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Costs and benefits of auditors' disclosure of critical audit matters: Initial evidence from the United States☆

Valerie Li, Yan Luo *

San Diego State University, USA

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ABSTRACT

In an effort to make audit reports more informative to financial statement users, the Public Company Accounting Oversight Board (PCAOB) requires an expanded audit report in which auditors are required to disclose critical audit matters (CAMs). The new standard (AS 3101) became effective for audits of financial statements of large accelerated filers for fiscal years ending on or after June 30, 2019. Using a sample of annual reports of large accelerated filers with and without CAM disclosures, we examine the costs and benefits of the mandatory disclosure of CAMs in auditors' reports. Our evidence suggests that compared to auditor reports reporting no CAMs, the presence of a single CAM disclosure in the auditor's report provides incremental information to equity investors without a significant increase in audit costs. However, using the benchmark of a single CAM disclosure, multiple CAMs in an auditor's report results in higher audit fees and longer audit delays.

1. Introduction

The Public Company Accounting Oversight Board's (PCAOB's) standard, AS 3101, addresses the demand for more informative communications from auditors. Previously, most audit reports with unqualified audit opinions were formulaic and contained only a pass-or-fail statement (Gutierrez, Minutti-Meza, Tatum, & Vulcheva, 2018). AS 3101 requires auditors to report any critical audit matters (CAMs) in the audit of the current period's financial statements.[1] For each CAM, auditors are required to (1) identify the CAM, (2) describe the principal considerations that have led the auditor to determine that the matter is a CAM, (3) describe how the CAM is addressed in the audit, and (4) refer to the relevant financial statement accounts or disclosures that relate to the CAM (PCAOB, 2017). For large accelerated filers, the requirements apply to all audits of fiscal years ending on or after June 30, 2019.[2] For all other companies to which AS 3101 applies, the requirements apply to fiscal years ending on or after Dec. 15, 2020.[3]

The primary objective of the new CAM disclosure requirement is to improve the informativeness and relevance of auditors' reports to financial statement users (PCAOB, 2017). Indeed, AS 3101 is the most significant change to auditors' reports in >70 years (PCAOB, 2020a). In the comment letters to the PCAOB, stakeholders claim that CAM disclosures provide relevant information by informing them of significant issues identified in the audit that are pertinent to understanding

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* Corresponding author.
E-mail addresses: vli@sdsu.edu (V. Li), yluo@sdsu.edu (Y. Luo).

[1] "A critical audit matter is any matter arising from the audit of the financial statements that was communicated or required to be communicated to the audit committee and that: (1) relates to accounts or disclosures that are material to the financial statements and (2) involved especially challenging, subjective, or complex auditor judgment." (AS 3101, para. 11).

[2] The SEC defines a large accelerated filer as an issuer that has a public float of $700 million or more as of the last business day of the issuer's most recently completed second fiscal quarter; an accelerated filer is an issuer that has a public float of at least $75 million but less than $700 million as of the last business day of the issuer's most recently completed second fiscal quarter (SEC 2020). The annual report is due within 60, 75, and 90 days for large accelerated filers, accelerated filers, and non-accelerated filers, respectively.

[3] "…communication of critical audit matters is not required for audits of brokers and dealers reporting under the Securities Exchange Act of 1934 (the 'Exchange Act') Rule 17a-5; investment companies other than business development companies; employee stock purchase, savings, and similar plans ('benefit plans'); and emerging growth companies ('EGCs'), as defined in Section 3(a)(80) of the Exchange Act. Auditors of these entities may choose to include critical audit matters in the auditor's report voluntarily. The other requirements of the final standard will apply to these audits" (PCAOB 2017, p. 3).

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financial statements (PCAOB, 2017). Lennox, Schmidt, and Thompson (2022) point out that an expanded audit report identifying any potential risk of material misstatement provides investors with more information about the audit and the accompanying financial statements. However, the new CAM disclosure requirement may increase audit fees and delay the completion of audits, especially for smaller firms (PCAOB, 2017). In this study, we investigate the potential costs and benefits of the new CAM disclosure requirement.

First, we examine the potential benefits of CAM disclosures to market participants by investigating whether CAM disclosure is associated with a change in the informativeness of firms' annual reports, which contain the audit reports.[4] We investigate two aspects of the informativeness of annual reports: the short-window information content and the long-window value relevance of annual earnings. Using a sample of firm-year observations of large accelerated firms with and without CAM disclosures, we find that firms with a CAM disclosure in their audit reports have higher short-window earnings response coefficients (ERCs), abnormal trading volume, and abnormal return variances around the annual report filing date, which suggests that CAM disclosure increases the short-window information content of earnings. In our long-window analyses, we find that CAM disclosure improves the value relevance of annual earnings to equity investors.

Second, we examine the potential costs of CAM disclosure, including the costs to the client (audit fees) and the costs to the market (audit delays). We measure audit fees as the logarithm of audit fees and measure audit delays as the number of days between the fiscal year-end and the audit report date. We do not find any significant increase in audit fees or audit delays. Taken together, our main results suggest that CAM disclosures are associated with a significant improvement in the informativeness of audit reports and are not associated with a significant increase in audit costs.

In additional analyses, we condition our tests on firms with CAM disclosures only. We find strong evidence that conditional on the presence of one CAM disclosure, multiple CAMs increases audit fees and delays the audit process without further enhancing the informativeness of audit reports; that is, disclosing multiple CAMs in the auditor's report results in higher costs without additional benefits, when benefits are defined as discussed above.

We conduct a set of sensitivity tests to enhance the validity of our findings. First, we reestimate our tests using two alternative samples. Our first alternative sample includes the CAM and non-CAM firm-year observations of all accelerated filers, instead of just large accelerated filers. This alternative sample allows us to make cross-sectional comparisons during a relatively short window. We find that CAM disclosure increases the informativeness and value relevance of the audit report, consistent with our main findings. However, we also find that firms that report CAMs have shorter audit processes, which is likely due to the difference in the 10-K filing deadlines for large and non-large accelerated filers in this alternative sample. Next, we adopt a propensity score-matching (PSM) approach to construct a control sample of large accelerated filers without CAMs that are similar along multiple dimensions of firm characteristics to CAM firms, and find slightly weaker results in the short-window ERC tests but stronger results in the abnormal trading volume and abnormal return variance tests. We also find consistent results of the value relevance and costs analyses using this PSM sample. These results suggest our finding that CAM disclosure increases earnings informativeness is robust across alternative samples.

Second, we re-estimate our tests using different proxies for unexpected earnings and an alternative model specification for our information-content analyses, and our inferences do not change. Third, we investigate only initial CAM disclosures and find that their impact on earnings informativeness and audit costs are similar to our main results. Fourth, we refine our sample period to eliminate the effects of the high market volatility and filing-date extensions that occurred during the COVID-19 pandemic, and our results are qualitatively similar. Lastly, our results are robust to a variety of alternative model specifications. In sum, our findings do not appear sensitive to the choice of sample, empirical measure, or model.

Our study contributes to the fast-growing literature on the regulatory changes to auditors' reports by providing archival evidence of the usefulness of expanded auditors' reports in the United States setting. Prior studies on CAM disclosures in the U.S. setting, including earlier experimental studies (e.g., Brasel, Doxey, Grenier, & Reffett, 2016; Christensen, Glover, & Wolfe, 2014; Gimbar, Hansen, & Ozlanski, 2016; Ozlanski, 2019; Rapley, Robertson, & Smith, 2021) and recent archival studies (Burke, Hoitash, Hoitash, & Xiao, 2021; Gurbutt & Shih, 2020), find mixed evidence on whether CAM disclosures are informative. Several concurrent papers analyze the content of CAM disclosures and find some but inconsistent evidence that multiple CAMs are associated with negative market returns and higher audit fees (Drake, Goldman, Lusch, & Schmidt, 2021; Klevak, Livnat, Pei, & Suslava, 2020; Sulcaj, 2020). Several published archival studies investigate expanded auditor disclosures in the United Kingdom setting (Gutierrez et al., 2018; Lennox et al., 2022; Reid, Carcello, Li, Neal, & Francis, 2019), in the French setting (Bédard, Gonthier-Besacier, & Schatt, 2019), and in the Asian setting (Goh, Li, & Wang, 2019; Liao, Minutti-Meza, Zhang, & Zou, 2022), but the generalizability of their findings to the U.S. setting may be limited due to differences in the information and legal environments of these countries, and slightly different CAR reporting requirements. Our study extends these prior studies and examines a longer sample period. We focus on U.S. firms with CAM disclosures and take a within-firm analysis approach, which alleviates concerns that our results might be driven by differences in firm characteristics. Our initial evidence suggests that CAM disclosures in the U.S. setting enhance the informativeness of earnings and audit reports, and provides practitioners and regulators insights into the costs and benefits of the initial CAM implementation in the United States. At the same time, our study complements recent experimental studies (e.g., Bentley, Lambert, & Wang, 2021) and the PCAOB's ongoing interim analysis of AS 3101 implementation (Gurbutt & Shih, 2020; Gurbutt, Shih, & Bose, 2020; PCAOB, 2020c; Smith, Zietsman, Mahoney, & Ray, 2020).

The remainder of the paper proceeds as follows. Section 2 provides the background and develops the hypotheses. Section 3 outlines our sample, and Section 4 presents the empirical results. Section 5 concludes with a discussion of this study's limitations and opportunities for future research.

2. Background and hypothesis development

An audit report communicates to investors the auditor's opinion as to whether a company's financial statements are prepared in compliance with accounting standards and are free from material misstatements. Nearly all public companies receive unqualified opinions. Traditional, standardized audit reports have been criticized for being uninformative due to their pass/fail model and formulaic language. In response to these criticisms, standard setters and regulators around the world have changed their audit reporting standards to require auditors to disclose more information about complex or challenging issues they encounter

[4] As the audit report is released concurrently with and included in the annual report, the tests of the informativeness of audit reports are essentially tests of earnings informativeness, which we refer to as informational benefits of CAM disclosures.

during an audit.[5] In the United States, the PCAOB issued AS 3101 on June 1, 2017. With the goal of including more audit engagement-specific information in audit reports, AS 3101 requires auditors to disclose CAMs and auditor tenure in their audit reports.

2.1. Changes in the usefulness of audit reports

CAM disclosures in auditors' reports can provide additional useful information to investors, as independent auditors have the expertise to inform investors of significant matters identified during an audit. Auditors have access to a wealth of private information about their clients' financial statements and are therefore in a unique position to bring additional useful information to the attention of investors (Burke et al., 2021; Lennox et al., 2022). Furthermore, CAM disclosures in audit reports are viewed as more credible than management's disclosures of similar matters because auditors perform specific audit procedures in addressing CAM issues, and auditors are viewed as independent (Bauman & Shaw, 2014; Glendening, 2017; Glendening, Mauldin, & Shaw, 2019; Levine & Smith, 2011; Pinello, Puschaver, & Volkan, 2020). Auditors' expanded disclosures may also help investors to prioritize the most significant financial reporting matters and increase the readability of the typically lengthy financial reports (CFA Institute, 2013). Studies examining expanded audit reports in non-U.S. settings find that clients' earnings quality improves significantly following the requirement of expanded audit reports (Drake et al., 2021; Reid et al., 2019; Zeng, Zhang, Zhang, & Zhang, 2021). Several archival studies investigating the requirement of adding auditors' going concern opinions to unqualified audit opinions under the U.S. Auditing Standards Board's AU Section 508 document that such explanatory language provides incremental information content, is value relevant, and can affect firms' subsequent disclosure behaviors (Carson et al., 2013; Citron, Taffler, & Uang, 2008; Gissel, Robertson, & Stefaniak, 2010; Kawada & Wang, 2020; Menon & Williams, 2010; Taffler, Lu, & Kausar, 2004).

