Mandatory Disclosure and Management Discretion: On the Case of Changes in Accounting Estimates

Anne Albrecht
Neeley School of Business
Texas Christian University

Kyonghee Kim
Eli Broad College of Business
Michigan State University

Kwang J. Lee
KAIST College of Business
Korea Advanced Institute of Science and Technology

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ABSTRACT: This study examines material changes in accounting estimates (CAEs) that firms are required to disclose in their financial reports per FASB Accounting Standards Codification Topic 250. We find that the frequency of income-increasing (positive) CAEs are comparable to the frequency of income-decreasing (negative) CAEs, and they are also similar in terms of the size of income effects. However, their impact on the meet/beat likelihood is highly asymmetric. The proportion of positive CAE firms that meet or beat on account of a positive CAE is three times larger than the proportion of negative CAE firms that miss due to a negative CAE. Consistent with this asymmetry, earnings surprise distributions show that negative CAEs significantly *increase* the frequency of just meet/beat, while positive CAEs disproportionally *decrease* the frequency of just miss. These findings suggest that managers time material CAE based on its anticipated effect on the meet/beat. Investors do not fully discount the meet/beat premium for a positive CAE, but the discount is larger when the CAE information is readily available to them. This finding provides the rationale for managers' timing of CAE, and suggests that more timely and transparent disclosure of CAE would improve investors' assessment of earnings news. Finally, consistent with the SEC and the PCAOB's concerns about managers' accounting estimates, financial reports containing CAEs are more likely misstated and subject to the SEC inquiries.

JEL classification: M41; M43

Key words: Material change in accounting estimate, mandatory disclosure, meet/beat, earnings distribution, financial reporting quality

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1. INTRODUCTION

Measuring a firm's earnings from its business transactions or events and assessing the status of its assets or liabilities based on *Generally Accepted Accounting Principles* (GAAP) involve accounting estimates.[1] These estimates rely on objective as well as subjective factors, and hence require managers' judgement and discretion. Financial Accounting Standard Board (FASB) Accounting Standards Codification Topic 250 (ASC 250), *Accounting Changes and Error Corrections*, requires managers to examine periodically any significant changes in the underlying assumption(s) or economic data used for the estimates and make adjustments to the estimates, if necessary. In other words, changes in accounting estimates (CAEs) are *a necessary consequence* of ongoing assessment of a firm's (expected) benefits and obligations by management. This paper examines managers' discretion on CAEs that have a material impact on earnings and hence are subject to mandatory disclosure.

Although CAEs are intended to provide more accurate and timely information about firms' earnings and financial position, they are also prone to estimation errors and management's self-serving biases due to inherent measurement uncertainty and subjectivity. The following excerpt from a 2002 speech by Robert Herdman, the chief accountant of the Securities and Exchange Commission (SEC) at the time, succinctly describes the challenges associated with accounting estimates:[2]

> "…A critical accounting policy is one that is very important to the portrayal of the company's financial condition and results, and requires management's most difficult, subjective or complex judgments. The circumstances that make these judgments difficult, subjective and/or complex have to do with the need to make estimates about the effect of matters that are inherently uncertain…"

[1] Examples of accounting estimates in financial statements include net realizable value of inventories and accounts receivable, property and casualty insurance loss reserves, estimates of revenues from long-term contracts, depreciation expense, impairment of long-lived assets, and pension and warranty expenses. See Appendix 1 for a more comprehensive list of examples.

[2] A full transcript of Robert Herdman's speech can be found at https://www.sec.gov/news/speech/spch537.htm.

Besides requiring managers to re-evaluate and update their accounting estimates periodically, ASC 250 also mandates managers to disclose the change in accounting estimates in the quarterly or annual financial report if it has a material impact on earnings. In addition, since 2003, the SEC has recommended that firms disclose their critical accounting estimate policies (CAP) in the Management Discussion and Analysis (MD&A) section of the annual report.[3] Both disclosure requirements result from an explicit recognition of the measurement uncertainty and subjectivity involved in managers' accounting estimates, and are intended to scrutinize managers' estimation by helping financial statement users discern the CAE information. This study aims at providing insight on the effectiveness of the current disclosure requirements by examining whether timing of material CAEs varies systemically with its anticipated effect on meeting or beating earnings expectations.

The CAE data used in this study is from Audit Analytics. The sample includes 2,293 CAEs disclosed in annual or quarterly financial reports (10-K or 10-Q) during December 15, 2005 through fiscal year 2015.[4] 51 percent of the CAEs have a positive impact on net income (positive CAEs), 39 percent have a negative impact (negative CAEs), and the remaining 10 percent do not report a net income impact (no-impact CAEs). When comparing positive CAEs to negative CAEs, the magnitude of their income effects is similar and economically significant. The mean (median) impact on earnings per share (EPS) is $0.093 ($0.022) for positive CAEs and -$0.097 (-$0.017) for negative CAEs. While CAEs involve various types of accounting estimates, revenue recognition (30 percent), liabilities, accruals or reserves (20 percent), and depreciation, amortization, depletion (17 percent) are the three most frequent types of CAEs.

[3] SEC 17 CFR Parts 211, 231, and 241 (Release Nos. 33-8350; 34-48960; FR-72)
[4] Our sample includes a small number of CAEs disclosed by early adopters in their 2005 filings.

To understand managers' timing of CAE, we examine whether disclosure of material CAEs is systematically associated with an anticipated effect on meeting or beating earnings expectations. Although managers have significant discretion on CAEs, it is not a foregone conclusion that they will use *material* CAEs to meet or beat earnings expectation. Due to the public disclosure requirement under ASC 250, managers face stringent scrutiny by investors and regulators for material CAEs. Further, auditors' examination is also likely more thorough for material CAEs. Given the high cost of using material CAEs, managers could simply make a CAE just below the materiality threshold, avoiding the public disclosure and additional external monitoring. Therefore, it is an empirical question whether managers use material CAEs for the meet/beat.

We find that firms are more likely to announce a positive CAE when earnings before CAE (henceforth 'pre-CAE earnings') miss consensus analyst forecasts, and a negative CAE when pre-CAE earnings far exceed the analyst forecasts such that the negative CAE is unlikely to result in a negative earnings surprise. This result suggests that the anticipated effect of CAE on the meet/beat is a significant factor for managers' decision to implement the CAE.

To further explore the timing explanation, we next examine whether / how positive CAEs and negative CAEs differentially influence earnings news and its distribution. If managers time their implementation of CAEs to avoid negative earnings news, the proportion of positive CAE firms that meet or beat on account of the positive CAE will be larger than the proportion of negative CAE firms that miss due to the negative CAE. We find patterns consistent with this prediction. While both positive CAEs and negative CAEs have similar income effects in magnitude, positive CAEs are much more likely to change firms' meet/beat status than negative CAEs – 26 percent of positive CAE firms change their meet/beat status from miss to meet/beat, but only 9 percent of negative CAE firms change their status from meet/beat to miss. Next, the comparison of earnings surprise distributions before versus after CAEs also reveals patterns suggestive of opportunistic

CAE timing. When earnings surprises are measured based on pre-CAE earnings, both negative CAE firms and positive CAE firms have a similar, bell-curve distribution of earnings news. The effect of negative CAEs on the distribution, however, is systematically different from that of positive CAEs. Negative CAEs have almost *no effect* on the just-miss frequency, while disproportionately increasing the just-meet/beat frequency. In comparison, positive CAEs *disproportionately decrease* the just-miss frequency, while significantly increasing the just-meet/beat frequency. These effects of positive and negative CAEs result in the well-known earnings surprise distribution with a kink at the just-miss frequency for both types of CAE firms.

The above inference about managers' opportunistic timing of CAE assumes that CAE disclosure does not influence analyst forecasts. However, it is plausible that analysts anticipate the CAE and update their earnings forecasts prior to the firms' filing of financial reports with the SEC, given that they also acquire information from other sources, such as conference calls, investors conferences, and site visits. If analysts fully incorporate the CAE information in their forecasts, pre-CAE earnings would mechanically be lower (higher) than the analyst forecasts for positive (negative) CAE firms. Further, a CAE in reported earnings would not have a significant impact on the meet/beat. To examine this alternative explanation, we relate firms' implementation of a CAE to their likelihood of meeting or beating consensus analyst forecasts. Inconsistent with the alternative explanation, we find that the meet/beat likelihood is significantly higher when reported earnings contain a positive CAE and lower when the earnings contain a negative CAE.[5]

Prior research suggests that investors recognize when earnings may have been enhanced by earnings management and discount meet/beat premiums (DeFond and Park 2001; Baber, Chen,

[5] Analysts sometimes exclude one-time items from GAAP earnings for their earnings forecasts (Gu and Chen 2004). Therefore, we determine the meet/beat using consensus analyst forecasts and actual EPS from IBES to ensure that the consensus forecast and actual EPS are on the same basis. For a robustness test, we limit the sample to firm quarters for which analysts are likely to forecast GAAP EPS that includes the CAE and hence the CAE is unlikely to influence the meet/beat probability. We continue to find a significant impact of CAEs on the meet/beat for this subsample.

and Kang 2006). Therefore, we next examine whether investors understand the implications of CAEs for earnings news. Using 3-day cumulative abnormal returns around earnings announcements, we find that investors positively respond to an increase in earnings by positive CAEs. Further, investors only partially discount the meet/beat premiums for firms that use a positive CAE to meet/beat – these firms still enjoy economically and statistically significant meet/beat premiums (8 percent). This result suggests that investors do not differentiate earnings news attributable to CAEs from other earnings news unrelated to CAEs.

Firms often announce their earnings before filing financial reports with the SEC. This suggests that the significant meet/beat premiums for positive CAE firms could be attributable to no CAE information available to investors at earnings announcement. To examine this alternative explanation, we re-estimate the meet/beat premiums for a subsample of firms of which earnings announcement date is the same as the filing date. The result is similar in that firms in the subsample continue to enjoy significant meet/beat premiums whether they have a positive or negative CAE. Importantly, it also suggests that CAE disclosure helps investors discern, albeit not fully, the effect of CAEs on earnings. Specifically, the discount for the use of positive CAE for the meet/beat is larger for the subsample than for the full sample. Further, firms that meet/beat even after applying a negative CAE enjoy additional premiums for the meet/beat. These results suggest that investors find CAE-related earnings less informative about future cash flows, and that more timely and transparent disclosure of CAEs could further improve investors' assessment of firm performance and financial position.

