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Critical accounting estimate disclosures and the value relevance of balance sheet items

Matthew Ryan Glendening
University of Iowa

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CRITICAL ACCOUNTING ESTIMATE DISLOSURES AND THE VALUE
RELEVANCE OF BALANCE SHEET ITEMS

by

Matthew Ryan Glendening

An Abstract

Of a thesis submitted in partial fulfillment
of the requirements for the Doctor of
Philosophy degree in Business Administration
in the Graduate College of
The University of Iowa

July 2012

Thesis Supervisors: Associate Professor Cristi A. Gleason
Professor W. Bruce Johnson

ABSTRACT

In the early 2000s, the Securities and Exchange Commission (SEC) called on firms to provide new MD&A disclosures about their critical accounting estimates. The new disclosures outline how reasonably likely changes in firms' highly uncertain accounting estimates would affect earnings. Because the new disclosure practice potentially highlights accrual estimates with a reduced level of reliability (i.e. greater estimation error) arising from uncertainty in the accrual measurement process, I examine whether the presence of a critical accounting estimate (CAE) disclosure partially explains cross-sectional variation in the value relevance of balance sheet items. Using a sample of non-financial and non-utility S&P 500 firms from 2004 to 2009, I find the value relevance of a balance sheet item is negatively associated with the presence of a related CAE disclosure. To corroborate my value relevance findings, I also examine whether the predictive value of accruals with respect to future cash flows and accrual noise, which are two accounting-based characteristics of useful accounting information, are associated with the presence of a CAE disclosure. I find the incremental predictive value of accruals with respect to future cash flows (accrual noise) is negatively (positively) associated with the presence of a CAE disclosure. Overall, these results suggest investors perceive balance sheet items accompanied by a related, account-specific CAE disclosure to have lower reliability, and consistent with investors' perceptions, accrual estimates have less predictive value and are noisier when these disclosures are present. Other findings indicate that the magnitude of estimation error and disclosure complexity play a role in the extent to which investors reduce their reliability perceptions in the presence of a CAE disclosure.

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Graduate College
The University of Iowa
Iowa City, Iowa

CERTIFICATE OF APPROVAL

PH.D. THESIS

This is to certify that the Ph.D. thesis of

Matthew Ryan Glendening

has been approved by the Examining Committee
for the thesis requirement for the Doctor of Philosophy degree
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To Meredith

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TABLE OF CONTENTS

LIST OF TABLES	v
LIST OF ABBREVIATIONS	vi
CHAPTER	
1. INTRODUCTION	1
2. BACKGROUND AND HYPOTHESIS DEVELOPMENT	7
2.1 Critical Accounting Estimate Disclosures	7
2.2 CAE Disclosures and the Value Relevance of Accounting Numbers	9
2.3 CAE Disclosures and the Usefulness of Accruals	17
3. SAMPLE SELECTION AND DESCRIPTIVE STATISTICS	22
3.1 Sample Selection	22
3.2 Descriptive Statistics	24
4. RESULTS	31
4.1 Tests of Hypothesis 1	31
4.2 Tests of Hypothesis 2 and Hypothesis 3	36
4.3 Tests of Hypothesis 4	38
4.4 Other Analyses	44
4.4.1 Within Disclosing Firm-Years Analysis	44
4.4.2 Pre-Disclosure versus Post-Disclosure Periods Analysis	44
4.4.3 CAE Disclosures: Accounting System Error versus Innate Operating Uncertainty	46
4.4.4 Controlling for the Effects of Industry Membership and Economic Downturns	48
5. CONCLUSION	50
APPENDIX A: EXAMPLES OF CAE DISCLOSURES	52
APPENDIX B: EXCERPT FROM FR-72	57
APPENDIX C: TABLES	58
REFERENCES	89

LIST OF TABLES

Table C1. Sample and Disclosure Frequency	59
Table C2. Cross-Sectional Differences in CAE Disclosure Frequencies	62
Table C3. Descriptive Statistics for Variables Used in Regressions	67
Table C4. Value Relevance of Balance Sheet Items with a CAE Disclosure	71
Table C5. Cross-Sectional Differences in the Value Relevance of Balance Sheet Items with a CAE Disclosure	75
Table C6. Incremental Predictive Value Accruals with Respect to Future Cash Flows	78
Table C7. Accrual Noise	79
Table C8. Value Relevance of Balance Sheet Items with a CAE Disclosure: Within Disclosing Firm-Years	83
Table C9. Value Relevance of Balance Sheet Items with a CAE Disclosure: Pre- Versus Post-Disclosure Periods	85
Table C10. Differences in Operating Volatility	88

LIST OF ABBREVIATIONS

ADPAMT	Book value of accumulated depreciation, depletion, and amortization, scaled by shares outstanding
AMOUNT	After-tax amount of earnings sensitivity reported during 2004, scaled by shares outstanding
AP	Book value of accounts payable, scaled by shares outstanding
AR	Book value of net accounts receivable, scaled by shares outstanding
BVA	Book value of total assets, scaled by shares outstanding
BE	Book value of shareholders' equity, scaled by shares outstanding
BVL	Book value of total liabilities, scaled by shares outstanding
CASH	Book value of cash and short-term investments, scaled by shares outstanding
CFO	Cash flow from operations per the statement of cash flows adjusted for extraordinary items and discontinued operations, scaled by average total assets
COMMENT LETTER	Indicator variable equal to 1 for firm-years with an SEC comment letter relating to CAE disclosures, zero otherwise, where SEC comment letters relating to CAE disclosures are identified as SEC-originated letters (i.e. 'UPLOAD' letters) that meet the following search string criteria: "critical" w/2 "estimate"
DEBT	Book value of long-term debt and debt in current liabilities, scaled by shares outstanding
DISCLOSE_ADPAMT	Indicator variable equal to 1 for firm-years with a CAE disclosure relating to accumulated depreciation, depletion, and amortization

	(ADPAMT), zero otherwise (refer to Appendix A for an example)
DISCLOSE_AR	Indicator variable equal to 1 for firm-years with a CAE disclosure relating to net accounts receivable (AR), zero otherwise (refer to Appendix A for an example)
DISCLOSE_BVE	Indicator variable equal to 1 for firm-years with DISCLOSE_PPEGROSS = 1, DISCLOSE_ADPMAT = 1, DISCOSE_INV = 1, DISCLOSE_AR = 1, DISCLOSE_INTAN = 1, DISCLOSE_DTA = 1, or DISCLOSE_OTHERLIABILITY = 1, zero otherwise
DISCLOSE_DTAL	Indicator variable equal to 1 for firm-years with a CAE disclosure relating to deferred tax assets (DTAL), zero otherwise (refer to Appendix A for an example)
DISCLOSE_INTAN	Indicator variable equal to 1 for firm-years with a CAE disclosure relating to intangible assets (INTAN), zero otherwise (refer to Appendix A for an example)
DISCLOSE_INV	Indicator variable equal to 1 for firm-years with a CAE disclosure relating to inventory (INV), zero otherwise (refer to Appendix A for an example)
DISCLOSE_NI	Indicator variable equal to 1 for firm-years with DISCLOSE_BVE = 1 or DISCLOSE_PENSION = 1, zero otherwise
DISCLOSE_OTHERLIABILITY	Indicator variable equal to 1 for firm-years with a CAE disclosure relating to other liabilities (OTHERLIABILITY), zero otherwise (refer to Appendix A for an example)
DISCLOSE_PENSION	Indicator variable equal to 1 for firm-years with a CAE disclosure relating to pension assets and/or pension liabilities, zero otherwise (refer to Appendix A for an example)
DISCLOSE_PPEGROSS	Indicator variable equal to 1 for firm-years with a CAE disclosure relating to gross property, plant,

	and equipment (PPEGROSS), zero otherwise (refer to Appendix A for an example)
DTA	Book value of net deferred tax assets, scaled by shares outstanding
DTA	Book value of net deferred tax asset (liability), scaled by shares outstanding (i.e. DTA - DTL)
DTL	Book value of net deferred tax liabilities, scaled by shares outstanding
EARN	Earnings before extraordinary items and discontinued operations, scaled by average total assets
FVPA	Fair value of pension assets, scaled by shares outstanding
HIGHAMOUNT	Indicator variable equal to 1 if AMOUNT is above the 75th percentile (0.209), zero otherwise
INTAN	Book value of intangible assets, scaled by shares outstanding
INV	Book value of inventory, scaled by shares outstanding
INVEST	Book value of investments and advances, scaled by shares outstanding
MTB	Market value of equity divided by book value of equity
MVE	Market value of equity, scaled by shares outstanding (measured 4 months after fiscal year-end)
NEW_DISCLOSER	Indicator variable equal to 1 for firm-years that switch from not providing a CAE disclosure to providing a CAE disclosure, zero otherwise
NI	Net income, scaled by shares outstanding
NUMBER	Total number of types of non-pension CAE disclosures a firm provides in a given year

OTHERASSET	Book value of other assets, scaled by shares outstanding (i.e. BVA-PPEGROSS+ADPAMT-INV-AR-INTAN-INVEST-CASH-DTA)
OTHERLIABILITY	Book value of other liabilities, scaled by shares outstanding (i.e. BVL-DEBT-AP-DTL-TP)
PBO	Projected benefit obligation, scaled by shares outstanding
PPEGROSS	Book value of gross property, plant, and equipment, scaled by shares outstanding
RECESSION	Indicator variable equal to 1 for firm-years ending during a recession year (i.e. 2001 or 2007-2009), zero otherwise
SD_CFO	Standard deviation of CFO_{t-1} , CFO_t , and CFO_{t+1}
TP	Book value of taxes payable, scaled by shares outstanding
UNCOLLECT	Allowance for uncollectible accounts, scaled by shares outstanding
ΔWC	Change in working capital (change in non-cash current assets minus the change in non-debt current liabilities), scaled by average total assets

CHAPTER 1: INTRODUCTION

In December 2003, the Securities and Exchange Commission (SEC) issued new rules intended to provide financial statement users with better information about firms' accounting estimates (SEC 2003).¹ These rules mandated disclosures in the Management's Discussion and Analysis (MD&A) section of the 10-K of a quantitative sensitivity analysis summarizing the earnings effects of "reasonably likely" changes in firms' "critical" accounting estimates, such as those pertaining to anticipated sales returns, inventory obsolescence, warranty reserves, and doubtful accounts.² Best Buy responded by providing sensitivity disclosures on its critical accounting estimates in 2004, shortly after the SEC issued the new guidance. Best Buy estimated that a 10 percent change in its inventory markdown reserve, inventory loss reserve, restricted stock vesting projection, and liabilities for self-insurance, location closings, and customer loyalty and rebate programs would change 2004 net earnings by \$31 million (3.15 percent) or approximately \$0.10 per share. Because Best Buy's critical accounting estimates involved previously undisclosed reserves and liabilities, the details provided

¹ FR-72, *Commission Guidance Regarding Management's Discussion and Analysis of financial Condition and Results of Operations*, was the culmination of a series of efforts in the early 2000s by the SEC to enhance disclosure practices pertaining to firms' accounting estimates. In May 2002, the SEC issued a proposed rule that called for firms to provide a sensitivity analysis on critical accounting estimates, but the rule was not released in final form (SEC May 2002).

² Throughout this manuscript, I refer to these disclosures as "CAE disclosures." Critical accounting estimates are defined as accounting estimates that are highly uncertain and have a material impact on the presentation of the firm (SEC 2003).

may convey new information about its accrual estimates and the potential for estimation error in the firm's inherently uncertain accrual measurement process.³

This study utilizes CAE disclosures to empirically examine how accounting estimation error influences the usefulness of accounting information. This question is important for two reasons. First, while estimation is integral to the accounting process, there is little evidence on how investors price uncertainty and errors relating to balance sheet item estimates. Prior research has examined whether the uncertainty and estimation error of accounting information influences investors' pricing decisions (e.g. Barth 1991; Barth 1994; Choi et al. 1997; Song et al. 2010), but it is limited to settings where the accounting information pertains to off-balance-sheet accounting numbers or on-balance-sheet accounting numbers within the financial services industry. This study complements prior research by examining how investors price estimation error relating to a comprehensive set of common balance sheet items. Second, the SEC intended for this new disclosure practice to inform investors about uncertainty in the accrual measurement process, but it is an empirical question as to whether CAE disclosures actually fulfill their intended purpose.

³ Firms are required to disclose a Schedule II outlining a reconciliation of their valuation and qualifying accounts, which include various contra-asset and liability accounts. While the materiality of the account is a determinant of whether it is disclosed in the Schedule II, the estimation uncertainty associated with the account does not determine whether it is disclosed in the Schedule II. Thus, it is likely that CAE disclosures convey information about estimation error that is incremental to what is included in the Schedule II. Also, the number of accounts included in the Schedule II is quite limited. The SEC previously acknowledged the deficient number of accounts firms include in the schedule and proposed a rule in 2000 requiring firms to include more accounts in their Schedule II (SEC 2000). The SEC specifically called on firms to disclose information about changes in valuation and loss accrual accounts, which include, but are not limited to, allowance for doubtful accounts and notes receivable, allowance for sales returns, valuation allowance for deferred tax assets, liabilities for exit costs relating to restructurings, liabilities for probable losses on pending litigation, liabilities for environmental remediation costs, inventory valuation allowance, and product warranty liabilities (SEC 2000). However, the rule was not released in final form and the number of accounts included in the Schedule II remains limited. Footnote 29 discusses the information contained in the Schedule II for firms in my sample.

I first examine whether the presence of a CAE disclosure partially explains cross-sectional variation in the value relevance of firms' balance sheet items.⁴ This analysis stems from the notion that investors will likely decrease the weight they place on financial information perceived to be more uncertain, or less reliable, due to greater estimation error (e.g. Maines and Wahlen 2006; Francis et al. 2007). The Best Buy example illustrates that CAE disclosures highlight the amount of estimation error inherent in firms' accrual measurement processes. Assuming managers truthfully report CAE disclosures, the disclosures provide an indication of the level of reliability (inherent estimation error) associated with firms' accruals.⁵ If investors price accounting numbers associated with more estimation error differently than accounting numbers associated with less estimation error, the value relevance of a balance sheet item is predicted to be negatively associated with the presence of a related CAE disclosure. Alternatively, CAE disclosures may have no discernible impact on investors' valuation decisions. One of the many concerns voiced by opponents in comment letters to the SEC is that the new disclosures would be too complicated for investors to understand.⁶ If investors are unable to properly interpret CAE disclosures, then the value relevance of a balance sheet item will be unrelated to the presence of a CAE disclosure.

⁴ An accounting amount is value relevant if it has a predictable association with equity market values (Barth et al. 2001).

⁵ Even though the FASB explicitly states that reliability does not imply certainty or precision (FASB 1980, 2010), the definition of reliability is often broadened in the context of academic research to include the concept uncertainty. For example, Kothari, Laguerre, and Leone (2002) state that most readers of their study interpreted uncertainty of future benefits to be synonymous with reliability.

⁶ Source: <http://www.sec.gov/rules/proposed/s71602/touche1.htm>

A second objective of this paper is to investigate whether observed differences in the value relevance of balance sheet items are consistent with investors correctly interpreting accrual estimates in the presence of a CAE disclosure as less useful for making cash flow assessments. Specifically, I examine whether the predictive value of accruals with respect to future cash flows and accrual noise are associated with the presence of a CAE disclosure.⁷ This analysis builds on the idea that current period accruals reflect estimates of future and previous cash flows (Dechow 1994; Dechow and Dichev 2002), but both intrinsic measurement difficulties and intentional manipulation can induce error into accrual estimates. To the extent CAE disclosures indicate greater estimation error in the accrual measurement process, accruals in the presence of a CAE disclosure are predicted to exhibit a reduced ability to predict future cash flows and less precision in the mapping between accruals and cash flows (i.e. greater accrual noise). However, it is possible that CAE disclosures do not indicate instances where accruals contain greater estimation error. A key criticism of the SEC's guidance was that these disclosures may give the impression to users that management is acknowledging greater inaccuracy in the accrual measurement process, when in fact the sensitivity disclosures simply reflect hypothetical scenarios. If this is the case, the ability of accruals to predict future cash flows and accrual noise will be unrelated to the presence of a CAE disclosure.

Using a sample of 339 non-financial and non-utility S&P 500 firms from 2004 to 2009 (2,033 firm-year observations), I obtain CAE disclosure data from the MD&A section of firms' 10-Ks. My value relevance tests estimate a cross-sectional equity

⁷ Following Dechow and Dichev (2002), accrual noise is measured as the absolute value of the error term, or the standard deviation of the error term, from a firm-specific regression of current working capital accruals on past, current, and future operating cash flows.

valuation model (e.g. Landsman 1986; Barth 1991) and examine how the presence of a CAE disclosure influences the valuation coefficient of the related balance sheet item. I find that balance sheet items with a CAE disclosure exhibit lower value relevance than the same balance sheet items without a CAE disclosure. This finding extends to both aggregate book-value of equity and many individual components of equity book-value, including accumulated depreciation, inventory, accounts receivable, intangible assets, and other liabilities. I also find that the negative association between the value relevance of equity book value and the presence of a CAE disclosure is more pronounced when the sensitivity dollar amount, i.e. the magnitude of estimation error, is greater but less pronounced when the number of CAE disclosures, i.e. disclosure complexity, is greater. This finding indicates the magnitude of disclosed estimation error and disclosure complexity influence the value relevance of financial statement amounts.

I use two accounting-based approaches to assess whether accrual estimates are indeed less useful when CAE disclosures are present. First, I examine how the incremental predictive ability of current earnings with respect to future operating cash flows (i.e. incremental to current operating cash flows) varies with the presence of a CAE disclosure. I find earnings add incremental value when predicting future operating cash flows in the absence of a CAE disclosure, but not when a CAE disclosure is present. Second, I rely on the Dechow and Dichev (2002) model to examine the association between the precision of the mapping between accruals and cash flows (i.e. accrual noise) and the presence of a CAE disclosure. I find accrual noise is greater when a working capital CAE disclosure is present, especially when the CAE disclosure pertains to a highly material working capital account.

Overall, the results suggest investors perceive the reliability of balance sheet items with a CAE disclosure to be lower than the reliability of the same balance sheet items without a CAE disclosure. Consistent with investors' reliability perceptions, I find accruals are less useful in assessing cash flows when a CAE disclosure is present. These findings suggest CAE disclosures highlight instances where accrual estimates are highly uncertain and contain more estimation error, and investors appropriately decrease weight they place on accounting numbers when a related CAE disclosure is present.

This study contributes to the accounting literature by providing empirical evidence on the trade-off between relevance and reliability. Several previous studies find that uncertainty and estimation error negatively influence the value relevance of accounting numbers (e.g. Barth 1994; Choi et al. 1997; Song et al. 2010), but these studies focus on the value relevance of pensions and other postretirement benefits or the value relevance of investment fair-values for a sample of banks. There is little empirical evidence on whether estimation error partially explains cross-sectional variation in the value relevance of a comprehensive set of balance sheet items, including inventory or accounts receivable. This study seeks to provide evidence on this issue.

