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Are key audit matter disclosures useful in assessing the financial distress level of a client firm? [☆]

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ABSTRACT

This study examines the usefulness of new expanded audit report key audit matters (KAM) disclosures in assessing the level of financial distress present at a client firm. Using six years of KAM disclosures for U.K. Premium-listed firms beginning in 2013, we investigate the relation between firm financial distress and the number, risk level, financial statement impact, and individual nature of auditor-disclosed KAMs. We expand on literatures examining audit report disclosures in gauging financial distress assessments as well as the utility of expanded audit reporting. We find the greater the number of KAMs disclosed, the higher a firm's financial distress level. Additionally, results show entity-level KAMs, account-level KAMs with a primary impact on profitability and solvency, and certain types of individual KAMs are more likely to be disclosed when client firms face higher levels of financial distress. The results are robust to alternative measures of financial distress and to endogeneity tests. Our findings also indicate KAMs have predictive ability in assessing subsequent periods' financial distress levels. In all, evidence from this study suggests a way financial statement users can use independent auditor disclosures to assess one of the main risks associated with a firm - the risk of failure.

1. Introduction

The enactment of expanded audit report regulation in major jurisdictions across the globe has spurred much debate on whether the benefits to financial statement users of enhanced transparency into the audit process exceed the costs of requiring auditors to disclose

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potentially sensitive client information in their audit opinions. A large part of this debate centers on the requirement to disclose the financial reporting area(s) auditors deem carry the most significant risk of material misstatement for a client firm. In requiring these disclosures, termed Key Audit Matters (KAMs) under International Standards on Auditing (ISAs) regulation (applied in the U.K.) and Critical Audit Matters (CAMs) under U.S. regulation, regulators aim to increase the usefulness of audit reports by providing visibility into the areas having the greatest effect on the overall audit strategy and requiring more challenging audit judgments (FRC, 2013; PCAOB, 2018).¹

Academic research has begun to examine the utility of KAMs, yielding mixed findings on the usefulness of these disclosures to financial statement users. Recent studies such as Smith (2022) and Seebeck and Kaya (2022) reveal KAM disclosures enhance the usefulness of the annual report concerning firm characteristics and client-specific audit risks, as do Moroney, Phang, and Xiao (2021) who condition by audit firm size. In the Chinese setting, Liu, Ning, Zhang, and Zhang (2022) show the incremental informativeness of KAMs for debt holders. However, studies such as Gutierrez, Minutti-Meza, Tatum, and Vulcheva (2018), Köhler, Ratzinger-Sakel, and Theis (2020), and Lennox, Schmidt, and Thompson (2022) find no evidence investors consider KAM disclosures incrementally informative. The mostly insignificant market effects associated with KAMs suggest the need for further research to provide clarity on whether these auditor disclosures may be useful in formulating judgments about audited firms (Minutti-Meza, 2021).

One of the most important yet complex judgments to make about a firm is the extent to which it remains a viable operating and financial entity. Audit standards require auditors to make assessments of a client's ability to remain a going concern (GC) and report in their audit opinions when they believe there exists substantial doubt in this regard (IAASB, 2015; PCAOB, 1989). Studies have shown, however, that auditors often misreport GC classifications (Geiger, Gold, & Wallage, 2021; Pincus, Tian, Wellmeyer, & Xu, 2017; Read & Yezege, 2018). The 2008 global financial crisis and its consequences propelled renewed interest from regulators and financial statement users in auditors' ability to provide accurate going concern opinion (GCO) assessments. Concerns regarding the accuracy of GCOs fueled calls for new approaches to gauging the extent a client remains a viable entity (Laitinen & Laitinen, 2020) as well as more academic research on the usefulness of expanded audit reporting in this regard (Franzel, 2017).

Some recent papers provide insights into the usefulness of audit opinion disclosures in the assessment of firm financial health (Gutierrez, Krupa, Minutti-Meza, & Vulcheva, 2020; Muñoz-Izquierdo, Laitinen, Camacho-Miñano, and Pascual-Ezama 2020). Muñoz-Izquierdo et al. (2020) investigate whether auditor disclosures in emphasis of matter, scope limitation, and GAAP violation paragraphs in the traditional pass/fail audit report combined with accounting data help distinguish between firms that fall into bankruptcy and those that do not. Using a matched sample of 808 Spanish unlisted non-financial firms (404 bankrupt and 404 non-bankrupt), they report that bankruptcy prediction models improve classification accuracy by 10% when combining accounting and traditional auditing data. Similarly using the traditional audit report format, Gutierrez et al. (2020) show that adding GCOs to a number of corporate default models increases the models' predictive ability.² These studies help motivate our paper by providing support for the possibility that new audit report disclosures (namely KAMs) may yield a window into the extent of financial distress risk a firm can face. Our study builds on these findings to examine the extent to which new required expanded audit report disclosures – in particular, reported KAMs – are useful in assessing the level of financial distress present at a firm. Specifically, we investigate the relation between the total number and type of KAMs reported by an auditor and the level of client firm financial distress. We analyze KAMs in three ways: (1) by risk-level, (2) by category of financial impact, and (3) by individual nature.³

The U.K.'s Financial Reporting Council (FRC) was the first to implement expanded audit reporting pursuant to the passage of ISA 700, requiring firms with Premium listings on the London Stock Exchange (LSE) to provide expanded audit reports beginning in fiscal year 2013. To carry out our analysis, we identify all Premium listed firms in 2013 with the necessary data and hand-collect KAM disclosures from the expanded audit reports for these firms through fiscal year 2018. We regress client firm proxies of financial distress level on various partitions of KAMs and their frequencies of occurrence. Our findings show auditor-disclosed KAMs have significant explanatory power in assessing the level of financial distress present at a client firm. Specifically, results suggest the greater the number of KAMs, the higher the level of financial distress present at the firm. This evidence holds when using alternative measures of financial distress and when applying predictive models. Hence, our findings show auditor-disclosed KAMs are useful in the assessment of a

¹ While named and defined with slightly different wording in IAASB and PCAOB expanded auditor regulations, a KAM/CAM in both standards is intended to represent a matter assessed by the auditor as a significant area of risk of material misstatement for the client firm. For consistency and readability, as well as the fact that we focus on U.K. expanded audit reports, we denote these disclosures as KAMs for the remainder of the paper. Also, note that since U.K. and U.S. institutional characteristics are sufficiently similar, especially with regard to KAMs/CAMs and also for expanded audit reports (auditor materiality disclosures in the U.K. being an exception), KAM-related and expanded audit reports-related research from both countries can be relevant to our study's discussions and analyses.

² It is important to emphasize that none of the aforementioned studies explore the usefulness of expanded auditor reporting nor the stand-alone usefulness of KAM disclosures as a component of these new reports in their evaluation of bankruptcy predictions. Also, unlike KAMs, that are required disclosures under new expanded audit report regulation, qualification and/or explanatory paragraph disclosures in traditional audit reports were voluntary disclosures and included only in cases when the auditor felt it necessary to communicate or highlight an accounting change, misstatement, scope limitation, or other matter of significance to the financial statements.

³ A KAM's risk level is determined based on whether a KAM represents a risk that affects a client's financial statements pervasively (an entity-level KAM) or that is isolated to a particular financial statement account (an account-level KAM). A KAM's financial impact is determined as follows. (1) For entity-level KAMs, whether the KAM represents a risk to the client's overall ability to continue as a going concern or other type of entity-level risk such as those related to entity internal controls or restructuring, to name a few (see Table 2 for a complete classification of other entity-level KAMs). (2) For account-level KAMs, whether a KAM represents a risk primarily affecting client profitability, liquidity, or solvency. A KAM's individual nature is determined in reference to an 18-item classification of distinct KAM types developed in the study (and explained in Table 2).

firm's current and future (years $t+1$ and $t+2$) level of financial distress. Additionally, we undertake a range of endogeneity tests to ensure KAM disclosures are not driven simply by firms' poor financial ratios included in our measure of financial distress level, such as two-step system Generalized Method of Moments (GMM) estimator technique, Propensity Score Matching (PSM), and change specification models. Results are robust to these tests.

Our study's findings contribute to both the financial distress and expanded audit reporting literature streams. While a number of papers have examined the extent to which financial statement users perceive expanded audit reports as incrementally useful, we believe our paper is the first to examine the usefulness of KAMs (in total, by risk, by category, and individually) in helping financial statement users make judgments about a firm's viability. Hence, we provide evidence of a new mechanism for using publicly available audit report information to help assess and monitor the state of a client's financial health. Financial statement users will be able to better gauge financial concerns, lessening the reliance in GCOs as the main auditor signal of client firm's failure risk. In addition, by examining the relation between the different types of risks reflected in KAMs and firm financial distress levels, we address international demand for more research examining the types of audit disclosures that may enhance assessments of financial distress and the usefulness of expanded audit reporting regulation (Lennox et al., 2022; Sierra-García, Gambetta, García-Benau, & Orta-Pérez, 2019). Our findings should also be useful in conducting future research where the risk of financial distress is an important consideration. Lastly, findings from this study should be of interest to regulators and practitioners in evaluating the benefits and costs of engagement-specific audit disclosures.

We organize the remainder of the paper as follows. Section II provides additional background and proposes our research questions. Section III describes the sample selection and empirical models. Section IV presents our results, and section V concludes.

2. Prior literature and research questions

2.1. Perceived utility value of KAMs

Studies examining the informative value of KAMs from a user perspective have yielded mixed conclusions on the importance and interpretations that financial statement users give these disclosures in formulating judgments about client firm risk. With regard to lenders' reactions to KAMs, Porumb, Zengin-Karaibrahimoglu, Lobo, Hooghiemstra, and De Waard (2021) find evidence suggesting KAMs improve lenders' ability to assess borrowing risks.⁴ For equity investors, studies such as Gutierrez et al. (2020), Gutierrez, Minutti-Meza, Tatum, and Vulcheva (2022), Lennox et al. (2022) in the U.K.; and Burke, Hoitash, Hoitash, and Xiao (2022) in the U.S. find no evidence markets react to these disclosures, suggesting investors do not find them incrementally informative. Lennox et al. (2022) attribute this finding to the probability investors already know about a client's risk areas described by KAMs in advance of auditors disclosing them. While these studies generally show KAMs do not reflect (or communicate) timely value-relevant information that would be detectable in share price movements,⁵ KAMs may help investors and other stakeholders to better understand the audit process and, as we hypothesize below, the extent of financial distress client firms face. We also note a recent study (Seebeck & Kaya, 2022) examines the communicative value of U.K. extended audit reports and finds that different proxies for communicative value (i.e., readability, evaluative content, visual aids, and specificity) improve during post-ISA 700 periods. Their cross-sectional tests show improvement differs across auditors and clients as well as for KAM disclosures' characteristics. They also find initial evidence that KAMs with more specific descriptions are significantly and positively associated with capital market reactions, suggesting investors value more precise KAM information.

In sum, with preliminary studies on mandated KAM disclosures yielding limited evidence of the perceived usefulness of KAMs to financial statement users, the extent to which the number and type of KAM disclosures may convey useful information about the complexity and financial condition of the firm is an open question.

