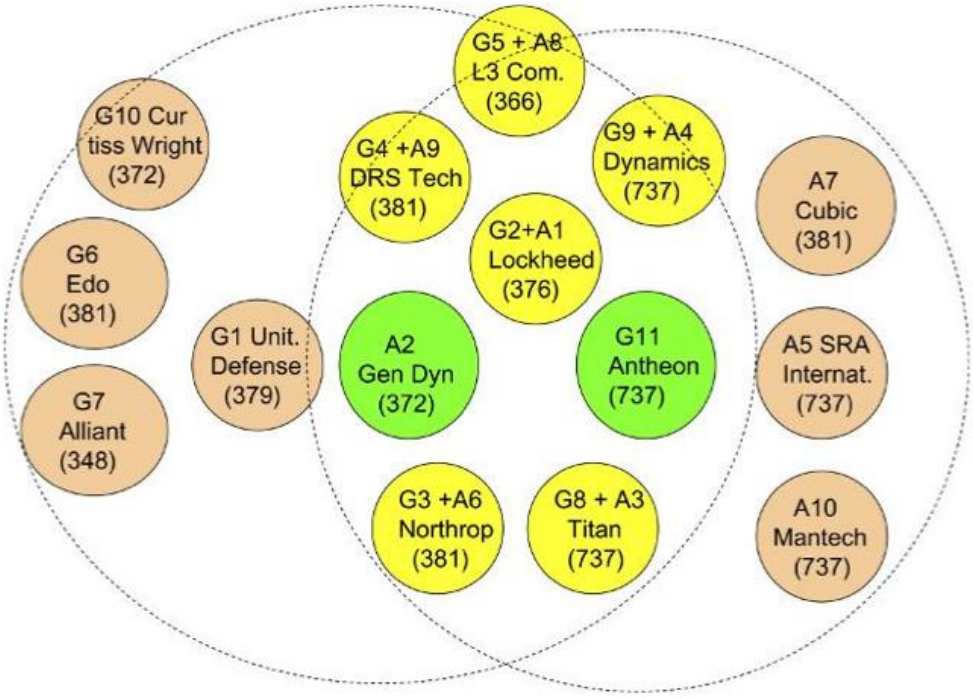
Table A.2 gives an example of how *FFDIFF* is calculated for Abbott Labs. Abbott Labs has 73 TNIC peers from the Hoberg and Phillips dataset (see table A.3). As would be expected using product description similarities, most TNIC peers operate in similar industry codes. The list of TNIC peers is matched to SIC codes disclosed in the Compustat segment file and I eliminate any four-digit SIC code not disclosed by at least five percent of TNIC peers. Abbott's TNIC peers operate in three four-digit SIC codes: 2834, 2835, and 2836. These three SIC codes make up the core operations of the product-market peer group at the five percent level.

I next compare these three four-digit SIC codes with industry codes disclosed by Abbott. Abbott discloses four segments, 2023, 2834, 3841, and 3842. When comparing TNIC peers and Abbott's disclosed segments, only SIC code 2834 is shared. SIC code 2834 comprises 56.58 percent of Abbott's sales. The sales from the

remaining three four-digit SIC codes would be summed together. SIC codes 2023, 3841, and 3842 constitute 36.38 percent of Abbott's sales.[42] I then take one plus the natural log of segment sales not disclosed by peers, the natural log of one plus 36.38 percent, or 0.3103.

[42] The sum of the shared segments and the distinct segments is less that 100 percent because the Other segment is eliminated.

Figure A.1:
Diagram of General Dynamics' and Antheon's Ten Closest Peers



This diagram is taken from Hoberg and Phillips (2010a, 3780). This diagram illustrates the network created by comparing product description similarities. The letters in the headers of each circle, "G" or "A", represent to which peer group the observations belongs. The number indicates the peer's proximity to the focal firm, General Dynamics or Antheon. For example, Lockheed Martin is the second closest peer to General Dynamics and the first closest peer to Antheon. Below the header is the name of the firm. The number in parentheses is the primary three-Digit SIC code of the firm.

Table A.1:
Abbott Labs Compustat Segments

Segment Name	Primary SIC Code	Segment Sales (in $ Millions)	Percent of Sales
Pharmaceuticals	2834	16,708.00	56.58%
Nutritionals	2023	4,924.00	16.68%
Diagnostics	3841	3,575.00	12.11%
Vascular	3842	2,241.00	7.59%
Other		2,080.00	7.04%
	Total	**29,528.00**	**100%**

This table provides reported segments for Abbott Labs in fiscal year 2008 from the Compustat Segment file.

Table A.2:
Calculation of FFDIFF for Abbott Labs

Company Name	No. Compustat Segment	Focal Firm SIC Code	Percent of Sales	TNIC Peer Firm SIC Codes
ABBOTT LABORATORIES	4	2023	16.68%	
		2834	56.58%	2834
		3841	12.11%	
		3842	7.59%	
				2835
				2836
			DIFF	***FFDIFF***
			36.38%	0.3103

This table provides an example of how *DIFF* is calculated using reported segments for Abbott Labs. Segment information is taken from the Compustat Segment File. TNIC peers are matched using data provided by Hoberg and Phillips (2010a; 2013). Four-digit SIC codes must be disclosed by at least five percent of all TNIC peers to be included in TNIC peer firm SIC codes.

Table A.3:
List of TNIC Peer Firm SIC Codes

Peer GVKEY	Company Name	No. Compustat Segments	1st SIC Code	2nd SIC Code	3rd SIC Code	4th SIC Code
	ABBOTT LABORATORIES	**4**	**3842**	**3841**	**2834**	**2023**
2086	BAXTER INTERNATIONAL INC	3	3845	3841	2836	
2111	BECTON DICKINSON & CO	3	3841	3826		
2403	BRISTOL-MYERS SQUIBB CO	2	2834	2023		
4409	ENZON PHARMACEUTICALS INC	3	6794	2836		
4843	FOREST LABORATORIES -CL A	1	2834			
6266	JOHNSON & JOHNSON	3	3842	2844	2834	
6730	LILLY (ELI) & CO	1	2834			
7257	MERCK & CO	3	2834			
7694	MARINA BIOTECH INC	1	2834			
8530	PFIZER INC	2	2834			
12250	AMAG PHARMACEUTICALS INC	1	2835			
13599	CELGENE CORP	1	2834			
15708	ALLERGAN INC	2	3841	2834		
23253	RADIENT PHARMACEUTICALS CORP	3	2835			
24396	HEALTHWAYS INC	1	8099			
24468	BIOGEN IDEC INC	1	2836			
24782	PERRIGO CO	4	2834			
25047	SCICLONE PHARMACEUTICALS INC	1	2834			
25623	HI TECH PHARMACAL CO INC	1	2834			
27845	ACTAVIS PLC	3	5122	2834		
27988	REPROS THERAPEUTICS INC	1	2834			
29127	INCYTE CORP	1	7375			
30007	VIVUS INC	1	2834			
30281	LA JOLLA PHARMACEUTICAL CO	1	2836			
30674	ARIAD PHARMACEUTICALS INC	1	2836			
61899	IDERA PHARMACEUTICALS INC	1	2836			
62263	ALEXION PHARMACEUTICALS INC	1	2836			
62921	NEUROCRINE BIOSCIENCES INC	1	2836			
63790	MAST THERAPEUTICS INC	1	2834			

Table A.3 *(Continued)*

Peer GVKEY	Company Name	No. Compustat Segments	1st SIC Code	2nd SIC Code	3rd SIC Code	4th SIC Code
64857	SAREPTA THERAPEUTICS INC	1	2836			
65011	HESKA CORP	2	2836	2835		
65944	DEPOMED INC	1	2834			
122257	BIOMARIN PHARMACEUTICAL INC	1	2836			
125531	OPEXA THERAPEUTICS INC	1	2836			
128098	ERBA DIAGNOSTICS INC	1	2835			
133468	RIGEL PHARMACEUTICALS INC	1	2834			
133868	LEXICON PHARMACEUTICALS INC	1	2835			
137642	PAIN THERAPEUTICS INC	1	2834			
138747	TELIK INC	1	2836			
141197	ARRAY BIOPHARMA INC	1	8071			
146156	ALERE INC	4	2835			
146616	CORCEPT THERAPEUTICS INC	1	2834			
150221	GALECTIN THERAPEUTICS INC	1	2834			
156857	GTX INC	1	2834			
157865	MEI PHARMA INC	1	2834			
157954	SANTARUS INC	1	2834			
160668	THERAVANCE INC	1	2834			
162892	MEDICINOVA INC	1	2836			
166435	VANDA PHARMACEUTICALS INC	1	2836			
176861	OREXIGEN THERAPEUTICS INC	1	2836			
177264	COVIDIEN PLC	4	3845	3842	2835	2834
177606	VIA PHARMACEUTICALS INC	1	2836			
177764	SYNTHETIC BIOLOGICS INC	1	2834			
179428	DARA BIOSCIENCES INC	1	2836			
1478	WYETH	3	2834			
3171	OSCIENT PHARMACEUTICALS CORP	1	2835			
5020	GENENTECH INC	1	2834			
5841	CYPRESS BIOSCIENCE INC	1	2836			
6110	IRIS INTERNATIONAL INC	2	3826			
9340	VALEANT PHARMACEUTICALS -OLD	4	6794	2834		

Table A.3 *(Continued)*

Peer GVKEY	Company Name	No. Compustat Segments	1st SIC Code	2nd SIC Code	3rd SIC Code	4th SIC Code
12091	MEDTOX SCIENTIFIC INC	2	8071	2835		
12180	OSI PHARMACEUTICALS INC	1	2835			
12233	GENZYME CORP	5	2836			
15106	BECKMAN COULTER INC	2	8731	3826		
20983	INDEVUS PHARMACEUTICALS INC	1	2834			
21066	MEDICAL NUTRITION USA INC	1	2834			
24191	MEDAREX INC	1	2836			
29312	HUMAN GENOME SCIENCES INC	1	2835			
30185	CARACO PHARMACEUTICAL LABS	1	2834			
62826	ONYX PHARMACEUTICALS INC	1	2834			
133328	ARDEA BIOSCIENCES INC	1	2834			
138662	ISTA PHARMACEUTICALS INC	1	2834			
154708	TALON THERAPEUTICS INC	1	2836			
155614	MIDDLEBROOK PHARMACEUTICALS	1	2834			
158746	METABASIS THERAPEUTICS INC	1	2834			
166200	MOLECULAR INSIGHT PHARMACTLS	1	2836			
175660	TORREYPINES THERAPEUTICS INC	1	2836			
178531	MAP PHARMACEUTICALS INC	1	2834			
178855	ABRAXIS BIOSCIENCE INC	1	2836			
264270	INHIBITEX INC	1	2836			

This table provides a list of all TNIC peers for Abbott Labs. The number of Compustat Segments is the number of segments reported in the Compustat Segment file, excluding any "Other" or "Corporate" segments. SIC codes are listed in numeric order. No TNIC Peer for Abbott Labs has more than four four-digit SIC codes listed in the Compustat Segment file.

