PCAOB
PUBLIC COMPANY ACCOUNTING OVERSIGHT BOARD

Staff White Paper

Econometric Analysis on the Initial Implementation of CAM Requirements

October 2020[1]

Michael J. Gurbutt
Deputy Director, Office of Economic and Risk Analysis, PCAOB

Wei-Kang Shih
Associate Director, Office of Economic and Risk Analysis, PCAOB

[1] The views expressed in the paper are the views of the authors and do not necessarily reflect the views of the Board, individual Board members, or other PCAOB staff. In preparing this paper, we benefited from insightful comments received during discussions with PCAOB staff and Board members. We would also like to thank Nayantara Hensel and Brandon Gipper for helpful discussions and comments. In addition, we are grateful to Pian Chen, Shalini McAdams, Sungho Noh, Pete Pacilio, Zoe Pham, Vikram Ramadas, Ricci Reber, Josh Smith, and Thomas Wanat for their research support.

TABLE OF CONTENTS

I. EXECUTIVE SUMMARY

The PCAOB is committed to understanding the impact of critical audit matter (CAM) requirements on audit firms, preparers, audit committees, investors, and other financial statement users.[2] As part of that commitment, Office of Economic and Risk Analysis (ERA) staff has performed an analysis to assess the initial implementation of the CAM requirements. To provide transparency around our findings, ERA staff has prepared two white papers to provide insight into the technical details of our analysis. This white paper presents results from econometric analysis on the initial effects of CAM implementation on audits and capital markets. The other white paper, "Stakeholder Outreach on the Initial Implementation of CAM Requirements", provides information regarding the results of various outreach efforts related to initial CAM implementation. Collectively, these two papers provide early evidence on the initial implementation of the CAM requirements.[3]

We employ two commonly used research methods to estimate the effects of the initial CAM implementation:

1) descriptive analysis of trends before and after the implementation of CAMs (i.e., a "pre-post analysis") and

2) a difference-in-differences analysis to compare outcome variables (audit fees, audit hours, number of days to file the audit report, and investor responses in the stock market) for issuers whose auditors communicated CAMs in the audit report (or determined that there were no CAMs to report) with those for issuers whose auditors are not (yet) required to include CAMs in their audit reports.[4]

In conducting the econometric analysis, we gathered and analyzed data from a number of sources, including (1) information collected through the PCAOB's inspection program and (2) third-party data from Audit Analytics, CRSP/Compustat, and S&P Capital IQ.

Key Findings from Econometric Analysis

- Investor Responses: Using information from issuers' stock market returns, we assess capital market effects related to initial CAM implementation. Specifically we examine the absolute cumulative abnormal returns (*3-Day ACAR*)[5]—a measure that captures the unanticipated changes in issuers' stock returns in the three-day window around their annual financial filings and reflects

[2] For more background on CAM requirements and related materials, *see* the PCAOB's online resource titled *New Auditor's Report* ("CAM Implementation Page"), available at https://pcaobus.org/Standards/Implementation-PCAOB-Standards-rules/Pages/new-auditors-report.aspx.

[3] The staff is unable to evaluate all possible costs and benefits of the CAM requirements (e.g., because some potential effects may take more time to manifest or stabilize). In addition, the results presented in this paper may not be predictive of the effect of the CAM requirements for audits of other companies to which the requirements will apply. In some cases, results are based on limited data and may not be generalizable to the entire stakeholder population. Further discussion of economic considerations related to the CAM requirements is available in the PCAOB's Adopting Release.

[4] The CAM requirements took effect for audits for fiscal years ending on or after June 30, 2019, for large accelerated filers and will take effect for audits for fiscal years ending on or after December 15, 2020 for all other issuers to which the requirements apply.

[5] See Appendix A for the definition. Academic researchers use an event study approach to measure the impact of significant corporate events (such as the filings of 10-K or other annual statements, and changes in accounting and audit policies) on abnormal returns. Thus, an increase in *3-Day ACAR* suggests that investors find the disclosed information value-relevant and use it to make their investment decisions.

the information provision of CAMs communicated in audit reports. Consistent with emerging academic research, we do not find systematic evidence that investors respond to the information content in CAMs in the first year of implementation. Nevertheless, the staff's stakeholder outreach finds that some investors are reading CAMs and find the information beneficial. We recognize that the full benefits of CAM communications to investors may take more time to materialize (e.g., as investor awareness of CAMs becomes more widespread and as comparative data on CAMs becomes available within issuers and across time).

- Audit Fees and Audit Hours: We use information on audit fees and audit hours to estimate costs of initial CAM implementation for individual audits. We do not find systematic evidence from this analysis of increased engagement-level costs (in terms of audit fees and audit hours) associated with initial CAM implementation in the first year of implementation. Emerging academic research on CAMs does not find a relationship between initial CAM implementation and audit fees; similarly, the staff's stakeholder outreach activities find that costs to issuers from initial CAM implementation have been largely inconsequential. Engagement partners report that, on average, about 1% of total audit hours were spent identifying, developing, and communicating CAMs. Other costs incurred by audit firms and issuers to implement the new requirements are discussed in the related white paper on stakeholder outreach.

- Time required to file audit reports: During the rulemaking process, some commenters expressed concern that, as a result of the additional effort required to determine, communicate, and document CAMs, auditors would take longer to issue their reports.[6] We examine changes in the time taken to issue audit reports and find no evidence of delays associated with initial CAM implementation.

II. SCOPE AND ANALYTICAL FRAMEWORK

In this paper, we perform an econometric analysis to examine the effects of CAM implementation on the following outcome measures. We assess the abnormal stock returns around the filing dates of annual reports—a measure of information provision of CAMs communicated in audit reports. We also examine whether auditors and companies incur costs, in terms of increased audit hours and audit fees charged to issuers, related to CAMs. Finally, we assess whether implementing the new requirements changes the number of days taken to issue audit reports.

To perform the analysis we use two methods commonly used in research. First, we provide a descriptive analysis of trends before and after the implementation of CAMs. For this analysis we use data from the issuer audits whose audit reports contain CAMs (including those where the auditor determined there were no CAMs to report), and rely on the estimated results from the following model:

$$Dependent\ Variable = \alpha + \beta_1\ Post + \Sigma\beta_i\ Independent\ Variables_i + \Sigma\beta_j\ Fixed\ Effects_j + \epsilon \quad (1)$$

Post is an indicator variable equal to one if the fiscal year-end of the issuer's financial statements falls on or after June 30, 2019; and β_1 is the coefficient of interest, denoting the change in the dependent variable after CAM implementation for the issuers with CAMs in the audit report (including audit reports where the auditors determined that there were no CAMs to communicate). The dependent variables include abnormal stock returns around the filing dates of annual reports (*3-Day ACAR*), audit fees (*Log Audit Fees*), audit hours (*Log Audit Hours*), and number of days to issue the audit report (*Log Days to File*). We also

[6] See *The Auditor's Report on an Audit of Financial Statements when the Auditor Expresses an Unqualified Opinion and Related Amendments to PCAOB Standards*, PCAOB Release No. 2017-001 (June 1, 2017) at 89.

include a list of independent variables and fixed effects that are commonly used in academic literature to control for other issuer and audit characteristics in the regression (e.g., Gutierrez et al, 2018 and Reid et al, 2019). Please see Appendix A for definitions of these variables.

Second, we use a difference-in-differences analysis to examine the potential effects of CAM implementation. In this analysis we take advantage of the staggered implementation to attempt to isolate effects associated with implementing CAMs from other confounding factors (e.g., changes in the accounting standards and macroeconomic environment). To do so we compare outcomes for issuers for which the CAM requirements apply and the auditor either communicated CAMs in the audit report, or communicated that there were no CAMs (collectively referred to as "CAMs Issuers" throughout this paper), with other issuers that are required to comply with the new requirements for fiscal year ends ending on or after December 15, 2020,[7] and emerging growth companies exempted from the CAM requirements (collectively referred to as "Comparison Issuers" throughout this paper).[8] We rely on the estimated results from the following model:

$$Dependent\ Variable = \alpha + \beta_1.Post + \beta_2.CAMs + \beta_3.Post \times CAMs + \Sigma\beta_i Independent\ Variables_i + \Sigma\beta_j Fixed\ Effects_j + \epsilon \quad (2)$$

Similar to equation (1), *Post* is an indicator variable that equals one if the fiscal year end of the issuer's financial statements audit falls on or after June 30, 2019. *CAMs* is an indicator variable that equals one for CAM Issuers and zero for Comparison Issuers. β_3 is the coefficient of interest, denoting the difference between: the change over time in the dependent variable for the issuers whose audit reports contain CAMs or the auditors determined that there were no CAMs to communicate, and the change for those issuers whose audit reports do not (yet) contain CAMs.

