Essays on Mandatory and Voluntary Disclosure: The Stock Market Reaction to Mandatory Segment Reporting Changes and the Credibility of Voluntary Management Forecasts

By

Jong Chool Park

A Dissertation
Presented to the Faculty of
the Tepper School of Business
at Carnegie Mellon University
in Partial Fulfillment
of the Requirements
for the Degree of
Doctor of Philosophy
(Accounting)

April 2006

To My Parents

Acknowledgement

I would like to express my deep gratitude to the members of my dissertation committee: Professor Zhaoyang Gu, Professor Adam Koch (Chair), Professor Burton Hollifield, and Professor Yuji Ijiri. Their guidance led to significant improvements of this thesis and deepened my understanding of accounting. I am especially indebted to Professor Adam Koch for his intellectual guidance, support, and technical and editorial advice essential to the completion of my dissertation. I thank Professor Yuji Ijiri for his helpful advice, insightful suggestions, and encouragement, which were immensely valuable. This dissertation has also benefited greatly from comments and suggestions of Professor Zhaoyang Gu. I also appreciate Professor Jon Glover, Professor Carolyn Levine, Professor Pierre Jinghong Liang, Professor Lin Nan, and Professor Jon O'Brien, for their comments and supports.

I gratefully acknowledge the financial support from the Tepper School of Business. The friendship of my fellow doctoral students is much appreciated. They supported me both in my academic and private life in many ways. Special thanks go to Janet Smith. Her help with preparing my job market interview was extremely helpful.

My greatest debt is to my family. My wife Eunyun, and my sons Sungho and Juno, sacrificed a lot so I could pursue my dream. My parents deserve my deepest love and gratitude for their unconditional sacrifice, support, and inspiration.

Abstract

My dissertation examines the stock market's assessment of corporate mandatory and voluntary disclosure. Specifically, the first part of the dissertation investigates the stock market reaction to the mandatory segment reporting changes and the second part studies how the stock market assesses credibility of voluntary management forecasts.

The dissertation is composed of two essays. The first essay examines the impact of SFAS 131 on the extent to which stock prices incorporate industry-wide and firm-specific components of future earnings. By decomposing earnings into industry-wide and firm-specific components, this paper finds that the stock market had difficulty in predicting industry-related earnings for firms that aggregated segments under the previous standards. These firms experience significant acceleration in the incorporation of future earnings into current stock prices upon adoption of SFAS 131. However, the acceleration of future earnings is mostly driven by the improved incorporation of industry-wide components of future earnings, which indicates that the market's ability to predict firm-specific components is not significantly changed. Supplemental analysis documents that firms that increased business segment disclosure tend to reduce geographic disclosure more than firms that are not affected by SFAS 131, suggesting that the reduced geographic earnings information is one possible reason for lack of improvement in incorporating firm-specific earnings into price.

The second essay examines the relation between a series of past earnings increases and the credibility of voluntary management earnings forecasts. Specifically, using strings of increasing earnings per share as our measure of past performance, we demonstrate that both analyst forecast revisions and stock price reactions around

management earnings forecasts are more pronounced when the firm has posted a string of recent earnings per share increases. These results are consistent with our primary hypothesis that voluntary management earnings forecasts are more believable when they are made by firms with a history of consistent growth in earnings per share. Additional analysis suggests that such forecasts are also more accurate relative to ex post realized earnings and are more effective in reducing the dispersion in analysts' expectations of future earnings.

Table of Contents

Dedication……..		ii
Acknowledgement……..…		iii
Abstract……..……		iv
Chapter 1	Introduction…….……	1
1.1	Mandatory Segment Disclosure: SFAS No. 14 and SFAS No. 131……...	1
1.2	Economic Consequences of SFAS No. 131……	3
1.3	Voluntary Disclosure……..	4
1.4	Credibility of Voluntary Disclosure……	6
Chapter 2	The Effect of SFAS 131 on the Stock Market's Ability to Predict Industry-Wide and Firm-Specific Components of Future Earnings……...	8
2.1	Introduction…….……	8
2.2	Background on SFAS 131 and Literature Review……..	15
2.2.1	SFAS 131 and Disclosure of Business Segments……...	15
2.2.2	Related Literature on SFAS 131…….	17
2.3	Earnings-Component Timing Hypothesis and Derivation of the Main Model……..	20
2.4	Sample Selection and Descriptive Statistics……...	24
2.4.1	Sample Selection……	24
2.4.2	Sample Description and Descriptive Statistics……...	26
2.5	Models and Empirical Results	28
2.5.1	The Change in the Market's Ability to Predict Industry-Wide and Firm-Specific earnings after the Adoption of SFAS 131……..	28
2.5.2	The Association between the Number of Increasing Segments and the Price Leads on Earnings…….……	32
2.5.3	Differential Effect of SFAS 131 across Firms Based on Pre-131 Reporting Status……	33
2.5.4	The Effect of Disclosure of Segments in Industries Different from Those Disclosed under SFAS 14……...	36
2.5.5	SFAS 131 and the Changes in Geographic Disclosure…….	38
2.6	Conclusions……...	41
Chapter 3	Consistent Earnings Growth and the Credibility of Management Forecasts……..	43
3.1	Introduction…….……	43

3.2 Development of Empirical Predictions……... 46
3.3 Sample Selection Criteria and Design of Empirical Tests…….. 50
3.4 Results……. 56
3.4.1 Regression Results…….. 56
3.4.2 Effect of Firms Size…… 58
3.4.3 Forecast Accuracy and Forecast Dispersion…… 60
3.5 Conclusions…… 63
Chapter 4 Conclusions and Future Work…… 64
Bibliography……... 68
Tables…….. 74

Chapter 1
Introduction

Corporate disclosure is central to the efficient allocation of resources in capital markets. Firms communicate with investors via various channels of mandatory and voluntary disclosure such as regulated financial reports, press releases, conference calls, and corporate websites.

This dissertation investigates important aspects of mandatory and voluntary disclosure. In the first part of the dissertation, I study the effectiveness of mandatory segment disclosure and firms' strategic reactions to it by examining the changes in the voluntary disclosure of geographic information. In the second part, I address an important issue in corporate voluntary disclosure. Specifically, I investigate the relation between patterns of earnings per share (hereafter, EPS) and the credibility of management earnings forecasts and provide evidence that the credibility of management earnings forecasts is enhanced for firms that report a long string of increases to EPS.

1.1 Mandatory Segment Disclosure: SFAS 14 and SFAS 131

Fundamental problems in the communication between managers and investors include information asymmetry and agency problems (Healy and Palepu [2001]).[1] Under these problems, the level of disclosure chosen by firms after weighting the costs and the benefits of voluntary disclosure may not achieve an efficient level of information required for allocating resources in capital markets.

For the past several decades regulatory agencies have consistently required increased levels and quality of corporate disclosure, forcing firms to reveal more

[1] Healy and Palepu [2001] provide an extensive review of empirical disclosure studies. Verrecchia [2000] reviews recent studies on disclosure from a theoretical perspective.

information to the capital market. One of the major mandatory disclosure requirements is a segment disclosure standard. The first regulatory action on the disclosure of segment information was SFAS 14 (FASB [1975]). SFAS 14 required corporations to report five annual variables on a segment-level basis: sales, operating profit, capital expenditures, depreciation, and identifiable total assets for industry segment, defined by SIC that constitutes at least 10 percent of total sales. In addition, the combined revenue of all separately reported operating segments must represent at least 75% of consolidated enterprise-wide revenue. With the intent of improving segment disclosures, SFAS 14 provided management with discretion in defining segments.

Previous studies show that the segment data under SFAS 14 provided useful information to investors in equity valuation (Kinney [1971] and Collins and Simonds [1979]) and to analysts in forecasting firm earnings (Collins [1976] and Swaminathan [1991]). However, segment reporting practices under SFAS No. 14 were heavily criticized by analysts and others. They suggested that management decrease informativeness of segment information by exploiting flexibility of SFAS 14 and defining operating segments very broadly or changing classifications over time (AIMR [1993] and Pactor [1993]).

FASB issued a new segment disclosure requirement, SFAS 131 in 1997. The main goal of the new standard is to improve informativeness of segment data, providing investors with useful information to predict future firm performance and thus helping to attain an efficient allocation of resources in the capital market. The new standard requires segments to be defined in the same manner as firms' internal organization. The change in the definition of segments significantly restricted managers' discretion in reporting segment performance, and many firms that previously aggregated information among various segments increased the number of segments and now disclose finer information

to the capital market.

Prior empirical findings suggest that a higher level of mandatory disclosure requirement is associated with higher equity valuation, improved information environments, less concentrated ownership, and economy-wide growth (e.g. La Porta, Lopez-de-Silanes, and Shleifer [1999]). However, there is a lack of consensus on the needs to regulate corporate disclosure and on the effectiveness of regulations (Healy and Palepu [2001]).[2]

In Chapter 2, I address a long-standing research question, that of how effective disclosure regulation is in facilitating credible communication between managers and investors, by analyzing the effect of SFAS 131 on the stock market's ability to predict future earnings. Specifically, I investigate changes in the speed with which information becomes impounded into prices and thus analyze the effectiveness of the new segment disclosure standard, showing evidence that SFAS 131 enhanced current stock prices' ability to impound future earnings information.

1.2 Economic Consequences of SFAS 131

Early studies of SFAS 131 document that firms affected by SFAS 131 increased the number of reported segments, and that segment information in the annual report became more consistent with information disclosed in other parts of annual report (Herrman and Thomas [2000], Street, Nichols, and Gray [2000]). Subsequent studies find SFAS 131 changed analysts' information environment. Venkataraman [2000] and Berger and Hann [2002] show evidence that analyst forecasts became more accurate after the issuance of the new segment standard. Ettredge et al. [2005] find greater future earnings response coefficient (FERC) in firms that increased the number of reported segments.

[2] Some recent studies (e.g. Bushee and Luez [2005] and Greenstone, Oyer, and Vissing-Jorgensen [2005]) document the positive economic consequences of disclosure regulation in the capital market, such as excess returns, increased liquidity and decreased information asymmetry.

Some papers, such as Botosan and Stanford [2005] and Ettredge, Smith and Kwon [2001], investigate the incentives for firms that withheld segment information before SFAS 131. Based on the arguments of Harris [1998] and Lundholm and Myers [2003], Botosan and Stanford [2005] find that hidden segments whose information is aggregated into other segment data were operated in less competitive industries. They conclude that firms withheld segment information to preserve abnormal profits in non-competitive industries.

In Chapter 2, I link firms' incentive to withhold segment information to stock price informativeness by decomposing firms' future earnings into industry-wide and firm-specific components. The results show that firms try to mitigate the costs of segment disclosure by reducing or stopping geographic earnings disclosure.

1.3. Voluntary Disclosure

In addition to mandatory disclosure such as annual and quarterly reports, firms frequently make voluntary disclosure in analyst meetings, conference calls, press releases, and corporate websites. Furthermore, many firms augment mandatory disclosure with various types of voluntary disclosure in regulated financial statements.[3]

Research in voluntary disclosure has become increasingly important, given the historic decline in the value relevance of earnings and other financial statements (Brown, Lo, and Lys [1999], Lev and Zarowin [1999], and Francis and Schipper [1999]). Prior studies document a number of specific benefits in expanding voluntary disclosure, including increased analyst following (Lang and Lundholm [1993]), reduced cost of capital (Botosan [1997] and Sengupta [1998]), increased equity valuation (Healy, Hutton, and

[3] Many firms actually voluntarily disclose information in the mandated financial statements. Some previous studies of voluntary disclosure assess the overall quality of disclosure by analyzing disclosure made in the financial statements (Botosan [1997] and Miller [2002]). These studies use researcher-created indices of disclosure, which cover limited range of mandatory and voluntary disclosure.

Palepu [1999]), and reduced bid-ask spread (Welker [1995]).

One of the most widely studied voluntary disclosures is management forecasts. Firms often use management forecasts as devices whereby firms with superior performance signal this to investors. Management forecasts are also issued in order to align market expectations with the firm's expected earnings. Ajinkya and Gift [1984] provide evidence that management forecasts are made to correct investor expectations that are either excessively high or low. Skinner [1994] shows an alternative explanation for the issuance of management forecasts. He argues that firms frequently issue forecasts to mitigate potential litigation risk. Empirical evidence of the litigation risk hypothesis suggests that many firms preempt bad earnings news by issuing management earnings forecasts.

Extant literature finds that management forecasts are informative (Patell [1976], Penman [1980], Waymire [1984], and Jennings [1987]) and that the information content of these forecasts varies with forecast horizon (Pownall and Waymire [1989]), the sign of the earnings news (Pownall, Wasley, and Waymire [1993]), forecast form (Baginski, Conrad, and Hassell [1993]), forecast venue (Bamber and Cheon [1998]), and management credibility (Frost [1997], Koch [2003] and Williams [1996]). Recent studies link management earnings forecasts to the ownership of sophisticated investors such as institutional investors and the corporate governance structure. For example, Ajinkya, Bhojraj, and Sengupta [2005] find that firms with more outside directors and greater institutional ownership tend to issue management earnings forecasts more frequently. Karamanou and Vafeas [2005] document that for firms with effective corporate board and audit committees, management forecasts are more frequently updated, more accurate, and elicit more favorable market responses.[4]

[4] Another stream of research on the management forecasts, which is perhaps the most closely related to the credibility of management forecasts, studies whether management earnings forecasts are biased or not. McNichols [1989] is one of the most comprehensive studies of the extent to which management forecasts

Although a number of studies investigate various issues of voluntary disclosure, the credibility of voluntary disclosure is a largely unexplored area. Chapter 3 of this dissertation investigates cross-sectional differences in credibility of management earnings forecasts and relates this to the patterns of previous EPS growth.

1.4 Credibility of Voluntary Disclosure

The extent to which disclosures mitigate the problem of resource misallocation depends on the credibility of disclosure (Healy and Palepu [2001]). Disclosures can convey information only when they are perceived as credible. Jennings [1987] notes that the stock market reaction to corporate disclosure depends on the new information contained in the disclosure and the believability of the disclosure.

Academic studies document that the credibility of voluntary disclosure is influenced by management incentives to bias forecasts at the time of disclosure (Frost [2000] and Koch [2003]), management credibility in previous forecasts (Williams [1996]), and other information that is accompanied by the forecasts (Han and Wild [1991] and Hutton, Miller and Skinner [2003]).

In Chapter 3, I show that cross-sectional differences in the credibility of management earnings forecasts are determined in part by the recent history of EPS. The underlying arguments are based on Jennings [1987], who claims that the credibility of management forecasts is determined by two factors: the incentive to bias forecasts, and the ability to predict the firm's future earnings accurately. If firms have little incentive to bias forecasts, then the credibility of management forecasts is mostly driven by the market's perception of the management's ability to forecast future performance. Based on

---

are systematically biased. She concludes that, on average, management earnings forecasts do not exhibit optimism relative to either existing consensus of analyst forecasts or ex post realized earnings. While McNichols [1989] documents that management forecasts are not biased, her findings do not rule out the possibility of cross-sectional differences in the bias of management forecasts.

this argument, this study finds that the credibility of management earnings forecasts is greater for firms with a history of consistent growth in earnings per share. Additional analysis suggests that such forecasts are also more accurate relative to *ex post* realized earnings, and are more effective in reducing the dispersion in analysts' expectations of future earnings.

Chapter 2 discusses the effect of SFAS 131 on the stock market's ability to predict industry-wide and firm-specific component of future earnings. Chapter 3 describes the relation between credibility of management forecasts and consistent growth in EPS. Chapter 4 provides a brief summary and limitations of the study, and suggestions for future research opportunities.

Chapter 2[5]

The Effect of SFAS 131 on the Stock Market's Ability to Predict Industry-Wide and Firm-Specific Components of Future Earnings

2.1 Introduction

As a response to analysts' requests for more detailed segment information the Financial Accounting Standard Board (FASB) issued SFAS 131, "Disclosure about Segments of an Enterprise and Related Information," in June 1997. In this study, I investigate the relevance and usefulness of segment data under the new segment disclosure regime. Specifically, I examine the impact of SFAS 131 on the extent to which stock prices anticipate industry-wide and firm-specific components of future earnings. Analyzing the effect of SFAS 131 on each component of earnings provides insights into how SFAS 131 improved the overall information environment. Additionally, this approach examines whether SFAS 131 differentially affects the incorporation of industry-wide and firm-idiosyncratic earnings components into current price. This research is also of interest given recent criticisms of SFAS 131 for possible deviation from GAAP and the lack of geographic disclosure. The previous segment disclosure standard, SFAS 14, was often criticized by investors and analysts for its broad definition of operating segments. Many firms took advantage of the flexibility in SFAS 14 to define segments very broadly, aggregating segment information across dissimilar industries into only a few segments. These firms increased the number of reported segments upon adoption of SFAS 131. This study focuses on these firms and examines how SFAS 131 affects the association between current stock prices and future earnings.

[5] This chapter is my job market paper. I especially thankful to Zhaoyang Gu, Yuji Ijiri, and Adam Koch for their guidance and insightful discussions. I also appreciate the comments of seminar participants at Carnegie Mellon University and Rensselaer Polytechnic Institute.

To assess the incremental effect of SFAS 131, I investigate the informativeness of disaggregated information, defined as the current stock market's ability to predict future firm performance. Studying the impact of SFAS 131 on price informativeness is important because more informative stock prices ultimately alleviate information asymmetry problems and result in more efficient allocation of resources in the capital market (e.g. see Healy and Palepu [2001]). For example, the earlier current prices anticipate an industry-wide (a firm-specific) component of future earnings, the sooner capital flows from less productive industries (firms) to more productive industries (firms).

The methodology in this paper is based on Ayers and Freeman [1997]. By decomposing annual earnings innovation into industry-wide and firm-specific components, they find that stock prices have a significantly stronger lead on industry-wide earnings than on firm-specific earnings, suggesting that returns associated with cross-industry performance begin and end earlier than returns associated with within-industry performance. This study modifies the Ayers and Freeman model by splitting firms into those that increased the number of business segments after SFAS 131 (hereafter, increasing segment firms or change firms) and those that did not (hereafter, non-increasing segment firms or no-change firms). By estimating models for both types of firms together, the modified Ayers and Freeman model controls for any potential effect that is not directly related to SFAS 131. I compare intertemporal changes in the coefficients of lead and lag earnings between pre- and post-131 of firms affected by the new rule after controlling for the changes in the coefficients of firms not affected by SFAS 131.

Using 8,353 firm-year observations from 1,745 firms, I estimate a modified Ayers and Freeman model in which 12-month cumulative abnormal returns are a function

of lead and lag industry-wide and firm-specific earnings for the time periods of three-years before and after the adoption of SFAS 131.[6] Primary results indicate that the stock market had significant difficulty predicting an industry-wide component of future earnings for firms that aggregated segment information under the previous standard. Considering that the accounting information of firms in the same industry is an important source of information for financial analysis (Lees [1981]), this result implies that investors and analysts had limited access to the information of segments in various industries for firms that aggregated segment data. I also find that these firms experience significant acceleration in incorporating industry-related component of future earnings upon adoption of SFAS 131, which suggests that the new standard provides relevant and useful information about each segment and thus improves intra-industry information transfer. However, this paper also finds that the new disclosure rule does not improve the stock market's ability to predict a firm-specific component of future earnings. This result is consistent with the criticism made in current debates that SFAS 131 has some undesirable characteristics limiting the market's ability to predict a firm-specific component of future earnings.[7] Additional analysis shows that the magnitude of association between current security returns and the industry-wide component of future earnings is positively related to the number of segments increased after SFAS 131.

In subsequent analysis, I separately estimate the same model for two different types of firms: pre-131 single-segment firms and pre-131 multiple-segment firms. Ettredge et al. [2005] document a significant increase in the future earnings response

[6] In this paper, the industry is defined by two-digit SIC code of each segment following Ayers and Freeman [1997].