The remainder of this study is organized as follows. Section 2 describes the institutional background pertaining to CAE disclosures, reviews relevant research, and develops hypotheses. Section 3 outlines the sample selection process and provides descriptive statistics. Section 4 presents empirical results. Section 5 concludes the study.

CHAPTER 2: BACKGROUND AND HYPOTHESIS DEVELOPMENT

2.1.Critical Accounting Estimate Disclosures

In December 2003, the SEC issued interpretive guidance (FR-72) calling on firms to include a quantitative sensitivity analysis summarizing the earnings effects of “reasonably likely” changes in firms’ critical accounting estimates in the MD&A section of the 10-K (SEC 2003).⁸ An accounting estimate is critical if (1) the accounting estimate requires a material level of subjectivity or judgment on behalf of the company to account for highly uncertain matters, and (2) the company could have reasonably used different accounting estimates in the current period and using these different accounting estimates would materially impact the presentation of firm performance (SEC May 2002; SEC 2003). CAE disclosures essentially outline how earnings would be affected by a change in a particular uncertain accounting estimate. Allowances for doubtful accounts, sales returns, and inventory valuation, liabilities for product warranties and probable losses from pending litigation, and accumulated depreciation are examples of accounts that are outlined in firms’ CAE disclosures. For example, Best Buy provided the following CAE disclosure for 2004 (refer to Appendix A for additional examples of CAE disclosures):⁹

“A 10% difference in actual physical inventory losses reserved for at February 26, 2005, would have affected net earnings by approximately \$5 million for the fiscal year ended February 26, 2005.”

⁸ Refer to Appendix B for an excerpt from FR-72. This interpretive guidance was issued as a part of the SEC’s “Interpretive Releases,” a type of SEC regulatory action. In interpretive releases, the SEC publishes their views and interprets securities laws and SEC regulations in order to provide guidance to the business and investment communities. FR-72 was effective on December 29, 2003. While other areas of the MD&A were discussed in the SEC’s guidance, enhanced disclosures pertaining to critical accounting estimates were a main focus of FR-72.

⁹ Source: BEST BUY CO INC, 10-K, May 10, 2005

Because CAE disclosures indicate the amount of potential estimation error arising from uncertainty in the accrual measurement process, accrual estimates with a CAE disclosure are potentially less reliable. While this study uses the term “reliability” to describe the level of estimation error in firms’ uncertain accounting estimates, the FASB’s Conceptual Framework replaced the term “reliability” with “faithful representation” when it issued SFAC No. 8 (FASB 2010).¹⁰ Accounting information achieves a faithful representation if it is complete, neutral, and free from error (FASB 2010). Thus, even though the term reliability is no longer used within the FASB’s Conceptual Framework, its usage in this study is consistent with the FASB’s definition of faithful representation.

It is important to note that the SEC’s interpretive guidance (FR-72) concluded a series of efforts in the early 2000s by the SEC to enhance the information firms publically disclose about the inherently uncertain measurement process associated with firms’ accounting policies and the estimates used in the application of those policies. For example, the SEC issued a proposed rule in 2002 that called for firms to provide a sensitivity analysis on critical accounting estimates (SEC May 2002).¹¹ However, the

¹⁰ SFAC No. 2 described reliability as having three important dimensions: representational faithfulness (“the correspondence or agreement between a measure or description and the phenomenon that it purports to represent” (FASB 1980, pg. 6)), verifiability (“the ability through consensus among measurers to ensure that information represents what it purports to represent or that the chosen method of measurement has been used without error or bias” (FASB 1980, pg. 6)), and neutrality (“absence in reported financial information of bias intended to attain a predetermined result or to induce a particular mode of behavior” (FASB 1980, pg. 6)).

¹¹ While the SEC’s proposed rule required firms to provide a quantitative sensitivity analysis for critical accounting estimates (e.g. inventory valuation reserve), another main purpose of the proposed rule was to enhance disclosure requirements pertaining to firms’ critical accounting policies (e.g. lower of cost or market rule when accounting for inventory) (SEC May 2002). Cho, Park, and Warfield (2004) investigate the determinants of critical accounting policy (CAP) disclosures and find a positive relation between the quality of CAP disclosures and accrual quality within firms providing CAP disclosures. Levine and Smith

rule was not released in final form, possibly due to the negative feedback the SEC received.

Companies and the major accounting firms voiced opposition to the SEC proposal because of increased preparation costs, auditor involvement, and MD&A complexity. Deloitte & Touche LLP cited a survey of public registrants in which respondents described the sensitivity analysis as having the “potential for misinterpretation” and indicated that it would be “too difficult to measure” or “too complicated to be meaningful.”¹² Ernst & Young expressed concerns with the term “highly uncertain” used in the definition of critical accounting estimates. Because the term “highly uncertain” is susceptible to inconsistent interpretation and application, the proposed rule could result in some firms disclosing the sensitivity analysis, while other firms do not.¹³

2.2.CAE Disclosures and the Value Relevance of Accounting Numbers

Value relevance studies examine the relation between accounting numbers and stock prices or returns to investigate whether investors view accounting numbers as

(2011) investigate the determinants and consequences of critical accounting policy (CAP) disclosures. The authors find firms with higher ex ante litigation risk are more likely to provide a CAP disclosure, which is consistent with firms using CAP disclosures to warn users about the potential uncertainty associated with accounting policies, and thus reduce their exposure to lawsuits. They also find a negative relation between accrual quality and the number of CAPs disclosed. Lastly, they find firms with a higher than expected number of CAPs have lower earnings multiples, which suggests CAP disclosures are negatively associated with investors’ reliability assessments of earnings. A key distinction between my study and Cho et al. (2004) and Levine and Smith (2011) is that they focus on the presence of a disclosure relating to a critical accounting policy (e.g. inventory policies or accounts receivable policies), while I focus on the presence of a quantitative sensitivity analysis relating to a critical accounting estimate (e.g. inventory valuation reserve or allowance for doubtful accounts). Focusing on CAE disclosures, which are far less common than CAP disclosures, allows me to indicate which balance sheet items exhibit greater estimation error and to quantify that estimation error. Examining CAE disclosures also allows me to provide insight on the usefulness of the quantitative sensitivity analysis, which was a major source of contention between the SEC and companies.

¹² Source: <http://www.sec.gov/rules/proposed/s71602/touche1.htm>

¹³ Source: <http://www.sec.gov/rules/proposed/s71602/ernstyoun1.htm>

relevant and sufficiently reliable to impact their valuation decisions. If accounting measurements are significantly associated with market values, then they are considered useful to equity holders.¹⁴ For example, Barth (1991) and Choi et al. (1997) examine the value relevance of pensions and other postretirement benefits, and Barth (1994) and Song et al. (2010) examine the value relevance of investment fair-values in the banking industry.¹⁵ These studies also draw inferences about the precision of accounting measurements based on the strength of the relation between accounting numbers and stock prices or returns (i.e. the magnitude of the valuation coefficient). The findings from these studies generally confirm that accounting numbers that are more susceptible to measurement error or managerial bias have lower perceived reliability and exhibit lower value relevance.¹⁶

While the studies mentioned above offer useful insight about how reliability (accounting estimation error) influences the value relevance of financial information, they focus on off-balance-sheet accounting numbers (i.e. those relating to pensions and post-retirement benefits) or on-balance-sheet accounting numbers that relate only to the

¹⁴ Value relevance studies are sometimes argued to have implications for standard setters in determining whether accounting numbers should be recognized or disclosed. However, there are issues with this argument (Holthausen and Watts 2001). For example, value relevance studies only focus on one role of accounting numbers (i.e. inputs to equity valuation) and ignore the perhaps more important role accounting numbers play in debt and compensation contracts.

¹⁵ Barth, Beaver, and Landsman (1996), Venkatachalam (1996), and Eccher, Ramesh, and Thiagarajan (1996) also examine the value relevance of bank fair value disclosures.

¹⁶ Maines and Wahlen (2006) note that studies using stock prices as proxies for investors' future cash flow expectations provide indirect evidence on the reliability of accounting information. The authors caution that interpreting the findings in these studies can be difficult because the studies are joint tests of: (1) investors' perception of the relevance of a particular accounting number for estimating the future cash flows of a firm, (2) investors perception of the reliability of that accounting number, (3) the model used to explain share prices and whether controls are included for all other factors that explain prices, and (4) market efficiency.

financial services industry. This study seeks to complement these findings by providing evidence on the trade-off between relevance and reliability for a wider range of accounting numbers included in firms' financial statements. Specifically, I utilize CAE disclosures to examine how estimation error associated with uncertain accounting estimates influences the value relevance of the related balance sheet item.

Barth (1991) estimates the relation between equity market values and alternative pension liability measures to assess the market's perception of the reliability, or measurement error, associated with the alternative measures.¹⁷ Rather than examining how estimation error influences the value relevance of accounting numbers, which is the focus of this study, Barth's (1991) analysis uses the value relevance of accounting numbers to make assessments about the amount of measurement error associated with those accounting numbers. Barth (1991) finds that out of the disclosed liability alternatives, the accumulated benefit obligation exhibits lower measurement error than both the vested benefit and projected benefit obligations.¹⁸ However, the projected benefit obligation exhibits less measurement error than the accumulated benefit obligation when the projected benefit obligation is larger and reflects the salary progression rate. These results are consistent with investors viewing the projected benefit obligation as having more measurement error than the accumulated benefit obligation

¹⁷ See Appendix A in Barth (1991) for a description of the econometric procedure used to estimate the amount of measurement error.

¹⁸ Under SFAS No. 87, three alternative measures for pension liabilities are disclosed: projected benefit obligation (i.e. actuarial present value of both vested and non-vested benefits with the effects of future compensation levels); accumulated benefit obligation (i.e. actuarial present value of both vested and non-vested benefits without the effects of future compensation levels); vested benefit obligation (i.e. actuarial present value of vested benefits without the effects of future compensation levels).

when the two are conceptually equivalent, but also viewing future salary changes, which include effects of future inflation and future productivity changes, as a component of firms' pension obligations.

Choi et al. (1997) investigate the value relevance of accumulated postretirement benefit obligations, that is, the accrued costs of non-pension postretirement health care benefits. While these accrued costs may be useful to investors when assessing firm equity values, they may suffer from low reliability because of the uncertainty and subjectivity associated with measuring per capita claims cost, health care cost trend rates, and Medicare reimbursement rates. The authors find accumulated postretirement benefit obligations are value relevant, but exhibit a smaller capitalization rate and a larger noise ratio than pension obligations, consistent with accumulated postretirement benefit obligations having a lower perceived reliability than pension obligations. They also show the accumulated postretirement benefit obligations for firms with a large retiree population relative to current workforce and firms less likely to reduce or terminate retiree health care benefits in the future exhibit a smaller noise ratio, which is consistent with the noise ratio for accumulated postretirement benefit obligations varying according to the level of perceived reliability.

Barth (1994) and Song et al. (2010) investigate the relevance and reliability of fair value estimates of investment securities. Barth (1994) finds that banking industry investment security fair values exhibit a statistically significant positive relation with equity market values, but the relation between fair value of securities' gains and losses and returns is statistically insignificant. This result suggests the fair values of investment securities are value relevant, whereas securities fair value gains and losses are not.

Greater estimation error associated with securities gains and losses appears to be driving this discrepancy. Barth (1994) finds that securities gains and losses are value relevant for large banks holding a high proportion U.S. Treasury securities in their investment portfolios, which is consistent with the value relevance increasing as fair value estimates become more reliable.

Song et al. (2010) use the SFAS No. 157 fair value hierarchy information to examine how reliability influences the value relevance of financial information. SFAS No. 157 defined fair value measurement levels based on the inputs used to calculate fair-value estimates and required firms to disclose fair values of assets and liabilities by levels. Level 1 fair value estimates are quoted prices from identical assets or liabilities in active markets. Level 2 fair value estimates are based on identical assets or liabilities in inactive markets, comparable assets or liabilities in active markets, or a valuation technique using market observables. Level 3 fair value estimates are based on firm-generated, unobservable inputs. Because investors may perceive Level 3 fair values to be the least reliable (due to the increased potential for measurement error), Song et al. (2010) hypothesize and find the value relevance of Level 3 fair values is less than that of Level 1 and Level 2 fair values.

A potential implication of firms providing CAE disclosures is that investors may perceive financial statement items with a CAE disclosure as less reliable. In fact, this concern was voiced in many companies' comment letters regarding SEC's initial proposed rule. For example, Lockheed Martin Corporation stated:¹⁹

¹⁹ Source: <http://www.sec.gov/rules/proposed/s71602/bhalla1.htm>

“A sensitivity analysis will put management in the position of being second guessed. Having to continually explain to shareholders and analysts why a certain estimate was not used distracts users from understanding management's actual decision. Further, analysts could use other amounts included in the range of reasonably possible amounts to create financial information which would reflect different conclusions than management's. Finally, the use of such a range could be interpreted as acknowledgement of possible inaccuracies in a registrant's financial statements, and result in concerns about the credibility of financial statements, thereby exacerbating the current general lack of confidence in financial reporting.”

The comment illustrates how CAE disclosures, by conveying information about the amount of potential estimation error or inaccuracy inherent in the accrual measurement process, could potentially provide an indication of reliability in certain accrual estimates. To the extent investors perceive balance sheet items with a CAE disclosure to be less reliable, the value relevance of those balance sheet items is predicted to be reduced. This argument is consistent with the notion that Bayesian investors will rationally place less weight on information that has more estimation error (Francis et al. 2007). Another reason why the value relevance of a balance sheet item would be negatively associated with the presence of a CAE disclosure is that the presence of a disclosure merely confirms investors' prior beliefs about estimation error. This point is important because a negative association between the value relevance of a balance sheet item and the presence of a CAE disclosure does not imply that these disclosures are informative.

It is also possible that CAE disclosures have no impact on the value relevance of balance sheet items if investors ignore the disclosures. In its comment letter criticizing the rule, Deloitte voiced this concern:²⁰

²⁰ Source: <http://www.sec.gov/rules/proposed/s71602/touche1.htm>

"For many companies implementation of the proposed rule would result in a vast amount of additional, detailed information. This would result in numerous additional pages of disclosure in MD&A for many companies. This "disclosure overload" could make it more difficult for investors to focus on the arguably more important disclosures about material events and changes, trends, demands, commitments, events, and uncertainties. Many investors already confess that annual reports and MD&A are currently so long and complex that they do not read or understand the information, so a significant expansion of MD&A with excessive detail would not seem consistent with these investors' concerns. MD&A has become so lengthy that the Commission is even considering a proposal for a summary of MD&A."

The comment suggests investors may ignore the disclosures. If this happens, I expect the value relevance of a balance sheet item to be unrelated to the presence of a CAE disclosure. This leads to my first hypothesis (stated in null and alternative form):

H1₀: The value relevance of a balance sheet item is not associated with the presence of a related CAE disclosure.

H1_A: The value relevance of a balance sheet item is negatively associated with the presence of a related CAE disclosure.

CAE disclosures indicate uncertainty arising from measurement imprecision in firms' accounting systems, and are also likely related to firms' business models and operating environments because these are primary determinants of whether an account is subject to more uncertainty in the accrual measurement process. For example, retail firms with significant receivables face more uncertainty in estimating uncollectible accounts than cash-only businesses. Furthermore, retail firms with receivables relating to high credit risk customers face more uncertainty in estimating uncollectible accounts than retail firms with receivables relating to low credit risk customers. If there is greater variation in the collectability of accounts receivable in volatile sales environments (e.g.

due to changes in the credit risk associated with customers), then higher sales volatility will result in less precise historical accounts receivable collection rates and will induce even more uncertainty in estimating uncollectible accounts. Because CAE disclosures may capture both accounting system uncertainty and inherent uncertainty arising from firms' operating environments or business models, it is possible that CAE disclosures merely confirm what investors already knew from assessing firms' business models and operating environments. The issue of whether CAE disclosures alter investors' perceptions of estimation error is explored in subsequent robustness tests.

An implicit assumption in this study is that firms with greater accrual estimation error arising from uncertainty in their accrual measurement processes truthfully report CAE disclosures. Whether an account is accompanied by a CAE disclosure is the phenomenon of interest in this study. However, because some may view CAE disclosures as a managerial choice, in subsequent robustness tests I acknowledge this view and attempt to mitigate concerns about selectivity bias.

Hypothesis 1 considers whether CAE disclosures partially explain the value relevance of balance sheet items *on average*. But if investors weigh information with more estimation error to a lesser extent (Francis et al. 2007), the value relevance reduction should increase with the magnitude of the estimation error measured by the total dollar amount of earnings sensitivity disclosed. This leads to my second hypothesis (stated in alternative form):

H2: The negative association between the value relevance of a balance sheet item and the presence of a related CAE disclosure is more pronounced when the total dollar amount of earnings sensitivity disclosed is greater.

Value relevance may be unrelated to CAE disclosures if investors ignore the sensitivities. As Deloitte asserted, investors may not understand or may ignore the information contained in CAE disclosures as disclosures become more detailed. Deloitte advised the SEC that companies should emphasize no more than 3 to 5 critical accounting estimates to avoid overly detailed disclosures.²¹ If investors tend to ignore CAE disclosures as disclosure complexity increases, then the negative relation between the value relevance of a balance sheet item and the presence of a CAE disclosure is predicted to become less pronounced as the total number of CAE disclosures a firm makes increases. This leads to my third hypothesis (stated in alternative form):

H3: The negative association between the value relevance of a balance sheet item and the presence of a related CAE disclosure is less pronounced when the number of sensitivity disclosures provided is greater.

2.3. CAE Disclosures and the Usefulness of Accruals

An important feature of accrual accounting is that it allows for the recognition of revenues and expenses both before and after the associated cash inflow and cash outflow. This attribute of accrual accounting attenuates the timing and mismatching problems inherent in cash flows. Because accruals incorporate managers' estimates of future cash inflows and outflows, accrual-based earnings and its components are generally better than operating cash flows at providing financial statement users with useful information in their assessment of the amounts, timing, and uncertainty of firms' future cash flows (FASB 1978, 2010).

²¹ Source: <http://www.sec.gov/rules/proposed/s71602/touche1.htm>

Several studies confirm the FASB's assertion that accrual-based earnings and its components exhibit more predictive ability with respect to future cash flows than operating cash flows. Dechow (1994) shows accrual-based earnings captures firm performance, as reflected in current stock returns, better than operating cash flows. The ability of accrual-based earnings to reflect firm performance is increasing in the degree of firms' potential timing and mismatching problems (i.e. firms with more volatile operating, investing, and financing activities and firms with longer operating cycles). Dechow et al. (1998) investigate the ability of earnings, compared to operating cash flows, to forecast future operating cash flows. They find that accruals add predictive value incremental to current operating cash flows when forecasting future operating cash flows. Decomposing total accruals into its components adds predictive value incremental to both current operating cash flows and total accruals when forecasting future operating cash flows (Barth et al. 2001). This result implies aggregate accruals masks the different information contained in accrual components with respect to future cash flows.