Appendix B: Variable Definitions

Segment Reporting Differentiation Measures

$DIFF$ = $\dfrac{Sales\ of\ Segments\ not\ Disclosed\ by\ Peers}{Total\ Sales\ for\ the\ Focal\ Firm}$

$FFDIFF$ = $\ln(1 + DIFF)$

$PFDIFF$ = $\ln\left(1 + \sum_{p=1}^{p} \frac{MV_p}{MV} * DIFF_p\right)$.

Excess Value Variables

Val = Actual firm value at the end of the fiscal year defined as the sum of equity market value and book value of debt

$AccItem_i$ = Accounting item of interest, such as sales or assets, for segment *i*

$Ind_i\left(Val/_{AccItem}\right)_{mean}$ = The multiple of firm value to the accounting item of interest for the mean single-segment firm in segment *i*'s industry

n = The total number of segments reported by the firm in the 10-K

$ImpVal$ = $\sum_{i=1}^{n} AccItem_i \times \left[Ind_i\left(Val/_{AccItem}\right)_{mean}\right]$

$ExVal$ = $ln\left(\frac{Val}{ImpVal}\right)$

$ExVal$ is calculated using either sales ($ExVal_{Rev}$)or assets ($ExVal_{AT}$)as the accounting variable of interest.

Control Variables

NumSeg = Number of segment

NumTNICPrs = The number of TNIC peers from the Hoberg and Phillips (2010a; 2013) data

HHI = The Herfindahl index from Hoberg and Phillips (2010b) that includes private firm information

Related = The difference between the total number of reported segments and the number of segments with different three-digit SIC codes

Size = The natural log of total assets

Profit = Return on assets

Invest = The ratio of capital expenditures to total assets

Leverage = The book value of long-term debt plus short-term debt divided by total assets

Control Variables (Continued)

SalesGrow = Sales in the current year divided by sales in the previous period

MAR = One plus the market-adjusted stock return for the fiscal year

StdROE = Historical standard deviation of return on equity computed over the previous 5 years

Corr5yr = Historical correlation between the annual stock returns and earnings per share computed on over the preceding 5 years

Surprise = The absolute value of the difference between current-year earnings per share and previous-year earnings per share, divided by the stock price at the beginning of the fiscal year

Mandatory Disclosure

Post = An indicator variable equal to one if the firm-year observation is prior to the change in standard from SFAS No. 14 to SFAS No. 131 (now ASC 280), zero otherwise

Segments Less than 10% of Sales

SmallSeg = Sum of the percentage of sales for a reported segments in a four-digit SIC code not reported by the industry core operations portfolio that is also less than 10 percent of total sales.

Impact of Competition

Q1HHI = An indicator variable equal to one if the firm-year observation is below the first quartile of the Herfindahl index for that year, zero otherwise

Q3HHI = An indicator variable equal to one if the firm-year observation is above the third quartile of the Herfindahl index for that year, zero otherwise

Figure 1:
Example of How to Calculate DIFF

Focal Firm Reported Segments		**TNIC Peer Firms**			***DIFF***	
Firm A		Firm X	Firm Y	Firm Z	Firm A	
Segments	Sales				Segments	Sales
1	35				1	35
2	65	2	2	2		
			3			
				4		
Total	100				*DIFF* = 35/100 = 35%	

This figure provides an example of how to calculate segment reporting differentiation for this study, *DIFF*, using a stylized example. *DIFF* is the sales of segments not reported by peers, divided by total sales. *DIFF* is used to calculate focal firm segment reporting differentiation, *FFDIFF*, and peer firm segment reporting differentiation, *PFDIFF*.

Table 1:
Industry Composition of Single and Multi-Segment Firms and Firm-Years

	Multi-Segment Firms				Single Segment Firms			
Industry Description	*Firms*	*Relative Percent*	*Firm-Years*	*Relative Percent*	*Firms*	*Relative Percent*	*Firm-Years*	*Relative Percent*
Agriculture	10	0.40%	52	0.39%	12	0.34%	44	0.26%
Food Products	51	2.06%	344	2.57%	74	2.08%	411	2.41%
Candy & Soda	3	0.12%	14	0.10%	10	0.28%	101	0.59%
Beer & Liquor	11	0.44%	69	0.52%	14	0.39%	58	0.34%
Tobacco Products	2	0.08%	4	0.03%	2	0.06%	5	0.03%
Recreation	25	1.01%	130	0.97%	42	1.18%	160	0.94%
Entertainment	38	1.54%	151	1.13%	82	2.30%	396	2.33%
Printing and Publishing	27	1.09%	180	1.35%	28	0.79%	124	0.73%
Consumer Goods	55	2.22%	335	2.51%	69	1.94%	330	1.94%
Apparel	50	2.02%	277	2.07%	68	1.91%	340	2.00%
Healthcare	75	3.03%	337	2.52%	90	2.53%	433	2.54%
Medical Equipment	82	3.32%	422	3.16%	171	4.80%	869	5.10%
Pharmaceutical Products	99	4.00%	473	3.54%	253	7.10%	1,132	6.65%
Chemicals	87	3.52%	535	4.00%	52	1.46%	220	1.29%
Rubber and Plastic Products	33	1.33%	142	1.06%	43	1.21%	178	1.05%
Textiles	28	1.13%	120	0.90%	32	0.90%	102	0.60%
Construction Materials	70	2.83%	472	3.53%	61	1.71%	257	1.51%
Construction	33	1.33%	150	1.12%	49	1.37%	226	1.33%
Steel Works, Etc.	66	2.67%	379	2.83%	47	1.32%	215	1.26%
Fabricated Products	14	0.57%	69	0.52%	18	0.51%	98	0.58%
Machinery	137	5.54%	903	6.75%	129	3.62%	622	3.65%
Electrical Equipment	63	2.55%	436	3.26%	62	1.74%	276	1.62%
Automobiles and Trucks	59	2.39%	285	2.13%	49	1.37%	261	1.53%
Aircraft	20	0.81%	180	1.35%	13	0.36%	43	0.25%
Shipbuilding, and Railroad Equipment	9	0.36%	36	0.27%	5	0.14%	37	0.22%
Defense	9	0.36%	74	0.55%	5	0.14%	13	0.08%

Table 1 (*Continued*)

	Multi-Segment Firms				Single Segment Firms			
Industry Description	***Firms***	***Relative Percent***	***Firm-Years***	***Relative Percent***	***Firms***	***Relative Percent***	***Firm-Years***	***Relative Percent***
Precious Metals	7	0.28%	36	0.27%	12	0.34%	40	0.23%
Non-Metallic and Industrial Metal Mining	13	0.53%	63	0.47%	6	0.17%	31	0.18%
Coal	8	0.32%	31	0.23%	5	0.14%	17	0.10%
Petroleum and Natural Gas	111	4.49%	607	4.54%	168	4.71%	832	4.89%
Personal Services	32	1.29%	147	1.10%	39	1.09%	215	1.26%
Business Services	395	15.98%	1,714	12.82%	577	16.19%	2,259	13.27%
Computers	111	4.49%	566	4.23%	204	5.72%	911	5.35%
Electronic Equipment	182	7.36%	1,008	7.54%	314	8.81%	1,719	10.10%
Measuring and Control Equipment	68	2.75%	473	3.54%	92	2.58%	493	2.90%
Business Supplies	55	2.22%	360	2.69%	45	1.26%	161	0.95%
Shipping Containers	12	0.49%	97	0.73%	10	0.28%	44	0.26%
Wholesale	118	4.77%	709	5.30%	164	4.60%	728	4.28%
Retail	138	5.58%	643	4.81%	306	8.59%	1,837	10.79%
Restaurants, Hotels, and Motels	33	1.33%	162	1.21%	106	2.97%	633	3.72%
Trading	4	0.16%	24	0.18%	2	0.06%	9	0.05%
Other	29	1.17%	160	1.20%	33	0.93%	139	0.82%
Total	2,472	100%	13,369	100%	3,564	100%	17,026	100%

This table provides the industry composition of multi-segment and single segment firms and firm-years over the sample period 1996 to 2011. Industries in this table are defined using the Fama-French 48 industries for descriptive purposes.