Reflecting measurement uncertainty and subjectivity in accounting estimates, CAEs have an economically and statistically significant impact on the likelihood of financial statement misstatements and receipt of SEC comment letters. Compared to financial statements with no CAEs, financial statements containing positive (negative) CAEs are 26 percent (48 percent) more

likely to be misstated and 23 percent (18 percent) more likely to raise inquiries during the SEC review process (i.e., SEC comment letters). These findings provide evidence of the challenges in evaluating accounting estimates, and validates the SEC and the PCAOB's concerns regarding accounting estimates.[6]

We conduct a battery of sensitivity tests to ensure that our results are robust. First, our primary findings continue to hold when we use a propensity score matched sample to address the concern that systematic differences in firm attributes between CAE and non-CAE firms may introduce bias. Second, CAE timing results are robust to alternative estimation methods: Firth's penalized logit to address the concern that CAE disclosures are relatively rare events, and OLS to account for the concern that our CAE measures are binary variables. Third, to address the concern that financial statements can be restated for reasons unrelated to CAEs, we redo the misstatement test by focusing on revenue-recognition-related CAEs and subsequent restatements related to revenue recognition, and find a similar result.

This study makes the following contributions. First, our findings have a direct policy implication for regulators. They suggest that managers opportunistically time CAE implementations and that this opportunism is not fully discounted by the market. This begs the question of whether firms' disclosure on material CAEs provides sufficient and timely information for financial statement users to update their priors.[7] Lundholm (1999) argues that under the current accounting standards, it is almost impossible for financial statement users to tell (even ex post) the

[6] PCAOB highlights the susceptibility of accounting estimates to measurement errors and audit deficiencies. It also reports the concerns expressed by auditors over perceived inconsistencies in the existing auditing standards on accounting estimates and emphasizes the need for changes in the PCAOB's auditing standards (PCAOB 2014).

[7] Investors find that there are very few disclosures on accounting estimates and the disclosures are uninformative. Jeffrey Mahoney, general counsel of the Council of Institutional Investors, states "Investors as a group…want more disclosures about these estimates and they want auditors to tell them more about what they've done" (PCAOB Standing Advisory Group meeting on October 2, 2014 on Auditing Accounting Estimates and Fair Value Measurement, Unofficial transcript pages 69, 76). In our manual inspection of some of the CAE disclosures, we similarly find that the disclosure is generally vague (Appendix 2 lists CAE disclosure examples)

accuracy of a firm's accounting estimates. Consistent with this assessment, in 2002, the SEC proposed a rule for quantitative disclosure of (1) the sensitivity of financial results to changes made in each critical accounting estimate and (2) historical changes in critical estimates in the past three years. However, this rule has never been adopted (Bauman and Shaw 2014). Our findings support the 2002 disclosure rule proposed by the SEC.

Next, our study contributes to the existing literature on accounting estimates. Prior studies on accounting estimates typically focus on a specific industry (e.g., banks, property-casualty insurers, or manufacturing firms) and/or specific type(s) of accounting estimates, and thus their findings are limited in application, e.g., development of disclosure policy. In comparison, CAEs examined in our study cover a large cross-section of accounting estimates and industries, making the results more generalizable. Therefore, our findings shed better insights on firms' CAE practices and the potential impact on capital markets. Compared to non-material CAEs, material CAEs are much more difficult to use opportunistically because of the disclosure requirement. Given the higher cost of using material CAEs, our findings highlight the pervasiveness of managerial opportunism in complex accounting estimates and their potential adverse impact on the quality of financial reporting. It also contributes to the earnings management literature. Most studies on earnings management focus on income-increasing discretionary accruals, and relatively limited research has been done regarding managers' choice of income-decreasing discretionary accruals. This study provides empirical evidence on how managers report negative CAEs while avoiding negative earnings news.

2. INSTITUTIONAL BACKGROUND AND LITERATURE REVIEW

2.1. Accounting Changes Standard

In May 2005, the FASB issued SFAS 154, *Accounting Changes and Error Corrections*, replacing APB Opinion 20, *Accounting Changes*, and SFAS 3, *Reporting Accounting Changes in*

Interim Financial Statements. This statement carries forward the guidance to prospectively account for changes in accounting estimates. However, SFAS 154 changes the requirements for accounting and reporting a change in accounting estimate that is caused by a change in accounting principle. Specifically, SFAS 154 requires that a change in method of depreciation, amortization, or depletion for long-lived, non-financial assets be accounted for prospectively as a change in accounting estimate rather than retrospectively as a change in accounting principle. When a company makes a material change to its accounting estimate, SFAS 154 requires the company to disclose the nature of the change including the effect on income. SFAS 154 became effective for accounting changes and error corrections made in fiscal years beginning after December 15, 2005. In 2009, the FASB codified SFAS 154 as ASC Topic 250, *Accounting Changes and Error Corrections*, without changing the statement's guidance.

Recently, accounting regulators highlighted measurement uncertainty embedded in accounting estimates as one of the areas for potential improvements. For instance, in 2011, the SEC selected measurement uncertainty as the topic of discussion at the Inaugural Public Roundtable for Financial Reporting Series (SEC 2011). The PCAOB identified accounting estimates, along with fair value measurement, as an area susceptible to measurement errors and audit deficiencies, and highlighted the need for changes in the PCAOB's auditing standard on CAEs (PCAOB 2014).

2.2. Related Literature

2.2.1. Accounting Estimates

Accounting estimates involve measurement uncertainty and subjectivity on the part of management, making it difficult to determine the reasonableness and accuracy of accounting estimates, while creating leeway for managers' self-serving biases and measurement errors (Christensen, Glover, and Wood 2012; Griffith, Hammersley, and Kadous 2015). In spite of widely shared concerns about accounting estimates, systematic documentation of how managers use

accounting estimates and its impact on financial reporting quality is scant primarily due to limited data availability. Of the small number of studies that examine managers' use of accounting estimates, most studies focus on the level of specific types of accounting estimates and/or specific industries (e.g., financial companies or property-casualty insurers). The types of accounting estimates examined by these studies include warranty reserve (Cohen, Darrough, Huang, and Zach 2011) and expected rate of return on pension assets (Comprix and Muller 2011; An, Lee, and Zhang 2014). More recently, some researchers have examined factors affecting the quality of accounting estimate disclosure. For example, Glendening, Mauldin, and Shaw (2018) document that the quality of critical accounting estimate disclosure decreases in managers' incentive to misreport earnings and increases in monitoring by the audit committee and auditors.

Reflecting the challenges auditors face in their evaluation of accounting estimates (PCAOB 2014), researchers have examined factors influencing auditors' ability to examine complex accounting estimates. DeZoort, Hermanson, and Houston (2003) find that, in auditor-management disagreements, audit committees lend greater support to auditors when there is less measurement uncertainty, and Kang, Trotman, and Trotman (2015) find that audit committees find more comfort in accounting estimates audited using innovative audit procedures. While auditors tend to follow management's lead and routinely audit the process management uses (Griffith et al. 2015), auditors are less influenced by management when auditors develop their own estimate expectation ex ante (Fitzgerald, Wolfe, and Smith 2015) and when auditors practice critical thinking (Griffith et al 2015). These studies typically rely on an experimental research design or small survey data.

2.2.2. Changes in Accounting Estimates

Examining managers' use of accounting estimates for earnings management requires researchers to have a benchmark for the accounting estimates. In the absence of such a benchmark, researchers often rely on cross-sectional variation in accounting estimates (e.g., An et al. 2014) or

resort to estimating the benchmark using a regression approach (e.g., Lev, Li, and Sougiannis 2010; Cohen et al. 2011). Material changes in accounting estimates allow researchers to observe managers' updates on their estimates and thus provide an opportunity to assess whether/how managers' incentives influence the updates and how the updates in turn influence financial reporting quality.

Until the early 2000s, researchers did not distinguish between changes in accounting principles and changes in accounting estimates although APB Opinion 20 required different accounting treatments. For example, studies in the 1980s and 1990s used both changes in accounting principles and changes in accounting estimates when they examined how firms use accounting changes to achieve certain goals (Moses 1987; Lilien, Mellman, and Pastena 1988; Pincus and Wasley 1994). Beginning the early 2000s, researchers started examining changes in accounting estimates exclusively by focusing on specific accounts such as changes in effective tax rate (Dhaliwal, Gleason, and Mills 2004) and restructuring charge reversal (Moehrle 2002). However, little research has been done on a broader classification of changes in accounting estimates, particularly material changes that are subject to mandatory disclosure. Our study extends this line of literature.

3. DATA AND DESCRIPTIVE STATISTICS

3.1. Research Design

3.1.1. Measure of CAE

To determine CAE announcement quarters (*CAE*), we use the Changes in Accounting Estimates dataset from Audit Analytics. This dataset reports changes in accounting estimates disclosed in SEC registrants' annual or quarterly filings (e.g., 10-K and 10-Q). Based on the data, we code *CAE* equals 1 for the quarter in which the change in accounting estimate becomes effective, and zero otherwise. While a CAE may impact multiple subsequent periods, we only examine the

initial effective quarter. This is because firms are required to disclose the material change in estimate in the fiscal period when the change is made but not required to disclose in future periods if the effect is not material to those periods (ASC 250). As part of the initial CAE disclosure, firms are required to report the CAE effect on net income. Using the income effect disclosure, we classify CAEs into income increasing CAEs (positive CAEs*)*, income decreasing CAEs (negative CAEs*)*, and CAEs with no effect on net income (no-impact CAEs) to analyze the timing and motivation of CAE implementation. *Positive* (*Negative*) *CAE* is an indicator for a firm quarter with income increasing (decreasing) CAEs.

3.1.2. Sample

As shown in Table 1, our sample starts with the cross-section of U.S. firms listed in both Compustat and Audit Analytics. We remove financial and utility firms and limit the sample period to December 15, 2005 through fiscal year 2015. This step results in 110,748 firm-quarters. Our sample period starts on December 15, 2005 to account for the adoption of SFAS No. 154, Accounting Changes and Error Corrections (FASB 2005). To obtain analyst earnings forecasts and actual earnings, we next merge the sample with IBES, removing 36,658 observations with missing analyst forecast data. Finally, we merge with CRSP, and remove 1,464 observations with missing return data. Our final sample consists of 72,626 firm-quarter observations, of which 2,293 firm-quarters have CAE disclosures.