[7] The key debate over SFAS 131 relates to the potential competitive harm by disclosing proprietary segment data. Other concerns over SFAS 131 relate to those of non-GAAP segment information and the lack of geographic earnings information.

coefficients (FERC) of increasing segments firms in the post-131 period, only for pre-131 single-segment firms. For pre-131 single-segment firms that increased the number of business segments, this study finds a significant increase in the sum of coefficients for both components of lead earnings, confirming the findings of Ettredge et al. [2005]. However, again the overall increase is driven only by an improved ability to predict future industry earnings only. For pre-131 multi-segment firms, both coefficients of lead industry and lead firm earnings exhibit significant increase in SFAS 131, but I find no significant difference in the coefficients of both components between increasing segment and non-increasing segment firms. The result suggests that SFAS 131 improved the overall quality of segment information for both types of multi-segment firms (increasing segment and non-increasing segment firms). This indicates the market's ability to predict multiple-segment firms enhanced by the "management approach" of SFAS 131, which requires disclosure of segment information more consistent with firms' internal decision making process and requires more items to be disclosed about each reportable segment. Despite the overall improvement of the quality of segment disclosure for both types of firms, increased disaggregation itself does not provide incremental information.

Among firms that increased the number of business segments, most firms disclosed new segments in the same industries as those in which they had disclosed segments under SFAS 14, while some firms began disclosing segments whose industry is different from those disclosed in the pre-131 period. I conjecture that firms that aggregated segments operated in different industries in terms of two-digit SIC codes, have more incentive to withhold the segment information to avoid proprietary cost of disclosure. Hence, the empirical test examines whether the improvement in the informativeness of security price is more pronounced in these firms and, at the same time,

whether the effect of finer segmentation in the same industry remains significant even after we control for the disclosure of dissimilar industries. Regression results confirm my prediction. I find larger coefficients on industry earnings in the post-131 era for firms that increased the number of business segments and the new segments operated in different industries from those of segments disclosed in SFAS 14. For the rest of the increasing segment firms, the increase in the number of business segments still significantly accelerates the incorporation of future industry earnings into current prices.

In the final analysis, I investigate firms' incentives to stop providing geographic earnings information in the post-131 period. The primary result shows negative association between the change in the number of business segments and the change in the number of geographic segments, which provides earnings data. This is consistent with the notion that increasing segment firms utilized the flexibility of SFAS 14 to the greatest extent possible to avoid proprietary cost of disclosure. Therefore, these firms try to minimize proprietary cost by no longer reporting geographic earnings disclosure, which were mandatory under SFAS 14.

This study is related to previous research on the association between informed parties, such as analysts, institutional investors, and insiders, and the acceleration of each component of earnings into current price. Piotroski and Roulstone [2004] provide evidence that analysts' forecasts revisions accelerate both industry-wide and firm-specific components of future earnings. They also find positive association between the ownership of institutional investors and the acceleration of firm-specific earnings. The results of this study provide implications on the effect of SFAS 131 on analysts' and institutional investors' information environments.[8] Based on these findings, if segment

[8] Another strand of studies investigates the institutional investors' activities. For example, Bushee and Noe [2000] find a positive association between institutional investors' holdings and firms' disclosure quality measured by AIMR disclosure ranking. Ke and Petrioni [2002] report institutional investors expect a break

disclosure under SFAS 131 provides more relevant and richer information to the stock market, this will affect analysts' activities and institutional investors' transactions in that analysts and the institutional investors better predict both industry-wide and firm-specific earnings.

Primary findings of this paper provide mixed results on my prediction. The price lead on earnings is mostly driven by improved incorporation of industry-wide earnings, not of firm-specific earnings. Considering that SFAS 131 is a response to analysts' complaints about excessive flexibility in defining operating segments under SFAS 14, the results imply that segment disclosure under SFAS 131 significantly helps analysts incorporating industry information of each segment of the multiple segment firms. However, insignificant change in predicting firm-specific performance indicates that the public segment information does not improve analysts' forecasts ability to predict firm-specific performances.

Although several explanations can be made, I conjecture increasing segment firms still try to withhold some valuable information about future performance. This is possible in several ways under the new standard. First, the new standard does not require firms to follow GAAP in reporting segment information, which disappointed many in the investment community. Further, it is reported that some firms frequently change definitions of segment profits and losses, or even change the method of segmentation, all of which make it tough to decipher the segment disclosure of these companies.[9]

---

of increasing EPS strings at least one quarter ahead, suggesting institutional investors have expertise to predict firms' future earnings. Hence, if segment disclosure provides value-relevant information to institutional investors, then we expect the ownership of institutional will be increased and subsequently the firm-specific earnings information is more reflected in the current price.

[9] Reason [2001] shows an example of changing the definition of segments. "SBC Communications has redefined its segments every year since SFAS 131 went into effect. In 1998, SBC adopts SFAS 131 in the fourth quarter and establishes four segments ((1)Wireline; (2)Wireless; (3)Directory; (4)Other). Next year, SBC eliminates the 'Other' segment and renames the Directory segment 'Information and Entertainment,' which also includes Ameritech's security and cable TV operations. As international operations move from

Another possibility is the changes in the geographic disclosure. Different from SFAS 14, SFAS 131 does not require firms to disclose earnings by geographic area. Firms are not required to disclose geographic earnings if operating segments are not defined along geographic lines.[10] Prior studies document a considerable decline in the number of geographic segments that disclose their earnings after the adoption of SFAS 131 (Hermann and Thomas [2000] and Hope et al. [2005]). Other studies find that disclosure of geographic segments provides relevant information to the capital market (Hope et al. [2005], Swaminathan [1998], Thomas [2000]). If geographic segment earnings provide value-relevant information, a potentially valuable source of information may be lost through SFAS 131 by its not requiring geographic disclosure (Thomas [2000]). Firms that were mandated to disclose business segments will respond to the new rule by giving up or reducing geographic earnings information. So the decline in the geographic segment information is another possible reason for insignificant change in price leads on firms-specific earnings. Evidence in this paper supports my prediction.

The remainder of this paper is organized as follows. Section 2.2 provides a background of SFAS 131 and the related literature review. Section 2.3 develops the main model of this essay. Section 2.4 describes sample selection procedure and provides descriptive statistics. Section 2.5 presents the specific models and the results of estimation. Finally, Section 2.6 provides a brief summary and conclusions.

"Other" to their own segment, international investments and other domestic operating subsidiaries become 'immaterial,' and are accounted for under 'corporate,' 'adjustments,' and 'eliminations.' The resulting segments are (1)Wireline, (2)Wireless, (3)Information and Entertainment, (4)International."

[10] SFAS 131 provides an example of how operating segments are defined in the new standard when companies have both business and geographic segments: "For example, in some enterprises, certain managers are responsible for different products and services worldwide, while other managers are responsible for specific geographic areas. The chief operating decision maker regularly reviews the operating results of both sets of components, and financial information is available for both. In that situation, the components based on products and services would constitute the operating segments" (FASB 1997, para. 15).

2.2 Background on SFAS 131 and Literature Review

2.2.1 SFAS 131 and Disclosure of Business Segments

The FASB promulgated SFAS 131, "Disclosures about Segments of an Enterprise and Related Information," which superseded the old segment disclosure standard, SFAS 14. SFAS 14 required disclosure of line-of-business information classified by industry segments defined in terms of individual products and services, or groups of products or services, which is referred to as "Industry approach." Over the years, SFAS 14 was criticized for its loose definition of industry, which allowed many companies to define industry segments too broadly for business reporting. The Association for Investment Management and Research (AIMR) criticized the vagueness of SFAS 14's definition of business segments, claiming that the industry approach allowed the management of diversified companies to lump dissimilar businesses together and report all of their operations as being in a single, very broadly defined segment (AIMR [1993]). Other criticisms include that segment disclosures were often out of alignment with management's discussion of operating units and business plans, and that segment information was reported only once a year.

SFAS 131 is effective for the fiscal year beginning after December 15, 1997, and it adopts the "management approach" in defining enterprise's operating segments. Under the management approach, segmentation is based on how management organizes segments within the enterprise for making decisions and assessing performance. FASB believed that segment information, based on the structure of an enterprise's internal organization, provides users of financial reporting with an ability to see an enterprise through the eyes of management, and thus enhances users' ability to predict the enterprise's future cash flows. Moreover, the segment information using the management

approach is less subjective because firms have less discretion about segment definition under the new standard. Since segment reporting under SFAS 131 is based on the internal units the chief operating decision maker uses to make operating decisions and to evaluate an enterprise's performance, segment information is more consistent with disclosures of other parts of the enterprise's annual report. Other than the definition of reportable segments, SFAS 131 requires interim reporting of several items for each reportable segment.[11]

Although management approach in SFAS 131 was welcomed by analysts, SFAS 131 is often criticized for several reasons. First, SFAS 131 does not specify the definition of segment profits or losses. It allows companies to report any measure used internally for decision making as the segment profits or losses, and thus reduces the comparability of segment information between business segments in the same industry.[12] Furthermore, segment disclosures need not conform to GAAP, even though firms are required to provide reconciliations explaining any material differences between the segment data and the enterprise-wide reporting. The possible deviations from GAAP raised concerns from many analysts and investors.[13] Another weakness of SFAS 131 is that it does not require firms to disclose geographic earnings information. Prior studies show that geographic disclosure provides value-relevant incremental information. Therefore, firms, not mandated to disclose geographic disclosure, have incentive to

[11] These include revenues from external customers, inter-segment revenues, a measure of segment profit or loss and a reconciliation of segment profit or loss to the enterprise's consolidated income, material change in total assets, and changes in basis of segmentation (FASB 131, Para. 33).

[12] One of the board members, Mr. Leisenring, dissented from the issuance of SFAS 131 because it does not define segment profit or loss and does not require that whatever measure of profit or loss is reported be consistent with the attribution of assets to reportable segments.

[13] For example, Pat McConnell, analyst at Bear, Stearns & Co. says, "I'm very surprised at this standard. We never imagined that FASB would introduce a standard that didn't follow GAAP definitions for all the segment disclosures. It doesn't fit with a board that has been so meticulous in telling companies exactly what they must disclose and how" (Springsteel [1998]).

reduce or to stop providing some of geographic information in order to mitigate the increased proprietary costs of SFAS 131.

In summary, SFAS 131 improved the relevance and consistency of the segment data, but reduced comparability, possible deviation from GAAP, and lack of geographic disclosure all seem to be negative aspects of SFAS 131. Thus, it would be an empirical issue to determine how these aspects of SFAS 131 influence the market's ability to predict future industry and firm earnings information.

2.2.2 Related Literature on SFAS 131

The special committee of FASB listed five improvements needed in the SFAS 131. Those include: (1) disclosure of segment information in interim financial reports; (2) a greater number of segments for some enterprises; (3) more information about segments; (4) segmentation that corresponds to internal management reports; (5) and consistency of segment information with other parts of an annual report (FASB [1997], para. 50). Some existing studies investigate whether SFAS 131 achieves the specific goals listed above.

For example, Hermann and Thomas [2000] analyze segment disclosures under SFAS 131 and SFAS 14 using a sample including 100 largest U.S. firms in the 1998 "Fortune 500" listings. They find that the new standard has increased the number of firms providing segment disclosure information and that more items for each operating segment, such as investment in equity-method investees, income tax expense, and interest and noncash items, were disclosed upon adoption of SFAS 131. They also document an increase in the proportion of country-level geographic disclosure, which is more informative than broader geographic disclosure because macroeconomic factors tend to vary by country. Hermann and Thomas [2000], however, raise some concerns about the

new standard. Some firms in their sample no longer provide segment information that was voluntarily disclosed under SFAS 14, such as research and development expenses, suggesting that the new rule has a negative effect on firms' voluntary disclosure. Significant decrease in disclosure of geographic earnings is another concern. Under the new standard, earnings are no longer required to be disclosed for enterprise-wide geographic disclosures, but were required for segment disclosure under SFAS 14. Among 74 sample firms, only 12 firms disclosed geographic earnings under SFAS 131 compared to 74 out of 77 firms under SFAS 14.

Similar to Hermann and Thomas [2000], Street, Nicols, and Gray [2000] use 160 U.S. companies drawn from "Business Week Global 1000 Companies" and find that under the new segment reporting standard, business reporting has improved. Specifically, they document that SFAS 131 resulted in greater consistency of segment disclosure with the items disclosed in other parts of the annual reports, a greater number of segments, and more items of information about each segment. Further, they also find that some firms realigned organizational structure and thus changed the groupings of the segments upon adoption of the new rule in such a way that reported segments are more consistent with firms' internal decision making.[14] Similar to Hermann and Thomas [2000], they examine the impact of the new rule on firms' voluntary disclosure and find that some firms stopped disclosing some items of each segment upon adoption of SFAS 131. In sum, the findings of Hermann [2000] and Thomas and of Street, Nicols, and Gray [2000] suggest that, overall, SFAS 131 has improved segment reporting, but it has some undesirable

[14] "For example, in 1997 Ingersol Rand reported four segments (standard machinery; engineered equipment; bearings, locks, and tools; and Thermo King). In 1998, Ingersoll Rand also reported four segments, but the composition changed (specialty vehicles; air and temperature control; hardware and tools; and engineered products)."

effects on firms' voluntary disclosure of geographic earnings information and of other important items which were disclosed under the old rule.

Another group of papers, perhaps more directly related to this paper, examines the effect of SFAS 131 on the analysts' information environment. Venkataraman [2001] analyzes the effect of SFAS 131 on the information environment of financial analysts and its effect on the precision of public and private information. Using the model of Barron et al. [1998], Venkataraman [2001] documents greater analysts' forecasts accuracy and precision of overall information and common information for firms that changed reported segments after the adoption of SFAS 131. Berger and Hann [2003] find that SFAS 131 is effective in inducing firms to increase the number of reported segments, and that financial analysts had access to part of segment information disclosed under SFAS 131 before the implementation of the standard, but that, at the same time, SFAS 131 provides new information about segments to the analysts and investors. Consistent with SFAS 131 providing additional information about segments to the stock market, Berger and Hann [2003] find a decline in analysts' forecasts accuracy. Botosan and Stanford [2005] also examine the impact of SFAS 131 on analysts' information environment. Using retroactive data required by SFAS 131, they find an increase in consensus among analysts, in overall uncertainty, and in mean squared error in forecasts. They interpret these findings as analysts' greater reliance on public data in the post-131 period compared to the pre-131 period. The greater consensus among analysts suggests an increased reliance on public data, which indicates that analysts are perhaps less inclined to search for more informative and costly private information.

This paper is closely related to Ettredge et al. [2005], which study the change of association between stock returns and future earnings. By comparing future earnings

response coefficients (FERC) before and after SFAS 131, they find an increase in the FERC for increasing segment firms compared to non-increasing segment firms and argue that SFAS 131 improved stock price informativeness in such a way that current stock price incorporates more information about future earnings. I extend their study by going one step further. Specifically, by partitioning annual earnings innovations into industry-wide and firm-specific components, this paper examines how the improvement of overall stock price informativeness is related to each component of future earnings. In addition, this paper addresses the question of whether segment disclosure in the post-131 regime is related to cross-industry performance, or within-industry performance, or both. This is important because investors' trading profit is closely related to the additional industry information and additional firm-specific information.[15] Further, the decomposition allows me to link my results to those of prior studies on the contemporaneous relation between price-leads and financial analysts, and to draw some meaningful implications from the impact of SFAS 131 on these informed market participants (Ayers and Freeman [2002], Piotroski and Roulstone [2004]). This article also extends the results of prior studies on the Earnings-Component Timing Hypothesis (Ayers and Freeman [1997, 1999]) by testing it on the different types of firms according to their incentives to reveal disaggregated information.

2.3 Earnings-Component Timing Hypothesis and Derivation of the Main Model

Ayers and Freeman [1997] hypothesize that returns associated with cross-industry performance begin and end earlier than returns associated with within-industry

[15] Liu [2003] finds that the investment value of additional industry-level information is greater than the investment value of additional firm-specific information in emerging industries where the fluctuation of industry-wide performance is higher than that of mature industries. In contrast, he finds that the investment value of additional firm-specific information is greater than the investment value of additional industry information in mature industries

performance, which is called the Earnings-Component Timing Hypothesis. To test this hypothesis, they decompose annual earnings into a market component, an industry component, and a firm-specific component. Specifically, they estimate the following cross-sectional regression model year by year:

$$CAR_{i,t} = \alpha + \sum_{t=-1}^{1} \beta_t I_{j,t} + \sum_{t=-1}^{1} \lambda_t F_{i,t} + \varepsilon_{i,t}$$

Where $CAR_{i,t}$ is the value-weighted, market-adjusted return for firm i in industry j for fiscal year t, $I_{j,t}$ is an industry component of earnings innovations, and $F_{i,t}$ is a firm-specific component of earning innovations as defined in Ayers and Freeman [1997].

They find that coefficients on the current and the next year's industry earnings changes (β_0 and β_1, respectively) are positive and significantly greater than corresponding coefficients on the current and the next year's firm-specific earnings changes (λ_0 and λ_1) after controlling for lagged earnings changes, indicating that the current year's returns anticipate the industry-wide component of future earnings earlier than the firm-specific component. Furthermore, Ayers and Freeman report that the coefficient of the lagged firm earnings (λ_{-1}) is significantly positive, while the coefficient of lagged industry earnings (β_{-1}) is negative and insignificant.

To investigate the impact of SFAS 131 on the market's ability to predict industry and firm earnings, this paper modifies Ayers and Freeman's model as follows. To mitigate the potential errors-in-variables bias (Collins et al. [1994], Ettredge et al [2005], Gelb and Zarowin [2002] and Lundhom and Myers [2002]), I include the next period's cumulative abnormal returns ($CAR_{i,t+1}$). Additionally, log of book-to-market ratios is included to capture the changes in growth opportunity (Collins and Kothari [1989]), and log of firm size is added in the regression equation to control for differences in returns arising from size (Piotroski and Roulstone [2004]). Following prior studies

(Ettredge et al. [2005] and Hope et al. [2005]), I define the pre-SFAS 131 period as three years before the implementation of SFAS 131 (1995-1997) and define the post-SFAS 131 period as three years after the implementation of SFAS 131 (1999-2001), respectively.[16] Then, using a dummy variable, 'INC,' which takes one for firms that increased the number of business segments, and zero otherwise, I estimate the coefficients of industry and firm earnings components respectively between increasing segment firms and non-increasing segment firms. Specifically, I estimate the following regression model for both the pre-131 and post-131 periods:

$$\begin{aligned} CAR_{i,t} = \alpha + \alpha_a INC + \sum_{t=-1}^{1} \beta_t I_{j,t} + \sum_{t=-1}^{1} \lambda_t F_{i,t} + \delta_1 BM_{it} + \delta_2 SZ_{it} + \delta_3 CAR_{i,t+1} + \sum_{t=-1}^{1} \beta_{a,t} INC \times I_{j,t} \\ + \sum_{t=-1}^{1} \lambda_{a,t} INC \times F_{i,t} + \delta_{a,1} INC \times BM_{i,t} + \delta_{a,2} INC \times SZ_{1,t} + \delta_{a,3} INC \times CAR_{i,t+1} + \varepsilon_{it} \end{aligned} \quad (2\text{-}1)$$

Where:

CAR_{it} = twelve-month summation of market-adjusted return for firm i for fiscal year t; firm and value-weighted market returns are measured from the fourth month of year t to the third month of year t+1;

$I_{j,t}$ = the industry-wide portion of firm i's change in earnings; measured as a weighted average of industry-wide component of each segment using segment sales as a weight ($\sum_k \frac{\text{SegSale}_k}{\text{Total Sale}} \times I^k_{j,t}$); for increasing segment firms (INC=1), the weight of the earliest post-131 year is used as weights for pre-131 segment sales; industry-wide components of segment k ($I^k_{j,t}$) is defined as $\Delta IE^k_{j,t} - \Delta ME^k_{i,t}$, where $\Delta IE^k_{j,t}$ is the median annual change in firm earnings for all firms in industry j sharing segment k's two-digit SIC code of firm i in year t and $\Delta ME_{i,t}$ is the median $\Delta IE_{j,t}$ for all industries in year t;

F_{it} = the firm-specific portion of firm i's change in earnings;

[16] SFAS 131 is effective for the fiscal year commencing after December 15, 1997. Since firms in this study are all December 31 year-end firms, firms' first 10-K containing segment data under SFAS 131 are reported in early 1999. Hence, for most firms, the associated cumulative abnormal returns, measured from April of 1998 to March of 1999, might not be related to the segment information. So the post-131 period in my study starts from 1999. To avoid possible confounding effect due to early adoption, I exclude all observations from the fiscal year ending 1998.

measured as $F_{i,t}=\Delta FE_{i,t}-\Delta IE_{j,t}$, where $\Delta FE_{i,t}$ is the first difference of firm i's earnings divided by its beginning of year market value; earnings is defined as net income before extraordinary items;

INC = is a dichotomous variable defined as 1 if a firm increased the number of its reported business segments and 0 otherwise;

$BM_{i,t}$ = natural log of a firm's book-to-market ratio; measured as the ratio of year-beginning book value of equity and market value of equity in year t;

$SZ_{i,t}$ = natural log of a firm's size; measured as common stock price multiplied by the number of common shares outstanding at the beginning of the year t.

