




Two-tier board characteristics and expanded audit reporting: Evidence from China

Emad Noureldeen^{1,5} · Mohamed Elsayed^{2,5}  · Ahmed A. Elamer^{3,6,7} · Jianming Ye⁴

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Abstract

This paper investigates the relationship between the characteristics of the two-tier board structure (board of directors and supervisory board) and the disclosure of key audit matters (KAMs) in the expanded audit report. Using a sample of 10,857 firm-year observations of Chinese listed firms spanning the 2017–2020 period, we offer two main results. First, with regard to the board of directors, we find that the auditor discloses a greater number and lengthier content of KAMs when there is a CEO duality and the board meetings are more frequent. Second, conversely, we find that the size and independence of the supervisory board are related to a lower number and length of KAMs disclosure. When we distinguish between account-level KAMs and entity-level KAMs, our further analysis shows that our results are principally associated with account-level KAMs rather than entity-level KAMs. Specifically, we find that CEO duality and the frequency of board of directors meetings are positively related to account-level KAMs. We also find that the size and independence of the supervisory board are negatively related to account-level KAMs. Our further analysis also shows evidence that these two-tier board structure characteristics are associated with the tone of KAMs disclosure in a consistent fashion. Our findings are robust and address endogeneity problems. Overall, our results suggest that the characteristics of the two-tier board structure drive KAMs disclosure, which should be of interest to regulatory bodies, policymakers, auditors, multinational firms, and users of financial reports.

Keywords Expanded audit report · Two-tier board · Corporate governance · Key audit matters · Board of directors · Supervisory board

JEL Classification M41 · M42 · M48

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Extended author information available on the last page of the article

1 Introduction

Until a few years ago, the content of the audit report had been kept without change since the 1940s (PCAOB, 2013). Because of the standardized language and minimal usefulness related only to a binary (pass/fail) auditor's opinion, the audit report's content was criticized (Bédard et al. 2014; Velte 2020), especially after the recent high-profile corporate failures. Therefore, standard setters worldwide mandated the independent auditors of listed companies to provide an expanded audit report to disclose the KAMs (i.e., the key matters that are most significant in the audit of financial statements) to the public.¹ This switch from the boilerplate pass/fail model to the expanded audit report is thought to enhance the information content of the auditor's report (e.g., ACCA, 2013; FRC, 2012; FRC, 2013; Elsayed et al. 2023).

So far, previous studies on the expanded audit report have paid attention to the consequences of KAMs disclosure by investigating the auditor's liability (e.g., Brasel et al. 2016; Gimbar et al. 2016), market reaction (e.g. Gutierrez et al. 2018; Lennox et al. 2023), and audit quality and audit fees (e.g., Reid et al. 2019; Zeng et al. 2020; Zhang and Shailer 2021). Another strand of literature concerns the determinants of KAMs disclosure by investigating the company, audit, and auditor characteristics (e.g., Abdelfattah et al. 2021; Pinto and Morais 2019; Sierra-García et al. 2019). However, ISA 701 highlights the need for the interaction between the auditor and those charged with governance to properly disclose KAMs (Fera et al. 2021). Therefore, KAMs disclosed by the auditor represent the matters identified and selected *after* communication with those charged with governance (Zhai et al. 2021), thereby whether there is a relationship between the characteristics of those charged with governance and KAMs disclosure is an empirical research question.

Prior research (e.g., Fakhfakh and Jarboui 2022; Feng et al. 2020) indicates that the characteristics of corporate governance can be linked to auditors' assessment of risk and their reporting behavior. In general, there are two main board structures in corporate governance: the one-tier (unitary) board structure and the two-tier (dual) board structure (Firth et al. 2007; Cho and Rui 2009). Under the one-tier board structure (as in the US and the UK), there is only a board of directors, normally comprising executive and independent non-executive directors, responsible for managerial and monitoring functions (Chen and Al-Najjar 2012). In the two-tier board structure, in addition to the board of directors, there is also a separate supervisory board comprised of a group of supervisors to oversee the firm, managers and board of directors. Typically, directors and managers cannot concurrently act as supervisors (Firth et al. 2007; Ran et al. 2015). Importantly, previous studies (e.g., Lin et al. 2020; Zhang and Shailer 2022) indicate that *those charged with governance* include not only the audit committee, as investigated by prior research, but also the board of directors and supervisory board, investigated in this paper.