Table 2:
Valuation, Performance, Size, and Model Descriptive Statistics for Single and Multi-Segment Firms

	Mean	Std. Dev.	Min	25th	Median	75th	Max
Panel A: Multi-Segment Firms							
$ExVal_{Rev}$	-0.23	0.61	-1.39	-0.69	-0.26	0.19	1.38
$ExVal_{AT}$	-0.09	0.55	-1.39	-0.47	-0.10	0.28	1.38
PM	0.05	0.27	-16.38	0.02	0.07	0.12	0.90
ROA	0.06	0.15	-1.44	0.02	0.08	0.13	0.37
NumSeg	2.96	1.16	2.00	2.00	3.00	3.00	10.00
Related	1.02	1.15	-1.00	0.00	1.00	1.00	9.00
V	4,802.12	18,314.73	3.14	178.46	731.55	2,761.24	460,767.94
Sale	2,711.46	5,983.62	20.06	177.63	649.42	2,153.95	38,614.00
Asset	2,927.75	7,999.26	3.60	160.67	610.14	2,155.40	97,860.60
$DIFF_{FF}$	0.37	0.41	0.00	0.00	0.16	0.85	1.00
$DIFF_{PF}$	0.20	0.24	0.00	0.04	0.09	0.28	1.00
NumTNICPrs	46.01	59.27	1.00	9.00	23.00	58.00	590.00
HHI	0.20	0.19	0.01	0.07	0.14	0.27	1.00
Profit	0.02	0.14	-1.48	0.00	0.04	0.08	0.26
Invest	0.05	0.05	0.00	0.02	0.03	0.06	0.37
Leverage	0.22	0.19	0.00	0.06	0.21	0.34	0.95
SalesGrow	0.04	0.25	-2.27	-0.02	0.07	0.15	0.89
StdROE	0.33	1.09	0.01	0.04	0.07	0.18	10.62
MAR	1.11	0.50	-0.31	0.83	1.08	1.34	3.29
Corr5yr	0.15	0.50	-0.92	-0.24	0.20	0.57	0.96
Surprise	1.72	4.10	0.00	0.20	0.52	1.31	29.00

Table 2 *(Continued)*

	Mean	Std. Dev.	Min	25th	Median	75th	Max
Panel B: Single Segment Firms							
$ExVal_{Rev}$	-0.16	0.55	-1.39	-0.55	-0.07	0.19	1.38
$ExVal_{AT}$	-0.13	0.49	-1.39	-0.46	-0.06	0.16	1.38
PM	0.01	0.44	-16.38	0.00	0.06	0.13	0.90
ROA	0.04	0.19	-1.44	0.00	0.08	0.14	0.37
V	2,291.36	9,913.58	2.36	87.79	322.16	1,216.13	467,092.88
Sale	1,312.15	4,052.03	20.00	75.68	233.78	778.79	38,614.00
Asset	1,214.17	3,854.24	2.73	75.91	234.00	762.36	87,095.00
$DIFF_{FF}$	0.25	0.43	0.00	0.00	0.00	0.10	1.00
$DIFF_{PF}$	0.15	0.22	0.00	0.03	0.06	0.18	1.00
NumTNICPrs	75.01	85.02	1.00	13.00	42.00	109.00	608.00
HHI	0.18	0.19	0.01	0.05	0.10	0.22	1.00
Profit	0.00	0.18	-1.48	-0.02	0.04	0.09	0.26
Invest	0.06	0.06	0.00	0.02	0.04	0.07	0.37
Leverage	0.20	0.21	0.00	0.00	0.14	0.33	0.95
SalesGrow	0.06	0.28	-2.27	-0.02	0.08	0.18	0.89
StdROE	0.44	1.33	0.01	0.04	0.10	0.25	10.62
MAR	1.13	0.56	-0.31	0.80	1.08	1.39	3.29
Corr5yr	0.19	0.50	-0.92	-0.19	0.25	0.61	0.96
Surprise	1.82	4.23	0.00	0.21	0.56	1.37	29.00

This table provides statistics for valuation, performance, and size statistics for the sample period, 1996 to 2011 for single and multi-segments. *PM* is the earnings before income and taxes (sum of income before extraordinary items, interested and related expenses, and income taxes). *ROA* is return on assets (EBIT defined previously divided by total assets). *V* value of the firm (price per share times the number of shares plus current and long-term liabilities). $DIFF_{FF}$ and $DIFF_{PF}$ are the values of segment reporting differentiation (percentage of sales not disclosed by peers) before adding one and taking the natural log. The remaining variables are defined in appendix B.

Table 3:
Correlations for Single and Multi-Segment Firms

Panel A: Multi-Segment Firms

	$ExVal_{Rev}$	$ExVal_{AT}$	*FFDIFF*	*PFDIFF*	*NumSeg*	*NumTNICPrs*	*HHI*	*Related*	*Size*
$ExVal_{Rev}$	1	0.623***	0.048***	0.058***	0.031**	-0.033**	0.025*	0.034**	0.170***
$ExVal_{AT}$	0.630***	1	0.036**	0.044***	0.023	-0.059***	0.002	0.022	0.115***
FFDIFF	0.046***	0.040***	1	0.379***	0.011	-0.216***	0.247***	-0.205***	-0.093***
PFDIFF	0.052***	0.043***	0.351***	1	-0.002	-0.235***	0.173***	-0.142***	-0.023*
NumSeg	0.025*	0.022	0.042***	0.009	1	-0.04***	-0.055***	0.671***	0.343***
NumTNICPrs	-0.041***	-0.035**	-0.271***	-0.281***	-0.019	1	-0.483***	0.074***	0.037***
HHI	0.024*	0.014	0.198***	0.189***	-0.030**	-0.873***	1	-0.050***	-0.266***
Related	0.029*	0.026	-0.234***	-0.156***	0.540***	0.069***	-0.017	1	0.188***
Size	0.176***	0.116***	-0.081***	-0.004	0.320***	0.100***	-0.273***	0.144***	1
Profit	0.212***	0.352***	0.021	0.042***	0.050***	-0.025*	-0.023*	0.001	0.186***
Invest	0.012	0.091***	-0.013	-0.052***	0.015	0.089***	-0.163***	-0.053***	0.086***
Leverage	0.034**	-0.060***	0.090***	0.093***	0.078***	-0.099***	-0.022	-0.054***	0.231***
SalesGrow	0.080***	0.080***	-0.028*	-0.036***	0.020	0.066***	-0.043***	0.003	0.023*
StdROE	-0.096***	-0.075***	-0.084***	-0.102***	-0.06***	0.091***	-0.016	0.052***	-0.201***
MAR	0.115***	0.194***	-0.011	-0.006	-0.010	0.001	0.022	0.014	-0.073***
Corr5yr	-0.071***	-0.088***	-0.033**	-0.048***	-0.023*	0.032**	-0.004	-0.005	-0.124***
Surprise	-0.133***	-0.17***	-0.064***	-0.079***	-0.043***	0.051***	0.005	0.017	-0.158***

Table 3 Panel A (*Continued*)

	Profit	***Invest***	***Leverage***	***SalesGrow***	***StdROE***	***MAR***	***Corr5yr***	***Surprise***
$ExVal_{Rev}$	0.143***	0.018	0.044***	0.049***	-0.021	0.097***	-0.068***	-0.063***
$ExVal_{AT}$	0.189***	0.064***	-0.041***	0.057***	0.004	0.182***	-0.084***	-0.089***
FFDIFF	0.021	-0.057***	0.073***	-0.010	-0.020	-0.013	-0.030**	-0.042***
PFDIFF	0.052***	-0.065***	0.089***	-0.015	-0.041***	-0.027*	-0.028*	-0.03**
NumSeg	0.072***	0.001	0.048***	0.026*	-0.028*	-0.019	-0.019	-0.016
NumTNICPrs	-0.106***	0.103***	-0.110***	0.017	0.029**	0.023*	0.062***	0.038***
HHI	-0.008	-0.114***	-0.002	-0.023*	0.009	0.025*	0.023*	0.001
Related	0.014	-0.019	-0.039***	0.004	0.018	0.002	-0.005	0.009
Size	0.221***	0.044***	0.161***	0.039***	-0.082***	-0.108***	-0.119***	-0.063***
Profit	1	0.042***	-0.174***	0.259***	-0.107***	0.164***	-0.091***	-0.06***
Invest	0.128***	1	0.059***	0.088***	-0.024*	-0.058***	0.000	-0.015
Leverage	-0.253***	0.064***	1	-0.026*	0.156***	-0.068***	0.012	0.034***
SalesGrow	0.299***	0.089***	-0.04***	1	-0.015	0.091***	-0.010	-0.14***
StdROE	-0.256***	-0.079***	0.131***	-0.062***	1	0.033**	0.031**	0.077***
MAR	0.165***	-0.065***	-0.073***	0.144***	0.05***	1	-0.011	0.036***
Corr5yr	-0.106***	-0.001	0.002	-0.014	0.093***	-0.017	1	0.059***
Surprise	-0.491***	-0.067***	0.064***	-0.166***	0.32***	0.015	0.136***	1

Table 3 (*Continued*)
Correlations for Single and Multi-Segment Firms

Panel B: Single Segment Firms

	$ExVal_{Rev}$	$ExVal_{AT}$	*FFDIFF*	*PFDIFF*	*NumTNICPrs*	*HHI*	*Size*
$ExVal_{Rev}$	1	0.707***	0.103***	0.052***	0.039***	-0.039***	0.226***
$ExVal_{AT}$	0.703***	1	0.066***	0.047***	0.026**	-0.036***	0.161***
FFDIFF	0.112***	0.083***	1	0.385***	-0.223***	0.265***	-0.110***
PFDIFF	0.045***	0.052***	0.31***	1	-0.263***	0.224***	-0.048***
NumTNICPrs	0.014	0.000	-0.277***	-0.285***	1	-0.502***	0.081***
HHI	-0.027**	-0.024*	0.214***	0.238***	-0.852***	1	-0.255***
Size	0.232***	0.166***	-0.109***	-0.085***	0.143***	-0.279***	1
Profit	0.201***	0.363***	0.036***	0.024*	-0.076***	-0.010	0.183***
Invest	0.046***	0.131***	-0.04***	-0.108***	0.064***	-0.184***	0.149***
Leverage	-0.027**	-0.063***	0.013	0.016	-0.146***	0.044***	0.195***
SalesGrow	0.161***	0.219***	-0.04***	-0.025*	0.122***	-0.073***	0.095***
StdROE	-0.131***	-0.079***	-0.093***	-0.078***	0.143***	0.005	-0.262***
MAR	0.136***	0.231***	-0.011	-0.010	-0.007	0.020*	-0.065***
Corr5yr	-0.072***	-0.064***	-0.011	-0.015	0.001	-0.006	-0.106***
Surprise	-0.168***	-0.204***	-0.044***	-0.039***	0.058***	0.003	-0.169***