If increased disaggregation mandated by SFAS 131 provides more information useful to predict future industry-wide and firm-specific earnings, we expect current prices to anticipate both industry and firm-specific earnings earlier in the post-131 period than in the pre-131 period for firms that increased the number of segments (INC=1). To formally test my primary question, I first estimate coefficients for model 2-1 using pooled data before and after SFAS 131.[17] Then, I compare coefficients of each time span and examine the changes in coefficients of industry and firm earnings. For non-increasing segment firms, the coefficients of industry and firm earning are β_t and λ_t, where t=-1,0, or 1. For increasing segment firms, the coefficients of industry and firm earning are $\beta_t+\beta_{at}$ and $\lambda_t+\lambda_{at}$, where t=-1,0, or 1. Therefore, any incremental change due to the increase in the number of business segments is captured by changes in β_{at} and λ_{at}. In

[17] Ayers and Freeman [1997] annually estimate their cross-sectional model and get coefficients by averaging coefficients obtained from annual cross-section regressions (Fama-MacBeth [1973]. However, due to the limited time span, Fama and Macbeth [1973]'s approach does not give meaningful test statistics. So I estimate model 2-1 by running a pooled regression of the periods before and after SFAS 131 separately. Even though the assumption that explanatory variables do not vary with time within each period is somewhat restrictive, this approach provides meaningful test statistics. Moreover, previous studies also find that the pooled regression works relatively well in a large cross-section and relatively short time period (eg. Skoulakis [2005]). Results obtained following Ayers and Freeman [1997] are qualitatively similar.

this way, I can control for any market-wide changes or shocks that influence all firms during the time-span and that are not related to the changes in the segment disclosure.

Ettredge et al. [2005] argues that the current prices of increasing segment firms are more informative under SFAS 131 compared to non-increasing segment firms. In model 2-1, this suggests that the sum of the changes in the coefficients of both industry and firm earnings is significantly positive ($((\hat{\beta}_{a,l}^{post} - \hat{\beta}_{a,l}^{pre}) + (\hat{\lambda}_{a,l}^{post} - \hat{\lambda}_{a,l}^{pre}) > 0$).[18] However, advantages and disadvantages of SFAS 131 stated in the previous section do not suggest a clear-cut direction of changes in the coefficients of industry component ($\hat{\beta}_{a,l}^{post} - \hat{\beta}_{a,l}^{pre}$) and those of firm-specific component ($\hat{\lambda}_{a,l}^{post} - \hat{\lambda}_{a,l}^{pre}$), respectively. Section 2.5 provides additional research questions and models, results of estimations, and interpretations of my findings.

2.4 Sample Selection and Descriptive Statistics

2.4.1 Sample Selection

The sample is drawn from the Compustat and CRSP databases for the period 1995-2001.[19] To control for any bias due to the inconsistency of the fiscal year-end, I include only December 31 year-end firms. Firms that do not have earnings information required to get an industry-wide ($I_{i,t-1}$, $I_{i,t}$, and $I_{i,t+1}$) and a firm-specific portion ($F_{i,t-1}$, $F_{i,t}$, and $F_{i,t+1}$) of annual earnings change are deleted.[20] Further, I delete observations without

[18] Pre- and post-131 means the coefficients are obtained on pooled data of the pre-131 and post-131 periods, respectively.

[19] For most sample selection criteria, I follow Ayers and Freeman [1997] and Ettredge et al. [2005].

[20] In Ayers and Freeman (1997), to obtain industry-wide component of earnings, firm observations in industries, defined as two-digit SIC codes, consisting of less than 10 firms are eliminated to increase the possibility of detecting differences between industry and firm earnings components. The results of Botosan and Stanford [2005] suggest that hidden segments are operated in less competitive industries. Enforcing Ayer and Freeman's condition may remove some firms whose hidden segments are operated in non-competitive industries, and this will introduce bias into my analysis. So I do not impose this condition in getting the industry component of each segment earnings to obtain a weighted average of industry component. Results of the empirical analysis do not change qualitatively and statistically even after I require this condition.

return information ($R_{i,t}$ and $R_{i,t+1}$). This results in an initial sample of 17,429 firm-year observations from 3,854 firms.

As in Ayers and Freeman [1997], I delete observations whose absolute value of price deflated earnings changes is greater than 1.5 to avoid the influence of outliers on the regression coefficients.[21] Ettredge et al [2005] and Hope et al. [2005] omit firm-year observations for fiscal years ending between December 1998 and November 1999 to avoid the potential confounding effect of early adoption or of actions taken in preparation for adoption. I follow their approach and delete all firm-year observations with the fiscal year ending in 1998. Firms with M&A or spin-off, etc., that affected segment composition between the pre- and post-131 periods, are also deleted.[22] Since the number of segments might have been changed due to these activities, it would not be clear whether changes in the number of segments are driven by SFAS 131 or by takeovers or restructuring, which may result in systematic changes in the return-earnings association.[23] Finally, to make the comparison of the coefficients more meaningful, I eliminate all firm observations if firms do not have at least one observation for both the pre-131 and post-131 periods. These sample selection criteria yield the final sample including 8,558 firm-year observations from 1,962 firms. Table 2-1 summarizes sample selection procedure.

[21] Regression results are qualitatively similar when including these observations.

[22] In identifying those firms, I follow Ettredge et al. [2005] and use Compustat annual data items #129 (Acquisitions) and #66 (Discontinued Operations).

[23] Multi-segment firms' decision over mergers and acquisitions (M&A), spin-offs, and divestitures are possibly affected by SFAS 131. Berger and Hann [2003] find evidence for improved monitoring in the diversified firms after 131 and finds a subsequent decline in the diversification discount. To the best of my knowledge, there is no paper that studies the direct impact of SFAS 131 on firms' decision to make structural change such as M&A or spin-offs.

2.4.2 Sample Description and Descriptive Statistics

Panel A of Table 2-2 presents frequency of observations by year and by reported firm type. Consistent with prior studies, a number of single-segment firms during 1995-1997 later reported themselves as multiple-segment firms after the adoption of SFAS 131. There is a significant decline in the number of single-segment firm observations in 1999, and a sizable increase in the number of multiple-segment firm observations is found in the same year. The ratio of single and multiple-segment firm observations is 2.57 before SFAS 131, dropping to 1.1 after the implementation of SFAS 131. Overall, Panel A confirms findings of prior studies showing that a significant number of single-segment firms under SFAS 14 switched to become multiple-segment firms under SFAS 131.

Table 2-2, Panel B compares the number of segments changed between pre-131 single-segment firms and pre-131 multi-segment firms. Ettredge et al. [2005] provide evidence that the effect of SFAS 131 on price informativeness is different between these two types of firms. Pre-131 single-segment firms are those that claimed to be single-segment firms and reported only aggregated firm-wide information before SFAS 131. As shown in Panel B, my sample is dominated by pre-131 single-segment firms. Specifically, about 73% of sample firms are pre-131 single-segment firms and 27% of firms are pre-131 multiple-segment firms. Almost 28% of pre-131 single-segment firms initiated segment reporting after the implementation of SFAS 131 and 34% of pre-131 multiple-segment firms increased the number of reported segments. Most firms that increased the number of segments after SFAS 131 added one or two new segments. Note that 12% of pre-131 multiple-segment firms reduced the number of reported segments after SFAS 131, showing that redefining segments following management approach reduced the number

of reported segments for some companies. Altogether, about 30% of firms of December year-end firms increased the number of segments, and the proportion of firms that increased the number of segments is slightly greater in pre-131 multi-segment firms. Consistent with prior findings, Panel B shows that SFAS 131 is effective in attaining the goal of increasing the number of reportable segments (Berger and Hann [2003], Botosan and Stanford [2005], Herrmann and Thomas [2000] and Gray and Nichols [2000]).

Table 2-3 reports the distribution among industry groups of the final sample. They are broadly distributed across 53 two-digit SIC industry groups. Among 53 industries based on the primary two-digit SIC codes, 41 industries have more than 50 firm observations, and only in 14 industries are observations less than 50. In sum, sample firms operate in various industries and the results of this paper are unlikely to be driven by any specific industries.

Table 2-4 presents descriptive statistics on the concurrent, lead and lag industry and firm earnings changes, size, book-to-market ratio, and next-period cumulative abnormal earnings. All statistics are reported by the types of firms (increasing segment firms versus non-increasing segment firms) and by the time periods (Pre-131 period versus Post-131 period). Size is measured by the natural logarithm of market capitalization ($SZ_{i,t}$) and the book-to-market ratio is measured by the natural logarithm of firm's book-to-market ratio ($BM_{i,t}$). Consistent with Ayers and Freeman [1997, 2000] and Brown and Ball [1967], industry variables have considerably lower range and standard deviation than firm variables. For example, in the pre-131 period, the standard deviation of lag, concurrent, and lead industry earnings of non-increasing segment firms is 0.064, 0.097, and 0.094, respectively, while the standard deviation of lag, concurrent, and lead firm-specific earnings of non-increasing segment firms is 0.148, 0.152, and 0.175,

respectively. Likewise, the same relation between the standard deviation of industry and firm-specific variables can be found in increasing segment firms.

In both periods, the industry variables of non-increasing segment firms are more dispersed than increasing segment firms. This is because all increasing segment firms are allegedly multi-segment firms before and after SFAS 131, although they reported themselves stand-alone firms before SFAS 131. Hence, these multi-segment firms usually reduce the variability of industry variables through diversification.

Ettredge, Smith, and Kwon [2002] argue that larger and more complex firms have an advantage in concealing proprietary information and thus have more incentive to aggregate the financial information of their segments. Consistent with their findings, the mean and median size of increasing segment firms are significantly greater than those of non-increasing segment firms. Ayers and Freeman [2000] provide evidence for a positive association between firm size and price leads on both industry-wide and firm-specific earnings. Therefore, all else equal, we expect the price leads to be more pronounced in increasing segment firms than in non-increasing segment firms. Results shown in Section 2.4 indicate that the relationship between the size and price lead earnings is affected by firms' aggregation of segment data. Finally, there is no significant change in industry and firm earnings between the pre-131 and post-131 periods.

2.5 Models and Empirical Results

2.5.1 The Change in the Market's Ability to Predict Industry-Wide and Firm-Specific Earnings after the Adoption of SFAS 131

In this section, I present the estimation results of the main model presented in section 2.2. Then, I introduce additional research questions and related models, and provide the results of empirical tests. To see how SFAS 131 changed the stock market's

ability to predict industry-wide and firm-specific earnings, I estimate model 2-1 in Section 2.3.

Model 2-1 uses dichotomous variable, INC, where INC=1 if the number of segments in the post-131 period is increased, and INC=0 otherwise. For firms that remained single-segment firms after SFAS 131 (INC=0), the magnitude of current prices' impounding of current and future industry earnings is captured by β_0 and β_1 respectively. Likewise, the amount of current prices' impounding of current and future firm-specific earnings is captured by λ_0 and λ_1. For firms that increased the number of business segments, $\beta_0 + \beta_{a,0}(\lambda_0 + \lambda_{a,0})$ and $\beta_1 + \beta_{a,1}(\lambda_1 + \lambda_{a,1})$ represent the amount of current prices' impounding of current and future industry (firm-specific) earnings innovation, respectively.

I first estimate Model 2-1 on the data from the pre-131 period and see whether the market had more difficulty in predicting future earnings of firms that aggregated segment information than those of control firms. As a next step, I estimate the same model on the data from the post-131 period and examine how the stock market's ability to predict future performance is changed for firms affected by SFAS 131 compared to those not affected. Note that $\mathrm{Inc} \times \mathrm{I}_{i,t}$ ($\mathrm{Inc} \times \mathrm{F}_{i,t}$) captures the incremental changes in the market's ability to predict industry (firm-specific) earnings for increasing segment firms after controlling for the changes of non-increasing firms.

Table 2-5 presents the estimation results of pooled cross-section and time-series regression for the pre-131 and post-131 periods. The first column reports the results of regression on pre-131 data. Ayers and Freeman [1997] find that the coefficients on contemporaneous ($I_{i,t}$) and next year's industry earnings changes ($I_{i,t+1}$) are significantly greater than corresponding coefficients on contemporaneous ($F_{i,t}$) and one-year ahead

firm-specific components of earnings changes ($F_{i,t+1}$). If Ayer and Freeman's hypothesis holds for both types of firms in my sample, we would see $\beta_0 > \lambda_0$ and $\beta_1 > \lambda_1$ for INC=0, and $\beta_0 + \beta_{a,0} > \lambda_0 + \lambda_{a,0}$ and $\beta_1 + \beta_{a,1} > \lambda_1 + \lambda_{a,1}$ for INC=1. Based on the results in the first column, we see that the primary finding of Ayers and Freeman [1997] holds only for the non-increasing segment firms (INC=0). For non-increasing segment firms (INC=0), the coefficient of contemporaneous industry earnings ($I_{i,t}$) is 0.943, which is larger than the coefficient of concurrent firm-specific earnings ($F_{i,t}$) of 0.751. For increasing segment firms (Inc=1), the coefficient of concurrent industry earnings ($\beta_0 + \beta_{a,0} = 0.943 - 0.030 = 0.913$) is larger than that of concurrent firm earnings ($\lambda_0 + \lambda_{a,0} = 0.751 + 0.104 = 0.855$). However, the coefficient of $INC \times I_{i,t+1}$ is -0.347 (p-value=0.03), which reverses the relation between industry and firm-specific earnings in Ayers and Freeman [1997]. This result implies that the stock market's ability to assess future performance is deterred by the reporting of aggregated segment information in the pre-131 period. This is consistent with analysts' long-standing complaints that SFAS 14 allowed too much flexibility in defining reportable industry, and that this flexibility was exploited by some firms to avoid providing segment information to mitigate proprietary cost of disclosure (AIMR 1993, AICPA 1994). Note that the firm-specific components of future earnings innovations are still significantly positive for increasing segment firms (0.299 + 0.022 = 0.321; p-value < 0.001). While having difficulty in predicting cross-industry performance, market participants could access firm-specific information through private information gathering, analysts' reports, conference calls, the trading records of institutional investors, and insider trading records (Piotroski and Roulstone [2004]).

The last column of the first set of estimations presents the changes of coefficients with the results of the significance test. To see the overall impact of SFAS

131 on stock price informativeness, I look at the changes in the coefficient of '$INC \times I_{i,t+1}$' and '$INC \times F_{i,t+1}$'. I get 0.651 for '$INC \times I_{i,t+1}$' and 0.070 for '$Inc \times F_{i,t+1}$'. The sum of the changes in these two coefficients (0.721; p-value=0.04) indicates overall improvement in stock price informativeness, which is consistent with Ettredge et al. [2005].

Next, I examine the changes in each component of earnings. After the implementation of SFAS 131, increasing segments firms experience significant acceleration of future industry earnings into price. The difference in the coefficient of $INC \times I_{i,t+1}$ between the post- and pre-131 periods is 0.651 and significant (p-value=0.03). Significant increase in the price lead on industry earnings shows the stock market's enhanced ability to predict cross-industry performance through more disaggregated information.

Note that there is no significant change in the coefficient of $I_{i,t+1,}$ indicating no acceleration of the price lead on industry earnings for non-increasing segment firms. The coefficient of $I_{i,t+1}$ in the post-131 period is 0.487 and this is slightly higher than the estimated coefficient in the pre-131 period ($\beta_1 = 0.333$), but the change is not statistically significant. This means that the price lead on industry earnings is not changed for non-increasing segment firms. Although increasing segment firms experience a large increase in the price lead on the industry-wide component, they do not have significant increase in price lead on the firm-specific component of future earnings. The change in the coefficient of '$INC \times F_{i,t+1}$' is small (0.092) and is not significant. Taken together, the results of the estimation of Model 2-1 indicate that SFAS 131 enhanced the informativeness of price, but it is mainly driven by the market's improved ability to predict cross-industry performances, not within-industry performances. Overall, estimation results of Model 2-1 suggest that SFAS 131 is effective in resolving investing

communities' complaints about SFAS 14 by forcing firms to provide relevant information about future industry earnings. However, SFAS 131 still seems to be unsuccessful in inducing firms to reveal useful information about future firm-specific earnings.

2.5.2 The Association between the Number of Increasing Segments and the Price Leads on Earnings

Prior studies on segment disclosure document that the number of segments reported is related to the amount of decrease in information asymmetry. For example, using SFAS 14 data, Swaminathan [1991] documents a positive association between the decrease in divergence of beliefs due to segment disclosure and the number of segments reported. Greenstein and Sami [1994] find that the decrease in bid-ask spread due to segment disclosure is positively related to the number of segments. If firms disclose more segments under the new rule, the amount of information for market participants to predict future earnings will be increased. So I examine whether the magnitude of increase in the price lead on industry and firm-specific earnings is positively related to the number of segments increased after the implementation of SFAS 131.

To answer the question, I employ a new variable, NUM_INC, which is equal to the number of segments changed after the adoption of SFAS 131. Specifically, I estimate the following model:

$$\begin{aligned} CAR_{it} = {} & \alpha + \alpha_a NUM\_INC + \sum_{t=-1}^{1} \beta_t I_{it} + \sum_{t=-1}^{1} \lambda_t F_{it} + \delta_1 BP_{it} + \delta_2 SZ_{it} + \delta_3 CAR_{i,t+1} + \sum_{t=-1}^{1} \beta_{a,t} NUM\_INC \times I_{it} \\ & + \sum_{t=-1}^{1} \lambda_{a,t} NUM\_INC \times F_{it} + \delta_{a,1} NUM\_INC \times BM_{it} + \delta_{a,2} NUM\_INC \times SZ_{it} + \delta_{a,3} NUM\_INC \times CAR_{it+1} + \varepsilon_{it} \end{aligned} \quad (2\text{-}2)$$

where NUM_INC= Number of business segments changed after the implementation of SFAS131.

Similar to the previous analysis, $\hat{\beta}_{a,1}^{post} - \hat{\beta}_{a,1}^{pre}$ and $\hat{\lambda}_{a,1}^{post} - \hat{\lambda}_{a,1}^{pre}$ capture incremental effect of the number of segments increased on the price lead on industry-wide and firm-specific earnings. Note that some firms decreased the number of segments. So the Model 2-2 implies decrease in price lead on components of earnings change for firms that decreased the number of business segments.

The second set of results in Table 2-5 reports the estimation of model 2-2. 'NUM_INC' is the number of increased segments disclosed after SFAS 131, which takes a value from -3 to 6. Estimation results again support the effectiveness of SFAS 131 such that the magnitude of the increase in the price lead is positively related to the number of segments increased after SFAS 131. Most results are similar to those of previous estimation. The change in the coefficient of 'NUM_INC$\times I_{i,t+1}$' is marginally significant with the amount of 0.244. Similar to the case of model 2-1, there is no significant change in the timing of price lead on firm-specific earnings with increase in the number of business segments, suggesting that the number of new segments is not related to the price lead on firm-idiosyncratic earnings.

2.5.3 Differential Effect of SFAS 131 across Firms Based on Pre-131 Reporting Status

Ettredge et al. [2005] document that the impact of the change in disclosure rules varies across firms based on their pre-131 period segment status. Following Ettredge et al. [2005], I assess the differential impact of the changes in the disaggregation of segments based on firms' pre-131 reporting status. Specifically, I split sample firms into pre-131 single-segment firms and pre-131 multiple-segment firms. Partitioning the sample into two different types of firms and looking into the effect of SFAS 131 on these different types of firms is important because of the difference in the incentives to conceal the segments in pre-131 era between these two types of firms. According to Botosan and

Stanford [2005], the managers of pre-131 single-segment firms, that increased the number of reported business segments, took maximum advantage of the flexibility inherent in SFAS 14 in defining their segments in order to avoid providing segment disclosures altogether. Based on their argument, I expect that the stock market had more difficulty in deciphering disclosure of pre-131 single-segment firms. In other words, this means that the improvement in the information environment due to the increased amount of segment reporting is more pronounced among the pre-131 single-segment firms than among pre-131 multi-segment firms.