However, it is possible that CAM disclosures are not incrementally informative. First, CAM disclosures may be formulaic, duplicate other corporate disclosures (e.g., critical accounting estimates or critical accounting policies) (Cooley, 2016; Council of Institutional Investors, 2019; Katz, 2013; Lennox et al., 2022; Pinello et al., 2020). PCAOB (2017) states that CAM disclosures are not expected to provide information about the company that is not publicly disclosed by the company itself. Second, investors may pay insufficient attention to CAM disclosures. A recent PCAOB survey indicates that investors make limited use of CAM disclosures: only 31% of investors read the CAMs in an audit report to identify risks associated with a given company (Gurbutt et al., 2020). Expanded auditors' reports may draw investors' attention away from the core information in financial reports and thus offset the potential incremental information benefits of an expanded audit report (Moroney, Phang, & Xiao, 2021; Sirois, Bédard, & Bera, 2018). Third, CAM disclosure may magnify investors' perception of a firm's risk, as CAMs are disclosed in the auditor's report as critical matters, hence increasing perceived uncertainty of the firm (PCAOB, 2017).[6] The increase in perceived risk could in turn decrease the perceived informativeness of earnings.

Prior academic studies provide inconclusive evidence of the informational benefits of CAM-related disclosures. In non-U.S. settings, prior research investigates the benefits of key audit matter (KAM) disclosures under requirements that are similar but not identical to the U.S. CAM disclosure requirements. In short-window tests (using signed or unsigned abnormal market returns, abnormal trading volume, and stock return volatility as dependent variables), Lennox et al. (2022, U.K. setting), Gutierrez et al. (2018, U.K setting), Bédard et al. (2019, France setting), and Liao et al. (2022), China and Hong Kong setting) find no evidence that expanded audit reports change the information content of earnings. However, Reid et al. (2019, U.K. setting) finds that expanded auditor reporting is associated with a significant improvement in the earnings response coefficient of companies whose auditors comply with the new standard. In a recent working paper, Goh et al. (2019) examines the adoption of expanded audit reports for Chinese companies and find that the 3-day abnormal trading volume and earnings response coefficients are higher and stock price synchronicity is lower in the post-adoption periods than in the pre-adoption periods. In long-window tests, Lennox et al. (2022) does not find a market reaction over 1-month, 3-month, 6-month, or 12-month horizons, but finds the valuation coefficients on earnings are significantly smaller when auditors include expanded disclosures in their audit reports.

In the U.S. setting, Burke et al. (2021) finds no evidence that changes in the absolute abnormal returns between the pre- and post-regulation periods are different for CAM issuers and non-issuers. Gurbutt and Shih (2020) reports that changes in the absolute abnormal returns in the post-regulation period are smaller for CAM issuers, but the difference disappears when excluding observations with filing dates after February 15, 2020 (i.e., observations affected by the market disruptions caused by the COVID-19 pandemic).[7] Pinello et al. (2020) finds that auditors' CAM disclosures and managements' critical accounting estimates or critical accounting policy disclosures provide incremental value to one another. Using an experimental research design, Rapley et al. (2021) finds that participants are less willing to invest in a company with an audit report that discloses a CAM than in a company with a traditional pass/fail audit report. Similarly, Kachelmeier, Schmidt, and Valentine (2020) finds that experimental participants have less confidence in accounts that are identified in the audit report as having CAMs. An experimental study by Christensen et al. (2014) finds that investors are more likely to change an investment decision based on an auditor's CAM disclosure than on the same information disclosed by managers, due to concerns over the credibility of management disclosures. These studies suggest that CAM

[5] Specifically, since 2003, French auditors are required to disclose justifications of their assessments of audit opinions in expanded audit reports (Bédard et al., 2019; Haut Conseil des Commissaires aux Comptes, 2006). In the United Kingdom, the Financial Reporting Council's (FRC's) revisions to ISA 700, which became effective in September 2013, requires auditors to discuss the risks of material misstatement that have the greatest effect on the overall audit strategy, the application of materiality, the scope of the audit, allocation of resources during the audit, and efforts of the audit engagement team (FRC 2013; Lennox et al., 2022). Similarly, auditors in the European Union are required to disclose key audit matters (KAMs) under ISA 701 (International Auditing and Assurance Standards Board, 2015a, 2015b; Jermakowicz, Epstein, & Ramamoorti, 2018). Under ISA 701, auditors must disclose the matters that require significant auditor attention based on the consideration of three factors: areas of higher risk of material misstatement, significant auditor judgment relating to areas in the financial statements that involve significant management judgment, and the effect of the audit of significant events or transactions that occurred during the period. The methods for determining and communicating CAMs and KAMs are similar; for a side-by-side comparison of AS 3101 and ISA 701, Refer to Exhibits 1 and 2 in Jermakowicz et al. (2018).

[6] AS 3101 indicates that the auditor should assess the risks of material misstatement in determining CAM. Therefore, the disclosure of CAM may increase investor's perception about the risk of the underlying firm (PCAOB, 2012, 2017).

[7] Our research design is significantly different from these two studies. Both studies use difference-in-difference specifications, and their results suggest that the *change* in the information content of earnings from the pre- to post-regulation period does not differ for CAM firms and non-CAM firms. We take a different approach and directly assess the potential effect of CAM disclosure on earnings informativeness. In addition, there is a one-to-one correlation between being a CAM issuer and being in the post-regulation period in our sample after we eliminate observations that do not have the data necessary for our analyses. Hence, we do not use a difference-in-difference approach. Another difference in our study's design is that we use signed 3-day abnormal returns in our short-window information-content tests rather than the absolute abnormal returns to allow for more variation in the dependent variables.

disclosures are relevant to investors' decisions and, hence, can provide information content.

To the extent that the communication of CAMs may inform financial statement users of significant issues, enhance the understanding of financial statements, and impact investor confidence in financial statements (PCAOB, 2017), CAM disclosure would increase the informativeness of audit reports. Hence, we propose the following hypothesis.

H1: CAM disclosure increases the informativeness of audit reports for large accelerated filers.

2.2. Changes in audit costs

Complying with the new audit reporting requirements could increase auditing costs (Chalmers, 2013; PCAOB, 2020b; PCAOB, 2020c).[8] Reid et al. (2019) points out that the costs associated with expanded auditor reporting take two forms: the cost to the market due to audit delays (i.e., less timely financial reporting) and the cost to the audit clients in the form of audit fees. In comment letters to the PCAOB, various stakeholders (e.g., smaller accounting firms, companies, and audit committee members) expressed concerns that the CAM disclosure requirement could increase audit cost or delay completion of audits (PCAOB, 2017). However, a recent PCAOB interim survey analysis (PCAOB, 2020c) suggests that these implementation costs (i.e., audit fees and audit hours) are largely inconsequential. We develop two separate hypotheses on the effects of CAM disclosures on audit delay and audit fees, as explained below.

2.2.1. Changes in audit delay

CAM disclosure may not require significant additional effort if the audit procedures needed to comply with the new standards were already being performed before the new standard came into effect.[9] An experimental study by Asbahr and Ruhnke (2019) finds that audit effort is not affected by the reporting of KAMs. Recent archival studies in the United Kingdom (Gutierrez et al., 2018; Reid et al., 2019), China and Hong Kong (Liao et al., 2022), and France (Bédard et al., 2019) find no significant changes in audit delay following the introduction of expanded audit reporting requirements.

However, auditors who are required to include more details about the audit process in audit reports (e.g., to disclose CAMs) may perform additional audit procedures or review processes due to a greater sense of accountability (Bédard et al., 2019; Carcello & Li, 2013). A survey of engagement partners by the PCAOB (Gurbutt et al., 2020) reports that in the first year of AS 3101 implementation about 1% of total audit hours were spent identifying, developing, and communicating CAMs. This suggests that the audit process is likely to be longer when CAM disclosure is required.

In addition, changes in management's disclosures when the auditor identifies a CAM may in turn require additional audit effort. A survey by Gurbutt, and Shih, Bose, (2020, p. 5) shows that "more than one-third of engagement partners (39%) reported that the issuer made changes to financial statement disclosures or other corporate reporting as a result of CAMs communicated in the auditor's report." Burke et al. (2021) find that when a CAM refers to a footnote, the length of management's disclosure in the footnote increases. Such attempts to expand and/or clarify financial reporting areas that are expected to be scrutinized may increase the length of the audit process. Thus, we make the following hypothesis.

H2a: Audit delay for large accelerated filers increases when auditors disclose a CAM in their audit report.

2.2.2. Changes in audit fees

Mandated CAM disclosure may not affect audit fees if the audit procedures needed to comply with the new standard were already performed before it came into effect. In that case, the main incremental effort associated with the implementation of AS 3101 is related to determining and preparing the language for CAMs reporting in audit reports (PCAOB, 2017). Hence, the incremental audit fees to report CAM would be minimal. Consistent with this notion, an archival study by Burke et al. (2021) in the U.S. setting and studies in the U.K. setting (Gutierrez et al., 2018; Reid et al., 2019), China and Hong Kong (Liao et al., 2022), and France (Bédard et al., 2019) find no significant changes in audit fees following the introduction of expanded audit reporting requirements.

However, CAM disclosure could require longer audit hours and additional audit effort by more senior members of the audit team to identify, review, and report the CAM in the audit report (Bédard et al., 2019; PCAOB, 2017). Such additional effort would likely lead to higher audit fees (DeFond & Zhang, 2014). In addition, CAM disclosure highlights the potentially riskier areas that involve more judgment in financial reports and make them more visible to users (Bédard et al., 2019), which invites more scrutiny of auditors' due diligence and increases their litigation risk and reputation cost when a subsequent misstatement is discovered (Brasel et al., 2016; Gaetano, 2014; Gimbar et al., 2016; Katz, 2014; Sulcaj, 2020; Vinson, Robertson, & Cockrell, 2019). To compensate for the heightened risk, auditors may charge a higher risk premium in audit fees (DeFond & Zhang, 2014). We therefore propose the following hypothesis.

H2b: Audit fees for large accelerated filers increase when auditors make a CAM disclosure in their audit reports.

3. Sample selection and descriptive analyses

3.1. Sample selection criteria

Our initial sample consists of large accelerated filers with at least one CAM disclosure in their audit reports for the fiscal period ending between June 30, 2019 and December 15, 2020. It includes firm-year observations for these firms, including firm-years that have CAM disclosures (CAM years) and firm-years that do not have CAM disclosures (non-CAM years). This within-firm sample mitigates the concern that our results might be driven by differences in firm characteristics.

Table 1 outlines our sample selection procedure. We start with all firms in the Audit Analytics database that have had at least one CAM disclosure in any fiscal year ending on or before December 14, 2020, one day before all firms were required to comply with AS 3101. This creates a sample of 2634 firm-year observations with 4479 CAMs. We delete 158 firm-year observations with CAM disclosures from firms that are not large accelerated filers to minimize the differences in firm characteristics. This sample selection procedure yields 2476 firm-year observations of large accelerated filers that have made at least one CAM disclosure

[8] Specifically, the potential costs associated with CAM requirements include "development and implementation of audit policies, procedures, methodology, tools, guidance, review processes, and other infrastructure directly related to CAMs…[They also include] [l] labor costs to identify, draft, and review CAMs; prepare documentation related to the determination of whether a matter is a CAM; draft communications related to CAMs; and engage in CAM-related discussions with national office resources, preparers, and audit committees" (PCAOB 2020b, pp. 3–4). Some large audit firms expect to incur training and implementation costs associated with setting up "additional quality control processes … around the new, more informative and tailored auditors' report" (Chalmers, 2013, p. 7).