The above findings suggest that accruals generally have a positive net effect in aiding users' assessments of future cash flows. However, the usefulness of accruals in making cash flow assessments diminishes when the accrual estimation process is subject to greater measurement difficulty (Lev et al. 2010).²² Measurement difficulty is likely greater for accrual estimates relating to accounts subject to more uncertainty, which may be determined by firms' business models and operating environments.

²² The usefulness of accruals is also compromised when managers use accrual estimates to opportunistically manipulate (i.e. intentionally bias) earnings in order to obfuscate underlying firm performance (Badertscher et al. 2011).

Consistent with the notion that accrual estimation error is higher when firms operate in volatile environments, Dechow and Dichev (2002) show firm accrual quality (i.e. the extent to which current accruals map into past, present, and future operating cash flows) is decreasing in sales volatility and accrual volatility. Dechow and Dichev (2002) measure firm accrual quality as the standard deviation of the residuals from a firm-level regression of current working capital accruals on previous, current, and future operating cash flows. Lev et al. (2010) examine whether accrual categories more susceptible to unreliable estimates aid in the prediction of future cash flows. The authors argue accruals can be decomposed into accruals largely unaffected by estimates (i.e. non-inventory working capital items) and accruals affected by estimates (i.e. all other accruals). They show accruals affected by estimates do not improve the prediction of cash flows beyond the information contained in operating cash flows and accruals unaffected by estimates. While the authors employ a fairly simple approach to determine which accruals are affected by estimates, their results suggest accruals more susceptible to unreliable estimates are less useful for forecasting future cash flows.

If CAE disclosures identify accrual estimates that contain a higher degree of estimation error due to uncertainty in the measurement process, then accrual estimates in the presence of a CAE disclosure ($Accrual_Estimate_{CAE, t}$) should exhibit higher variance than accrual estimates in the absence of a CAE disclosure ($Accrual_Estimate_{Non-CAE, t}$). This argument can be represented as follows:

$$Accrual_Estimate_{CAE, t} \sim N(\mu, \sigma_{CAE})$$

$$Accrual_Estimate_{Non-CAE, t} \sim N(\mu, \sigma_{Non-CAE})$$

$$\text{where } \sigma_{Non-CAE} < \sigma_{CAE}$$

Assuming managers are not intentionally manipulating accrual estimates in the presence of a CAE disclosure, $Accrual_Estimate_{CAE, t}$ does not exhibit more bias than $Accrual_Estimate_{Non-CAE, t}$, but it does exhibit more variance. A potential consequence of this difference is that accruals in the presence of a CAE disclosure will exhibit a diminished predictive value with respect to future cash flows and greater noise in the mapping between accruals and past, current, and future cash flows.

Conversely, the existence of a CAE disclosure may have no impact on the usefulness of accruals. CAE disclosures provide the hypothetical current earnings effect if future cash flow realizations differ from the assumptions and estimates imbedded in current period accruals. This point is made by Best Buy in its CAE disclosure for 2004:²³

“We do not believe there is a reasonable likelihood that there will be a material change in the future estimates or assumptions we use to calculate our inventory loss reserve. However, if our estimates regarding physical inventory losses are inaccurate, we may be exposed to losses or gains that could be material. A 10% difference in actual physical inventory losses reserved for at February 26, 2005, would have affected net earnings by approximately \$5 million for the fiscal year ended February 26, 2005.”

Whether Best Buy’s inventory reserve is a less predictive (or noisier) estimate of actual physical inventory losses is an empirical question. To the extent that CAE disclosures are purely hypothetical examples, accrual estimates in the presence of a CAE disclosure will not be distinctly different than accrual estimates in the absence of a CAE disclosure, and I expect the usefulness of accruals to be unrelated to whether accruals have a CAE disclosure. This leads to my fourth hypothesis (stated in null and alternative form):

²³ Source: BEST BUY CO INC, 10-K, May 10, 2005

- H4₀:** The incremental predictive ability of accruals with respect to future cash flows and accrual noise are unrelated to the presence of a CAE disclosure.
- H4_A:** The incremental predictive ability of accruals with respect to future cash flows (accrual noise) is negatively (positively) associated with the presence of a CAE disclosure.

CHAPTER 3: SAMPLE SELECTION AND DESCRIPTIVE STATISTICS

3.1 Sample Selection

The initial sample comprises of 339 S&P 500 firms from 2004, and includes years 2004 to 2009 for these firms.²⁴ Limiting the sample to S&P 500 firms provides a comprehensive set of firms while also making the data collection process manageable. I exclude firms in the financial services industry (four-digit SIC code: 6000-6999), utilities industry (four-digit SIC code: 4900-4949), and non-classifiable firms (four digit SIC code: 9900-9999). Because firms in these industries have unique accrual estimates, excluding these industries ensures more commonality in the information provided in firms' CAE disclosures. I also exclude acquired firms to provide a stable sample and firms with missing Compustat or CRSP data used in the empirical analyses. This process provides a sample of 2,033 firm-year observations (339 firms) from 2004 to 2009.

Rather than inspect each 10-K for every firm-year, I use the following procedure to collect CAE disclosure data.²⁵ First, I examine the 10-Ks for all 339 firms in 2004 to identify firms with a CAE disclosure. Second, I examine the 2010 10-Ks for the same 339 firms in order to confirm (1) whether 2004 disclosing firms still disclose in 2010, and (2) whether 2004 non-disclosing firms also do not disclose in 2010. If new disclosure is identified for a firm in 2010, I inspect the firm's 10-Ks from 2004 to 2010 to see when

²⁴ The sample period begins in 2004 because the SEC's guidance became effective in December 2003. Starting the sample period in 2004 ensures that firms' CAE disclosures are standardized according to the SEC's guidance. I exclude from my analysis CAE disclosures provided by firms after the SEC proposed its initial rule on the issue in 2002.

²⁵ CAE disclosures are provided in firms' annual reports, thus, the data collection process focuses on the 10-K, not the 10-Q.

this CAE disclosure started.²⁶ If a disclosure is not found in 2010 but was present in 2004, I inspect the firm's 10-Ks from 2004 to 2010 to see when this CAE disclosure ceased.²⁷ This approach will not capture firms that are non-disclosers in 2004 and 2010 but disclosers in 2005-2009, a pattern that is likely to be rare. Consistent with this assertion, I find that only 3.4 percent of disclosing firm-years (36 out of 1,061) during the 2005-2009 period involve a switch from non-disclosing status to disclosing status (refer to Panel E of Table C2).

For each CAE disclosure I identify the financial statement account associated with the disclosure. For 2004, I also obtain the total dollar amount of earnings sensitivity disclosed in firms' CAE disclosures. The following normalization process is used to express the CAE earnings effects in a comparable manner. For firms disclosing a percent change sensitivity in an underlying dollar amount (e.g. see the Baker Hughes example in Appendix A), the disclosed earnings effect is adjusted to 10 percent. For firms disclosing a basis point change sensitivity in an underlying percent or rate (e.g. see the Abbott Laboratories example in Appendix A), the disclosed earnings effect is adjusted to a 100 basis point change.²⁸ The earnings effects firms disclose are primarily on a pre-tax basis.

²⁶ These firms could be 2004 non-disclosing firms that become disclosing firms during the 2005-2010 period or 2004 disclosing firms that begin to make a new type of disclosure.

²⁷ These firms are 2004 disclosing firms that stop making a particular type of disclosure or stop disclosing all together.

²⁸ I normalize the earnings effects according to which disclosure format is used, and I only normalize within a disclosure format, not across different disclosure formats. Firms also disclosed earnings sensitivity analyses using a one year change in depreciable lives or given a "reasonably possible" change in an underlying estimate. The earnings effects given within these disclosure formats are already comparable, so normalization is not applied. The phrase "reasonably possible" is used to describe future events or transactions that have a more than remote but less than likely chance of occurring, which implies reasonably possible events or transactions are less likely than probable events or transactions. This definition of "reasonably possible" is consistent with SFAS No. 5 (SEC May 2002).

After-tax earnings effects are adjusted to before-tax earnings effects by dividing by 1 minus the statutory tax rate (35%).

3.2 Descriptive Statistics

Panel B of Table C1 reports the annual CAE disclosure rates for non-pension CAEs, pension CAEs, and either type.²⁹ The non-pension CAE disclosure rate is 20.5 percent. Panel B also reports that the disclosure rates are monotonically increasing for both non-pension CAEs and pension CAEs from 2004 to 2009. From the time the SEC issued its guidance in December 2003 to 2009, the disclosure rate for non-pension CAEs increased by 35 percent and the disclosure rate for pension CAEs increased by 20 percent. Another important message from Panel B is that the disclosure rates for pension CAEs are approximately double the disclosure rates for non-pension CAEs. A possible explanation for this pattern is the fact that the SEC explicitly mentioned in its guidance that the assumed long-term rate of return on pension assets is a critical accounting estimate that may require a CAE disclosure. Firms may be providing only pension CAE disclosures as a way to achieve minimum compliance with the SEC's guidance. Panel C of Table C1 reports the total dollar amount of CAE earnings sensitivity disclosed for 2004. The median per share pre-tax dollar amount of firms' non-pension (pension) CAE earnings sensitivity for 2004 was \$0.12 (\$0.18).

²⁹ Examining the Schedule II for the 60 firms providing a CAE disclosure in 2004 reveals that CAE disclosures may convey information about accrual estimates that is incremental to the information included in the Schedule II. Over half of my sample firms providing a CAE disclosure for inventory in 2004 did not reconcile the inventory reserve account in the Schedule II or in the footnote disclosures. The rate at which firms reconcile liabilities in the Schedule II is even lower. Less than 20 percent of the 60 sample firms that provided a non-pension CAE disclosure included any liability in the Schedule II.

Reported non-pension CAEs involve the following balance sheet items: gross property, plant, and equipment (*PPEGROSS*), accumulated depreciation, depletion, and amortization (*ADPAMT*), inventory (*INV*), accounts receivable (*AR*), intangible assets (*INTAN*), deferred tax assets (*DTAL*), and other liabilities (*OTHERLIABILITY*). Because firms' balance sheets do not provide line item amounts for many of the liabilities pertaining to CAEs, I group liabilities excluding debt, accounts payable, deferred tax liabilities, and taxes payable associated with CAEs into *OTHERLIABILITY*. Appendix A provides examples of CAE disclosures for each category. Panel D of Table C1 reports the annual disclosure rates for non-pension CAEs by each category. The disclosure rates are relatively constant during the sample period for most categories. Two exceptions are the decrease in CAE disclosures relating to *ADPAMT* and the increase in CAE disclosures relating to *OTHERLIABILITY*.

As mentioned above, the non-pension CAE disclosure rate is approximately 20 percent. Since CAE disclosures are mandated by the SEC if an accounting estimate is deemed "critical," the CAE disclosure rate implies that while all firms comply with the CAE disclosure requirement, only about 20 percent of firm-years have accounting estimates that are deemed by management to be material and highly uncertain. One way to empirically validate whether account materiality is related to CAE disclosure rates is to test whether account-specific CAE disclosure rates are positively associated with the magnitude of the account. While not all accounts related to CAE disclosures are disclosed separately in the financial statements and footnotes (e.g. accrued expenses and inventory reserves), data is available for the allowance for uncollectible accounts (*UNCOLLECT*),

accumulated depreciation, depletion, and amortization (*ADPAMT*), and the projected benefit obligation (*PBO*).

Panel A of Table C2 reports the mean and median values for *UNCOLLECT*, *ADPAMT*, and *PBO* according to whether a related CAE disclosure is present. Panel A of Table C2 shows that the mean and median values for *UNCOLLECT*, *ADPAMT*, and *PBO* are significantly greater when a related CAE disclosure is present. For example, *UNCOLLECT* has a mean of \$0.25 per share for firm-years that provide a CAE disclosure relating to accounts receivable, which is significantly greater than the mean of \$0.12 per share for firm-years that do not provide such a disclosure. This result suggests that account materiality is one factor contributing to cross-sectional differences in whether a firm provides a CAE disclosure. Firms' business models and industry membership are also likely to play a role in whether they provide a CAE disclosure. Panels B and C report CAE disclosure rates by industry. The results are consistent with CAE disclosure rates varying predictably with the industries where the account is more likely to be a critical estimate. For example, retail firms exhibit the highest CAE disclosure rate for inventory estimates and transportation firms exhibit the highest CAE disclosure rate for depreciation estimates.

Other aspects of firms' business models, such as credit policies, likely play a role in whether an accounting estimate is "critical." A simple anecdotal example, while not generalizable, provides insight on how business model differences are related to CAE disclosures. Panel D of Table C2 compares the credit card policies and CAEs relating to the allowance for doubtful accounts between two retailers: GAP and Nordstrom. GAP does not own the accounts issued under its credit card programs and any losses for

uncollectible accounts are absorbed by the third party that finances the cards. However, Nordstrom owns its own private label credit card and absorbs the losses resulting from uncollectible accounts. As a result of differences in the firms' business models, Nordstrom faces more uncertainty when estimating the allowance for doubtful accounts than GAP. This results in Nordstrom providing a CAE disclosure relating to the allowance for doubtful accounts, while GAP does not.

This example and the univariate statistics suggest accounting estimate uncertainty and materiality partially explain why not all firms provide a CAE disclosure. Furthermore, evidence from examining SEC comment letters suggests that the SEC was attentive to any non-compliance with the CAE disclosure requirement. Consistent with the SEC enforcing CAE disclosure requirements, Cassell, Dreher, and Myers (2011) find that 29 percent of comment letters issued from the SEC from 2004 to 2008 involve 10-K disclosures of "Critical accounting policies and estimates" as the comment topic. While Cassell et al. (2011) do not separately examine comment topics relating to critical accounting policies versus critical accounting estimates, their result is consistent with firms' CAE disclosure practices receiving scrutiny from the SEC. As a result, firms likely expected SEC enforcement and complied with the CAE disclosure requirements.

Further examination of CAE disclosure rates also supports this conjecture. Firms that begin providing a CAE disclosure during 2005-2009, as opposed to the firms that began providing a CAE disclosure during 2004 immediately following the SEC guidance, are more likely to have delayed compliance with the CAE disclosure requirement. However, I find that only 36 firm-years switched from non-disclosing status in the prior year to disclosing status in the current year, which accounts for less than 5 percent of the

total sample of 1,061 disclosing firm-years. In other words, less than 5 percent of the disclosing firm-years in my sample represent a potential delay in compliance. Other possible reasons for firms providing new CAE disclosures after 2004 include the occurrence of specific transactions (e.g. location closings) or business model changes (e.g. creating a wholly owned credit card program).

The SEC likely issues comment letters to firms not complying with the CAE disclosure requirement. I examine whether SEC comment letters relating to CAE disclosures (*COMMENT LETTER*) are associated with a firm becoming a newly disclosing firm (*NEW DISCLOSER*). The results reported in Panel E of Table C2 are consistent with newly disclosing firms being more likely to receive a comment letter from the SEC in the prior year. Firms that receive a comment letter are significantly more likely to begin providing CAE disclosures. However, SEC comment letters explain a minority of new disclosures. Only 19.4 percent of newly disclosing firms (7 of 36) received an SEC comment letter. Taken together, the preceding analysis is consistent with firms complying with the CAE disclosure requirement during my sample period, in part due to SEC enforcement, and is inconsistent with CAE disclosures being a managerial choice. Nevertheless, in subsequent robustness tests I conduct my value relevance analysis within the sample of disclosing firm-years, which mitigates concerns about selectivity bias.

Next, I examine the mean disclosure rates for each category of CAE disclosure, which are reported in Panel A of Table C3. *DISCLOSE_PENSION* takes on a value of one for firm-years providing a CAE disclosure associated with the projected benefit obligation (*PBO*), zero otherwise. Because pension CAE disclosures relate to off-balance

sheet items (i.e. *PBO*), I do not consider them to be associated with equity book value (*BVE*). It is important to note that while the projected benefit obligation (*PBO*) and fair value of plan assets (*FVPA*) are off-balance-sheet accounts, a portion of firms' pension resources and obligations may be recognized on the balance sheet via the minimum pension liability or pension funded status.³⁰ Since the projected benefit obligation (*PBO*) and fair value of plan assets (*FVPA*) are included as control variables and implicitly include the on-balance-sheet portion of pension resources and obligations, the balance sheet items are adjusted to avoid double-counting the recognized pension asset or liability in my subsequent value relevance analysis. Specifically, recognized pension assets and liabilities are subtracted from equity book value (*BVE*), recognized pension assets are subtracted from other assets (*OTHERASSETS*), and recognized pension liabilities are subtracted from other liabilities (*OTHERLIABILITY*).

For firm-years providing any non-pension CAE disclosure *DISCLOSE_BVE* equals one, zero otherwise. I further decompose non-pension CAE disclosures based on the related balance sheet account and code an indicator variable one if the firm makes a CAE disclosure for that account. *DISCLOSE_OTHERLIABILITY* (mean = 0.111) is the largest category of non-pension disclosures, encompassing liabilities such as accrued expenses and unearned revenue. Accounts receivable (mean *DISCLOSE_AR* = 0.073) and accumulated depreciation, depletion, and amortization (mean *DISCLOSE_ADPMAT* =

³⁰ SFAS No. 87 required firms to recognize a minimum pension liability to the extent that the accumulated benefit obligation exceeds the fair value of plan assets. SFAS No. 158 required firms to recognize the pension funded status (i.e. the difference between *PBO* and *FVPA*) on the balance sheet for fiscal years ending after 12/15/06.

0.051) sensitivities are disclosed more frequently than those for other non-pension, balance sheet accounts.