2.2. Number of KAMs and financial distress risk

The implementation of expanded audit reporting regulation now enhances transparency into auditor judgments regarding the material risk areas of clients, beyond what can be gleaned from a modification to a traditional audit opinion, by requiring auditors to specifically report these assessments via KAM disclosures. While regulators leave the determination of the number of KAMs issued largely to auditor judgment, in identifying a KAM, both IAASB and PCAOB regulations require auditors to consider client areas assessed as significant risks in the audit, including matters requiring complex and/or subjective estimation.

⁴ Experimental studies yield inconclusive findings with respect to the usefulness of KAMs to shareholders. For instance, while Christensen, Glover, and Wolfe (2014) find non-professional investors who are presented with an audit report with KAMs are more likely to change their investment decisions compared with investors who receive a standard audit report, Köhler et al. (2020) show KAMs do not seem to affect non-professional investors' investment decisions. Furthermore, Boolaky and Quick (2016) examine the credit approval decisions of bank loan officers/directors and find no evidence the inclusion of KAMs in audit reports significantly affects their credit-granting decisions or their perceptions about the quality of a firm's financial reporting. Recently, Hoang, Moroney, Phang, and Xiao (2022) indicate the varying communicative value of KAMs across financial and non-financial contexts.

⁵ This is not necessarily a surprising result given that expanded audit reporting regulation explicitly states (ISA 701 section A37 and PCAOB AS 3101 Section 14) that an auditor is not expected to provide information that the firm has not been made publicly available. That is, unless such information is necessary to describe the principal considerations that led the auditor to determine that a matter is a KAM.

Recent studies examine the association between the number of KAMs and client characteristics. Examining the expanded audit reports issued in the U.K. and the E.U., [Pinto and Morais \(2019\)](#) find a significant and positive association between the number of issued KAMs and the business segments and specific accounting standards reported by a firm. In their analysis of U.K. FTSE 100 firms during the period 2013–2016, [Sierra-García et al. \(2019\)](#) show client characteristics such as leverage, structural complexity, and client industry are significant determinants of the number of reported KAMs; clients with higher leverage and reported losses disclose a greater number of KAMs. Both papers report a positive relation between audit fees and the number of reported KAMs, as audit fees are positively linked to the client's specific financial, strategic, operational, and governance risks ([Yang, Yu, Liu, & Wu, 2018](#)) and to its internal control weaknesses ([Munsif, Raghunandan, Rama, & Singhvi, 2011](#)).

With the implementation of expanded audit report regulations, auditors now have a new mechanism to alert users of material client risks without the need to qualify the audit opinion. In communicating material risks as to a client firms' ability to continue as a GC, auditors might use KAMs as a way to publicly signal client financial distress risk while avoiding the negative consequences that could accrue to the client from receiving a GCO. Indeed, [Chen, Elemen, Hope, and Yoon \(2023\)](#) posit that clients with higher leverage ratios, losses, and prior accounting restatements are riskier from the auditor's perspective, and thus receive more KAMs.

While the above studies suggest a link between firm risk level and financial distress may exist, there are many reasons why an auditor's evaluation and eventual judgment as to whether to report a KAM could be unrelated to the extent of financial distress present at a firm. First, audit standards define KAMs generally as those matters considered "significant" to the audit that are required to be communicated to the audit committee and involve significant, complex, or subjective judgments related to a material account or disclosure on the financial statements. There is no requirement for auditors to specifically consider the impact of a significant audit matter on the financial distress risk of a client in determining whether the matter classifies as a KAM. Moreover, audit standards specify that not all significant risks need be KAMs as not every risk involves especially complex or subjective judgments or relates to a material account or disclosure. Thus, it is possible auditors do not report matters with the potential to affect a client firm's financial distress level as KAMs, such as debt covenant negotiations, potential loss contingencies, or illegal act violations, which are not required to be disclosed. Furthermore, there are many instances in which an auditor may report a KAM based solely on the complexity of the accounting standards or estimates governing recognition of a particular account or disclosure (e.g., revenue). As the source of such complexities are regulatory driven and not firm specific, these KAMs may not relate to the extent of financial distress present at a client firm. Second, extant literature suggests it is also possible the number of KAMs disclosed by an auditor could be a product of how auditors perceive the reputation and/or litigation risk surrounding KAM reporting ([Gimbar, Hansen, & Ozlanski, 2016](#)). With Brazilian firms, [Ferreira and Morais \(2019\)](#) find the number of KAMs disclosed is associated (1) with auditor size, with Big 4 audit firms on average issuing a greater number of KAM disclosures in their audit opinions,⁶ and (2) with the type of audit opinion issued, finding that clients with unqualified audit opinions have a greater number of reported KAMs. [Ferreira and Morais \(2019\)](#) attribute that finding as possibly an outcome of auditor-client negotiation as clients seek to avoid the negative consequences linked to annual reports filed with qualified audit opinions (e.g., the U.K. considers annual reports filed with adverse opinions to be in violation of the Companies Act). Auditors could also choose to disclose a higher number of KAMs as a way of "covering their bases" and reduce the likelihood of litigation, especially when auditing financially troubled clients ([Dye, 1993](#)). In fact, [Brown, Majors, and Peecher \(2020\)](#) find KAMs reduce culpability assessments by generating more positive beliefs about the audit firm's conduct. If auditors perceive KAM disclosures as a means of reducing litigation risk, then it is not clear an increase in the number of KAMs an auditor discloses on a client's financial statements will be related to the client's financial distress risk.⁷ Finally, the number of KAMs auditors identify can be related to a number of factors, including non-financial distress issues. Studies show, for instance, that number of KAMs can also be related to the amount of time and effort an auditor spends on a given client as reflected through audit fees ([Pinto & Morais, 2019](#); [Sierra-García et al., 2019](#)).

In sum, both prior research and practice guidance suggest the nature of the relation between reported KAMs and a client firm's level of financial distress is neither straightforward nor intuitive. Whether a link between KAMs and client firm financial distress exists, however, is a relevant and important empirical question that academic research has not yet examined. We address this need by posing our first research question.

RQ1: Is there an association between the total number of auditor-reported KAMs and the client firm's level of financial distress?

2.3. Nature of KAMs and financial distress risk

As with the number of KAMs, expanded audit reporting regulation allows the determination of the type (or nature) of KAMs disclosed to be based largely on auditor judgment. While scarce, academic research studying pre-expanded audit report modifications and emphasis of matter paragraphs provides some insights on the usefulness of auditor disclosures. For example, in a natural experiment in Canada, [Bédard, Brousseau, and Vanstraelen \(2019\)](#) find when annual reports include a GC uncertainty disclosure, an emphasis of matter paragraph in the audit report may be accompanied by incremental negative share price effects in contrast to when the GC uncertainty disclosure does not accompany an emphasis of matter paragraph. In addition, [Casterella, Desir, Stallings, and](#)

⁶ This is likely because large audit and professional service entities are more exposed to litigation risk (seen as having "deep pockets") or to regulatory sanctions ([Dye, 1993](#)).

⁷ [Brasel, Doxey, Grenier, and Reffett \(2016\)](#) also provide experimental evidence that under certain conditions KAM disclosures reduce auditor liability.

Wainberg (2020) suggest an impact on the share pricing of industry peer firms occurs when there is no warning from auditors and a rival goes bankrupt without having received a prior year GCO.

Moreover, a line of research has recently emerged providing insights on the usefulness of types of audit report disclosures in assessing financial distress risk. Many of the well-established models developed and used in the literature to assess financial distress risk rely on the analysis of accounting-based ratios computed from financial statement data (Altman, Iwanicz-Drozdzowska, Laitinen, & Suvas, 2017). Several studies, however, question the predictive power of accounting-only variable models, documenting evidence of enhancements to these models with the addition of market-based and non-financial variables (Bellovary, Giacomino, & Akers, 2007; Hernández-Tinoco & Wilson, 2013; Hillegeist, Keating, Cram, & Lundstedt, 2004; Laitinen & Laitinen, 2009). One such category of non-financial variables is information extracted from external auditing data, including the type of audit opinion (Altman, Sabato, & Wilson, 2010) and the content of audit report disclosures (Muñoz-Izquierdo, Camacho-Miñano, Segovia-Vargas, & Pascual-Ezama, 2019). In general, prior literature using traditional pass/fail audit opinions has observed associations between financial distress risk and qualified opinions, finding the type of audit opinion (e.g., GCO), the accumulation of opinion modifications, and high auditor rotation contribute significantly to the assessment of financial distress (Altman et al., 2010; Gutierrez et al., 2020; Kim, Kim, & McNeil, 2008).

With the implementation of the expanded audit report regulations, research has emerged providing some insights on the content and determinants of KAM disclosures. No studies that we are aware of, however, have examined how the types of KAMs reported by the auditor may be useful in assessing a client's level of financial distress risk. If new expanded audit report disclosures provide a mechanism for auditors to inform financial statement users about client firm risk, then factors reflecting the risk of material misstatements disclosed as KAMs might help inform users of matters contributing to assessing client firm financial distress.

Expanded audit reporting standards leave the determination of "significance" to the audit in assessing a matter as a KAM up to auditor judgment; therefore, KAMs can represent risks that impact the overall financial statements of a firm pervasively (entity-wide) or be specific to particular accounts (account-level). KAMs pertaining to matters that affect a client's financial statements (e.g., a restructuring) may better capture risks relevant to the financial distress position of a firm than those pertaining to matters specific to one account (e.g., pension costs) given the former impacts a firm's financial health entity-wide. Alternatively, to the extent account-level KAMs better capture risks having direct impact on the components of a firm's financial viability (e.g., debt versus assets), they may be useful for assessing a client firm's financial distress level. As prior research shows differences exist in the extent to which entity-wide versus account-level KAMs capture value-relevant risks for a client firm (Lennox et al., 2022; Sierra-García et al., 2019), we believe it is important to explore whether differences exist in how entity-wide versus account-level KAMs capture risks relevant to a client's financial distress level. We investigate this by posing our second research question.

RQ2: Is there an association between the risk level of auditor-reported KAMs and the client firm's level of financial distress?

Prior studies document that profitability, liquidity, and solvency financial ratios are significant predictors of financial distress risk (Altman, 1968; Balcaen & Ooghe, 2006). Lukason and Laitinen (2019), for instance, report a negative profitability ratio is the most important contributor to financial distress risk predictions. Based on these findings, we believe classification and analysis of account-level KAMs by their primary effect on the variables of a firm's financial health (profitability, liquidity, or solvency) may be useful in the assessment of firm financial distress risk. Similarly for entity-level KAMs, prior research into bankruptcy and GC documents firm-level GC disclosures in pre-expanded audit reports can signal bankruptcy risk (Flagg, Giroux, & Wiggins, 1991; Gutierrez et al., 2020; Muñoz-Izquierdo et al., 2020). Given this documented association, we believe examining GC KAMs separately from other entity-level KAMs may be useful in better understanding the association between entity-level KAMs and financial distress risk. Hence, we further separately categorize entity-level and account-level KAMs by their primary impact on a firm's financial health and ask our third research question as follows.

RQ3: Is there an association between auditor-reported KAMs categorized by their primary impact on a firm's financial health and the client firm's level of financial distress?