Table 2-6 presents the results of the estimations.[24] The regression among pre-131 single-segment firms measures the impact of the increase in the reported segments for firms that became multiple-segments firms in post-131 period. By setting as a control group single-segment firms that did not change their disclosure, the regression captures the incremental effect of the change in the number of reporting segments on the timing of current return's association with future industry and firm earnings. The change in the coefficients of $I_{i,t+1}$ and $F_{i,t+1}$ (β_1 and λ_1, respectively) captures any changes in the association between current returns and future earnings that is not caused by the reporting changes related to SFAS 131. The incremental effect, if any, is captured by the coefficient of $INC \times I_{i,t+1}$ and $INC \times F_{i,t+1}$.

Estimation on the pre-131 single-segment firms shows that SFAS 131 resulted in the acceleration of one-year-ahead industry earnings. The coefficient of $INC \times I_{i,t+1}$ is significantly positive for both disaggregation measures (Inc and NUM_INC). Note that the coefficient of $INC \times I_{i,t+1}$ is significantly positive (0.371) in the post-131 regime. This suggests that, for increasing segment firms, current returns associated with the industry

[24] The coefficients of other independent variables($SZ_{i,t+T}$,$BM_{i,t+T}$, and $CAR_{i,t+T}$) and the variables interacted with 'Inc'($INC \times SZ_{i,t+T}$, $INC \times BM_{i,t+T}$, and $INC \times CAR_{i,t+T}$) are not tabulated for parsimony.

component of future earnings begin earlier than the stand-alone firms. This is confirmed by the change of the coefficient of $INC \times I_{i,t-1}$. In the pre-131 era, the coefficient of $INC \times I_{i,t-1}$ is significantly positive (0.872), which suggests that it took a significant amount of time for the stock market to understand the implications of industry components of the previous year's earnings for increasing segment firms. This implies that disclosure of earnings information aggregated from dissimilar segments hampered the market's ability to analyze the implications of previously reported earnings, as well as to predict future earnings. The insignificant coefficient of idiosyncratic component of future earnings is consistent with the results of estimation using the overall sample.

Estimation results with the pre-131 multiple-segment firms are also shown in Table 2-6. Different from the case of pre-131 single-segment firms, the coefficient of $INC \times I_{i,t+1}$ is positive. This confirms my earlier prediction that the difficulty of the stock market's anticipating future industry performance is not serious in pre-131 multi-segment firms. Consistent with Ettredge et al. [2005], pre-131 multiple-segment firms have increased price lead on both industry and firm earnings components. The change of the coefficients of $I_{i,t+1}$ and $F_{i,t+1}$ (β_1 and λ_1) are both significantly positive while the change is more pronounced in the industry earnings. However, there is no incremental effect of the increase on the number of segments, as evidenced by the insignificant coefficients for both $INC \times I_{i,t+1}$ and $INC \times F_{i,t+1}$. Ettredge et al. [2005] interpret this as evidence of SFAS 131 having qualitative effects on the segment disclosure. Since pre-131 multiple-segment firms already provided segment information before SFAS 131 and these firms have less incentive to conceal segment information to minimize proprietary costs, I conjecture that the increase in the number of business segments has little impact on the earnings

component timing. Regression results of Model 2-2 are almost the same as the results of Model 2-1.

In sum, the results of the estimation using pre-131 multi-segment firms implies that, even when multi-segment firms do not increase their numbers of business segments, segment information, using management approach under SFAS 131, enhances users' ability to understand and predict future earnings. It also suggests that segment information under the new rule, which is more consistent with other sections of enterprise's annual report, such as Management Discussion and Analysis section (MD&A), provides relevant information in predicting enterprise's future cash flows and earnings. Consequently, I argue that SFAS 131 has improved the quality of segment information for both increasing and non-increasing segment firms. Nevertheless, the effect of the increase in the number of segments on price informativeness is not significant.

2.5.4 The Effect of Disclosure of Segments in Industries Different from Those Disclosed under SFAS 14

Ettredge, Kwon, and Smith [2002] document that large firms in more concentrated industries, those that are more complex and with higher proportions of major customers, were more likely to aggregate business segments in SFAS 14. Similar results are reported by Botosan and Stanford [2005], in which they find that managers' motives for withholding segment information under SFAS 14 are greater for firms with high proprietary cost of disclosure. Thus, it appears that the limitations of the stock market's ability to forecast future earnings are positively related to the number of newly disclosed segments which operated in industries different from the firms' primary industries. Based on this argument, I expect that the improvement in price lead earnings

is pronounced for firms that increased the number of business segments and that the newly disclosed segments are operated in different industries from those disclosed in the pre-131 era (hereafter, I call these segments "new industry segments"). Specifically, I predict that increasing segment firms whose new segments had operations in industries different from those disclosed under SFAS 14, experience higher acceleration of price lead on earnings than increasing segment firms that disaggregate segments in the same industries. Same as previous analyses, I use two-digit SIC codes as my definition of industries. I estimate the following model by employing an additional dummy variable, NEW_SIC, which has a value of one for increasing segments with new two-digit SIC codes, and zero otherwise.

$$\begin{aligned} CAR_{i,t} = {} & \alpha + \alpha_a INC + \alpha_n NEW\_SIC + \sum_{t=-1}^{1}\beta_t I_{i,t} + \sum_{t=-1}^{1}\lambda_t F_{i,t} + \delta_1 BP_{i,t} + \delta_2 SZ_{i,t} + \delta_3 CAR_{i,t+1} \\ & + \sum_{t=-1}^{1}\beta_{a,t} INC \times I_{i,t} + \sum_{t=-1}^{1}\lambda_{a,t} INC \times F_{i,t} + \delta_{a,1} INC \times BP_{i,t} + \delta_{a,2} INC \times SZ_{i,t} + \delta_{a,3} INC \times CAR_{i,t+1} \\ & + \sum_{t=-1}^{1}\beta_{new,t} NEW\_SIC \times I_{i,t} + \sum_{t=-1}^{1}\lambda_{new,t} NEW\_SIC \times F_{i,t} + \delta_{new,1} NEW\_SIC \times BP_{i,t} \\ & + \delta_{new,2} NEW\_SIC \times SZ_{i,t} + \delta_{new,3} NEW\_SIC \times CAR_{i,t+1} + \varepsilon_{i,t} \end{aligned} \quad (2\text{-}3)$$

where NEW_SIC = a dichotomous variable, which takes one if increasing segment firms whose newly disclosed segments had operation in industries different from those disclosed under SFAS 14, and takes zero otherwise.

Table 2-7 presents the estimation of Model 2-3. Panel A of Table 2-7 reports the frequency of newly disclosed business segments whose two-digit SIC codes are different from SIC codes of business segments disclosed under SFAS 14. The number of observations for firms that increased the number of segments (denoted by 'INC=1') is 2,621, and among those increasing segments, almost 30% of firm-years (denoted by 'NEW_SIC=1') began to disclose segments operating in new industries.

The regression results using a dichotomous variable NEW_SIC to examine the effect of increasing the number of new industry segments are reported in Panel B. To

capture the additional impact of disclosure of new industry segments, I interact NEW_SIC with all the independent variables. The third column of Panel B shows the changes in the price lead on future industry and firm earnings. The change in the price lead on industry-wide earnings for firms who disclosed new industry segments is captured by the sum of coefficients of $INC \times I_{i,t+1}$ and $NEW\_SIC \times I_{i,t+1}$. The sum of coefficient is positive (0.967 =0.639+0.328) and significant, (p-value=0.07) indicating that these firms experience much higher increases in the price leads on industry earnings than stand-alone firms. However, the increase in price lead is not significantly greater than the increase in price-lead of firms with new segments in the same industries, as indicated by the insignificant coefficient of $NEW\_SIC \times I_{i,t+1}$. Note that the change of the coefficient of $INC \times I_{i,t+1}$ is still positive (0.639) and significant even after we control for an additional effect of disclosure of new industry segments, implying that the market's improved prediction about the future industry earnings is not driven by the disclosure of new industry segments. The change in the coefficient of $NEW\_SIC \times F_{i,t+1}$ is insignificantly positive, suggesting that the increase in the number of new industry segments does not improve the speed of incorporation of future firm-specific earnings. Taken as a whole, Table 2-7 confirms my prediction that increasing segment firms with segments in new industries experience more acceleration in the price lead on industry earnings than no-change firms, but there is still no change in the price lead on firm-specific earnings.

2.5.5. SFAS 131 and the Changes in Geographic Disclosure

Analyses in the previous subsections can be summarized as follows. For pre-131 single-segment firms, increased disaggregation by SFAS 131 accelerated the

incorporation of industry-wide earnings into current returns, but it had no impact on the incorporation of firm-specific earnings. For pre-131 multi-segment firms, increased disaggregation had no additional impact on price informativeness. In this subsection, I provide one possible explanation for my findings by investigating the changes in the geographic disclosure.

Ijiri [1995] argues that as assets are aggregated across industries and geographical regions, the value of conventional liquidity disaggregation in the financial statements decreases. He suggests that the returns and risks variance is greater along the industry and geographical regions, which heighten the need for accounting information disaggregated along theses dimensions. Under SFAS 131, disclosure of geographic segment earnings is no longer required. Thomas [2000] asserts that geographic earnings provide value-relevant information and that SFAS 131 needs to be amended in such a way that it requires firms to disclose geographic earnings. Hope et al. [2005] find firms that stopped providing geographic earnings data experience a decline in abnormal trading volume and interprets non-disclosure of geographic earnings as dampening investors' ability to utilize or generate private information in conjunction with the disclosure of public information. So by not mandating geographic disclosure, SFAS 131 might lead to the loss of a potentially valuable source of information. This means that geographic segment information complements, not substitutes for, current business segment information. If firms had an incentive to withhold proprietary information before SFAS 131, they try to minimize the proprietary cost under the new rule by reducing or stopping disclosure of geographic earnings information. Hope et al. [2005] confirm this argument. They report a substantial decline in the geographic segment disclosure after the implementation of SFAS 131.

To see how firms reacted to SFAS 131 by changing their geographic disclosure, I compare firms that stopped geographic disclosure after the adoption of SFAS 131 to those that increased the number of business segments. Specifically, I compare the number of geographic segments between the pre-131 and post-131 periods for both increasing and non-increasing segment firms. Since a significant portion of single-segment firms do not have any geographic segments, the size of the sample firms is reduced to 1,166 firms with 754 non-increasing segment firms and 412 increasing segment firms.

Panel A of Table 2-8 confirms the prior literature showing that a significant number of firms decreased the number of geographic segments, which indicates that most firms aggregated geographic segments after the adoption of SFAS 131. Among 1,166 firms, 716 firms reduced the number of geographic segments under SFAS 131 and only 17% of sample firms increased the number of geographic segments. Considering that the geographic disclosure provides incremental value relevant information, the results suggest that SFAS 131 has some adverse effect on the stock market information environments by inducing firms to reduce useful information that was available under SFAS 14.

Panel B provides contingency tables classifying firms based on: (1) firms that increased business segments after SFAS 131; and (2) firms that stopped geographic segment disclosure after SFAS 131. It shows that 684 firms stopped providing geographic earnings information after SFAS 131. It also shows that firms that aggregated segments in the pre-131 period and that are forced to disclose the business segments under the new rule, stopped disclosing geographic segment information more than firms that are not affected by SFAS 131. This suggests that firms that had incentive to hide some business segments information try to minimize proprietary costs by reducing or stopping

geographic segment disclosure. This may be one possible reason for the lack of significant change in the market's anticipating firm-specific earnings, since geographic earnings information is more related to firm-specific earnings.

2.6 Conclusion

SFAS 131 was established by the standard-setters' belief that disaggregated information provides incremental information beyond firm-wide measures. Forcing firms to provide more segment information that is consistent with firms' internal decision making, the new segment standard seems to achieve its goal. Investors, under the new rule, are better able to understand the firms' decision-making on the investment projects and related risks because of the expanded reporting requirements. Segment information that is more consistent with other information disclosed in firms' financial statements provides a richer information environment to stock market participants. At the same time, the new standard appears to have some undesirable characteristics. Under the new rule, geographic earnings disclosure is not required and it is now left to the discretion of management. Another negative aspect of SFAS 131 is that it does not require GAAP-based segment information. With these positive and negative sides of the new standard, it is not clear how they affect the information environment of the stock market.

This study provides explanations as to whether SFAS 131 improved overall information environments. At the same time, by focusing on the components of annual earnings, this paper also provides explanations for how the improvement in the overall information environments is achieved. The results of this paper find that the market's enhanced ability to predict future earnings is mostly driven by improved ability to predict industry-wide, cross-industry performances of each firm. This paper also finds that the

stock market participants' ability to anticipate future firm-specific, within-industry performances is not changed by the new rule.

I provide one possible reason for my findings by investigating firms' geographic disclosure. I find firms that increased the number of reported business segments try to minimize the increased proprietary costs by reducing the number of geographic segments or by stopping geographic disclosure. These results suggest that requiring firms to provide geographic earnings will enhance the stock market's ability to forecast future earnings even better, and eventually attain the goals of SFAS 131.

Chpater 3[25]

Consistent Earnings Growth and the Credibility of Management Forecasts

3.1 Introduction

This chapter examines the relation between steady earnings per share (EPS) growth and the credibility of voluntary management earnings forecasts. Specifically, using strings of increasing EPS as our measure of management's past performance, we demonstrate that earnings forecasts issued by firms with a recent string of increasing EPS are more credible than forecasts issued by firms without a recent string of increasing EPS. Prior studies suggest that the information content of management forecasts is a function of their perceived accuracy (Jennings [1987] and King, Pownall, and Waymire [1990]). We argue that managers of firms with long strings of increasing EPS are able to generate more accurate forecasts of future profitability relative to managers of firms that have not experienced long strings of increasing EPS. As a result market participants' reactions to management earnings forecasts are more pronounced when preceded by a string of EPS increases.

The empirical observation that many managers focus on creating a string of increasing earnings changes (e.g., Burghstahler and Dichev [1997]) has created a growing interest in the rewards to firms that exhibit this pattern. For example, Barth, Elliot, and Finn [1999] find that firms which exhibit a pattern of increasing EPS are priced higher than those firms that do not exhibit such a pattern, even after controlling for growth opportunities and risk. We document an additional benefit that is associated with such a pattern of earnings – voluntary disclosures made by management appear more credible. The

[25] This chapter is joint work with Professor Adam Koch. We appreciate First Call for providing the data used in this study.

expectations adjustment hypothesis, as discussed by Ajinkya and Gift [1984] and King, Pownall, and Waymire [1990], suggests that aligning market participants' expectations with management's private information is important to managers, but that providing detailed, quantitative voluntary disclosures is costly due to litigation concerns and proprietary costs. Firms therefore voluntarily release as little information as possible in order to generate the revision in expectations that they need. One implication of the expectations adjustment hypothesis is that firms that face credibility problems may need to supplement management earnings forecasts with the release of more detailed, potentially costly, information (Han and Wild [1991]). If voluntary disclosures made by firms that exhibit long strings of increasing EPS are more credible, these firms may find it less costly to align market participants' expectations with management's private information.

In discussing management communication strategies, Palepu, Healy, and Bernard [2000, p. 17-6] note:

> When is management likely to face credibility problems with investors? There is very little evidence on this question. However, we expect that managers of new firms, firms with volatile earnings, firms in financial distress, and firms with poor track records in communicating with investors will find it difficult to be seen as credible reporters.

Our study examines one facet of credibility – the role of volatile earnings. We argue that firms which post a long string of consecutive EPS increases are viewed by market participants are being more credible reporters – first because they may have superior forecasting ability and second because they have more to lose (in terms of reputation) from issuing a forecast that turns out to be, ex post, inaccurate.

To test this research question, we empirically examine the relation between firm's prior performance and the credibility of management earnings forecasts using a sample of 4,115 quantitative management earnings forecasts collected by First Call Corporation. Prior

research on voluntary disclosure has used two proxies for the credibility of the management earnings forecasts: market returns (e.g., Pownall and Waymire [1989] and Pownall, Wasley, and Waymire [1993]) and analyst forecast revisions (e.g., Jennings [1987], Williams [1996], and Koch [2003]). We use both proxies as measures of credibility. Supplemental analyses control for financial distress and firm size, examine the ex post accuracy of management earnings forecasts relative to subsequently realized earnings, and examine the effect of management earnings forecasts on the dispersion in analyst forecasts.

Our results are consistent with the primary hypothesis that management earnings forecasts are more credible for firms with long patterns of consecutively increasing EPS. Capital market participants react more (in terms of both stock market reaction and analyst forecast revisions) to management forecasts made by firms with long strings of increasing EPS, in essence screening the management forecasts based on the length of the past string of EPS increases. Additional evidence suggests that this effect varies with firm size in that the positive relation between past EPS growth and credibility is more pronounced for small firms. Supplemental analysis suggests that forecasts made by firms with long strings of prior EPS increases are also more accurate, where accuracy is measured by a comparison to ex post realized earnings. Finally, forecasts from firms that have experienced consistent EPS growth are also more effective in reducing the dispersion in financial analysts' expectations of future earnings.

This study makes two important contributions to the empirical accounting literature. First, to date, there is little existing empirical research identifying factors associated with management credibility. This study examines one such factor. While theoretical work has typically suggested a link between management's overall ability and the specific ability to forecast accurately (e.g., Trueman [1986]), this link has not been previously demonstrated

empirically. By assuming management's prior performance is associated with the ability to accurately forecast future performance, this paper finds an association between credibility of management earnings forecasts and management ability.[26] Second, this study extends Barth, Elliot, and Finn [1999] by identifying an additional market reward associated with firms that show a pattern of increasing EPS. Our results suggest that firms which can continuously post increasing EPS may face fewer costs in aligning market expectations with management's private information.

The next section develops our empirical predictions. Section III discusses our research design and sample selection criteria. Results are presented in section IV and section V concludes.

3.2 Development of Empirical Predictions

Jennings [1987] argues that investors' belief revision and subsequent reaction to management earnings forecasts depends on (1) the surprise or unexpected component and (2) the believability of the management forecast. The believability of a forecast is in turn a function of management's ability to forecast accurately and management's incentives to issue forecasts that are free from intentional bias. While theoretical work has typically suggested a link between management's overall ability and management's ability to generate an accurate forecast of future performance (e.g., Trueman [1986]), most prior empirical work on voluntary management earnings forecasts has focused on the extent to which such forecasts are free of intentional bias (e.g., McNichols [1989], Frankel,

[26] The assumption that firms which have posted a long string of EPS increases do make more accurate forecasts is directly tested in section IV.C.

McNichols, and Wilson [1995], and Koch [2003]) rather than focusing on the effects of management's ability.[27] In this study we focus on the relation between the credibility of management earnings forecasts for firms with long strings of increasing EPS because we argue that managers of firms that have consistently performed well may have superior ability in predicting future earnings. This is consistent with intuition given by Demski [1998] in which managers exerting high levels of effort are better in both running the firm and in forecasting future earnings. By smoothing earnings, managers in Demski's [1998] model both demonstrate their ability to predict future performance and reveal their high effort. The ability to forecast future earnings is obtained through hard work, and therefore only hard working managers can smooth earnings. Recent empirical work by Xue [2003] also suggests that there is a link between management's earnings smoothing behavior and management's private information about future firm performance.