Table 3 Panel B *(Continued)*

	Profit	***Invest***	***Leverage***	***SalesGrow***	***StdROE***	***MAR***	***Corr5yr***	***Surprise***
$ExVal_{Rev}$	0.120***	0.042***	0.001	0.099***	-0.021	0.120***	-0.076***	-0.09***
$ExVal_{AT}$	0.211***	0.112***	-0.025*	0.166***	0.022*	0.219***	-0.069***	-0.108***
FFDIFF	0.034***	-0.086***	-0.016	-0.027**	-0.041***	-0.011	-0.013	-0.028**
PFDIFF	0.044***	-0.073***	0.042***	-0.026**	-0.053***	-0.011	-0.015	-0.024*
NumTNICPrs	-0.160***	0.062***	-0.086***	0.098***	0.109***	-0.004	-0.002	0.038***
HHI	0.016	-0.129***	0.015	-0.053***	-0.019	0.024*	0.007	-0.001
Size	0.202***	0.104***	0.163***	0.073***	-0.078***	-0.090***	-0.108***	-0.069***
Profit	1	0.057***	-0.214***	0.253***	-0.142***	0.192***	-0.079***	-0.026**
Invest	0.166***	1	0.133***	0.093***	-0.034***	-0.053***	0.014	-0.029**
Leverage	-0.256***	0.136***	1	-0.019	0.199***	-0.061***	0.043***	0.045***
SalesGrow	0.293***	0.102***	-0.028**	1	0.002	0.122***	-0.035***	-0.073***
StdROE	-0.273***	-0.146***	0.124***	-0.030***	1	0.034***	0.045***	0.098***
MAR	0.198***	-0.064***	-0.058***	0.184***	0.066***	1	0.018	0.029**
Corr5yr	-0.095***	0.001	0.041***	-0.037***	0.107***	0.009	1	0.076***
Surprise	-0.401***	-0.105***	0.063***	-0.139***	0.312***	0.010	0.154***	1

This table provides Pearson correlations above the diagonal and Spearman correlations below the diagonal. All variables are defined in appendix B.

Significance: *** p-value < 0.01, ** p-value < 0.05, and * p-value < 0.1.

Table 4

Regressions of ExVal on Segment Reporting Differentiation & Controls

Panel A: Multi-Segment Firms

	All Firm-Years						**Post ASC 280**					
	$ExVal_{Rev}$			$ExVal_{AT}$			$ExVal_{Rev}$			$ExVal_{AT}$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
FFDIFF	**0.14*** **		**0.11*** **	**0.092** **		**0.070***	**0.15*** **		**0.12*** **	**0.095*** **		**0.075** **
	(4.19)		**(3.32)**	**(2.569)**		**(1.940)**	**(4.39)**		**(3.56)**	**(2.597)**		**(2.027)**
PFDIFF		**0.200*** **	**0.15** **		**0.14** **	**0.106***		**0.197*** **	**0.14** **		**0.13** **	**0.098***
		(3.126)	**(2.24)**		**(2.56)**	**(1.927)**		**(3.017)**	**(2.10)**		**(2.41)**	**(1.751)**
NumSeg	-0.05***	-0.041***	-0.05***	-0.026**	-0.02*	-0.027**	-0.05***	-0.040***	-0.05***	-0.026**	-0.02*	-0.027**
	(-3.69)	(-3.231)	(-3.76)	(-2.068)	(-1.82)	(-2.122)	(-3.57)	(-3.105)	(-3.65)	(-2.048)	(-1.78)	(-2.098)
Related	0.04***	0.033***	0.04***	0.023*	0.02	0.025**	0.04***	0.034***	0.04***	0.024*	0.02	0.026**
	(3.19)	(2.712)	(3.34)	(1.845)	(1.59)	(1.982)	(3.22)	(2.707)	(3.37)	(1.916)	(1.62)	(2.044)
NumTNICPrs	0.00	0.000	0.00	-0.001**	-0.00**	-0.001**	0.00	0.000	0.00	-0.001**	-0.00**	-0.001**
	(0.14)	(0.325)	(0.35)	(-2.435)	(-2.29)	(-2.282)	(0.14)	(0.328)	(0.35)	(-2.368)	(-2.23)	(-2.230)
HHI	0.19***	0.213***	0.19***	0.013	0.03	0.011	0.19***	0.216***	0.19***	0.010	0.03	0.008
	(3.44)	(3.757)	(3.35)	(0.220)	(0.51)	(0.192)	(3.40)	(3.779)	(3.31)	(0.165)	(0.49)	(0.145)
Size	0.06***	0.063***	0.06***	0.038***	0.04***	0.038***	0.06***	0.061***	0.06***	0.036***	0.04***	0.036***
	(7.64)	(7.482)	(7.66)	(3.925)	(3.86)	(3.920)	(7.37)	(7.207)	(7.39)	(3.670)	(3.60)	(3.664)
PM	0.43***	0.427***	0.42***	0.480***	0.48***	0.472***	0.44***	0.432***	0.43***	0.492***	0.49***	0.485***
	(4.88)	(4.822)	(4.76)	(4.098)	(4.10)	(4.049)	(4.90)	(4.850)	(4.77)	(4.123)	(4.13)	(4.079)
Invest	0.30	0.299	0.32	0.999***	1.00***	1.017***	0.28	0.280	0.30	0.976***	0.98***	0.993***
	(1.23)	(1.252)	(1.34)	(4.258)	(4.30)	(4.348)	(1.13)	(1.147)	(1.23)	(3.986)	(4.01)	(4.065)

Table 4 Panel A (*Continued*)

Leverage	0.16***	0.155***	0.15***	-0.093	-0.10	-0.100	0.16***	0.160***	0.15***	-0.090	-0.09	-0.096
	(2.82)	(2.780)	(2.64)	(-1.407)	(-1.48)	(-1.535)	(2.83)	(2.815)	(2.66)	(-1.324)	(-1.38)	(-1.439)
SalesGrow	0.02	0.020	0.02	-0.011	-0.01	-0.010	0.02	0.019	0.02	-0.015	-0.01	-0.013
	(0.58)	(0.594)	(0.63)	(-0.517)	(-0.50)	(-0.449)	(0.52)	(0.543)	(0.58)	(-0.694)	(-0.67)	(-0.621)
StdROE	-0.00	-0.003	-0.00	0.017*	0.02*	0.017**	-0.00	-0.003	-0.00	0.018*	0.02**	0.018**
	(-0.51)	(-0.408)	(-0.38)	(1.890)	(1.95)	(1.962)	(-0.54)	(-0.441)	(-0.42)	(1.922)	(1.98)	(1.987)
MAR	0.14***	0.139***	0.14***	0.206***	0.21***	0.207***	0.14***	0.140***	0.14***	0.204***	0.20***	0.205***
	(6.25)	(6.339)	(6.41)	(9.060)	(9.12)	(9.150)	(6.17)	(6.236)	(6.33)	(8.815)	(8.88)	(8.897)
Corr5yr	-0.05***	-0.048***	-0.05***	-0.052***	-0.05***	-0.052***	-0.05***	-0.051***	-0.05***	-0.053***	-0.05***	-0.053***
	(-3.08)	(-3.159)	(-3.10)	(-3.181)	(-3.26)	(-3.193)	(-3.19)	(-3.315)	(-3.24)	(-3.114)	(-3.21)	(-3.131)
Surprise	-0.01***	-0.007***	-0.01***	-0.010***	-0.01***	-0.010***	-0.01***	-0.007***	-0.01***	-0.011***	-0.01***	-0.011***
	(-3.93)	(-4.154)	(-3.95)	(-8.216)	(-8.58)	(-8.288)	(-3.76)	(-3.981)	(-3.77)	(-7.989)	(-8.32)	(-8.037)
Constant	-0.83***	-0.835***	-0.85***	-0.526***	-0.53***	-0.541***	-0.83***	-0.831***	-0.85***	-0.514***	-0.52***	-0.528***
	(-13.67)	(-13.746)	(-13.91)	(-7.153)	(-7.26)	(-7.267)	(-13.30)	(-13.293)	(-13.51)	(-6.777)	(-6.87)	(-6.886)
No. Obs.	11,959	11,959	11,959	10,111	10,111	10,111	11,491	11,491	11,491	9,705	9,705	9,705
Adj. R^2	6.81%	6.74%	6.95%	9.02%	9.02%	9.12%	6.78%	6.67%	6.91%	8.82%	8.79%	8.90%

Table 4 (*Continued*)
Regressions of ExVal on Segment Reporting Differentiation & Controls