III. RELATED ACADEMIC RESEARCH

Several academics have begun to examine the initial implementation of CAM requirements in the U.S. using archival data. Appendix C summarizes the findings from these emerging studies. Our econometric analysis complements this research by analyzing data collected through the PCAOB's inspection program or obtained from third party providers such as Audit Analytics, CRSP/Compustat, and S&P Capital IQ.

IV. DATA

We collect three years of audit, issuer financial, and stock market data for CAMs Issuers and Comparison Issuers. The three-year time period corresponds to the fiscal year 2019 audits (post CAMs requirement or *post*) that were filed prior to May 15, 2020 (with fiscal year ends ranging between June 30, 2019 and February 3, 2020), and audits for fiscal years 2017 and 2018 (pre CAMs requirement or *pre*).[9] **Table 1**

[7] *See* footnote 4 for a description of the issuer audits for whom the CAM requirements do not currently apply.

[8] Communication of CAMs are not required for emerging growth companies (EGCs), audits of brokers and dealers, investment companies (other than business development companies), and employee stock purchase, savings, and similar plans. *See* AS 3101.05(b). Though the standard excludes emerging growth companies (EGCs) from applying the CAM requirements, we include EGCs in the econometric analysis as they are similar in operating structure to issuers that have to comply with the CAM requirements.

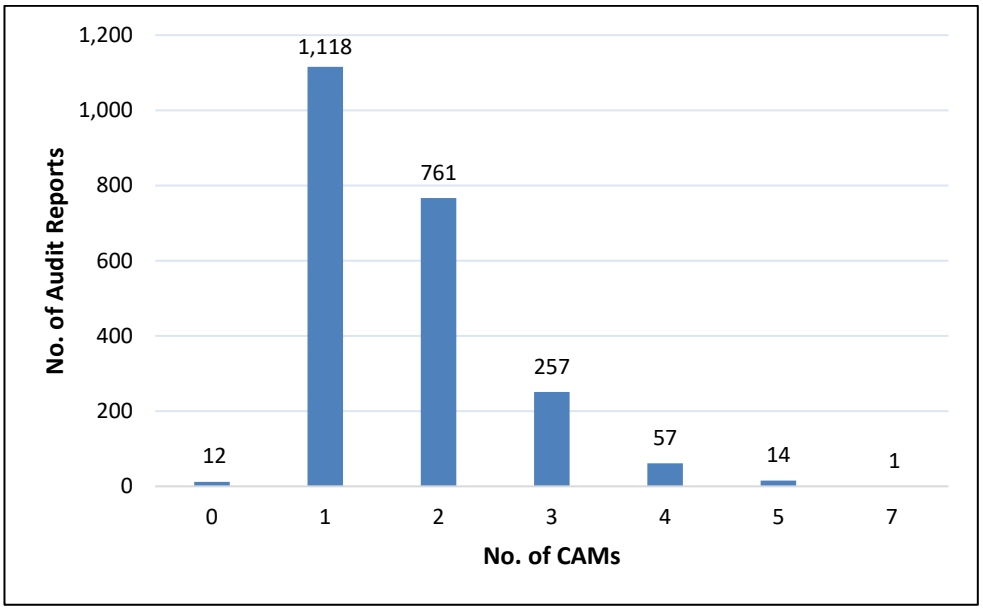
[9] We use the first effective date for CAM requirements to construct the pre and post periods. For example, the post period represents audits with fiscal year-ends June 30, 2019 through February 3, 2020. We exclude issuers with fiscal year-ends after February 3, 2020, or issuers with fiscal year-ends before February 3, 2020 that filed annual reports after May 15, 2020, to maximize the number of observations and to publish a timely report in 2020, before the CAM requirements take effect for other issuers to whom the requirements apply.

contains details on the sample selection process and reports final sample counts for the analyses on the outcomes of interest. The final samples include only those issuer audits with data on outcome and explanatory variables for consecutive years across both the pre and post periods.

V. DESCRIPTIVE STATISTICS

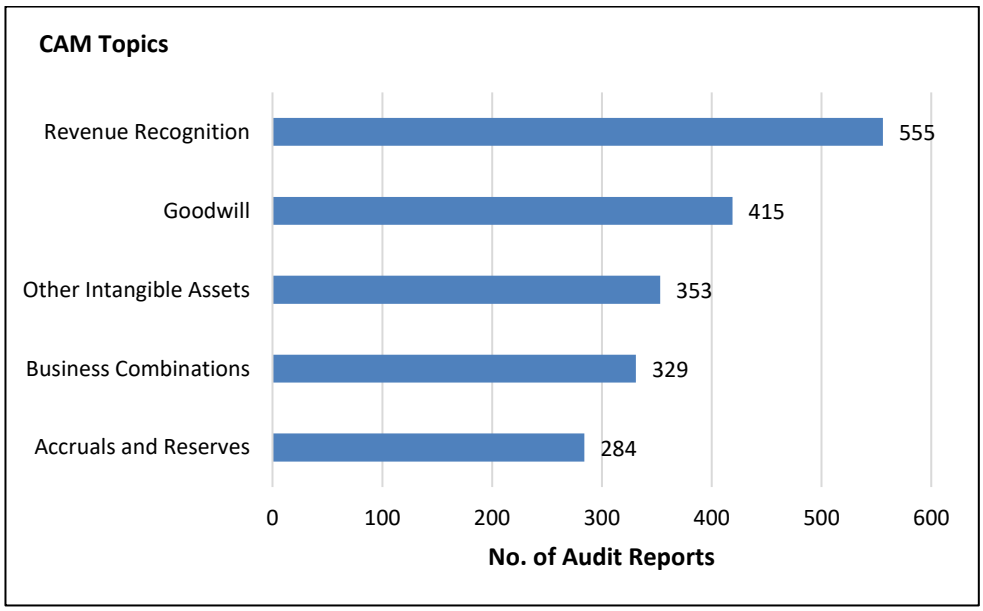
In this section, we describe the characteristics of CAMs communicated in the 2,220 audit reports in our sample. As shown in **Figure 1**, about half of the audit reports (1,118 or 50.4%) contain a single CAM while about one-third include two CAMs (761 or 34.3%). Of the remaining audit reports, 257 (11.6%) include three CAMs and 72 (3.2%) include four or more CAMs. Moreover, in 12 audit reports the auditor determined that there were no CAMs. The average number of CAMs communicated is 1.7.

Figure 1 Audit Reports by Number of CAMs



Overall, the five most frequently communicated CAM topics are “Revenue Recognition,” followed by “Goodwill,” “Other Intangible Assets,” “Business Combinations,” and “Accruals and Reserves” (**Figure 2**). We also observe that the most common topics differ by industry sectors in expected ways**.** For example, **Figure 3** in Appendix B shows that the most frequently communicated CAMs in the financial industry sector is “Allowance for Loan Losses,” whereas it is “Property, Plant, and Equipment” for issuers in the energy sector.

Figure 2 Most Frequently Communicated CAMs



Note: CAM topics are based on a PCAOB internal taxonomy.

VI. RESULTS AND DISCUSSION

In this section, we present results and discuss our findings. In our evaluation of the various outcome measures, the pre-post analysis uses the issuer-year observations only for CAMs Issuers, whereas the difference-in-differences analysis uses data from both sets of issuers (CAMs Issuers and Comparison Issuers).[10]

Investor Responses

We use information from the issuers' stock market returns to assess the capital market effects related to CAMs. We do not find systematic evidence that investors respond to the information content in CAMs in the first year of implementation. Specifically, we examine the absolute cumulative abnormal returns (*3-Day ACAR*)—a measure that captures the unanticipated changes in issuers' stock returns in the three-day window around their annual filings—for 2,017 CAMs Issuers and 1,448 Comparison Issuers, to obtain 10,341 issuer-year observations over the two pre- and one post- year periods. (See **Table 1**).