Prior research on bias in forecasting suggests that managers issuing voluntary disclosures take into account both the potential benefits and the potential costs associated with issuing an intentionally biased forecast. Potential benefits come from employment concerns and equity-contingent wealth. Potential costs arise from loss of reputation and legal concerns. On average these costs are sufficient to deter biased forecasting (McNichols [1989]), although particular firms may choose to intentionally bias upwards or downwards based on individual circumstances. Penalties from issuing inaccurate forecasts provide an

[27] One possible exception is Williams [1996]. Williams [1996] documents that analyst forecast revisions in response to management's earnings forecasts are increasing in the ex post accuracy of prior management forecasts. While Williams [1996] finds that some managers develop a reputation for inaccurate reporting, she does not examine whether such reputations for inaccuracy are the result of poor forecasting ability, the result of operating in an environment in which it is particularly difficult to forecast, or the result of intentional bias on the part of management.

additional motivation for predicting a link between past EPS growth and the credibility of management earnings forecasts. Anecdotal evidence suggests that firms which experience long strings of EPS growth attract attention in the business press and a wider analyst following. Firms that have experienced a long string of EPS growth have developed a good reputation among capital market participants, and so may be particularly concerned about the loss of reputation that would accompany the revelation that a previously released forecast was inaccurate or biased.

Recent empirical research (e.g., Williams [1996] and Koch [2003]) has used analyst forecast revisions as a proxy for the credibility of management earnings forecasts. The motivation for this proxy comes from Jennings [1987], who argues that analyst forecasts reflect the beliefs of the investing community and analyst forecast revisions around management earnings forecasts therefore contain information about the extent to which that forecast is viewed as credible. The disadvantage of using analyst forecast revisions in empirical research is that sell-side analysts are known to suffer from a number of biases related to their individual processing abilities and the incentive structure in which they operate.[28] One particular concern for our study is that analyst compensation is tied to forecast accuracy. If firms are able to exert discretion over reported earnings, analysts may take this flexibility into account in generating their prediction of future earnings. The results of Kasznik [1999] suggest that firms which issue overly optimistic management forecasts may later manipulate earnings upward in order to meet that forecast. If analysts anticipate this behavior, then a management earnings forecast issued by a firm that can easily manipulate accruals could be "credible" in the sense that it generates a large revision in analyst forecasts even though that analyst reaction is driven by the anticipation of

[28] For a summary of these biases see Francis [1997].

earnings management rather than by any substantive revision in expected future performance.

The possibility that mangers can manipulate accruals to hit their own forecasts and that analysts could simply revise their own forecasts in anticipation of such manipulation is particularly important to our study because of our focus on firms that have a history of smooth earnings. We argue that a smooth series of prior EPS increases proxies for superior forecasting ability. If it instead proxies for the ability and or willingness to manipulate accruals then this would affect the interpretations of our results. Due to these concerns, we use share price reactions as an additional proxy for credibility. This proxy has been used in the prior literature as well; for example, Pownall and Waymire [1989] compare abnormal returns associated with management earnings forecasts to the abnormal returns associated with earnings announcements under the assumption that disclosures of lower credibility have less information content in establishing security prices in an efficient market. Assuming that stock price equals the discounted value of expected future dividends, stock market reactions in response to a management earnings forecast are driven by revisions in expected future dividends. Therefore, in contrast to analyst forecasts, it seems unlikely that share prices would move in the direction of anticipated earnings manipulation. If the news component of a management earnings forecast is driven by the anticipation of earnings manipulation rather than any substantive revision in expected future performance then we would expect to find analysts revising their expectations without observing corresponding stock price reactions.

The use of both analyst forecast revisions and stock price reactions to assess the credibility of management earnings forecasts leads to the following two predictions:

H3-1: Analyst forecast revisions in response to management earnings forecasts are more pronounced for firms that exhibit a string of past EPS increases than for firms that do not exhibit a string of past EPS increases.

H3-2: Stock price reactions in response to management earnings forecasts are more pronounced for firms that exhibit a string of past EPS increases than for firms that do not exhibit a string of past EPS increases.

3.3 Sample Selection Criteria and Design of Empirical Tests

Our sample includes firms with voluntary management forecasts of annual EPS in the First Call Historical Database for the years 1994 to 2002. We restrict our attention to forecasts that are either point estimates or range estimates.[29] As in the majority of studies on quantitative management earnings forecasts, we convert a range forecast into a point estimate by taking the mid point of the range. Forecasts issued on or after the fiscal year-end were eliminated to focus on management forecasts rather than preannouncements of actual earnings.[30] To control for possible sources of management bias, forecasts issued during mergers, bankruptcies, and stock offerings are not included. To mitigate the small denominator problem associated with using price as a deflator, we also exclude firms with pre-release share prices under $2.00. Utilities, transportation firms, and financial services firms are also eliminated. We also require CRSP and COMPUSTAT data on EPS, daily returns, and the variables necessary to calculate Altman's [1968] Z-score. These sample selection procedures result in a final sample of 4,115 management earnings forecasts.

Table 3-1, panel A shows the number of management earnings forecasts issued per year over our sample period. There are fewer observations in the earlier years

[29] We exclude minimum forecasts ("EPS will be at least…") and maximum forecasts ("EPS will be less than…"). We also exclude qualitative forecasts that do not explicitly state a per share amount (such as "EPS will be consistent with expectations").

[30] Such preannouncements differ from management earnings forecasts in that while management is still giving a prediction (that may in fact differ from actual realized earnings), preannouncements are made after the end of the fiscal year and so do not require the forecasting of actual economic activity.

because First Call was just beginning to compile their historical database. Table 3-2, panel B shows the number of times each firm enters the sample through forecasting for multiple periods.

When calculating analyst forecast consensus, revisions in analyst forecasts, and the news in management earnings forecasts we use analysts forecasts of annual EPS related to the same fiscal year for which management is issuing a forecast. In this paper, consensus analyst forecasts prior to management earnings forecasts for a given firm are calculated as the median analyst forecast for all analyst reporting a forecast for that firm in the 90 days prior to the management earnings forecast. Consensus analyst forecasts subsequent to management's earnings forecast are calculated as the median analyst forecast as of 30 days after the management earnings forecast for only those analysts included in the group composing the prior consensus forecast.[31] Analyst forecast revision (AFR_{it}) is defined as the change between the consensus forecast prior to the management earnings forecast and the consensus forecast following the management earnings forecast and is calculated as follows:

$$AFR_{it} = \frac{SFAF_{it} - PFAF_{it}}{P_i}$$

where:

$SFAF_{it}$ = consensus analyst forecast subsequent to management's earnings forecast,

$PFAF_{it}$ = consensus analyst forecast prior to management's earnings forecast, and

[31] All results from using the mean analyst forecast are qualitatively similar to results from using the median forecast.

P_{it} = share price of the firm on the first day of the fiscal year in which the management earnings forecast is made.[32]

Cumulative abnormal returns (CAR_{it}) measure the unexpected return over a three-day window (-1, 0, +1) surrounding the management earnings forecast and is defined as follows:

$$CAR_{it} = \sum_{t=-1}^{1} U_{it}$$

where:

U_{it} = $R_{it} - R_{mt}$,

R_{it} = the holding period return for firm i on day t, and

R_{mt} = the return on the CRSP Value-Weighted Market Index on day t.

Forecast deviation (FD_{it}) measures the surprise component of the management earnings forecast and is calculated as the difference between the management forecast and the prior consensus analyst forecast (deflated by the share price of the firm on the first day of the fiscal year in which the management earning forecast is made):

$$FD_{it} = \frac{MEF_{it} - PFAF_{it}}{P_i}$$

where:

MEF_{it} = management's EPS forecast for firm i,

$PFAF_{it}$ = consensus analyst forecast prior to management's earnings forecast, and

P_{it} = share price of the firm on the first day of the fiscal year in which the management earnings forecast is made.

Forecast deviations (FD_{it}) greater than zero represent "good news" (management is forecasting earnings greater than the current consensus analyst forecast), while forecast

[32] Forecast revisions and forecast deviations are deflated by a preannouncement price in order to control for size effects in cross-sectional comparisons.

deviations less than zero represent "bad news" (management is forecasting earnings lower than the current consensus earnings forecast).

We calculate the length of the string of earnings increases ($STRN_{it}$) as the number of consecutive increases in annual EPS (before extraordinary items) that precede the management earnings forecast.[33] As a link to prior research (in particular Barth, Elliot, and Finn [1999]) we also divide firms into two groups – those with long strings of prior EPS increases versus those without. We use five years as the cut-off point to identify firms with long strings (the same cut-off as Barth, Elliot, and Finn [1999]). $STRN\_D_{it}$ is the qualitative variable taking the value of one if the number of years of increasing EPS prior to the management forecast is five or more and taking the value of zero otherwise. Tests of hypotheses 1 and 2 are conducted using both $STRN_{it}$ and $STRN\_D_{it}$.

Prior research (including Frost [1997] and Koch [2003]) predicts that voluntary disclosures made by firms in financial distress are less credible than disclosures made by non-distressed firms. Of particular importance to this study is Koch's [2003] finding that analyst revisions in response to the news in management earnings forecasts are decreasing in the estimated probability of bankruptcy. Because financially distressed firms seem less likely to have a recent history of EPS increases, it is important for us to control for this result in testing the relation between credibility and past EPS growth. We control for the effect of financial distress by calculating Altman's [1968] Z-Score (Z_SCORE_{it}) for each observation in our sample. Z_SCORE_{it} is an indicator of financial stability and prior research has documented that Z_SCORE_{it} is negatively related to incidence of future bankruptcy over short horizons.

[33] We use COMPUSTAT, rather than First Call, as the source for EPS data in calculating the string of past EPS increases because First Call EPS estimates are incomplete prior to 1994.

To test H3-1 and H3-2, we use multiple regression models modified from Williams [1996]. Following Jennings' [1987] arguments that investors' belief revision and reaction to management earnings forecasts depend on the unexpected component as well as the believability of the management forecast, we construct a model in which both security price movements and analyst forecast revisions are functions of the surprise component and the string of past EPS increases. The length of prior EPS growth is not an independent factor but rather it is interacted with the surprise component. That is, market participants are not reacting to the prior EPS growth alone, but instead are conditioning their reaction to the news in management's forecast on the prior EPS growth. The following pooled cross-sectional regression equations are used to test H3-1 and H3-2:

Model [1]: $AFR_{it} = \beta_0 + \beta_1 FD_{it} + \beta_2 FD_{it} \times STRN_{it} + \varepsilon_{it}$

Model [2]: $CAR_{it} = \beta_0 + \beta_1 FD_{it} + \beta_2 FD_{it} \times STRN_{it} + \varepsilon_{it}$

Model [3] $AFR_{it} = \beta_0 + \beta_1 FD_{it} + \beta_2 FD_{it} \times STRN\_D_{it} + \varepsilon_{it}$

Model [4] $CAR_{it} = \beta_0 + \beta_1 FD_{it} + \beta_2 FD_{it} \times STRN\_D_{it} + \varepsilon_{it}$

Model [5] $AFR_{it} = \beta_0 + \beta_1 FD_{it} + \beta_2 FD_{it} \times STRN_{it} + \beta_3 FD_{it} \times Z\_SCORE_{it} + \varepsilon_{it}$

Model [6] $CAR_{it} = \beta_0 + \beta_1 FD_{it} + \beta_2 FD_{it} \times STRN_{it} + \beta_3 FD_{it} \times Z\_SCORE_{it} + \varepsilon_{it}$

Model [7] $AFR_{it} = \beta_0 + \beta_1 FD_{it} + \beta_2 FD_{it} \times STRN\_D_{it} + \beta_3 FD_{it} \times Z\_SCORE_{it} + \varepsilon_{it}$

Model [8] $CAR_{it} = \beta_0 + \beta_1 FD_{it} + \beta_2 FD_{it} \times STRN\_D_{it} + \beta_3 FD_{it} \times Z\_SCORE_{it} + \varepsilon_{it}$

where:

AFR_{it} = consensus analyst forecast subsequent to management's earnings forecast less consensus analyst forecast prior to management's earnings forecast, deflated by prior period price,

CAR_{it} = cumulative abnormal returns for the three-day period beginning a day before the management forecast and ending a day after the management forecast,

FD_{it} = management forecast less the prior consensus analyst forecast, deflated by beginning of year price,

$STRN_{it}$ = number of years of increasing EPS before the management forecast,

$STRN\_D_{it}$ = qualitative variable taking the value of one if years of increasing EPS before the management forecast is five or more and taking zero otherwise, and

Z_SCORE_{it} = Altman's Z-Score, a measure of financial stability. Z_SCORE_{it} is increasing in financial stability (decreasing in the likelihood of financial distress).

In models [1], [3], [5], and [7] the coefficient β_1 captures extent to which a unit of earnings news generates a revision in the analysts' consensus forecast. In models [2], [4], [6], and [8] the coefficient β_1 captures extent to which a unit of earnings news generates a price reaction. A great deal of prior research (beginning with Patel [1976] and Penman [1980]) suggests that management earnings forecasts are, on average, credible and should generate both price reactions and analyst forecast revisions. Therefore, we predict that β_1 should be positive in all regression equations. The coefficient β_2 reflects the incremental analyst revision and price reaction in response to earnings news that is associated with firms that have a history of prior EPS increases. The coefficient on β_2 in models [1] and [5] (or models [2] and [6]) would suggest that analysts responses (or price responses) to the news in a management earnings forecast become more pronounced with the number of preceding consecutive years of EPS increases A positive coefficient on β_2 in models [3] and [7] (or models [4] and [8]) would suggest that analyst responses (or price responses) to the news in a management earnings forecast become more pronounced when the firm has experience a long (greater than or equal to five years) string of prior EPS increases. Prior research on financial distress and the credibility of management earnings forecasts predicts that β_3 should be positive in models [5] through [8]. That is, the credibility of management earnings forecasts is increasing in Altman's Z-Score, a measure of financial stability.

3.4 Results

3.4.1. Regression Results

Table 3-2 presents regression results from estimating equations [1] through [8]. Consistent with the findings of prior research, β_1 is positive and significant in all eight specifications, suggesting that the news in management earnings forecasts is, on average, credible in the sense that it generates both analyst forecast revisions and abnormal price movements in the same direction as the news. Models [5] through [8] include the news in management earnings forecast interacted with Altman's Z-Score to control for credibility differences for firms in financial distress. The coefficient on Z_SCORE_{it} is positive and significant in models [6] and [8], but is not significantly positive in models [5] and [7]. Therefore, we find only mixed support for the link between credibility and financial distress that has been documented in prior research.[34]

Models [1] and [5] examine the effect of the string of prior EPS increases on analyst forecast revisions in response to management earnings forecasts. The coefficient β_2 captures the incremental revision in analyst forecast associated with each year of consecutive prior EPS increases. β_2 is significant in both model [1] and [5] ($\beta_2 = 0.0325$ and 0.0326 respectively) suggesting that the analyst reaction to the news in management earnings forecasts is increasing in the number of consecutive prior EPS increases, consistent with hypothesis 1.

Models [2] and [6] examine the effect of the string of prior EPS increases on price responses to management earnings forecasts. In these specifications the coefficient β_2 captures the incremental revision in share prices associated with each year of consecutive

[34] There are at least two possible explanations for these mixed results. First, prior research by Begley, Ming, and Watts [1997] suggests that the usefulness of Altman's Z-score may be declining in recent years. In addition, Koch [2003] finds that the relation between financial distress and credibility varies with the sign of the forecast deviation (good versus bad news).

prior EPS increases. β_2 is again positive and significant in both model [2] and [6] (β_2 = 0.3087 and 0.3004 respectively) suggesting that price responses to the news in management earnings forecasts is increasing in the number of consecutive prior EPS increases, consistent with hypothesis 2.

Models [3] and [7] examine the effect of a long series of EPS increases on analyst forecast revisions in response to management earnings forecasts. The coefficient β_2 captures the incremental revision in analyst forecasts associated with the qualitative variable $STRN\_D_{it}$. β_2 is positive and significant in both model [3] and [7] (β_2 = 0.2167 and 0.2166 respectively) suggesting that the analyst reaction to the news in management earnings forecasts is more pronounced when a management forecast is preceded by a long string of consecutive EPS increases, consistent with hypothesis 1. Models [4] and [8] examine the effect of a long series of EPS increases on price responses to management earnings forecasts. The coefficient β_2 captures the incremental revision in share prices associated with the qualitative variable $STRN\_D_{it}$. β_2 is again significant in both model [4] and [8] (β_2 = 2.7869 and 2.7709 respectively) suggesting that price responses to the news in management earnings forecasts is more pronounced when it is preceded by a long string of consecutive EPS increases, consistent with hypothesis 2.

In summary, results from regressions [1] through [8] are consistent with our hypothesis that market participants react more strongly to quantitative management earnings forecasts when such forecasts are preceded by a series of EPS increases. This result holds both when using the number of preceding EPS increases as an explanatory variable and when using an indicator variable to denote firms with long strings of increasing EPS. This result also holds after controlling for financial distress.

3.4.2 Effect of Firm Size

Atiase [1985] and Freeman [1987] propose that market participants' reactions to earnings news vary systematically with firm size because a large firm attracts more attention from investors and analysts than a small firm. These differences in the information environment lead to cross-sectional variation in the timeliness and information content of earnings. In the preceding section we document that market responses to voluntary management earnings forecasts are conditioned on the length of consecutive EPS growth. Our results are consistent with our prediction that consistent prior EPS growth is interpreted as a signal about the credibility of voluntary disclosures. In this section we examine how the importance of this signal varies with firm size. Our prediction is that the effect of strings of EPS growth on market participants' reactions to management earnings forecasts is not as pronounced for large firms. Large firms are more closely followed by analysts and the business press and as a result market participants have more sources of information to draw on in assessing the abilities of management for large firms. Therefore the importance of this particular signal about management's forecasting ability may be reduced accordingly. We measures firm size as market capitalization (shares multiplied by price per share) of the firm on the first day of the fiscal year in which the management earnings forecast is made.

Table 3-3, panel A presents regression results by quartile of firm size (where the 1st quartile includes the smallest firms) using the length of the string of EPS growth as an explanatory variable. A visual inspection of the estimation results from model [5] and [6] does not suggest a clear pattern. As before, hypotheses 1 and 2 predict a positive coefficient on the interaction between the news in the management earnings forecast and the string of prior EPS growth (β_2). While the coefficient β_2 is positive for quartiles one through three, it

is not always statistically significant. β_2 is not statistically different from zero for either price reactions or analyst forecast in quartile four (the group of largest firms). Table 3-3, panel B presents regression results by firm size after dividing firms into two groups ("large" and "small") using the median market capitalization as the cut-off. In the case of small firms, β_2 is positive and significant in both model [5] and [6], suggesting that the length of consecutive prior EPS increases is positively associated with the credibility of management earnings forecasts. In the case of large firms, β_2 is positive and significant in only model [6] (which examines price reactions) and even there the coefficient is significantly smaller than the corresponding coefficient using small firms ($\beta_2 = 0.2164$ for large firms versus $\beta_2 = 0.3799$ for small firms).

Table 3-4, panel A presents regression results by quartile of firm size using the qualitative variable $STRN\_D_{it}$ to identify firms with long stings of EPS increases. Again, a visual inspection of the estimation results from model [7] and [8] does not suggest a clear pattern. While the coefficient β_2 is positive for quartiles one through three, it is not always statistically significant. β_2 is not statistically different from zero for either price reactions or analyst forecast revisions in quartile four (the largest firms). Table 3-4, panel B presents regression results by firm size after dividing firms into large and small groups using the median. In the case of small firms, β_2 is positive and significant in both model [7] and [8], suggesting that a long series of consecutive prior EPS increases is positively associated with credibility. In the case of large firms, β_2 is positive but not significant in either model [7] or [8].

In summary, the importance of prior EPS growth in determining the credibility of management earnings forecasts appears to decline with firm size. When models [5] through [8] are estimated by quartile of firm size, the coefficients on the interaction between the

news in the management earnings forecast and the proxy for the string of prior EPS growth (β_2) are never significant for the largest quartile of firms. In addition, regression results when the sample is split into large and small firms using the median suggest that the coefficient β_2 for the sample of large firms is either insignificant (in models [5], [7], and [8]) or smaller than the corresponding coefficient for small firms (in model [6]). Overall, these results are consistent with the prediction that as investors have access to more information, they do not need to rely on past EPS growth as an indicator of management's forecasting ability.