Panel B: Single Segment Firms

	All Firm-Years						**Post ASC 280**					
	$ExVal_{Rev}$			$ExVal_{AT}$			$ExVal_{Rev}$			$ExVal_{AT}$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
FFDIFF	**0.26*** **		**0.24*** **	**0.162*** **		**0.139*** **	**0.27*** **		**0.25*** **	**0.165*** **		**0.142*** **
	(11.62)		**(9.97)**	**(7.819)**		**(6.648)**	**(11.93)**		**(10.70)**	**(7.499)**		**(6.309)**
PFDIFF		**0.252*** **	**0.10** **		**0.21*** **	**0.123*** **		**0.251*** **	**0.09** **		**0.21*** **	**0.121*** **
		(5.951)	**(2.26)**		**(5.35)**	**(3.118)**		**(6.166)**	**(2.29)**		**(5.58)**	**(3.195)**
NumTNICPrs	0.00***	0.000***	0.00***	0.000**	0.00**	0.000**	0.00***	0.000**	0.00***	0.000**	0.00**	0.000**
	(2.80)	(2.595)	(2.98)	(1.966)	(2.08)	(2.312)	(2.76)	(2.541)	(2.90)	(2.122)	(2.24)	(2.463)
HHI	0.05	0.097**	0.04	0.016	0.04	0.010	0.06	0.110**	0.05	0.013	0.04	0.007
	(1.14)	(2.161)	(1.00)	(0.458)	(1.22)	(0.294)	(1.35)	(2.404)	(1.21)	(0.330)	(1.04)	(0.175)
Size	0.08***	0.078***	0.08***	0.044***	0.04***	0.044***	0.08***	0.076***	0.08***	0.043***	0.04***	0.043***
	(10.98)	(10.529)	(10.90)	(5.755)	(5.60)	(5.700)	(10.49)	(10.191)	(10.44)	(5.320)	(5.19)	(5.262)
PM	0.12**	0.125**	0.12**	0.325***	0.33***	0.323***	0.13**	0.131**	0.13**	0.336***	0.34***	0.334***
	(2.14)	(2.284)	(2.11)	(8.579)	(8.63)	(8.487)	(2.16)	(2.286)	(2.14)	(8.798)	(8.84)	(8.725)
Invest	0.27*	0.238	0.28*	0.783***	0.77***	0.794***	0.22	0.190	0.23	0.747***	0.73***	0.758***
	(1.65)	(1.453)	(1.70)	(5.780)	(5.75)	(5.879)	(1.33)	(1.137)	(1.38)	(5.507)	(5.52)	(5.635)
Leverage	-0.02	-0.035	-0.03	-0.054	-0.06	-0.058	-0.03	-0.044	-0.04	-0.056	-0.06	-0.060
	(-0.65)	(-0.986)	(-0.77)	(-1.271)	(-1.50)	(-1.391)	(-0.86)	(-1.191)	(-0.95)	(-1.246)	(-1.46)	(-1.344)
SalesGrow	0.10***	0.099***	0.10***	0.150***	0.15***	0.150***	0.09***	0.087***	0.09***	0.138***	0.14***	0.138***
	(3.32)	(3.369)	(3.32)	(7.397)	(7.56)	(7.434)	(2.96)	(3.010)	(2.97)	(6.467)	(6.55)	(6.484)
StdROE	0.00	0.004	0.00	0.023***	0.02***	0.023***	0.01	0.005	0.01	0.024***	0.02***	0.024***
	(0.88)	(0.853)	(0.97)	(5.060)	(5.08)	(5.156)	(1.09)	(1.048)	(1.17)	(4.897)	(4.91)	(4.983)

Table 4 Panel B (*Continued*)

MAR	0.14***	0.136***	0.14***	0.186***	0.18***	0.187***	0.14***	0.134***	0.14***	0.184***	0.18***	0.185***
	(6.88)	(6.581)	(6.93)	(12.745)	(12.37)	(12.897)	(6.14)	(5.895)	(6.18)	(11.380)	(11.07)	(11.509)
Corr5yr	-0.05***	-0.051***	-0.05***	-0.042***	-0.04***	-0.042***	-0.04***	-0.043***	-0.04***	-0.035**	-0.04***	-0.035**
	(-3.24)	(-3.355)	(-3.23)	(-2.901)	(-2.97)	(-2.874)	(-3.05)	(-3.186)	(-3.03)	(-2.540)	(-2.63)	(-2.513)
Surprise	-0.01***	-0.009***	-0.01***	-0.011***	-0.01***	-0.011***	-0.01***	-0.009***	-0.01***	-0.010***	-0.01***	-0.010***
	(-11.10)	(-11.626)	(-11.04)	(-12.417)	(-12.75)	(-12.413)	(-10.10)	(-10.674)	(-10.08)	(-10.996)	(-11.42)	(-11.065)
Constant	-0.85***	-0.822***	-0.87***	-0.663***	-0.65***	-0.677***	-0.84***	-0.808***	-0.85***	-0.653***	-0.64***	-0.666***
	(-15.79)	(-14.966)	(-15.68)	(-12.637)	(-12.74)	(-12.752)	(-14.81)	(-14.386)	(-14.91)	(-11.916)	(-12.23)	(-12.152)
No. Obs.	15,432	15,432	15,432	16,488	16,488	16,488	14,027	14,027	14,027	15,019	15,019	15,019
Adj. R^2	10.60%	9.23%	10.67%	14.13%	13.68%	14.27%	10.24%	8.76%	10.30%	13.73%	13.26%	13.86%

This table presents the estimation of equation (6). Variables are defined in appendix B. Panel A presents estimations for multi-segment firms. Panel B presents estimations for single segment firms. Equation (6) is estimated first with all firm years, regressions 1-6, then with firm years post ASC 280 to hold constant the reporting regime, regressions 7-12. Coefficients are presented on top and t-statistics below in parentheses. All regressions are estimated using two-way clustering by firm and year.
Significance: *** p-value < 0.01, ** p-value < 0.05, and * p-value <0.1

Table 5

Regressions of ExVal on Segment Reporting Differentiation & Controls for Firms with and without a Change in Segments

Panel A: No Change in Segment Reporting

	Single Segment Firms						Multi-Segment Firms					
	$ExVal_{Rev}$			$ExVal_{AT}$			$ExVal_{Rev}$			$ExVal_{AT}$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Post	0.00	-0.006	-0.01	-0.027	-0.05	-0.046	-0.04	0.035	-0.00	-0.029	0.01	-0.001
	(0.13)	(-0.135)	(-0.14)	(-0.565)	(-0.82)	(-0.809)	(-0.76)	(0.831)	(-0.00)	(-0.458)	(0.19)	(-0.023)
FFDIFF	0.25***		0.25***	0.189***		0.197***	-0.08		-0.14	0.036		-0.020
	(4.75)		(3.53)	(5.809)		(4.456)	(-0.82)		(-1.53)	(0.438)		(-0.279)
Post*FFDIFF	**0.02**		**0.00**	**0.045***		**0.001**	**0.07**		**0.15**	**0.007**		**0.045**
	(0.51)		**(0.01)**	**(1.694)**		**(0.028)**	**(0.71)**		**(1.18)**	**(0.055)**		**(0.318)**
PFDIFF		0.175*	0.03		0.09	-0.034		0.224	0.29**		0.29**	0.296***
		(1.691)	(0.20)		(0.73)	(-0.259)		(1.561)	(2.10)		(2.50)	(2.822)
Post*PFDIFF		**0.102**	**0.10**		**0.20**	**0.199**		**-0.272*** **	**-0.35** **		**-0.19**	**-0.213**
		(1.047)	**(0.72)**		**(1.64)**	**(1.423)**		**(-3.192)**	**(-2.46)**		**(-1.51)**	**(-1.350)**
NumSeg							-0.05	-0.050*	-0.04	-0.039	-0.04	-0.039
							(-1.57)	(-1.750)	(-1.49)	(-1.216)	(-1.27)	(-1.201)
Related							-0.00	0.002	-0.00	0.018	0.02	0.021
							(-0.11)	(0.049)	(-0.08)	(0.461)	(0.53)	(0.551)
NumTNICPrs	0.00	0.000	0.00	-0.000	-0.00	-0.000	0.00	0.001	0.00	-0.001*	-0.00	-0.001
	(1.35)	(1.341)	(1.51)	(-0.393)	(-0.43)	(-0.303)	(1.25)	(1.293)	(1.27)	(-1.691)	(-1.51)	(-1.531)
HHI	-0.02	0.029	-0.02	-0.062	-0.02	-0.059	0.26	0.238	0.25	-0.074	-0.08	-0.088
	(-0.26)	(0.308)	(-0.25)	(-0.919)	(-0.28)	(-0.892)	(1.44)	(1.400)	(1.42)	(-0.498)	(-0.63)	(-0.617)
Size	0.09***	0.091***	0.09***	0.077***	0.08***	0.077***	0.08***	0.076***	0.08***	0.069***	0.07***	0.070***
	(7.90)	(7.602)	(7.91)	(7.511)	(7.14)	(7.412)	(4.22)	(4.134)	(4.22)	(4.681)	(4.70)	(4.670)

Table 5 Panel A (*Continued*)

PM	0.19*	0.194*	0.19*	0.338***	0.34***	0.334***	0.49	0.479	0.47	1.222**	1.20**	1.196**
	(1.82)	(1.731)	(1.79)	(3.502)	(3.35)	(3.410)	(1.06)	(1.027)	(1.01)	(2.410)	(2.28)	(2.273)
Invest	0.93***	0.866***	0.94***	1.343***	1.29***	1.353***	1.83***	1.834***	1.84***	1.902***	1.90***	1.908***
	(5.48)	(4.869)	(5.37)	(8.756)	(8.08)	(8.312)	(4.37)	(4.423)	(4.47)	(5.020)	(4.99)	(5.080)
Leverage	-0.02	-0.030	-0.02	-0.078	-0.09	-0.083	0.01	0.001	0.00	-0.021	-0.04	-0.044
	(-0.23)	(-0.429)	(-0.30)	(-1.252)	(-1.47)	(-1.374)	(0.06)	(0.006)	(0.00)	(-0.107)	(-0.20)	(-0.207)
SalesGrow	0.16***	0.147**	0.15***	0.149***	0.14***	0.147***	-0.09	-0.089	-0.10	-0.029	-0.03	-0.035
	(2.64)	(2.562)	(2.59)	(3.963)	(3.96)	(3.977)	(-1.37)	(-1.390)	(-1.56)	(-0.594)	(-0.75)	(-0.752)
StdROE	0.01	0.006	0.01	0.030**	0.03**	0.031**	0.00	0.002	0.00	0.029	0.03	0.030
	(0.40)	(0.438)	(0.45)	(2.096)	(2.22)	(2.173)	(0.05)	(0.115)	(0.13)	(0.980)	(1.05)	(1.048)
MAR	0.13***	0.126***	0.13***	0.196***	0.19***	0.197***	0.12***	0.120***	0.12***	0.177***	0.18***	0.178***
	(7.03)	(6.366)	(7.08)	(12.919)	(11.50)	(13.117)	(4.63)	(4.367)	(4.71)	(8.876)	(8.50)	(8.587)
Corr5yr	-0.11***	-0.115***	-0.11***	-0.089***	-0.09***	-0.088***	-0.09*	-0.090*	-0.09*	-0.032	-0.03	-0.031
	(-4.76)	(-4.849)	(-4.73)	(-4.749)	(-4.90)	(-4.764)	(-1.82)	(-1.802)	(-1.82)	(-0.992)	(-0.99)	(-0.981)
Surprise	-0.01***	-0.009***	-0.01***	-0.009***	-0.01***	-0.009***	-0.01***	-0.006***	-0.01***	-0.009***	-0.01***	-0.009***
	(-4.96)	(-5.381)	(-4.94)	(-8.767)	(-10.40)	(-9.201)	(-3.00)	(-2.905)	(-3.06)	(-3.397)	(-3.50)	(-3.371)
Constant	-0.93***	-0.891***	-0.94***	-0.839***	-0.80***	-0.843***	-0.93***	-0.981***	-0.97***	-0.725***	-0.77***	-0.763***
	(-11.61)	(-10.846)	(-11.35)	(-12.223)	(-10.03)	(-10.767)	(-5.99)	(-6.549)	(-6.30)	(-5.602)	(-5.85)	(-5.816)
No. Obs.	3,390	3,390	3,390	3,588	3,588	3,588	1,042	1,042	1,042	987	987	987
Adj. R^2	15.11%	13.64%	15.13%	20.14%	19.11%	20.24%	9.44%	9.62%	9.62%	18.56%	19.04%	18.89%