CHAPTER 4: RESULTS

4.1 Tests of Hypothesis I

The cross-sectional equity valuation framework outlined in Landsman (1986) and Barth (1991, 1994) is used to assess the value relevance of balance sheet items.³¹ This framework derives from the notion that the accounting book values of assets and liabilities provide information to investors about the market values of those assets and liabilities, and thus serve as link between accounting numbers and firm market value (Holthausen and Watts 2001). The framework expresses market value of equity as equal to net assets (i.e. book-value of equity (*BVE*)) or equal to the sum of the asset and liability components of book value of equity. Because CAE disclosures relate to specific assets and liabilities, I decompose equity book value (*BVE*) into its specific asset and liability components as shown in Equation (1b). This provides the following baseline equations estimated in the value relevance tests:

$$MVE_{it} = \gamma_0 + \gamma_1 BVE_{it} + \gamma_2 NI_{it} + \gamma_3 MTB_{it} + \gamma_4 PBO_{it} + \gamma_5 FVPA_{it} + \varepsilon_{it} \quad (1a)$$

$$\begin{aligned} MVE_{it} = & \alpha_0 + \alpha_1 PPEGROSS_{it} + \alpha_2 ADPAMT_{it} + \alpha_3 INV_{it} + \alpha_4 AR_{it} + \\ & \alpha_5 INTAN_{it} + \alpha_6 INVEST_{it} + \alpha_7 CASH_{it} + \alpha_8 OTHERASSET_{it} + \\ & \alpha_9 DTAL_{it} + \alpha_{10} DEBT_{it} + \alpha_{11} AP_{it} + \alpha_{12} TP_{it} + \\ & \alpha_{13} OTHERLIABILITY_{it} + \alpha_{14} NI_{it} + \alpha_{15} MTB_{it} + \alpha_{16} PBO_{it} + \\ & \alpha_{17} FVPA_{it} + \varepsilon_{it} \end{aligned} \quad (1b)$$

³¹ Holthausen and Watts (2001) refer to this specification as the balance sheet model. They note that the balance sheet model holds only if any existing rents (e.g. a competitive advantage that allows a firm to earn a positive abnormal return) can be sold separately from the firm (e.g. the competitive advantage is in the form of a patent). If the existing rents cannot be sold separately from the firm (e.g. the competitive advantage is in the form of unrecognized goodwill), then market equity value exceeds book equity value, which will result in a nonzero intercept in the balance sheet model. Consistent with the balance sheet model omitting variables that influence price, previous studies find a nonzero intercept when estimating the model (e.g. Barth 1994; Choi et al. 1997). Holthausen and Watts (2001) also note that if the amounts implicit in market equity values are equivalent to the accounting book values for equity, assets, and liabilities (i.e. accounting measurements represent the true economic value without error or bias), then the valuation coefficient would equal 1 for the book value of equity and the book value of asset components and equal -1 for the book value of contra-asset and liability components.

The dependent variable, *MVE*, is market value of equity four months after fiscal year end. This ensures annual report data (including CAE disclosures) are available to the market. Variable definitions are provided in the List of Abbreviations. Per share data are used in my value relevance tests to reduce heteroskedasticity. To remove the effects of outliers, I remove observations with a studentized residual greater than 2 in the estimation of the equity valuation equations (e.g. Belsley et al. 1980; Fox 1991). Equations (1a) and (1b) are based on a valuation model that expresses firm market value as a function of firm book value and has been used in prior research (e.g. Barth 1991; Barth 1994). However, there are other firm attributes, such as growth prospects (e.g. Modigliani and Miller 1961) and expected abnormal earnings (e.g. Ohlson 1995; Feltham and Ohlson 1995), that are key determinants of firm market value. To incorporate these other determinants of firm market value, I include measures of growth expectations (*MTB*) and profitability (*NI*) in year t in my value relevance tests. I expect both *MTB* and *NI* to exhibit a positive relation with equity market values.³² I also control for the value relevance of firms' projected benefit obligations (*PBO*) and fair value of pension plan assets (*FVPA*). Panel B of Table C3 reports differences in the mean and median values of the regression variables between firm-years that have a non-pension CAE disclosure and firm-years that do not have this type of CAE disclosure. Disclosing firm-years generally exhibit greater book values of assets and liabilities than non-disclosing firm-years.

The coefficient on *BVE* is expected to be positive in Equation (1a). In Equation (1b), the coefficients on the asset components (i.e. *PPEGROSS*, *INV*, *AR*, *INTAN*,

³² Because *MTB* is a scaled version of the independent variable in the balance sheet model, in untabulated sensitivity analyses I replace *MTB* with its lagged value and my inferences are unchanged.

OTHERASSET, and *DTAL*) are expected to be positive, and the coefficients on contra-asset or liability components (i.e. *ADPAMT*, *DEBT*, *AP*, *TP*, and *OTHERLIABILITY*) are expected to be negative. Except for the valuation coefficient on *TP*, which is insignificantly different from zero, the regression results for Model 1 in Panels A and B of Table C4 confirm these expectations.

To test whether and how the value relevance of a balance sheet item is associated with the presence of a CAE disclosure, I add interaction terms to Equations (1a) and (1b) indicating whether the balance sheet item has a related CAE disclosure. I interact *BVE* in Equation (1a) and *PPEGROSS*, *ADPAMT*, *INV*, *AR*, *INTAN*, *DTAL*, and *OTHERLIABILITY* in Equation (1b) with an indicator variable that denotes whether the balance sheet item has a related CAE disclosure. Specifically, I include *BVE*DISCLOSE_BVE* in Equation (1a) and the *PPEGROSS*DISCLOSE_PPEGROSS*, *ADPAMT*DISCLOSE_ADPAMT*, *INV*DISCLOSE_INV*, *AR*DISCLOSE_AR*, *INTAN*DISCLOSE_INTAN*, *DTAL*DISCLOSE_DTAL*, and *OTHERLIABILITY*DISCLOSE_OTHERLIABILITY* in Equation (1b). Since the propensity to provide a non-pension CAE disclosure is likely related to whether the firm provides a pension CAE disclosure (*DISCLOSE_PENSION*). While the focus of this study is on the value relevance of balance sheet items, for completeness I also add an interaction term indicating whether the projected benefit obligation (*PBO*) has a CAE disclosure.³³

CAE disclosures explicitly highlight the uncertainty associated with various assets and liabilities, but CAE disclosures also indirectly highlight uncertainty in earnings

³³ My results are unchanged if I exclude this interaction.

because earnings essentially represents the change in the asset and liability accounts. Since the presence of a CAE disclosure (pension or non-pension related) also indicates uncertainty in earnings, I include $NI*DISCLOSE_NI$ in Equations (1a) and (1b). CAE disclosures also indicate uncertainty in the market-to-book ratio (MTB) because it is an accounting-based signal of firms' growth prospects, so I also include the $MTB*DISCLOSE_BVE$ in Equations (1a) and (1b).

If investors ignore CAE disclosures, or if CAE disclosures are inconsistent with investors' beliefs about estimation error, then I expect the interaction terms to be insignificantly different from zero. Alternatively, if investors perceive balance sheet items in the presence of a CAE disclosure to have greater estimation error and less reliability, or if CAE disclosures confirm investors' prior beliefs about estimation error, then the valuation coefficients on the interaction terms should exhibit the opposite sign of the valuation coefficient on the associated balance sheet item. That is, coefficients for equity book value and asset interactions should be negative and coefficients for liability and contra-asset interactions should be positive. I also expect the coefficients on the net income and market-to-book interactions to be negative if investors perceive them have greater estimation error and less reliability in the presence of a CAE disclosure.

The regression results for Equation (1a) and Equation (1b) are reported in Table C4. The results generally provide support for Hypothesis 1. In Panel A of Table C4, which reports the regression results for Equation (1a), the valuation coefficient on BVE is significantly positive and the valuation coefficient on the interaction term for BVE is significantly negative. The valuation coefficients on the interaction terms for NI and MTB

are also significantly negative.³⁴ The regression results for Model 3 in Panel A of Table C4 indicate that investors capitalize equity book value into price at a rate of 1.016 per dollar of equity book value when a firm does not make a CAE disclosure. When a firm does make a CAE disclosure the capitalization rate decreases to 0.719, a decrease of about 25 percent.

Consistent with Hypothesis 1, the valuation coefficients on the interaction terms for *INV*, *AR*, and *INTAN* in Panel B of Table C4 are significantly negative, and the valuation coefficient on the interaction term for *OTHERLIABILITY* is significantly positive. The valuation coefficients on the interaction terms for *PPEGROSS*, *ADPAMT*, and *DTAL* are insignificantly different from zero. The valuation coefficients on the interaction terms for *NI* and *MTB* continue to be significantly negative.³⁵ Examining the regression results for Model 3 in Panel B of Table C4 reveals that investors capitalize accounts receivable into price at a rate of 1.233 per dollar of accounts receivable when there is no associated CAE disclosure, but this rate decreases by nearly half to 0.707 when there is a CAE disclosure. The results in Table C4 are consistent with investors perceiving financial statement amounts to have lower value relevance when accompanied

³⁴ Table C4 reports a significantly negative coefficient on the interaction term for *PBO*. This result is inconsistent with Hypothesis 1 because it implies the value relevance of *PBO* is positively associated with the presence of a pension CAE disclosure. There are two possible explanations for this peculiar result. First, due to the non-linear relation between the discount rate and the *PBO*, the net effect on the *PBO* of a possible basis point change in the discount rate is positive. That is, the incremental increase in the present value of future benefit obligations resulting from a basis point decrease in the discount rate is greater than the incremental decrease in the present value of future benefit obligations resulting from a basis point increase in the discount rate. The incrementally negative coefficient could reflect this positive net effect. Second, although some pension CAE disclosures relate to the discount rate component of the *PBO*, the expected rate of return, which does not directly impact the *PBO* or the *FVPA*, is also a common source of uncertainty mentioned in pension CAE disclosures. Since the expected rate of return, and its uncertainty, is reflected in unrecognized gains and losses, the incrementally negative coefficient could reflect additional off-balance-sheet liabilities.

³⁵ The valuation coefficient on the interaction term for *PBO* also continues to be negative.

by an account-specific CAE disclosure. One explanation is that investors perceive balance sheet items in the presence of a related CAE disclosure to have greater estimation error, and thus less reliability.

The above finding suggests that CAE disclosures matter to investors' pricing decisions, which is the primary result of this study. However, it is still unclear as to what information, if any, CAE disclosures provide to capital market participants. While CAE disclosures may alter investors' perceptions of estimation error, it could be the case that CAE disclosures merely confirm what investors already knew about estimation error just by observing firms' operating environments. To provide evidence on this issue, subsequent robustness tests in Section 4.4 examine (1) whether the pricing of CAE disclosures changes between the pre- and post-disclosure periods and (2) whether CAE disclosures are associated with operating uncertainty. First, I find that the reduced value relevance result is only present in the post-disclosure period, which is consistent with CAE disclosures providing information about estimation error to investors. I also find that operating uncertainty (measured as cash flow volatility) is unrelated to whether a firm provides a CAE disclosure, which is inconsistent with CAE disclosures only capturing information about operating uncertainty. Together, these results suggest CAE disclosures provide information to investors about the previously unobservable estimation error inherent in accrual-based accounting systems, rather than only innate operating uncertainty.

4.2 Tests of Hypothesis 2 and Hypothesis 3

The results thus far indicate that, on average, balance sheet items in the presence of a related CAE disclosure are perceived to be less reliable by investors. To investigate

whether the magnitude of estimation error disclosed and the complexity of the CAE disclosure play a part in determining how investors incorporate the information in these disclosures into their valuation decisions, I estimate the following equation:

$$\begin{aligned} MVE_{it} = & \lambda_0 + \lambda_1 BVE_{it} + \lambda_2 NI_{it} + \lambda_3 MTB_{it} + \lambda_4 PBO_{it} + \lambda_5 FVPA_{it} + \\ & \lambda_6 DISCLOSE_BVE_{it} + \lambda_7 BVE_{it} * DISCLOSE_BVE_{it} + \\ & \lambda_8 AMOUNT_{it} + \lambda_9 BVE_{it} * DISCLOSE_BVE_{it} * AMOUNT_{it} + \\ & \lambda_{10} NUMBER_{it} + \lambda_{11} BVE_{it} * DISCLOSE_BVE_{it} * NUMBER_{it} + \varepsilon_{it} \end{aligned} \quad (2)$$

Since I have earnings sensitivity data for only 2004 at the time of this writing, Equation (2) is estimated for a subsample of observations from 2004. *AMOUNT* is the normalized total after-tax dollar amount of earnings sensitivity reported during 2004 in firms' non-pension CAE disclosures, scaled by shares outstanding. Panel A of Table C3 reports that the median of *AMOUNT* is 0.079. *NUMBER* equals the total number of non-pension CAE disclosures a firm provides in a given year. The mean *NUMBER* of non-pension CAE disclosures is 1.53 and the maximum is 4. Both *AMOUNT* and *NUMBER* are set to zero for non-disclosing firms.

Table C5 provides the regression results for Equation (2). In Panel A, the valuation coefficient on the *AMOUNT* interaction term is significantly negative, which is consistent with H2 and suggests that the negative influence CAE disclosures have on investors' reliability perceptions is more pronounced in instances where the disclosure portrays a large magnitude of estimation error. Inconsistent with H3, the valuation coefficient on the *NUMBER* interaction term is insignificantly different from zero in Panel A. However, the coefficient on the *NUMBER* interaction term is significantly positive in Panel B of Table C5, which suggests that the insignificant result in Panel A is likely due to a decrease in the magnitude of the coefficient, rather than an increase in the

standard error of the variable. Panel B of Table C5 replaces *AMOUNT* with *HIGHAMOUNT*, which is an indicator variable equal to 1 if *AMOUNT* is above the 75th (0.209), zero otherwise. I use the 75th percentile cutoff in order to capture instances where the magnitude of disclosed estimation error is large. The valuation coefficient on the interaction term for *HIGHAMOUNT* is significantly negative. Also, the valuation coefficient on the *NUMBER* interaction term is significantly positive in Panel B, which is consistent with H3 and suggests that the negative influence CAE disclosures have on investors' reliability perceptions is less pronounced in instances where the disclosure is more complex.

4.3 Tests of Hypothesis 4

To corroborate my value relevance findings, I examine whether and how the presence of a CAE disclosure is associated with accounting-based characteristics of accruals. This analysis also sheds light on whether investors are misinterpreting CAE disclosures, which was a concern voiced in the SEC comment letters. Following Dechow et al. (1998), I estimate the following equations to test whether and how the presence of a CAE disclosure is associated with the predictive value of accruals with respect to future cash flows:

$$CFO_{it+1} = \beta_0 + \beta_1 CFO_{it} + \varepsilon_{it} \quad (3a)$$

$$CFO_{it+1} = \alpha_0 + \alpha_1 CFO_{it} + \alpha_2 EARN_{it} + \varepsilon_{it} \quad (3b)$$

In the above equations, *CFO* is operating cash flows and *EARN* is earnings before extraordinary items and discontinued operations. All variables are scaled by average total assets. Complete variable definitions are available in the List of Abbreviations. Equation (3a) explains future operating cash flows using only current operating cash flows.

Equation (3b) explains future operating cash flows using both current operating cash flows and current earnings. Any difference in the ability of Equation (3b) to explain future operating cash flows compared to Equation (3a) is attributable to the accrual portion of current earnings (Dechow et al. 1998). Prior research suggests Equation (3b) should exhibit greater predictive value when forecasting future cash flows than Equation (3a) because accruals include estimates of future cash flows (Dechow 1994; Dechow et al. 1998). However, estimation error arising from uncertainty in the accrual measurement process will reduce the incremental predictive value of accruals. To the extent that the presence of a CAE disclosure indicates instances where accrual estimates have greater variance due to more estimation error in the accrual measurement process, Equation (3b) may not exhibit a greater ability to forecast future cash flows. That is, given the average positive relation between future cash flows and current earnings captured by α_2 , assessing future cash flows using earnings with more volatile accrual estimates will result in a reduced ability to accurately predict future cash flows.

Table C6 reports the regression results from estimating Equation (3a) and Equation (3b). The regression results reported in Table C6 confirm that the coefficients on *CFO* and *EARN* are statistically positive, which is consistent with the predictive relation between future cash flows and current cash flows or current accruals being positive on average. To determine whether accruals add incremental predictive value, I examine the mean change in the absolute value of the residuals from Equation (3a) to Equation (3b). Table C6 reports the mean change in the absolute value of the residuals for several subsamples. The mean change in the absolute value of the residuals is significantly negative for firms and firm-years without a CAE disclosure, which is

consistent with accruals having positive incremental predictive value in the absence of a CAE disclosure.³⁶ The mean change in the absolute value of the residuals is insignificantly different from zero for firms with a CAE disclosure, but significantly negative for firm-years with a CAE disclosure. These results provide mixed evidence on whether accruals exhibit incremental predictive value in the presence of a CAE disclosure. To investigate this issue further, I also examine whether the incremental predictive value of accruals depends on the importance (i.e. materiality) of the accounts relating to the CAE disclosures.

If increased accrual estimation error in the presence of a CAE disclosure results in accruals that are less useful in predicting future cash flows, then accruals should exhibit a decreased predictive value in the presence of a CAE disclosure, especially when CAE disclosures highlight estimation error in accounts that are important enough to have a material impact on the usefulness of accruals. For disclosing firm-years, I define *CAE_ACCOUNTIMPORTANCE* as the sum of the average of the beginning and ending account balances in year t for which a firm provides a CAE disclosure multiplied by 1 percent, scaled by the absolute value of earnings in year t .³⁷ This specification reflects the sensitivity of earnings to a 1 percent change in CAE accounts, which is a straight-

³⁶ Because the usefulness of accruals is likely a firm characteristic, I report results according to whether a firm-year has a CAE disclosure and according to whether a firm has at least one CAE disclosure during the sample period.

³⁷ *CAE_ACCOUNTIMPORTANCE_t* equals $0.01 * (\text{Avg. } PPEGROSS_t * \text{DISCLOSE_PPEGROSS}_t + \text{Avg. } ADPAMT_t * \text{DISCLOSE_ADPAMT}_t + \text{Avg. } INV_t * \text{DISCLOSE_INV}_t + \text{Avg. } AR_t * \text{DISCLOSE_AR}_t + \text{Avg. } INTAN_t * \text{DISCLOSE_INTAN}_t + \text{Avg. } DTA_t * \text{DISCLOSE_DTAL}_t + \text{Avg. } OTHERLIABILITY_t * \text{DISCLOSE_OTHERLIABILITY}_t)$, scaled by the absolute value of *EARN_t*. Average account values are computed as the sum of the beginning balance in year t and the ending balance in year t , divided by two. Non-deflated continuous variables are used in the definition of *CAE_ACCOUNTIMPORTANCE*.

forward extension of the CAE disclosure format. Disclosing firm-years with values above the 75th percentile of this variable are considered to have CAE disclosures that highlight accrual estimation error in accounts that are important enough to have a material impact on the usefulness of accruals. Table C6 reports that the mean change in the absolute value of the residuals is insignificantly different from zero for a subsample of disclosing firm-years with *CAE_ACCOUNTIMPORTANCE* above the 75th percentile. Overall, these results are consistent with Hypothesis 4 and suggest accruals have a reduced incremental predictive value for firms with a CAE disclosure and firm-years with a CAE disclosure, but only when CAE disclosures relate to accounts that are important.