3.1.3. Model Specification

Prior research documents that stock market response is significantly negative when firms fail to meet or beat their earnings benchmarks (Kasznik and McNichols 2002; Lopez and Rees 2002; Skinner and Sloan 2002; Brown and Caylor 2005). Consistent with managers' incentive to avoid negative earnings surprises, in their survey with chief financial officers, Graham, Harvey, and Rajgopal (2005) find that managers take a mix of accounting and economic actions to ensure that

earnings benchmarks are met. Findings in these prior studies suggest that earnings news will significantly influence managers' decision to disclose a CAE. Specifically, managers are more likely to make a positive CAE when it would help them avoid a negative earnings surprise, and a negative CAE when it is unlikely to result in a negative earnings surprise. We examine this hypothesis by estimating the following logit model:

$$\begin{aligned} Positive\ (or\ Negative)\ CAE \\ = \alpha_0 + \alpha_1 MB\ Incentive + \alpha_2 lag(BTM) + \alpha_3 lag(Sales\ Growth) \\ + \alpha_4\, lag(lnMVE) + \alpha_5 lag(ROA) + \alpha_6 lag(DAcc) + \alpha_7 Analysts \\ + \alpha_8 Special\ Items + \alpha_9 Big4 + Industry\ fixed\ effect \\ + QtrYear\ fixed\ effects + \varepsilon \end{aligned} \quad (1)$$

Where *Positive (Negative) CAE* indicates whether the firm discloses an income-increasing (decreasing) CAE during the quarter, as described above.

MB Incentive denotes our variables of interest and indicate whether the firm's earnings *before* CAE, i.e., pre-CAE earnings, creates managerial incentives to use a positive or negative CAE in the context of meeting or beating analyst forecasts. Consistent with prior research, we use the IBES unadjusted database to obtain quarterly actual earnings per share (EPS) and quarterly consensus analyst forecasts (e.g. Payne and Thomas 2003; Doyle, Jennings, and Soliman 2013). If the actual EPS is equal to or greater than the median forecast, the firm meets or beats the analyst forecast (i.e., *MB* = 1). If the actual EPS is less than the median forecast, the firm misses the analyst forecast (i.e., *MB* = 0). To examine how managers' anticipation of a negative earnings surprise influences their decision to implement a CAE, we also measure how much earnings before CAEs (i.e., pre-CAE earnings) are above or below the consensus analyst forecasts. We use the net income effect disclosure and the number of shares outstanding to calculate the CAE impact on IBES quarterly

actual EPS.[8] For firms that do not report a CAE in the current quarter, the CAE impact on quarterly EPS is set to zero. Then, we subtract the CAE impact on EPS from actual EPS to get the pre-CAE EPS amount. When the dependent variable is *Positive CAE*, we use two measures of *MB Incentive*: 1) an indicator denoting that pre-CAE earnings fall short of the median analyst forecast (*Pre-CAE Miss*), and 2) an indicator denoting that pre-CAE earnings are lower than the median analyst forecast by $0.02 or less (*Pre-CAE Just Miss*). We expect a positive coefficient on both variables. Similarly, when the dependent variable is *Negative CAE, MB Incentive* is an indicator denoting that pre-CAE earnings far exceed or grossly miss the median analyst forecast (*Pre-CAE Extreme Beat* or *Pre-CAE Extreme Miss*). We expect that managers will be more willing to make a negative CAE when it does not impact the firm's chance of meeting or beating its earnings benchmark.

We control for several firm attributes that are likely to influence a firm's propensity to meet/beat analyst forecasts (e.g. Doyle et al. 2013). The attributes are firm size (market capitalization, *MVE*), growth opportunity (book to market ratio of equity, *BTM*), operating performance (quarter-over-quarter sales growth rate and quarterly return on assets, *Sales Growth* and *ROA* respectively), and earnings quality (discretionary accruals, *DAcc*). We include lagged versions of these variables because this is a prediction model. We also include an indicator for one-time special items in income statement (*Special Items*), analyst following (*Analysts*), and an indicator denoting whether the firm is audited by a Big 4 accounting firm (*Big4*). Detailed variable descriptions are reported in Appendix 3. All continuous variables are winsorized at the 1st and 99th percentile levels. We also include industry fixed effects based on the firm's two digit SIC code and quarter-year fixed effects.

[8] We use the post-tax, current quarter estimated net income impact reported in Audit Analytics. If this amount is not reported, we use the pre-tax estimated net income impact and estimate the post-tax amount based on the tax rate implied from the tax expense account. If only year-to-date amounts are reported, we estimate the quarterly impact by dividing the estimated net income impact by the number of the quarter. For example, if a firm reports a CAE and the related year-to-date income effects in the second quarter 10-Q, we would divide the year-to-date income effect by 2.

When estimating regression model (1) with *Positive CAE* as the dependent variable, we exclude negative CAE firms from the sample, so that we can examine the likelihood of positive CAE (*Positive CAE* = 1) versus non-CAE or no-impact CAE (*Positive CAE* = 0).[9] Similarly, we exclude positive CAE firms from the sample when the dependent variable is *Negative CAE*.

3.2. Descriptive Statistics

3.2.1. Firm Characteristics

Our final sample includes 70,333 non-CAE firm quarters and 2,293 CAE firm-quarters. Of the 2,293 CAE firm-quarters, 1,170 quarters (51%) report positive CAEs and 889 quarters (39%) report negative CAEs. Table 2 Panel A compares the mean differences between non-CAE firm quarters to CAE firm quarters. Compared to non-CAE firms, CAE firms tend to be larger, have greater analyst following, and are more likely to have one-time special items. Consistent with their bigger firm size, CAE firms are also more likely to hire a Big 4 accounting firm for their external audit. Also, their quarter-over-quarter sales growth rate is lower. Given the systematic differences in certain firm attributes between CAE firms and non-CAE firms, we control for the firm attributes in the regression analysis.

3.2.2. Changes in Accounting Estimates

We examine the frequency of CAEs in our sample by year and by Fama-French 12 industries and find no systematic patterns over time or industries. Audit Analytics provides a brief description of the CAE and its impact on income for each CAE observation. Using this description, we broadly classify the CAEs into 15 categories, resulting in 2,293 unique CAE-firm quarter combinations (Table 2 Panel B). The most frequent type of CAEs is revenue-recognition CAEs, representing 30%

[9] When using fixed effects, logit models drop observations in groups where there is no variation in the dependent variable. Thus, we include the 'asis' command in Stata when estimating our models to retain our full sample. When we exclude the asis command, our sample drops to 71,085 when *Positive CAE* is the dependent variable and to 70,279 when *Negative CAE* is the dependent variable. The results are qualitatively and quantitatively similar whether or not the asis command is used.

of total CAEs for the sample. Examples of CAEs in this category include CAEs related to percentage of completion contract accounting, sales returns and allowances, and vendor rebates. The next most frequent types of CAEs are CAEs related to liabilities, accruals, or reserves (20%), and CAEs related to depreciation, amortization, and depletion (17%). Tax expenses and pension-related CAEs are relatively less frequent with each representing 6% and 2% of total CAEs, respectively.

Given our interest in the impact of CAEs on meeting/beating, we next examine the magnitude of income effects (Table 2 Panel C). For positive CAEs, the mean (median) after-tax net income effect is $14.9 million ($1.4 million). This net income effect translates to the mean (median) EPS effect of $0.093 ($0.022). Income effect of negative CAEs is comparable to that of positive CAEs. The mean (median) after-tax net income effect is -$7.9 million (-$0.90 million) for negative CAEs, and the corresponding EPS effect is -$0.097 (-$0.017). These summary statistics suggest that CAEs, on average, have an economically significant impact on earnings.

3.2.3. Correlations

Table 3 reports Pearson correlations of the key variables. *MB* is positively associated with *Positive CAE* ($\rho = 0.016$, $p < 0.05$), and negatively associated *Negative CAE* ($\rho = -0.019$, $p < 0.05$), suggesting that income effects of CAEs are large enough to influence firms' likelihood of meeting/beating earnings benchmarks. The negative correlation between *Positive CAE* and *Sales Growth* ($\rho = -0.013$, $p < 0.05$) suggests that firms are more likely to make an income-increasing CAE when sales growth is lower. *Positive CAE* is positively associated with market capitalization (*MVE*), analyst following (*Analysts*), and Big 4 accounting firm (*Big4*) – the correlations are statistically significant at the $p < 0.01$ level. These patterns are consistent with larger firms being more likely to make a positive CAE. Interestingly, most firm characteristics are insignificantly associated *Negative CAE*.

4. EMPIRICAL ANALYSIS AND RESULTS

4.1. CAE information

4.1.1. Timing of CAE implementation

Table 4 reports the logit estimates based on regression model (1). When the dependent variable is *Positive CAE* (Models 1 and 2), we expect a positive coefficient on both *MB Incentive* variables. Consistent with this expectation, the coefficient on *Pre-CAE Miss* (1.024, z = 12.21) and the coefficient on *Pre-CAE Just Miss* (0.670, z = 7.04) are positive and statistically significant at the $p < 0.01$ level, suggesting that firms are more likely to disclose a material CAE when the estimate change helps the firm meet/beat analyst expectations.

Models 3 and 4 report logit regression estimates for the likelihood of negative CAE. Consistent with managers being more willing to make a negative CAE when it does not impact the firm's chance of meeting or beating its earnings benchmark, we find a positive and statistically significant coefficient on *Pre-CAE Extreme Beat* (0.480, z = 5.74) at the $p < 0.01$ level. However, the coefficient on *Pre-CAE Extreme Miss* is insignificantly different from zero.

Overall, the regression results in Table 4 are consistent with our conjecture that managers' incentive to avoid negative earnings surprises significantly influences their CAE implementation.

4.1.2. Comparative Distribution Analysis

We next compare the distribution of pre-CAE earnings surprises with that of post-CAE earnings surprises. We define Pre-CAE (post-CAE) earnings surprise as the difference between pre-CAE (post-CAE) EPS and the median analyst forecast of EPS. We group positive (or negative) CAE firms into 20 bins based on their earnings surprises, ranging from -20 cents to +20 cents per share with 2-cent intervals to plot the frequencies.