3.4.3 Forecast Accuracy and Forecast Dispersion

Our empirical prediction that the credibility of management earnings forecasts is increasing in the string of past EPS growth is predicated on the assumption that forecasts made by such firms are more accurate predictors of actual subsequent performance. In order to provide direct evidence on this issue we also examine how forecast accuracy varies systematically with the length of the prior string of EPS growth. We calculate management forecast errors (MFE_{it}) as:

$$MFE_{it} = \frac{EPS_{it} - MF_{it}}{P_i}$$

where:

EPS_{it}	=	actual realized EPS for firm *i*,
MF_{it}	=	management's EPS forecast for firm *i*, and
P_i	=	share price of the firm on the first day of the fiscal year in which the management earnings forecast is made.

Under this definition, a forecast error is less than zero when management's forecast is optimistic (higher than subsequently realized earnings), while a forecast error is greater

than zero when management's forecast is pessimistic (lower than subsequently realized earnings). For this comparison of ex post accuracy we use the actual realized EPS as reported by First Call rather than COMPUSTAT because First Call's editors have made an effort to ensure that the treatment of special or non-recurring items is consistent across the management earnings forecast and the subsequent realized earnings.

Table 3-5, panel A presents evidence on the ex post accuracy of management earnings forecasts conditioned on the length of the preceding string of EPS increases. A visual inspection of table 3-4, panel A suggest that the mean absolute error tends to decrease with the length of the preceding string of consecutive EPS increases, although this relationship is not monotonic. We formally test for such a relation in Table 3-5, panel B. Here we examine the ex post accuracy of management earnings forecasts for firms with long strings of EPS increases versus those without. The mean absolute forecast error for firms without a prior string of EPS increases is 0.0189, while the mean absolute forecast error for firms with a prior string of EPS increases is 0.0148. This difference between the mean absolute errors is significant at the 0.05 level. Overall, these results are consistent with our assumption that the accuracy of management earnings forecasts is increasing in the length of consecutive prior EPS increases. However, these results are also consistent with the competing hypothesis that firms which have posted long strings of EPS increases are the ones that have the greatest discretion over reported earnings and are therefore the ones best able to manage earnings in order to hit their own management earnings forecast. Our results on forecast accuracy must therefore be interpreted with caution.[35]

[35] As discussed in section II, the results regarding market reactions to management earnings forecasts do not suffer from this same caveat because it seem unlikely that prices would move in the direction of, and in response to, anticipated earnings management.

As a final test of the role of increasing EPS strings in explaining the credibility of voluntary disclosures we examine the changes in analyst forecast dispersion around management earnings forecasts. If the credibility of management earnings forecasts is greater for firms with long strings of EPS growth then we expect forecasts from such firms will be more effective in reducing uncertainty about expected future earnings among capital market participants. Pre-announcement and post-announcement dispersion is calculated as the standard deviation of outstanding analyst forecasts as of the dates we measure the corresponding consensus analyst forecast. We calculate the change in dispersion as the post-announcement dispersion in analyst forecasts minus the pre-announcement dispersion in analyst forecasts. A negative change in dispersion therefore represents a reduction in the dispersion of expectations about future earnings among capital market participants.

In calculating dispersion we require that the preannouncement consensus forecast consists of forecasts from at least three financial analysts. Imposing this additional sample selection criterion reduces our sample to 2,613 observations. Table 3-6, panel A presents evidence on the relation between strings of EPS growth and reductions in forecast dispersion for this restricted sample. The mean change in dispersion is negative (-0.0025) which is consistent with the idea that management earnings forecasts, on average, reduce uncertainty about expected future earnings. A visual inspection of Table 3-6, panel A does not suggest any clear systematic relation between reduction in dispersion and the length of the string of increasing EPS. We formally test for such a relation in Table 3-6, panel B. Here we compare the average reduction in dispersion for firms with long strings of prior EPS growth to reductions in dispersion for firms without long strings of prior EPS growth. The reduction is dispersion is more negative for firms

with long strings of prior EPS growth and this difference is significant at the 0.05 level. This empirical result is consistent with our prediction that the credibility of management earnings forecasts is higher for firms that have a long string of consecutive EPS increases. Forecasts made by such firms are more effective in reducing the dispersion in expectations about future earnings.

3.5 Conclusions

This paper examines the relation between credibility of management forecasts and prior firm performance. Specifically consecutive years of increasing EPS are chosen to proxy for managements' ability and incentive to forecast accurately. Using a sample of 4,115 management forecasts of annual earnings, we find that management earnings forecasts from firms with relatively long strings of increasing EPS are more credible than those from firms with relatively short strings. These results are consistent with the primary hypothesis that voluntary management earnings forecasts are more believable when they are made by firms with long patterns of increasing EPS. Supplemental analysis suggests that this result is driven primarily by firms below the sample median of firm size . Additional analysis suggests that management earnings forecasts from firms with long strings of consecutive EPS increases are also more accurate relative to ex post realized earnings and are more effective in reducing the dispersion in analysts' expectations of future earnings.

Chapter 4
Conclusions and Future Work

This study investigates market reaction to mandatory and voluntary disclosure. In Chapter 2, I examine the economic impact of the recent segment disclosure requirement. I provide explanations as to whether SFAS 131 improved overall information environments. At the same time, by focusing on the components of annual earnings, this paper also provides explanations for how the improvement in the overall information environments is achieved. The results show that the market's enhanced ability to predict future earnings is mostly driven by the improved ability to predict the industry-wide, cross-industry performances of each firm; at the same time, stock market participants' ability to anticipate future firm-specific, within-industry performance is not changed by the new rule.

I provide one possible explanation for my findings by investigating firms' geographic disclosure. I find that firms which increased the number of reported business segments try to minimize the increased proprietary costs by reducing the number of geographic segments or by stopping geographic disclosure. These results suggest that requiring firms to provide geographic earnings will enhance the stock market's ability to forecast future earnings, eventually attaining the goals of SFAS 131.

Chapter 3 investigates the stock price reaction and analyst forecasts revision to voluntary management forecasts from firms with various lengths of increasing earnings per share. Based on the notion that the credibility of management forecasts is composed of management's ability to predict future performance and situational incentive to bias forecasts, the study conjectures that the managers of firms with long strings of increasing EPS are able to generate more accurate forecasts of future profitability relative to managers

of firms that have not experienced long strings of increasing EPS. As a result, market participants' reactions to management earnings forecasts are more pronounced when preceded by a string of EPS increases.

The empirical results are consistent with the primary hypothesis that management earnings forecasts are more credible for firms with long patterns of consecutively increasing EPS. Capital market participants react more (in terms of both stock market reaction and analyst forecast revisions) to management forecasts made by firms with long strings of increasing EPS, in essence screening the management forecasts based on the length of the past string of EPS increases. Additional evidence suggests that the positive relation between past EPS growth and credibility is more pronounced for small firms, and forecasts made by firms with long strings of prior EPS increases are also more accurate, where accuracy is measured by a comparison to ex post realized earnings. Finally, forecasts from firms that have experienced consistent EPS growth are also more effective in reducing the dispersion in financial analysts' expectations of future earnings.

One limitation on the study of SFAS No. 131 is that the stock price informativeness may be driven by segment data disclosed in the quarterly reports. As opposed to SFAS No. 14, SFAS No. 131 requires multi-segment firms to report certain line items in their quarterly reports. Hence, if the segment information disclosed in the quarterly reports provides more timely information about the firm's future earnings, the stock market's ability to predict future earnings may be driven by the timeliness of segment information, not by the informativeness of the segment data itself. Since the effect of SFAS No. 131 on the changes in the firms' disclosure choice in quarterly reports, the answer for this limitation is largely left to the future research.

There are also limitations of the study on the credibility of management forecasts. First, ex post forecast accuracy and forecast dispersion are affected by many other

variables such as size, litigation risk, and forecasts horizons. To avoid potential compounding effects of these variables, either paired-sample tests or regression analysis would provide more convincing evidence. Another potential limitation is that the stock market results in credibility driven by investor irrationality. In order to check this possibility, long window post-announcement returns could be examined. Presumably if there is an irrational reaction, it should reverse itself over longer horizons.

Finally, I would like to discuss some avenues for future research related to this study. Due to the small number of studies on SFAS No. 131, there are many unanswered questions related to SFAS No. 131. One interesting extension related to SFAS No. 131 would be to examine changes in the cost of the equity and debt capital of firms that increased segment disclosure. Typical methodological problems in the disclosure literature are endogeneity and correlated omitted-variable problems (Healy and Palepu [2001] and Lang [1999]). Specifically, findings of negative relation between a firm's cost of capital and the level of disclosure may be driven by other omitted variables, which affect both the cost of capital and the disclosure level. SFAS No. 131 provides an excellent research environment in which a firm's optimal choice of disclosure is not driven by other factors, such as firm performance, and thus correlated omitted-variable problems are significantly mitigated.

Also, it would be worthwhile to study the impact of SFAS No. 131 on corporate governance. Since segmentation under SFAS No. 131 should be the same as the firm's internal organization, investors now see the company through the eyes of management. This will greatly affect the manager's incentive to manage earnings, the manager's decision on intra-segment resource transfer, the firm's choice between outsourcing and purchasing, and corporate transactions such as M&A and spin-offs. Reduced reporting discretion and the asymmetry of segment information probably affect management's

choices listed above. Further, recent studies document that management forecasts are closely related to the effectiveness of corporate governance. Hence, it would also be interesting to examine changes in the frequency of management forecasts and the bias and market reaction to the forecasts for firms affected by SFAS 131.

Another very interesting study in this area might be done by applying empirical Bayesian methods. Analysts often predict the performance of each industry segment and issue enterprise-wide earnings or cash forecasts based on segment forecasts. Also, forecasts are made according to the geographic area for multi-national firms. Further, analysts often issue cash forecasts with earnings forecasts. This multivariate nature of analyst forecasts generates typical missing-data problems. For example, some firms only disclose industry segment information, while others disclose both industry segment and geographic segment information. In this case, undisclosed geographic information can be treated as missing data. Using Markov Chain Monte Carlo (MCMC) method, we can get an efficient maximum likelihood estimator in the situation when data have missing observations. It would also be interesting to compare this number with actual analyst forecasts to see how analysts make firm-level forecasts from the forecasts of each segment and geographic region.

Finally, it would be fruitful to combine the implications of the studies in Chapter 2 and Chapter 3 in such a way that we see the changes in the credibility of management forecasts after SFAS No. 131.

Biblography

American Institute of Certified Public Accountants (AICPA), Special Committee on Financial Reporting. *Improving Business Reporting – A Customer Focus*. Jersey City, NJ: AICPA, 1994.

AIMR. Financial Reporting in the 1990's and Beyond. A Position Paper of the Association for Investment Management and Research. (Authored by Knutson). The Wharton School. 1993.

Ajinkya, B., and M. Gift. 1984. Corporate managers' earnings forecasts and symmetrical adjustments of market expectations. *Journal of Accounting Research* 22: 425-444.

Altman, E. 1968. Financial ratios, discriminant analysis and the prediction of corporate bankruptcy. *Journal of Finance* 23: 589-609.

Atiase, R. K. 1985. Predisclosure information, firm capitalization, and security price behavior around earnings announcements. *Journal of Accounting Research* 23: 21-36.

Ayers, B. C., and R. N. Freeman. 1997. Market assessment of industry and firm earnings information. *Journal of Accounting and Economics* 24: 205-218.

Ayers B. C., and R. N. Freeman. 2000. Why do large firms' prices anticipate earnings earlier than small firms' prices? *Contemporary Accounting Research* 17: 191-212.

Ayers B. C., and R. N. Freeman. 2003. Evidence that analyst following and institutional ownership accelerate the pricing of future earnings. *Review of Accounting Studies* 8: 47-67.

Baginski, S., E. Conrad, and J. Hassell. 1993. The effects of management forecast precision on equity pricing and on the assessment of earnings uncertainty. *The Accounting Review* 68: 913-927.

Barron, O., O. Kim, S. Lim, and D. Stevens. 1998. Using analysts' forecasts to measure properties of analysts' information environment. *The Accounting Review* 74: 421-433.

Barth, E. M., J.A. Elliot, and M. Finn. 1999. Market rewards associated with patterns of increasing earnings. *Journal of Accounting Research* 37: 387-413.

Begley, J., J. Ming, and S. Watts. 1997. Bankruptcy classification errors in the 1980s: An empirical analysis of Altman's and Ohlson's Models. *Review of Accounting Studies* 1: 267-284.

Berger, P. G., and R. Hann. 2003. The impact of SFAS No. 131 on information and monitoring. *Journal of Accounting Research* 41: 163-224.

Bhojraj, S., B. Ajinkya, and P. Sengupta. 2005. The association between outside directors, institutional investors and the properties of management earnings forecasts. *Journal of Accounting Research* 43: 343-376.

Botosan, C. 1997. Disclosure level and the cost of equity capital. *The Accounting Review* 72: 323-349

Botosan, C., and M. Stanford. 2005. Managers' motives to withhold segment disclosures and the effect of SFAS No. 131 on analysts' information environment. *The Accounting Review* 80: 752-771.

Brown, S., K. Lo, and T. Lys. 1999. Use of R^2 in accounting research: measuring changes in value relevance over the last four decades. *Journal of Accounting and Economics* 28: 83-115

Burghstahler, D., and I. Dichev. 1997. Earnings management to avoid earnings decreases and losses. *Journal of Accounting and Economics* 24: 99-126.

Bushee, B., and C. Leuz. 2005. Economic consequences of SEC disclosure regulation. *Journal of Accounting and Economics* 39: 233-264.

Bushee, B., and C. Noe. 2000. Corporate disclosure practices, institutional investors, and stock return volatility. *Journal of Accounting Research* 38: 171-202.

Collins, D. 1976. Predicting earnings with sub-entity data. *Journal of Accounting Research* 14: 163-177.

Collins, D., and S. Kothari. 1989. An analysis of the cross-sectional and intertemporal determinants of earnings response coefficients. *Journal of Accounting and Economics* 11: 143-181.

Collins, D., S., Kothari, J. Shanken, and R. Sloan. 1994. Lack of timeliness versus noise as explanations for low contemporaneous return-earnings association. *Journal of Accounting and Economics* 18: 289-324.

Collins, D., R., and Simonds. 1979. SEC line-of-business disclosure and market risk adjustments. *Journal of Accounting Research* 17: 352-383.

Demski, J. 1998. Performance measure manipulation. *Contemporary Accounting Research* 15: 261-285.

Durnev, A., R. Morck, B. Yeung, and P. Zarowin. 2003. Does greater firm-specific return variation mean more or less informed stock pricing? *Journal of Accounting Research* 41: 797-836.

Ettredge, M., S. Kwon, and D. Smith. 2002. Security market effects associated with SFAS No. 131: Reported business segments. *Review of Quantitative Finance and Accounting* 18: 323-344.

Ettredge, M., S. Kwon, D. Smith, and P. Zarowin. 2005. The impact of SFAS No. 131 business segment data on the market's ability to anticipate future earnings. *The Accounting Review* 80: 773-804.

Financial Accounting Standards Board (FASB). 1975. *Financial Reporting for Segments of a Business Enterprise*. Statement of Financial Accounting Standards No. 14. Norwalk, CT: FASB.

Financial Accounting Standards Board (FASB). 1997. *Disclosures about Segments of an Enterprise and Related Information*. Statement of Financial Accounting Standards No. 131. Norwalk, CT: FASB.

Francis, J. 1997. Discussion of self selection and analyst coverage. *Journal of Accounting Research* 35: 201-208.

Francis, J., and K. Schipper. 1999. Have financial statements lost their relevance? *Journal of Accounting Research* 37: 319-52.

Frankel, R., M. McNichols, and P. Wilson. 1995. Discretionary disclosure and external financing. *The Accounting Review* 70: 135-150.

Freeman, R. 1987. The association between accounting earnings and security returns for large and small firms. *Journal of Accounting and Economics* 9: 195-228.

Frost, C. 1997. Disclosure policy choices of UK firms receiving modified audit reports. *Journal of Accounting and Economics* 23: 163-187.

Gelb, D., and P. Zarowin. 2002. Corporate disclosure policy and the informativeness of stock prices. *Review of Accounting Studies* 7: 33-52.

Greenstein, M., and H. Sami. 1994. The impact of the SEC's segment disclosure requirement on the bid-ask spread. *The Accounting Review* 69: 179-199.

Greenstone, M., Oyer, P., and Vissing-Jorgensen, A. 2005. Mandated disclosure, stock returns, and the 1964 securities acts amendments. *Quarterly journal of Economics*, forthcoming.

Han, J., and J. Wild. 1991. Stock price behavior associated with managers' earnings and revenue forecasts. *Journal of Accounting Research* 29: 79-95.

Harris, M. 1998. The association between competition and managers' business segment reporting choices. *Journal of Accounting Research* 36: 111-128.

Hayes, R., and R. Lundholm. 1996. Segment reporting to the capital market in the presence of a competitor. *Journal of Accounting Research* 34: 261-279.

Healy, P., A. Hutton, and K. Palepu. 1999. Stock performance and intermediation changes surrounding sustained increases in disclosure. *Contemporary Accounting Research* 16: 485-520.

Healy, P., and K. Palepu. 2001. A review of the empirical disclosure literature. *Journal of Accounting and Economics* 31: 405-440.

Herrmann D., and W. Thomas. 2000. An analysis of segment disclosures under SFAS No. 131 and SFAS No. 14. *Accounting Horizons* 14: 287-302.

Hope, O., T. Kang, W. Thomas, and F. Vasvari. 2004. The effects of SFAS 131 geographic segment disclosures on the valuation of foreign earnings. Working Paper, University of Toronto, Canada.

Hope, O., W. Thomas, and G. Winterbotham. 2005. The relation between geographic earnings disclosure and trading volume. Working Paper, University of Toronto, Canada.

Hutton, A., G. Miller, and D. Skinner. 2003. The role of supplementary statements with management earnings forecasts. *Journal of Accounting Research* 41: 867-890.

Ijiri, Y. 1995. Segment statements and informativeness measures: Managing capital vs. managing resources. *Accounting Horizons* 9: 55-67.

Jennings, R. 1987. Unsystematic security price movements, management earnings forecasts, and revisions in consensus analyst earnings forecasts. *Journal of Accounting Research* 25: 90-110.

Karamanou, I., and N. Vafeas. 2005. The association between corporate boards, audit committees, and management earnings forecasts: An empirical analysis. *Journal of Accounting Research* 43: 453-486.

Kasznik, R., 1999. Voluntary disclosure and earnings management. *Journal of Accounting Research* 37: 57-81.

Ke, B., and K. Petroni. 2004. How informed are actively trading institutional investors? Evidence from their trading behavior before a break in a string of consecutive earnings increases. *Journal of Accounting Research* 42: 895-927.

King, R., G. Pownall, and G. Waymire. 1990. Expectation adjustment via timely management forecast: Review, synthesis, and suggestions for future research. *Journal of Accounting Literature* 9: 113-144.

Kinney, W. R. 1971. Predicting earnings: entity versus subentity data. *Journal of Accounting Research* 9: 127-136

Koch, A. 2003. Financial distress and the credibility of management earnings forecasts. Working Paper, Carnegie Mellon University, Pittsburgh, PA.

Lang, M. 1999. Discussion of "Stock performance and intermediation changes surrounding sustained increases in disclosure." *Contemporary Accounting Research* 16: 521-524.

Lang, M., and R. Lundholm 1993. Cross-sectional determinants of analyst ratings of corporate disclosures. *Journal of Accounting Research* 31: 246-271.

La Porta, R., F. Lopez-De-Silanes, and A. Shleifer 1999. Corporate ownership around the world. *The Journal of Finance* 54: 471-517.

Lees, F. 1981. Public disclosure of corporate earnings forecasts. *The Conference Board*, Report No. 804.

Lev, B., and P. Zarowin. 1999. The boundaries of financial reporting and how to extend them. *Journal of Accounting Research* 37: 353-385

Liu, M. 2003. Analysts' incentives to produce firm-specific versus industry-level information: Theory and evidence. Working Paper, University of Kentucky, Lexington, KY.

Lundholm, R., and L. Myers. 2003. Bringing the future forward: The effect of disclosure on the returns-earnings relation. *Journal of Accounting Research* 40: 809-839.

McNichols, M. 1989. Evidence of informational asymmetries from management earnings forecasts and stock returns. *Accounting Review* 64: 1-27.