Table 5 (*Continued*)

Regressions of ExVal on Segment Reporting Differentiation & Controls for Firms with and without a Change in Segments

Panel B: Increases in Segment Reporting

	Single Segment to Multi-Segment						**Multi-Segment to Multi-Segment**					
	$ExVal_{Rev}$			***$ExVal_{AT}$***			***$ExVal_{Rev}$***			***$ExVal_{AT}$***		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Post	-0.00	-0.017	0.01	0.035	-0.02	0.010	-0.03	-0.015	-0.04	-0.009	-0.02	-0.031
	(-0.02)	(-0.171)	(0.13)	(0.556)	(-0.28)	(0.139)	(-0.26)	(-0.245)	(-0.40)	(-0.174)	(-0.48)	(-0.621)
FFDIFF	0.25***		0.21***	0.196***		0.192***	0.10		0.11	0.031		0.050
	(5.44)		(4.32)	(4.702)		(5.120)	(0.93)		(0.79)	(0.375)		(0.508)
Post*FFDIFF	**-0.20****		**-0.19***	**-0.136****		**-0.193*****	**0.14**		**0.12**	**0.090**		**0.050**
	(-2.53)		**(-1.95)**	**(-2.459)**		**(-2.759)**	**(0.90)**		**(0.63)**	**(0.961)**		**(0.511)**
PFDIFF		0.425***	0.31***		0.16	0.046		0.034	-0.03		-0.05	-0.078
		(4.209)	(2.82)		(1.24)	(0.352)		(0.220)	(-0.13)		(-0.22)	(-0.284)
Post*PFDIFF		**-0.218**	**-0.11**		**0.13**	**0.246**		**0.149****	**0.11**		**0.21**	**0.203**
		(-1.505)	**(-0.58)**		**(0.62)**	**(1.046)**		**(2.404)**	**(0.73)**		**(0.92)**	**(0.801)**
NumSeg	-0.04	-0.039	-0.04	0.014	0.01	0.009	-0.12***	-0.114***	-0.13***	-0.044**	-0.04**	-0.045**
	(-0.72)	(-0.744)	(-0.77)	(0.400)	(0.37)	(0.271)	(-4.69)	(-4.930)	(-4.73)	(-2.221)	(-2.26)	(-2.297)
Related	0.02	0.014	0.02	-0.045*	-0.04*	-0.038*	0.13***	0.122***	0.14***	0.044*	0.04*	0.047*
	(0.26)	(0.244)	(0.31)	(-1.835)	(-1.78)	(-1.700)	(2.83)	(3.060)	(2.90)	(1.696)	(1.65)	(1.822)
NumTNICPrs	-0.00	-0.000	-0.00	-0.000	-0.00	-0.000	-0.00**	-0.001**	-0.00**	-0.001	-0.00	-0.001
	(-1.53)	(-1.388)	(-1.26)	(-0.797)	(-0.87)	(-0.727)	(-2.38)	(-2.535)	(-2.37)	(-1.127)	(-1.05)	(-1.044)
HHI	-0.13	-0.107	-0.14	-0.018	0.01	-0.021	0.17	0.181	0.17	0.162	0.17	0.161
	(-1.21)	(-0.931)	(-1.27)	(-0.125)	(0.04)	(-0.140)	(0.84)	(0.882)	(0.84)	(0.991)	(1.01)	(0.984)
Size	0.07***	0.075***	0.07***	0.051***	0.05***	0.052***	0.10***	0.091***	0.10***	0.068***	0.07***	0.068***
	(5.08)	(5.056)	(5.22)	(3.769)	(3.85)	(3.898)	(5.82)	(5.538)	(5.79)	(3.450)	(3.35)	(3.420)

Table 5 Panel B (*Continued*)

PM	0.41**	0.391*	0.39*	0.467*	0.46*	0.452*	0.23	0.292	0.22	1.909***	1.94***	1.901***
	(2.02)	(1.896)	(1.88)	(1.948)	(1.86)	(1.855)	(0.68)	(0.929)	(0.67)	(3.191)	(3.20)	(3.145)
Invest	0.51	0.536	0.55	0.995***	1.01***	1.016***	0.16	0.087	0.16	0.242	0.22	0.229
	(1.23)	(1.292)	(1.32)	(3.382)	(3.28)	(3.339)	(0.34)	(0.192)	(0.33)	(0.362)	(0.34)	(0.334)
Leverage	0.17	0.152	0.15	0.016	0.01	0.007	0.47**	0.463**	0.47**	0.244	0.23	0.236
	(1.23)	(1.095)	(1.11)	(0.099)	(0.06)	(0.044)	(2.30)	(2.307)	(2.29)	(1.417)	(1.35)	(1.369)
SalesGrow	0.02	0.014	0.03	0.181***	0.18***	0.191***	0.09	0.081	0.09	-0.029	-0.03	-0.028
	(0.17)	(0.108)	(0.20)	(3.358)	(3.71)	(3.758)	(0.76)	(0.647)	(0.76)	(-0.328)	(-0.38)	(-0.317)
StdROE	0.00	0.001	0.00	0.008	0.01	0.010	0.01	0.010	0.01	-0.008	-0.01	-0.009
	(0.05)	(0.041)	(0.13)	(0.328)	(0.34)	(0.415)	(0.13)	(0.157)	(0.14)	(-0.170)	(-0.15)	(-0.199)
MAR	0.14***	0.150***	0.15***	0.198***	0.20***	0.201***	0.12**	0.124**	0.12**	0.207***	0.21***	0.211***
	(4.78)	(4.545)	(4.73)	(8.379)	(7.97)	(8.107)	(2.10)	(2.197)	(2.18)	(5.110)	(5.16)	(5.160)
Corr5yr	-0.04	-0.039	-0.04	-0.053*	-0.05*	-0.052*	-0.03	-0.024	-0.03	-0.023	-0.02	-0.022
	(-1.19)	(-1.017)	(-0.99)	(-1.918)	(-1.95)	(-1.878)	(-0.75)	(-0.603)	(-0.72)	(-0.522)	(-0.42)	(-0.467)
Surprise	-0.01***	-0.007**	-0.01***	-0.009***	-0.01***	-0.008***	-0.01	-0.011	-0.01	-0.011	-0.01	-0.010
	(-2.61)	(-2.407)	(-2.60)	(-4.560)	(-4.31)	(-4.300)	(-1.25)	(-1.283)	(-1.26)	(-1.410)	(-1.40)	(-1.377)
Constant	-0.80***	-0.836***	-0.86***	-0.766***	-0.75***	-0.776***	-0.81***	-0.779***	-0.82***	-0.820***	-0.79***	-0.815***
	(-7.80)	(-7.923)	(-8.15)	(-8.570)	(-8.24)	(-8.492)	(-4.36)	(-4.587)	(-4.47)	(-5.224)	(-5.66)	(-5.336)
No. Obs.	1,631	1,631	1,631	1,531	1,531	1,531	665	665	665	607	607	607
Adj. R^2	8.65%	8.59%	9.04%	12.89%	12.65%	13.20%	15.00%	14.42%	14.77%	16.53%	16.49%	16.37%

This table presents estimation of equation (7). Panel A provides estimation for firms with no change in segment reporting before and after ASC 280 implementation, holding constant firm segment reporting quality. Regressions 1-6 in panel A provide estimation for single segment firms before and after ASC 280 implementation. Regressions 7-12 in panel A provide estimation for multi-segment firms with no change in segment reporting before and after ASC 280 implementation. Panel B provides estimation for firms with a change in segment reporting before and after ASC 280 implementation. Regressions 1-6 in panel B provide estimation for firms changing from single segment to multi-segment reporting. Regressions 7-12 in panel B provide estimation for firms reporting additional segments (multi-segment to more segments than reported under SFAS No. 15). Variables are defined in appendix B. Coefficients are reported above, t-statistics below in parentheses. All regressions are estimated using two-way clustering by firm and year.
Significance: *** p-value < 0.01, ** p-value < 0.05, and * p-value <0.1

Table 6

Regressions for ExVal on Segment Reporting Differentiation for Robustness Tests with Controls