Although the above findings are consistent with Hypothesis 4, I also test whether and how the presence of a CAE disclosure is associated with accrual noise. I estimate the following Dechow and Dichev (2002) model:

$$\Delta WC_{it} = \alpha_0 + \alpha_1 CFO_{t-1} + \alpha_2 CFO_t + \alpha_3 CFO_{t+1} + \varepsilon_t \quad (4)$$

I estimate Equation (4) by firm over the sample period of 2004-2009, which provides six observations per firm. ΔWC is the change in working capital, defined as the change in non-cash current assets minus the change in non-debt current liabilities, and CFO is operating cash flows.³⁸ All variables are scaled by average total assets. Complete variable definitions are available in the List of Abbreviations. Following Dechow and Dichev (2002), I define accrual noise as the inverse precision in the mapping between

³⁸ This definition of working capital accruals is consistent with Francis et al. (2005, 2007), Chen et al. (2007), and Core et al. (2008). Following Hribar and Collins (2002) and Ball and Shivakumar (2006), in untabulated sensitivity analyses I re-estimate Equation (4) after (1) measuring working capital accruals off the statement of cash flows and (2) including an indicator variable for an economic loss (i.e. $CFO_t < 0$) and its interaction with CFO_t . After re-estimating Equation (4), untabulated results indicate that consistent with Hypothesis 4 (1) the absolute value of the residuals and (2) the standard deviation of the residuals are significantly greater for firms with a non-pension CAE disclosure than for firms without a non-pension CAE disclosure.

accruals and cash flows, which can be measured as (1) the absolute value of the residuals (i.e. a firm-year measure) from estimating Equation (4) or (2) the standard deviation of the residuals (i.e. a firm measure) from estimating Equation (4).

Panel A of Table C7 reports the results from estimating Equation (4). Consistent with previous research (e.g. Dechow and Dichev 2002), the coefficient on past and future operating cash flows is positive and the coefficient on current operating cash flows is negative. Panel B of Table C7 defines accrual noise as the absolute value of the residuals from estimating Equation (4). Panel C of Table C7 defines accrual noise as the standard deviation of the residuals over a three-year period (i.e. standard deviation of ϵ_{it-1} , ϵ_{it} , ϵ_{it+1}) from estimating Equation (4). To the extent that the presence of a CAE disclosure indicates instances where accrual estimates have greater variance due to more estimation error in the accrual measurement process, accrual noise should be greater in the presence of a CAE disclosure. With the exception of the insignificant difference in the median accrual noise between firm-years with a CAE disclosure and firm-years without a CAE disclosure, Table C7 reports that accrual noise is generally greater in firms and firm-years with a CAE disclosure, which is consistent with Hypothesis 4.

Since the Dechow and Dichev (2002) model provides a measure of accrual noise within working capital accruals, accrual noise should be greater in the presence of a CAE disclosure relating to a working capital account such as inventory, accounts receivable, or other liabilities. Consistent with this notion, Table C7 reports that accrual noise is greater in firm-years with a working capital CAE disclosure compared to firm-years without a working capital CAE disclosure. Table C7 also reports differences in accrual noise within disclosing firm-years. Construction of *CAE_WC_ACCOUNTIMPORTANCE* is

similar to the construction of *CAE_ACCOUNTIMPORTANCE*, but focuses on working capital accounts. It is the sum of the average working capital account balances in year t for which a firm provides a CAE disclosure multiplied by 1 percent, scaled by the absolute value of earnings in year t .³⁹ Table C7 reports that accrual noise is greater for disclosing firm-years with CAE disclosures that relate to highly important working capital accounts (i.e. *CAE_WC_ACCOUNTIMPORTANCE* above the 75th percentile) than accrual noise for disclosing firm-years with CAE disclosures that do not relate to highly important working capital accounts (i.e. *CAE_WC_ACCOUNTIMPORTANCE* below the 75th percentile). This result suggests that the positive association between accrual noise and the presence of a CAE disclosure is more pronounced when the working capital account is important enough to materially impact the mapping between accruals and cash flows.

Overall, the results reported in Table C6 and Table C7 are consistent with CAE disclosures actually indicating instances of greater estimation error in the accrual measurement process, which results in accruals that are less useful in assessing cash flows. These results corroborate my value relevance findings, which suggest investors' perceive balance sheet items with a related CAE disclosure to be less reliable. It seems that investors are not misinterpreting CAE disclosures.

³⁹ *CAE_WC_ACCOUNTIMPORTANCE*, equals $0.01 * (\text{Avg. } INV_t * \text{DISCLOSE_INV}_t + \text{Avg. } AR_t * \text{DISCLOSE_AR}_t + \text{Avg. } INTAN_t * \text{DISCLOSE_INTAN}_t + \text{Avg. } OTHERLIABILITY_t * \text{DISCLOSE_OTHERLIABILITY}_t)$, scaled by the absolute value of *EARN_t*. Average account values are computed as the sum of the beginning balance in year t and the ending balance in year t , divided by two. Non-deflated continuous variables are used in the definition of *CAE_WC_ACCOUNTIMPORTANCE*.

4.4 Other Analyses

4.4.1 Within Disclosing Firm-Years Analysis

To ensure differences in firm attributes, unrelated to accrual estimation error, between disclosing firms and non-disclosing firms are not driving my value relevance results, I re-estimate Model 2 in Panel B of Table C4 within a sample of 416 firm-years that provide a non-pension CAE disclosure (i.e. *DISCLOSE_BVE* = 1).⁴⁰ By removing non-disclosing firm-years from the sample, this analysis exploits variation in the types of CAE disclosures to test Hypothesis 1 and mitigates concerns about selectivity bias. Table C8 reports the regression results from this analysis, and the results remain consistent with Hypothesis 1. The valuation coefficients on the interaction terms for *INV*, *AR*, *INTAN*, and *DTAL* are significantly negative, and the valuation coefficients on the interaction terms for *ADPAMT* and *OTHERLIABILITY* are significantly positive. It appears omitted variables that are correlated with the presence of any type of non-pension CAE disclosure are not driving the results in Panel B of Table C4.⁴¹

4.4.2 Pre-Disclosure versus Post-Disclosure Periods Analysis

While my findings provide insight on how this new disclosure practice potentially influences the interaction between relevance and reliability within the accrual

⁴⁰ I exclude the interaction between *PBO* and *DISCLOSE_PENSION* from this analysis because I remove firm-years that have pension CAE disclosure but do not have a non-pension CAE disclosure. Following Belsley et al. (1980) and Fox (1991), I remove 17 outlier observations that have a studentized residual greater than 2, which reduces the sample used in this analysis from 416 to 399 observations from 2004 to 2009.

⁴¹ If the presence of a particular non-pension CAE disclosure (as opposed to any type) is correlated with some firm characteristic unrelated to accrual estimation error that is also inducing a negative relation between balance sheet items and price, then this analysis does not mitigate this issue.

measurement process, it remains unclear how the initiation of this disclosure practice impacted investors' reliability perceptions. On one hand, investors could have always perceived balance sheet items with a CAE disclosure to be less reliable. On the other hand, the emergence of this new disclosure practice in the early 2000s could have negatively altered investors' perceptions of reliability.

My findings up to this point in this study do not address whether CAE disclosures altered the perceptions of capital market participants. I estimate my value relevance analysis in both the pre-disclosure and post-disclosure periods to provide some insight on whether CAE disclosures are priced differently between these two time periods. Specifically, I estimate Equation (1b) for the period prior to the SEC's first consideration of a CAE disclosure requirement. In the six-year pre-disclosure period (1996-2001), I code the indicator variables indicating whether a balance sheet item has a related CAE disclosure as equal to the indicator variables in the six-year post-disclosure period (2004-2009). This process assumes the firm-year CAE disclosures in the pre-disclosure period (1996-2001) match the eight-year-ahead firm-year CAE disclosures in the post-disclosure period (2004-2009).

The pre-disclosure period consists of 1,857 firm-years from 1996 to 2001 for the original 339 sample firms.⁴² The post-disclosure period consists of 2,033 firm-years from 2004 to 2009 and represents the sample used throughout this study. I also adjust the sample in the post-disclosure period to reflect a balanced sample comparison between the pre- and post- disclosure periods. If a firm has missing data in the pre-disclosure period,

⁴² Firm-years from 2002 and 2003 are excluded from this analysis because firms may have been complying with a rule proposed by the SEC that called for CAE disclosures (SEC May 2002).

then the eight-year-ahead firm-year is deleted during the post-disclosure period. This alternative post-disclosure period sample consists of 1,857 firm-years from 2004 to 2009.

Table C9 reports the regression results for the pre-disclosure and post-disclosure periods. Within the full post-disclosure period sample, the valuation coefficients on the interaction terms for *INTAN*, *INV* and *AR*, *NI*, and *MTB* are significantly negative, and the valuation coefficient on the interaction term for *OTHERLIABILITY* is significantly positive. Within the reduced post-disclosure period sample, the valuation coefficients on the interaction terms for *INV* and *AR*, and *MTB* are significantly negative, and the valuation coefficients on the interaction terms for *ADPAMT* and *OTHERLIABILITY* are significantly positive. If accrual estimation error is a relatively stable firm characteristic and investors are able to assess estimation error prior to the existence of CAE disclosures, then the valuation coefficients on the interaction terms should be similar between the pre-disclosure and post-disclosure periods. However, none of the valuation coefficients on the interaction terms are statistically significant in the predicted direction during the pre-disclosure period. The results in Table C9 are consistent with account-specific CAE disclosures reducing investors' reliability perceptions of the related balance sheet item.

4.4.3 CAE Disclosures: Accounting System Error versus Innate Operating Uncertainty

Reported accounting numbers (Y) represent some unobservable primitive construct (X) with error (ε). This definition of reported accounting numbers can be characterized as follows:

$$\text{Reported Accounting Number } (Y) = \text{Primitive Construct } (X) + \varepsilon$$

The reported accounting number (Y) represents an accounting signal such as assets, liabilities, or earnings, and the primitive construct (X) represents an underlying

economic attribute such as resources, obligations, or performance. Accounting system estimation error (ε) represents the inability of firms' accounting signals (Y) to perfectly capture the underlying economic attributes (X) due to the imprecise estimates and judgments inherent in accrual-based accounting systems.

CAE disclosures indicate uncertainty associated with a reported accounting number ($\sigma^2(Y)$), which is an increasing function of both accounting system uncertainty ($\sigma^2(\varepsilon)$) and inherent operating uncertainty arising from firms' operating environments or business models ($\sigma^2(X)$). As a result, it is unclear *ex ante* whether CAE disclosures provide information about accounting system uncertainty or operating uncertainty. However, the results from the pre- versus post-disclosure period analysis in Table C9 suggest that CAE disclosures are providing at least some information about accounting system uncertainty to investors.

Because innate operating uncertainty arises from volatility in firms' operating environments, it is possible that investors are able to partially assess firms' operating uncertainty. If CAE disclosures provided information only about firms' innate operating uncertainty, then the disclosures would duplicate the information already available to investors and the value relevance effect would be present in both the pre- and post-disclosure periods, but this is not the case. The results in Table C9 suggest CAE disclosures influence how investors price reported accounting numbers in the post-disclosure period only, which is consistent with CAE disclosures informing investors about previously unobservable accounting estimation error. Of course, this interpretation hinges on the assumption that investors are better able to observe firms' operating uncertainty compared to firms' accounting system measurement error. It is also possible

that firms' operating uncertainty is not observable. In this case, the results from the pre-versus post-disclosure period analysis do not disentangle whether CAE disclosures capture information about operating uncertainty, accounting system measurement error, or both.

I also test the issue of whether CAE disclosures capture information about innate operating uncertainty more directly. Using cash flow volatility (SD_CFO) to serve as a proxy for innate operating uncertainty, I examine the differences in cash flow volatility between the pre- and post-disclosure periods for disclosing firms and the differences in cash flow volatility between disclosing and non-disclosing firms during the post-disclosure period. The results from this analysis are reported in Table C10. I find that cash flow volatility actually decreased from the pre-disclosure period to the post-disclosure period for disclosing firms, which is inconsistent with the emergence of CAE disclosures being associated with a simultaneous increase in operating uncertainty. I also find no significant difference in cash flow volatility between disclosing and non-disclosing firms, which is inconsistent with CAE disclosures solely capturing innate operating uncertainty. These results suggest CAE disclosures likely provided at least some information to investors about the estimation errors inherent in firms' accounting systems.

4.4.4 Controlling for the Effects of Industry Membership and Economic Downturns

Industry characteristics and the overall economic climate are both plausible determinants of the amount of estimation error imbedded in financial statement amounts. For example, the retail sector will likely have more estimation error associated with estimating inventory valuation and shortage reserves than other industries, and this effect

would be more pronounced during economic downturns. The CAE disclosure rates actually confirm this notion. Certain CAE disclosures are more likely to be present in certain industries (e.g. firms in the retail sector have more inventory CAE disclosures) and the disclosure rates, especially for working capital accounts, were highest during the 2007-2009 recession.

To ensure that the negative association between the value relevance of a financial statement item and the presence of a related CAE disclosure is not being driven by either firms' industry membership or economic downturns, the models in Table C9 include controls for industry fixed effects and whether the economy is in a recession. I include industry fixed effects for the following industry divisions: Agriculture, Forestry, and Fishing (2-digit SIC codes 01-09), Mining (2-digit SIC codes 10-14), Construction (2-digit SIC codes 15-17), Manufacturing (2-digit SIC codes 20-38), Transportation, Communications, Electric, Gas, and Sanitary Services (2-digit SIC codes 40-49), Wholesale Trade (2-digit SIC codes 50-51), Retail Trade (2-digit SIC codes 52-59), and Services (2-digit SIC codes 70-89). I also include *RECESSION* as an additional control variable to capture whether the firm-year ends during a recession (i.e. 2001 or 2007-2009). The regression results reported in Table C9 are robust to controlling for industry and recessionary effects, which suggests that CAE disclosures are not merely capturing information about industry characteristics and economic cycles.

CHAPTER 5: CONCLUSION

This study tests whether and how the value relevance of balance sheet items is associated with the presence of a related CAE disclosure. Firms began providing CAE disclosures in the early 2000s after the SEC called on firms to provide a quantitative sensitivity analysis outlining the earnings effects of reasonably likely changes in uncertain accounting estimates. Consistent with CAE disclosures indicating instances of greater estimation error arising from uncertainty in the accrual measurement process, the value relevance of balance sheet items is negatively associated with the presence of a related CAE disclosure. I also examine two accounting-based characteristics of useful accounting information and find accruals exhibit a reduced incremental predictive value with respect to future cash flows and greater noise in the presence of a CAE disclosure. Together, these results are inconsistent with concerns voiced to the SEC that investors would misinterpret these disclosures as an indication of a lack of credibility in financial reporting.

Other findings indicate that characteristics of CAE disclosures influence the negative association between the value relevance of a balance sheet item and the presence of a related CAE disclosure. The negative association between the value relevance of a balance sheet item and the presence of a related CAE disclosure is more pronounced when the total dollar amount of earnings sensitivity disclosed is greater and less pronounced when the total number of disclosures a firm makes is greater. These results imply the negative influence CAE disclosures have on investors' perceptions of reliability is increasing in the magnitude of disclosed estimation error and decreasing in the complexity of the disclosure.

Overall, my findings provide insight on how this new disclosure practice influences the interaction between relevance and reliability within the accrual measurement process. Investors perceive balance sheet items with a CAE disclosure to be less reliable, but only in the post-disclosure period. It seems that CAE disclosures altered investors' perceptions of reliability and the disclosures did not merely confirm what investors already knew. However, my findings are subject to an important caveat. The sample used in this study includes non-financial and non-utilities companies in the S&P 500 and the results may not generalize to smaller, more regulated firms.

APPENDIX A:
EXAMPLES OF CAE DISCLOSURES

EXAMPLES OF CAE DISCLOSURES

Variable	10-K Excerpt	Source
<i>DISCLOSE_PPEGROSS</i>	In respect to the wireless assets, a hypothetical 10% increase or decrease in the current cost factors would have changed the impairment charge by \$17 million. Also relative to the wireless assets, a hypothetical 100 basis point change in the discount factors related to physical deterioration, functional obsolescence and economic obsolescence would have changed the impairment charge by \$10 million.	QWEST COMMUNICATIONS INTERNATIONAL INC, 10-K, February 18, 2005
<i>DISCLOSE_ADPAMT</i>	To the extent that Microelectronics' actual useful lives differ from management's estimates by 10 percent, consolidated net income in 2005 would have been an estimated \$48 million higher if the actual lives were longer than the estimates and an estimated \$59 million lower if the actual lives were shorter than the estimates (based upon 2005 results).	INTERNATIONAL BUSINESS MACHINES CORP, 10-K, February 28, 2006
<i>DISCLOSE_ADPAMT</i>	If the estimated useful lives of all depreciable assets were increased by one year, annual depreciation expense would decrease by approximately \$43 million. If the estimated useful lives of all depreciable assets were decreased by one year, annual depreciation expense would increase by approximately \$45 million.	UNION PACIFIC CORP, 10-K, February 23, 2007
<i>DISCLOSE_INV</i>	As a measure of sensitivity, for every 1% of additional inventory valuation allowance at December 31, 2009 we would have recorded an additional cost of sales of approximately \$23 million.	AMAZON COM INC, 10-K, January 29, 2010
<i>DISCLOSE_INV</i>	For fiscal 2009, a 100 basis point change in total vendor funds earned, including advertising allowances, with no offsetting changes to the base price on the products purchased, would impact gross profit by 10 basis points...As of February 28, 2009, each 25 basis point change in the estimated inventory shortages would impact the allowances for inventory shortages by approximately \$13.	SUPERVALU INC, 10-K, April 28, 2009

<i>DISCLOSE_AR</i>	A five percent change in the allowance for doubtful accounts would have had a pre-tax impact of approximately \$2.6 million in 2005.	BAKER HUGHES INC, 10-K, March 01, 2006
<i>DISCLOSE_AR</i>	A significant estimate in the McGraw-Hill Education segment, and particularly within the Higher Education, Professional and International Group (“HPI”), is the allowance for sales returns, which is based on the historical rate of return and current market conditions. Should the estimate for the HPI Group vary by one percentage point, it would have an approximate \$11.3 million impact on operating profit.	MCGRAW-HILL COMPANIES INC, 10-K, February 29, 2008
<i>DISCLOSE_AR</i>	A change of 5% in the estimated sell-through levels by our wholesaler customers and in the estimated wholesaler inventory levels would have an effect on our reserve balance of approximately \$11 million.	MYLAN INC., 10-K, February 24, 2011
<i>DISCLOSE_INTAN</i>	An impairment charge of \$1,420 million was recorded in 2004. Had we used a discount rate of 12%, the impairment charge would have been approximately \$90 million lower. Had we used a discount rate of 13%, the impairment charge would have been approximately \$80 million higher.	CORNING INC /NY, 10-K, February 22, 2005
<i>DISCLOSE_DTAL</i>	The effect of a change in the valuation allowance is reported in the current period tax expense. A 1% point increase (decrease) in the Company’s effective tax rate would have decreased (increased) net income by approximately \$15.	AIR PRODUCTS & CHEMICALS INC /DE/, 10-K, November 26, 2008
<i>DISCLOSE_DTAL</i>	We believe that our estimates for the uncertain tax positions and valuation allowances against the deferred tax assets are appropriate based on current facts and circumstances. A 5 percent change in the amount of the uncertain tax positions and the valuation allowance would result in a change in net income of approximately \$78 million and \$26 million, respectively.	LILLY ELI & CO, 10-K, February 29, 2008
<i>DISCLOSE_OTHERLIABILITY</i>	A 10% change in the sales return reserve would have had a \$4 impact on our net earnings for the year ended January 31, 2009.	NORDSTROM INC, 10-K, March 23, 2009