Miller, G. 2002. Earnings performance and discretionary disclosure. *Journal of Accounting Research* 40: 173-204.

Mork, R., B. Yeung., and W. Yu. 2000. The information content of stock markets: Why do emerging markets have synchronous stock price movements? *Journal of Financial Economics* 59: 215-260.

Pacter, P. 1993. Reporting disaggregated information. *Financial Accounting Series Research Report*. Norwalk, Conn. FASB.

Palepu, K., P. Healy, and V. Bernard. 2002. Business Analysis and Valuation. South-Western College Publishing.

Patell, J. 1976. Corporate forecasts of earnings per share and stock price behavior: Empirical tests. *Journal of Accounting Research* 14: 246-276.

Penman, S. 1980. An empirical investigation of the voluntary disclosure of corporate earnings forecasts. *Journal of Accounting Research* 18:132-160.

Piotroski, J. D., and D. T. Roulstone. 2004. The influence of analysts, institutional investors, and insiders on the incorporation of market, industry, and firm-specific information into stock prices. *The Accounting Review* 79: 1119-1151.

Pownall, G., C. Wasley, and G. Waymire. 1993. The stock price effects of alternative types of management earnings forecasts. *The Accounting Review* 68: 896 912.

Pownall, G., and G. Waymire. 1989. Voluntary disclosure credibility and securities prices: Evidence from management earnings forecasts, 1969-73. *Journal of Accounting Research* 27: 227-245.

Reason, T. 2001. Picking apart the pieces: Is the SEC's new focus on segment reporting more bark than bite? *CFO: The Magazine for Senior Financial Executives* (August): 128.

Sengupta, P. 1998. Corporate disclosure quality and the cost of debt. *The Accounting Review* 73: 459-474.

Skinner, D. 1994. Why firms voluntarily disclose bad news? *Journal of Accounting Research* 32: 1-38.

Skoulakis, G. 2005. Panel data inference in finance: Least squares vs Fama-McBeth. Working paper, Northwestern University, Evanston, IL.

Springsteel, I. 1998. Sliced, diced, and still obscure: New rules on reporting business segment information set by the financial accounting standard board. *CFO: The Magazine for Senior Financial Executives* (February): 85.

Street, D., N. Nicols, and S. Gray 2000. Segment disclosures under SFAS No. 131: Has business segment reporting improved? *Accounting Horizons* 14: 259-285.

Swaminathan, S. 1991. The impact of SEC mandated segment data on price variability and divergence of beliefs. *The Accounting Review* 66: 23-41.

Thomas, W. 2000. The value-relevance of geographic segment earnings disclosures under SFAS 14. *Journal of International Financial Management and Accounting* 11: 133-161.

Trueman, B. 1986. Why do managers voluntarily release earnings forecasts? *Journal of Accounting and Economics* 8: 53-72.

Venkataraman, R. 2001. The impact of SFAS 131 on financial analysts' information environment. Working paper, Penn State University, College Park, PA.

Xue, Y. 2003. Information content of earnings management: Evidence from managing earnings to exceed thresholds. Working paper, MIT, Boston, MA.

Welker, M. 1995. Disclosure policy, information asymmetry, and liquidity in equity markets. *Contemporary Accounting Research* 11: 801-827.

Williams, P. 1996. The relation between a prior earnings forecast by management and analyst response to a current management forecast. *The Accounting Review* 71:103-113.

Tables

Table 2-1
Summary of Sample Selection Procedures

Sample Selection Criteria	No. of Firms	No. of Firm Years
December year-end firm observations available in COMPUSTAT Segment Database and CRSP Database with earnings data required to get an industry-wide ($I_{i,t-1}$, $I_{i,t}$, and $I_{i,t+1}$) , a firm-specific portion ($F_{i,t-1}$, $F_{i,t}$, and $F_{i,t+1}$) of annual earnings, returns data ($CAR_{i,t}$ and $CAR_{i,t+1}$), and data required to get $SZ_{i,t}$ and $BM_{i,t}$.[1]	3,854	17,429
Less:		
Firm observations in industries whose absolute value of $I_{j,t}$ and $F_{j,t}$ is greater than 1.5	(34)	(420)
Firm observations belong to the transition year, 1998	(97)	(2,773)
Firms making acquisitions and divestitures during the sample year	(73)	(1,259)
Firm observations with only pre- and post-131 period[2]	(1,900)	(4,624)
Sample for Pooled Regression Analysis	1,745	8,353

[1] $CAR_{i,t}$ is a twelve-month summation of market-adjusted return for firm i for fiscal year t. $I_{i,t}$ is the industry-wide portion of firm i's change in earnings. $F_{i,t}$ is the firm-specific portion of firm i's change in earnings. $SZ_{i,t}$ is a natural log of a firm's book-to-market ratio; measured as the ratio of year-beginning book value of equity and market value of equity in year t. $BM_{i,t}$ is a natural log of a firm's size; measured as common stock price multiplied by the number of common shares outstanding at the beginning of the year t.

[2] Pre-131 period: 1995-1997; Post-131 period: 1999-2001.

Table 2-2
Frequency of observations by reporting status and the number of segments changed after SFAS 131

Panel A: Frequency of observations by year and reported firm type

Year	Single segment	Multiple Segment	Ratio	Total
1995	871	366	2.38	1,237
1996	1,042	397	2.62	1,439
1997	1,165	436	2.67	1,601
1999	772	695	1.11	1,467
2000	734	646	1.14	1,380
2001	628	601	1.04	1,229
Pre-131	3,078	1,199	2.57	4,277
Post-131	2,134	1,942	1.10	4,076
Total	5,212	3,141	1.66	8,353

Panel B: Frequency of observations by the number of segments changed after SFAS 131

No. of Changed Segments	Total Firms				Pre-131 Single Segment Firms				Pre-131 Multiple Segment Firms			
	Firm	%	Firm Year	%	Firm	%	Firm Year	%	Firm	%	Firm Year	%
-3	1	0.00	13	0.00	0	0.00	0	0.00	1	0.00	13	0.01
-2	6	0.00	46	0.01	0	0.00	0	0.00	6	0.01	46	0.02
-1	53	0.03	293	0.04	0	0.00	0	0.00	53	0.11	293	0.13
0	1,162	0.67	5,380	0.64	915	0.72	4,254	0.70	247	0.53	1,126	0.49
1	289	0.17	1,414	0.17	179	0.14	873	0.14	110	0.24	541	0.24
2	161	0.09	804	0.10	130	0.10	641	0.11	31	0.07	163	0.07
3	53	0.03	291	0.03	37	0.03	215	0.04	16	0.03	76	0.03
4	11	0.01	72	0.01	9	0.01	57	0.01	2	0.00	15	0.01
5	6	0.00	24	0.00	5	0.00	18	0.00	1	0.00	6	0.00
>=6	3	0.00	16	0.00	2	0.00	14	0.00	1	0.00	2	0.00
Increasing	523	0.30	2,621	0.31	362	0.28	1,818	0.30	161	0.34	803	0.35
Non-Increasing	1,222	0.70	5,732	0.69	915	0.72	4,254	0.70	307	0.66	1,478	0.65
Total	1,745	1.00	8,353	1.00	1,277	1.00	6,072	1.00	468	1.00	2,281	1.00

Table 2-3
Frequency of observations by segment industry classification by primary two-digit SIC code[1]

Industry	SIC	Total	INC[2]	NO_INC[3]	Industry	SIC	Total	INC[2]	NO_INC[3]
Metal Mining	10	88	18	70	Trucking	42	114	37	77
Oil Drilling	13	352	42	310	Water Transport	44	45	13	32
NonMetal Mining	14	19	4	15	Air Transport	45	70	13	57
Building Construct	15	77	32	45	Travel Services	47	25	5	20
Heavy Construct	16	29	16	13	Communications	48	197	60	137
Food Manufacture	20	186	19	167	Utilities	49	504	266	238
Textiles	22	55	21	34	Durable Sales	50	238	84	154
Apparel	23	60	19	41	NonDurable Sales	51	88	31	57
Lumber	24	74	28	46	Auto Sales	55	6	2	4
Furniture	25	51	8	43	Restaurants	58	139	9	130
Paper Products	26	129	49	80	Misc. Retail	59	62	23	39
Printing	27	98	33	65	Credit Union	61	101	39	62
Chemicals	28	732	164	568	Brokers	62	65	12	53
Refining	29	83	31	52	Insurance Carrier	63	426	147	279
Rubber	30	109	54	55	Insurance Agent	64	61	25	36
Leather	31	27	12	15	Real Estate	65	99	44	55
Stone Products	32	59	29	30	Finance Holding	67	739	201	538
Metal manufacture	33	193	90	103	Hotel	70	72	41	31
Metal Fabrication	34	195	89	106	Business Services	73	519	157	362
Machinery	35	478	152	326	Film	78	16	5	11
Electronics	36	546	144	402	Recreation	79	96	13	83
Transport Equipment	37	199	88	111	Health Services	80	138	45	93
Precision Equipment	38	412	115	297	Engineering	87	104	35	69
Misc. Manufacture	39	76	24	52	Others[4]	1-99	36	8	28
Railroad	40	59	18	41	Total		8,353	2,621	5,732

[1]Distribution of segment industry classifications for a pooled time-series and cross-section of 8,353 firm-year observations. Data is obtained from Compustat Segment database.

[2]'INC' = firm-year observations of firms that increased the number of business segments.

[3]'NO_INC' = firm-year observations of firms that did not increase the number of business segments.

[4] This category has 5 two-digit industries with firm-observations with no observations either INC or NO_INC.

Table 2-4

Descriptive Statistics of control variables before and after SFAS 131 by the types of firms

Panel A: Pre-131 Period (1995-1997)

	Non-Increasing Segment Firms (N=2,970)							Increasing Segment Firms (N=1,307)							Mean
Variables[1]	Mean	Min	25%	Median	75%	Max	Std.	Mean	Min	25%	Median	75%	Max	Std.	Diff
$I_{i,t-1}$	0.004	-0.396	-0.003	0.000	0.003	1.360	0.064	0.007	-0.284	-0.001	0.000	0.003	1.230	0.065	0.003
$I_{i,t}$	0.003	-0.854	-0.004	0.000	0.003	1.124	0.067	0.004	-0.485	-0.002	0.000	0.002	0.652	0.049	0.001
$I_{i,t+1}$	0.000	-1.172	-0.005	0.000	0.003	1.411	0.094	0.002	-0.984	-0.002	0.000	0.002	0.646	0.058	0.002
$F_{i,t-1}$	-0.018	-1.439	-0.032	0.002	0.017	1.125	0.148	-0.008	-1.245	-0.023	0.004	0.019	1.352	0.144	0.010**
$F_{i,t}$	-0.005	-1.107	-0.028	0.003	0.024	1.369	0.152	-0.005	-0.964	-0.026	0.005	0.024	1.277	0.136	0.000
$F_{i,t+1}$	-0.008	-1.406	-0.035	0.003	0.031	1.436	0.175	-0.004	-1.193	-0.033	0.004	0.029	1.043	0.155	0.004
$BM_{i,t}$	-0.628	-6.220	-1.059	-0.554	-0.119	1.646	0.772	-0.532	-4.118	-0.915	-0.488	-0.074	1.821	0.726	0.096***
$SZ_{i,t}$	5.276	0.042	3.790	5.154	6.675	11.780	2.003	5.793	0.963	4.223	5.795	7.262	11.424	2.061	0.517***
$CAR_{i,t+1}$	-0.114	-1.251	-0.364	-0.132	0.124	1.546	0.416	-0.145	-1.249	-0.373	-0.150	0.079	1.391	0.374	-0.031**

Panel B: Post-131 Period (1999-2001)

	Non-Increasing Segment Firms (N=2,762)							Increasing Segment Firms (N=1,314)							Mean
Variables	Mean	Min	25%	Median	75%	Max	Std.	Mean	Min	25%	Median	75%	Max	Std.	Diff
$I_{i,t-1}$	-0.004	-1.278	-0.003	0.000	0.002	0.906	0.085	-0.002	-1.175	-0.002	0.000	0.001	0.866	0.078	0.002
$I_{i,t}$	-0.004	-1.444	-0.003	0.000	0.002	1.191	0.106	-0.008	-1.095	-0.003	0.000	0.001	0.798	0.078	-0.004
$I_{i,t+1}$	-0.005	-1.305	-0.005	0.000	0.002	1.384	0.113	-0.004	-0.874	-0.003	0.000	0.001	0.568	0.084	0.001
$F_{i,t-1}$	-0.006	-1.447	-0.028	0.004	0.027	1.306	0.189	-0.009	-1.329	-0.029	0.004	0.026	1.284	0.195	-0.003
$F_{i,t}$	0.005	-1.453	-0.033	0.002	0.029	1.49	0.194	-0.005	-1.375	-0.035	0.003	0.030	1.498	0.214	-0.010
$F_{i,t+1}$	-0.006	-1.497	-0.039	0.000	0.035	1.468	0.204	-0.009	-1.477	-0.045	0.000	0.033	1.481	0.223	-0.003
$BM_{i,t}$	-0.655	-5.296	-1.117	-0.534	-0.051	2.454	0.936	-0.451	-4.402	-0.874	-0.423	0.021	1.899	0.758	0.204***
$SZ_{i,t}$	5.649	0.450	4.065	5.565	7.055	12.312	2.156	6.069	0.845	4.412	6.106	7.644	12.168	2.252	0.420***
$CAR_{i,t+1}$	0.197	-1.259	-0.058	0.216	0.471	1.573	0.467	0.209	-1.231	-0.025	0.212	0.454	1.547	0.439	0.012

[1] $CAR_{i,t+1}$ is a twelve-month summation of market-adjusted return for firm i for fiscal year t+1. $I_{i,t}$ is the industry-wide portion of firm i's change in earnings. $F_{i,t}$ is the firm-specific portion of firm i's change in earnings. $SZ_{i,t}$ is a natural log of a firm's book-to-market ratio; measured as the ratio of year-beginning book value of equity and market value of equity in year t. $BM_{i,t}$ is a natural log of a firm's size; measured as common stock price multiplied by the number of common shares outstanding at the beginning of the year t.

*/**/***/ Statistically significant at the 0.1, 0.05, and 0.01 level.

Table 2-5
The change in market's ability to predict industry- and firm-specific earnings before and after SFAS 131

$$\text{Model 1: } CAR_{i,t} = \alpha + INC + \sum_{t=-1}^{1} \beta_t I_{i,t} + \sum_{t=-1}^{1} \lambda_t F_{i,t} + \delta_1 BP_{i,t} + \delta_2 SZ_{i,t} + \delta_3 CAR_{i,t+1} + \sum_{t=-1}^{1} \beta_{a,t} INC \times I_{i,t} + \sum_{t=-1}^{1} \lambda_{a,t} INC \times F_{i,t} + \delta_{a,1} INC \times BP_{i,t} + \delta_{a,2} INC \times SZ_{i,t} + \delta_{a,3} INC \times CAR_{i,t+1} + \varepsilon_{i,t}$$

$$\text{Model 2: } CAR_{i,t} = \alpha + NUM\_INC + \sum_{t=-1}^{1} \beta_t I_{i,t} + \sum_{t=-1}^{1} \lambda_t F_{i,t} + \delta_1 BP_{i,t} + \delta_2 SZ_{i,t} + \delta_3 CAR_{i,t+1} + \sum_{t=-1}^{1} \beta_{a,t} NUM\_INC \times I_{i,t} + \sum_{t=-1}^{1} \lambda_{a,t} NUM\_INC \times F_{i,t} + \delta_{a,1} NUM\_INC \times BP_{i,t} + \delta_{a,2} NUM\_INC \times SZ_{i,t} + \delta_{a,3} NUM\_INC \times CAR_{i,t+1} + \varepsilon_{i,t}$$

Independent	Model 1 (INC[2])			Model 2 (NUM_INC)		
Variable[1]	Pre-131	Post-131	**Diff.**	Pre-131	Post-131	**Diff.**
Intercept	0.155***	0.424***	**0.269*** **	0.143***	0.427***	**0.283*** **
Inc	-0.069***	-0.060	**0.009**	-0.018	-0.042*	**-0.025****
$I_{i,t-1}$	-0.323***	0.144	**0.467*** **	-0.282***	0.106	**0.388*** **
$I_{i,t}$	0.943***	0.948***	**0.005**	0.922***	0.915***	**-0.007**
$I_{i,t+1}$	0.333***	0.487***	**0.154**	0.298***	0.497***	**0.199***
$F_{i,t-1}$	0.126***	0.272***	**0.146****	0.118***	0.235***	**0.118***
$F_{i,t}$	0.751***	0.810***	**0.059**	0.740***	0.815***	**0.075**
$F_{i,t+1}$	0.299***	0.496***	**0.197*** **	0.270***	0.520***	**0.250*** **
$BM_{i,t}$	0.056***	0.074***	**0.018**	0.055***	0.079***	**0.023***
$SZ_{i,t}$	-0.022***	-0.017***	**0.005**	-0.020***	-0.018***	**0.003**
$CAR_{i,t+1}$	0.004	-0.263***	**-0.267*** **	0.009	-0.266***	**-0.275*** **
$INC \times I_{i,t-1}$	0.731***	-0.222	**-0.953*** **	0.415***	-0.113	**-0.528*** **
$INC \times I_{i,t}$	-0.030	-0.381*	**-0.351**	0.059	-0.144	**-0.203**
$INC \times I_{i,t+1}$	-0.347*	0.304*	**0.651****	-0.040	0.204*	**0.244***
$INC \times F_{i,t-1}$	0.203**	-0.198**	**-0.401*** **	0.144***	-0.070	**-0.214*** **
$INC \times F_{i,t}$	0.104	-0.083	**-0.187**	0.113**	-0.073	**-0.186*** **
$INC \times F_{i,t+1}$	0.022	0.092	**0.070**	0.092**	0.025	**-0.067**
$INC \times BM_{i,t}$	0.010	0.010	**0.000**	0.002	0.006	**0.003***
$INC \times SZ_{i,t}$	0.017	0.045**	**0.028**	0.012	0.015	**0.003**
$INC \times CAR_{i,t+1}$	-0.001	-0.009	**-0.008**	-0.017	0.002	**0.019**
R-Square	9.98	13.39		9.98	13.27	
N	4,277	4,076		4,277	4,076	

*/**/***/ Statistically significant at the 10%, 5%, and 1% level.

[1] $CAR_{i,t+1}$ is a twelve-month summation of market-adjusted return for firm i for fiscal year t+1. $I_{i,t}$ is the industry-wide portion of firm i's change in earnings. $F_{i,t}$ is the firm-specific portion of firm i's change in earnings. $SZ_{i,t}$ is a natural log of a firm's book-to-market ratio; measured as the ratio of year-beginning book value of equity and market value of equity in year t. $BM_{i,t}$ is a natural log of a firm's size; measured as common stock price multiplied by the number of common shares outstanding at the beginning of the year t.

[2] Inc represents two variables, INC and NUM_INC, which are defined as follows.
INC=Dichotomous variable, which takes 1 for firms increased the number of business segments after the implementation of SFAS 131, zero otherwise.
NUM_INC= Number of business segments changed after the implementation of SFAS131.