Finally, studies have begun to emerge examining specific types of KAMs, suggesting the complexity and uncertainty involved in measuring accounting transactions (e.g., tax and fair value estimates) could condition auditor KAM reporting behavior (Lynch, Mandell, & Rousseau, 2022; Ma, Coram, & Troshani, 2021). Moreover, prior research provides evidence high-risk accounts such as revenue and inventory are associated with increased loss exposure for firms and have a greater influence on auditors' GC assessments (Bell & Tabor, 1991; Carson et al., 2013). Taken together, the above findings suggest certain types of KAMs may reflect a firm's financial distress level better than others as we discuss later in the paper. To explore the extent to which the individual nature of KAMs may be useful in assessing firm financial distress, we categorize KAMs into 18 distinct types,⁸ and we ask our final research question as follows.

RQ4: Is there an association between the nature (i.e., individual type) of auditor-reported KAMs and a client firm's level of financial distress?

⁸ We present KAM classifications and associated descriptions in Table 2. Our first partition into entity-wide and account-specific KAMs builds both on guidance from IAS 701 and prior literature (Lennox et al., 2022; Sierra-García et al., 2019).

Based on prior research and our intuition, we offer the following conjectures of possible links between selected KAMs and financial distress. Prior GC studies document that GC opinions provide incremental information to predict corporate default in listed companies using the traditional pass/fail audit report (Gutierrez et al., 2020). In some cases, KAMs about risky and complex transactions such as mergers and acquisitions (MA) may be associated with the likelihood of client firm financial distress. Revenues (REV) and accruals (ACCREST) might be positively related to the level of financial distress because these KAMs inform about challenging and subjective judgments related to earnings management. Prior literature suggests highly distressed firms exhibit earnings management through real and accrual manipulation (Campa & Camacho-Miñano, 2015; Habib, Bhuiyan, & Islam, 2013; Li, Li, Xiang, & Djajadikerta, 2020). It seems reasonable to expect a significant relation between intangible assets (INTANG) and financial distress, because these KAMs relate to hard to value items. Also, between financial distress and long-term debt (LLTD) and pensions (PENS), as these KAMs reflect client financial leverage concerns, which are closely related to the level of financial distress (e.g., Bell & Tabor, 1991; Carson et al., 2013; Jansen, Ramnath, & Yohn, 2012).

3. Research design

3.1. Sample selection

Our initial sample consists of all firms listed on London Stock Exchange in 2013 (2149 firms). We narrow our sample to firms with a Premium listing classification since the U.K. expanded audit report regulation applies only to audit reports of firms in this classification (899 firms). Auditors of Premium-listed firms must present expanded audit reports beginning with fiscal year-ends on or after September 30, 2013.⁹ Due to the costs and effort of hand-collecting data, we focus our sample on firms with a Premium listing in fiscal year 2013 and hand-collect KAMs for these firms beginning with their first presentation of expanded audit reporting (2013 or 2014, depending on their fiscal year-end date) through 2018. In cases where a firm becomes insolvent or acquired by another entity during our sample period, we include data for such firm through the last available fiscal year-end's expanded audit report.

Our data come from four different sources. (1) KAM disclosures and audit firm names hand-collected from firms' annual reports (from the expanded audit report for each available firm-year in our sample). (2) Other auditor-related variables (including audit opinion, GC emphasis of matter paragraphs, restatements, audit- and non-audit fees) derived from the Audit Analytics Europe database (where we manually collect missing values from firms' annual reports for each available firm-year in our sample)¹⁰. (3) We obtain financial and ownership data for the sample firms from the ORBIS database.¹¹ (4) For missing ownership data in ORBIS, we manually search Companies House, the U.K.'s registrar that examines and stores limited companies' data.¹² To ensure consistency in coding of KAMs by risk-level, category, and individual type, two members of the research team (one of whom with extensive auditing experience) independently categorized each KAM. Any differences in coding were resolved through discussion. Appendix A provides a sample firm's auditor-reported KAM disclosures along with the categorization we gave to each reported KAM. We drop firms without the necessary financial variables (six firms) in ORBIS and exclude 411 firms in the financial industry (financial and investment trusts) due to their distinctive operating and regulatory nature. Table 1 summarizes the sample selection process and firm-year observations for the final sample of 482 firms and 2214 firm-years.¹³

3.2. Empirical models

In examining the relation between firm financial distress level and auditor-reported KAMs, we first consider RQ1, the relation between the level of financial distress client firms face and the number of KAMs (No.KAM) for each client firm-year.¹⁴ We use the following OLS regression model to investigate RQ1:

$$\text{Model 1: } FD_{it} = \beta_0 + \beta_1 \text{No.KAM}_{it} + \sum \text{Controls} + \mu_{it}$$

The coefficient β_1 captures the relation between the level of financial difficulties and the number of KAMs. Consistent with Sierra-García et al. (2019) and Lennox et al. (2022), we calculate the No.KAM variable as the total number of individual KAMs for each firm

⁹ Firms with 2013 fiscal year-ends prior to September 30 were not required to provide expanded audit reports in their 2013 annual reports. Implementation of expanded audit reporting was required for these firms beginning with fiscal year 2014.

¹⁰ For audit- and non-audit fees amounts that we manually search for in the firms' annual accounts, when amounts appeared in EUROs or GB Pounds (GBP), we converted them to thousands of U.S. dollars (USD) using year-end exchange rates. The following were the exchange rates applied. GBP to USD: 1.6564 (year-end 2013), 1.5586 (2014), 1.4737 (2015); 1.2345 (2016), 1.3515 (2017), 1.2747 (2018); EURO to USD: 1.2141 (year-end 2014), 1.0887 (2015), 1.1733 (2016), 1.1256 (2017).

¹¹ Due to data restrictions in ORBIS, we use ownership information as of the end of 2018, the last year of our sample.

¹² We collect firms' ownership data from Companies House on the website <https://www.gov.uk/get-information-about-a-company> in a section labelled as "Persons with significant control".

¹³ Lack of data availability in a given firm-year can reduce the sample size of particular analyses.

¹⁴ We conduct several tests to identify the best statistical model for our purpose (untabulated). Then we examine its reliability, autocorrelation, and heteroskedasticity. First, we choose between pooled OLS and random effects, using the Breusch-Pagan Lagrangian multiplier test. Second, we check between pooled OLS and fixed effects, using the F restrictive test. Third, we run the Hausman test to check between random and fixed effects. The fixed effect approach is better than the other in all models.

Table 1
Sample selection criteria.

Firms and firm-year observations of the sample	
Initial sample: All firms listed in London Stock Exchange in 2013	2149
(–) Firms not listed as Premium	(1250)
All Premium firms listed in London Stock Exchange in 2013	899
(–) Financial firms	(360)
(–) Investment trusts	(51)
All Premium firms listed in London Stock Exchange in 2013, excluding financial firms and investment trusts	488
(–) Firms with no consolidated annual report data available in ORBIS database	(6)
Total firms of the sample: Firms with consolidated annual report data in ORBIS database for all or some years of the sample (2013–2018)	482
Total firm-year observations	2214

Table 1 reports the sample selection criteria, starting with the initial sample, which consists of all listed companies in the London Stock Exchange (LSE) in 2013, extracted from the LSE website. The first filter is all Premium-listed firms (a total of 899 companies), as expanded audit report regulation in the UK applies only to Premium-listed companies beginning with fiscal year-ends on or after September 30, 2013. We then search for the industry and consolidated annual report data in ORBIS, and eliminate 411 financial companies and investment trusts, and 6 firms without any consolidated data in the period studied (2013–2018). The final sample comprises 482 companies, which are all non-financial Premium-listed companies on the LSE reporting extended audit report and with consolidated annual report data in ORBIS database for all or some of the years of the sample (2013–2018). The total firm-year observations are 2214. A total of 678 firm-year observations is eliminated because companies publish the short format of the audit report or ORBIS database does not provide sufficient data to implement our empirical analyses and the annual report is not available on the internet. The unavailability of the annual report is due to the firm being liquidated or being acquired.

in each year in the sample.

We measure the level of firm financial distress (*FD*) by employing Altman's Z'' -Score model as the continuous dependent variable. This is an updated version of the original Z-Score model developed by Altman (1983) and is widely accepted in both academic research and practice as a leading bankruptcy prediction and analysis tool (Altman et al., 2017; Balcaen & Ooghe, 2006; Habib, Costa, Huang, Bhuiyan, & Sun, 2020; Laitinen, 1991). Prior literature has validated the application of the Z'' -Score in different countries, including the U.K., where the classification performance (measured by the area under the curve (AUC)) reaches an accuracy of 0.719 (Altman et al., 2017).

The Z'' -Score is calculated using the following four-variable model:

$$Z''\text{-Score} = 3.25 + 6.56 \times Z1 + 3.26 \times Z2 + 6.72 \times Z3 + 1.05 \times Z4$$

The four financial ratios, considered in the top ten ranking of the most accurate predictors of bankruptcy (see literature review by Bellovary et al., 2007), are as follows. Z1 is working capital to total assets, a liquidity ratio, expressing a firm's book value of net current assets over total assets; we expect firms with low liquidity to be more financially distressed than firms with no liquidity issues. Z2 is retained earnings to total assets and reflects cumulative profitability as a proportion of total assets. Profitability is negatively linked to bankruptcy, so we expect a negative correlation between this long-term profitability measure and financial distress. Z3 is earnings before interest and taxes to total assets. It shows how productive a firm is in generating earnings before deducting interest and taxes; thus, a low value of Z3 occurs when firms are under financial distress.¹⁵ Lastly, Z4 is book value of equity to total liabilities. It captures financial leverage or capital structure by measuring the relation between a firm's shareholders' equity and its obligations to external parties. A decrease in this ratio indicates a warning signal for financial difficulties, as we expect distressed firms are highly leveraged.

Generally, a Z'' -Score of 2.6 or above indicates a firm is in a safe zone regarding financial distress whereas a Z'' -Score below 2.6 positions a firm in the distress or grey zone, suggesting a higher probability of financial difficulties in the short term. Thus, the general interpretation of Z'' -Score is that the lower the score is, the higher the financial distress risk present at a firm. To ease the interpretation of results in our study (so that a positive relation between number of KAMs and financial distress score/level answers our research questions), we present our dependent variable (*FD*) as Z'' -Score multiplied by -1 . In other words, in our study, financial distress risk is higher when *FD* is larger.

We include control variables in all of our models related to auditor and client characteristics (\sum Controls) that prior literature suggests could affect the disclosure of KAMs (Lennox et al., 2022; Sierra-García et al., 2019). We include *AUDITFEES* and *NAFEES-RATIO* to control for audit quality (Francis & Wang, 2008) and *CHANGEAUDIT* to control for a change in auditor from the prior year. The indicator variable *AUDITOP* controls for the presence of a qualified opinion and *GCEMP* for the presence of a GC uncertainty disclosure in an emphasis of matter paragraph of the audit report. To account for client characteristics, we include controls for firm size

¹⁵ The Z3 ratio appears to be the most powerful predictor of bankruptcy (Altman et al., 2017) as it continually outperforms other measures in assessing the risk of failure.

Table 2
Classification of key audit matters (KAMs).