We estimate the statistical models for the pre-post and difference-in-differences analyses with the abnormal return measure *3-Day ACAR* as the dependent variable.[11] After controlling for factors that affect

[10] Figure 4 in Appendix B presents the trends in audit and capital market outcome measures in the sample period. Our visual inspection of the trends in the pre periods for both CAM Issuers and Comparison Issuers suggests that the parallel trend assumption for the difference-in-difference analysis holds for these outcome measures.

[11] See equations (1) and (2) for the statistical models. Also, see Appendix A and **Table 2** for the definitions and the descriptive statistics of the explanatory variables included in the statistical models, respectively.

stock returns,[12] the regression results in column (1) of Panel A in **Table 3** indicate, on average, a statistically significant 0.8% increase in the abnormal returns for the CAMs Issuers, over the pre and the post periods. To examine the potential effects of CAM implementation, column (2) in the same panel presents results from comparing the change in the returns for CAMs Issuers with those of the Comparison Issuers (i.e., a difference-in-differences analysis). Results from this analysis indicates, on average, a 2.7% decrease in the abnormal return measure for CAMs Issuers over the pre and post period, relative to the change for the Comparison Issuers. Column (3) presents the results from comparing the change in the abnormal returns measure for CAMs Issuers with a weighted combination of Comparison Issuers—whereby Comparison Issuers that are more similar to the CAMs Issuers receive greater weights in the analysis.[13] The results for the weighted regression are similar to those for the unweighted regression.

Our results can be explained by the market disruptions due to the COVID-19 pandemic as well as observations from the staff's stakeholder outreach. First, we observe high levels of market volatility associated with the COVID-19 pandemic in the U.S., specifically after mid-February 2020—when a large number of Comparison Issuers filed their Form 10-K or other annual statements. To reduce the impact of the pandemic on our analysis, in column (4) we repeat the analysis from column (2) but exclude issuers with a filing date after February 15, 2020.[14] The effect sizes drop by several orders of magnitude, indicating that the pandemic is a significant driver of the results in column (2). Moreover, the change in the abnormal returns for CAMs Issuers in relation to the Comparison Issuers in the post period *(Post×CAMs*) becomes statistically insignificant.[15] Second, comments received from two investors representatives to the staff's public request for comment (RFC) and the results of the staff's investor survey suggest that, while investors believed CAMs can improve their ability to analyze financial statements, the full benefits of CAMs may take some time to materialize (e.g., as investor awareness of CAMs becomes more widespread and as comparative data on CAMs becomes available within issuers and across time).[16]

Audit Fees and Audit Hours

We use information on audit fees and audit hours to estimate costs of initial CAM implementation for individual audits. Other costs incurred by audit firms and issuers to implement the new requirements are discussed in the related white paper on stakeholder outreach.

Audit Fees

We use data from 1,987 CAMs Issuers and 1,647 Comparison Issuers, to obtain 10,856 issuer-year observations over the two pre- and one post- year periods (*see* **Table 1**). A comparison of the average *Log Audit Fees* (shown in Panel A of **Table 4**) indicates an increase in audit fees for CAMs Issuers over the pre

[12] We include *Log Market Cap, Return on Assets, Book to Market Ratio, Loss Indicator, Cash Flow Volatility, Leverage, Sales Growth Volatility, and Stock Beta*, and audit firm and issuer industry fixed effects as control variables. Definitions for all variables are provided in Appendix A.

[13] See Appendix D for further details on weighted regressions.

[14] See Appendix D for further details on identifying issuers affected by the COVID-19 pandemic.

[15] In column (4), we exclude the issuers with a filing date after February 15, 2020 across both the pre and the post periods. As this results in a significant drop in the number of observations (10,341 to 2,173), we repeat the analysis and exclude issuers with the post-mid-February filing date only in the post period. In unreported results, the sign on *Post×CAMs* becomes negative but is still statistically insignificant.

[16] See discussion in the white paper, "Stakeholder Outreach on the Initial Implementation of CAM Requirements."

and post periods. After controlling for factors that typically affect audit fees,[17] the regression results in column (1) of Panel A in **Table 5** indicate, on average, a statistically significant 1.1% decrease[18] in audit fees for CAMs Issuers over the pre and the post periods. Column (2) in the same panel presents the results from comparing the change in audit fees for CAMs Issuers with that of the Comparison Issuers (i.e., a difference-in-differences analysis). Results from this analysis indicate, on average, a statistically significant 2.2% decrease in audit fees for CAMs Issuers over the pre and post period, relative to the change for the Comparison Issuers.[19] Column (3) presents the results from the weighted regression, suggesting the change in the audit fees for CAMs Issuers over the pre and post period, relative to the change for the Comparison Issuers, becomes statistically insignificant.[20]

Overall, the results of our econometric analyses do not suggest that initial CAM implementation is associated with an increase in audit fees in the first year of implementation. Our results generally align with emerging academic research, stakeholder responses to the staff's public RFC, and the staff's interviews of preparers and audit committee chairs. In particular, stakeholders generally reported low or inconsequential changes to audit fees related to CAMs.

Audit Hours

We obtain total audit hours for both the pre and post periods from the six U.S. Global Network Firms[21] (U.S. GNFs) and repeat the audit market analysis described above with *Log Audit Hours* as the outcome of interest.[22] A comparison of the average *Log Audit Hours* (shown in Panel A of **Table 4**) indicates an increase in audit hours for CAMs Issuers over the pre and post periods. After controlling for other factors that typically affect audit hours,[23] we still find a statistically significant increase in the post period. The regression results in column (1) of Panel B in **Table 5** indicate, on average, a 3.7% increase in audit hours for CAMs Issuers over the pre and the post periods.[24] Column (2) in the same panel presents the results from comparing the change in audit hours for the CAMs Issuers with those of the Comparison Issuers (i.e., a difference-in-differences analysis). This analysis shows that audit hours increase for both sets of issuers,

[17] We include *Log Total Assets, Book-to-Market Ratio, Cash Flow to Total Assets, Leverage Ratio, Sales Growth, Quick Ratio, Intangible Assets to Total Assets, Receivables to Total Assets, Inventory to Total Assets, Merger Indicator, Restructuring Indicator, BigR Announcement Indicator, December Year-End Indicator, Loss Indicator, Multinational Corporation Indicator, ICFR Group Indicator, Going Concern Indicator, New Client Indicator,* and audit firm and issuer industry fixed effects as control variables. Definitions for all variables are provided in Appendix A.

[18] The percentage change from the pre to the post period is calculated as 100 x [exp(*Post*)-1]. Given the estimated coefficient for the *Post* variable in column (1) is -0.0112, the change is -1.1% (100 x [exp(-0.0112) – 1]).

[19] The percentage change from the pre to the post period for CAMs Issuers, relative to the change for the Comparison Issuers, is calculated as 100 x [exp(*PostxCAMs*)-1]. Given the estimated coefficient in column (2), the change is -2.2% (100 x [exp(-0.0226) – 1].

[20] See Appendix D for further details on the weighted regressions. Column (4) is similar to column (2) except that we exclude data for issuers that could be affected by the recent COVID-19 pandemic. See Appendix D for further details on how we identify issuers affected by the COVID-19 pandemic.

[21] The information on the six global networks that contain the largest number of registered, non-U.S. firms is available on the PCAOB website at https://pcaobus.org/Registration/Firms/Pages/GlobalNetworkFirms.aspx.

[22] We exclude smaller audit firms from the analysis based on the extent of the available data in the post period.

[23] See footnote 17.

[24] Given the estimated coefficient for the *Post* variable in column (1) is 0.0370, the change is 3.7% (100 x [exp(0.0370) – 1]).

with a larger increase for the comparison group.[25] The difference between the increases in audit hours for the two groups manifests as a negative sign, and we estimate a statistically significant decrease of 5.5% in audit hours for CAMs Issuers, relative to the change for the Comparison Issuers.[26] Similarly, results from the weighted regression in column (3) also suggest a negative and statistically significant difference-in-differences estimate.

Overall, our econometric analysis suggests that, on average, CAM implementation is associated with a decrease in audit hours. Given that the amount of time engagement partners reported spending on CAMs is relatively small compared to total audit hours,[27] it is not surprising that our econometric analysis does not find evidence of an increase in engagement-level audit hours associated with initial CAM implementation. The relative decrease may be explained by other unobservable factors. For example, it is possible that LAF audits benefit from unidentified economies of scale (e.g., fixed costs associated with implementation of new accounting standards). The result could also be due to potential variation across audit firms and engagement teams in their use of charge codes to record CAM-related audit hours.