[9] Before the implementation of AS 3101, auditors in the United States were already required by PCAOB Standard No. 16 to discuss with audit committees any significant risks identified by the auditor; certain matters regarding the company's accounting policies, practices, and estimates; significant unusual transactions; certain matters related to the auditor's evaluation of the company's relationships and transactions with related parties; among others. (PCAOB 2012, 2017).

Table 1
Sample selection.

	Number of observations
Firm-year observations with at least one CAM disclosure covered by Audit Analytics with fiscal year ending by December 14, 2020	2634
Less: CAMs disclosed by non-large accelerated filers	(158)
Firm-year observations with CAM disclosures by large accelerated files for the fiscal period ending between June 30, 2019 and December 14, 2020	2476
Add: Firm-year observations without CAM disclosure for the CAM firms during the fiscal year 2017 to fiscal year 2019 period	4161
Firm-year observations in the sample	6637
Firm-year observations with available data for the market reaction analyses	5952
Firm-year observations with available data for the cost analyses	6007

This table outlines the sample selection procedures for our descriptive and multivariate analyses. To maximize our sample size for each test, we use different subsamples for different multivariate analyses.

during the fiscal period ending between June 30, 2019 and December 14, 2020. We then identify 4161 non-CAM firm-year observations of these CAM firms from the period between fiscal year 2017 and fiscal year 2019 as our control sample.[10] Thus, our initial within-firm sample for the multivariate analyses consists of 6637 firm-year observations that only include large accelerated filers that disclosed CAMs during the fiscal period from June 30, 2019 to December 14, 2020. We obtain accounting data for these firms from Compustat and market data from CRSP. We require firms to have non-missing data for the variables used in each of our regression models. To maximize our sample size for each multivariate test, we do not use a common sample for all of the tests. After dropping observations missing the relevant data, the within-firm subsample for our market reaction tests consists of 5952 firm-year observations, and the within-firm subsample for the audit cost analyses consists of 6007 firm-year observations.

3.2. Descriptive analyses

Table 2 – Panel A summarizes the distribution of key variables in the complete within-firm sample. To minimize the potential influence of outliers, we winsorize each of the continuous variables at the 1st and 99th percentiles. The median firm in our sample has $5115 million in total assets, 3% return on assets, and leverage of 1.5. A loss was reported by 17% of our sample firms. In addition, 92% hire one of the Big 4 accounting firms as their auditors. Table 2 – Panel B displays the composition of our sample firms by industry, based on the 2-digit Standard Industrial Classification (SIC) code. Business services is the largest industry, accounting for 10.91% of the sample, followed by chemical and allied products (8.41%), depository institutions (8.14%), holding and other investment offices (7.44%), and electronic and other electric equipment (5.38%). No other 2-digit industry classification comprises >5% of our sample firms.

Table 2 – Panel C compares the firm characteristics of subsamples of the within-firm sample. First, we compare the firm characteristics for firm-years with CAM disclosures to those firm-years from the same firms without CAM disclosures. As expected, the firm-characteristic variables that are likely fixed or stable over a short window, such as size, leverage, book-to-market, and indicator variable for whether the firm hires a Big 4 audit firm, do not differ significantly between the CAM firm-years and non-CAM subsamples, suggesting that using a within-firm sample successfully mitigates concerns that our results are driven by differences in firm characteristics. However, firm-years with CAM disclosures appear to have lower ROA, higher incidence of loss, and higher return volatilities, and the auditors seem to be from offices with fewer audit clients but with more industry expertise. These differences are plausible, as these characteristics can vary year over year.[11] In our second comparison, we compare firm-years in which auditors report just one CAM and those with multiple CAMs. On average, firms with multiple CAMs are larger, more volatile, have higher leverage, higher incidence of losses, and tend to hire auditors from audit offices with fewer clients but higher industry expertise. We control for these variables in our multivariate analyses.

Appendix A outlines the distribution and frequency of the CAM topics in our sample. Of the 2476 auditor reports with at least one CAM, 49.4% (1225 firm-years) have more than one CAM disclosed in their audit reports. The average number of CAMs disclosed is 1.7, and the median is 1 (Table A1 – Panel A). We summarize the CAM issues in broad categories in Table A1 – Panel B. Liabilities, assets, and revenue-related issues are the three most frequently reported CAM topics, consistent with these issues being the most commonly misreported or the most difficult to measure (Dechow, Ge, Larson, & Sloan, 2011).[12]

4. Empirical results

4.1. Tests of the benefits of CAM disclosure

Our first hypothesis predicts that CAM disclosure improves the informativeness of auditors' reports, which are released at the same time as, and are included in, the annual reports. Hence our empirical analyses are joint tests to assess the impact of CAM disclosure on the informativeness of earnings and the auditor's report. Earnings informativeness is reflected by changes in the level or variability of security prices or trading volume following an accounting event (i.e., the information content of earnings), or the earnings' ability to capture changes in the information set, as reflected in security returns over a given period (i.e., the value relevance of earnings; Kothari, 2001). Prior studies measure the short-window information content of earnings by the association of earnings with contemporaneous stock returns (short-window ERC) and abnormal trading volume and return variances around the earnings announcement day, and they measure the value relevance of earnings by the long-window ERC in valuation models (see Kothari, 2001 for a review). If CAM disclosure in audit reports increases the informativeness of earnings and the auditor's reports, investors would put more weight on earnings and rely less on information from other sources. Empirically, we expect higher ERCs and increased abnormal trading volume and return variances in our short-window information-content analyses, and stronger associations between annual earnings and the level and changes of security prices (i.e., higher ERCs) in our long-window value-

[10] We start our non-CAM firm-year observations in 2017 to match the 2-year observations with CAM disclosures.

[11] In addition to controlling for these firm characteristics in our multivariate analyses, we perform PSM analyses as robustness tests to mitigate the concerns that our results might be driven by these differences in firm characteristics.

[12] When reporting CAMs, auditors refer to the specific management disclosures in the notes to the financial statements that the auditors have identified as CAMs. However, the reports do not provide information about the direction or extent of the CAM's impact on the firm's financial performance. To examine how different CAM topics affect earnings informativeness and audit costs, we define indicator variables for the five main CAM topics (assets, liabilities, revenues, expenses, and going concerns) and reestimate our tests. In untabulated analyses, we do not find consistent or robust evidence that a particular CAM topic affects earning informativeness and audit costs relative to other CAM topics.

Table 2
Descriptive statistics.

Panel A: Summary statistics of the key variables

Variable	N	Mean	Std. Dev.	25th Pctl.	Median	75th Pctl.
DCAM	6637	0.37	0.48	0.00	0.00	1.00
SIZE	6522	8.67	1.65	7.51	8.54	9.64
LEV	6484	2.55	4.84	0.77	1.50	3.26
ROA	6522	0.03	0.10	0.01	0.03	0.07
BTM	6482	0.49	0.43	0.19	0.39	0.69
SDREVT	6332	0.07	0.09	0.01	0.04	0.09
LOSS	6522	0.17	0.38	0.00	0.00	0.00
BIG4	6637	0.92	0.28	1.00	1.00	1.00
CAR	6187	0.00	0.05	−0.02	0.00	0.02
RET	5981	0.02	0.36	−0.20	0.00	0.20
DELAY	6637	56.42	13.91	51.00	56.00	59.00
BUSY	6637	0.78	0.42	1.00	1.00	1.00
LN_FEES	6525	14.88	1.02	14.18	14.78	15.50
AVOL	6171	1.33	0.80	0.82	1.10	1.60
AVAR	6171	4.87	15.31	0.29	0.79	2.36
OFCLIENTS	6637	0.22	0.20	0.06	0.14	0.35
AUDEXP	6637	0.53	0.50	0.00	1.00	1.00

Panel B: Industry composition of sample

Observations	Percent	2-digit SIC code	Name of industry classification
724	10.91	73	Business services
558	8.41	28	Chemical & allied products
540	8.14	60	Depository institutions
494	7.44	67	Holding & other investment offices
357	5.38	36	Electronic & other electric equipment
322	4.85	49	Electric, gas, & sanitary services
294	4.43	38	Instruments & related products
280	4.22	35	Industrial machinery & equipment
231	3.48	63	Insurance carriers
191	2.88	62	Security & commodity brokers
190	2.86	37	Transportation equipment
182	2.74	13	Oil & gas extraction
181	2.73	48	Communications
158	2.38	20	Food & kindred products
88	1.33	50	Wholesale trade – durable goods
86	1.3	33	Primary metal industries
86	1.3	34	Fabricated metal products
81	1.22	58	Eating & drinking places
72	1.08	80	Health services
71	1.07	59	Miscellaneous retail
69	1.04	51	Wholesale trade – nondurable goods
68	1.02	87	Engineering & management services
67	1.01	70	Hotels & other lodging places
1247	18.79	NA	Combination of industries with <1% sample
	6637	**100**	

Panel C: Comparisons of CAM disclosure subsamples

Firm-years with and without CAM disclosure

Variable	*DCAM* = 0	*DCAM* = 1	Diff.	t value
SIZE	8.67	8.67	0.00	−0.06
LEV	2.54	2.55	0.01	−0.09
ROA	0.03	0.02	−0.01***	5.12
BTM	0.49	0.49	0.00	−0.41
SDREVT	0.06	0.08	0.01***	−5.4
LOSS	0.15	0.20	0.05***	−4.96
BIG4	0.92	0.92	0.00	0.28
OFCLIENTS	0.23	0.20	−0.02***	4.81
AUDEXP	0.52	0.56	0.03***	−2.61

Firm-years with one CAM and with multiple CAMs

Variable	One CAM	Multiple CAMs	Diff.	t value
SIZE	8.31	9.03	0.72***	−11.14
LEV	2.22	2.89	0.67***	−3.41
ROA	0.02	0.02	0.00	−0.12
BTM	0.45	0.53	0.08***	−4.34
SDREVT	0.07	0.08	0.01***	−2.38

(*continued on next page*)

Table 2 (*continued*)

Firm-years with one CAM and with multiple CAMs				
Variable	One CAM	Multiple CAMs	Diff.	t value
LOSS	0.19	0.22	0.04**	−2.25
BIG4	0.91	0.92	0.01	−0.68
OFCLIENTS	0.21	0.20	−0.01*	1.88
AUDEXP	0.52	0.59	0.06***	−3.07

Panel A presents the summary statistics for key variables. All variables are defined in Appendix B.
Panel B reports the industry composition of the sample.
Panel C compares CAM disclosure subsamples. ***, ** and * indicate statistical significance at the 0.01, 0.05 and 0.10 levels, respectively.

relevance analyses.[13]

4.1.1. Information-content analysis

Following prior studies (e.g., Elliott & Hanna, 1996; Hanlon, Maydew, & Shevlin, 2008; Warfield, Wild, & Wild, 1995), we measure the information content of earnings as the earnings response coefficient from the classic short-window return-earnings regression model, shown in Eq. (1). For brevity, we omit firm subscripts:

$$CAR = \beta_0 + \beta_1 \Delta NI + \beta_2 DCAM + \beta_3 \Delta NI{*}DCAM + Controls + \varepsilon \quad (1a)$$

$$CAR = \beta_0 + \beta_1 \Delta EPS + \beta_2 DCAM + \beta_3 \Delta EPS{*}DCAM + Controls + \varepsilon \quad (1b)$$

Consistent with prior studies of information content (e.g., Aboody & Lev, 1998; Asquith, Mikhail, & Au, 2005; Bradshaw & Sloan, 2002; Elliott & Hanna, 1996; Hanlon et al., 2008), our dependent variable *CAR* is the signed 3-day cumulative abnormal returns surrounding the date on which the annual report, containing the auditor's report, is publicly released (i.e., the filing date of the annual report).