Classification		Type (Variable)	Description of categorical variables
A.	Entity-level KAMs (<i>ENTKAM</i>)	Category	
1.	Going concern	<i>GC</i>	Number of going concern KAMs disclosed
2.	Internal control and fraud	<i>ICFRAUD</i>	Number of internal control and fraud KAMs disclosed
3.	Restructuring and discontinued operations	<i>RDO</i>	Number of restructuring and discontinued operations KAMs disclosed
4.	Merger and acquisition (M&A) accounting	<i>MA</i>	Number of merger and acquisition (M&A) accounting KAMs disclosed
5.	Tax-related	<i>TAX</i>	Number of tax-related KAMs disclosed
6.	Exceptional items and presentation and disclosure	<i>EIPD</i>	Number of exceptional items, presentation and disclosure KAMs disclosed
7.	Litigation, macroeconomic and system implementation	<i>LITMACRO</i>	Number of litigation, macroeconomic and system implementation KAMs disclosed
B.	Account-level KAMs (<i>ACCKAM</i>)		
8.	Management and/or performance fees	Profitability (<i>PROF</i>)	<i>MGFEES</i> Number of management and/or performance fees KAMs disclosed
9.	Revenue recognition		<i>REV</i> Number of revenue recognition KAMs disclosed
10.	Expense recognition		<i>EXP</i> Number of expense recognition KAMs disclosed
11.	Accruals, deferrals and management estimates	Liquidity (<i>LIQU</i>)	<i>ACCREST</i> Number of accruals, deferrals and management estimates KAMs disclosed
12.	Inventory		<i>INV</i> Number of inventory KAMs disclosed
13.	Cash and receivables		<i>CASHREC</i> Number of cash and receivables KAMs disclosed
14.	Investments and related impairment issues	Solvency (<i>SOLV</i>)	<i>INVEST</i> Number of investments and related impairment issues KAMs disclosed
15.	Intangibles and related impairment issues		<i>INTANG</i> Number of intangibles and related impairment issues KAMs disclosed
16.	Property, plant and equipment and related impairment issues		<i>PPE</i> Number of property, plant and equipment and related impairment issues KAMs disclosed
17.	Leases and long-term debt		<i>LLTD</i> Number of leases and long-term debt KAMs disclosed
18.	Pension and defined benefit plan accounting		<i>PENS</i> Number of pension and defined benefit plan accounting KAMs disclosed

Table 2 reports the variables that represent the 18-item codification of key audit matters (KAMs), segregated into two sections: entity-level KAMs (*ENTKAM*) and account-level KAMs (*ACCKAM*). The table shows the section in the first column. The following columns present the item number and its name, abbreviated name, and the variable definition. In the entity-level KAMs section, KAMs are also segregated into two categories: KAMs about GC uncertainties (*GC*) and other entity-level KAMs (*OTHERENT*). In the account-level KAMs section, KAMs are additionally classified depending on their impact on the profitability (*PROF*), liquidity (*LIQU*) or solvency (*SOLV*) of a client firm.

(*SIZE*), the presence of a restatement (*RESTATEMENT*), the presence of a loss (*LOSS*), and the variable *OWNERSHIP* (concentration) to control for firm corporate governance quality.¹⁶ We also include industry-, year-, and audit firm-fixed effects to mitigate concerns that firm industry characteristics, time-series trends, and auditors may affect the frequency and type of KAM disclosures (Lennox et al., 2022).¹⁷ We calculate p-values using statistics estimated from robust standard errors clustered by firm. We winsorize continuous variables at the 1st and 99th percentiles to avoid biased results from the presence of extreme values.

We next explore the relation between type of KAMs and financial distress. RQ2 examines the impact of KAMs by risk level (entity-wide, *ENTKAM*, or account-specific, *ACCKAM*); RQ3 the impact of KAMs by category of financial impact (entity-level KAMs categorized by *GC* and other entity-level risks (*OTHERENT*), and account-level KAMs categorized by profitability, liquidity, or solvency); and RQ4 the impact of KAMs by individual type (nature). Table 2 presents and describes our KAM categorizations.

We use three distinct OLS regression models (Models 2, 3, and 4, respectively) to answer RQ2, RQ3, and RQ4. Model 2 examines the relation between the level of risk a KAM represents to a firm's financial statements (i.e., entity-wide or account-specific) and firm financial distress:

$$\text{Model 2: } FD_{it} = \beta_0 + \beta_1 ENTKAM_{it} + \beta_2 ACCKAM_{it} + \sum Controls + \mu_{it}$$

¹⁶ To create this indicator variable, we use the "Indicator and Degree of Ownership Concentration" variable provided by ORBIS. We include as low concentration independent client firms (those with known recorded shareholders, each of them having less than 25% of direct or total ownership of the company), and firms with shareholders with ownerships below 50%, but with one or more shareholders with ownership percentages above 25%. We include as high concentration firms with known recorded shareholders with a total or calculated ownership above 50% and firms with a recorded shareholder that has direct ownership above 50%. For firms with missing values, we use "Persons with significant control" provided by Companies House, as stated above.

¹⁷ Some financial ratios from client financial statements used in other KAM archival studies are not included in our analysis due to collinearity issues with our *FD* dependent variable, which is derived from the Altman's Z'-Score model and consists of the four financial ratios explained above.

Table 3
Variable descriptive statistics.

Variable	No. Obs.	Mean	Median	Std. Dev.	Min.	Max.
FD	2214	-7.41	-6.64	4.34	-33.97	0.46
Z1	2214	0.11	0.07	0.19	-0.31	0.73
Z2	2214	0.39	0.41	0.26	-0.59	0.88
Z3	2214	0.07	0.07	0.10	-0.37	0.40
Z4	2214	1.58	0.87	2.95	-0.24	23.55
TA	2214	6,954,393	1,329,097	19,200,000	9715.4	136,000,000
NI	2214	285,894.5	52,432.5	912,653.7	-1,175,000	6,259,487
CA	2214	1,819,755	346,902.3	4,501,999	2734	30,100,000
CL	2214	1,726,354	239,087.9	4,970,535	731	35,900,000
EBIT	2214	424,014.3	80,750.1	1,214,790	-786,000	8,274,000
SE	2214	2,678,590	526,142.3	7,946,536	-158,191.8	60,700,000
TL	2214	4,329,942	635,202.4	12,300,000	1543.5	83,300,000
OPCF	2214	613,117.5	89,257.2	1,845,919	-76,641.5	13,200,000

Table 3 presents summary statistics for the financials of our sample: number of observations, mean, standard deviation, minimum and maximum. See **Appendix B** for variable definitions. Recall, FD is multiplied by -1 . All amounts are in USD, and all continuous variables are winsorized at the 1st and 99th percentiles. See **Appendix B** for variable definitions.

where $ENTKAM$ is the sum of entity-level KAMs and $ACCKAM$ is the sum of account-specific KAMs for a client firm for a given year. The coefficients β_1 and β_2 capture the relation between the level of financial distress and the number of specific KAMs at the risk-level. If the association between level of KAMs and client firm financial distress holds, β_1 and β_2 will be positive and significant.

Model 3 examines the relation between KAMs classified by category of financial impact and firm financial distress:

$$\text{Model 3: } FD_{it} = \beta_0 + \beta_1 GC_{it} + \beta_2 OTHERENT_{it} + \beta_3 PROF_{it} + \beta_4 LIQU_{it} + \beta_5 SOLV_{it} + \sum Controls + \mu_{it}$$

where GC is the number of KAMs about uncertainties of the entity's viability; $OTHERENT$ is the number of entity-level KAMs other than GC ; and $PROF$, $LIQU$ and $SOLV$ are the number of KAMs classified as having a primary effect on a firm's profitability, liquidity and solvency, respectively. If there is a relation between the category KAMs and client firm financial distress, then the β_1 - β_5 coefficients in Model 3 should be positive and significant.

Lastly, Model 4 examines the relation between individual types of KAMs and firm financial distress:

$$\text{Model 4: } FD_{it} = \beta_0 + \beta_1 GC_{it} + \beta_2 ICFRAUD_{it} + \beta_3 RDO_{it} + \beta_4 MA_{it} + \beta_5 TAX_{it} + \dots + \beta_{18} PENS_{it} + \sum Controls + \mu_{it}$$

where GC , $ICFRAUD$, RDO , MA , TAX , ..., $PENS$ are the 18 KAM types described in **Table 2**. If a relation between KAM types and client financial distress appears, then the β_1 - β_{18} coefficients will be positive and significant.

4. Results

4.1. Descriptive statistics

Table 3 presents sample descriptive statistics. On average, firms in our sample report (in USDs) 6954 thousand of assets (TA) and 286 thousand in net income after tax (NI), indicating sample firms are large and profitable. The first five rows of **Table 3** show statistics for FD and its components. After winsorizing at the 1st and 99th percentiles, the average Z'' -Score (FD) is -7.41 (multiplied by -1) across the sample, indicating the safe zone.

Table 4 provides descriptive statistics of firm-year observations and KAMs disclosed in our sample firms. Panel A shows the industry distribution of our sample firms by year. The most frequently represented industry is 'manufacturing' (33.1%), followed by 'other services' (10.2%) and 'wholesale and retail trade' (9.7%). Panel B displays the distribution of audit firms by year. The Big 4 audit over 90% of our sample firms.

Table 4 Panel C displays the distribution of the number of KAMs per auditor and year. The number of KAMs disclosed per client ranges from 1 to 10 per year. The mean is 3.58 and it decreased somewhat over our sample period from 3.92 in 2013 to 3.48 in 2018. As for the breakdown by auditor size, the mean of KAMs from small auditors (2.79) is lower than KAMs from both the Big 4 (3.59) and mid-tier auditors (3.69). Mid-tier auditors issued the highest mean of KAMs in 2013 and 2014 (4.36 and 4.48, respectively). Small auditors consistently reported the fewest KAMs, a result that likely reflects a tendency for smaller firms to audit fewer complex clients (Pinto & Morais, 2019).

Table 4 Panel D displays the distribution of KAMs by classification and year. There is a total of 7918 KAMs across our sample's 2214

Table 4
Sample descriptive statistics.

Panel A. Industry distribution of firm-year observations								
Industry	2013	2014	2015	2016	2017	2018	Totals	%
Agriculture, forestry, fishing and mining	32	37	32	30	30	30	191	8.6%
Information and communication	24	39	38	35	33	31	200	9.0%
Manufacturing	85	143	137	128	125	114	732	33.1%
Other services	25	46	43	39	36	36	225	10.2%
Professional, scientific and technical activities	18	28	26	22	21	20	135	6.1%
Real estate	15	34	34	32	32	32	179	8.1%
Transportation and accommodation	18	32	32	32	29	29	172	7.8%
Utilities and construction	18	32	31	31	26	26	164	7.4%
Wholesale and retail trade	16	44	42	41	37	36	216	9.7%
Total	251	435	415	390	369	354	2214	100%
Panel B. Auditor distribution of sample firms by year								
Big 4	236	404	389	367	344	328	2068	93.4%
Mid-tier	11	21	18	17	19	17	103	4.7%
Small	4	10	8	6	6	9	43	1.9%
Panel C. Summary statistics of KAMs issued per auditor by year								
	2013	2014	2015	2016	2017	2018	Means	
Mean No. of KAMs by Big 4	3.92	3.80	3.61	3.41	3.37	3.48	3.59	
Mean No. of KAMs by Mid-tier	4.36	4.48	3.56	3.35	3.26	3.24	3.69	
Mean No. of KAMs by small auditor	3.00	3.30	3.00	2.67	2.50	2.22	2.79	
For total auditors:								
Mean No. of KAMs	3.92	3.83	3.60	3.39	3.35	3.44	3.58	
Median No. of KAMs	3.00	3.00	3.00	3.00	3.00	3.00	3.00	
Std. Dev. No. of KAMs	1.40	1.50	1.44	1.43	1.55	1.53	1.49	
Minimum No. of KAMs	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Maximum No. of KAMs	10.0	10.0	8.00	9.00	9.00	9.00	10.00	

Table 4, Panel A reports the industry distribution of firm-year observations in absolute figures. Industry information comes from ORBIS database and the nine industry categories are based on NACE 4-digit codes, following [Lennox et al. \(2022\)](#). Panel B presents the auditor distribution of sample firms by year in absolute figures. Auditors are classified by size into Big 4 audit firms, mid-tier auditors, and small audit firms. Panel C shows summary statistics of number of KAMs issued per auditor by year.