Time to File the Audit Report

As described in the adopting release of the new auditing standard, some commenters expressed concern that, as a result of the additional effort required to determine, communicate and document CAMs, auditors would take longer to issue their reports.[28] We examine changes in the time taken to issue audit reports and find no evidence of delays associated with initial CAM implementation.

We report the results from our pre-post and difference-in-differences analyses in Panel C of **Table 5**. On average, issuers in the CAMs Issuers group took slightly less time to file the report in the post period. Results in either columns (2) and (3) suggest an average decrease of only a fraction of a day.[29] The estimated increase for issuers in the Comparison Issuers group (coefficient for *Post* in column (2)) can be explained by the 45-days extension provided by the U.S. Securities and Exchange Commission (SEC) in response to the COVID-19 pandemic.[30] This is evident in the null results in column (4), after we drop the issuers most likely affected by the pandemic from the sample.[31]

[25] Given the estimated coefficients in column (2), the percentage change from the pre to the post period for CAMs Issuers is 3.5% (100 x [exp(0.0923-0.0566) – 1] while the change for the Comparison Issuers is 9.6% (100 x [exp(0.0923) – 1].

[26] Given the estimated coefficient in column (2), the change is -5.5% (100 x [exp(-0.0566) – 1].

[27] Results of the staff's stakeholder outreach suggests that on average, about 1 percent of total audit hours were spent identifying, developing, and communicating CAMs. See the discussion in the white paper "Stakeholder Outreach on the Initial Implementation of CAM Requirements."

[28] See footnote 6.

[29] For example, in column (2), given that the average days to file is 57 days in the pre period for CAMs Issuers, the approximate decrease in the post period is about 0.17 days (57 × 0.30%). A change by one to three days between the pre and the post periods is most likely due to the filing deadline falling on a weekend in one of the periods. In such cases the issuers are allowed to file the next business day.

[30] See https://www.sec.gov/news/press-release/2020-73.

[31] See Appendix D for further details.

REFERENCES

Bochkay, K., R. Chychyla, E. De George, M. Minutti-Meza, and J. Schroeder. 2020. *RE: Interim Analysis No. 2020-01, Critical Audit Matter Requirements*. Available at: https://pcaobus.org/EconomicAndRiskAnalysis/pir/PostImplementationReviewAS3101UnqualifiedOpinion/18_Miguel-Minutti-Meza.pdf

Burke, Jenna and Hoitash, Rani and Hoitash, Udi and Xiao, Xia, An Investigation of U.S. Critical Audit Matter Disclosures (June 2020). Available at SSRN: https://ssrn.com/abstract=3635477

Drake, K. D., N.C. Goldman, S. J. Lusch. and J. J. Schmidt. 2020. "Have Critical Audit Matter Disclosures Indirectly Benefitted Investors by Constraining Earnings Management? Evidence from Tax Accounts." *Working Paper*. Available at SSRN: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3606701

Gutierrez, E., M. Minutti-Meza, K.W. Tatum, and M. Vulcheva. 2018. "Consequences of adopting an expanded auditor's report in the United Kingdom." *Review of Accounting Studies*, *23*(4), pp.1543-1587.

Klevak, Julia and Livnat, Joshua and Pei, Duo and Suslava, Kate, A New Uncertainty Measure - CAM (July 23, 2020). Available at SSRN: https://ssrn.com/abstract=3659633

PCAOB Release No. 2017-001, *The Auditors' Report on an Audit of Financial Statements when the Auditor Expresses an Unqualified Opinion and Related Amendments to PCAOB Standards*, June 1, 2017.

Reid, L.C., J.V. Carcello, C. Li, T. L. Neal, and J. R. Francis. 2019. "Impact of auditor report changes on financial reporting quality and audit costs: Evidence from the United Kingdom." *Contemporary Accounting Research*, 36(3): 1501-1539.

APPENDIX A. DATA DEFINITIONS

The table below defines the dependent and independent variables used in the econometric analysis. Audit fees and days to file are obtained from publicly available information from Audit Analytics, audit hours are from a PCAOB proprietary database, and issuers' stock returns and market returns are from CRSP/Compustat. The independent variables are from publicly available information from CRSP/Compustat, S&P Capital IQ, and Audit Analytics.

Variable	Definition
Dependent Variables:	
Log Audit Fees	The natural logarithm of the audit fees.
Log Audit Hours	The natural logarithm of the total number of global audit hours reported by the issuer's audit firm to the PCAOB.
Log Days to File	The number of calendar days between the period end date and the signature date on the audit report.
3-Day ACAR	The absolute value[32] of cumulative abnormal returns for a 3-day event window (includes one day before and after the filing date). Cumulative abnormal returns are calculated as the sum of the daily abnormal returns (obtained by subtracting the CRSP total market index return from the issuer's stock return) during the event window.
Independent Variables:	
Post	An indicator variable equal to one if the fiscal year end date of an issuer audit is on or after June 30, 2019.
CAMs	An indictor variable equal to one if the issuer audit report contains CAMs, or the auditor determined that there are no CAMs in year t.
Issuer Characteristics	
Log Market Cap	The natural logarithm of the issuer's market capitalization as of the fiscal year end date.
Log Total Assets	The natural logarithm of total assets in year t.
Loss Indicator	An indicator variable equal to one if the net income before extraordinary items is negative in year t.
Book to Market Ratio	The book value of equity divided by the market capitalization as of the fiscal year end date.
Merger Indicator	An indicator variable equal to one if the acquisitions that contribute to sales is non zero in year t.
Restructuring Indicator	An indicator variable equal to one if the restructuring cost is non zero in year t.
Cash Flow to Total Assets	The cash flow from operations divided by beginning period total assets in year t.
Cash Flow Volatility	Standard deviation of the cash flow from operations divided by beginning period assets from year t-2 through t.

[32] An absolute value function of x, denoted as abs (x), calculates the distance of x from zero. For example, abs (-0.02) is 0.02, abs (-0.01) is 0.01, abs (0.01) is 0.01, and so on.

Variable	Definition
Sales Growth	One year growth rate of sales revenue in year t.
Sales Growth Volatility	Standard deviation of one year growth rate of sales revenue from year t-2 through t.
Leverage Ratio	Total debt divided by total assets in year t.
Quick Ratio	Current assets minus inventories divided by current liabilities.
BigR Rest. Announcement Indicator	An indicator variable equal to one if a BigR restatement affected at least one of the financial statements over the past two years.
Multinational Corporation Indicator	An indicator variable equal to one if the foreign income taxes are non-zero in year t.
Return on Assets	Net income before extraordinary items divided by total assets in year t.
Stock beta	Slope coefficient obtained by regressing the company daily return on daily returns of the S&P 500 index over a 220-day period (−250, −21), relative to the filing date.
Intangible Assets to Total Assets	One minus the ratio of Gross Property, Plant & Equipment to Total Assets.
Inventory to Total Assets	Total inventory scaled by total assets in year t.
Receivables to Total Assets	Total receivables scaled by total assets in year t.
Issuer Industry	Industry categories using the Fama-French industry classifications.
Audit Characteristics	
December Year End Indicator	An indicator variable equal to one if the issuer audit has a December fiscal year-end date in year t.
New Client Indicator	An indicator variable equal to one if the current issuer audit is a first time engagement with the auditor.
ICFR Group	An indicator variable that identifies if a) the audit is exempt from the SOX internal control requirements, b) the audit is not exempt from the requirement, or c) the audit is not exempt and the audit report an internal control material weakness in year t.
Going Concern Indicator	An indicator variable equal to 1 if a going concern explanatory paragraph is issued in year t.
Audit Firm Indicator	An indicator for each audit firm based on their PCAOB registration ID.