We use two measures to proxy for unexpected earnings: time-series changes in net income from last year to this year, scaled by the fiscal-year-end market value of equity (*ΔNI*), and the time-series changes in earnings per share, scaled by the fiscal-year-end stock price (*ΔEPS*).[14] *DCAM* is an indicator variable for whether the auditor's report contains at least one CAM topic. We include the natural logarithm of total assets to control for size (*SIZE*), book-to-market ratio to control for growth (*BTM*), leverage to control for firms' risk (*LEV*), an indicator variable for negative net income (*LOSS*), return on assets (*ROA*), sales volatility (*SDREVT*, the standard deviation of sales scaled by total assets over the past three years), and three auditor characteristic variables.[15] The first auditor characteristic variable is audit office size, as measured by the number of public company audit clients an office has (*OFCLIENTS*); the second auditor characteristic variable is an indicator variable for auditor's industry expertise (*AUDEXP*), defined as whether the audit firm has more than a 30% market share of the audit fees in an industry based on 2-digit SIC code (Reichelt & Wang, 2010), and the third is audit firm size (*BIG4*, an indicator variable equal to one if the auditor is a Big 4 audit firm). We also include industry fixed effects as defined by the 2-digit SIC codes and year fixed effects to control for any industry- and year-related effects.[16] The coefficient of interest is β_3 in each model, which represents the incremental effect of CAM disclosure on the information content of earnings. If the CAM disclosure in the auditor's report provides incremental information that is useful to investors, as predicted by our H1, we expect β_3 to be positive.

Table 3 – Panel A reports the results. Columns (1) and (3) present the results for the basic return-earnings regressions without our variables of interest. *ΔNI* and *ΔEPS* are significantly and positively associated with *CAR*, consistent with the ERC literature. Turning to columns (2) and (4), we see that the coefficients on the two interaction terms are both significantly positive at the 5% (for *DCAM*ΔNI*) and 1% (for *DCAM*ΔEPS*) significance levels, based on one-tailed tests. Specifically, the coefficient on the interaction term between *DCAM* and *ΔNI* is 0.056 ($t = 2.455$), and the coefficient on the interaction term between *DCAM* and *ΔEPS* is 0.077 ($t = 3.516$). In addition, adding *DCAM* and the interaction terms slightly improves the explanatory power (as seen in the adjusted R-squared values). The results are consistent with H1 and suggest that CAM disclosure in the auditor's report improves the informativeness of earnings and the auditor's report and provides incremental information to equity investors.

Our next two proxies for the informativeness of earnings and the auditor's report are the abnormal return variance and abnormal trading volume, where higher variance and trading volume are consistent with greater information content (e.g., Beaver, 1968; DeFond, Hung, & Trezevant, 2007; Gutierrez et al., 2018; Landsman, Maydew, & Thornock, 2012). Following prior studies (DeFond et al., 2007;Gutierrez et al., 2018; Landsman et al., 2012), we calculate abnormal trading volume as the ratio of the mean trading volume over the event period to the mean trading volume over the estimation period ($\overline{V_{it}}/V_i$). The event period is the 3-day period surrounding the filing date ($t = -1, 0, +1$), and the estimation period runs from Day −120 to Day −21. We take the natural log to calculate the abnormal trading volume *AVOL*:

$$AVOL = ln(\overline{V_{it}}/V_i). \quad (2)$$

Following DeFond et al. (2007) and Landsman et al. (2012), we measure the abnormal return variance as the mean squared prediction errors from the market model (Eq. 3) over the event window, divided by the variance of the residual from the firm's market model estimated over the estimation window ($\overline{\mu_{it}^2}/\sigma_i^2$). We then take the natural log to calculate the abnormal return variance *AVAR*:

$$R_{it} = \alpha_1 + \beta_1 R_{mt} + \varepsilon \quad (3)$$

[13] An increase in earnings informativeness does not translate to an increase in stock returns for firms with a CAM disclosed in their audit report. It translates to a higher earnings response coefficient in the short-window tests, but the overall effect on the dependent variable (e.g., *CAR*) could be either positive or negative.

[14] In untabulated tests, we use other scalers, including the market value of equity at the previous fiscal year-end, total assets for net income, and lagged price and assets per share for earnings per share. Our results are qualitatively similar.

[15] Sierra-García, Gambetta, García-Benau, and Orta-Pérez (2019) finds that auditor characteristics are determinants of KAM disclosure, and a survey by Daugherty, Dickins, Pitman, and Tervo (2021) of audit engagement partners, audit committee chairs, and chief officials of 62 large accelerated domestic issuers suggests that identifying and reporting CAMs are largely controlled by the auditors.

[16] In our main analyses, we include typical firm characteristics as our control variables and do not interact the control variables with our proxies of unexpected earnings. In robustness analyses, we adopt the ERC model in Reid et al. (2019) to use earnings surprise, measured by the difference between actual earnings and consensus analyst forecast, and include interaction terms between all of the control variables and earnings surprise. Our results continue to hold.

Table 3
Information-content tests.

Panel A: Analysis of 3-day cumulative abnormal returns

Dep. var.	Predicted sign	*CAR*			
		(1)	(2)	(3)	(4)
ΔNI	+	0.027***	0.012		
		(3.144)	(1.125)		
DCAM	+		−0.006		−0.006
			(−1.355)		(−1.310)
*DCAM*ΔNI*	+		0.056**		
			(2.455)		
ΔEPS	+			0.029***	0.009
				(3.651)	(0.963)
*DCAM*ΔEPS*	+				0.077***
					(3.516)
SIZE	+	−0.000	−0.000	−0.000	−0.000
		(−0.489)	(−0.472)	(−0.475)	(−0.447)
BTM	−	−0.007***	−0.006***	−0.007***	−0.006***
		(−3.466)	(−3.348)	(−3.392)	(−3.216)
LEV	−	−0.000*	−0.000	−0.000*	−0.000
		(−1.656)	(−1.585)	(−1.669)	(−1.591)
LOSS	−	0.001	0.001	0.001	0.002
		(0.488)	(0.550)	(0.552)	(0.683)
OFCLIENTS	?	0.000	0.000	0.000	0.000
		(0.025)	(0.020)	(0.010)	(0.006)
AUDEXP	?	0.002	0.002	0.002	0.002
		(0.899)	(0.864)	(0.894)	(0.853)
ROA	+	0.006	0.006	0.006	0.006
		(0.711)	(0.641)	(0.703)	(0.647)
BIG4	?	0.001	0.001	0.001	0.000
		(0.219)	(0.210)	(0.205)	(0.156)
SDREVT	−	−0.018**	−0.018**	−0.018**	−0.018**
		(−2.024)	(−2.021)	(−2.006)	(−2.032)
Constant		0.009	0.010	0.008	0.009
		(0.366)	(0.430)	(0.358)	(0.397)
Observations		5951	5951	5951	5951
Adjusted R^2		0.026	0.027	0.027	0.029
IndDummies		Yes	Yes	Yes	Yes
YearDummies		Yes	Yes	Yes	Yes

Panel B: Analyses of abnormal trading volume and abnormal return variance

Dep. var.	Predicted sign	*AVOL*	*AVAR*
		(1)	(2)
DCAM	+	0.472***	1.862***
		(11.301)	(14.047)
ROA	+	0.186**	0.000
		(2.328)	(0.002)
SIZE	+	−0.001	0.001
		(−0.165)	(0.039)
BTM	−	−0.037**	0.048
		(−2.126)	(0.877)
LEV	+	0.001	0.008*
		(0.830)	(1.727)
ΔNI	?	0.018	0.299
		(0.232)	(1.244)
LOSS	+	0.010	−0.049
		(0.445)	(−0.689)
SDREVT	+	0.160**	0.801***
		(2.047)	(3.233)
OFCLIENTS	?	0.023	0.036
		(0.694)	(0.341)
AUDEXP	?	−0.025	−0.130*
		(−1.097)	(−1.821)
BIG4	?	−0.026	0.002
		(−1.029)	(0.024)
Constant		−0.111	−1.654**
		(−0.537)	(−2.516)
Observations		5936	5936
Adjusted R^2		0.191	0.272
IndDummies		Yes	Yes
YearDummies		Yes	Yes

This table reports the results of the short-window information-content analyses for the within-firm sample. All of the variables are defined in Appendix B. ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 level, respectively, under two-tailed tests for nondirectional predictions and one-tailed tests for directional predictions. All of the continuous variables are winsorized at 1% and 99% to mitigate outliers.

Panel A performs the analyses of cumulative abnormal returns. Column (1) performs the basic return-earnings regression using change in net income to measure earnings. Column (2) reports the results of estimating eq. (1a). Column (3) performs the basic return-earnings regression using change in earnings per share to measure earnings. Column (4) reports the results of estimating eq. (1b).
Panel B performs the analyses of abnormal trading volume and abnormal return variance. Column (1) reports the results of estimating eq. (5a) and Column (2) reports the results of estimating eq. (5b).

$$AVAR = ln\left(\frac{\overline{\mu}_{it}^2}{\sigma_i^2}\right), \quad (4)$$

where R_{it} is the firm-specific daily stock returns, and R_{mt} is the value-weighted daily market returns.

To test whether abnormal trading volume and abnormal return variance increase for firms with CAM disclosures in their auditors' reports, we estimate Eqs. 5a and 5b:

$$AVOL = \beta_0 + \beta_1 DCAM + Controls + \varepsilon \quad (5a)$$

$$AVAR = \beta_0 + \beta_1 DCAM + Controls + \varepsilon, \quad (5b)$$

where *AVOL*, *AVAR*, and *DCAM* are as previously defined. We include the same control variables as in our short-window tests. As predicted by H1, we expect β_1 to be positive.

Table 3 – Panel B report the results. Column (1) presents the results from estimating Eq. (5a), where *AVOL* is the dependent variable, and column (2) presents the results from estimating Eq. (5b), where *AVAR* is the dependent variable. Recall that *DCAM* equals one for firms with at least one CAM topic disclosed in the auditor's report. A positive coefficient on *DCAM* indicates that the annual reports of firms with auditors' reports that disclose at least one CAM topic provide more information than those of firms that do not disclose any CAMs. In column (1), the coefficient on *DCAM* is 0.472 ($t = 11.301$), significant at the 1% level using one-tailed tests, suggesting that firms with annual reports containing a CAM disclosure experience higher abnormal trading volume on the filing date than firms without CAM disclosures. Similarly, in column (2), the coefficient on *DCAM* is 1.862 ($t = 14.047$), significant at the 1% level using one-tailed tests, meaning that the abnormal return variances are higher for firms that make a CAM disclosure. Among the control variables, *ROA* is positively related with abnormal trading volume, suggesting that higher profit induces higher trading volume. *LEV* is positively associated with abnormal return variance, which is consistent with the expectation that higher risk induces higher return volatility. *BTM* is negatively related to abnormal trading volume, suggesting that growth firms have higher abnormal trading volume. As expected, sales volatility is positively related to abnormal trading volume and abnormal return variances. *AUDEXP* is negatively related to abnormal return variance, suggesting that firms audited by an industry expert experience lower return volatility. Our results for the control variables are generally consistent with those of prior studies (Gutierrez et al., 2018; Landsman et al., 2012).

Taken together, our results provide evidence that CAM disclosure increases the information content of audited annual reports, as shown by its incremental effect on abnormal returns, abnormal trading volumes, and abnormal return variance around the filing date of the annual report, which is also the date that the auditor's report is released to the public. Reid et al. (2019) and Gutierrez et al. (2018) examine the effect of a new auditing standard in a sample of U.K. firms but get mixed results. Our results are consistent with those of Reid et al. (2019), which finds that the earnings response coefficient is higher after the implementation of new auditing standards for firms that comply with the new disclosure requirements. In contrast, our results are inconsistent with Gutierrez et al. (2018), which finds no significant changes in abnormal returns after the adoption of the expanded audit reports. The difference in our results could be due to the different samples and different jurisdictions.