Figure 1 Panel A reports distributions of earnings surprises measured based on pre- versus post-CAE earnings for positive CAE firms. The distribution of pre-CAE earnings surprises

resembles a normal bell curve with the largest frequency, 15.8 percent, for the just meet/beat bin [$0, $0.02], followed by 15.3 percent for the just miss bin [-$0.02, $0.00). Not surprisingly, positive CAEs generally decrease the frequencies of firms in the negative earnings surprise bins, while increasing the frequencies of firms in the positive earnings surprise bins, shifting the distribution to the right. What is notable, however, is the disproportionately large decline in the just miss frequency after applying positive CAEs. Positive CAEs increase the just meet/beat frequency from 15.8 percent to 21.7 percent, while disproportionately decreasing the just miss frequency from 15.3 percent to 5.8 percent, resulting in a typical kink in the distribution – in comparison, the frequency of earnings surprise in the range of [-$0.04, -$0.02) decreases from 8.8 percent to 7.5 percent. The kink in the earnings surprise distribution introduced by positive CAEs suggests managers' opportunistic use of positive CAEs to avoid negative earnings surprises.

We repeat the comparative distribution analysis for negative CAE firms. Figure 1 Panel B compares earnings surprise distributions before versus after applying negative CAEs. In contrast to positive CAEs, negative CAEs have almost *no effect* on the just-miss frequency, while disproportionately increasing the just-meet/beat frequency from 15.7 percent to 24.7 percent – the 9.0 percent *increase* in the just meet/beat proportion is contrary to the general *decline* in the frequencies of all other positive earnings surprises. This asymmetric impact of negative CAEs on the just meet/beat frequency suggests that managers tend to implement negative CAE such that the firm's earnings still meet or beat the earnings benchmark even after the negative CAE.[10]

4.1.3 Asymmetric Effect of Positive versus Negative CAEs on Earnings Surprise

To further our understanding, we compare the impact of CAEs on the proportion of miss versus meet/beat across positive and negative CAE firms. If managers opportunistically use CAEs to

[10] This result does not imply that the mean effect of negative CAEs on the meet/beat likelihood is positive. Figure 1 Panel B shows that negative CAEs shift the distribution of earnings surprises to the left, suggesting that negative CAEs on average decrease the likelihood of meet/beat likelihood (see Table 4).

avoid negative earnings surprises, positive CAEs and negative CAEs will have a systematically different impact on earnings news and hence the meet/beat. Specifically, holding the magnitude of income effect constant across positive and negative CAEs, the tendency of positive CAEs to push earnings up from the miss to the meet/beat will be much larger than the tendency of negative CAEs to pull earnings down from the meet/beat to miss.

Table 5 Panel A reports the proportion of pre-CAE earnings that miss versus meet or beat the median analyst forecast. Similarly, the table reports the miss and meet/beat proportions based on earnings after applying CAEs (i.e., post-CAE earnings). Based on pre-CAE earnings, 55 percent of positive CAE firms miss their earnings benchmark, while 34 percent of negative CAE firms miss analyst forecasts. Applying positive CAEs decrease the proportion to 29 percent (a decline of 26 percent), while negative CAEs increase it to 43 percent (an increase of 9 percent).

In Panel B of Table 5, we repeat the analysis in Panel A, but limit the sample to those firms that just miss or just meet/beat their earnings benchmark (i.e., the difference between actual EPS and the median analyst forecast of EPS is in the range of ±$0.02). The pattern observed in Panel A becomes much more pronounced for this subsample. Specifically, after applying positive CAEs, the proportion of positive CAE firms that just miss their earnings benchmark decreases by 52 percent. In comparison, the proportion of negative CAE firms that just miss increases by 11 percent after applying negative CAEs.

Positive CAEs and negative CAEs have a similar impact on earnings per share in magnitude (Table 1 Panel B). Therefore, the asymmetric effects of positive CAEs and negative CAEs in Table 4 are more consistent with managers' opportunistic use of CAEs than attributable to differences in their income effect.

4.1.4. CAE Information in Analyst Forecasts

The CAEs we examine are those with a material impact on earnings and hence explicitly disclosed in the financial report as per ASC 250. Our test on managers' use of CAE in Table 4 assumes that analysts have yet to adjust their forecasts for the CAEs at the earnings announcement. However, analysts may know or anticipate CAEs based on their other information acquisition activities or managers' earnings guidance, and incorporate the CAE information into their earnings forecasts. If so, pre-CAE earnings would be lower (higher) than analyst forecasts for firms with a positive (negative) CAE. In other words, the results we report in Table 5 could be a mechanical outcome. To examine this alternative explanation, we examine the impact of positive (negative) CAEs on the probability of meeting or beating consensus forecasts. If analyst forecasts fully incorporate the CAEs information, CAEs in the reported earnings will not have a systematic effect on the meet/beat likelihood. Table 6 reports the results.

The dependent variable is the probability of reported earnings (i.e., IBES actual earnings) to meet or beat the median analyst forecast, and the test variables are indicators for positive CAE firm quarters (*Positive CAE*) and negative CAE firm quarters (*Negative CAE*). The results estimated with the full sample (Table 6 Panel A) show that the meet/beat likelihood is significantly higher when firms disclose a positive CAE ($t = 2.34$, $p < 0.05$) and lower when they disclose a negative CAE ($t = -3.17$, $p < 0.01$). This result suggests that the effect of CAEs in reported earnings are not fully incorporated in analyst forecasts and that our results reported in Table 5 are not a mechanical outcome.

Prior studies suggest that analysts exclude transitory items from their forecasts (e.g., Gu and Chen 2004). To account for the possibility that analysts consider CAEs as a transitory item and exclude them from their forecasts, we limit our sample to firm quarters when analysts forecast

GAAP EPS and thus would include the CAE in their forecasts if it is known and/or anticipated.[11] We then re-estimate the effect of *Positive CAE* and *Negative CAE* on the meet/beat likelihood for the subsample (Table 6 Panel B). Consistent with the results from the full sample, we find a significantly higher probability of meet/beat in positive CAE quarters and lower probability in negative CAE quarters. Overall, the results in Panels A and B do not suggest that analysts fully update their forecasts for the income effect of CAEs.

4.2. Investor Response to CAE Information

Prior studies suggest that investors recognize when earnings may have been enhanced via income-increasing earnings management and discount the premiums paid for meeting or exceeding earnings benchmarks accordingly (e.g., DeFond and Park 2001; Balsam, Bartov, and Marquardt 2002; Baber et al. 2006; Das, Kim, and Patro 2011). In this section, we investigate whether investors respond to earnings news that contain CAEs. Using investor response to positive CAEs and the meet/beat attributable to the positive CAEs, we examine whether investors differentiate earnings attributable to CAEs from other earnings. Table 7 reports the results.

The dependent variable in Table 7 is 3-day cumulative abnormal returns around earnings announcements (*3-day CAR*). *MB After Positive CAE* is an indicator for earnings meeting or beating thanks to the positive CAE (i.e., the firm would have missed the earnings target without the CAE). In Model 1 of Table 7, the coefficient on the indicator for positive CAE firm quarter (*Positive CAE*) is positive and significant at $p < 0.05$, suggesting that investors respond positively to the increase in earnings by the positive CAE. Consistent with prior findings, the coefficient on *MB* (0.094) is positive and statistically significant at the $p < 0.01$ level. The negative coefficient on *MB After Positive CAE* (-0.014) suggests a discount on meet/beat premium when firms meet or

[11] We classify a firm quarter as a quarter with GAAP EPS forecasts, if IBES actual EPS for the quarter is the same as EPS reported in Compustat (epsfxq).

beat due to a positive CAE. However, the discount is relatively minor. Even after accounting for the discount, firms still enjoy 8 percent meet/beat premium, which is both statistically and economically significant. Based on these results, it appears that investors do not fully discount the income effect of positive CAEs. Unlike positive CAEs, the coefficient on *MB After Negative CAE* is insignificantly different from zero. A potential explanation is that given the nature of accounting estimates and firms' disclosure practice, investors find it difficult to determine whether managers underreport the negative CAE to meet/beat analyst forecasts.

For about two-third of our sample firms, the earnings announcement date precedes the financial report filing date. This suggests that investors may not have the CAE information at earnings announcement for these firms, unless the firms disclose the CAE information along with earnings. To examine whether investors fully discount the CAE-related earnings when the CAE information is readily available to them, we re-estimate the regression after limiting the sample to the firm quarters when the earnings announcement date is the same as the filing date. We continue to find significant meet/beat premiums for this subsample, whether the earnings contain a positive or negative CA. Importantly, it suggests that public CAE information helps investors discern the implication of CAEs on earnings news. Specifically, the discount of meet/beat premiums for the use of positive CAE is larger for the subsample than the discount for the full sample ($p < 0.10$ one-tailed, untabulated). Further, firms that meet/beat even after applying a negative CAE enjoy additional meet/beat premiums.

The overall results in Table 7 suggest that investors find CAE-related earnings less informative about future cash flows. The results also suggests potential benefits of improved CAE disclosure. That is, more timely and transparent disclosure of CAEs could further improve investors' assessment of firm performance and financial position.

4.3. Financial Reporting Quality

To the extent that CAEs are influenced by managerial opportunism and not reflective of changes in economic factors that underlie the accounting estimates, we expect CAEs to be associated with lower financial reporting quality. We use two measures of financial reporting quality: the likelihood of financial misstatement (*Misstatement*) and the likelihood of SEC comment letter receipt (*Comment Letter*). *Misstatement* is a binary variable, indicating whether the current quarter financial statements are subsequently restated. *Comment Letter* is also a binary variable that equals one if the firm's current fiscal quarter or fiscal year is referenced in an SEC comment letter issued to the firm, and zero otherwise. Both variables are measured using data from Audit Analytics.

4.3.1. Likelihood of Misstatement

Table 8, Models 1 and 2 report our misstatement results. Consistent with CAEs being associated with an increased likelihood of misstated financial statements, the CAE variables in Model 1 are positively associated with the probability of a misstatement – the coefficient is 0.233 ($p < 0.05$) for *Positive CAE* and 0.393 ($p < 0.01$) for *Negative CAE*.

To account for the possibility that firms restate financial statement(s) for reasons other than CAE-related misstatements, we next relate revenue-related misstatements to revenue recognition CAEs – for our sample of CAEs, revenue-recognition is the most frequent type of CAEs, representing 30% of total CAEs. Further supporting the result in Model 1, Model 2 shows a positive association between the likelihood of revenue-related misstatement and the disclosure of positive CAEs related to revenue recognition. The coefficient on *Positive CAE-Revenue* (1.721) is positive and statistically significant at the $p < 0.01$ level. Interestingly, we do not find any significant association between negative revenue-recognition CAEs and revenue-related misstatement. A potential explanation is that measurement errors in revenue recognition estimates

are typically associated with positive CAEs. Overall, the results reported in Models 1 and 2 of generally suggest that the probability of a financial misstatement is greater when earnings contain CAEs.