APPENDIX B. TABLES AND FIGURES

Table 1 Sample Selection

	CAMs Issuers†	Comparison Issuers†	Total
Issuers in analysis (excluding issuers with FYEs after February 3, 2020 and/or filing date after May 15, 2020) [a]	2,220	3,369	
Issuers with data in both pre and post periods, and for both outcome and explanatory variables [Issuer-year observations between 2017 and 2019] [b]			
Audit fees analysis	1,987 [5,955]	1,647 [4,901]	[10,856]
Audit hours analysis [c]	1,588 [4,749]	641 [1,894]	[6,643]
Days to file analysis	2,048 [6,149]	1,819 [5,420]	[11,569]
Issuers' stock market analysis	2,017 [6,038]	1,448 [4,303]	[10,341]

Notes:

† The CAMs Issuers group contains issuer audits for whom the CAM requirements apply and the auditor either communicated CAMs in the audit report, or communicated that there were no CAMs. The Comparison Issuers group contains issuers that are required to comply with the new requirements for fiscal year ends ending on or after December 15, 2020, and the EGCs exempted from the CAM requirements. *See* Sections II and IV for additional details.

a. We use the PCAOB's *AuditorSearch* database to identify issuers that are operating companies, and exclude mutual funds, investment companies and trusts, employee benefit plans, and subsidiary companies or operating partners whose financial information are not separable from their parent companies. We exclude issuers with fiscal year-ends after February 3, 2020, or issuers with fiscal year-ends before February 3, 2020 that filed their annual reports after May 15, 2020, to maximize the number of observations and to publish a timely report in 2020, before the CAM requirement take effect for other issuers to whom the requirements apply.

b. We use the first effective date for CAM requirements to construct the pre and post periods. For example, the post period represents audits with fiscal year-ends June 30, 2019 through February 3, 2020.

c. The final counts for the audit hours analysis are lower than that for the audit fees, days to file, and issuers' stock market analyses because we use hours information only for the issuer clients of the U.S. GNFs.

Table 2 Issuers' Stock Market Analysis: Descriptive Statistics

Panel A: Dependent Variable

	Pre (2017-2018)	Post (2019)	Difference (Post – Pre)
3-Day ACAR			
CAMs Issuers	0.04	0.05	0.01***
Comparison Issuers	0.06	0.10	0.04***

Panel B: Independent Variables

	Pre (2017-2018)	Post (2019)	Difference (Post – Pre)
Log Market Cap			
CAMs Issuers	8.45	8.58	0.13***
Comparison Issuers	5.07	4.97	-0.10**
Return on Assets			
CAMs Issuers	0.02	0.03	0.01
Comparison Issuers	-0.14	-0.13	-0.01
Book to Market Ratio			
CAMs Issuers	0.49	0.51	0.02
Comparison Issuers	0.72	0.79	0.07**
Loss Indicator			
CAMs Issuers	0.18	0.18	0.002
Comparison Issuers	0.49	0.53	0.04**
Cash Flow Volatility			
CAMs Issuers	0.03	0.03	-0.002*
Comparison Issuers	0.09	0.08	-0.01
Leverage			
CAMs Issuers	0.29	0.32	0.03***
Comparison Issuers	0.23	0.28	0.05***
Sales Growth Volatility			
CAMs Issuers	0.07	0.07	0.003
Comparison Issuers	0.11	0.12	0.001
Stock Beta			
CAMs Issuers	0.96	1.01	0.05***
Comparison Issuers	0.74	0.81	0.07***

Notes:
See Appendix A for definitions of the variables. Two-sided t-test assuming unequal variances. *** denotes significance at 1%, ** at 5%, and * at 10%.

Table 3 Issuers' Stock Market Analysis Results

The table presents the regression results of Equations (1) and (2) with the three-day absolute cumulative abnormal returns (*3-Day ACAR*) as the dependent variable. *Post* refers to the 2019 fiscal year issuer audits, i.e., with fiscal year ends between June 30, 2019 and February 3, 2020. *CAMs* is an indicator variable that equals one if the issuer's audit report contains CAMs or the auditors determined there were no CAMs to communicate. The estimated coefficient for *Post* in column (1) indicates the change in *3-Day ACAR* between the pre and post CAM implementation periods for the issuers whose audit reports contain CAMs or the auditors determined there were no CAMs to communicate (CAMs Issuers). The estimated coefficients for *Post×CAMs* in columns (2) through (4) indicate the difference between: the change over time in *3-Day ACAR* for the CAMs Issuers and the change for Comparison Issuers. The number of observations in column (1) is lower because the pre-post analysis is performed using only the data from CAMs Issuers. The number of observations in column (4) is lower relative to columns (2) and (3) because we exclude COVID-19 observations. *See* Section VI and Appendix D for further details. For the sake of brevity, we do not report coefficients for the independent variables or the fixed effects in the model. These are: *Log Market Cap, Return on Assets, Book to Market Ratio, Loss Indicator, Cash Flow Volatility, Leverage, Sales Growth Volatility, and Stock Beta*, and audit firm and issuer industry fixed effects. The definitions of all the variables are provided in Appendix A. The standard-errors are clustered at the issuer-level and presented in the parenthesis below the estimated coefficient. Significance levels are *** 1%, ** 5%, and * 10%.

	(1) Pre-Post on CAMs Issuers sample	(2) Difference-in-Differences	(3) Difference-in-Differences	(4) Difference-in-Differences
		Unweighted	Weighted	Exclude COVID-19 observations
Post	0.0088***	0.0359***	0.0324***	0.0017
	(0.0012)	(0.0026)	(0.0038)	(0.0052)
CAMs		0.0044**	0.0001	0.0035
		(0.0022)	(0.0030)	(0.0045)
Post×CAMs		-0.0274***	-0.0237***	-0.0005
		(0.0029)	(0.0039)	(0.0056)
Observations	6,038	10,341	10,341	2,173
Adjusted R^2	0.155	0.191	0.206	0.177

Table 4 Audit Fees, Hours, and Days to File Analysis: Descriptive Statistics

Panel A: Dependent Variables

	Pre (2017-2018)	Post (2019)	Difference (Post – Pre)
Log Audit Fees			
CAMs Issuers	14.81	14.88	0.07***
Comparison Issuers	12.86	12.92	0.06
Log Audit Hours			
CAMs Issuers	9.55	9.65	0.10***
Comparison Issuers	8.63	8.74	0.11***
Log Days to File			
CAMs Issuers	4.02	4.01	-0.01*
Comparison Issuers	4.32	4.33	0.01**

Panel B: Independent Variables[†]

	Pre (2017-2018)	Post (2019)	Difference (Post – Pre)
Log Total Assets			
CAMs Issuers	8.57	8.75	0.17***
Comparison Issuers	5.11	5.19	0.08
Book to Market Ratio			
CAMs Issuers	0.48	0.50	0.02
Comparison Issuers	0.59	0.64	0.05
Cash Flow to Total Assets			
CAMs Issuers	0.07	0.07	-0.002
Comparison Issuers	-0.11	-0.11	0.003
Leverage Ratio			
CAMs Issuers	0.29	0.33	0.04***
Comparison Issuers	0.29	0.33	0.04***
Sales Growth			
CAMs Issuers	0.17	0.11	-0.06***
Comparison Issuers	0.26	0.17	-0.09***
Quick Ratio			
CAMs Issuers	1.95	1.81	-0.12
Comparison Issuers	2.47	2.21	-0.26**
Intangible Assets to Total Assets			
CAMs Issuers	0.54	0.51	-0.02*
Comparison Issuers	0.56	0.53	-0.03**
Receivables to Total Assets			
CAMs Issuers	0.09	0.09	-0.004
Comparison Issuers	0.11	0.11	-0.003
Inventory to Total Assets			
CAMs Issuers	0.06	0.05	-0.004

	Pre (2017-2018)	Post (2019)	Difference (Post – Pre)
Comparison Issuers	0.08	0.08	-0.002
Merger Indicator			
CAMs Issuers	0.31	0.30	-0.01
Comparison Issuers	0.15	0.14	-0.01
Restructuring Indicator			
CAMs Issuers	0.32	0.34	0.03**
Comparison Issuers	0.13	0.15	0.02*
BigR Announcement Indicator			
CAMs Issuers	0.003	0.002	-0.001
Comparison Issuers	0.02	0.02	-0.0008
December Year-End Indicator			
CAMs Issuers	0.86	0.86	-0.004
Comparison Issuers	0.81	0.81	0.002
Loss Indicator			
CAMs Issuers	0.17	0.18	0.01
Comparison Issuers	0.51	0.53	0.03*
Multinational Corp. Indicator			
CAMs Issuers	0.55	0.56	0.01
Comparison Issuers	0.28	0.28	-0.01
ICFR Group (% of issuers)			
CAMs Issuers			
Exempt	4.9	1.8	-3.1***
No MW	91.5	95.6	4.1***
MW exists	3.6	2.6	-1.0**
Comparison Issuers			
Exempt	51.8	46.8	-5.0***
No MW	43.9	47.9	4.0***
MW exists	4.2	5.2	1.0
Going Concern Indicator			
CAMs Issuers	0.00	0.01	0.002
Comparison Issuers	0.13	0.17	0.03***
New Client Indicator			
CAMs Issuers	0.02	0.02	-0.002
Comparison Issuers	0.08	0.07	-0.01

Notes:

† We do not report the descriptive statistics separately for the subset of U.S. GNF-issuer audits used in the audit hours analysis. The results are qualitatively similar to those reported above.