<i>DISCLOSE_OTHERLIABILITY</i>	a 10% variance in the workers' compensation and general liability reserves at year-end 2008 would have affected net income by approximately \$14 million.	J C PENNEY CO INC, 10-K, March 31, 2009
<i>DISCLOSE_OTHERLIABILITY</i>	To the extent that our actual systems warranty costs differed from our estimates by 5 percent, consolidated pre-tax income would have increased/decreased by approximately \$10.0 in 2006.	EMC CORP, 10-K, February 27, 2007
<i>DISCLOSE_OTHERLIABILITY</i>	A one-percentage point increase in the percentage of rebates to related gross sales would decrease net sales and operating earnings by approximately \$109 million in 2005.	ABBOTT LABORATORIES, 10-K, February 22, 2006
<i>DISCLOSE_OTHERLIABILITY</i>	A 10% change in our self-insured liabilities at February 26, 2005, would have affected net earnings by approximately \$5 million for the fiscal year ended February 26, 2005.	BEST BUY CO INC, 10-K, May 10, 2005
<i>DISCLOSE_OTHERLIABILITY</i>	If the environmental reserve balance were to either increase or decrease based on the factors mentioned above, the amount of the increase or decrease would be immediately recognized in earnings. For example, if the reserve balance were to decrease by 10 percent, Occidental would record a pre-tax gain of \$42 million. If the reserve balance were to increase by 10 percent, Occidental would record an additional remediation expense of \$42 million.	OCCIDENTAL PETROLEUM CORP /DE/, 10-K, March 01, 2006
<i>DISCLOSE_OTHERLIABILITY</i>	A 10% change in our closed property reserves at September 28, 2008, would have affected net income by approximately \$4.0 million for fiscal year 2008.	WHOLE FOODS MARKET INC, 10-K, November 26, 2008
<i>DISCLOSE_OTHERLIABILITY</i>	In addition, if future evidence indicates that the costs of performing services under these contracts are incurred on other than a straight-line basis, the timing of revenue recognition under these contracts could change. A 10% change in the amount of revenue recognized in 2009 under these contracts would have affected net earnings by approximately \$9 million.	LOWES COMPANIES INC, 10-K, March 30, 2010

<i>DISCLOSE_PENSION</i>	<p>Our pension expense is sensitive to changes in our estimate of discount rate. Holding other assumptions constant, for a 100 basis point reduction in the discount rate, annual pension expense would increase by approximately \$19.4 million before taxes. Holding other assumptions constant, for a 100 basis point increase in the discount rate, annual pension expense would decrease by approximately \$19.2 million before taxes...Our pension expense is sensitive to changes in our estimate of expected rate of return on plan assets. Holding other assumptions constant, an increase or decrease of 100 basis points in the expected rate of return on plan assets would increase or decrease annual pension expense by approximately \$7.7 million before taxes.</p>	FMC TECHNOLOGIES INC, 10-K, March 01, 2007
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APPENDIX B: EXCERPT FROM FR-72

FR-72 specifically states the following:

“A company should address specifically why its accounting estimates or assumptions bear the risk of change. The reason may be that there is an uncertainty attached to the estimate or assumption, or it just may be difficult to measure or value. Equally important, companies should address the questions that arise once the critical accounting estimate or assumption has been identified, by analyzing, to the extent material, such factors as how they arrived at the estimate, how accurate the estimate/assumption has been in the past, how much the estimate/assumption has changed in the past, and whether the estimate/assumption is reasonably likely to change in the future. Since critical accounting estimates and assumptions are based on matters that are highly uncertain, a company should analyze their specific sensitivity to change, based on other outcomes that are reasonably likely to occur and would have a material effect. Companies should provide quantitative as well as qualitative disclosure when quantitative information is reasonably available and will provide material information for investors.

For example, if reasonably likely changes in the long-term rate of return used in accounting for a company's pension plan would have a material effect on the financial condition or operating performance of the company, the impact that could result given the range of reasonably likely outcomes should be disclosed and, because of the nature of estimates of long-term rates of return, quantified” (SEC 2003).

While the phrase “reasonably likely” was not explicitly defined in FR-72, the SEC indicated in an earlier interpretive release that the “reasonably likely” disclosure threshold is lower than the “more likely than not” (i.e. greater than 50 percent likelihood) disclosure threshold (SEC January 2002). Because of the subjectivity involved in determining what constitutes a reasonably likely change in an accounting estimate, the SEC considered (but did not follow through on) implementing a specified percentage increase or decrease, such as 10 percent, for firms to assume when determining a reasonably likely change (SEC May 2002). The SEC’s use of the phrase “reasonably likely” in FR-72 suggests the SEC may have intended for firms to provide a confidence interval for critical accounting estimates. However, firms do not make such a probability judgment in their disclosures. Instead, firms’ CAE disclosures provide pre-specified changes (e.g. a 10 percent change or a 1 basis point change) in estimates deemed to be critical.

APPENDIX C:
TABLES

Table C1: Sample and Disclosure Frequency*Panel A: Sample Used in Analyses*

	Firms	Firm-years
Initial S&P 500 Sample for 2004-2010	460	3,220
Financial services firms (four-digit SIC code: 6000-6999)	(72)	(504)
Utilities firms (four-digit SIC code: 4900-4949)	(40)	(280)
Non-classifiable firms (four digit SIC code: 9900-9999)	(3)	(21)
Firms acquired during 2004-2010	(6)	(42)
Firms with missing 2010 Compustat data	0	(1)
Data collection sample	339	2,372
Firms with missing 2011 Compustat or CRSP data ^a	0	(339)
Final sample used in empirical analysis	<u>339</u>	<u>2,033</u>

Panel B: Frequency of CAE Disclosures by Year

Year	Number of	Firms Making a CAE Disclosure					
		Type = Non-Pension		Type = Pension		Type = Either	
		N	%	N	%	N	%
2004	339	60	17.70	127	37.46	154	45.43
2005	339	64	18.88	139	41.00	168	49.56
2006	339	65	19.17	140	41.30	173	51.03
2007	339	71	20.94	145	42.77	182	53.69
2008	339	75	22.12	150	44.25	190	56.05
2009	338	81	23.96	153	45.27	194	57.40
	<u>2033</u>	<u>416</u>	<u>20.46</u>	<u>854</u>	<u>42.01</u>	<u>1061</u>	<u>52.19</u>

Table C1 Continued

Panel C: Total Dollar Amount of Earnings Sensitivity Reported during 2004

	Non-Pension CAE Disclosures (N=60)			Pension CAE Disclosures (N=127)		
	Scaled by Shares		Scaled by Pretax Income	Scaled by Shares		Scaled by Pretax Income
	\$ (in Millions)	Outstanding	\$ (in Millions)	Outstanding		
Before Tax Effect:						
Mean	325.771	0.363	0.244	141.181	0.522	0.152
Median	34.850	0.122	0.038	50.900	0.182	0.054
After Tax Effect:						
Mean	211.751	0.236	N/A	91.768	0.340	N/A
Median	22.653	0.079	N/A	33.085	0.118	N/A

Panel D: Number of Non-Pension CAE Disclosures Provided (by Year)

Year	Total	Frequency by Category (as a % of Total)						
		PPEGROSS	ADPAMT	INV	AR	INTAN	DTAL	OTHERLIABILITY
2004	60	1.7%	28.3%	13.3%	35.0%	5.0%	18.3%	51.7%
2005	64	0.0%	28.1%	15.6%	35.9%	3.1%	21.9%	50.0%
2006	65	0.0%	26.2%	13.8%	35.4%	1.5%	21.5%	53.8%
2007	71	1.4%	23.9%	16.9%	36.6%	2.8%	21.1%	53.5%
2008	75	1.3%	22.7%	16.0%	36.0%	5.3%	20.0%	54.7%
2009	81	1.2%	21.0%	18.5%	35.8%	6.2%	19.8%	59.3%
	416	1.0%	24.8%	15.9%	35.8%	4.1%	20.4%	54.1%

Table C1 Continued

^aBecause Compustat and CRSP data for 2011 was not available at the time of this writing, all 339 observations for 2010 are excluded from the analysis. 2011 data is required because my empirical analyses include lead variables.

Note: Panel A outlines the sample selection process. The initial sample of firms consists of firms on the S&P 500 for 2004 and includes years 2004-2010 for these firms. The initial sample of firms was identified from Compustat ExecuComp as firms with an SP CODE equal to 'SP' for 2004. Panel B outlines the disclosure rate for CAE disclosures by year. Disclosing firms are identified as firms making at least one CAE disclosure. Disclosure rates are provided for non-pension disclosures, pension disclosures, and either non-pension or pension disclosures. Panel C outlines the total dollar amount of earnings sensitivity reported in firms' CAE disclosures for 2004. In order to express the earnings effects provided by firms in a comparable format, I normalize the earnings effects according to which disclosure format is used. Firms provided earnings effects in CAE disclosures according to one of the following four formats: (1) earnings effect given a percent change in an underlying dollar amount (e.g. see the Baker Hughes example in Appendix A), (2) earnings effect given a basis point change in an underlying percent or rate (e.g. see the Abbott Laboratories example in Appendix A), (3) earnings effect given a one year change in depreciable lives, and (4) earnings effect given a "reasonably possible" change in an underlying estimate. The earnings effects given in disclosure formats (3) and (4) are already provided on a comparable basis, so a normalization procedure was not applied to earnings effects given in these formats. However, a normalization procedure was applied to earnings effects given in disclosure formats (1) and (2). Earnings effects given in disclosure format (1) are adjusted to an earnings effect given a 10 percent change in an underlying dollar amount. For example, the earnings effect given a 5 percent change in an underlying dollar amount is multiplied by 2. Earnings effects given in disclosure format (2) are adjusted to an earnings effect given a 100 basis point change in an underlying percent or rate. For example, the earnings effect given a 50 basis point change in an underlying percent or rate was multiplied by 2. The earnings effects provided by firms are made primarily on a pre-tax basis. Out of the 60 non-pension disclosing firms for 2004, 15 (49) firms provided at least one after-tax (before-tax) earnings effect. Out of the 127 pension disclosing firms for 2004, 6 (123) firms provided at least one after-tax (before-tax) earnings effect. After-tax earnings effects are adjusted to before-tax earnings effects by dividing by 0.65 (i.e. 1 minus the 35% statutory tax rate). Before-tax earnings effects are adjusted to after-tax earnings effects by multiplying by 0.65. Panel D outlines the yearly disclosure rates for non-pension CAE disclosures provided by disclosing firms. The categories of non-pension CAE disclosures are the following: gross property, plant, & equipment, depreciation, depletion, & amortization, inventory, accounts receivable, intangible assets, deferred tax assets, and other liabilities. Appendix A provides examples for each category of non-pension CAE disclosure.

Table C2: Cross-Sectional Differences in CAE Disclosure Frequencies

Panel A: Account Magnitudes and CAE Disclosure Frequencies

	<u><i>UNCOLLECT</i></u>	
	<u>Mean</u>	<u>Median</u>
Firm-years with <i>DISCLOSE_AR</i> = 0 (N = 1,884)	0.118	0.047
Firm-years with <i>DISCLOSE_AR</i> = 1 (N = 149)	0.245	0.150
Difference	0.127 ***	0.103 ***
Two-sided p-value	<0.001	<0.001
	<u><i>ADPAMT</i></u>	
	<u>Mean</u>	<u>Median</u>
Firm-years with <i>DISCLOSE_ADPMAT</i> = 0 (N = 1,179)	9.599	5.339
Firm-years with <i>DISCLOSE_ADPMAT</i> = 1 (N = 854)	18.265	18.450
Difference	8.666 ***	13.111 ***
Two-sided p-value	<0.001	<0.001
	<u><i>PBO</i></u>	
	<u>Mean</u>	<u>Median</u>
Firm-years with <i>DISCLOSE_PENSION</i> = 0 (N = 1,179)	1.740	0.000
Firm-years with <i>DISCLOSE_PENSION</i> = 1 (N = 854)	13.128	5.833
Difference	11.388 ***	5.833 ***
Two-sided p-value	<0.001	<0.001

Table C2 Continued

Panel B: Frequency CAE Disclosures by Industry Division

<u>Industry Division</u>	<u>N</u>	<u>Disclosure Frequency</u>	
		<u>Type = Non-Pension</u>	<u>Type = Pension</u>
Agriculture, Forestry, and Fishing	6	0.0%	100.0%
Mining	132	28.0%	32.6%
Construction	36	5.6%	2.8%
Manufacturing	1,151	15.5%	52.6%
Transportation, Communications, Electric, Gas, and Sanitary Services	138	37.0%	57.2%
Wholesale Trade	48	37.5%	29.2%
Retail Trade	246	29.7%	22.4%
Services	276	20.7%	18.5%

Panel C: Frequency CAE Disclosures by Industry Division (by Account Category)

<u>Industry Division</u>	<u>N</u>	<u>Disclosure Frequency by Account Category</u>						
		<u>PPEGROSS</u>	<u>ADPAMT</u>	<u>INV</u>	<u>AR</u>	<u>INTAN</u>	<u>DTAL</u>	<u>OTHERLIABILITY</u>
Agriculture, Forestry, and Fishing	6	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Mining	132	0.0%	13.6%	0.0%	4.5%	0.0%	9.1%	14.4%
Construction	36	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.6%
Manufacturing	1,151	0.0%	3.4%	2.0%	6.2%	0.7%	3.3%	8.3%
Transportation, Communications, Electric, Gas, and Sanitary Services	138	0.7%	31.9%	0.0%	8.7%	5.1%	10.1%	5.1%
Wholesale Trade	48	0.0%	0.0%	0.0%	29.2%	0.0%	14.6%	18.8%
Retail Trade	246	1.2%	0.0%	16.7%	4.5%	0.8%	0.8%	22.0%
Services	276	0.0%	0.7%	0.7%	12.7%	0.0%	4.3%	14.1%

Table C2 Continued

Panel D: Anecdotal Example: GAP Inc. and Nordstrom Inc.

GAP Inc.: DISCLOSE_AR = 0

Discussion of Credit Card Policy:

We have credit card agreements (the “Agreements”) with third parties to provide our customers with private label credit cards and/or co-branded credit cards (collectively, the “Credit Cards”). Each private label credit card bears the logo of one of our brands and can be used at any of our U.S. or Canadian store locations and online. The co-branded credit card is a VISA credit card bearing the logo of one of our brands and can be used everywhere VISA credit cards are accepted. A third-party financing company is the sole owner of the accounts issued under the Credit Card programs, and this third party absorbs the losses associated with non-payment by the cardholder and a portion of any fraudulent usage of the accounts. We receive cash from the third-party financing company in accordance with the Agreements and based on usage of the Credit Cards. We also receive cash from Visa U.S.A. Inc. in accordance with the Agreements and based on specified transactional fees. We recognize income for such cash receipts when the amounts are fixed or determinable and collectibility is reasonably assured, which is generally the time at which the actual usage of the Credit Cards or specified transaction occurs. The income is recorded in other income, which is a component of operating expenses in our Consolidated Statements of Income.

Discussion of Critical Accounting Estimates Relating to the Allowance for Doubtful Accounts:

None

Source: GAP INC, 10-K, March 26, 2010

Table C2 Continued*Panel D Continued***Nordstrom Inc.: DISCLOSE_AR = 1****Discussion of Credit Card Policy:**

Our Credit segment includes our wholly owned federal savings bank, Nordstrom fsb, through which we offer a private label card, two Nordstrom VISA credit cards and a debit card for Nordstrom purchases. The credit and debit cards feature a shopping-based program designed to increase customer visits and spending. Although the primary purpose of our Credit business is to foster greater customer loyalty and drive more sales, we also generate revenues through finance charges and other fees on these cards.

Discussion of Critical Accounting Estimates Relating to the Allowance for Doubtful Accounts:

Our allowance for doubtful accounts represents our best estimate of the losses inherent in our Nordstrom private label card and Nordstrom VISA credit card receivables as of the balance sheet date. We evaluate the collectability of our accounts receivable based on several factors, including historical trends of aging of accounts, write-off experience and expectations of future performance, including trends in unemployment rates. We recognize finance charges on delinquent accounts until the account is written off. We write off credit card loans when accounts are, at a minimum, 151 days contractually delinquent. Accounts relating to cardholder bankruptcies, cardholder deaths and fraudulent transactions are written off earlier.

Management believes the allowance for doubtful accounts is adequate to cover anticipated losses in our credit card accounts receivable under current conditions; however, significant deterioration in any of the factors mentioned above or in general economic conditions could materially change these expectations. Recent increases in unemployment and associated delinquency and write-off trends have prompted us to record significant increases to our allowance for doubtful accounts, which increased from \$138 at January 31, 2009 to \$190 at January 30, 2010. A 10% change in our allowance for doubtful accounts would have affected net earnings by \$12 for the fiscal year ended January 30, 2010.

Source: NORDSTROM INC, 10-K, March 22, 2010

Table C2 Continued*Panel E: Prevalence of SEC Comment Letters Relating to CAE Disclosures*

<u>Variable</u>	<i>NEW_DISCLOSER_{t=1} = 1</i>		<i>NEW_DISCLOSER_{t=0}</i>		Between Sample Tests	
	(N = 36)	Mean	(N = 1658)	Median	Mean	Median
<i>COMMENT LETTER_{t-1}</i>		0.194		0.000	0.054	0.000
					2.10**	3.61***

Note: *, **, *** denote statistical significance at the 0.10, 0.05, and 0.01 levels (two-tailed), respectively. This table reports cross-sectional differences in CAE disclosure frequencies. Panel A reports differences in account magnitudes between the presence and absence of a related CAE disclosure. A t-test is used to test differences in means and a Wilcoxon rank-sum test is used to test differences in medians. All variables are defined in Appendix A. Panels B and C report the frequency of account-specific CAE disclosures by the following industry divisions: Agriculture, Forestry, and Fishing (2-digit SIC codes 01-09), Mining (2-digit SIC codes 10-14), Construction (2-digit SIC codes 15-17), Manufacturing (2-digit SIC codes 20-38), Transportation, Communications, Electric, Gas, and Sanitary Services (2-digit SIC codes 40-49), Wholesale Trade (2-digit SIC codes 50-51), Retail Trade (2-digit SIC codes 52-59), and Services (2-digit SIC codes 70-89). Panel D compares the credit card policies and the critical accounting estimates relating to the allowance for doubtful accounts between two firms: GAP Inc. and Nordstrom Inc. Panel E compares the prevalence of SEC comment letters relating to CAE disclosures between two subsamples: newly disclosing firm-years and non-newly disclosing firm-years. *COMMENT LETTER* is an indicator variable equal to 1 for firm-years with an SEC comment letter relating to CAE disclosures, zero otherwise. SEC comment letters relating to CAE disclosures are identified as SEC-originated letters (i.e. 'UPLOAD' letters) that meet the following search string criteria: "critical" w/2 "estimate." *NEW_DISCLOSER* is an indicator variable equal to 1 for firm-years that switch from not providing a CAE disclosure to providing a CAE disclosure. The total sample in Panel E is reduced by 339 firm-years because all 2004 observations are removed due to the fact that *NEW_DISCLOSER* cannot be measured for this year.