4.3.2. Likelihood of SEC Comment Letter

The SEC reviews disclosures made by registrant firms to ensure their filings are in compliance with applicable financial reporting requirements. When the SEC determines a company's financial disclosure to be insufficient or unclear, it sends a comment letter outlining its questions and concerns to the company. The SEC may scrutinize financial reports that contain a material CAE, increasing the likelihood of its comment letter issuance. This is particularly so if the SEC suspects earnings are influenced by measurement errors or managers' self-serving biases. We use the issuance of SEC comment letters as an alternative proxy for the quality of financial reports and examine whether the issuance of SEC comment letters is more likely for financial reports containing CAEs. Table 8 Models 3 and 4 report the results. Model 3 estimates the likelihood of receiving a comment letter regardless of issue types and Model 4 focuses on comment letters identifying accounting issues. Consistent with CAEs being associated with lower quality of financial reporting, the coefficient on *Positive CAE* is positive and significant at the $p < 0.01$ level for both types of comment letters. However, the coefficient on *Negative CAE* is marginally significant or insignificant, suggesting that negative CAEs are a less of concern to the SEC. These results also support lower financial reporting quality when earnings contain a positive CAE.

5. ROBUSTNESS TESTS

5.1 Propensity-Score Matched Sample

The comparison of firm attributes between CAE firms and non-CAE firms shows systematic differences (Table 2 Panel A). We have addressed the differences by adding the firm attributes as control variables in our regression analysis. As an alternative, we use a propensity score matched

(PSM) sample (Rosenbaum and Rubin 1983). We match *Positive* (*Negative*) *CAE* firms to *Non CAE* firms based on the control variables used in Table 3: lag(*BTM*), lag(*Sales Growth*), lag(*lnMVE*), lag(*ROA*), *Analysts*, *Special Items*, and *Big4*.[12] We confirm that the CAE firms and the matched control firms are insignificantly different along each of the covariates (untabulated but available upon request). Using the PSM sample, we re-estimate our main regressions for the likelihood of CAE (Table 4), and financial reporting quality (Table 8), and find that the results are robust to using the matched sample. Table 9 reports the results.

5.2 Other Sensitivity Tests

We conduct additional sensitivity tests (untabulated) and find that our results are robust to alternative estimation methods and regression specifications. First, instead of estimating a logit model for Table 3, we use both a penalized Firth logit model to account for potential rare-event bias (King and Zeng 2001) and an OLS model assuming linearity, and continue to find quantitatively and qualitatively similar results. In all regression models, we have used industry fixed effects based on the firm's two-digit SIC code. As a sensitivity test, we define industry using the Fama-French 12 industry groups, and find that results are robust to this alternative industry classification.

6. CONCLUSION

This paper examines firms' general practice in making a material CAE and its impact on the earnings news and financial reporting quality. Consistent with managers' self-serving bias in CAEs, we find that managers tend to implement a positive CAE when it helps meet or beat earnings benchmark and a negative CAE when it is unlikely to cause a negative earnings surprise. We also find that investors do not fully discount the income effect of positive CAEs on the meet/beat, but

[12] We use one to one matching without replacement and a caliper of 0.001.

the discount is larger when the CAE information is readily available to investors. This finding provides a rationale for managers' timing of CAE implementation. It also suggests that more timely and transparent disclosure of CAEs will improve investor assessment of CAE information. Finally, we find that CAEs are associated with lower financial reporting quality as measured by financial misstatements, receipt of SEC comment letters, lower readability of financial report, and greater financial reporting risk assessed by external auditors.

Our findings have a direct policy implication for regulators. Lundholm (1999) argues that it is almost impossible for financial statement users to tell (even ex post) the accuracy of a firm's accounting estimates. The SEC proposed in 2002 a rule for quantitative disclosure of (1) the sensitivity of financial results to changes made in each critical accounting estimate and (2) historical changes in critical estimates in the past three years. However, this rule has never been adopted (Bauman and Shaw 2014). Our findings suggest potential benefits of revisiting the proposed SEC disclosure rule, particularly for material CAEs. This paper also provides systematic documentation of firms' CAE practices including the timing and impact of the CAEs on earnings news. Unlike prior studies on accounting estimates focusing on specific industries and/or specific types of estimates, our study examines CAEs in a large cross-section of accruals and industries. Therefore, the results of this study are more generalizable and have a broader implication. Finally, it contributes to the earnings management literature by introducing CAEs as an additional measure of earnings management.

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Appendix 1

Examples of Accounting Estimates

(Obtained from PCAOB interim standard AU 342 Auditing Accounting Estimates)

Category	Examples
Revenue	Airline passenger revenue, subscription income, freight and cargo revenue, dues income, losses on sales contracts
Contracts	Revenue to be earned, costs to be incurred, percent of completion
Receivables	Uncollectible receivables, allowance for loan losses, uncollectible pledges
Inventories	Obsolete inventory, net realizable value of inventories where future selling prices and future costs are involved, losses on purchase commitments
Financial Instruments	Valuation of securities, trading versus investment security classification, probability of high correlation of a hedge, sales of securities with puts and calls
Leases	Initial direct costs, executory costs, residual values
Property, Plant & Equipment, Intangibles	Useful lives and residual values, depreciation and amortization methods, recoverability of costs, recoverable reserves
Litigation	Probability of loss, amount of loss
Tax and Interest	Annual effective tax rate in interim reporting, imputed interest rates on receivables and payables
Accruals	Property and casualty insurance company loss reserves, compensation in stock option plans and deferred plans, warranty claims, taxes on real and personal property, renegotiation refunds, actuarial assumptions in pension costs
Other	Losses and net realizable value on disposal of segment or restructuring of a business, fair values in nonmonetary exchanges, interim period costs in interim reporting

*This list is not all-inclusive

Appendix 2

Disclosure on Changes in Accounting Estimates (Examples)

From Boeing Co 6/30/12 10-Q filed on 7/25/12.

Contract accounting is used for development and production activities predominantly by Defense, Space & Security (BDS). Contract accounting involves a judgmental process of estimating total sales and costs for each contract resulting in the development of estimated cost of sales percentages. Changes in estimated revenues, cost of sales and the related effect on operating income are recognized using a cumulative catch-up adjustment which recognizes in the current period the cumulative effect of the changes on current and prior periods based on a contract's percent complete. For the six and three months ended June 30, 2012, net favorable cumulative catch-up adjustments, including reach-forward losses, across all BDS contracts increased operating earnings by $234 million and $122million and earnings per share by $0.20 and $0.11. For the six and three months ended June 30, 2011, net favorable cumulative catch-up adjustments, including reach-forward losses, increased operating earnings by $153 million and $100 million and earnings per share by $0.14 and $0.09.

From Google Inc. 6/30/2013 10-Q filed on 7/25/13.

The preparation of consolidated financial statements in conformity with GAAP requires us to make estimates and assumptions that affect the amounts reported and disclosed in the financial statements and the accompanying notes. Actual results could differ materially from these estimates. On an ongoing basis, we evaluate our estimates, including those related to the accounts receivable and sales allowances, fair values of financial instruments, intangible assets and goodwill, useful lives of intangible assets and property and equipment, fair values of stock-based awards, inventory valuations, income taxes, and contingent liabilities, among others. We base our estimates on historical experience and on various other assumptions that are believed to be reasonable, the results of which form the basis for making judgments about the carrying values of assets and liabilities.

In the second quarter of 2013, we revised the estimated useful lives of certain types of property and equipment which resulted in an additional depreciation expense of $121 million during the three months ended June 30, 2013.

From Zale Corp 10/31/11 10-Q filed on 12/8/11.

We offer our Fine Jewelry customers lifetime warranties on certain products that cover sizing and breakage with an option to purchase theft protection for a two-year period. ASC 605-20, Revenue Recognition-Services, requires recognition of warranty revenue on a straight-line basis until sufficient cost history exists. Once sufficient cost history is obtained, revenue is required to be recognized in proportion to when costs are expected to be incurred. The Company has historically recognized revenue from lifetime warranties on a straight-line basis over a five-year period because sufficient evidence of the pattern of costs incurred was not available. During the first quarter of fiscal year 2012, we began recognizing revenue related to lifetime warranty sales in proportion to when the expected costs will be incurred, which we estimate will be over an eight-year period. The deferred revenue balance as of July 31, 2011 related to lifetime warranties will be recognized prospectively, in proportion to the remaining estimated warranty costs. The change in estimate related to the pattern of revenue recognition and the life of the warranties is the result of accumulating additional historical evidence over the five-year period that we have been selling the lifetime warranties. The change in estimate increased revenues by $6.3 million during the first quarter of fiscal year 2012. In addition, net loss and net loss per share improved by $5.9 million and $0.18 per share during the first quarter of fiscal year 2012.

Appendix 3

Variable Description

Variable Name	Definition
Acc Filer	Indicator coded as 1 if the firm is an accelerated filer, 0 otherwise.
Acctg Comment Letter	Indicator denoting that the firm's current fiscal quarter or fiscal year is referenced in an accounting related SEC comment letter issued to the firm, 0 otherwise. The accounting classification is obtained from Audit Analytics.
Acquisition	1 if the company has an acquisition that is greater than 5% of assets in year t, 0 otherwise.
Analysts	Number of analysts following the firm in quarter q.
Big 4	Indicator coded as 1 if the firm is audited by a Big 4 auditor, 0 otherwise.
BTM	Book value of equity scaled by market value of equity at the end of year t.
CAE	Indicator for CAE firm quarter. It takes value 1 if the firm reports a change in accounting estimate in quarter q, 0 otherwise.
Comment Letter	Indicator denoting that the firm's current fiscal quarter or fiscal year is referenced in an SEC comment letter issued to the firm, 0 otherwise.
DAcc	Signed discretionary accruals estimated using the quarterly Jones (1991) model from Linck, Netter, and Shu (2013) and adjusting for firm performance (Kothari et al. 2005). For the Audit Fee analysis, we estimate this variable using annual data.
Delay	The number of days between the company's fiscal year end and the filing date.
Earnings Surprise	The difference between actual EPS and the median analyst forecast, scaled by lagged stock price.
EPS	Actual earnings per share (unadjusted for stock split) reported in IBES.
EPS Impact	The post-tax, current quarter estimated EPS impact of the change in accounting estimate.
Finance	1 if the company issued debt or equity greater than 5 percent of total assets, and 0 otherwise.
Foreign	1 if the company reports foreign taxes in year t, 0 otherwise.
Going Concern	1 if a going concern opinion was received in year t, 0 otherwise.
Just MB	Indicator for just meet/beat. It is coded as1 if Earnings Surprise is within the range [0, 0.02], 0 otherwise.
Just Miss	Indicator for just miss. It is coded as 1 if Earnings Surprise is within the range [-0.02, 0), 0 otherwise.
Leverage	Total debt in year t, scaled by lagged total assets.
Liquid	Current assets divided by current liability in year t.