See Appendix A for definitions of the variables. Two-sided t-test assuming unequal variances. *** denotes significance at 1%, ** at 5%, and * at 10%.

Table 5 Audit Fees, Hours, and Days to File Analysis Results

The tables in panels A, B, and C present the regression results of the pre-post and difference-in-differences analyses (equations (1) and (2), respectively) with *Log Audit Fees*, *Log Audit Hours*, and *Log Days to File* as the dependent or outcome variables. *Post* refers to the 2019 fiscal year issuer audits, i.e., with fiscal year ends between June 30, 2019 and February 3, 2020. *CAMs* is an indicator variable that equals one if the issuer's audit report contains CAMs or the auditors determined there were no CAMs to communicate. In Panels A, B, and C the estimated coefficient for *Post* in column (1) indicates the change in the dependent variable between the pre and post CAM implementation periods for the issuers whose audit reports contain CAMs or the auditors determined there were no CAMs to communicate (CAMs Issuers). The estimated coefficients for *Post×CAMs* in columns (2) through (4) indicate the difference between: the change over time in the dependent variable for the CAMs Issuers and the change for Comparison Issuers. The number of observations in column (1) is lower because the pre-post analysis is performed using only the data from CAMs Issuers. The number of observations in column (4) is lower relative to columns (2) and (3) because we exclude COVID-19 observations. *See* Section VI and Appendix D for further details. For the sake of brevity, we do not report coefficients for the independent variables or the fixed effects in the model. These are: *Log Total Assets, Book-to-Market Ratio, Cash Flow to Total Assets, Leverage Ratio, Sales Growth, Quick Ratio, Intangible Assets to Total Assets, Receivables to Total Assets, Inventory to Total Assets, Merger Indicator, Restructuring Indicator, BigR Announcement Indicator, December Year-End Indicator, Loss Indicator, Multinational Corporation Indicator, ICFR Group Indicator, Going Concern Indicator, New Client Indicator,* and audit firm and issuer industry fixed effects. The definitions of all the variables are provided in Appendix A. The standard-errors are clustered at the issuer-level and presented in the parenthesis below the estimated coefficient. Significance levels are *** 1%, ** 5%, and * 10%.

Panel A: Log Audit Fees

	(1) Pre-Post on CAMs Issuers sample	(2) Difference-in-Differences	(3) Difference-in-Differences	(4) Difference-in-Differences
		Unweighted	Weighted	Exclude COVID-19 observations
Post	-0.0112***	0.0129*	0.0223	0.0143*
	(0.0058)	(0.0077)	(0.0405)	(0.0081)
CAMs		-0.0121	0.0032	-0.0128
		(0.0241)	(0.0394)	(0.0254)
Post×CAMs		-0.0226**	-0.0329	-0.0260***
		(0.0092)	(0.0400)	(0.0096)
Observations	5,955	10,856	10,856	9,948
Adjusted R^2	0.764	0.880	0.843	0.878

Panel B: Log Audit Hours

	(1) Pre-Post on CAMs Issuers sample	(2) Difference-in-Differences	(3) Difference-in-Differences	(4) Difference-in-Differences
		Unweighted	Weighted	Exclude COVID-19 observations
Post	0.0370***	0.0923***	0.149***	0.0883***
	(0.0070)	(0.0137)	(0.0430)	(0.0149)
CAMs		-0.0865***	-0.0814**	-0.0908***
		(0.0259)	(0.0355)	(0.0282)
Post×CAMs		-0.0566***	-0.112**	-0.0540***
		(0.0147)	(0.0437)	(0.0159)
Observations	4,749	6,643	6,643	6,162
Adjusted R^2	0.682	0.747	0.747	0.742

Panel C: Log Days to File

	(1) Pre-Post on CAMs Issuers sample	(2) Difference-in-Differences	(3) Difference-in-Differences	(4) Difference-in-Differences
		Unweighted	Weighted	Exclude COVID-19 observations
Post	-0.0025	0.0140***	0.0104	-0.0017
	(0.0026)	(0.0035)	(0.0114)	(0.0034)
CAMs		-0.126***	-0.135***	-0.130***
		(0.0088)	(0.0146)	(0.0094)
Post×CAMs		-0.0170***	-0.0146	-0.0028
		(0.0042)	(0.0116)	(0.0041)
Observations	6,149	11,569	11,569	10,406
Adjusted R^2	0.150	0.470	0.345	0.426

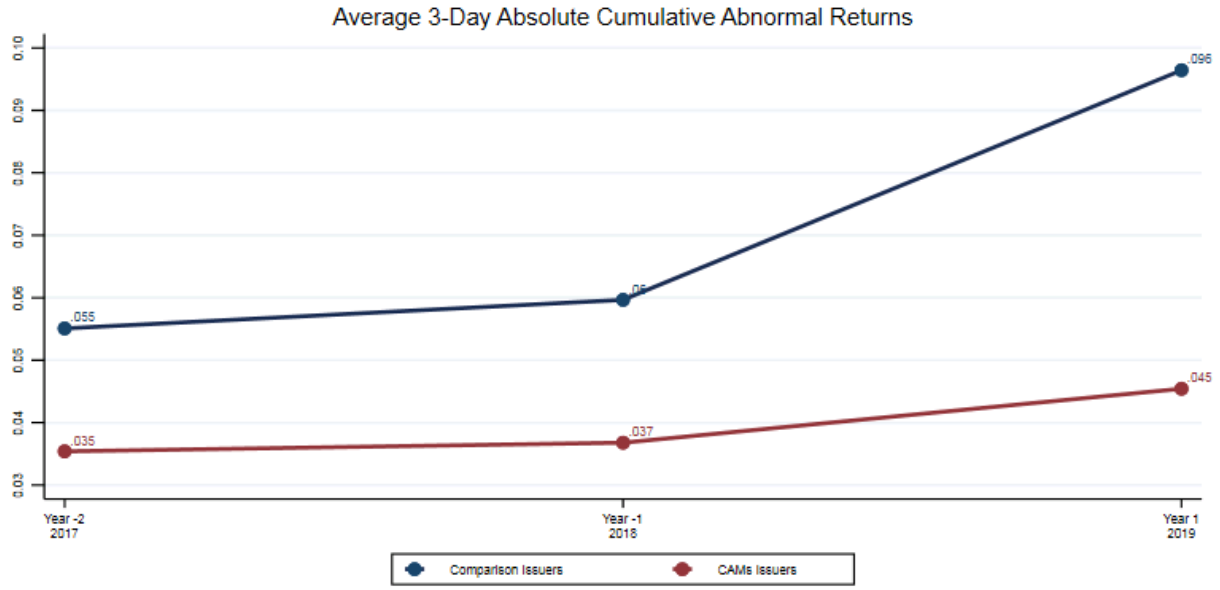
Figure 3 Most Frequently Communicated CAMs by Issuer Industry Sector

Issuer Industry Sector	No. of Audit Reports	Most Frequently Reported CAMs [no. of audit reports]		
		1st	2nd	3rd
Communication Services	119	Revenue Recognition[44]	Other Intangible Assets[26] Goodwill[26]	Business Combinations[21]
Consumer Discretionary	232	Accruals and Reserves[51]	Revenue Recognition[49]	Goodwill[46]
Consumer Staples	83	Other Intangible Assets[25]	Goodwill and Other Intangible Assets[19]	Taxes - Uncertain Tax Positions[15]
Energy	156	Property, Plant, and Equipment[92]	Goodwill[42]	Business Combinations[17]
Financials	384	Allowance for Loan Losses[204]	Level 3 Assets and Liabilities[69]	Investments[67]
Health Care	277	Revenue Recognition[140]	Accruals and Reserves[85]	Other Intangible Assets[59]
Industrials	301	Goodwill[104]	Revenue Recognition[81]	Other Intangible Assets[55]
Information Technology	278	Revenue Recognition[155]	Other Intangible Assets[74]	Business Combinations[73]
Materials	146	Goodwill[60]	Property, Plant, and Equipment[37]	Taxes - Uncertain Tax Positions[26]
Real Estate	161	Real Estate[110]	Leases[17]	Goodwill[14]
Utilities	83	Other Liabilities[55]	Other Assets and Deferred Costs[52]	Property, Plant, and Equipment[15]