	Line of Business Primary Type		**NAICS Codes**				**Fama & French 48 Industry Codes**			
	Multi-Segment		***Multi-Segment***		***Single Segment***		***Multi-Segment***		***Single Segment***	
	$ExVal_{Rev}$	$ExVal_{AT}$	$ExVal_{Rev}$	$ExVal_{AT}$	$ExVal_{Rev}$	$ExVal_{AT}$	$ExVal_{Rev}$	$ExVal_{AT}$	$ExVal_{Rev}$	$ExVal_{AT}$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
FFDIFF	**0.10*** **	**0.037**	**0.09*** **	**0.080** **	**0.23*** **	**0.133*** **	**0.05**	**-0.037**	**0.16*** **	**0.074** **
	(2.74)	**(0.890)**	**(2.62)**	**(2.230)**	**(9.39)**	**(6.015)**	**(0.89)**	**(-0.642)**	**(3.19)**	**(2.255)**
PFDIFF	**0.19** **	**0.148** **	**0.14** **	**0.116***	**0.07**	**0.103** **	**0.17***	**0.240*** **	**0.19*** **	**0.205*** **
	(2.53)	**(2.451)**	**(2.12)**	**(1.957)**	**(1.33)**	**(2.208)**	**(1.93)**	**(3.036)**	**(3.20)**	**(3.508)**
NumSeg	-0.05***	-0.022*	-0.05***	-0.028**			-0.04***	-0.021*		
	(-3.87)	(-1.850)	(-3.50)	(-2.197)			(-3.00)	(-1.663)		
Related	0.05***	0.019	0.04***	0.026**			0.03**	0.018		
	(3.56)	(1.439)	(3.10)	(2.100)			(2.50)	(1.420)		
NumTNICPrs	0.00	-0.000	0.00	-0.001**	0.00***	0.000**	0.00	-0.001**	0.00**	0.000*
	(0.27)	(-1.210)	(0.33)	(-2.180)	(2.89)	(2.414)	(0.08)	(-2.267)	(2.00)	(1.646)
HHI	0.18***	0.042	0.20***	0.008	0.07	0.014	0.19***	0.029	0.06	0.017
	(2.89)	(0.661)	(3.45)	(0.144)	(1.43)	(0.346)	(3.26)	(0.459)	(1.33)	(0.438)
Size	0.06***	0.039***	0.06***	0.037***	0.08***	0.043***	0.06***	0.036***	0.08***	0.042***
	(7.03)	(3.767)	(7.32)	(3.699)	(10.46)	(5.265)	(7.12)	(3.599)	(10.32)	(5.270)
PM	0.46***	0.443***	0.43***	0.486***	0.12**	0.334***	0.44***	0.489***	0.13**	0.340***
	(4.93)	(3.743)	(4.76)	(4.105)	(2.11)	(8.710)	(4.93)	(4.169)	(2.28)	(8.881)
Invest	0.33	1.213***	0.28	0.991***	0.22	0.755***	0.26	0.975***	0.18	0.727***
	(1.16)	(5.372)	(1.13)	(4.060)	(1.29)	(5.620)	(1.06)	(4.060)	(1.07)	(5.469)
Leverage	0.16**	-0.109	0.16***	-0.096	-0.04	-0.060	0.16***	-0.094	-0.04	-0.063
	(2.47)	(-1.476)	(2.77)	(-1.424)	(-1.01)	(-1.355)	(2.90)	(-1.402)	(-1.14)	(-1.421)

Table 6 (*Continued*)

SalesGrow	0.01	-0.015	0.02	-0.013	0.09***	0.138***	0.02	-0.014	0.09***	0.138***
	(0.37)	(-0.707)	(0.55)	(-0.623)	(2.93)	(6.380)	(0.52)	(-0.668)	(3.04)	(6.735)
StdROE	-0.01	0.014	-0.00	0.018**	0.01	0.024***	-0.00	0.018*	0.00	0.023***
	(-1.20)	(1.335)	(-0.49)	(1.987)	(1.20)	(4.983)	(-0.53)	(1.947)	(0.95)	(4.792)
MAR	0.14***	0.218***	0.14***	0.205***	0.14***	0.185***	0.14***	0.204***	0.13***	0.183***
	(6.11)	(10.014)	(6.21)	(8.853)	(6.15)	(11.413)	(6.14)	(8.882)	(5.85)	(10.901)
Corr5yr	-0.06***	-0.084***	-0.05***	-0.053***	-0.04***	-0.035**	-0.05***	-0.054***	-0.04***	-0.037***
	(-4.18)	(-5.362)	(-3.26)	(-3.140)	(-3.02)	(-2.546)	(-3.25)	(-3.122)	(-3.31)	(-2.728)
Surprise	-0.01***	-0.010***	-0.01***	-0.011***	-0.01***	-0.010***	-0.01***	-0.011***	-0.01***	-0.011***
	(-3.50)	(-7.408)	(-3.89)	(-8.112)	(-10.06)	(-11.015)	(-3.99)	(-8.217)	(-10.89)	(-11.622)
Constant	-0.82***	-0.584***	-0.84***	-0.534***	-0.85***	-0.666***	-0.81***	-0.513***	-0.78***	-0.627***
	(-12.52)	(-7.716)	(-13.34)	(-7.074)	(-15.14)	(-12.171)	(-13.15)	(-7.229)	(-14.05)	(-11.846)
No. Obs.	9,706	8,057	11,491	9,705	14,027	15,019	11,491	9,705	14,027	15,019
Adj. R^2	7.41%	9.98%	6.75%	8.95%	9.92%	13.68%	6.54%	8.87%	8.67%	13.09%

This table presents estimation of equation (6) for robustness tests. Variables are defined in appendix B. Regressions 1-2 eliminate firms for which geographic segments are their primary segment reporting type. Regressions 3-6 change the industry code for comparison between the focal firm and the industry core operations portfolio to NAICS codes. Regressions 7-10 change the industry code for comparison between the focal firm and the industry core operations portfolio to Fama & French 48 Industry codes. Coefficients are reported above, t-statistics below in parentheses. All regressions are estimated using two-way clustering by firm and year.
Significance: *** p-value < 0.01, ** p-value < 0.05, and * p-value <0.1

Table 7
Regressions of ExVal on Segment Reporting Differentiation, a Variable for Small Differentiating Segments & Controls

	$ExVal_{Rev}$			$ExVal_{AT}$		
	(1)	(2)	(3)	(4)	(5)	(6)
FFDIFF	0.15***		0.12***	0.097***		0.077**
	(4.59)		(3.74)	(2.663)		(2.084)
PFDIFF		0.197***	0.14**		0.13**	0.099*
		(3.017)	(2.13)		(2.41)	(1.770)
SmallSeg	**1.04*** **		**1.04*** **	**0.481***		**0.487***
	(3.63)		**(3.63)**	**(1.648)**		**(1.686)**
NumSeg	-0.07***	-0.040***	-0.07***	-0.035***	-0.02*	-0.036***
	(-4.77)	(-3.105)	(-4.84)	(-2.768)	(-1.78)	(-2.827)
Related	0.06***	0.034***	0.06***	0.031**	0.02	0.033***
	(4.36)	(2.707)	(4.51)	(2.515)	(1.62)	(2.658)
NumTNICPrs	0.00	0.000	0.00	-0.001**	-0.00**	-0.001**
	(0.06)	(0.328)	(0.27)	(-2.442)	(-2.23)	(-2.301)
HHI	0.19***	0.216***	0.19***	0.008	0.03	0.007
	(3.36)	(3.779)	(3.28)	(0.143)	(0.49)	(0.123)
Size	0.06***	0.061***	0.06***	0.037***	0.04***	0.037***
	(7.48)	(7.207)	(7.50)	(3.685)	(3.60)	(3.679)
PM	0.43***	0.432***	0.42***	0.491***	0.49***	0.484***
	(4.89)	(4.850)	(4.77)	(4.116)	(4.13)	(4.072)
Invest	0.29	0.280	0.31	0.978***	0.98***	0.996***
	(1.17)	(1.147)	(1.27)	(3.992)	(4.01)	(4.073)
Leverage	0.16***	0.160***	0.16***	-0.088	-0.09	-0.095
	(2.90)	(2.815)	(2.73)	(-1.305)	(-1.38)	(-1.420)
SalesGrow	0.02	0.019	0.02	-0.016	-0.01	-0.014
	(0.45)	(0.543)	(0.51)	(-0.740)	(-0.67)	(-0.668)
StdROE	-0.00	-0.003	-0.00	0.017*	0.02**	0.018**
	(-0.59)	(-0.441)	(-0.47)	(1.911)	(1.98)	(1.977)
MAR	0.14***	0.140***	0.14***	0.204***	0.20***	0.205***
	(6.21)	(6.236)	(6.38)	(8.825)	(8.88)	(8.907)
Corr5yr	-0.05***	-0.051***	-0.05***	-0.052***	-0.05***	-0.052***
	(-3.16)	(-3.315)	(-3.20)	(-3.121)	(-3.21)	(-3.137)
Surprise	-0.01***	-0.007***	-0.01***	-0.011***	-0.01***	-0.011***
	(-3.75)	(-3.981)	(-3.76)	(-7.912)	(-8.32)	(-7.958)
Constant	-0.81***	-0.831***	-0.83***	-0.504***	-0.52***	-0.518***
	(-12.94)	(-13.293)	(-13.15)	(-6.692)	(-6.87)	(-6.793)
Number of observations	11,491	11,491	11,491	9,705	9,705	9,705
Adj. R-Squared	6.99%	6.67%	7.12%	8.87%	8.79%	8.95%

Table 7 (Continued)
This table presents the estimation of equation (6) with an additional variable for differentiating segments that are less than 10% of sales, *SmallSeg*. All other variables are defined in appendix B. By definition *SmallSeg* firms must have more than one segment. Thus, regressions 1-6 are estimated for only multi-segment firms. Coefficients are reported above, t-statistics below in parentheses. All regressions are estimated using two-way clustering by firm and year.
Significance: *** p-value < 0.01, ** p-value < 0.05, and * p-value <0.1