LnAssets	Natural logarithm of total assets in year t.
LnAuditFees	Natural logarithm of audit fees in year t.
LnMVE	Natural logarithm of the market value of equity
Loss	1 if the firm records net income below zero in year t, 0 otherwise.
MB	Indicator for actual, reported earnings meeting or beating earnings benchmarks. It takes value 1 if Earnings Surprise is greater than or equal to 0, 0 otherwise.
Misstatement	Indicator denoting that the firm's current quarter financial statements are subsequently restated, 0 otherwise. Misstatements identified as clerical errors are set to zero.
MTB	Market value of equity scaled by book value of equity at the end of year t.
NBS	Natural logarithm of the number of business segments. If business segment information is not available, then the number of business segments is set to 1.
Negative CAE	Indicator that takes value 1 if the firm reports a change in accounting estimate that negatively impacts net income in quarter q, 0 otherwise. For the Audit Fee analysis, Positive CAE is an indicator that takes a value of 1 if the firm reports a change in accounting estimate that negatively impacts net income any time during year t, 0 otherwise.
No Impact CAE	Indicator that takes value 1 if the firm reports a change in accounting estimate without a reported net income impact in quarter q, 0 otherwise.
Non-CAE	Indicator for no CAE firm quarters. It is coded as 1 if the firm does not report a change in accounting estimate in quarter q, 0 otherwise.
Positive CAE	Indicator that takes value 1 if the firm reports a change in accounting estimate that positively impacts net income in quarter q, 0 otherwise. For the Audit Fee analysis, Positive CAE is an indicator that takes a value of 1 if the firm reports a change in accounting estimate that positively impacts net income any time during year t, 0 otherwise.
Pre-CAE Extreme Miss (Beat)	Indicator denoting that pre-CAE earnings far exceed or grossly below the earnings benchmark. It is coded as 1 if the difference between the pre-CAE EPS (actual EPS less EPS Impact) and the median analyst forecast is greater than 0.02 or less than -0.02, 0 otherwise.
Pre-CAE Just Miss	Indicator that takes value 1 if the difference between the pre-CAE EPS (i.e., actual EPS less EPS Impact) and the median analyst forecast is greater than or equal to -0.02 and less than 0, 0 otherwise.
Pre-CAE Miss	Indicator that takes value 1 if the difference between the pre-CAE EPS (i.e., actual EPS less EPS Impact) and the median analyst forecast is less than 0, 0 otherwise.
Profitable	Indicator denoting that the firm’s earnings per share is greater than 0, 0 otherwise.

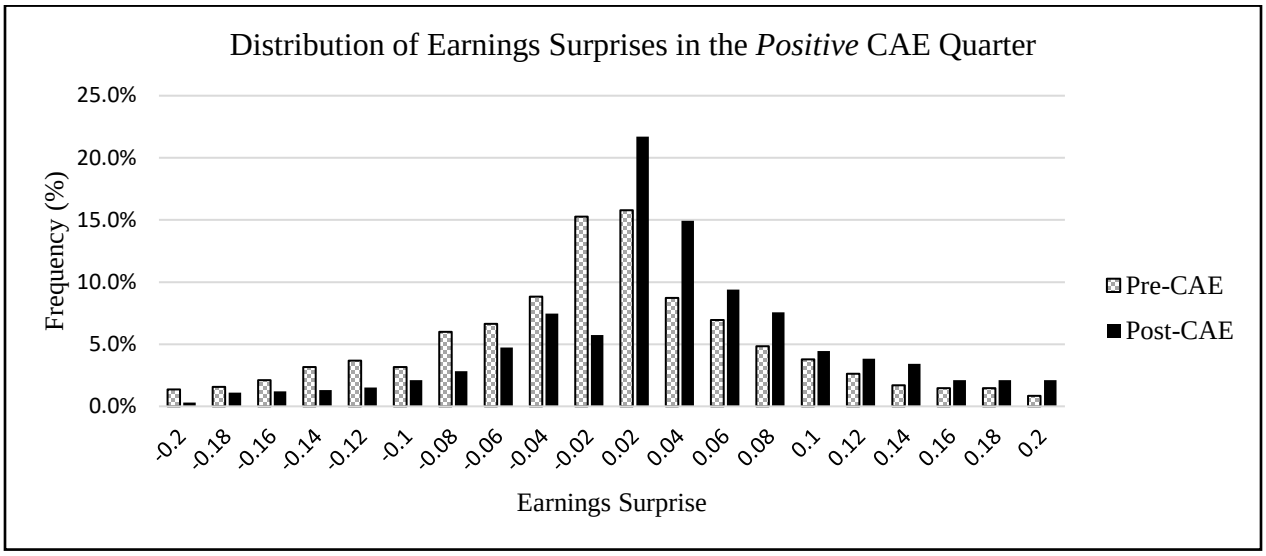
Restatement Announcement	Indicator denoting that the firm announced a restatement on previously issued financial statements, 0 otherwise.
Restructure	1 if the firm had restructuring expenses during the year, 0 otherwise.
Revenue Misstatement	Indicator denoting that the firm's current quarter revenue amount is subsequently restated, 0 otherwise. Misstatements identified as clerical errors are set to zero.
ROA	Income before extraordinary items scaled by total assets.
Sales Growth	Sales in quarter q less prior year sales from the same quarter, divided by prior year sales from the same quarter.
Short Auditor Tenure	1 if auditor tenure is less than or equal to 2 in year t, and 0 otherwise.
Special Items	Special items in the quarter scaled by quarterly total assets.
3 Day CAR	The market adjusted 3 day (-1,1) cumulative return around the earnings announcement date.
302 MW	Indicator coded as 1 if the firm reports a 302 material weakness in quarter q, 0 otherwise.
404 MW	Indicator coded as 1 if the firm reports a 404 material weakness in year t, 0 otherwise.

Figure 1

Distribution of Earnings Surprises: Pre-CAE versus Post-CAE

This following figures compare the distributions of earnings surprises before applying CAEs (Pre-CAE) versus after applying CAEs (Post-CAE) for firms that announced positive or negative CAEs. The interval for earnings surprise is 2 cents, in which \$0.02 indicates \$0 ≤ Earnings Surprise ≤ \$0.02, and -\$0.02 indicates -\$0.02 ≤ Earnings Surprise < \$0.

Panel A: Positive CAE Quarters



Panel B: Negative CAE Quarters

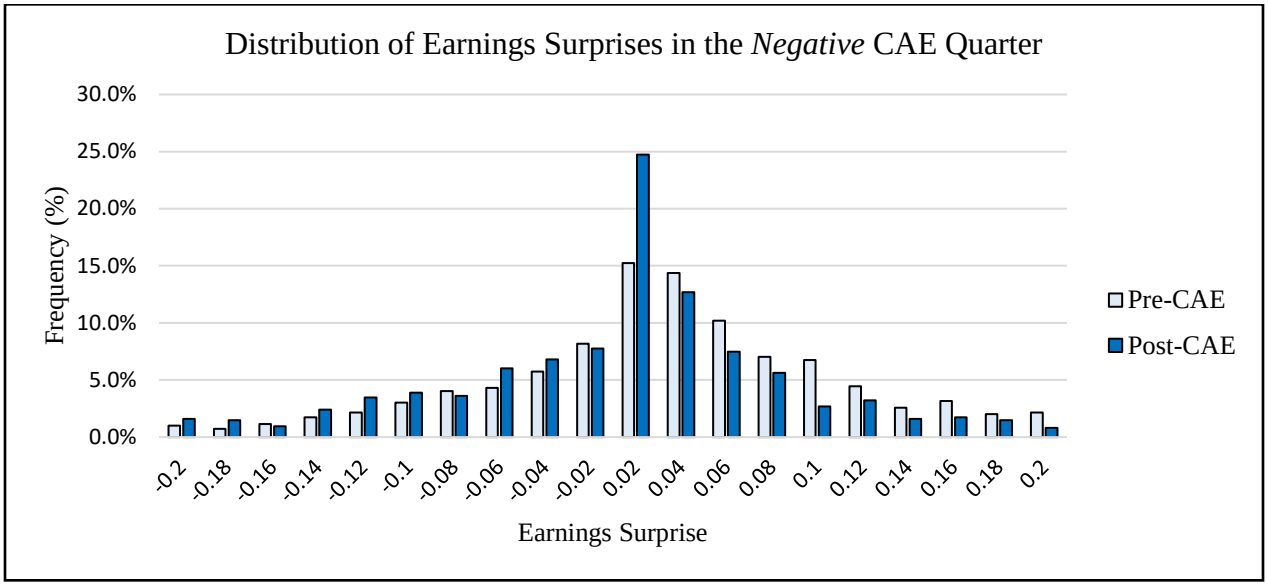


Table 1

Sample Selection

Cross-section of firm-quarters in Audit Analytics and Compustat	146,987
Less:	
Financial institutions and utilities	(36,239)
Observations missing IBES data	(36,658)
Observations missing CRSP data	(1,464)
Final Sample	72,626