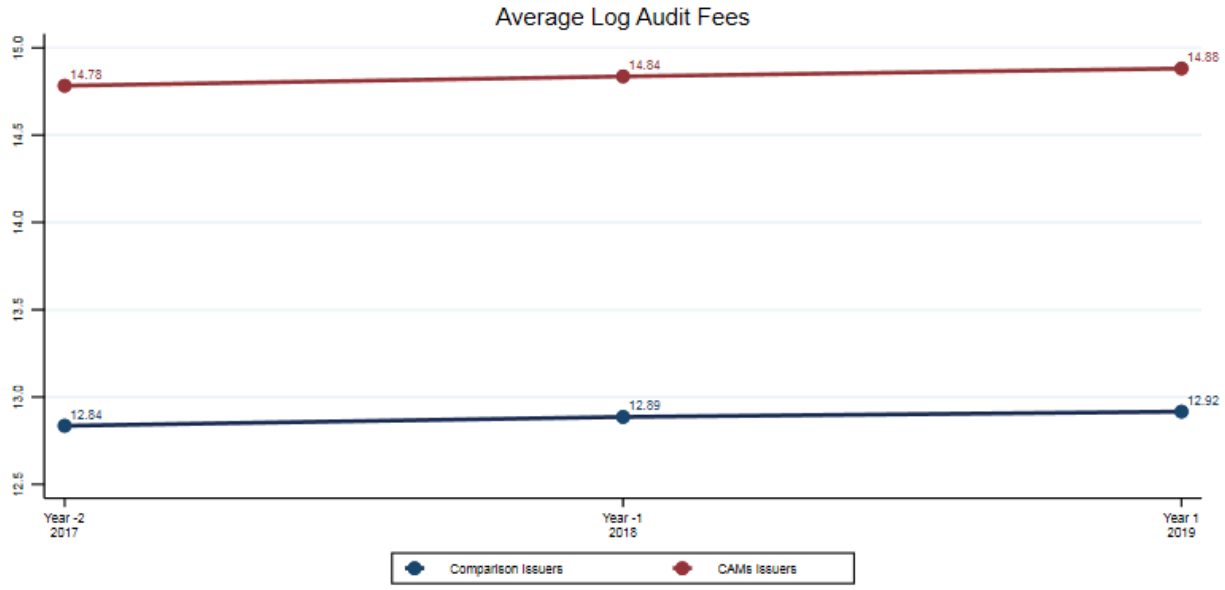
Figure 4 Trends in Outcome Measures

We plot below the average *3-Day ACAR*, *Log Audit Fees, Log Audit Hours, and Log Days to File* in panels A, B, C, and D, respectively. Please see Table 1, Table 2, and Table 4 for the sample sizes and descriptive statistics for these outcome measures.