4.1.2. Long-window valuation models

Disclosing CAMs in the auditor's report could also improve the value relevance of the annual report if it contains incremental information that can move the stock price or change the value of a company. The report may directly affect expectations about the firm's future growth or indirectly update beliefs about the firm's financial reporting quality. We use the modified equity value-relevance models (Aboody & Lev, 1998) and long-window return-earnings association models (Aboody & Lev, 1998; Bradshaw & Sloan, 2002), shown in Eqs. (6a) through (6d), to examine whether disclosing a CAM in the auditor's report enhances the relevance of the annual report.

$$LN\_MVE = \beta_0 + \beta_1 ROA + \beta_2 DCAM + \beta_3 ROA{*}DCAM + Controls + \varepsilon \quad (6a)$$

$$PRC = \beta_0 + \beta_1 EPS + \beta_2 DCAM + \beta_3 EPS{*}DCAM + Controls + \varepsilon \quad (6b)$$

$$RET = \beta_0 + \beta_1 \Delta NI + \beta_2 DCAM + \beta_3 \Delta NI{*}DCAM + Controls + \varepsilon \quad (6c)$$

$$RET = \beta_0 + \beta_1 \Delta EPS + \beta_2 DCAM + \beta_3 \Delta EPS{*}DCAM + Controls + \varepsilon \quad (6d)$$

The dependent variables are measured at the filing date: *LN_MVE*, the natural log of market value of equity; *PRC*, the stock price; and *RET*, the 1-year stock return. All other variables are as previously defined. We include the same set of control variables as in Eq. (1a).[17] The coefficient β_3 on the interaction term measures the incremental value relevance of net income and earnings per share for firms with CAM disclosures in their audit reports. A significantly positive coefficient is consistent with H1 and indicates that CAM disclosure enhances the value relevance and, hence, the informativeness of earnings.

Table 4 presents the results of our long-window valuation tests. Panel A reports the results of estimating the value-relevance models (6a) and (6b). The results of the basic models, given in columns (1) and (3), are consistent with the hypothesis that earnings are relevant for equity valuation. The findings in columns (2) and (4) reveal that disclosing CAMs provides incremental information that enhances the value relevance of earnings. Specifically, the coefficient ($\beta_3 = 0.972$, $t = 3.73$) on *DCAM*ROA* is highly significant and positive at the 1% level in column (2), although the coefficient on *DCAM*EPS* ($\beta_3 = 0.389$, $t = 0.990$) is positive but insignificant, probably due to multicollinearity when including *ROA* as a control. Most of the control variables have the predicted signs. The tests in Panel B produce stronger results and are consistent with H1, as shown by the highly significant and positive coefficients on the two interaction terms. Specifically, the coefficient on *DCAM*ΔNI* is 0.559 ($t = 3.838$), and the coefficient on *DCAM*ΔEPS* is 0.425 ($t = 3.029$).

Collectively, our findings in the long-window tests are largely consistent with CAM disclosure in audit reports enhancing the relevance of the annual reports to equity valuation. While inconsistent with the results of Lennox et al. (2022), which finds that disclosing the risk of material misstatement in audit reports reduces the value relevance of the annual reports in a sample of U.K. firms, our results suggest that CAM disclosure could be a positive signal of increased transparency of audit reports, and that investors perceive disclosure of the financial reporting risks in CAMs as informative and/or that auditors have exerted extra effort to address those risks. Our results differ from those of Lennox et al. (2022), possibly because U.S. auditors face higher legal liability from CAM disclosures and have stronger motivation to provide more

[17] In estimating Equation (6a), we scale net income by total assets instead of market value at the end of the fiscal year because our dependent variable is the market value of equity. Similarly, we scale earnings per share by assets per share in Equation (6b). Hence our *NI* is essentially measured as *ROA*.

Table 4
Long-window value-relevance analyses.

Panel A: Valuation models

Dep. var.	Predicted signs	*LN_MVE*		*PRC*	
		(1)	(2)	(3)	(4)
DCAM	+		−0.253***		−7.842*
			(−3.302)		(−1.737)
*DCAM*ROA*	+		0.972***		
			(3.730)		
EPS	+			12.794***	12.685***
				(60.534)	(52.751)
*DCAM*EPS*	+				0.389
					(0.990)
SIZE	+	0.706***	0.705***	4.504***	4.498***
		(83.611)	(83.687)	(9.005)	(8.992)
BTM	−	−1.561***	−1.559***	−39.728***	−39.691***
		(−49.974)	(−50.010)	(−21.764)	(−21.736)
LEV	−	−0.027***	−0.027***	−0.737***	−0.729***
		(−10.526)	(−10.464)	(−4.986)	(−4.931)
LOSS	−	0.107***	0.110***	34.334***	34.277***
		(2.651)	(2.722)	(14.247)	(14.203)
OFCLIENTS	?	0.973***	0.974***	20.847***	20.814***
		(16.198)	(16.235)	(5.986)	(5.976)
AUDEXP	?	0.006	0.004	−5.707**	−5.754**
		(0.140)	(0.101)	(−2.392)	(−2.411)
ROA	+	1.417***	1.095***	−36.064***	−37.062***
		(9.692)	(6.552)	(−4.078)	(−4.183)
BIG4	?	−0.180***	−0.180***	−0.415	−0.434
		(−3.877)	(−3.889)	(−0.154)	(−0.162)
SDREVT	−	−0.412***	−0.414***	−9.265	−8.890
		(−2.885)	(−2.906)	(−1.121)	(−1.075)
Constant		9.963***	9.982***	7.890	8.495
		(26.247)	(26.343)	(0.359)	(0.386)
Observations		5952	5952	5952	5952
Adjusted R^2		0.659	0.661	0.530	0.530
IndDummies		Yes	Yes	Yes	Yes
YearDummies		Yes	Yes	Yes	Yes

Panel B: Long-window return-earnings models

Dep. var.	Predicted signs	*RET*			
		(1)	(2)	(3)	(4)
ΔNI	+	0.448***	0.298***		
		(8.207)	(4.440)		
DCAM	+		−0.110***		−0.161***
			(−3.673)		(−17.951)
*DCAM*ΔNI*	+		0.559***		
			(3.838)		
ΔEPS	+			0.471***	0.305***
				(9.025)	(4.909)
*DCAM*ΔEPS*	+				0.425***
					(3.029)
SIZE	+	0.004	0.004	0.003	0.005
		(1.197)	(1.256)	(0.843)	(1.493)
BTM	−	−0.207***	−0.205***	−0.218***	−0.216***
		(−16.733)	(−16.586)	(−17.233)	(−17.522)
LEV	−	−0.002**	−0.002**	−0.002**	−0.002**
		(−2.243)	(−2.127)	(−2.035)	(−2.104)
LOSS	−	0.015	0.015	0.012	0.012
		(0.906)	(0.953)	(0.716)	(0.766)
OFCLIENTS	?	0.072***	0.072***	0.092***	0.080***
		(3.077)	(3.086)	(3.830)	(3.445)
AUDEXP	?	0.027*	0.026	0.008	0.017
		(1.691)	(1.641)	(0.501)	(1.032)
ROA	+	0.133**	0.123**	0.166***	0.119**
		(2.318)	(2.151)	(2.799)	(2.061)
BIG4	?	−0.012	−0.012	−0.001	−0.009
		(−0.646)	(−0.667)	(−0.069)	(−0.501)
SDREVT	−	−0.069	−0.066	−0.142**	−0.074
		(−1.229)	(−1.174)	(−2.467)	(−1.322)
Constant		0.019	0.009	−0.042	−0.008
		(0.130)	(0.058)	(−0.271)	(−0.054)
Observations		5943	5943	5943	5943
R-squared		0.191	0.195	0.139	0.186

(*continued on next page*)

Table 4 (*continued*)

Panel B: Long-window return-earnings models					
Dep. var.	Predicted signs	*RET*			
		(1)	(2)	(3)	(4)
IndDummies		Yes	Yes	Yes	Yes
YearDummies		Yes	Yes	Yes	Yes

This table reports the results of the long-window value-relevance analyses for the within-firm sample. All of the variables are defined in Appendix B. ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 level, respectively, under two-tailed tests for nondirectional predictions and one-tailed tests for directional predictions. All of the continuous variables are winsorized at 1% and 99% to mitigate outliers.
Panel A estimates the valuation models. Column (1) performs the basic valuation regression using market value of equity to measure firm value. Column (2) reports the results of estimating eq. (6a). Column (3) performs the basic valuation regression using stock price as the dependent variable. Column (4) reports the results of estimating eq. (6b).
Panel B estimates the long-window return-earnings models. Column (1) performs the basic long-window return-earning regression using change in net income to measure earnings. Column (2) reports the results of estimating eq. (6c). Column (3) performs the basic long-window return-earnings regression using change in earnings per share to measure earnings. Column (4) reports the results of estimating eq. (6d).

informative and complete disclosures of CAMs.[18] Our findings are consistent with the comment letters to the PCAOB, which state that "the communication of critical audit matters … enhance[es] investor confidence in the financial statements" (PCAOB, 2017, p. 15).

4.2. Costs of CAM disclosure

To examine the costs associated with CAM disclosure, we assess audit delay (H2a) and audit fees (H2b) by estimating Eqs. (7a) and (7b):

$$\text{DELAY} = \delta_0 + \delta_1 DCAM + Controls_t + \varepsilon \quad (7a)$$

$$\text{LN\_FEES} = \delta_0 + \delta_1 DCAM + Controls_t + \varepsilon, \quad (7b)$$

where *DELAY* equals the number of calendar days between a firm's fiscal year-end and the date of its audit report, and *LN_FEES* equals the natural logarithm of audit fees (Abbott, Parker, & Peters, 2012; Reid et al., 2019). Our variable of interest is *DCAM*. Following prior studies (Carcello & Li, 2013; Reid et al., 2019), we control for firm size (*SIZE*), growth opportunities (*BTM*), leverage (*LEV*), financial performance (*ROA* and *LOSS*), cash flow from operations (*CFO*), sales volatility (*SDREVT*), inventory and receivables intensity (*INVTS* and *RECTS*), the use of a Big 4 auditor (*BIG4*), auditor busy season (*BUSY*), the number of public company audit clients the audit office has (*OFCLIENTS*), auditor industry expertise (*AUDEXP*), and industry and year fixed effects. H2a and H2b both predict a positive δ_1 in eqs. (7a) and (7b); that is, mandated CAM disclosure increases audit costs.

Table 5 reports the results for the analyses of audit fees and audit delay. In columns (1) and (2), the coefficients on *DCAM* are insignificant: CAM disclosure does not cause a significant delay in the auditing process, and audit fees do not change significantly with CAM disclosure. Our findings in Table 5 are consistent with the PCAOB's interim analysis (PCAOB, 2020c), which finds that in the first year of the AS 3101 regime, CAMs are not associated with any significant increase in audit fees or in audit delay.

In both models, most of our control variables show results consistent with those of prior studies (Carcello & Li, 2013; Reid et al., 2019). For example, audit delays are associated with smaller size, lower ROA, higher BTM, and audits conducted in the busy season. Higher audit fees are associated with larger size, lower ROA, lower BTM, more volatile sales, higher inventory and receivables intensity, reported losses, and hiring a Big 4 auditor or an auditor with a large client portfolio or industry expertise. Taken together, our results suggest that the presence of CAM disclosures does not result in a significant change in audit cost.

Table 5
Costs of the new CAM disclosure requirement.