Table 2

Descriptive Statistics

Panel A: Firm Characteristics: Non-CAE Firms versus CAE Firms

	Non CAE			CAE			Difference Test	
	Obs.	Mean	Median	Obs.	Mean	Median	Mean t-stat	Median z-stat
MB	70,333	0.652	1.000	2,293	0.649	1.000	0.224	0.224
lag(BTM)	70,333	0.509	0.411	2,293	0.514	0.448	-0.437	-2.111**
lag(Sales Growth)	70,333	0.179	0.081	2,293	0.141	0.052	3.009***	6.863***
lag(lnMVE)	70,333	6.742	6.611	2,293	7.050	7.020	-8.137***	-8.225***
lag(ROA)	70,333	-0.005	0.010	2,293	-0.005	0.008	0.325	5.141***
lag(DAcc)	70,333	0.017	-0.001	2,293	0.016	0.000	0.065	-1.590
Analysts	70,333	8.082	6.000	2,293	9.287	8.000	-8.403***	-10.040***
Special Items	70,333	-0.004	0.000	2,293	-0.009	0.000	-14.254***	-14.234***
Big 4	70,333	0.726	1.000	2,293	0.792	1.000	-6.916***	-6.914***

Table 2
(Continued)

Panel B: Frequency of CAE by CAE Type

Nature of Change	Overall	Positive Impact		Negative Impact		No Impact	
	Obs.	Obs.	Percent of Total	Obs.	Percent of Total	Obs.	Percent of Total
Revenue Recognition	687	403	58.66%	257	37.41%	27	3.93%
Liabilities, Accruals or Reserves	448	226	50.45%	220	49.11%	2	0.45%
Depreciation, Amortization, Depletion	380	154	40.53%	168	44.21%	58	15.26%
Other Accounting Estimates	421	226	53.68%	167	39.67%	28	6.65%
Deferred or Stock-Based Compensation	211	102	48.34%	58	27.49%	51	24.17%
Lease, Legal, Contingencies, Commitments	224	105	46.88%	113	50.45%	6	2.68%
Tax Expense	142	100	70.42%	35	24.65%	7	4.93%
Mergers and Acquisitions	122	73	59.84%	37	30.33%	12	9.84%
Inventory	56	21	37.50%	33	58.93%	2	3.57%
Asset Retirement Obligations	90	16	17.78%	10	11.11%	64	71.11%
AR and Loans Receivable	38	21	55.26%	16	42.11%	1	2.63%
Expenses (Payroll, SGA, Other)	24	14	58.33%	10	41.67%	0	0.00%
Pension	44	16	36.36%	13	29.55%	15	34.09%
PPE, Intangibles, Goodwill	22	10	45.45%	7	31.82%	5	22.73%
Derivatives and Hedging	3	2	66.67%	1	33.33%	0	0.00%
Overall CAE disclosure*	2,293	1,170	51.13%	889	39.32%	234	9.55%

* The sum of individual types of CAEs (Obs.) is 2,912, while the total number of CAE disclosure is 2,293. This is because a CAE can impact multiple financial statement line items (e.g., revenue recognition and accounts receivable).

Table 2
(Continued)

Panel C: Income Effect of Changes in Accounting Estimates

Impact on Earnings		Positive CAE (Obs. = 1,170)	Negative CAE (Obs. = 889)
Net Income Impact ($ million)	Mean	14.892	-7.868
	Median	1.400	-0.900
Net Income Impact (Scaled by Revenue)	Mean	0.042	-0.134
	Median	0.004	-0.005
EPS Impact	Mean	0.093	-0.097
	Median	0.022	-0.017
EPS Impact (Scaled by lagged Price)	Mean	0.013	-0.069
	Median	0.000	0.000

Table 3

Correlation Matrix (Pearson Correlations)

		1	2	3	4	5	6	7	8	9	10	11
Positive CAE	1											
Negative CAE	2	**-0.014**										
MB	3	**0.016**	**-0.019**									
Misstatement	4	0.008	**0.013**	**-0.014**								
lag(BTM)	5	0.000	0.003	**-0.077**	**0.039**							
lag(Sales Growth)	6	**-0.013**	-0.009	**-0.015**	0.000	**-0.118**						
lag(lnMVE)	7	**0.037**	-0.002	**0.151**	**-0.013**	**-0.269**	**-0.038**					
lag(ROA)	8	0.007	-0.009	**0.092**	0.008	**0.011**	**-0.023**	**0.342**				
lag(DAcc)	9	-0.002	0.001	-0.003	**0.011**	0.005	**-0.021**	**0.029**	**0.041**			
Analysts	10	**0.031**	0.002	**0.141**	**-0.019**	**-0.145**	**-0.022**	**0.724**	**0.185**	0.009		
Special Items	11	0.000	**-0.023**	**0.048**	-0.006	**-0.084**	**0.011**	**0.041**	**0.038**	0.008	**0.023**	
Big 4	12	**0.028**	0.004	**0.106**	**0.033**	**-0.091**	**-0.051**	**0.465**	**0.136**	0.006	**0.337**	**0.020**

Note: Correlations in bold represent significance at $p < 0.05$.

Table 4

Prospect of Meeting/Beating Earnings Benchmark and the Likelihood of CAE

The dependent variable, *Positive CAE* (*Negative CAE*), equals 1 if the firm discloses a positive CAE (negative CAE), and 0 otherwise. *Pre-CAE Miss* (*Pre-CAE Just Miss*) indicates that EPS before applying the positive CAEs falls short of the median analyst earnings forecast (by $0.02 or less). *Pre-CAE Extreme Miss* (*Beat*) indicates that EPS before applying the negative CAEs falls short of (exceeds) the analyst earnings forecast by more than $0.02. The sample for positive (negative) CAE regressions does not include negative (positive) CAE observations. Z-statistics are based on standard errors robust to clustering at the firm level. *, ** and *** denote significance at the 0.10, 0.05 and 0.01 level, respectively (two-tailed).

	Prob.(Positive CAE)				Prob.(Negative CAE)			
	Model 1		Model 2		Model 3		Model 4	
	Estimate	Z-stat	Estimate	Z-stat	Estimate	Z-stat	Estimate	Z-stat
Pre-CAE Miss	1.024***	(12.21)						
Pre-CAE Just Miss			0.670***	(7.04)				
Pre-CAE Extreme Beat					0.480***	(5.74)		
Pre-CAE Extreme Miss							-0.006	(-0.06)
lag(BTM)	0.172*	(1.72)	0.213**	(2.14)	0.100	(0.83)	0.103	(0.85)
lag(Sales Growth)	-0.106	(-1.29)	-0.117	(-1.33)	-0.121*	(-1.69)	-0.118*	(-1.67)
lag(LnMVE)	0.146***	(3.20)	0.130***	(2.90)	-0.079	(-1.59)	-0.064	(-1.29)
lag(ROA)	-0.638	(-0.99)	-1.174*	(-1.89)	-1.335**	(-2.15)	-1.229**	(-1.98)
lag(DAcc)	-0.039	(-1.09)	-0.035	(-0.97)	0.009	(0.28)	0.007	(0.20)
Analysts	0.021**	(2.41)	0.015*	(1.66)	0.023**	(2.08)	0.024**	(2.14)
Special Items	0.202	(0.42)	-0.254	(-0.48)	-1.727***	(-3.83)	-1.646***	(-3.94)
Big 4	0.353***	(2.71)	0.328**	(2.49)	0.060	(0.39)	0.090	(0.58)
Intercept	-7.714***	(-4.92)	-7.003***	(-4.47)	-19.449	(-0.60)	-19.223	(-0.13)
Obs.	71,737		71,737		71,456		71,456	
Firm Clustering	Yes		Yes		Yes		Yes	
Industry/Qtr-Year Fixed Effects	Yes		Yes		Yes		Yes	
Pseudo R^2	0.0926		0.0738		0.0743		0.0694	

Table 5

Asymmetric Impact of Positive versus Negative CAEs on Meet/Beat

The table reports the effects of positive CAEs versus negative CAEs on the proportion of firm quarters that miss (or meet/beat) the median analyst forecast. Panel A is for the full sample and Panel B is for a subsample with earnings news in the range of -0.02 to 0.02.

Panel A: Miss versus Meet/Beat of Earnings Benchmarks

	Overall	Miss		Meet/Beat	
	Obs.	Obs.	%	Obs.	%
Positive CAE					
Pre	1,170	646	55%	524	45%
Post	1,170	339	29%	831	71%
Negative CAE					
Pre	889	300	34%	589	66%
Post	889	381	43%	508	57%
No Impact CAE	234	84	36%	150	64%
Non CAE	70,333	24,502	35%	45,831	65%

Panel B: Just Miss versus Just Meet/Beat of Earnings Benchmarks

	Overall	Just Miss		Just Meet/Beat	
	Obs.	Obs.	%	Obs.	%
Positive CAE					
Pre	265	187	71%	78	29%
Post	265	50	19%	215	81%
Negative CAE					
Pre	242	32	13%	210	87%
Post	242	57	24%	185	76%
No Impact CAE	62	17	27%	45	73%
Non CAE	21,179	5,373	25%	15,806	75%

Table 6

Changes in Accounting Estimates and Probability of Meet/Beat

This table examines whether analysts incorporate CAE information in to their forecasts by relating CAE quarters to the likelihood of meet/beat (*MB*). *Positive CAE* (*Negative CAE*) is an indicator that the firm disclosed a positive (negative) change in accounting estimate in quarter q. The dependent variable, *MB*, is an indicator denoting that reported earnings for quarter q meets or beats the median analyst forecast. Panel A reports results based on full sample. For a robustness test, Panel B re-estimates the regressions in Panel A, using a subsample of analyst forecasts that are likely for GAAP EPS, i.e., post-CAE earnings. We classify a firm quarter as a GAAP forecast quarter, if the actual EPS in IBES is the same as the EPS in Compustat (epsfxq). t-statistics are based on standard errors robust to clustering at the firm level. *, ** and *** denote significance at the 0.10, 0.05 and 0.01 level, respectively (two-tailed).