Panel D. Distribution of KAMs by level, category, and nature by year										
Classification of KAMs			2013	2014	2015	2016	2017	2018	Totals	%
ENT-KAM	OTHER-ENT	1. GC	28	46	45	30	13	27	189	2.4%
		2. ICFRAUD	78	82	28	20	22	18	248	3.1%
		3. RDO	11	28	21	19	10	7	96	1.2%
		4. MA	47	96	115	96	79	92	525	6.6%
		5. TAX	106	149	135	111	111	92	704	8.9%
		6. EIPD	38	85	67	65	69	63	387	4.9%
		7. LITMACRO	24	47	41	43	41	61	257	3.3%
Subtotal ENT-KAM			332	533	452	384	345	360	2406	30.4%
			33.7%	32.0%	30.3%	29.0%	27.9%	29.6%	30.4%	
ACC-KAM	PROF	8. MGFEES	0	2	1	0	0	2	5	0.1%
		9. REV	167	275	247	223	203	191	1306	16.5%
		10. EXP	17	38	40	40	38	34	207	2.6%
	LIQU	11. ACCREST	67	112	89	92	87	76	523	6.6%
		12. INV	49	101	97	84	70	68	469	5.9%
		13. CASHREC	26	53	42	33	34	27	215	2.7%
	SOLV	14. INVEST	37	60	48	35	64	93	337	4.3%
		15. INTANG	142	233	230	208	183	166	1162	14.7%
		16. PPE	88	144	141	123	124	110	730	9.2%
		17. LLTD	14	19	19	18	11	18	99	1.3%
		18. PENS	46	94	88	83	76	72	459	5.8%
Subtotal ACC-KAM			653	1131	1042	939	890	857	5512	69.6%
			66.3%	68.0%	69.7%	71.0%	72.1%	70.4%	69.6%	
Total KAMs			985	1664	1494	1323	1235	1217	7918	
			12.4%	21.0%	18.9%	16.7%	15.6%	15.4%	100%	
OTHERENT			304	487	407	354	332	333	2217	28.0%
PROF			184	315	288	263	241	227	1518	19.2%
LIQU			142	266	228	209	191	171	1207	15.2%

(continued on next page)

Table 4 (continued)

Panel D. Distribution of KAMs by level, category, and nature by year								
Classification of KAMs	2013	2014	2015	2016	2017	2018	Totals	%
SOLV	327	550	526	467	458	459	2787	35.2%

Table 4, Panel D reports the distribution of KAMs by level, category, and individual type per year. KAMs are first divided by level (entity- and account-level KAMs). Then, entity-level KAMs are divided by category (KAMs disclosing GC uncertainties and KAMs about other entity risks). Account-level KAMs are also segregated by category (KAMs disclosing issues related to profitability, liquidity, or solvency). Also, both entity- and account-level KAMs are split into individual KAMs according to the nature of the disclosure. See Table 2 for KAM definitions and Appendix B for other variable definitions.

Panel E. Type of opinion and emphasis paragraphs issued by year									
	2013	2014	2015	2016	2017	2018	Totals	%	
<u>Audit opinion</u>									
Unqualified		250	432	411	386	364	352	2195	99.1%
Qualified		1	3	4	4	5	2	19	0.9%
-Qualified for going concern (GCO)		1	2	1	2	3	0	9	47.4%
-Qualified for other reasons but GC		0	1	3	2	2	2	10	52.6%
<u>Other paragraphs:</u>									
Emphasis of matter paragraph about going concern (GCEMP)	12	25	25	17	15	16	110	5.0%	
Reports with GCEMP or GC KAM (and unqualified opinion)	33	58	54	38	21	38	242	10.9%	

Table 4, Panel E shows the type of opinions and other paragraphs issued by year. Opinions are partitioned into clean or unqualified, and qualified. Qualified opinions are also segregated by qualified for going concern issues (GCO) or qualified for other reasons. Then, emphasis of matter paragraphs about going concern uncertainties (GCEMP) are presented. Finally, the number of going concern disclosures in the outcomes of emphasis of matter paragraphs or KAM paragraphs are also reported. Both GCEMP and KAMs about GC do not qualify the audit opinion.

Panel F. Audit fees (averaged) per auditor by year							
	2013	2014	2015	2016	2017	2018	Totals
Big 4 audit fees	2991	2507	2118	2413	2676	2810	2549
Non-Big 4 audit fees	255	607	321	391	483	570	458
Total audit fees	2288	2371	2006	2294	2527	2645	2411
Big 4 non-audit fees	1471	1319	1093	946	903	714	1063
Non-Big 4 non-audit fees	138	159	70	208	367	215	212
Total non-audit fees	1392	1237	1035	902	867	678	1006
Audit fees ratio	67%	67%	70%	74%	79%	82%	73%
Non-audit fees ratio	33%	33%	30%	26%	21%	18%	27%

Table 4, Panel F informs about the mean of audit and non-audit fees classified by auditor size (Big 4 and non-Big 4) by year. Absolute figures are provided in thousands of USD and are winsorized to the 1st and 99th percentile to avoid extreme values. Additionally, audit fees and non-audit fees ratio (over total fees) are reported.

firm-years. When comparing risk-level KAMs, there are generally more account-level (69.6%) than entity-level (30.4%) KAMs reported over all the years. Among the entity-level KAMs, there is a total of 189 (2.4%) going concern related KAMs.¹⁸ Other entity-level KAMs total 2217 (28%), with tax and mergers and acquisitions KAMs (8.9% and 6.6%, respectively) disclosed most frequently. Among the account-level KAMs, solvency related KAMs are the most commonly disclosed (35.2%), followed by profitability related KAMs (19.2%) and liquidity related KAMs (15.2%). With respect to the frequency of individual KAMs, revenue recognition is the most recurrent type (16.5%). This is not surprising given revenue recognition can involve significant management estimates and complex contract arrangements and is commonly an area where earnings management is more likely to occur in profit-driven firms (Jansen et al., 2012). The next three most frequently reported types are intangibles, tangibles, and tax at 14.7%, 9.2%, and 8.9%, respectively.

Table 4 Panel E summarizes the types of audit opinions and emphasis paragraphs found in our sample. 99.1% (2195) of firm-year audit reports are unqualified (i.e., report a clean opinion). Of the 0.9% (19) of qualified opinions, 9 are GC qualified opinions (GCOs). The few GCOs agree with prior studies that posit GC qualifications are infrequent, even for bankrupt firms (Feldmann & Read, 2010). It is interesting to note that 10.9% (242) of the sample receive GC uncertainties in the form of a KAM paragraph or an emphasis of matter paragraph. This evidence suggests auditors may prefer to disclose uncertainties regarding the future viability of the company in an emphasis or KAM paragraph rather than the more extreme GCO.

Lastly, Table 4 Panel F presents the mean of total audit and non-audit fees of firms per year in the sample. Across all firm-years, Big 4 auditors report higher audit and non-audit fees than non-Big 4 auditors, as would be expected.

Table 5 Panel A displays the interconnections between *FD* values and the number of KAMs. Client firms with one KAM in their audit report have a mean *FD* of -10.83 (multiplied by -1), indicating a healthy firm condition per Altman (1983). As the number of KAMs rise, the level of financial distress rises as reflected in higher values of *FD*.

¹⁸ We have only nine observations (five firms) with going concern opinions, which is not surprising given the nature of our firms (LSE Premium listed firms). Interestingly, all these GCOs were accompanied by a high number of KAMs, a KAM about going concern, and/or a GC emphasis of matter paragraph. We also found three of these firms were liquidated a few years after the GCO and the other two had recurrent losses during the years after, with one firm delisted in 2021. Thus, while the sample of GCOs is small, these descriptives suggest no Type I errors (firms receiving a GCO and subsequently remain viable) after GCOs were reported in combination with KAM disclosures.

Table 5Descriptive statistics and univariate analysis of financial distress level (*FD*) and number of KAMs.

Panel A. Descriptive statistics						
No. KAM	Firm-year obs.	Mean FD	Median FD	Standard Deviation	Percentile 95	Percentile 5
1	125	-10.83	-8.17	8.60	-4.25	-33.97
2	425	-8.42	-7.90	4.06	-4.28	-14.83
3	584	-7.54	-6.84	3.71	-3.99	-12.86
4	547	-7.05	-6.33	4.39	-3.08	-12.24
5	320	-6.44	-6.05	2.87	-3.14	-10.97
6	130	-5.84	-5.51	2.60	-1.85	-11.17
7	51	-4.79	-4.94	2.17	-1.35	-8.38
8	24	-5.17	-5.20	1.57	-2.42	-7.20
9	6	-3.74	-4.24	1.85	-0.18	-5.39
10	2	-2.58	-2.58	4.30	0.46	-5.62
Total	2214	-7.41	-6.64	4.34	-3.31	-13.32
Panel B. Univariate analysis						
No. KAM	Firm-year obs.	Mean FD	Standard Deviation	p-value	t-test	
1-2	550	-8.97	5.52	0.000	9.03***	
6-10	213	-5.42	2.46			

Table 5 provides descriptive statistics of financial distress (*FD*) by the number of KAMs. All audit reports present from one KAM up to ten KAMs, and financial data to calculate the financial distress score are winsorized to the 1st and 99th percentile. Panel A includes mean, median, standard deviation, and percentiles 5 and 95 of *FD* by KAMs disclosed (from one to ten KAMs). Panel B reports the *t*-test differences in means of two sub-samples: firms that disclose one or two KAMs, and firms disclosing 6–10 KAMs. Recall, *FD* is multiplied by -1 .

Furthering our analysis, we divide our sample into two sub-samples: firm-years with the fewest number of KAMs in our sample (one or two) and firms reporting the highest number (6–10). **Table 5** Panel B includes a *t*-test of differences in means. The results indicate substantial differences between the two sub-samples, as the mean *FD*s for the two groups are significantly different. Essentially, firms disclosing one or two KAMs tend to be less financially distressed than firms disclosing six or more KAMs. Overall, these univariate results support RQ1.

4.2. Correlations, regression models, and results

Table 6 presents Pearson correlations between *FD* and the independent variables we use to address the RQs. Generally, the correlations are statistically significant but relatively low. The dependent variable is correlated with all of the independent variables used in our models except for liquidity KAMs (*LIQU*), auditor-related characteristics such as the change in auditors during the period considered (*CHANGEAUDIT*) and audit opinion (*AUDITOP*),¹⁹ and the ownership concentration of the client firm (*OWNERSHIP*). The majority of the signs are positive indicators of the relation between financial distress level and KAMs.