Dep. var.	Predicted sign	*DELAY*	*LN_FEES*
		(1)	(2)
DCAM	+	−0.011	−0.033
		(−0.009)	(−0.687)
ROA	?	−7.598**	−0.383***
		(−2.184)	(−2.823)
SIZE	+	−0.991***	0.539***
		(−7.776)	(108.641)
BTM	−	6.353***	−0.098***
		(13.185)	(−5.215)
LEV	−	0.003	−0.003*
		(0.087)	(−1.793)
SDREVT	+	6.182***	0.783***
		(2.868)	(9.327)
INVTS	+	1.831	0.478***
		(0.646)	(4.326)
RECTS	+	1.156	0.153**
		(0.717)	(2.439)
CFO	−	−0.138	−0.018
		(−0.043)	(−0.141)
BUSY	+	3.788***	−0.027
		(7.365)	(−1.324)
LOSS	+	−0.464	0.068***
		(−0.746)	(2.824)
BIG4	+	3.784***	0.354***
		(5.353)	(12.849)
OFCLIENTS	?	−13.324***	0.374***
		(−14.245)	(10.249)
AUDEXP	?	−0.867	0.050**
		(−1.390)	(2.040)
Constant		54.711***	10.153***
		(9.303)	(44.296)
Observations		6007	6007
Adjusted R^2		0.146	0.747
IndDummies		Yes	Yes
YearDummies		Yes	Yes

This table reports the results of the audit cost analyses for the within-firm sample. All of the variables are defined in Appendix B. ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 level, respectively, under two-tailed tests for nondirectional predictions and one-tailed tests for directional predictions. All of the continuous variables are winsorized at 1% and 99% to mitigate outliers. Column (1) reports the results of estimating eq. (7a) and Column (2) reports the results of estimating eq. (7b).

[18] U.S. auditors face higher legal liability for the following reasons. First, in general, the United States has a more litigious environment than the United Kingdom, and the PCAOB and SEC have more enforcement power than the FRC (Lennox et al., 2022). Second, U.S. auditors face much higher litigation risk than U.K. auditors if their risk disclosure is associated with an alleged misstatement, because U.S. auditors operate under rules-based accounting standards, whereas U.K. auditors operate under principles-based accounting standards (Gimbar et al., 2016). Third, U.S. auditors' legal liability associated with CAM is further heightened under the PCAOB auditing standards, which do not require an explicit disclaimer statement that the audit provides reasonable assurance but not a guarantee that a material misstatement will always be detected (Backof, Bowlin, & Goodson, 2022).

Table 6
Analyses of multiple CAMs in audit reports.

Panel A: Cumulative abnormal return models

Dep. var.	Predicted signs	*CAR*	
		(1)	(2)
ΔNI	+	0.038	
		(1.348)	
CNTCAM2	?	−0.007	−0.007
		(−1.595)	(−1.594)
*CNTCAM2*ΔNI*	?	0.010	
		(0.300)	
ΔEPS	+		0.042
			(1.510)
*CNTCAM2*ΔEPS*	?		0.006
			(0.189)
SIZE	+	−0.002	−0.002
		(−1.225)	(−1.214)
BTM	−	−0.009*	−0.009*
		(−1.850)	(−1.846)
LEV	−	−0.001*	−0.001*
		(−1.813)	(−1.796)
LOSS		0.013*	0.013*
		(1.801)	(1.821)
OFCLIENTS		−0.003	−0.003
		(−0.300)	(−0.306)
AUDEXP		−0.000	−0.000
		(−0.008)	(−0.003)
ROA		0.023	0.023
		(1.080)	(1.082)
BIG4		0.009	0.009
		(1.089)	(1.061)
SDREVT		−0.043*	−0.042*
		(−1.760)	(−1.731)
Constant		0.011	0.010
		(0.165)	(0.162)
Observations		2096	2096
Adjusted R^2		0.057	0.058
IndDummies		Yes	Yes
YearDummies		Yes	Yes

Panel B: Abnormal trading volume and abnormal return variance tests

Dep. var.	Predicted signs	*AVOL*	*AVAR*
		(1)	(2)
CNTCAM2	?	−0.006	0.028
		(−0.268)	(0.358)
ROA	+	0.085	0.002
		(0.685)	(0.004)
SIZE	+	−0.004	−0.138***
		(−0.460)	(−4.471)
BTM	−	0.015	0.235**
		(0.536)	(2.546)
LEV	+	0.009***	0.023***
		(3.471)	(2.660)
ΔNI	+	0.170*	0.253
		(1.807)	(0.801)
LOSS	+	0.009	−0.094
		(0.232)	(−0.707)
SDREVT	+	0.292**	1.153**
		(2.121)	(2.496)
OFCLIENTS	?	0.079	0.201
		(1.281)	(0.967)
AUDEXP	?	−0.026	−0.346**
		(−0.599)	(−2.352)
BIG4	?	−0.104**	−0.000
		(−2.170)	(−0.001)
Constant		0.138	1.367
		(0.380)	(1.120)
Observations		2081	2081
R-squared		0.130	0.152
IndDummies		yes	yes
YearDummies		Yes	Yes

Panel C: Long-window value-relevance analyses

Dep. var.	Predicted signs	*LN_MVE*	*PRC*	*RET*	
		(1)	(2)	(3)	(4)
CNTCAM2	?	−0.182***	1.861	−0.041***	−0.040**
		(−4.064)	(0.706)	(−2.594)	(−2.551)
*CNTCAM2*ROA*	?	0.409			
		(1.101)			
EPS	+		13.986***		
			(29.475)		
*CNTCAM2*EPS*	?		−2.662***		
			(−4.930)		
ΔNI	?			0.474***	
				(4.339)	
*CNTCAM2*ΔNI*	?			−0.226*	
				(−1.811)	
ΔEPS	?				0.425***
					(3.961)
*CNTCAM2*ΔEPS*	?				−0.242**
					(−1.993)
SIZE	+	0.757***	6.555***	0.041***	0.041***
		(43.549)	(7.222)	(6.835)	(6.781)
BTM	−	−1.401***	−28.183***	−0.199***	−0.203***
		(−27.180)	(−10.584)	(−10.925)	(−11.095)
LEV	−	−0.029***	−0.754***	−0.003*	−0.003*
		(−5.804)	(−3.003)	(−1.734)	(−1.687)
LOSS		0.106	33.703***	−0.024	−0.029
		(1.418)	(8.560)	(−0.916)	(−1.095)
OFCLIENTS	?	0.979***	19.039***	0.090**	0.090**
		(8.297)	(3.166)	(2.198)	(2.195)
AUDEXP	?	0.012	−5.651	−0.008	−0.007
		(0.142)	(−1.331)	(−0.273)	(−0.240)
ROA		1.267***	−21.893*	0.223***	0.231***
		(4.926)	(−1.745)	(2.716)	(2.812)
BIG4		−0.213**	−4.084	−0.032	−0.033
		(−2.349)	(−0.882)	(−1.015)	(−1.028)
SDREVT		−0.352	0.228	−0.208**	−0.206**
		(−1.340)	(0.017)	(−2.272)	(−2.242)
Constant		9.230***	−25.511	−0.177	−0.169
		(13.332)	(−0.723)	(−0.735)	(−0.698)
Observations		2092	2092	2092	2092
Adjusted – R^2		0.629	0.539	0.239	0.237
IndDummies		Yes	Yes	yes	yes
Year Dummies		Yes	Yes	Yes	Yes

Panel D: Audit-fee and audit-delay analyses

Dep. var.	Predicted sign	*DELAY*	*LN_FEES*
		(1)	(2)
CNTCAM2	+	1.873***	0.099***
		(4.870)	(7.505)
ROA	?	−7.596	−0.089
		(−1.397)	(−0.475)
SIZE	+	−1.398***	0.512***
		(−5.607)	(59.654)
BTM	−	5.293***	−0.098***
		(7.041)	(−3.783)
LEV	−	−0.004	−0.002
		(−0.060)	(−0.775)
SDREVT	+	8.256**	0.530***
		(2.257)	(4.217)
INVTS	+	1.523	0.554***
		(0.282)	(2.982)
RECTS	+	1.585	0.160
		(0.541)	(1.592)
CFO	−	0.576	−0.250
		(0.106)	(−1.345)
BUSY	+	3.341***	−0.079**
		(3.064)	(−2.119)
LOSS	+	−1.322	0.076**
		(−1.239)	(2.076)
BIG4	+	5.489***	0.344***
		(4.167)	(7.590)
OFCLIENTS	?	−15.018***	0.380***
		(−8.422)	(6.203)

(*continued on next page*)

Table 6 (*continued*)

Panel D: Audit-fee and audit-delay analyses			
Dep. var.	Predicted sign	*DELAY*	*LN_FEES*
		(1)	(2)
AUDEXP	?	−0.663	0.067
		(−0.560)	(1.639)
Constant		54.374***	10.038***
		(5.218)	(28.010)
Observations		2221	2221
Adjusted R-squared		0.128	0.744
IndDummies		Yes	Yes
YearDummies		Yes	Yes

This table reports the regression results for a sample of firms with CAM disclosures. All of the variables are defined in Appendix B. ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 level, respectively, under two-tailed tests for nondirectional predictions and one-tailed tests for directional predictions. All of the continuous variables are winsorized at 1% and 99% to mitigate outliers.
Panel A performs the analyses of cumulative abnormal returns. Columns (1) and (2) report the results of estimating eqs. (1a) and (1b), respective, but replace *DCAM* with *CNTCAM2*.
Panel B performs the analyses of abnormal trading volume and abnormal return variance. Column (1) reports the results of estimating eq. (5a) and Column (2) reports the results of estimating eq. (5b).
Panel C performs the long-window value-relevance analyses. Columns (1)–(4) report the results of estimating eqs. (6a) – (6b), respective, but replace *DCAM* with *CNTCAM2*.
Panel D performs the costs of the new CAM disclosure analyses. Columns (1) and (2) report the results of estimating eqs. (7a) and (7b), respective, but replace *DCAM* with *CNTCAM2*.

4.3. Additional analysis

Our main analyses of the costs and benefits of the new auditing standard focus on the effect of the presence of a CAM disclosure but do not consider the costs and benefits of multiple CAMs disclosed in an auditor's report. Our main results suggest that CAM disclosure provide incremental information to investors; however, having multiple CAMs in an auditor's report may suggest a significantly increased audit risk associated with the company's financial reporting. This perception of increased audit risk may lead investors to discount the information given in the rest of the annual report.[19] In addition, evaluating and communicating multiple CAMs requires additional effort from auditors, potentially increasing audit costs.[20] We investigate these possibilities by examining whether disclosing multiple CAMs in the auditor's report incrementally affects the informativeness of earnings and the auditor's report as well as the cost of audits (i.e., audit fees and audit delays), relative to the benchmark of a single CAM disclosure.

We define an indicator variable, *CNTCAM2*, equal to one if the number of CAMs disclosed in an audit report is greater than one, zero otherwise. We reestimate the previous information-content models, long-term value-relevance models, and the determinants models of audit fees and audit delays, replacing *DCAM* with *CNTCAM2*. We reestimate the tests only for firms with audit reports that disclose at least one CAM (i.e., *DCAM* = 1).

Table 6 – Panel A reports the results of reestimating Eqs. (1a) and (1b) using *CNTCAM2* and the interaction between *CNTCAM2* and earnings. The coefficients on the interaction terms in both models are positive but insignificant, indicating that disclosing multiple CAMs does not provide more information as proxied by abnormal stock returns incremental to disclosing just one CAM. In Panel B, we reestimate Eqs. (5a) and (5b) to test the abnormal trading volume and abnormal return variance, respectively, and find the coefficients on *CNTCAM2* are insignificant in both models.