Panel A: Full Sample

	Dependent Variable: Prob.(MB)					
	Model 1		Model 2		Model 3	
	Estimate	Z-stat			Estimate	Z-stat
Positive CAE	0.174**	(2.43)			0.168**	(2.34)
Negative CAE			-0.271***	(-3.22)	-0.267***	(-3.17)
BTM	-0.137***	(-5.20)	-0.137***	(-5.21)	-0.137***	(-5.22)
Sales Growth	0.313***	(11.36)	0.312***	(11.34)	0.312***	(11.35)
LnMVE	0.036***	(2.75)	0.036***	(2.74)	0.036***	(2.73)
ROA	6.541***	(24.34)	6.530***	(24.32)	6.530***	(24.31)
DAcc	-0.034***	(-2.59)	-0.034***	(-2.59)	-0.034***	(-2.59)
Analysts	0.037***	(11.15)	0.037***	(11.20)	0.037***	(11.18)
Special Items	-0.148***	(-6.68)	-0.145***	(-6.55)	-0.146***	(-6.60)
Big 4	0.218***	(6.24)	0.218***	(6.27)	0.218***	(6.25)
Intercept	-0.406	(-1.44)	-0.409	(-1.45)	-0.406	(-1.44)
N	72,626		72,626		72,626	
Firm Clustering	Yes		Yes		Yes	
Industry/Qtr-Year Fixed Effects	Yes		Yes		Yes	
Pseudo R2	0.069		0.069		0.069	

Table 6
(Continued)

Panel B: GAAP Analyst Forecast Sample

	Dependent Variable: Prob.(MB)					
	Model 1		Model 2		Model 3	
	Estimate	Z-stat			Estimate	Z-stat
Positive CAE	0.238**	(2.27)			0.233**	(2.21)
Negative CAE			-0.254**	(-2.28)	-0.247**	(-2.22)
BTM	-0.210***	(-5.84)	-0.210***	(-5.86)	-0.211***	(-5.86)
Sales Growth	0.302***	(8.97)	0.302***	(8.97)	0.302***	(8.97)
LnMVE	-0.031	(-1.61)	-0.031	(-1.62)	-0.031	(-1.63)
ROA	8.280***	(19.78)	8.275***	(19.78)	8.277***	(19.78)
DAcc	-0.033**	(-1.98)	-0.033**	(-1.96)	-0.033**	(-1.97)
Analysts	0.042***	(7.84)	0.042***	(7.88)	0.042***	(7.86)
Special Items	-0.312***	(-10.18)	-0.309***	(-10.06)	-0.311***	(-10.13)
Big 4	0.247***	(5.55)	0.248***	(5.57)	0.247***	(5.56)
Intercept	0.463	(1.13)	0.461	(1.13)	0.463	(1.13)
N	34,729		34,729		34,729	
Firm Clustering	Yes		Yes		Yes	
Industry/Qtr-Year Fixed Effects	Yes		Yes		Yes	
Pseudo R2	0.076		0.076		0.077	

Table 7

Investor Response at Earnings News and Changes in Accounting Estimate

This table examines whether/how CAE disclosures influence the meet/beat premium and investor response to CAE-related earnings news at earnings announcements. The dependent variable, *CAR*, is the 3-day cumulative abnormal return around a firm's earnings announcement. *Earnings Surprise* is the analyst forecast error, measured as actual earnings minus the median analyst forecast, scaled by lagged stock price. *MB* is an indicator for actual earnings meeting or beating the earnings benchmark as measured by the median analyst forecast. *MB After Positive CAE* (*MB After Positive CAE*) is an indicator denoting that actual earnings meet or beat (miss) the median analyst forecast due to a positive (negative) CAE. EA Date is an earnings announcement date from IBES. Filing Date is the filing date of the financial report. t-statistics are based on standard errors robust to clustering at the firm level. * and *** indicates significance at the 0.10 and 0.01 level, respectively (two-tailed).

	Dependent variable: 3 day CAR (-1,1)			
	Full Sample		Subsample (EA Date = Filing Date)	
	Estimate	t-stat	Estimate	t-stat
Earnings Surprise	0.071***	(2.79)	0.040	(1.01)
MB	0.094***	(20.84)	0.078***	(9.19)
Positive CAE	0.007**	(2.22)	0.011*	(1.86)
MB After Positive CAE	-0.014***	(-3.11)	-0.023***	(-2.80)
Negative CAE	-0.002	(-0.36)	-0.007	(-0.88)
MB After Negative CAE	0.006	(0.88)	0.021*	(1.89)
MTB	-0.000	(-1.02)	-0.000	(-0.91)
MB * MTB	0.000	(0.03)	-0.000	(-1.12)
Log(MktCap)	0.003***	(5.72)	0.003***	(2.72)
MB * Log(MktCap)	-0.005***	(-7.08)	-0.003*	(-1.88)
Beta	0.004	(1.64)	0.001	(0.12)
MB * Beta	-0.003	(-1.28)	0.001	(0.21)
Spcl Items	-0.027*	(-1.86)	-0.006	(-0.28)
MB * Spcl Items	-0.052***	(-2.58)	-0.069*	(-1.82)
Loss	0.010***	(7.27)	0.009***	(3.75)
MB * Loss	-0.014***	(-7.80)	-0.013***	(-3.98)
Estnum	-0.000***	(-2.66)	-0.001*	(-1.79)
MB * Estnum	0.000	(0.59)	0.000	(0.26)
Intercept	-0.058***	(-4.78)	-0.110***	(-5.03)
N	68,555		18,731	
Firm Clustering	Yes		Yes	
Industry Fixed Effects	Yes		Yes	
Qtr-Year Fixed Effects	Yes		Yes	
Adjusted R^2	0.094		0.097	

Table 8

Changes in Accounting Estimates and Misstatements/SEC Comment Letters

Misstatement indicates that the firm's current quarter financial statements are subsequently restated. *Revenue Misstatement* indicates that the firm's current quarter financial statements are subsequently restated due to revenue recognition errors. *Comment Letter* indicates that the firm's current fiscal quarter or fiscal year is referenced in an SEC comment letter issued to the firm. *Acctg Comment Letter* indicates that the firm's current fiscal quarter or fiscal year is referenced in an accounting-related SEC comment letter. *Positive CAE* (*Negative CAE*) indicates that the firm disclosed a positive (negative) change in accounting estimate in the current quarter. *Positive CAE-Revenue* (*Negative CAE-Revenue*) indicates that the firm discloses a positive (negative) CAE related to revenue recognition. Z-statistics are based on standard errors robust to clustering at the firm level. *, ** and *** denote significance at the 0.10, 0.05 and 0.01 level, respectively (two-tailed).

	Prob.(Misstatement)		Prob.(Revenue Misstatement)		Prob.(Comment Letter)		Prob. (Acctg Comment Letter)	
	Model 1		Model 2		Model 3		Model 4	
	Estimate	Z-stat	Estimate	Z-stat	Estimate	Z-stat	Estimate	Z-stat
Positive CAE	0.233**	(1.97)			0.211**	(2.40)	0.242***	(2.69)
Negative CAE	0.393***	(3.10)			0.164*	(1.71)	0.104	(0.97)
Positive CAE - Revenue			1.721***	(3.74)				
Negative CAE - Revenue			0.815	(1.50)				
BTM	0.212***	(3.79)	-0.156	(-0.88)	0.098***	(3.45)	0.120***	(3.89)
Sales Growth	0.057	(1.14)	-0.026	(-0.20)	0.101***	(2.87)	0.080**	(2.20)
LnMVE	-0.010	(-0.33)	-0.034	(-0.50)	0.105***	(6.84)	0.105***	(6.67)
Profitable	0.035	(0.49)	0.311	(1.62)	0.032	(0.74)	-0.026	(-0.57)
ROA	-0.403	(-0.84)	-0.387	(-0.35)	0.743**	(2.49)	0.916***	(2.85)
Special Items	-0.224	(-0.81)	-0.389	(-0.46)	-0.557**	(-2.25)	-0.545**	(-2.12)
Analysts	-0.008	(-1.10)	-0.034**	(-2.07)	0.019***	(5.71)	0.015***	(4.35)
DAcc	0.052*	(1.71)	0.029	(0.24)	0.015	(0.91)	0.023	(1.35)
302 MW	0.774***	(10.64)	0.707***	(4.09)	0.141**	(2.17)	0.141**	(2.09)
Acc Filer	0.021	(0.21)	0.181	(0.92)	0.060	(1.17)	0.099*	(1.95)
Big 4	0.419***	(4.78)	0.406*	(1.79)	-0.058	(-1.58)	-0.082**	(-2.02)
lag(Restatement Announcement)					-0.060	(-0.56)	-0.081	(-0.72)
Intercept	-1.562***	(-3.90)	-2.748**	(-2.32)	-5.014***	(-7.83)	-4.783***	(-7.48)

Obs.	72,626	72,626	72,626	72,626
Firm Clustering	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes
Qtr-Year Fixed Effects	Yes	Yes	Yes	Yes
Pseudo R^2	0.0380	0.1014	0.2342	0.1901

Table 9
Robustness Test: Propensity-Score-Matched Sample

To account for the potential self-selection bias, we estimate the probability of making CAEs using a logit regression and match each positive and negative CAE firms with non-CAE firms based on their propensity score – we use one to one matching without replacement and a caliper of 0.001. Using the matched sample, we re-estimate the association between meet/beat incentives and managers' CAE decision (Panel A), financial reporting quality (Panel B) and financial reporting readability (Panel C). The regression specifications used for these tests are the same as the specifications of the main test using the full sample, but we tabulate only the key variables of interest for brevity. Z-statistics (t-statistics) are based on standard errors robust to clustering at the firm level. *, ** and *** denote significance at the 0.10, 0.05 and 0.01 level, respectively (two-tailed).

Panel A: Likelihood of CAE

	Prob.(Positive CAE)				Prob.(Negative CAE)			
	Estimate	Z-stat	Estimate	Z-stat	Estimate	Z-stat	Estimate	Z-stat
Pre-CAE Miss	1.011***	(9.23)						
Pre-CAE Just Miss			0.668***	(4.12)				
Pre-CAE Extreme Beat					0.675***	(5.63)		
Pre-CAE Extreme Miss							-0.154	(-1.15)
Intercept	-1.945	(-0.80)	-1.283	(-0.61)	-17.116	(0.00)	-17.743	(0.00)
Obs.	2,336		2,336		1,774		1,774	
Pseudo R^2	0.1700		0.1430		0.1740		0.1600	

Panel B: Financial Reporting Quality

	Prob.(Revenue Misstatement)				Prob.(Acctg Comment Letter)			
	Estimate	Z-stat	Estimate	Z-stat	Estimate	Z-stat	Estimate	Z-stat
Positive CAE - Revenue	2.843***	(3.77)						
Negative CAE - Revenue			1.148	(1.48)				
Positive CAE					0.438***	(2.67)		
Negative CAE							0.186	(1.01)
Intercept	-36.745	(0.00)	-5.466***	(-3.96)	-18.993	(0.00)	0.087	(0.04)
Obs.	2,336		1,774		2,336		1,774	
Pseudo R^2	0.3844		0.1070		0.2920		0.2553	