The correlation between *FD* and *No.KAM* is 0.259 and significant, consistent with the expectation that *FD* increases as *No.KAM* rises. Additionally, we find positive and significant correlations for *FD* and both *ENTKAM* and *ACCKAM*, and for *FD* and both *PROF* and *SOLV*. There are several significant correlations in **Table 6** between the variables included in the regression models, but no evidence that multicollinearity is a problem.²⁰

Table 7 reports results for the four regression models we use to explore our RQs. Model 1 results show a positive and significant relation between the number of KAMs and financial distress (0.356), indicating the higher the number of KAMs reported for a client firm, the greater the level of financial distress risk (RQ1). With respect to economic significance, the number of KAMs is about 36% higher for firms under financial distress. Given the mean number of KAMs per sample firm is 3.58 (see **Table 4** Panel C for mean number of KAMs by year and audit firm), our estimate suggests that financially distressed client firms receive on average approximately $3.58 \times 1.36 \approx 5$ KAMs (rounded).

To answer RQ2-RQ4, we examine the association between KAM type and firm financial distress in three distinct OLS regression models (see **Table 7**). Model 2 results show that both the number of entity-wide KAMs (0.471) and the number of account-specific KAMs (0.281) have a positive and statistically significant relation with firm *Z*'-Score (RQ2). The higher coefficient on *ENTKAM* over *ACCKAM* suggests overall entity-level KAMs better capture structural risks relating to financial distress when compared to overall account-level KAMs. With regard to economic significance, the number of entity-level KAMs and account-level KAMs is about 47% and 28% higher for firms under financial distress, respectively. The mean number of entity- and account-level KAMs per firm is about 1.09 (2406/2214) and 2.49 (5512/2214), respectively (see **Table 4** Panel D for distribution of KAMs by level). Our estimates suggest that out of the five KAMs typical financially distressed client firms disclose, on average, about $1.09 \times 1.47 \approx 2$ (rounded) are entity-level KAMs and $2.49 \times 1.28 \approx 3$ (rounded) are account-level KAMs.

¹⁹ This is likely because most of the opinions issued in the sample are unqualified (see **Table 4** Panel E).

²⁰ We carried out a diagnostic test for multicollinearity through the estimation of the variance inflation factor (VIF) coefficients for all regressions. The VIF coefficients are always below the threshold of 10 (Kennedy, 2008), suggesting that multicollinearity does not materially affect the analyses.

Table 6
Pearson correlation matrix.

	Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1)	<i>FD</i>	1.000																	
(2)	<i>No.KAM</i>	.259***	1.000																
(3)	<i>ENTKAM</i>	.208***	.660***	1.000															
(4)	<i>ACCKAM</i>	.158***	.735***	-.023	1.000														
(5)	<i>GC</i>	.090***	.144***	.262***	-.044**	1.000													
(6)	<i>OTHERENT</i>	.190***	.643***	.961***	-.011	-.015	1.000												
(7)	<i>PROF</i>	.132***	.346***	.022	.440***	-.083***	.047**	1.000											
(8)	<i>LIQU</i>	.020	.348***	-.055***	.513***	-.029	-.049**	-.071***	1.000										
(9)	<i>SOLV</i>	.094***	.446***	-.004	.597***	.030	-.012	-.143***	-.070***	1.000									
(10)	<i>CHANGEAUDIT</i>	-.010	.010	.001	.012	-.057***	.018	-.011	.037*	-.006	1.000								
(11)	<i>AUDITOP</i>	.022	-.029	-.018	-.023	.059***	-.035*	-.038*	.005	-.005	.013	1.000							
(12)	<i>GCEMP</i>	.082***	.034*	.102***	-.046**	.287***	.023	-.049**	-.031	.001	-.021	.204***	1.000						
(13)	<i>AUDITFEES</i>	.253***	.394***	.376***	.186***	-.088***	.414***	.055**	.072***	.153***	.009	-.047**	-.049**	1.000					
(14)	<i>NONAFRATIO</i>	.072***	.040*	.025	.030	-.006	.027	.035*	.004	.010	-.075***	.024	.024	-.030	1.000				
(15)	<i>SIZE</i>	.259***	.380***	.317***	.220***	-.156***	.373***	.026	.063***	.231***	.022	-.040*	-.103***	.640***	.047**	1.000			
(16)	<i>RESTATEMENT</i>	.042**	.036*	-.007	.054**	-.030	.002	.026	.043**	.018	.007	-.021	-.041*	.019	-.029	-.016	1.000		
(17)	<i>LOSS</i>	.129***	.114***	.149***	.017	.388***	.043**	-.036*	-.025	.075***	-.029	.046**	.218***	-.041*	.035*	-.124***	-.010	1.000	
(18)	<i>OWNERSHIP</i>	-.016	-.005	.043**	-.046**	.033	.035*	.025	-.084***	-.013	-.041*	.000	.070***	-.060***	-.052**	-.061***	-.033	.040*	1.000

Table 6 presents the Pearson correlation matrix of the dependent and independent variables included in the regression models, except for the classification of KAMs per type. All continuous financial data included are winsorized to the 1st and 99th percentile to avoid extreme values. We report p-values with ***, ** and * indicate (two-tailed) statistical significance at the 1%, 5%, and 10% levels, respectively, and show the probability of observing this correlation under the null hypothesis that the correlation is zero. Additionally, we test the correlations of the classification of KAMs per type and there are no multicollinearity issues among them (untabulated). See Table 2 for KAM definitions and Appendix B for other variable definitions.

Table 7
Linear regression models.

Dependent variable	Model 1	Model 2	Model 3	Model 4
	<i>FD</i>	<i>FD</i>	<i>FD</i>	<i>FD</i>
<i>No.KAM</i>	0.356*** (0.06)			
<i>ENTKAM</i>		0.471*** (0.08)		
<i>ACCKAM</i>		0.281*** (0.07)		
<i>GC</i>			1.972*** (0.46)	2.089*** (0.46)
<i>OTHERENT</i>			0.334*** (0.09)	
<i>PROF</i>			0.634*** (0.13)	
<i>LIQU</i>			-0.061 (0.12)	
<i>SOLV</i>			0.285*** (0.11)	
<i>ICFRAUD</i>				0.508** (0.25)
<i>RDO</i>				0.364 (0.32)
<i>MA</i>				0.416*** (0.16)
<i>TAX</i>				-0.044 (0.17)
<i>EIPD</i>				0.510*** (0.16)
<i>LITMACRO</i>				-0.296 (0.23)
<i>MGFEES</i>				1.289 (1.58)
<i>REV</i>				0.606*** (0.15)
<i>EXP</i>				-0.025 (0.25)
<i>ACCREST</i>				0.313** (0.14)
<i>INV</i>				-0.517** (0.21)
<i>CASHREC</i>				-0.531* (0.32)
<i>INVEST</i>				-0.270 (0.29)
<i>INTANG</i>				0.431*** (0.15)
<i>PPE</i>				-0.809*** (0.30)
<i>LLTD</i>				0.819*** (0.28)
<i>PENS</i>				1.175*** (0.15)
Observations	2214	2214	2214	2214
R-squared	0.201	0.201	0.214	0.251
F-Stat	11.94***	12.08***	11.42***	12.29***
Year, Industry, Audit-Firm F.E. and controls	Yes	Yes	Yes	Yes
VIF of the model	1.73	1.72	1.71	1.61

Table 7 shows the results of our regression models examining the relationship between KAMs and firm financial distress. KAM disclosures are included as independent variables in our models as follows: Model 1, number of KAMs only; Model 2, KAMs by risk level; Model 3, entity-level and account-level KAMs by category; and Model 4, KAMs by individual type. In the models, all continuous financial data are winsorized to the 1st and 99th percentiles. Robust standard errors are reported in parentheses. ***, ** and * indicate (two-tailed) statistical significance at the 1%, 5%, and 10% levels, respectively. Significant coefficients are shown in bold. See Table 2 for KAM definitions and Appendix B for other variable definitions.

Model 3 separates *GC* from the rest of the entity-level (*OTHERENT*) KAMs, and groups account-level KAMs by whether their primary impact is on a firm's profitability (*PROF*), liquidity (*LIQU*), or solvency (*SOLV*) (RQ3). Consistent with our predictions, the results show *GC* (1.972), other entity-level KAMs (0.334), profitability (0.634), and solvency (0.285) KAMs each have a significant and positive relation with firm financial distress level. Liquidity related KAMs, however, are insignificant. A possible explanation for this is

that liquidity deficiencies in the short term are more difficult for the auditor to identify. According to Chen and Du (2009, p. 4075), for example, “a company can manipulate its current ratio by up to 200% so that its liquidity deficiency will not show up as a financial distress in the short run.” As a result, *LIQU*s may have less explanatory power than other KAM categories.²¹ *PROFs* are consistent with the financial distress literature examining ratios-based prediction models that show measures of profitability outperform other measures in predicting the risk of business failure (Altman, 1968, 1983; Altman et al., 2017; Lukason & Laitinen, 2019). *SOLVs* are also consistent with prior bankruptcy studies documenting leverage measures are accurate predictors of corporate default (Altman & Sabato, 2007; Muñoz-Izquierdo et al., 2020).

For RQ4, Model 4 examines whether individual types of KAMs differ in their contribution to financial distress assessments. This model has the highest R^2 (25.1%), suggesting that identifying KAMs by nature (i.e., individual types) enhances the explanatory power of KAMs over simply the number of KAMs concerning assessing financial distress. The results show that of the 18 individual KAM types we examine, 12 are significantly related to firm financial distress values. Not surprisingly, the KAM variable with the largest coefficient is *GC* (2.089). This finding is supported by prior research on GCOs, which suggests auditors are more likely to issue GCOs on financially distressed clients than on clients with healthier financial status (Basioudis, Papakonstantinou, & Geiger, 2008; Hudaib & Cooke, 2005). Prior GC studies document GCOs provide incremental information to predict corporate default in listed firms using the traditional pass/fail audit report (Gutierrez et al., 2020). Similar results have been found regarding GC disclosures in emphasis of matter paragraphs of the traditional audit report (Muñoz-Izquierdo et al., 2020) and in the MD&A section (Alexeyeva & Sundgren, 2021).

The results further reveal KAMs related to the following – internal control and fraud (*ICFRAUD*), merger and acquisition accounting (*MA*), exceptional items/presentation and disclosure (*EIPD*), revenues (*REV*), accruals, deferrals, and management estimates (*ACCREST*), inventory (*INV*), cash and receivables (*CASHREC*), intangibles and related impairment issues (*INTANG*), property, plant and equipment and related impairment issues (*PPE*), leases and long-term debt (*LLTD*), and pension and defined benefit plan accounting (*PENS*) – are also linked with higher levels of firm financial distress.

*REV*s are positively related to the level of firm financial distress. This finding is intuitive as prior studies suggest revenue accounts have a higher influence on an auditor’s GC assessment (Bell & Tabor, 1991; Carson et al., 2013) and tend to be most associated with earnings management (Jansen et al., 2012). *ACCREST* is also positively associated with firm financial distress level. This finding is consistent with prior literature that suggests highly distressed firms exhibit earnings management through real and accrual manipulation (Campa & Camacho-Miñano, 2015; Habib et al., 2013; Li et al., 2020).