Table 8
Regressions of ExVal on Segment Reporting Differentiation & Controls Split by Median Industry Concentration

Panel A: $ExVal_{Rev}$

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Q1HHI * FFDIFF	**0.14***		**0.10**				**0.13**
	(1.65)		**(1.17)**				**(1.48)**
Q3HHI * FFDIFF		**-0.145****	**-0.12***				**-0.17****
		(-2.090)	**(-1.69)**				**(-2.31)**
FFDIFF	0.12***	0.189***	0.17***				0.16***
	(3.24)	(4.954)	(3.75)				(3.32)
Q1HHI * PFDIFF				**-0.096**		**-0.020**	**-0.13**
				(-0.739)		**(-0.156)**	**(-1.02)**
Q3HHI * PFDIFF					**0.18****	**0.169***	**0.26*****
					(2.00)	**(1.938)**	**(2.85)**
PFDIFF				0.214***	0.13*	0.136*	0.06
				(3.008)	(1.88)	(1.853)	(0.72)
Q1HHI	-0.08**		-0.08**	-0.026		-0.041	-0.07*
	(-2.36)		(-2.25)	(-0.754)		(-1.220)	(-1.77)
Q3HHI		0.104***	0.10***		0.03	0.035	0.06*
		(2.957)	(2.91)		(0.95)	(1.199)	(1.77)
NumSeg	-0.05***	-0.047***	-0.05***	-0.040***	-0.04***	-0.039***	-0.05***
	(-3.56)	(-3.629)	(-3.62)	(-3.094)	(-3.08)	(-3.075)	(-3.66)
Related	0.04***	0.041***	0.04***	0.033***	0.03***	0.032***	0.04***
	(3.15)	(3.257)	(3.20)	(2.662)	(2.65)	(2.609)	(3.29)
NumTNICPrs	0.00	0.000	0.00	0.000	0.00	0.000	0.00
	(0.90)	(0.318)	(1.06)	(0.727)	(0.19)	(0.716)	(1.03)
HHI	0.20***	0.101	0.08	0.203***	0.09	0.070	0.08
	(3.40)	(1.530)	(1.25)	(3.483)	(1.36)	(1.085)	(1.31)
Size	0.06***	0.063***	0.06***	0.062***	0.06***	0.062***	0.06***
	(7.47)	(7.394)	(7.50)	(7.228)	(7.19)	(7.240)	(7.50)
PM	0.44***	0.438***	0.44***	0.436***	0.43***	0.435***	0.44***
	(4.97)	(4.874)	(4.94)	(4.905)	(4.84)	(4.902)	(4.85)
Invest	0.34	0.273	0.33	0.309	0.25	0.291	0.34
	(1.37)	(1.105)	(1.33)	(1.259)	(1.03)	(1.185)	(1.36)
Leverage	0.17***	0.160***	0.17***	0.164***	0.16***	0.161***	0.16***
	(2.94)	(2.810)	(2.91)	(2.848)	(2.73)	(2.794)	(2.68)
SalesGrow	0.02	0.018	0.02	0.018	0.02	0.018	0.02
	(0.45)	(0.502)	(0.45)	(0.518)	(0.55)	(0.526)	(0.49)

Table 8 Panel A (*Continued*)

StdROE	-0.00	-0.004	-0.00	-0.004	-0.00	-0.004	-0.00
	(-0.55)	(-0.509)	(-0.54)	(-0.466)	(-0.42)	(-0.450)	(-0.37)
MAR	0.14***	0.140***	0.14***	0.141***	0.14***	0.141***	0.14***
	(6.17)	(6.121)	(6.13)	(6.212)	(6.20)	(6.191)	(6.24)
Corr5yr	-0.05***	-0.050***	-0.05***	-0.050***	-0.05***	-0.050***	-0.05***
	(-3.13)	(-3.273)	(-3.20)	(-3.277)	(-3.29)	(-3.247)	(-3.18)
Surprise	-0.01***	-0.007***	-0.01***	-0.007***	-0.01***	-0.007***	-0.01***
	(-3.81)	(-3.875)	(-3.93)	(-4.024)	(-3.99)	(-4.053)	(-3.90)
Constant	-0.84***	-0.838***	-0.85***	-0.839***	-0.81***	-0.816***	-0.85***
	(-13.22)	(-13.071)	(-12.98)	(-13.153)	(-12.50)	(-12.440)	(-12.87)
No. Obs.	11,491	11,491	11,491	11,491	11,491	11,491	11,491
Adj. R^2	6.88%	6.93%	7.01%	6.70%	6.79%	6.82%	7.27%

Table 8 (*Continued*)
Regressions of ExVal on Segment Reporting Differentiation & Controls Split by Median Industry Concentration

Panel B: $ExVal_{AT}$

	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Q1HHI * FFDIFF	**0.089**		**0.091**				**0.115**
	(1.274)		**(1.264)**				**(1.498)**
Q3HHI * FFDIFF		**-0.02**	**0.001**				**-0.038**
		(-0.29)	**(0.008)**				**(-0.454)**
FFDIFF	0.082*	0.10**	0.081				0.073
	(1.944)	(2.47)	(1.618)				(1.361)
Q1HHI * PFDIFF				**-0.11**		**-0.03**	**-0.110**
				(-1.04)		**(-0.34)**	**(-1.005)**
Q3HHI * PFDIFF					**0.185***	**0.17***	**0.197***
					(1.784)	**(1.67)**	**(1.796)**
PFDIFF				0.15**	0.063	0.07	0.040
				(2.40)	(1.103)	(1.11)	(0.551)
Q1HHI	-0.057		-0.059	-0.01		-0.02	-0.048
	(-1.436)		(-1.548)	(-0.24)		(-0.55)	(-1.157)
Q3HHI		0.03	0.029		-0.013	-0.01	-0.002
		(0.75)	(0.675)		(-0.358)	(-0.23)	(-0.055)
NumSeg	-0.026**	-0.03**	-0.026**	-0.02*	-0.022*	-0.02*	-0.027**
	(-2.037)	(-2.06)	(-2.037)	(-1.78)	(-1.762)	(-1.76)	(-2.104)
Related	0.024*	0.02*	0.024*	0.02	0.020	0.02	0.025**
	(1.860)	(1.92)	(1.852)	(1.60)	(1.571)	(1.54)	(1.965)
NumTNICPrs	-0.000	-0.00**	-0.000	-0.00	-0.001**	-0.00	-0.000
	(-1.444)	(-2.28)	(-1.366)	(-1.54)	(-2.337)	(-1.56)	(-1.390)
HHI	0.013	-0.03	-0.042	0.02	-0.024	-0.03	-0.039
	(0.213)	(-0.50)	(-0.664)	(0.33)	(-0.371)	(-0.54)	(-0.622)
Size	0.037***	0.04***	0.037***	0.04***	0.035***	0.04***	0.037***
	(3.874)	(3.69)	(3.902)	(3.77)	(3.589)	(3.77)	(3.874)
PM	0.495***	0.49***	0.495***	0.49***	0.485***	0.49***	0.486***
	(4.116)	(4.09)	(4.081)	(4.13)	(4.132)	(4.14)	(4.040)
Invest	1.016***	0.97***	1.011***	0.99***	0.955***	0.97***	1.010***
	(4.232)	(3.97)	(4.195)	(4.15)	(3.887)	(4.07)	(4.197)
Leverage	-0.085	-0.09	-0.085	-0.09	-0.093	-0.09	-0.095
	(-1.255)	(-1.33)	(-1.263)	(-1.37)	(-1.409)	(-1.38)	(-1.421)
SalesGrow	-0.016	-0.02	-0.016	-0.01	-0.013	-0.01	-0.015
	(-0.737)	(-0.72)	(-0.751)	(-0.71)	(-0.651)	(-0.68)	(-0.683)

Table 8 Panel B (*Continued*)

StdROE	0.017*	0.02*	0.017*	0.02**	0.018**	0.02*	0.018*
	(1.902)	(1.92)	(1.897)	(1.97)	(1.961)	(1.96)	(1.954)
MAR	0.204***	0.20***	0.204***	0.20***	0.204***	0.20***	0.205***
	(8.791)	(8.78)	(8.761)	(8.81)	(8.849)	(8.81)	(8.796)
Corr5yr	-0.052***	-0.05***	-0.052***	-0.05***	-0.054***	-0.05***	-0.051***
	(-3.087)	(-3.13)	(-3.098)	(-3.18)	(-3.180)	(-3.17)	(-3.054)
Surprise	-0.011***	-0.01***	-0.011***	-0.01***	-0.011***	-0.01***	-0.011***
	(-8.086)	(-7.93)	(-8.006)	(-8.41)	(-8.225)	(-8.33)	(-8.044)
Constant	-0.522***	-0.51***	-0.519***	-0.52***	-0.497***	-0.50***	-0.520***
	(-6.992)	(-6.89)	(-7.040)	(-7.05)	(-6.451)	(-6.62)	(-6.873)
No. Obs.	9,705	9,705	9,705	9,705	9,705	9,705	9,705
Adj. R^2	8.86%	8.82%	8.86%	8.80%	8.86%	8.87%	9.04%

This table presents estimation of equation (6) with two additional indicator variables. *Q3HHI* is an indicator variable equal to one if the firm-year observation is above third quartile HHI in for the year, zero otherwise. *Q1HHI* is an indicator variable equal to one if the firm year observation is below the first quartile HHI for the year, zero otherwise. Regressions 1-14 are estimates for multi-segment firms. Regressions 1-7 use $ExVal_{Rev}$ as the dependent variable. Regressions 8-14 use $ExVal_{AT}$ as the dependent variable. All remaining variables are defined in appendix B. Coefficients are reported above, t-statistics below in parentheses. All regressions are estimated using two-way clustering by firm and year.

Significance: *** p-value < 0.01, ** p-value < 0.05, and * p-value <0.1