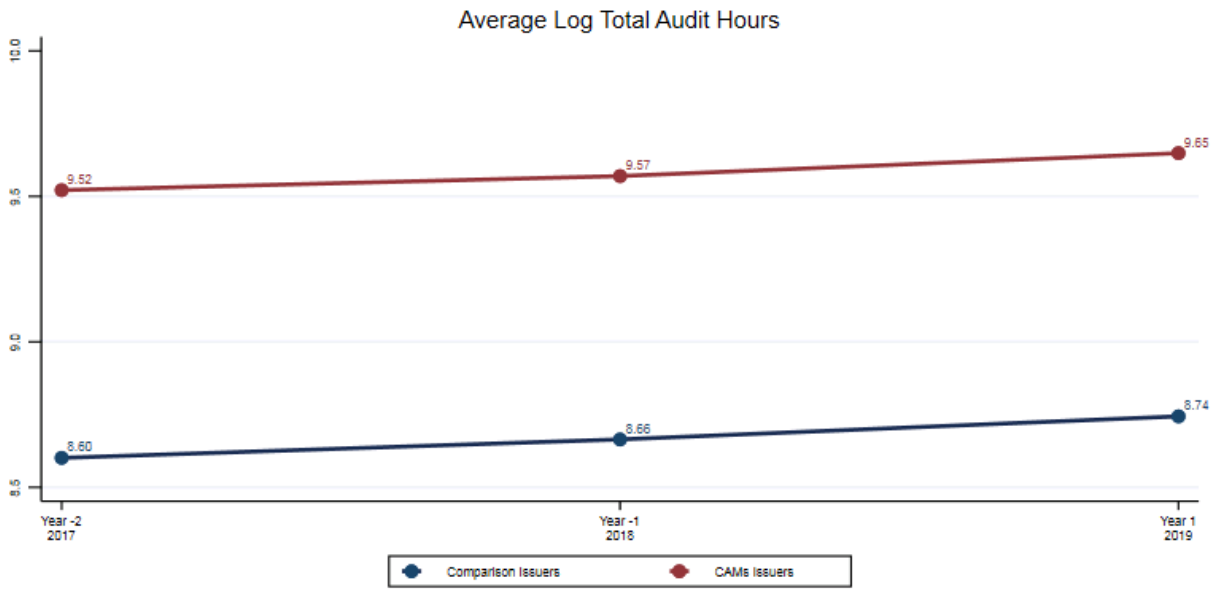
Panel A: Issuers' Stock Market Analysis



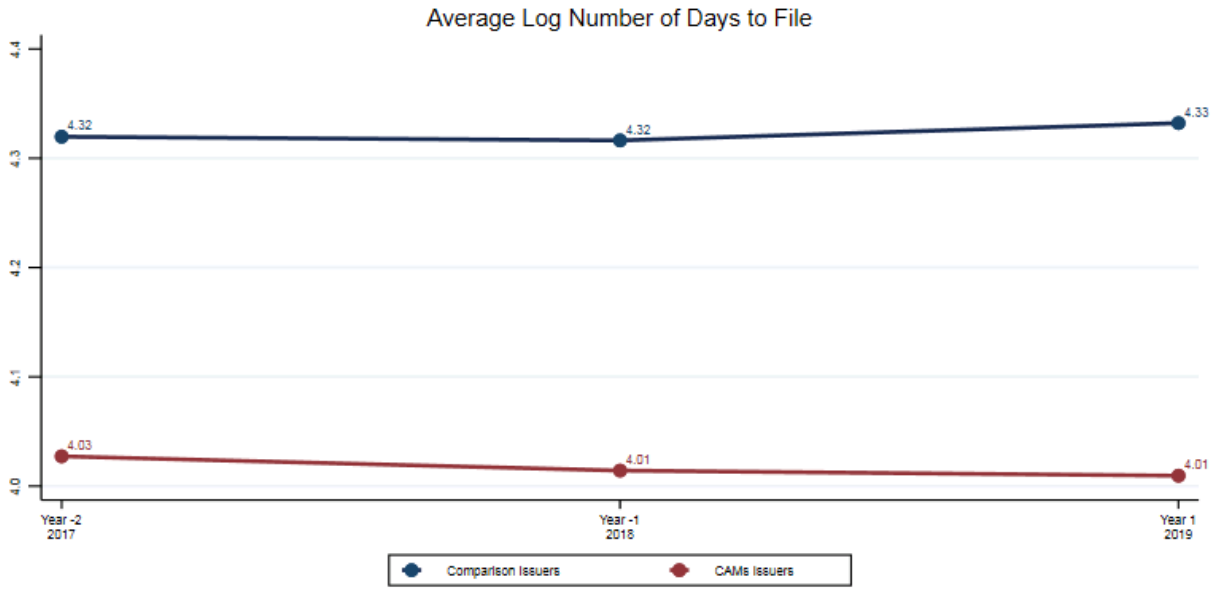
Panel B: Audit Fees Analysis



Panel C: Audit Hours Analysis



Panel D: Days to File Analysis



APPENDIX C. ACADEMIC RESEARCH ON THE IMPLEMENTATION OF CAMS

In a comment letter responding to the PCAOB's Request for Comment, Bochkay et al (2020) provide an assessment on the consequences of the CAM requirements, among other things.[33] In descriptive analysis, the authors find that the number of CAMs is typically low (between one and two on average), and are concentrated in four common topics (revenue recognition, business combinations and consolidations, goodwill valuation and impairment, and accounting for income taxes). They also find little variation in CAM characteristics among the six largest audit firms, aside from some differences in the average length of the CAMs. Using publicly available issuer-level data from large accelerated filers subject to the CAM requirements and accelerated filers not yet subject to the requirements, the authors use a difference-in-differences analysis to assess the effects of CAM adoption on audit fees and market reactions. On audit fees, the authors do not find that auditors' implementation of CAM requirements had an observable impact on audit fees charged to issuers. For market reactions, the authors do not find evidence in support of a systematic increase in the decision usefulness of the new audit report. They also do not find that the variations in the length and number of CAMs have a noticeable effect on investors' reactions. Klevak et al (2020) examine the relationship between investor reactions and the variation in CAM text. These authors use a proprietary text analytics tool to construct textual variables, such as the count of CAMs, length of CAM section, and number of distinct audit procedures described in CAMs. They find that the signed abnormal returns immediately around the release of the annual reports are negatively associated with the level of uncertainty measured by the textual variables.

Burke et al (2020) present a comprehensive review of early CAM disclosures focusing on the determinants of the CAM subjects and the number of CAMs. Their analysis suggests that reported CAMs have the following features. First, issuer characteristics such as complexity, financial reporting issues, and the magnitude of accounts that require high degrees of judgment determine the number and type of CAMs. Second, the authors use textual similarity measures and find that CAMs are not boilerplate. Third, they document significant changes in the financial statement footnotes referenced in the CAMs and posit that the changes in the footnotes could be driven by management and/or management and the auditor. Finally, similar to our analysis, the authors do not find significant effects on market reactions and audit fees following the new CAM requirements.

Drake et al (2020) document that tax-related CAMs disclosed under the new CAM requirements could benefit investors indirectly—by constraining tax-related earnings management. The authors argue that the complexities of tax reporting, compensation incentives related to meeting earnings benchmarks, and the opportunity for management manipulation to make fourth-quarter earnings management via the tax expense provide a strong setting to evaluate how CAMs affect the reporting of tax accounts. Using a difference-in-differences analysis with a balanced issuer sample for two years, they find that tax-related CAM disclosures are associated with (1) a lower likelihood that the issuer uses tax expense to meet analysts' consensus forecasts and (2) an increase in the reported reserves for prior-period uncertain tax benefits.

[33] See comment letter no. 18 to the public request for comment, available at https://pcaobus.org/EconomicAndRiskAnalysis/pir/Pages/Comments-Interim-Analysis-AS-3101-Auditors-Report-Audit-Financial-Statements-When-Auditor-Expresses-Unqualified-Opinion.aspx.

APPENDIX D. POTENTIAL CONFOUNDING FACTORS AND BACKGROUND ON OTHER ROBUSTNESS TESTS

Potential Confounding Factors

Confounding factors are concurrent events during the analysis time period that may also correlate with the outcome measures. Examples of such events include new accounting standards and financial or macroeconomic events. In this section, we discuss confounding factors and how we addressed them in our analysis.

COVID-19 Pandemic

The COVID-19 pandemic could have impacted issuers differently: issuers with fiscal year ends after December 2019 and/or issuers that were due to file annual reports after February 2020 (mainly issuers in the Comparison Issuers group) may have faced significant disruptions to their financial statement reporting and audit processes. The SEC granted extensions to file reports that would otherwise have been due, which in turn affects the average number of days taken to file the annual report and could have increased the audit fees and hours. Thus, to adjust for the impact of the pandemic on audit outcomes (audit fees, hours, and days to file), we perform additional tests using an alternative sample. This sample excludes issuers (from both the pre and post periods) that indicate a delay of their annual filings in Form 8-K and/or Form NT filings in 2020.

The pandemic also affects capital market outcomes in our analysis. There were significant swings in the daily market returns beginning around mid-February 2020 (indicating high levels of market volatility associated with the market reaction to the pandemic in the U.S.) especially on days when a large number of issuers filed their annual reports. We conduct tests on an alternate sample that excludes issuers (from both the pre and post periods) with a filing date after February 15, 2020 to reduce the impact of the pandemic on the results.

CAM Dry Runs

Audit firms spent significant time and resources to prepare for CAM implementation, ahead of the effective dates for CAMs.[34] To account for the impact of these dry runs, we reduce the total audit hours in the pre and the post periods for issuers in such programs (thus removing the impact of the programs on the individual audit hours) based on the amount of time reported by auditors in the stakeholder survey[35] and re-estimate the models for audit hours. The results from the regressions with the adjusted audit hours (not reported here) are similar to those in **Table 5**.

[34] Prior to the first CAMs effective date, large audit firms conducted CAMs dry runs (or practice runs) to gain familiarity with the new requirements. While the scope and timing of dry run programs varied by audit firm, many engagement teams drafted possible CAMs and discussed them with issuer management and audit committees without including them in company filings. We obtained information from the U.S. GNFs on the timing and the issuers—for both the CAMs Issuer and the Comparison Issuer groups—included in such practice runs to understand their potential influence on audit costs.

[35] See the discussion in the white paper "Stakeholder Outreach on the Initial Implementation of CAM Requirements."

Recent changes in FASB accounting standards

The analysis time period coincides with changes in accounting rules promulgated by the Financial Accounting Standards Board (FASB), such as new requirements for leases or derivatives and hedging. Our analysis accounts for these changes because we include fixed effects—by audit firm, issuer industry, or a combination of these—to accommodate trends that either do not change or change at a constant rate.

Financial and/or Macroeconomic Events

Although the influence of macroeconomic events, such as Brexit and the transition away from LIBOR as a benchmark rate, could be potentially large in scale, their effects on issuers vary. For example, Brexit is likely a larger concern for issuers who have significant presence in the U.K. market, and the LIBOR transition is most likely to affect issuers with financial contracts and related obligations tied to LIBOR. Our analysis accounts for these potentially confounding events by including issuer industry fixed effects in the model.

Other Robustness Tests

Weighted Regressions

The descriptive statistics in **Table 2** and **Table 4** in Appendix B indicate significant differences in some of the explanatory variables across the two groups of issuers. The differences in the mean values across the various explanatory variables (in the pre or the post periods) suggest that on average, relative to the CAMs Issuers, the Comparison Issuers tend to be smaller in size, less profitable, and have more restatements and going concern explanatory paragraphs. Such differences could be large enough that the groups have no overlap in these variables and therefore bias our difference-in-differences analysis. To mitigate this problem, we estimate our models using entropy-balanced samples. Hainmuller and Xu (2012, 2013) proposed an iterative procedure to obtain entropy balancing weights for the observations in the Comparison Issuers group such that the moments of distribution of the explanatory variables in the group approximately equal those in the CAMs Issuers group (we chose to balance the means for the variables).[36] We then estimate a weighted regression using the balancing weights whereby Comparison Issuers that are more similar to the CAMs Issuers receive greater weights (*see* columns titled *Weighted* in the tables above). Entropy balancing has advantages relative to other methods such as propensity score matching due to its ability to achieve a better match and retain all observations in the control and treatment groups.[37] We discuss the results from the weighted regressions in Section VI.

Restrict the Sample to One Year around Implementation

We repeat the analyses on a sample that contains fiscal year 2018 and 2019 audits only, i.e., one year each in the pre and post periods. The results (not reported here) are similar to those presented in this paper.

---

[36] Hainmueller, J. (2012). "Entropy Balancing for Causal Effects: A Multivariate Reweighting Method to Produce Balanced Samples in Observational Studies." *Political Analysis*, 20 (1), pp. 25-46. Also see Hainmueller, J., and Y. Xu (2013). ebalance: A Stata package for entropy balancing. *Journal of Statistical Software*, 59 (7), pp.1-18.

[37] Propensity score matching often fails to achieve covariate balance when the propensity score function is mis-specified. It also discards unmatched data, resulting in a loss of power (DeFond, Erkens, and Zhang 2016; Gaver and Utke 2018; King and Nielsen 2018; McMullin and Schonberger 2018).