The coefficient on *INTANG* indicates the more KAMs there are about intangibles, the more likely a client firm is financially distressed. This type of KAM, along with *MA*, reflect harder to value elements, such as the estimation of goodwill impairments. Bepari, Mollik, Nahar, and Islam (2022) suggest firm-specific factors such as firms’ life cycle, size, complexity, and intangible intensity are related to the number of KAMs. In addition, related to *MA*, KAMs about these risky and complex transactions are associated with the likelihood of client firm financial distress since *MA* is a way of exiting distress (Balcaen, Manigart, Buyze, & Ooghe, 2012).

*PENS*s and *LLTD*s also have significant and positive coefficients. This is consistent with Muñoz-Izquierdo et al. (2019) who show auditor disclosures related to liabilities and contingencies in traditional (pre-expanded) audit reports are higher in bankrupt than non-bankrupt firms. These findings also affirm companies that are generally more leveraged exhibit greater financial distress than non-financially distressed firms (Altman et al., 2017). Prior research also shows a link between financial distress and *LLTD* and *PENS* because these KAMs reflect client financial leverage concerns, which are closely related to the financial distress level (e.g., Bell & Tabor, 1991; Carson et al., 2013; Jansen et al., 2012).²²

4.3. Robustness tests

To assess the robustness of our results and our dependent variable, we use three alternative measures of financial distress²³: *Z'*-Score indicator variable or *FDdum*; the Charitou, Neophytou, and Charalambous’s (2004) Score or *FDCha*; and the Charitou’s Score indicator variable or *FDChadum*.²⁴ *FDdum* is an indicator variable coded as 0 if firm financial distress risk is present and 1 in its absence. The *Z'*-Score categorizes firms with *Z'*-Scores of 2.6 or above as being in a safe zone regarding financial distress (i.e., absent financial distress). Using *FDdum*, untabulated results indicate a significant relation between the number of KAMs and financial distress (0.564), corroborating our main model’s finding. The model’s area under the curve (AUC) is 0.910,²⁵ the pseudo R^2 is 34.1%, and the presumption is the number of KAMs represents an efficient variable to explain the financial distress level. The remaining results segregating KAMs are also generally positive and significant.

²¹ We define *LIQU* as including three types of KAMs: *ACCREST*, *CASHREC*, and *INV*. As a robustness check, we drop both *CASHREC* and *INV* from the definition of *LIQU*, since both *CASHREC* and *INV* have negative coefficients while *ACCREST* has a positive coefficient. Defining *LIQU* solely as *ACCREST* and re-estimating Model 3, *LIQU* becomes positive and significant. Hence, the *LIQU* results are sensitive to the definition of *LIQU*.

²² Regarding our controls, we highlight the coefficients on *GCEMP*, *AUDITFEES*, *NONAFRATIO*, *SIZE*, and *LOSSES* are positive and significant in all the estimated models. This is consistent with findings documented in GC studies (Gutierrez et al., 2020) and the financial distress literature (Altman et al., 2010; Balcaen & Ooghe, 2006).

²³ We define the components of the three additional measures in Appendix B.

²⁴ Kruskal-Wallis independent samples tests show the distribution of *No.KAM* differs across the two dependent variable 0/1 indicator variables for *FDdum* and for *FDChadum*.

²⁵ In order to measure the ability to explain financial distress, AUCs are used. The closer the value of AUC to 1, the more precise is its discriminating ability.

Table 8

Two-step system generalized method of moments (GMM), Propensity score matching (PSM), and changes of the main independent variable model.

Dependent variable	Two-step GMM	PSM	PSM	Change specification model
	Model 5	First stage Model 6	Second stage Model 7	Model 8
	<i>FD</i>	<i>Treatment</i>	<i>FD</i>	<i>FD</i>
<i>FD_lag</i>	0.352*** (0.09)			
<i>No.KAM</i>	0.193*** (0.05)		Treatment 0.769*** (0.22)	
<i>No.KAM_CHG</i>				0.128*** (0.04)
<i>CHANGEAUDIT</i>	-0.310** (0.13)		-0.356 (0.34)	-0.239 (0.33)
<i>AUDITOP</i>	0.842 (0.95)		0.879 (0.94)	1.266 (1.22)
<i>GCEMP</i>	1.211** (0.50)		2.538*** (0.41)	2.190*** (0.55)
<i>AUDITFEES</i>	0.348** (0.16)	0.921*** (0.12)	0.689*** (0.18)	0.659*** (0.19)
<i>NONAFRATIO</i>	0.297 (0.30)	0.993*** (0.27)	1.204*** (0.43)	1.062*** (0.40)
<i>SIZE</i>	0.713*** (0.25)	0.478*** (0.09)	1.035*** (0.15)	1.179*** (0.17)
<i>RESTATEMENT</i>	0.286 (0.23)	0.634*** (0.23)	0.374 (0.41)	0.465 (0.34)
<i>LOSSES</i>	1.445*** (0.20)			1.927*** (0.29)
<i>OWNERSHIP</i>	0.017 (0.29)			-0.078 (0.20)
Observations	1774	2214	2214	1963
R-squared			16.75***	19.97***
Wald chi ² (28)	6930.46***			
F-Stat				10.06***
Year, Industry and Audit firm F.E.	Yes	Yes	Yes	Yes
VIF of the model	5.80		1.74	1.74
AR (1) (p-value)	-3.88 (0.000)			
AR (2) (p-value)	1.37 (0.170)			
Hansen test (p-value)	2.58 (0.630)			
Diff-Hansen test (p-value)	1.05 (0.305)			

Table 8 shows the results of additional tests for endogeneity issues. Model 5 presents the results of the system-generalized method of moments (GMM) estimators of *FD* and *No.KAM*. The lag of the dependent variable (*FD_lag*) is our instrumental variable for testing endogeneity. By implementing the two-step system GMM estimators, we better control different sources of endogeneity, namely omitted variables bias, measurement errors, unobserved panel heterogeneity, simultaneity and dynamic endogeneity. Models 6 and 7 report the results for the propensity score matching (PSM) analysis for treatment (equal to 1 for audit reports that contain 5 or more KAMs, and 0 otherwise). The treatment group includes those audit partners whose number of KAMs fall above or equal to the 75th percentile across all firms in year *t*. The control (lower number of KAMs that firms have) group includes those audit partners whose number of KAMs fall below 75th percentile across all firms in year *t*. Model 8 presents the main model but substituting the main independent variable (*No.KAM*) by *No.KAM_CHG* (its changes between years). In the models, all continuous financial data are winsorized to the 1st and 99th percentiles to avoid extreme values. Robust standard errors are reported in parentheses. ***, ** and * indicate (two-tailed) statistical significance at the 1%, 5%, and 10% levels, respectively. Significant coefficients are shown in bold. See Appendix B for other variable definitions.

The next measure of financial distress, *FDCha*, is used specifically in the financial distress literature in the U.K. setting. Consistent with our main results, we find expanded audit reports with a higher number of KAMs indicate a higher probability of financial distress (untabulated). Likewise, our inferences are similar to those based on Table 7 results when segregating KAMs.

In the same way we tested the indicator variable of *Z''*-Score financial distress index (*FDdum*), we run the logistic regression models for Charitou et al.'s indicator variable. Untabulated models show results for total KAMs and KAMs by types are similar to *FDdum*'s results.

In summary, across our main and alternative measures of financial distress, *No.KAM* is always significant, as well as *ENTKAM* and *ACCKAM*. *GC*, *OTHERENT*, *PROF*, and *SOLV* are always significant except for *OTHERENT* when *FDdum* is tested. Regarding individual KAMs, *GC*, *REV*, *ACCREST*, *LLTD*, and *PENS* are significant across all measures.

4.4. Additional tests

Having found generally consistent and significant evidence in support of our RQs, concerns are present regarding the usefulness of our evidence for assessing bankruptcy and for financial distress predictive purposes. To address these concerns, we separately rerun

our regression models using (1) firm bankruptcy status as our dependent variable and (2) lag variables to assess the predictive utility of KAMs.

First, extracting bankruptcy information from the ORBIS database, we define firms as bankrupt when they have started their legal insolvency proceedings or are in liquidation, and non-bankrupt otherwise. This definition has been commonly used in bankruptcy literature (Gutierrez et al., 2020). As the nature of our dataset (Premium-listed companies) leaves us with a relatively small sample of bankruptcy observations (65 out of 2214), we employ a matched sample approach to determine whether a significant difference exists in the number of KAMs given to bankrupt versus non-bankrupt firms. We determine a subsample match of 65 non-bankrupt observations based on year, industry and firm size. According to the Kolmogorov–Smirnov test, our 130 observations do not follow a normal distribution for total KAMs, so we apply a Mann–Whitney U two-sample test to test the null hypothesis of no difference between our bankrupt and non-bankrupt groups with respect to number of KAMs. Results show statistically significant differences between the subsamples in number of KAMs disclosed (−3.362). Additionally, using the bankruptcy indicator as the dependent variable, we re-estimate our main models using logistic regressions and find KAM disclosures are significantly and positively associated with firm bankruptcy status (untabulated). This outcome reinforces our main findings and indicates KAMs are not only useful in assessing firms' financial distress level, but also their bankruptcy status.

Second, we examine the predictive power as a way to highlight further the utility of KAMs in financial distress risk assessments. By using lagged values for our independent variables, we show whether KAMs disclosed in year t help to predict financial distress level in the two subsequent years ($t+1$ and $t+2$). In these models, we use FD in the subsequent periods as our dependent variable. Untabulated results are generally robust with our previously reported findings. Specifically, the coefficient on $No.KAM$ for both subsequent periods (0.380 and 0.370), for $ENTKAM$ (0.520 and 0.520) and for $ACCKAM$ (0.287 and 0.226), are positive and significant. Similarly, $PROF$ and $SOLV$ and 12 individual KAMs have positive and significant coefficients. These results enable us to contribute insights into the predictive power of auditor-reported KAMs, a finding that accentuates the utility of the expanded audit report.

4.5. Endogeneity tests

We employ three techniques to test whether the potential our results could be driven primarily by a causal relation between KAMs and poor firm fundamentals. First, we apply a two-step system GMM estimator since we wish to control for unobserved panel data heterogeneity, simultaneity and dynamic endogeneity. This estimator can also address omitted variable bias and other measurement errors including correcting for heteroskedasticity and autocorrelation (Roodman, 2009; Singh, Sultana, Islam, & Singh, 2022). Second, we use PSM to alleviate the dependency on the specification of the relation between FD and KAMs. Third, we employ change specification models that difference out any unmeasured and unchanging causes of KAMs related to client firm performance.

4.5.1. Two-step system GMM estimator

Prior studies using panel data have applied a GMM estimator to deal with endogeneity problems (Arellano & Bond, 1991; Coakley, Fuertes, & Smith, 2006; Ullah, Akhtar, & Zaefarian, 2018), such as unobserved panel heterogeneity, simultaneity and dynamic endogeneity. We employ this technique to address the risks that (1) there might be measurement errors or omitted unobservable variables in our controls that affect FD level, and (2) client firms' poor financial condition may drive the KAM disclosures, causing simultaneous causality. We apply a two-step system GMM estimator approach as Roodman (2009) confirms it corrects heteroscedasticity and autocorrelation more accurately than the one-step GMM estimator.