Furthermore, in line with the ISA 701 requirement of the communication between those charged with governance and auditor, only a few studies examine the relationship between audit committee characteristics and KAMs disclosure (e.g., Velte 2018, 2020; Zhang and Shailer 2022). Still, to our knowledge, no previous study has examined the relationship between the characteristics of the two-tier board structure and KAMs disclosure. To this end, we conduct our study in China, where the unique two-tier board structure is

¹ While the International Auditing and Assurance Standards Board (IAASB) refers to these matters as key audit matters (KAMs), the Financial Reporting Council (FRC) in the UK refers to them as risks of material misstatement (RMMs), and the Public Company Accounting Oversight Board (PCAOB) in the US refers to them as critical audit matters (CAMs). Throughout the paper, we use the term KAMs for ease of exposition.

implemented, which provides distinctive governance mechanisms as compared to their counterparts in the US, UK, and broadly Anglo-Saxon countries (Chen et al. 2006; Firth et al. 2006, 2007; Cho and Rui 2009). Considering that KAMs disclosed by the auditor are likely to be influenced by governance attributes, particularly board structure (e.g., Fera et al. 2021), and in response to calls of prior research (e.g., Abdelfattah et al. 2021; Velte 2018) for investigation of the determinants of KAMs disclosure in the two-tier structure, this paper contributes to addressing this gap in the literature by examining the association between the characteristics of the two-tier board structure and KAMs disclosure in China. Conducting our study in China further seems reasonable to see the novelty of contribution provided by our paper as expanding the UK- and US-based literature in the area of KAMs disclosure and corporate governance.

According to *China's Company Law* of 1993, China has adopted the two-tier board structure. Since then, firms are required to form a supervisory board that comprises at least three members of shareholders' representatives and elected employees' representatives (Firth et al. 2007; Cho and Rui 2009).² The Law indicates that among the primary duties of the supervisory board are (1) examining the firm's financial affairs, (2) supervising directors and senior managers, and submitting proposals regarding the dismissal of (or filing suit against) any of them who violate laws, administrative regulation, bylaws, or any resolution of the meeting of shareholders, (3) requesting directors to rectify their misconduct if it harms the company's interests, and (4) proposing, calling, and presiding over meetings of shareholders whenever they deem this necessary and putting forward proposals at shareholders' meetings (Lin and Liu 2009a).

Prior research (e.g., Cohen et al. 2002; Firth et al. 2007; Feng et al. 2020) suggests that the strength of corporate governance (through providing strong monitoring, controlling operations effectively, and thus minimizing client risk) impacts external auditing. As highlighted by ISA 701, the auditor is expected to communicate with those who are responsible for corporate governance (e.g., the board of directors and supervisory board) while defining the scope and the number of KAMs (Lin et al. 2020). Literature provides compelling reasons to expect that such communication is likely to affect the audit outcomes, like KAMs disclosure. For example, audit outcomes may be impaired because of unscrupulous managers aiming at expanding their opportunities by leading auditor's failure to detect KAMs or to deal appropriately with the detected KAMs (e.g., Lu 2006). Additionally, Zeng et al. (2020) suggest several reasons in relation to the communication between those charged with governance and the auditor that may drive the auditor to disclose more KAMs, e.g., high audit risk, managerial opportunism, professional skepticism about misreporting, liability exposure, and to provide additional information for their reasonable assurance and improvement of audit quality.