Turning to Table 6 – Panel C, we test the effect of *CNTCAM2* on the value relevance of earnings by reestimating Eqs. (6a) to (6d) and find that, except in column (1), the coefficients on the interaction terms between *CNTCAM2* and earnings are significantly negative. These results indicate that within the subsample of firms with CAMs, the earnings of firms with multiple CAMs are less value relevant to investors, suggesting that investors might perceive multiple CAMs in an audit report as a signal of increased risk and, thus, discount the relevance of earnings. Lastly, in Panel D, we reestimate Eqs. (7a) and (7b) to conduct cost analyses for the subsample of firms whose audit reports include CAM disclosures. We find that the coefficients on *CNTCAM2* in both the audit fee and the audit delay models are significantly positive, suggesting that comparing to single CAM disclosure, identifying more CAMs significantly increases audit fees and significantly delays the audit process.

Overall, we find no evidence that identifying multiple CAMs provides additional information content about earnings over the short window, but we find evidence that conditional on the presence of at least one CAM disclosure, disclosing multiple CAMs decreases the value relevance of the annual reports, increases audit fees, and prolongs the audit process.

4.4. Sensitivity tests

4.4.1. Alternative control sample

We construct an alternative sample that includes all of the accelerated and large accelerated filers in Audit Analytics with fiscal years ended between June 30, 2019, and December 14, 2020. The initial cross-sectional sample consists of 4127 firm-year observations, of which 62.5% are large accelerated filers. After requiring the data necessary to estimate our regressions, the sample size varies in different tests. This sample allows us to make cross-sectional comparisons and mitigates the concern that our results are driven by changes year over year. We reestimate our information-content models, long-term value-relevance models, and the determinants models of audit fees and audit delays using this alternative cross-sectional sample.

[19] Three concurrent papers examine stakeholders' response to multiple CAMs. Klevak et al. (2020) analyzes the content of CAM disclosures and finds a negative market reaction to firms with multiple CAM disclosures. Sulcaj (2020) shows that the number of CAMs increases as financial reporting quality decreases (measured by an increase in the absolute value of discretionary accruals), suggesting that CAM disclosures contain information about financial reporting quality. Burke et al. (2021) finds that the number, length, and tone uncertainty in CAM disclosures are significantly negatively associated with signed abnormal returns.

[20] Sulcaj (2020) finds that audit effort increases with the number of CAM disclosures.

Table 7
Cross-sectional sample.

Panel A: Short-window information-content analyses

	Predicted signs	*CAR*	*CAR*	*AVOL*	*AVAR*
Variables		(1)	(2)	(3)	(4)
DCAM	?	−0.005	−0.004	0.077***	0.130
		(−0.913)	(−0.781)	(2.636)	(1.429)
*DCAM*ΔNI*	+	0.057*			
		(1.867)			
*DCAM*ΔEPS*	+		0.078***		
			(2.650)		
Observations		3194	3194	3173	3173
Adjusted R-squared		0.028	0.028	0.114	0.145
IndDummies		Yes	Yes	yes	yes
YearDummies		Yes	Yes	Yes	Yes

Panel B: Long-window value-relevance analyses

Dep. var.	Predicted signs	*LN_MVE*	*PRC*	*RET*	
		(1)	(2)	(3)	(4)
DCAM	?	0.971***	12.215***	0.050**	0.053**
		(19.290)	(5.329)	(2.416)	(2.544)
*DCAM*ROA*	+	1.179***			
		(4.790)			
*DCAM*EPS*	+		5.702***		
			(9.547)		
*DCAM*ΔNI*	+			0.462***	
				(3.703)	
*DCAM*ΔEPS*	+				0.506***
					(4.175)
Observations		3492	3492	3183	3183
Adjusted – R^2		0.768	0.541	0.194	0.186
IndDummies		Yes	Yes	Yes	Yes
YearDummies		Yes	Yes	Yes	Yes

Panel C: Costs of the new CAM disclosure requirement

Dep. var.	Predicted sign	*DELAY*	*LN_FEES*
		(1)	(2)
DCAM	+	−10.229***	−0.028
		(−13.190)	(−1.071)
Observations		3403	3403
Adjusted R-squared		0.231	0.804
IndDummies		Yes	Yes
YearDummies		Yes	Yes

This table reports the regression results for the cross-sectional sample. The coefficients on control variables are omitted for brevity. All of the variables are defined in Appendix B. ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 level, respectively, under two-tailed tests for nondirectional predictions and one-tailed tests for directional predictions. All of the continuous variables are winsorized at 1% and 99% to mitigate outliers.
Panel A performs the short-window information-content analyses. Columns (1) and (2) report the results of estimating eqs. (1a) and (1b), respectively. Column (3) and (4) reports the results of estimating eq. (5a) and (5b), respectively.
Panel B performs the long-window value-relevance analyses. Columns (1)–(4) report the results of estimating eqs. (6a) – (6b), respectively.
Panel C performs the costs of the new CAM disclosure analyses. Columns (1) and (2) report the results of estimating eqs. (7a) and (7b), respectively.

Table 7 reports the results.[21] Panel A repeats the short-window information-content analyses. The coefficient on *DCAM*ΔNI* is 0.057 (t = 1.867), and the coefficient on *DCAM*ΔEPS* is 0.078 (t = 2.65) in columns (1) and (2), respectively, when the dependent variable is *CAR*. Columns (3) and (4) present the results of estimating Eqs. (5a) and (5b) for the alternative sample. The coefficient on *DCAM* is significantly positive in the abnormal trading volume. In Panel B, we reestimate the effect of CAM disclosure on the long-term value relevance of earnings in Eqs. (6a) to (6d). In all specifications, the interaction terms between *DCAM* and the earnings measures are significantly positive, consistent with our main results. We then use our alternative sample to test the costs of CAM disclosure using Eqs. (7a) and (7b) in Panel C. The results for audit fee are qualitatively similar to our main results. However, the coefficient on *DCAM* in column (1), when the dependent variable is *DELAY*, is significantly negative. The negative association between *DCAM* and *DELAY* for this sample may not reflect the actual differences in the length of audit process but rather is likely due to the difference in 10-K filing deadlines required for the non-CAM firms in this sample, i.e., accelerated filers which are required to file within 75 days, and for the CAM firms, i.e., large accelerated filers which are required to file within 45 days.

4.4.2. PSM approach

Propensity score matching (PSM) has been widely used in observational studies to estimate a causal treatment effect when a pure experiment with random assignment is not feasible (Armstrong, Jagolinzer, & Larcker, 2010). It is also a popular technique for estimating treatment effects in the accounting literature (Shipman, Swanquist, & Whited, 2017). In this section, we construct an alternative sample that matches all firm-years with and without CAM disclosures on *SIZE*, *ROA*, *LEV*, *BTM*, *LOSS*, and *BIG4*. We search for matched observations from large accelerated filers that do not report a CAM in their audit reports in our Audit Analytics sample, which begins in 2006.[22] We then calculate their propensity scores. We match with replacement and select one control firm-year observation for each CAM firm-year observation that has a nearest propensity score within 0.1 difference. We are able to find matches for 1978 firms. Untabulated results suggest that the PSM matched sample achieves reasonable covariant balance, a necessary condition for a successful PSM approach.

Table 8 presents the results of re-estimating our information-content models, long-term value-relevance models, and the costs tests using the PSM matched sample. Panel A repeats the short-window information-content tests. In Columns (1) and (2), the coefficient on *DCAM*ΔNI* is insignificant, and the coefficient on *DCAM*ΔEPS* is positive and significant at the 5% level using one-tailed tests. When the dependent variables are abnormal trading volumes (*AVOL*) and abnormal return volatility (*AVAR*), shown in columns (3) and (4), the results are stronger and consistent with our main analyses. Panel B repeats the long-window value-relevance analyses, and the results are consistent with our main results. In Panel C, we continue to find no evidence that CAM disclosure is related to audit delay and audit fees. In sum, the results of the PSM sample are largely consistent with our main results.[23]

4.4.3. Alternative proxies for unexpected earnings

In our main analyses, we measure unexpected earnings as the time-series differences in annual net income and earnings per share. In this robustness check, we follow Reid et al. (2019) and (1) adopt a different model specification and (2) measure unexpected earnings (*UE*) as the difference between actual earnings per share and the most recent mean

[21] For brevity, we omit the results for control variables.

[22] Ideally, we should look for matched control firms in the same fiscal years as the CAM firm-years. However, all large accelerated filers are required to follow the CAM disclosure requirements in their auditors' reports after the implementation of AS 3101, and there are insufficient large accelerated filers that did not report a CAM in 2019 and 2020 to construct a PSM control sample.

[23] In untabulated tests, we include non-large accelerated filers when constructing our PSM sample and use up to three observations for each CAM firm-year observation, and our results are mostly consistent, with the exception of a negative association between *DCAM* and audit delay, which is likely due to the difference in the 10-K filing deadlines.

Table 8
PSM sample.

Panel A: Cumulative abnormal return models

Variables	Predicted signs	*CAR*	*CAR*	*AVOL*	*AVAR*
		(1)	(2)	(3)	(4)
DCAM	+	−0.010	−0.010	0.442***	1.322***
		(−0.895)	(−0.897)	(4.457)	(4.477)
*DCAM*ΔNI*	+	0.102			
		(0.957)			
*DCAM*ΔEPS*	+		0.217**		
			(2.072)		
Observations		3676	3674	3662	3662
Adjusted R-squared		0.022	0.023	0.199	0.274
IndDummies		Yes	Yes	yes	yes
YearDummies		Yes	Yes	yes	yes

Panel B: Long-window value-relevance analyses

Dep. var.	Predicted signs	*LN_MVE*	*PRC*	*RET*	
		(1)	(2)	(3)	(4)
DCAM	?	−0.539***	−26.127***	−0.137	−0.134
		(−2.807)	(−3.471)	(−1.618)	(−1.584)
*DCAM*ROA*	+	8.048***			
		(7.945)			
*DCAM*EPS*	+		6.544***		
			(8.601)		
*DCAM*ΔNI*	+			3.711***	
				(4.540)	
*DCAM*ΔEPS*	+				3.911***
					(4.846)
Observations		3676	3676	3542	3542
Adjusted – R^2		0.610	0.505	0.156	0.153
IndDummies		Yes	Yes	Yes	Yes
YearDummies		Yes	Yes	yes	yes

Panel C: Costs of the new CAM disclosure requirement

Dep. var.	Predicted sign	*DELAY*	*LN_FEES*
		(1)	(2)
DCAM	+	0.385	−0.072
		(0.103)	(−0.629)
Observations		3850	3850
Adjusted R-squared		0.097	0.742
IndDummies		Yes	Yes
YearDummies		Yes	Yes

This table reports the regression results for the PSM sample. The coefficients on the control variables are omitted for brevity. All of the variables are defined in Appendix B. ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 level, respectively, under two-tailed tests for nondirectional predictions and one-tailed tests for directional predictions. All of the continuous variables are winsorized at 1% and 99% to mitigate outliers.
Panel A performs the short-window information-content analyses. Columns (1) and (2) report the results of estimating eqs. (1a) and (1b), respectively. Column (3) and (4) reports the results of estimating eq. (5a) and (5b), respectively.
Panel B performs the long-window value-relevance analyses. Columns (1)–(4) report the results of estimating eqs. (6a) – (6b), respectively.
Panel C performs the costs of the new CAM disclosure analyses. Columns (1) and (2) report the results of estimating eqs. (7a) and (7b), respectively.

consensus analyst earnings forecast prior to the earnings announcement, scaled by the stock price:

$$CAR = \beta_0 + \beta_1 UE + \beta_2 DCAM + \beta_3 UE{*}DCAM + Controls + \varepsilon. \quad (8)$$

CAR and *DCAM* are defined as above. We include the set of control variables used by Reid et al. (2019): the log of market value of the firm (*MVE*), profitability (*ROA* and *LOSS*), market-to-book (*MB*), leverage (*LEV*), cash flow from operations (*CFO*), sales volatility (*SDREVT*), analyst forecast dispersion (*DISPERSION*), the lag between the last analyst forecast date before the earnings announcement and the earnings announcement date (*HORIZON*), and the use of a Big 4 auditor (*BIG4*). We also include the interaction terms between the control variables and *UE* as well as industry fixed effects.