Table C3: Descriptive Statistics for Variables Used in Regressions

Panel A: Full Sample

Variable	N	Mean	Std Dev	Q1	Median	Q3
<i>MVE</i>	2033	47.098	48.839	25.480	39.350	58.280
<i>BVE</i>	2033	15.492	16.765	7.286	12.167	19.554
<i>BVA</i>	2033	37.314	36.516	16.539	28.453	47.342
<i>BVL</i>	2033	21.569	22.983	7.828	15.002	27.558
<i>PPEGROSS</i>	2033	21.397	29.661	4.792	11.564	25.891
<i>ADPAMT</i>	2033	10.038	14.975	2.293	5.600	11.600
<i>INV</i>	2033	3.921	5.692	0.519	2.118	5.172
<i>AR</i>	2033	5.069	7.672	1.319	2.997	5.696
<i>INTAN</i>	2033	8.836	14.801	0.890	4.638	11.288
<i>INVEST</i>	2033	1.346	3.414	0.000	0.236	1.183
<i>CASH</i>	2033	3.749	4.987	1.364	2.711	4.610
<i>OTHERASSET</i>	2033	0.997	2.786	0.090	0.515	1.393
<i>DTAL</i>	2033	-0.732	4.554	-0.913	0.000	0.659
<i>DEBT</i>	2033	8.834	10.475	1.912	5.924	11.856
<i>AP</i>	2033	3.378	5.693	0.679	1.684	3.884
<i>TP</i>	2033	0.334	0.529	0.003	0.155	0.431
<i>OTHERLIABILITY</i>	2033	6.255	7.636	2.124	3.850	7.473
<i>DISCLOSE_BVE</i>	2033	0.205	0.404	0.000	0.000	0.000
<i>DISCLOSE_PPEGROSS</i>	2033	0.002	0.044	0.000	0.000	0.000
<i>DISCLOSE_ADPAMT</i>	2033	0.051	0.219	0.000	0.000	0.000
<i>DISCLOSE_INV</i>	2033	0.032	0.177	0.000	0.000	0.000
<i>DISCLOSE_AR</i>	2033	0.073	0.261	0.000	0.000	0.000
<i>DISCLOSE_INTAN</i>	2033	0.008	0.091	0.000	0.000	0.000
<i>DISCLOSE_DTAL</i>	2033	0.042	0.200	0.000	0.000	0.000
<i>DISCLOSE_OTHERLIABILITY</i>	2033	0.111	0.314	0.000	0.000	0.000

Table C3 Continued

Panel A Continued

<u>Variable</u>	<u>N</u>	<u>Mean</u>	<u>Std Dev</u>	<u>Q1</u>	<u>Median</u>	<u>Q3</u>
<i>NI</i>	2033	2.321	3.185	1.130	1.979	3.323
<i>MTB</i>	2033	3.963	11.919	1.975	3.044	4.578
<i>DISCLOSE_PENSION</i>	2033	0.420	0.494	0.000	0.000	1.000
<i>PBO</i>	2033	6.524	12.731	0.000	1.739	6.090
<i>FVPA</i>	2033	5.822	13.713	0.000	1.342	5.189
<i>EARN</i>	2033	0.078	0.081	0.044	0.078	0.117
<i>CFO</i>	2033	0.137	0.074	0.090	0.128	0.176
<i>ΔWC</i>	2033	-0.002	0.037	-0.018	-0.002	0.016
<i>AMOUNT</i>	60	0.236	0.622	0.033	0.079	0.209
<i>NUMBER</i>	60	1.533	0.812	1.000	1.000	2.000

Table C3 Continued

Panel B: Disclosing Firm-Years Versus Non-Disclosing Firm-Years

Variable	Disclosing Firm-Years		Non-Disclosing Firm-Years		Between Sample Tests	
	Mean	Median	Mean	Median	Mean	Median
<i>MVE</i>	44.096	39.605	47.870	39.300	-2.10 **	0.25
<i>BVE</i>	14.802	12.286	15.669	12.142	-1.23	0.31
<i>BVA</i>	42.713	32.179	35.925	27.329	3.59 ***	4.74 ***
<i>BVL</i>	27.702	18.347	19.991	14.039	5.50 ***	6.72 ***
<i>PPEGROSS</i>	27.271	14.417	19.886	10.752	4.30 ***	6.11 ***
<i>ADPAMT</i>	11.732	7.158	9.602	5.232	2.71 ***	5.53 ***
<i>INV</i>	4.643	2.236	3.736	2.097	2.61 ***	1.59
<i>AR</i>	6.566	3.116	4.684	2.991	3.22 ***	2.03 **
<i>INTAN</i>	7.458	5.035	9.191	4.497	-2.92 ***	-0.43
<i>INVEST</i>	1.732	0.400	1.246	0.186	2.87 ***	4.81 ***
<i>CASH</i>	3.692	2.692	3.764	2.716	-0.32	-0.54
<i>OTHERASSET</i>	0.518	0.432	1.120	0.545	-4.97 ***	-3.19 **
<i>DTAL</i>	-1.155	0.000	-0.623	0.000	-1.90 *	-0.87
<i>DEBT</i>	12.162	8.253	7.978	5.323	5.70 ***	7.27 ***
<i>AP</i>	4.475	1.807	3.095	1.666	3.38 ***	3.35 ***
<i>TP</i>	0.363	0.194	0.327	0.144	1.27	1.99 **
<i>OTHERLIABILITY</i>	6.983	4.196	6.068	3.749	2.18 *	3.47 ***
<i>NI</i>	2.263	2.075	2.335	1.934	-0.41	1.41
<i>MTB</i>	4.452	2.853	3.837	3.093	0.60	-2.16 **
<i>PBO</i>	7.382	1.927	6.303	1.712	1.38	1.42
<i>FVPA</i>	6.520	1.561	5.643	1.289	1.18	1.54
<i>EARN</i>	0.070	0.069	0.081	0.080	-2.72 ***	-3.58 ***
<i>CFO</i>	0.135	0.131	0.138	0.127	-0.78	-0.64
<i>ΔWC</i>	-0.003	-0.002	-0.002	-0.001	-0.29	-0.45

Table C3 Continued

Note: *, **, *** denote statistical significance at the 0.10, 0.05, and 0.01 levels (two-tailed), respectively. This table provides the descriptive statistics for variables used in regressions. Panel A reports the descriptive staistics for the full sample. Panel B reports compares mean and median values for variables used in regressions between disclosing firm-years and non-disclosing firm-years. Mean t-statistics are from two-sample t-tests and median Z-statistics are from two-sample Wilcoxon tests.

Table C4: Value Relevance of Balance Sheet Items with a CAE Disclosure

Panel A: Value Relevance of Book-Value of Equity with a CAE Disclosure

Variable	Predicted	Model 1			Model 2			Model 3		
	Sign	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	
Intercept	?	18.084	19.93 ***	17.687	19.05 ***	14.444	12.96 ***			
BVE	+	0.925	17.59 ***	0.933	16.94 ***	1.016	19.47 ***			
NI	+	3.995	16.13 ***	4.166	16.77 ***	4.442	12.20 ***			
MTB	+	0.465	3.89 ***	0.462	3.88 ***	0.979	5.04 ***			
PBO	-	-2.250	-9.98 ***	-1.893	-8.07 ***	-1.950	-8.32 ***			
FVPA	+	2.786	10.97 ***	2.801	11.97 ***	2.817	12.43 ***			
DISCLOSE_PENSION	?			-0.542	-0.60	-0.025	-0.01			
DISCLOSE_BVE	?			2.733	1.57	7.719	3.22 ***			
PBO*DISCLOSE_PENSION	+			-0.399	-2.69 ***	-0.343	-2.22 **			
BVE*DISCLOSE_BVE	-			-0.223	-2.07 **	-0.257	-2.34 **			
DISCLOSE_NI	?					0.083	0.04			
NI*DISCLOSE_NI	-					-0.820	-1.83 *			
MTB*DISCLOSE_BVE	-					-0.957	-4.85 ***			
Adjusted R ²			71.06%			71.64%		72.64%		
N			1,987			1,983		1,984		

Table C4 Continued

Panel B: Value Relevance of Assets and Liabilities with a CAE Disclosure

Variable	Predicted	Model 1			Model 2			Model 3		
	Sign	Coefficient	t-statistic		Coefficient	t-statistic		Coefficient	t-statistic	
Intercept	?	15.126	14.56 ***		14.159	13.60 ***		11.168	8.93 ***	
<i>PPEGROSS</i>	+	0.986	10.99 ***		0.959	11.14 ***		1.036	11.92 ***	
<i>ADPAMT</i>	-	-1.017	-7.29 ***		-1.015	-7.61 ***		-1.101	-8.22 ***	
<i>INV</i>	+	0.741	6.95 ***		0.749	7.25 ***		0.865	7.78 ***	
<i>AR</i>	+	1.064	7.58 ***		1.293	9.27 ***		1.233	8.11 ***	
<i>INTAN</i>	+	0.922	13.51 ***		0.901	13.60 ***		0.972	14.34 ***	
<i>INVEST</i>	+	1.148	6.49 ***		0.920	5.38 ***		1.046	6.31 ***	
<i>CASH</i>	+	1.988	10.11 ***		2.173	11.12 ***		2.120	11.13 ***	
<i>OTHERASSET</i>	+	1.103	6.16 ***		1.049	6.04 ***		1.121	6.54 ***	
<i>DTAL</i>	+	1.468	7.21 ***		1.462	7.41 ***		1.698	8.35 ***	
<i>DEBT</i>	-	-1.105	-10.32 ***		-1.068	-10.45 ***		-1.087	-10.34 ***	
<i>AP</i>	-	-1.014	-7.01 ***		-1.027	-7.22 ***		-0.966	-6.22 ***	
<i>TP</i>	-	0.207	0.22		-0.143	-0.15		0.147	0.16	
<i>OTHERLIABILITY</i>	-	-0.647	-4.40 ***		-0.745	-5.08 ***		-0.881	-5.94 ***	
<i>NI</i>	+	3.925	14.86 ***		3.840	14.81 ***		4.386	11.45 ***	
<i>MTB</i>	+	0.468	3.81 ***		0.459	3.83 ***		0.939	4.86 ***	
<i>PBO</i>	-	-2.428	-11.46 ***		-2.133	-8.76 ***		-2.355	-9.41 ***	
<i>FVPA</i>	+	2.748	11.84 ***		2.946	13.47 ***		3.121	14.02 ***	
<i>DISCLOSE_PENSION</i>	?				2.288	2.43 **		3.860	2.11 **	
<i>DISCLOSE_PPEGROSS</i>	?				-5.987	-0.23		6.222	0.23	
<i>DISCLOSE_ADPAMT</i>	?				-5.136	-1.52		-4.821	-1.35	

Table C4 Continued

Panel B Continued

Variable	Predicted Sign	Model 1		Model 2		Model 3	
		Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
<i>DISCLOSE_INV</i>	?			5.653	1.43	8.524	1.92 *
<i>DISCLOSE_AR</i>	?			0.069	0.05	-0.526	-0.28
<i>DISCLOSE_INTAN</i>	?			3.630	0.77	2.220	0.44
<i>DISCLOSE_DTAL</i>	?			2.165	1.12	0.742	0.38
<i>DISCLOSE_OTHERLIABILITY</i>	?			-0.442	-0.24	-0.432	-0.20
<i>PBO*DISCLOSE_PENSION</i>	+			-0.570	-3.49 ***	-0.465	-2.80 ***
<i>PPEGROSS*DISCLOSE_PPEGROSS</i>	-			-0.183	-0.15	-0.848	-0.68
<i>ADPAMT*DISCLOSE_ADPAMT</i>	+			0.292	1.56	0.288	1.53
<i>INV*DISCLOSE_INV</i>	-			-1.041	-2.02 **	-1.586	-2.46 **
<i>AR*DISCLOSE_AR</i>	-			-0.559	-4.20 ***	-0.526	-3.78 ***
<i>INTAN*DISCLOSE_INTAN</i>	-			-0.712	-3.59 ***	-0.796	-4.06 ***
<i>DTAL*DISCLOSE_DTAL</i>	-			-0.182	-0.66	-0.242	-0.89
<i>OTHERLIABILITY*DISCLOSE_OTHERLIABILITY</i>	+			0.554	2.38 **	0.524	2.27 **
<i>DISCLOSE_NI</i>	?					-0.739	-0.36
<i>DISCLOSE_BVE</i>	?					5.981	2.63 ***
<i>NI*DISCLOSE_NI</i>	-					-1.170	-2.63 ***
<i>MTB*DISCLOSE_BVE</i>	-					-0.918	-4.69 ***
Adjusted R ²		69.36%		70.51%		70.83%	
N		1,977		1,972		1,980	

Table C4 Continued

Note: *, **, *** denote statistical significance at the 0.10, 0.05, and 0.01 levels (two-tailed), respectively. This table provides the results of an OLS regression of market value of equity on book-value of equity or the components of book-value of equity. All continuous variables are deflated by the number of common shares outstanding. Following Belsley et al. (1980) and Fox (1991), the sample excludes outlier observations that have a studentized residual greater than 2 in the estimation of the models. All t-statistics and significance tests are based on White (1980) standard errors.

Table C5: Cross-Sectional Differences in the Value Relevance of Balance Sheet Items with a CAE Disclosure

Panel A: Amount of Earnings Sensitivity = AMOUNT

<u>Variable</u>	Predicted	<u>Sign</u>	<u>Coefficient</u>	<u>t-statistic</u>
Intercept		?	15.664	6.53 ***
BVE		+	0.946	5.23 ***
NI		+	4.271	4.94 ***
MTB		+	0.996	2.90 ***
PBO		-	-2.573	-4.30 ***
FVPA		+	3.210	4.37 ***
DISCLOSE_BVE		?	8.237	1.40
BVE*DISCLOSE_BVE		-	-0.689	-1.96 *
AMOUNT		?	-1.229	-0.66
BVE*DISCLOSE_BVE*AMOUNT		-	-0.297	-1.84 *
NUMBER		?	-3.486	-0.88
BVE*DISCLOSE_BVE*NUMBER		+	0.468	1.57

Adjusted R² 60.54%

N 326

Table C5 Continued

Panel B: Amount of Earnings Sensitivity = HIGHAMOUNT

	<u>Predicted</u>	<u>Sign</u>	<u>Coefficient</u>	<u>t-statistic</u>
Intercept		?	-18.734	-1.30
BVE		+	0.843	4.70 ***
NI		+	4.642	5.10 ***
MTB		+	0.753	3.80 ***
PBO		-	-2.245	-4.25 ***
FVPA		+	2.806	4.32 ***
DISCLOSE_BVE		?	62.783	3.00 ***
BVE*DISCLOSE_BVE		-	-1.877	-3.36 ***
HIGHAMOUNT		?	35.936	2.58 **
BVE*DISCLOSE_BVE*HIGHAMOUNT		-	-2.423	-3.31 ***
NUMBER		?	-20.023	-2.90 ***
BVE*DISCLOSE_BVE*NUMBER		+	1.593	3.25 ***

Adjusted R ²	60.64%
N	326

Table C5 Continued

Note: *, **, *** denote statistical significance at the 0.10, 0.05, and 0.01 levels (two-tailed), respectively. This table provides the results of an OLS regression of market value of equity on book-value of equity and illustrates how the magnitude of earnings sensitivity disclosed in CAE disclosures influences the value relevance of book-value of equity. All continuous variables are deflated by the number of common shares outstanding. Panel A provides the results when the magnitude of earnings sensitivity is measured as *AMOUNT*. Panel B provides the results when the magnitude of earnings sensitivity is measured as *HIGHAMOUNT*. *AMOUNT* is defined as the after-tax amount of earnings sensitivity reported during 2004, scaled by shares outstanding. The median of *AMOUNT* is 0.079 (see Panel C of Table C1). *HIGHAMOUNT* is an indicator variable equal to 1 if *AMOUNT* is above the 75th percentile (0.209), zero otherwise. Because only firms with *DISCLOSE_BVE* = 1 have a value for *AMOUNT*, *AMOUNT* and *HIGHAMOUNT* are both set to zero for firms with *DISCLOSE_BVE* = 0 (i.e. firms not providing a non-pension CAE sensitivity disclosure). *NUMBER* equals the total number of types of non-pension CAE disclosures a firm provides in a given year (see Table C1, Panel D for the various types of non-pension CAE disclosures). Because I have earnings sensitivity data for only 2004 at the time of this writing, the sample used in this table includes the 339 observations from 2004. Following Belsley et al. (1980) and Fox (1991), the sample excludes outlier observations that have a studentized residual greater than 2 in the estimation of the models. All t-statistics and significance tests are based on White (1980) standard errors.

Table C6: Incremental Predictive Value Accruals with Respect to Future Cash Flows

	Model 1: $CFO_{t+1} = \beta_0 + \beta_1 CFO_{it} + \varepsilon_{it}$				Model 2: $CFO_{t+1} = \alpha_0 + \alpha_1 CFO_{it} + \alpha_2 EARN_{it} + \varepsilon_{it}$			
	Intercept		α_1		α_2			
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	N	Adjusted R²
Model 1:	0.037	10.80 ***	0.725	30.11 ***			2,033	54.83%
Model 2:	0.039	11.43 ***	0.636	18.21 ***	0.131	4.20 ***	2,033	56.13%

<i>Panel B: Change in the Absolute Value of the Residuals from Model 1 to Model 2</i>	Mean	t-statistic
Firms (251 firms) without a Non-Pension CAE Disclosure (N = 1,505)	-0.0006	-2.770 ***
Firms (88 firms) with a Non-Pension CAE Disclosure (N = 528)	-0.0004	-1.41
Firm-years without a Non-Pension CAE Disclosure (N = 1,617)	-0.0005	-2.460 **
Firm-years with a Non-Pension CAE Disclosure (N = 416)	-0.0007	-2.130 **
Firm-years with CAE_WC_ACCOUNTIMPORTANCE Below the 75th percentile (N = 312)	-0.0008	-1.980 **
Firm-years with CAE_WC_ACCOUNTIMPORTANCE Above the 75th percentile (N = 104)	-0.0004	-0.780

Note: *, **, *** denote statistical significance at the 0.10, 0.05, and 0.01 levels (two-tailed), respectively. This table outlines the incremental predictive value of earnings with respect to future cash flows for non-disclosing firms and firm-years and disclosing firms and firm-years. Model 1 is a regression of future cash flows on current cash flows. Model 2 is a regression of future cash flows on current cash flows and current earnings. The mean change in the absolute value of the residuals from Model 1 and Model 2 is reported for subsamples of non-disclosing firms and firm-years and subsamples of disclosing firms and firm-years. All t-statistics and significance tests when estimating Model 1 and Model 2 are based on White (1980) standard errors. CAE_ACCOUNTIMPORTANCE equals the sum of the average account values for which a firm provides a CAE disclosure multiplied by 1 percent, scaled by the absolute value of earnings. Specifically, CAE_ACCOUNTIMPORTANCE equals 0.01 * (Avg. PPEGROSS * DISCLOSE_PPEGROSS + Avg. ADPAMT * DISCLOSE_ADPMAT + Avg. INV * DISCLOSE_INV + Avg. AR * DISCLOSE_AR + Avg. INTAN * DISCLOSE_INTAN + Avg. DTA * DISCLOSE_DTA + Avg. OTHERLIABILITY * DISCLOSE_OTHERLIABILITY), scaled by the absolute value of EARN. Non-deflated continuous variables are used in the definition of CAE_ACCOUNTIMPORTANCE.