More specifically, regarding two-tier board structure attributes, first, the board of directors is more involved in significant management judgments and accounting estimates, including those with a high degree of uncertainty, that constitute KAMs, since it is responsible for the financial reporting process. Second, similar to the audit committee, the supervisory board also oversees the financial reporting to ensure the firm's disclosure is reliable (Komal et al. 2022; Lee 2019), thereby impacting audit outcomes, including KAMs. Third, previous studies (e.g., Firth et al. 2012) indicate that we would expect that auditors are less constrained by market forces and have less self-discipline to maintain audit quality in China. Besides, communications between those responsible for governance and auditors in

² Firms with a low number of shareholders can however appoint one or two supervisors rather than establishing a supervisory board (Tian 2009).

China are intense (Jiang and Kim 2015). Therefore, the disclosure of KAMs is likely to be influenced by directors and/or supervisors through their communications with the auditors (Lin et al. 2020).

China provides a unique context to examine our research question for several reasons. First, we are able to have the historical data to archivally investigate our research question since the expanded audit report and two-tier board structure are implemented in China. Second, prior research (Firth et al. 2007, 2012; Jiang and Kim 2020; Wang et al. 2008) indicates that there are different institutional factors between China and the US or the UK that motivate studies in the Chinese context. These institutional factors, for example, include prevailing economic conditions, the way that firms are governed, institutional and regulatory frameworks, and the legal environment (e.g., investor protection, capital market pressures, legal enforcement). Third, as an emerging market, China suffers from a weak institutional environment, ineffective external governance mechanisms and shareholders have limited legal protection compared to those in Western economies (Chen et al. 2006; Firth et al. 2006; Jiang and Kim 2015). Therefore, internal governance mechanisms are more likely to play a pivotal role in such a setting (Firth et al. 2007; Chang et al. 2020). Fourth, auditors face lower risks of litigation than their counterparts in the US and UK, which may affect their reporting behavior (Lisic et al. 2015). Fifth, unlike developed economies, the ownership structure of Chinese firms is highly concentrated with strong state control (Firth et al. 2016). Finally, auditors in China are less prone to litigation risk and regulatory sanctions compared to those in the US, making it more likely for them to be more resilient regarding the disclosure of KAMs (Elsayed et al. 2022; Lennox et al. 2023). Collectively, the Chinese setting enables us to offer important insights currently missing from the debate on corporate governance and KAMs disclosure.

Using a sample of 10,857 firm-year observations for Chinese A-share firms listed on the Shanghai and Shenzhen Stock Exchanges over the period 2017–2020, we find that auditors disclose a larger number of KAMs and provide lengthier content disclosure for boards of directors characterized by the CEO dual role and holding more meetings. However, auditors disclose fewer KAMs and less lengthy content of KAMs for supervisory boards characterized by larger size and higher independence. In our further analysis, when we separate the KAMs into account-level KAMs and entity-level KAMs, we find that CEO duality and the board of directors' meeting frequency are positively associated with account-level KAMs. In terms of the supervisory board, our results show that the supervisory board size and independence are negatively related to account-level KAMs. Our further analysis also shows evidence that these two-tier board structure characteristics are associated with the tone of KAMs disclosure in a consistent fashion. Our robustness tests, addressing endogeneity concerns, yield results that are consistent with those of our main analysis, suggesting that the two-tier board structure characteristics are related to KAMs disclosure.

Our study makes several novel contributions to the literature on the expanded audit report, particularly the disclosure of KAMs. To the best of our knowledge, this is the first study concerning the relationship between the two-tier board structure characteristics (particularly, the board of directors and supervisory board) and KAMs disclosure. This study extends the limited studies on the *ex ante* determinants of KAMs disclosure by providing evidence on the association between the two-tier board structure attributes and KAMs disclosure. Our paper extends the study of Sierra-García et al. (2019) on the relationship between the characteristics of the client and auditor and the type of KAMs (i.e., account-level KAMs and entity-level KAMs). Practically, our findings provide Chinese decision-makers with useful evidence-based insights to develop the two-tier board structure and thereby corporate governance mechanisms in China. Our findings have important