Table 9 reports the results. Column (1) reestimates Eq. (1b), replacing *ΔEPS* with *UE*. Column (2) does not include the interaction terms of the control variables. Column (3) presents the results of estimating Eq. (8). In all of the specifications, the coefficients on the interaction term *DCAM*UE* are significantly positive, based on one-tailed tests. These results are consistent with our main results reported in Table 3.

4.4.4. Other sensitivity tests

In our sample of 2634 annual reports with CAM disclosures, 2419 of these represent the first time a firm's annual report contains a CAM disclosure. None of these reports are from the pre-AS 3101 period. To examine whether the effect of CAM disclosure is different for firms disclosing a CAM for the first time, we repeat our analyses for these initial CAM firms only, and use two years of observations prior to the initial CAM disclosure as controls. The untabulated results are qualitatively similar to our main results.

Table 9
Alternative model for information-content tests.

Variables	Pred.	(1)	(2)	(3)
		CAR	*CAR*	*CAR*
UE	+	−0.003	0.010	0.102
		(−0.149)	(0.524)	(0.864)
DCAM	?	0.001	−0.014**	−0.012**
		(0.188)	(−2.336)	(−1.980)
*DCAM*UE*	+	0.059*	0.063*	0.115**
		(1.534)	(1.553)	(1.981)
MVE	+		0.004**	0.003**
			(2.573)	(2.289)
ROA	+		0.007	0.001
			(0.297)	(0.038)
LOSS	−	0.004	0.013**	0.014**
		(0.757)	(2.216)	(2.069)
MB	+		0.000	0.000
			(1.038)	(0.824)
LEV	−	−0.000	−0.001**	−0.001
		(−0.697)	(−1.976)	(−1.159)
CFO	+		0.012	0.015
			(0.462)	(0.537)
SDREVT	−		−0.011	−0.019
			(−0.582)	(−0.930)
DISPERSION	−		0.012	0.013
			(1.322)	(1.193)
HORIZON	−		−0.000	−0.000
			(−1.150)	(−0.740)
BIG4	+		0.009	0.008
			(1.601)	(1.333)
*MV*UE*	?			−0.012
				(−1.023)
*ROA*UE*	?			−0.183
				(−0.940)
*LOSS*UE*	?			0.034
				(0.576)
*MB*UE*	?			0.009
				(1.045)
*LEV*UE*	?			0.004
				(0.527)
*CFO*UE*	?			−0.071
				(−0.266)
*SD_REV*UE*	?			−0.464
				(−1.586)
*DISPERSION*UE*	?			0.087
				(0.640)
*HORIZON*UE*	?			0.001
				(0.788)
*BIG4*UE*	?			−0.026
				(−0.609)
SIZE	+	−0.001		
		(−0.982)		
BTM	−	−0.002		
		(−0.435)		
Constant		0.005	−0.057	−0.055
		(0.094)	(−1.001)	(−0.971)
Observations		2903	2625	2625
Adjusted R-squared		0.020	0.030	0.031
IndDummies		Yes	Yes	Yes

This table adopts the model developed by Reid et al. (2019). All of the variables are defined in Appendix B. ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 level, respectively, under two-tailed tests for nondirectional predictions and one-tailed tests for directional predictions. All of the continuous variables are winsorized at 1% and 99% to mitigate outliers. Column (1) reestimates Eq. (1b), replacing *ΔEPS* with *UE*. Column (2) does not include the interaction terms of the control variables. Column (3) presents the results of estimating Eq. (8).

To mitigate the concern that the global COVID-19 pandemic might confound our results, we conduct two sets of sensitivity tests. First, following Gurbutt and Shih (2020), we exclude observations with filing dates after February 15, 2020, to reduce the impact of pandemic-related high market volatility, and perform the analyses presented in Tables 3 and 4. Our inferences do not change. Second, we exclude observations with filing dates after March 25, 2020, to account for the potential effect of the filing extension for eligible firms allowed by the SEC on March 25, 2020, for our audit cost tests in Table 5.[24] Our results are qualitatively similar.

In our abnormal return tests, we measure cumulative abnormal returns (*CAR*) as the value-weighted 3-day CAR around the filing date. To mitigate the concern that our results are sensitive to our measure of CAR, we estimate a market model to measure firm-specific beta and use the beta to calculate a risk-adjusted CAR. We reestimate our tests in Table 3, and our results hold.

Prior research suggests that the market-response tests could be sensitive to different scalers used to deflate earnings variables (i.e., the scaling effect; Barth & Clinch, 2009). To examine whether our results are sensitive to different scalers, we scale earnings and change in earnings using lagged market value of equity and total assets. The untabulated results are qualitatively similar to our main results.

Our main tests include industry fixed effects. As our sample size is relatively small, including fixed effects reduces the degrees of freedom of our tests. To check whether the reduced degrees of freedom affects our results, we exclude industry fixed effects, and our results hold.

5. Conclusion

On June 1, 2017, the PCAOB adopted a new standard, AS 3101, that requires the auditors to disclose whether there are any CAMs in the audit of the current period's financial statements (PCAOB 2017). The new standard became effective for audits of financial statements of large accelerated filers for fiscal year ending on or after June 30, 2019. The objective of this new standard is to make the auditor's report more informative and relevant to the users of financial statements (PCAOB, 2017). Our study directly examines whether the adoption of the new auditing standard increases the informativeness of earnings and the audit reports.

Using a sample of large accelerated filers that have disclosed at least one CAM, we provide evidence that CAM disclosure in audit reports improves the short-term information content of annual reports, as reflected in increased abnormal stock returns, abnormal trading volumes, and abnormal return variances around the filing date of the annual report. In the long-window value-relevance analyses, we find robust evidence that CAM disclosures in the audit reports are associated with more value-relevant annual reports. Interestingly, we find no evidence that the mere presence of CAM disclosure is associated with increased audit fees or prolonged audit processes. However, in tests conditional on the presence of a CAM disclosure, we find that identifying multiple CAMs increases audit fees and delays the audit process. Collectively, our evidence suggests that expanding auditors' reports to include CAM disclosure provides incremental information to investors without a significant increase in audit cost. However, audit fees and the time to complete the audit process seem to be higher when multiple CAMs are disclosed in the auditor's report.

We note several limitations of our study. First, the large accelerated filers in our sample (i.e., those with market capitalization of $700 million or more) have rich information environments and usually hire

[24] See https://www.sec.gov/news/press-release/2020-73 for more detail.

Big 4 auditors which can impact their audit fees. These factors may affect the incremental informativeness of the audit reports and the audit fees in the short term. As a result, our empirical findings may not be generalizable to other type of firms. For example, auditors' disclosures for smaller companies may be more informative to investors and have a more significant impact on audit fees. In addition, audit firms' CAM reporting for the same clients may differ over a span of years (Hollie & Yu, 2020). As our study examines a sample of large accelerated filers during the initial year of AS 3101, our results may not be generalizable to smaller companies, to subsequent years, or to other jurisdictions.

Second, the lack of evidence of a significant increase in audit fees and audit delays cannot be interpreted as conclusive evidence that the new auditing requirements do not generate additional costs. Indeed, the survey of engagement partners by Gurbutt et al. (2020) suggests that audit firms make significant investments related to CAM implementation. In their first year of implementing new auditing regulations, auditors may have borne some additional costs related to the new standards that they did not pass along to their clients or to the market in the form of audit fees or audit delays.

Third, we acknowledge potential confounding factors during our sample period (e.g., the Covid-19 pandemic, the impact of working from home on the effectiveness and efficiency of both clients and audit firms) that may confound our results. While we have performed sensitivity tests to control for these potential confounding factors, we leave more comprehensive analyses to future research.

Despite these limitations, our study provides timely and relevant evidence of the costs and benefits of the PCAOB's new auditor reporting requirements under AS 3101. Our study is informative to a broader audience, including financial statement users, standard setters, regulators, audit committees, and auditors.

Data availability

Data will be made available on request.

Appendix A. Details of critical accounting matter topics

We identify 2476 annual reports containing audit reports that disclose at least one CAM in the fiscal period ending between June 30, 2019 and December 14, 2020; 1225 of these annual reports have more than one CAM disclosed in their audit reports. Panel A summarizes the summary statistics on the number of CAM topics per firm. The audit reports refer to a variety of CAM topics. We broadly categorize the CAM topics referred to in the audit reports in Panel B.

Table A1
Panel A: distribution of the number of CAM topics.

	Mean	Std. Dev.	25th Pctl.	Median	75th Pctl.
CNTCAM	1.7	0.87	1.00	1.00	2.00

Panel B: frequency of CAM topics.

CAM topic	Frequency	Percent
Assets	671	16.02
Expense	138	3.29
Going concern	11	0.26
Goodwill/intangible	488	11.65
Liabilities	860	20.53
Other	299	7.14
Revenues	543	12.96
Tax	401	9.57
Business strategies	526	12.56
Investment	252	6.02
Total	4189	100

Appendix B. Variable definitions

Variable	Definition
AUDEXP	An indicator variable set to one if the audit firm has >30% market share of the audit fees in an industry based on 2-digit SIC codes, zero otherwise.
AVAR	Abnormal return variance, which equals the natural log of the ratio of the mean squared prediction errors from the market model over the event window to the variance of the residual from the firm's market model estimated over the estimation window.
AVOL	Abnormal trading volume, which equals the natural log of the ratio of the mean trading volume over the event period to the mean trading volume over the estimation period.
BIG4	An indicator variable set to one if the firm hires a Big 4 audit firm in our sample period, zero otherwise.
BTM	Book-to-market ratio, which equals the total common stockholders' equity divided by market capitalization.
BUSY	An indicator variable set to one if the firm has a fiscal year-end in December, zero otherwise.
CAR	The 3-day cumulative market-adjusted return surrounding the filing date of the company's annual report.
CNTCAM	The number of CAMs disclosed in the auditor's report.
CNTCAM2	An indicator variable for firms with two or more CAMs in their auditor's reports.
CFO	Cash flow from operations, divided by total assets at the end of the year.
DCAM	An indicator variable set to one if the firm has at least one CAM disclosed in its auditor's report.
DELAY	The number of calendar days between a firm's fiscal year-end and the date of its audit report.
DISPERSION	The standard deviation of analysts' earnings forecasts, scaled by the stock price at the end of the year.
EPS	Basic earnings per share.
INVTS	Total inventory divided by total assets at the end of the year.
HORIZON	The number of calendar days between the last analyst forecasting date before the earnings announcement and the earnings announcement date.

(*continued on next page*)

(*continued*)

Variable	Definition
LEV	Total long-term liabilities divided by total assets.
LOSS	An indicator variable set to one if *Compustat* net income is less than zero.
LN_FEES	The natural log of fees charged by the auditor for auditing services.
LN_MVE	The natural log of market capitalization, computed as the number of shares outstanding multiplied by the firm's stock price.
MB	Market-to-book ratio of the firm.
MVE	Market value of the firm.
NI	Income before extraordinary items.
OFCLIENTS	Number of public company audit clients an auditor office has, scaled by the largest value in the industry
PRC	The stock price.
ROA	Income before extraordinary items, scaled by total assets.
RECTS	Total accounts receivables divided by total assets at the end of the year.
RET	One-year buy-and-hold returns calculated at the filing date.
SDREVT	The standard deviation of the prior three years of sales, scaled by beginning total assets.
SIZE	Natural log of total assets.
UE	Unexpected earnings, measured as the difference between actual earnings per share and analysts' mean consensus earnings per share.

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