Table 8 presents the evidence of the GMM estimator used (Model 5). The utilization of this estimator has two main issues: the serial autocorrelation of errors and the proliferation of instruments. First, for testing the no correlation in the errors term, we use the Arellano and Bond test. To confirm the absence of serial autocorrelation in the errors, AR(1) should be significant at the 5% level and the probability of AR(2) should not be significant at 5% (Cameron & Trivedi, 2009). Our results show the error terms are not serially correlated as we find an AR(1) p-value of 0.000 and an AR(2) p-value of 0.170. Second, to check whether the number of instruments is adequate and does not produce over identification, we use the Hansen test and the Diff-Hansen test, recommended in two-step estimations (Hansen, 1982). If the probability of these tests obtained is equal or higher than 0.05, the used instruments in the estimation are valid, and therefore overidentification is not an issue. We find a p-value of 0.630 for the Hansen test and a p-value of 0.305 in the Diff-Hansen test. As we cannot reject the null hypotheses, we conclude our additional instruments are valid. To assess the dynamic nature of KAM disclosures and financial distress models, we choose as an instrumental variable the lagged value of our dependent variable, that is, the lag of financial distress (FD_{lag}) in the GMM estimator. Our evidence confirms the dynamic nature of the model as the estimated coefficient of FD_{lag} is positive and significant. Finally, we regress the level of financial distress (FD) on the total number of KAMs disclosed and find the coefficient on $No.KAM$ is positive and significant, indicating the two-step GMM estimator validates the results of our main analysis.

4.5.2. Propensity score matching

Next, we undertake PSM to relieve the dependency on the specification of the relation between FD and $No.KAM$. PSM requires the creation of treatment and control groups from our independent variable, $No.KAM$. Thus, while controlling for auditor and client firm characteristics that may impact KAMs, we create an indicator variable ($TREATMENT$) equal to 1 for audit reports containing 5 or more KAMs, and 0 otherwise. We select this cutoff point as this number of KAMs are disproportionate in our sample allowing us to better identify the differences in KAM disclosures. We provide the results of the PSM in Table 8 (Models 6 and 7). The first-stage regression model (Model 6) indicates the control variables are significantly related to $TREATMENT$. That is, the disclosure of KAMs is associated with audit firm characteristics such as audit and non-audit fees and to client firm characteristics such as firm size and accounting

restatements. In the second-stage regression model (Model 7) we apply the propensity score to match each audit report with high versus low numbers of KAMs. Our results indicate the association between KAMs and financial distress (0.769) is still positive and significant, corroborating our main results that suggest KAM disclosures are an accurate indicator and can assess financial distress.

4.5.3. Change specification models

Lastly, we examine change specification models as an additional way of showing KAMs are not driven simply by the firms' poor fundamentals. That is, due to the calculations of the dependent variable of our main models (Z'' -Score, or a score comprising liquidity, profitability, and leverage ratios), it is possible KAM disclosures depend primarily on firms' financial condition. To address this endogeneity concern, we employ change specification models; that is, models in which we define KAMs as the change between year t and the preceding year $t-1$, denoted $No.KAM_CHG$. We re-estimate the regressions of the main models and report the results in [Table 8](#) (Model 8). The evidence from the change specification analysis is highly similar to the results reported in [Table 7](#) and suggests KAMs assess the extent of client firm financial distress.

5. Conclusions

This study contributes to the auditing literature in that we investigate the usefulness of key (critical) audit matter disclosures in expanded audit reports to assess firm financial distress. The topic is relevant and timely given the enactment of expanded audit report regulation in major jurisdictions across the globe. Specifically, we shed light on whether enhanced transparency into the audit process from auditor disclosures of key audit matters (KAMs) is useful in assessing the risk of financial distress present at client firms. In doing so, we respond to recent calls for more investigation of the utility of these new auditor disclosures ([Minutti-Meza, 2021](#)).

We investigate the relation between financial distress and KAMs by identifying Premium-listed firms on the London Stock Exchange starting in 2013, hand-collecting these disclosures and obtaining financial information for these firms through 2018 (resulting in 2214 firm-year observations). Results from our analyses show auditor-reported KAMs are useful in gauging and predicting firm financial distress risk. We find the greater the number of KAMs disclosed for a firm-year, the greater the contemporaneous and predictive level of financial distress of the client firm. Results also show that type of KAM is useful in the assessment of financial distress. We find a greater occurrence of entity-level KAMs in general, and of account-level KAMs related to a firm's profitability and solvency, are associated with higher levels of financial distress. Our analysis indicates the usefulness of KAMs in assessing financial distress is highest when KAMs are considered by individual type. Results show that GC, internal control and fraud, mergers and acquisition accounting, exceptional items, revenue recognition, accruals and management estimates, inventories, cash and receivables, tangible and intangible assets, long-term debt and pensions are consistently important individual KAMs in assessing financial distress. Our results are robust to a number of checks that employ alternative measures of financial distress, endogeneity tests, and predictive analyses.

Findings from this study have important implications for regulators, financial statement users, and auditors alike. By showing KAMs are useful in the assessment (contemporaneous and predictive) of firm financial distress, our results aid regulators in the cost-benefit assessment of new expanded audit reporting regulation, and specifically, of the requirement auditors disclose key (critical) audit matters in their audit opinions. This study should also be useful to financial statement users since our results reveal a new mechanism for using public independent auditor data to assess and monitor a firm's financial health. Lastly, this study should be useful to auditors in (1) their assessments of engagement risk for prospective clients and (2) as they consider audit report disclosure alternatives for signaling firm going concern risk to financial statement users.

Data availability

Data will be made available on request.

Appendix A

Extract from the expanded audit report issued to John Wood Group PLC by KPMG, LLP in the annual accounts of 2018. The key audit matters (KAMs) addressed in this expanded audit report were the following.

1. The impact of uncertainties due to the UK exiting the European Union on our audit
2. Revenue recognition on fixed price contracts
3. Goodwill impairment
4. Litigation, investigations and contingent liabilities
5. Uncertain tax positions
6. U.S. asbestos related claims provision
7. Gross defined benefit pension liability
8. Amec Foster Wheeler Plc acquisition measurement period adjustments
9. Parent Company risk: Recoverability of parent company's investment in subsidiaries

On our 18-item classification of KAMs, the previous KAMs are included in the following categories (using a one-to-one match from above).

1. Litigation, macroeconomic, and system implementation
2. Revenue recognition
3. Intangibles and related impairment issues (included research and development)
4. Litigation, macroeconomic and system implementation
5. Tax
6. Accruals, deferrals and management estimates
7. Pension and defined benefit plan accounting
8. Mergers and acquisitions (M&A)
9. Investments and related impairment issues

Appendix B

Variable definitions.

Dependent variables.

Main analysis: (<i>FD</i> is multiplied by -1)	
<i>FD</i>	Continuous dependent variable used for main results: Financial distress (<i>FD</i>) = = Altman's <i>Z''</i> - Score for non-manufacturers and listed companies = $Z'' = 3.25 + 6.56 \times Z1 + 3.26 \times Z2 + 6.72 \times Z3 + 1.05 \times Z4$
Z1	$Z1 = (CA-CL)/TA$ First ratio of Altman's <i>Z''</i> -Score: $Z1 = (\text{Current assets} - \text{Current liabilities})/\text{Total assets}$
Z2	$Z2 = RE/TA$ Second ratio of Altman's <i>Z''</i> -Score: $Z2 = \text{Retained earnings}/\text{Total assets}$
Z3	$Z3 = EBIT/TA$ Third ratio of Altman's <i>Z''</i> -Score: $Z3 = \text{Earnings before interest and taxes}/\text{Total assets}$
Z4	$Z4 = BV \text{ of equity}/TL$ Fourth ratio of Altman's <i>Z''</i> -Score: $Z4 = \text{Book value of equity}/\text{Total liabilities}$
Robustness tests and endogeneity tests:	
<i>FDdum</i>	Financial distress indicator (<i>FDdum</i>) = Altman's <i>Z''</i> -Score categorized: $Z'' > 2.6$ (Safe zone) = value of 1; $Z'' < 2.6$ (grey and distressed zone) = value of 0
<i>FDCha</i>	Financial distress Charitou (<i>FDCha</i>) = = Charitou, Neophytou, and Charalambous (2004) Score for U.K. firms = $= 1/1 + \text{EXP}\{-7.1786 + [12.3826 \times (TL/TA)] - [20.9691 \times (NI/TL)] - [3.0174 \times (OPCF/TL)]\}$
<i>FDChadum</i>	Financial distress Charitou indicator (<i>FDChadum</i>) = Charitou's index categorized: Score > 0.2 (Non-distressed) = value of 1 Score < 0.2 (Distressed) = value of 0
<i>FD_lag</i>	Continuous dependent variable used for main results (<i>FD</i>) for the period immediately before (<i>t-1</i>)

Independent variables and sample descriptives.

SIZE	Logarithm of total assets
TA	Total assets in thousands of dollars
NI	Profit or loss for the period (net income) in thousands of dollars
CA	Current assets in thousands of dollars
CL	Current liabilities in thousands of dollars
EBIT	Earnings before interest and taxes in thousands of dollars
SE	Shareholders' funds in thousands of dollars
TL	Total liabilities in thousands of dollars
OPCF	Net cash from operating activities in thousands of dollars
No.KAM	Number of KAMs disclosed by an auditor
No.KAM_CHG	Change of reported KAMs between one period (<i>t</i>) and the period immediately before (<i>t-1</i>)
ENTKAM	Entity level KAMs
OTHERENT	Entity level KAMs other than going concern KAMs (<i>GC</i>)
ACCKAM	Accounting level KAMs
PROF	Profitability KAMs (includes <i>MGFEES</i> , <i>REV</i> and <i>EXP</i>)
LIQU	Liquidity KAMs (includes <i>ACCREST</i> , <i>INV</i> and <i>CASHREC</i>)
SOLV	Solvency KAMs (includes <i>INVEST</i> , <i>INTANG</i> , <i>PPE</i> , <i>LLTD</i> and <i>PENS</i>)
CHANGEAUDIT	Change in audit firm from the prior year (1 if audit firm has changed, 0 otherwise)
AUDITOP	Audit opinion indicator variable (1 if qualified, 0 if unqualified)

(continued on next page)

(continued)

SIZE	Logarithm of total assets
GCEMP	Going concern emphasis of matter paragraph indicator variable (1 if this paragraph is disclosed, 0 otherwise)
AUDITFEES	Logarithm of audit fees
NONAFRATIO	Non-audit fees ratio (Non-audit fees/Total fees)
RESTATEMENT	Restatement indicator variable (1 if financial statements are restated, 0 otherwise)
LOSS	Loss for the period indicator variable (1 if a loss is reported in the income statement, 0 otherwise)
OWNERSHIP	Ownership concentration indicator variable (1 if high concentration, 0 if low concentration)

See Table 2 for explanation of KAMs included under *ENTKAM*, *OTHERENT*, *ACCKAM*, *PROF*, *SOLV*, and *LIQU* variables.

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