Table C7: Accrual Noise

$$\Delta WC_t = \alpha_0 + \alpha_1 CFO_{t-1} + \alpha_2 CFO_t + \alpha_3 CFO_{t+1} + \varepsilon_t$$

Panel A: Mean Coefficients from Firm-Specific Regressions (339 firms during 2004-2009)

<u>Intercept</u>		<u>α_1</u>		<u>α_2</u>		<u>α_3</u>	
<u>Coefficient</u>	<u>t-statistic</u>	<u>Coefficient</u>	<u>t-statistic</u>	<u>Coefficient</u>	<u>t-statistic</u>	<u>Coefficient</u>	<u>t-statistic</u>
0.018	1.99 **	0.107	2.33 ***	-0.354	-7.50 ***	0.124	2.72 **

N = 339
 Average Adjusted R² = 27.31%

Table C7 Continued

Panel B: Differences in Accrual Noise = Absolute Value of the Residuals

	<u>Mean</u>	<u>Median</u>
Firms (251 firms) without a Non-Pension CAE Disclosure (N = 1,505)	0.011	0.007
Firms (88 firms) with a Non-Pension CAE Disclosure (N = 528)	0.013	0.008
Difference	0.002 ***	0.001 **
Two-sided p-value	0.001	0.034
	<u>Mean</u>	<u>Median</u>
Firm-years without a Non-Pension CAE Disclosure (N = 1,617)	0.011	0.007
Firm-years with a Non-Pension CAE Disclosure (N = 416)	0.013	0.007
Difference	0.002 *	0.000
Two-sided p-value	0.053	0.678
	<u>Mean</u>	<u>Median</u>
Firm-years without a Working Capital CAE Disclosure (N = 1,712)	0.011	0.007
Firm-years with a Working Capital CAE Disclosure (N = 321)	0.013	0.008
Difference	0.002 ***	0.001 **
Two-sided p-value	0.006	0.047
	<u>Mean</u>	<u>Median</u>
Firm-years with <i>CAE_WC_ACCOUNTIMPORTANCE</i> Below the 75th percentile (N = 312)	0.011	0.006
Firm-years with <i>CAE_WC_ACCOUNTIMPORTANCE</i> Above the 75th percentile (N = 104)	0.017	0.010
Difference	0.006 ***	0.004 ***
Two-sided p-value	0.002	<0.001

Table C7 Continued

Panel C: Differences in Accrual Noise = Standard Deviation (ε_{it-1} , ε_{it} , ε_{it+1})

	<u>Mean</u>	<u>Median</u>
Firms (251 firms) without a Non-Pension CAE Disclosure (N = 1,003)	0.013	0.010
Firms (88 firms) with a Non-Pension CAE Disclosure (N = 352)	0.016	0.012
Difference	0.003 ***	0.002 **
Two-sided p-value	0.003	0.014
Firm-years without a Non-Pension CAE Disclosure (N = 1,074)	0.014	0.010
Firm-years with a Non-Pension CAE Disclosure (N = 281)	0.015	0.011
Difference	0.001 *	0.001
Two-sided p-value	0.070	0.383
Firm-years without a Working Capital CAE Disclosure (N = 1,137)	0.014	0.010
Firm-years with a Working Capital CAE Disclosure (N = 218)	0.016	0.012
Difference	0.002 **	0.002 *
Two-sided p-value	0.019	0.076
Firm-years with <i>CAE_WC_ACCOUNTIMPORTANCE</i> Below the 75th percentile (N = 211)	0.014	0.010
Firm-years with <i>CAE_WC_ACCOUNTIMPORTANCE</i> Above the 75th percentile (N = 70)	0.020	0.015
Difference	0.006 **	0.005 *
Two-sided p-value	0.026	0.052

Table C7 Continued

Note: *, **, *** denote statistical significance at the 0.10, 0.05, and 0.01 levels (two-tailed), respectively. This table compares accrual noise between subsamples of non-disclosing firms and firm-years and subsamples of disclosing firms and firm-years. Panel A reports the mean coefficients from firm-specific regressions of working capital accrals on lag, current, and lead operating cash flows. Panel B reports differences in the absolute value of the residuals between subsamples of non-disclosing firms and firm-years and subsamples of disclosing firms and firm-years. Panel C reports differences in the standard deviation of the residuals between subsamples of non-disclosing firms and firm-years and subsamples of disclosing firms and firm-years. *CAE_WC_ACCOUNTIMPORTANCE* equals the sum of the average working-capital account values for which a firm provides a CAE disclosure multiplied by 1 percent, scaled by the absolute value of earnings. Specifically, *CAE_WC_ACCOUNTIMPORTANCE* equals $0.01 * (\text{Avg. INV} * \text{DISCLOSE_INV} + \text{Avg. AR} * \text{DISCLOSE_AR} + \text{Avg. NON-DEBT CURRENT LIABILITIES} * \text{DISCLOSE_OTHERLIABILITY})$, scaled by the absolute value of *EARN*. Non-deflated continuous variables are used in the definition of *CAE_WC_ACCOUNTIMPORTANCE*. Because Panel C requires lead and lag data, 339 observations from year 2004 and 339 observations from 2009 are excluded in Panel C. A t-test is used to test differences in means and a Wilcoxon rank-sum test is used to test differences in medians.

Table C8: Value Relevance of Balance Sheet Items with a CAE Disclosure: Within Disclosing Firm-Years

<u>Variable</u>	<u>Predicted</u>	<u>Model 1</u>		<u>Model 2</u>	
	<u>Sign</u>	<u>Coefficient</u>	<u>t-statistic</u>	<u>Coefficient</u>	<u>t-statistic</u>
Intercept	?	20.930	13.13 ***	21.941	8.54 ***
<i>PPEGROSS</i>	+	0.855	5.56 ***	0.865	5.64 ***
<i>ADPAMT</i>	-	-1.067	-4.34 ***	-1.303	-4.66 ***
<i>INV</i>	+	0.710	3.14 ***	0.771	2.96 ***
<i>AR</i>	+	0.760	3.46 ***	1.034	3.05 ***
<i>INTAN</i>	+	0.589	4.38 ***	0.634	4.79 ***
<i>INVEST</i>	+	0.376	0.92	0.090	0.21
<i>CASH</i>	+	1.037	3.36 ***	0.981	3.45 ***
<i>OTHERASSET</i>	+	1.785	4.40 ***	2.081	4.34 ***
<i>DTAL</i>	+	0.771	2.28 **	1.278	3.51 ***
<i>DEBT</i>	-	-1.089	-5.66 ***	-0.827	-4.45 ***
<i>AP</i>	-	-0.789	-3.71 ***	-0.727	-3.07 ***
<i>TP</i>	-	5.027	2.54 **	5.311	2.60 ***
<i>OTHERLIABILITY</i>	-	-0.222	-0.82	-0.721	-2.47 ***
<i>NI</i>	+	3.032	6.90 ***	2.949	6.98 ***
<i>MTB</i>	+	0.040	0.89	0.027	0.71
<i>PBO</i>	-	-0.590	-1.24	-0.517	-1.20
<i>FVPA</i>	+	1.142	2.21 **	1.116	2.53 **
<i>DISCLOSE_PENSION</i>	?			0.532	0.31
<i>DISCLOSE_PPEGROSS</i>	?			11.423	0.43
<i>DISCLOSE_ADPAMT</i>	?			-6.879	-1.96 *
<i>DISCLOSE_INV</i>	?			3.413	0.86

Table C8 Continued

<u>Variable</u>	<u>Predicted Sign</u>	<u>Model 1</u>		<u>Model 2</u>	
		<u>Coefficient</u>	<u>t-statistic</u>	<u>Coefficient</u>	<u>t-statistic</u>
<i>DISCLOSE_AR</i>	?			-0.620	-0.32
<i>DISCLOSE_INTAN</i>	?			1.956	0.43
<i>DISCLOSE_DTAL</i>	?			-0.474	-0.27
<i>DISCLOSE_OTHERLIABILITY</i>	?			0.118	0.05
<i>PPEGROSS*DISCLOSE_PPEGROSS</i>	-			-1.109	-0.93
<i>ADPAMT*DISCLOSE_ADPAMT</i>	+			0.599	2.94 ***
<i>INV*DISCLOSE_INV</i>	-			-1.110	-2.15 **
<i>AR*DISCLOSE_AR</i>	-			-0.570	-1.90 *
<i>INTAN*DISCLOSE_INTAN</i>	-			-0.619	-3.14 ***
<i>DTAL*DISCLOSE_DTAL</i>	-			-0.442	-1.73 *
<i>OTHERLIABILITY*DISCLOSE_OTHERLIABILITY</i>	+			0.690	2.69 ***
Adjusted R ²		62.75%		63.78%	
N		399		400	

Note: *, **, *** denote statistical significance at the 0.10, 0.05, and 0.01 levels (two-tailed), respectively. This table provides the results of an OLS regression of market value of equity on the components of book-value of equity for a sub-sample of 416 firm-years with a non-pension CAE disclosure. All continuous variables are deflated by the number of common shares outstanding. Following Belsley et al. (1980) and Fox (1991), the sample excludes outlier observations that have a studentized residual greater than 2 in the estimation of the models. All t-statistics and significance tests are based on White (1980) standard errors.

Table C9: Value Relevance of Balance Sheet Items with a CAE Disclosure: Pre- Versus Post-Disclosure Periods

<u>Variable</u>	Predicted	Pre-Disclosure Period			Full Sample		Reduced Sample	
		<u>1996-2001</u>			<u>Post-Disclosure Period</u>		<u>Post-Disclosure Period</u>	
		<u>Sign</u>	<u>Coefficient</u>	<u>t-statistic</u>	<u>Coefficient</u>	<u>t-statistic</u>	<u>Coefficient</u>	<u>t-statistic</u>
Intercept		?	20.741	12.37 ***	13.100	8.58 ***	12.689	9.15 ***
PPEGROSS		+	1.010	8.95 ***	1.042	12.34 ***	1.033	12.02 ***
ADPAMT		-	-1.022	-6.31 ***	-1.067	-8.29 ***	-1.039	-7.94 ***
INV		+	0.584	4.58 ***	0.817	6.63 ***	0.883	7.50 ***
AR		+	1.139	7.69 ***	1.282	8.78 ***	1.391	11.02 ***
INTAN		+	1.041	8.94 ***	1.037	15.39 ***	1.051	16.95 ***
INVEST		+	1.095	6.48 ***	1.191	7.14 ***	1.124	7.72 ***
CASH		+	1.430	6.47 ***	2.259	11.75 ***	1.746	11.26 ***
OTHERASSET		+	0.962	6.78 ***	1.144	6.83 ***	1.102	6.70 ***
DTAL		+	1.606	4.90 ***	1.771	8.85 ***	1.664	8.22 ***
DEBT		-	-1.228	-9.77 ***	-1.121	-10.91 ***	-1.109	-12.07 ***
AP		-	-0.522	-2.91 ***	-1.076	-6.90 ***	-1.111	-7.80 ***
TP		-	1.075	1.17	-1.117	-1.17	-0.982	-1.09
OTHERLIABILITY		-	-0.868	-5.02 ***	-0.836	-5.59 ***	-0.869	-5.67 ***
NI		+	2.130	7.45 ***	4.147	11.14 ***	3.395	11.17 ***
MTB		+	0.706	7.27 ***	0.843	4.95 ***	1.066	4.67 ***
PBO		-	-2.242	-5.52 ***	-2.322	-9.14 ***	-2.365	-7.99 ***
FVPA		+	2.396	7.27 ***	2.963	12.85 ***	3.015	10.40 ***
DISCLOSE_PENSION		?	2.021	0.98	4.969	2.75 ***	3.813	2.08 **
DISCLOSE_PPEGROSS		?	-24.105	-2.33 **	39.662	1.29	-5.077	-0.25
DISCLOSE_ADPAMT		?	1.718	0.42	-2.159	-0.62	-2.787	-0.77
DISCLOSE_INV		?	0.599	0.18	6.565	1.60	7.714	1.88 *

Table C9 Continued

<u>Variable</u>	<u>Predicted</u>	Pre-Disclosure Period			Full Sample		Reduced Sample	
		<u>1996-2001</u>			<u>2004-2009</u>		<u>Post-Disclosure Period</u>	
		<u>Sign</u>	<u>Coefficient</u>	<u>t-statistic</u>	<u>Coefficient</u>	<u>t-statistic</u>	<u>Coefficient</u>	<u>t-statistic</u>
<i>DISCLOSE_AR</i>	?		3.589	1.66 *		0.246	0.13	
<i>DISCLOSE_INTAN</i>	?		-8.592	-2.22 **		2.855	0.49	
<i>DISCLOSE_DTAL</i>	?		5.025	1.80 *		1.514	0.77	
<i>DISCLOSE_OTHERLIABILITY</i>	?		-1.069	-0.42		-0.062	-0.03	
<i>PBO*DISCLOSE_PENSION</i>	+		-0.569	-3.96 ***		-0.389	-2.43 **	
<i>PPEGROSS*DISCLOSE_PPEGROSS</i>	-		2.240	4.50 ***		-2.228	-1.56	
<i>ADPAMT*DISCLOSE_ADPAMT</i>	+		-0.192	-1.01		0.259	1.43	
<i>INV*DISCLOSE_INV</i>	-		-0.328	-0.96		-1.211	-1.96 **	
<i>AR*DISCLOSE_AR</i>	-		-0.163	-1.29		-0.566	-4.02 ***	
<i>INTAN*DISCLOSE_INTAN</i>	-		1.727	1.39		-0.669	-2.69 ***	
<i>DTAL*DISCLOSE_DTAL</i>	-		-0.290	-0.83		-0.246	-0.90	
<i>OTHERLIABILITY*DISCLOSE_OTHERLIABILITY</i>	+		-0.057	-0.18		0.503	2.13 **	
<i>DISCLOSE_NI</i>	?		-3.658	-1.58		-1.672	-0.81	
<i>DISCLOSE_BVE</i>	?		-3.550	-1.47		5.435	2.47 **	
<i>NI*DISCLOSE_NI</i>	-		2.174	4.13 ***		-1.106	-2.55 **	
<i>MTB*DISCLOSE_BVE</i>	-		1.013	6.93 ***		-0.825	-4.80 ***	
<i>RECESSION</i>	-		0.258	0.27		-7.450	-10.13 ***	
Adjusted R ²			65.43%			72.41%		78.33%
N			1,761			1,980		1,792

Table C9 Continued

Note: *, **, *** denote statistical significance at the 0.10, 0.05, and 0.01 levels (two-tailed), respectively. This table provides the results of an OLS regression of market value of equity on the components of book-value of equity estimated in the pre-disclosure period (1996-2001) and the post-disclosure period (2004-2009). Fixed effects are included for the following industry divisions: Agriculture, Forestry, and Fishing (2-digit SIC codes 01-09), Mining (2-digit SIC codes 10-14), Construction (2-digit SIC codes 15-17), Manufacturing (2-digit SIC codes 20-38), Transportation, Communications, Electric, Gas, and Sanitary Services (2-digit SIC codes 40-49), Wholesale Trade (2-digit SIC codes 50-51), Retail Trade (2-digit SIC codes 52-59), and Services (2-digit SIC codes 70-89). The sample used in Column (1) represents the firm-years for the 339 sample firms during the pre-disclosure period and consists of 1,857 firm-years from 1996 to 2001. To formulate the binary disclosure variables in the pre-disclosure period, the firm-year disclosure variables for the six-year post-disclosure period are superimposed on the firm-years in the six-year pre-disclosure period. This process assumes the firm-year CAE disclosures in the pre-disclosure period (1996-2001) match the eight-year-ahead firm-year CAE disclosures in the post-disclosure period (2004-2009). For example, the presence/absence of an inventory related CAE disclosure for a particular firm in 2004 would match the presence/absence of an inventory related CAE disclosure for a particular firm in 1996, and the presence/absence of an accounts receivable related CAE disclosure for a particular firm in 2009 would match the presence/absence of an accounts receivable related CAE disclosure for a particular firm in 2001. The sample used in Column (2) represents the sample used throughout this study and consists of 2,033 firm-years from 2004 to 2009. The sample used in Column (3) consists of 1,857 firm-years from 2004 to 2009 and results from adjusting the full post-disclosure period sample to reflect a balanced sample comparison between the pre- and post- disclosure periods. For example, if a firm has missing data in the pre-disclosure period, then the eight-year-ahead firm-year is deleted during the post-disclosure period. Following Belsley et al. (1980) and Fox (1991), the sample excludes outlier observations that have a studentized residual greater than 2 in the estimation of the models. All t-statistics and significance tests are based on White (1980) standard errors.

Table C10: Differences in Operating Volatility

Panel A: Differences in Operating Volatility Between the Pre- and Post-Disclosure Periods for Disclosing Firms

	<u>Mean</u>	<u>SD</u>	<u>CFO</u>
Disclosing Firms (87 firms) During the Pre-Disclosure Period (N = 513)		0.041	
Disclosing Firms (87 firms) During the Post-Disclosure Period (N = 513)		0.030	
Difference		0.011 ***	

Panel B: Differences in Operating Volatility Between Disclosing and Non-Disclosing Firms for the Post-Disclosure Period

	<u>Mean</u>	<u>SD</u>	<u>CFO</u>
Disclosing Firms (88 firms) During the Post-Disclosure Period (N = 528)		0.031	
Non-Disclosing Firms (251 firms) During the Post-Disclosure Period (N = 1,505)		0.029	
Difference		0.002	

Note: *, **, *** denote statistical significance at the 0.10, 0.05, and 0.01 levels (two-tailed), respectively. This table compares operating volatility between subsamples of disclosing firms and non-disclosing firms. Operating volatility (*SD_CFO*) is measured as the standard deviation of CFO_{t-1} , CFO_t , and CFO_{t+1} . Panel A reports differences in operating volatility between the pre-disclosure period and post-disclosure period for disclosing firms. Panel B reports differences in operating volatility between disclosing firms and non-disclosing firms for the post-disclosure period. To provide a balanced subsample comparison in Panel A, disclosing firms with missing data in the pre-disclosure period are excluded from the post-disclosure period subsample. A t-test is used to test differences in means.

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