Table 2-6
Differential effect of SFAS 131 across firms based on pre-131 reporting status[1]

Model 1: $CAR_{i,t} = \alpha + INC + \sum_{t=-1}^{1}\beta_t I_{i,t} + \sum_{t=-1}^{1}\lambda_t F_{i,t} + \delta_1 BP_{i,t} + \delta_2 SZ_{i,t} + \delta_3 CAR_{i,t+1} + \sum_{t=-1}^{1}\beta_{a,t} INC \times I_{i,t} + \sum_{t=-1}^{1}\lambda_{a,t} INC \times F_{i,t} + \delta_{a,1} INC \times BP_{i,t} + \delta_{a,2} INC \times SZ_{i,t} + \delta_{a,3} INC \times CAR_{i,t+1} + \varepsilon_{i,t}$

Model 2: $CAR_{i,t} = \alpha + NUM\_INC + \sum_{t=-1}^{1}\beta_t I_{i,t} + \sum_{t=-1}^{1}\lambda_t F_{i,t} + \delta_1 BP_{i,t} + \delta_2 SZ_{i,t} + \delta_3 CAR_{i,t+1} + \sum_{t=-1}^{1}\beta_{a,t} NUM\_INC \times I_{i,t} + \sum_{t=-1}^{1}\lambda_{a,t} NUM\_INC \times F_{i,t} + \delta_{a,1} NUM\_INC \times BP_{i,t} + \delta_{a,2} NUM\_INC \times SZ_{i,t} + \delta_{a,3} NUM\_INC \times CAR_{i,t+1} + \varepsilon_{i,t}$

Independent	Model 1 INC[2]						Model 2 NUM_INC					
Variable	Pre-131 Single-segment Firms			Pre-131 Multi-segment Firms			Pre-131 Single-segment Firms			Pre-131 Multi-segment Firms		
	Pre-131	Post-131	Diff.	Pre-131	Post-131	Diff.	Pre-131	Post-131	Diff.	Pre-131	Post-131	Diff.
$I_{i,t-1}$	-0.190	0.204	**0.394****	-0.895***	-0.240	**0.655***	-0.130	0.177	**0.307***	-0.783***	-0.283	**0.500***
$I_{i,t}$	1.162***	0.948***	**-0.214**	0.246	0.985***	**0.739*****	1.130***	0.921***	**-0.209**	0.289*	0.979***	**0.691*****
$I_{i,t+1}$	0.396***	0.389***	**-0.007**	-0.133	0.958***	**1.091*****	0.370***	0.374***	**0.005**	-0.077	0.983***	**1.060*****
$F_{i,t-1}$	0.137**	0.338***	**0.201****	0.045	0.152*	**0.107**	0.130**	0.284***	**0.154***	0.050	0.168**	**0.118**
$F_{i,t}$	0.838***	0.907***	**0.069**	0.523***	0.607***	**0.084**	0.833***	0.908***	**0.075**	0.530***	0.666***	**0.136**
$F_{i,t+1}$	0.353***	0.480***	**0.127***	0.107***	0.561***	**0.454*****	0.316***	0.489***	**0.173****	0.183***	0.660***	**0.478*****
$INC \times I_{i,t-1}$	0.872***	-0.399*	**-1.271*****	0.902***	1.221**	**0.320**	0.440**	-0.267*	**-0.707*****	0.433**	0.716**	**0.283**
$INC \times I_{i,t}$	-0.419	-0.367	**0.052**	0.885***	-0.376	**-1.261****	-0.117	-0.147	**-0.030**	0.355**	-0.064	**-0.419**
$INC \times I_{i,t+1}$	-0.248	0.371*	**0.619***	0.029	0.142	**0.113**	-0.051	0.362**	**0.413***	0.147	-0.133	**-0.279**
$INC \times F_{i,t-1}$	0.262**	-0.317***	**-0.579*****	0.188	0.135	**-0.052**	0.162***	-0.117*	**-0.279*****	0.129*	-0.122	**-0.251****
$INC \times F_{i,t}$	0.064	-0.187	**-0.251***	0.102	0.269	**0.166**	0.054	-0.125**	**-0.178****	0.169**	-0.033	**-0.203**
$INC \times F_{i,t+1}$	-0.057	0.054	**0.111**	0.447***	0.434**	**-0.013**	0.056	0.035	**-0.021**	0.198**	0.117	**-0.081**
N	3,078	2,994		1,199	1,082		3,078	2,994		1,199	1,082	
R-Square	10.65	13.22		9.93	15.81		10.57	13.14		9.42	15.59	

*/**/***/ Statistically significant at the 10%, 5%, and 1% level.

[1] The coefficients of other independent variables($SZ_{i,t+T}$,$BM_{i,t+T}$, and $CAR_{i,t+T}$) and the variables interacted with 'INC'($Inc \times SZ_{i,t+T}$, $Inc \times BM_{i,t+T}$, and $Inc \times CAR_{i,t+T}$)are not tabulated for parsimony.

[2] Inc represents two variables, Inc and Num_Inc, which are defined as follows. Inc=Dichotomous variable, which takes 1 for firms increased the number of business segments after the implementation of SFAS 131, zero otherwise. Num_Inc= Number of business segments changed after the implementation of SFAS131.

Table 2-7
The effect of disclosure of segments in industries different from those disclosed under SFAS 14

Panel A: Frequency of newly disclosed industries

		Inc	Total
New_Sic[2]	0	1	
0	5,732 [68.62%] (100.00%)	1,824 [21.84%] (69.59%)	7,556 [90.46%]
1	0 [0.00%] (0.00%)	797 [9.54%] (30.41%)	797 [9.54%]
Total	5,732 (68.62%)	2,621 (31.38%)	8,353 (100.00%)

Panel B: Pooled time-series and cross-sectional regression explaining the effect of disclosing segments in new industries

Model 3: $CAR_{i,t} = \alpha + INC + NEW\_SIC + \sum_{t=-1}^{1}\beta_t I_{i,t} + \sum_{t=-1}^{1}\lambda_t F_{i,t} + \delta_1 BP_{i,t} + \delta_2 SZ_{i,t} + \delta_3 CAR_{i,t+1}$
$+ \sum_{t=-1}^{1}\beta_{a,t} INC \times I_{i,t} + \sum_{t=-1}^{1}\lambda_{a,t} INC \times F_{i,t} + \delta_{a,1} INC \times BP_{i,t} + \delta_{a,2} INC \times SZ_{i,t} + \delta_{a,3} INC \times CAR_{i,t+1}$
$+ \sum_{t=-1}^{1}\beta_{new,t} INC \times NEW\_SIC \times I_{i,t} + \sum_{t=-1}^{1}\lambda_{new,t} INC \times NEW\_SIC \times F_{i,t} + \delta_{new,1} INC \times NEW\_SIC \times BP_{i,t}$
$+ \delta_{new,2} INC \times NEW\_SIC \times SZ_{i,t} + \delta_{new,3} INC \times NEW\_SIC \times CAR_{i,t+1} + \varepsilon_{i,t}$

Independent	Inc		
Variables	Pre-131	Post-131	Diff
$I_{i,t-1}$	-0.304***	0.133	**0.436*** **
$I_{i,t}$	0.961***	0.945***	**-0.016**
$I_{i,t+1}$	0.385***	0.476***	**0.092**
$F_{i,t-1}$	0.131***	0.269***	**0.138****
$F_{i,t}$	0.765***	0.810***	**0.045**
$F_{i,t+1}$	0.314***	0.490***	**0.175*** **
$INC \times I_{i,t-1}$	0.716***	-0.288***	**-1.004*** **
$INC \times I_{i,t}$	-0.025	-0.438	**-0.413**
$INC \times I_{i,t+1}$	-0.346	0.294	**0.639***
$INC \times F_{i,t-1}$	0.174	-0.247	**-0.421*** **
$INC \times F_{i,t}$	0.093	-0.049	**-0.142**
$INC \times F_{i,t+1}$	-0.004	0.090	**0.094**
$NEW\_SIC \times I_{i,t-1}$	-0.251	0.450	**0.701**
$NEW\_SIC \times I_{i,t}$	-0.055	1.376	**1.431***
$NEW\_SIC \times I_{i,t+1}$	-0.143	0.185	**0.328**
$NEW\_SIC \times F_{i,t-1}$	0.079	0.254	**0.175**
$NEW\_SIC \times F_{i,t}$	-0.019	-0.141	**-0.122**
$NEW\_SIC \times F_{i,t+1}$	0.061	0.184	**0.123**
N	4,277	4,076	
R-Square	10.08	13.55	

[1] The coefficients of other independent variables($SZ_{i,t+T}$,$BM_{i,t+T}$, and $CAR_{i,t+T}$) and the variables interacted with 'Inc'($Inc \times SZ_{i,t+T}$, $Inc \times BM_{i,t+T}$, and $Inc \times CAR_{i,t+T}$)are not tabulated for parsimony.

[2] New_Sic is a dichotomous variable, which takes one for firms that increased the number of business segments AND the segments' SIC codes are different from those of segments disclosed under SFAS 14.

Table 2-8
Changes in the geographic segment disclosure after SFAS 131[1]

Panel A: Frequency of changes in the number of geographic segments after SFAS 131

Changes in geographic segments	Frequency	Percent	Cumulative Frequency	Cumulative Percent
-4	171	14.67	171	14.67
-3	218	18.70	389	33.36
-2	301	25.81	690	59.18
-1	26	2.23	716	61.41
0	303	25.99	1,019	87.39
1	84	7.20	1,103	94.60
2	38	3.26	1,141	97.86
3	19	1.63	1,160	99.49
4	4	0.34	1,164	99.83
5	2	0.17	1,166	100.00

Panel B: Contingency tables classifying firms based on (1) firms that increased business segments after SFAS 131, and (2) firms that stopped disclosing geographic segment information after SFAS 131

	STOP[2]		Total
INC[3]	0	1	
0	360 [47.75%] (74.69%)	394 [52.25%] (57.60%)	754 [64.67%]
1	122 [29.61%] (25.31%)	290 [70.39%] (42.40%)	412 [35.33%]
Total	482 (41.34%)	684 (58.66%)	1,166

Chi-Square statistic=36.13 (p-value<0.0001, df=1)

[1]This table presents the changes in the geographic disclosure after the implementation of SFAS 131 for Reduced sample of 412 increasing business segment firms and 754 non-increasing segment firms from the original sample.

[2]STOP=1 for firms that stopped disclosing geographic segment information after SFAS 131, 0 otherwise.

[3]INC=1 for firms that increased the number of business segments after SFAS 131, 0 otherwise.

Table 3-1
Descriptive statistics for the sample of management earnings forecasts[a]

Panel A: Number of forecast by year

Year	Number of forecasts	Number of firms
1994	22	22
1995	121	105
1996	122	104
1997	185	146
1998	327	251
1999	372	258
2000	494	343
2001	1,227	612
2002	1,245	520
Total	4,115	

Panel B: Frequency of management forecasts over the sample period

Number of firms in sample	Forecast frequency in sample period
425	1
217	2
148	3
111	4
68	5
67	6
52	7
36	8
22	9
15	10
8	11
6	12
5	13
7	14
17	15 or more

[a]Our sample consists of 4,115 quantitative management earnings forecasts of annual earnings made by 1,204 firms between 1994 and 2002.

Table 3-2
Estimation results on the credibility of management earnings forecasts[a]

Variable	Prediction	Model [1]	Model [2]	Model [3]	Model [4]	Model [5]	Model [6]	Model [7]	Model [8]
Intercept	?	-0.0027**	-0.0194**	-0.0026**	-0.0193**	-0.0027**	-0.0196**	-0.0026**	-0.0196**
FD_{it}	+	0.1506**	0.3943**	0.1771**	0.6416**	0.1508**	0.3596**	0.1768**	0.5944**
$FD_{it} \times STRN_{it}$	+	0.0325**	0.3087**			0.0326**	0.3004**		
$FD_{it} \times STRN\_D_{it}$	+			0.2167**	2.7869**			0.2166**	2.7709**
$FD_{it} \times Z\_SCORE_{it}$	+					-0.0001	0.0153*	0.0001	0.0173**
Adj R^2		0.1927	0.0363	0.1896	0.0345	0.1925	0.0370	0.1894	0.0355

[a] Model [1]: $AFR_{it} = \beta_0 + \beta_1 FD_{it} + \beta_2 FD_{it} \times STRN_{it} + \varepsilon_{it}$

Model [2]: $CAR_{it} = \beta_0 + \beta_1 FD_{it} + \beta_2 FD_{it} \times STRN_{it} + \varepsilon_{it}$

Model [3] $AFR_{it} = \beta_0 + \beta_1 FD_{it} + \beta_2 FD_{it} \times STRN\_D_{it} + \varepsilon_{it}$

Model [4] $CAR_{it} = \beta_0 + \beta_1 FD_{it} + \beta_2 FD_{it} \times STRN\_D_{it} + \varepsilon_{it}$

Model [5] $AFR_{it} = \beta_0 + \beta_1 FD_{it} + \beta_2 FD_{it} \times STRN_{it} + \beta_3 FD_{it} \times Z\_SCORE_{it} + \varepsilon_{it}$

Model [6] $CAR_{it} = \beta_0 + \beta_1 FD_{it} + \beta_2 FD_{it} \times STRN_{it} + \beta_3 FD_{it} \times Z\_SCORE_{it} + \varepsilon_{it}$

Model [7] $AFR_{it} = \beta_0 + \beta_1 FD_{it} + \beta_2 FD_{it} \times STRN\_D_{it} + \beta_3 FD_{it} \times Z\_SCORE_{it} + \varepsilon_{it}$

Model [8] $CAR_{it} = \beta_0 + \beta_1 FD_{it} + \beta_2 FD_{it} \times STRN\_D_{it} + \beta_3 FD_{it} \times Z\_SCORE_{it} + \varepsilon_{it}$

AFR_{it} is analyst forecast revision, which is defined as consensus analyst forecast subsequent to management's earnings forecast less consensus analyst forecast prior to management's earnings forecast, deflated by prior period price. CAR_{it} is cumulative abnormal returns for the three-day period beginning a day before the management forecast and ending a day after the management forecast. FD_{it} is forecast deviation, which is defined as management forecast less the prior consensus analyst forecast, deflated by year beginning price. $STRN_{it}$ is number of years of increasing EPS before the management forecast. $STRN\_D_{it}$ is a qualitative variable taking the value of one if years of increasing EPS before the management forecast is five or more and taking zero otherwise. Z_SCORE_{it} is Altman's Z-Score, a measure of financial stability. Z_SCORE_{it} is increasing in financial stability (decreasing in the likelihood of financial distress). * and ** indicate statistical significance at the 0.1 and 0.05 level.

Table 3-3
Tests for credibility of management earnings forecasts conditioned on firm size[a]

Panel A: Results using $STRN_{it}$ by quartile of firm size (1^{st} quartile denotes smallest firms)

Independent Variable	Prediction	1st Quartile		2nd Quartile		3rd Quartile		4th Quartile	
		Model [5]	Model [6]	Model [5]	Model [6]	Model [5]	Model [6]	Model [5]	Model [6]
β_0	?	-0.0042**	-0.0189**	-0.0032**	-0.0308**	-0.0019**	-0.0161**	-0.0011**	-0.0145**
FD_{it}	+	0.3895**	0.1065	0.0775**	0.4786**	0.0429**	-0.0776	0.1177**	1.7467**
$FD_{it} \times STRN_{it}$	+	0.0189	0.1949*	0.0834**	0.1485**	0.0003	0.3139**	-0.0071	-0.2431
$FD_{it} \times Z\_SCORE_{it}$	+	-0.0081	0.2519**	0.0041	0.0395	0.0007	0.0104	-0.0003	-0.0043
Adj R^2		0.3950	0.0837	0.1788	0.0570	0.0694	0.0147	0.0964	0.0348

Panel B: Results using $STRN_{it}$ for large and small firms (using the median firm size as the cut-off)

Independent Variable	Prediction	Small Firms		Large Firms	
		Model [5]	Model [6]	Model [5]	Model [6]
β_0	?	-0.0036**	-0.0247**	-0.0014**	-0.0137**
FD_{it}	+	0.2286**	0.3233**	0.0489**	0.1146
$FD_{it} \times STRN_{it}$	+	0.0784**	0.3799**	0.0004	0.2164**
$FD_{it} \times Z\_SCORE_{it}$	+	-0.0029	0.1175**	0.0005	0.0075
Adj R^2		0.3045	0.0653	0.0699	0.0130

[a]For model and variable definitions see the notes to Table 2. Firm size is measured as market capitalization (shares multiplied by price per share) of the firm on the first day of the fiscal year in which the management earnings forecast is made.

Table 3-4
Tests for credibility of management earnings forecasts conditioned on firm size[a]

Panel A: Results using STRN_D$_{it}$ by quartile of firm size (1st quartile denotes smallest firms)									
Independent Variable	Prediction	1st Quartile		2nd Quartile		3rd Quartile		4th Quartile	
		Model [7]	Model [8]	Model [7]	Model [8]	Model [7]	Model [8]	Model [7]	Model [8]
β_0	?	-0.0042**	-0.0186**	-0.0032**	-0.0310**	-0.0019**	-0.0158**	-0.0011**	-0.0146**
FD_{it}	+	0.4048**	0.2830**	0.1028**	0.6847*	0.0429**	0.2148**	0.1086**	1.4738**
$FD_{it} \times STRN\_D_{it}$	+	0.1821	6.1740**	0.6886**	4.2658**	0.0492	1.8549**	0.0045	-0.8374
$FD_{it} \times Z\_SCORE_{it}$	+	-0.0071	0.2503**	0.0062**	0.0643**	0.0007	0.0119	-0.0003	-0.0046
Adj R^2		0.3942	0.0872	0.1674	0.0479	0.0699	0.0104	0.0956	0.0334

Panel B: Results using STRN_D$_{it}$ for large and small firms (using the median firm size as the cut-off)					
Independent Variable	Prediction	Small Firms		Large Firms	
		Model [7]	Model [8]	Model [7]	Model [8]
β_0	?	-0.0036**	-0.0247**	-0.0014**	-0.0135**
FD_{it}	+	0.2779**	0.5568**	0.0489**	0.3164**
$FD_{it} \times STRN\_D_{it}$	+	0.4709**	4.7884**	0.0492	1.1109
$FD_{it} \times Z\_SCORE_{it}$	+	-0.0003	0.1277**	0.0005	0.0084
Adj R^2		0.2887	0.0645	0.0705	0.0113

[a]For model and variable definitions see the notes to Table 2. Firm size is measured as market capitalization (shares multiplied by price per share) of the firm on the first day of the fiscal year in which the management earnings forecast is made.

Table 3-5
Tests for ex post accuracy of management earnings forecasts[a]

Panel A: Forecast error by length of preceding string of EPS increases			
Length	n	Mean Absolute Error	s.d.
0	1,794	0.0197	0.049
1	1,131	0.0200	0.053
2	658	0.0172	0.033
3	325	0.0149	0.024
4	108	0.0185	0.055
5	50	0.0165	0.020
6	25	0.0169	0.023
7	13	0.0079	0.009
8	4	0.0011	0.001
9	7	0.0153	0.014
Total	4,115	0.0189	0.0461
Panel B: Comparison using five years as the cut-off for long strings			
Length	n	Mean Absolute Error	s.d.
< 5yr	4,016	0.0189	0.0466
> 5yr	99	0.0148	0.0198

[a] This table reports the ex post accuracy of management earnings forecasts conditioned on the length of the string of prior EPS increases. Ex post accuracy is determine by comparing the management earnings forecast to the subsequent actual earnings. Length of strings is the number of consecutive EPS increases announced by the firm prior to the release of the management earnings forecast.

Table 3-6
Tests for the reduction in analyst forecast dispersion[a]

Panel A: Forecast dispersion by length of string

Length of String	Number of Forecasts	Mean Pre-Dispersion	Mean Post-Dispersion	Change in Dispersion
0	1,128	0.0616	0.0572	-0.0044
1	727	0.0617	0.0576	-0.0041
2	425	0.0602	0.0589	-0.0013
3	199	0.0686	0.0743	0.0058
4	168	0.0629	0.0944	0.0315
5	35	0.0439	0.0478	0.0039
6	14	0.1645	0.0565	-0.1081
7	10	0.0290	0.0346	0.0055
8	4	0.0915	0.0783	-0.0132
9	3	0.0702	0.0734	0.0033
Total	2,613	0.0622	0.0597	-0.0025

Panel B: Comparison using five years as the cut-off for long strings

Length of String	Number of Forecasts	Mean Pre-Dispersion	Mean Post-Dispersion	Change in Dispersion
Less than 5yr	2,547	0.0619	0.0599	-0.0020
More than 5yr	66	0.0713	0.0507	-0.0207

[a] This table reports the dispersion in analyst forecasts before and after the release of quantitative management earnings forecasts. Length of strings is the number of consecutive EPS increases announced by the firm prior to the release of the management earnings forecast. Dispersion is calculated as the standard deviation of outstanding analyst forecasts. Change in dispersion is calculated as the post-announcement dispersion in analyst forecasts minus the pre-announcement dispersion in analyst forecasts. In calculating dispersion we eliminate all observations for which the preannouncement consensus forecast does not consists of forecasts from at least three financial analysts.