implications for policymakers, auditors, multinational firms, and users of financial reports, particularly shareholders. Specifically, the Chinese stock market is capturing the attention of international shareholders owing to the rapid growth of China's economy gaining global recognition. The international institutional shareholders who enter the Chinese stock market are substantially interested in understanding the effective role played by corporate governance mechanisms (such as the two-tier board structure) and auditor reporting (such as KAMs) since this is likely to impact the market information asymmetry; affecting the existing and prospective shareholders' ability in analyzing and pricing risks in capital valuation and allocation, thereby contributing to their ability to make investment decisions (Elsayed et al. 2023). Given that other transitional and emerging markets exhibit some similar characteristics to China (e.g., poor market and legal infrastructure), our findings can be generalized to these countries. Our research is large-scale and, therefore, reliably advances the extant evidence on KAMs disclosure.³

The remainder of this paper is organized as follows. Section 2 presents the institutional background, theoretical foundation, literature review, and hypothesis development. Section 3 includes the research design, including sample selection procedures, empirical models, and variables measurement. Section 4 discusses the results of our primary analysis, and Sect. 5 contains our additional analysis and robustness checks. Section 6 concludes with a summary of our research findings, limitations, and recommendations for future research.

2 Institutional background, theoretical foundation, literature review, and hypothesis development

2.1 KAMs disclosure in China

As discussed earlier, the two-tier board structure features the Chinese context. The choice of adopting the two-tier board structure *vis-à-vis* the one-tier board structure can be attributable to differences in the capital market, economy, and legal system in the countries (Firth et al. 2007; Tian 2009). For example, the two-tier board structure is adopted in civil/code law countries such as China, as opposed to the one-tier board structure that prevails in common law countries (Belot et al. 2014; Millet-Reyes and Zhao, 2010). In this setting, the two-tier board structure is adopted as a stricter internal governance mechanism to address various conflicts of interest among different stakeholders of principals and agents (Guo et al. 2013; Shan 2013). Specifically, in the absence of adequate legal protection and the lack of an external market for corporate control, shareholders in China rely on internal governance mechanisms of the two-tier board structure and the independent auditor to monitor firm activities and risks (Firth et al. 2006, 2007). Therefore, the two-tier board structure in China provides a unique governance setting to examine whether there is a relationship between the characteristics of those charged with governance and KAMs disclosure as highlighted by ISA 701 (Li 2021; Wei and Geng 2008).

In December 2016, in line with ISA 701, China's Ministry of Finance released the new Chinese Standard on Auditing (CSA) 1504, "*Communicating Key Audit Matters in the Independent Auditor's Report*", introducing the expanded audit reports in China (Zeng et al. 2020). CSA 1504 was implemented in two phases for different types of firms. The

³ Our sample of firms is larger than those in previous studies, as it contains 3,397 unique firms against 312 in Abdelfattah et al. (2020), 135 in Pinto et al. (2020), 93 in Pinto and Morais (2019), and 70 in Sierra-García et al. (2019).

first phase included audits of financial statements of firms with dual-listing in Mainland China's (Shanghai and Shenzhen) and Hong Kong's stock exchanges (A+H-shares) for fiscal periods ending on or after December 15, 2016. In the second phase, firms listed only on the Mainland China stock exchange (A-shares) were required to comply with CSA 1504 for fiscal years ending on or after December 30, 2017 (Chen et al. 2020; Zhai et al. 2021).

According to CSA 1504, KAMs are defined as those issues and areas that were most significant in the audit based upon the auditor's professional judgment, and those are selected among other matters communicated to those responsible for governance. Typically, KAMs relate to significant risks, unusual transactions, events, and/or management estimates that require high auditor attention. Thus, KAMs in the expanded audit report basically relate to risk information content about financial reporting reliability (Florou et al. 2022). In defining KAMs, the auditor should consider the areas of high risk of material misstatement or significant risks, significant transactions and events that occurred during the period, and employ judgment in the areas of the financial statements that involved significant management judgment, including accounting estimations that were identified as having high uncertainty in estimation (Minutti-Meza 2021; Zeng et al. 2020).

In terms of the presentation and content of KAMs, CSA 1504 indicates that KAMs should be reported in a separate section within the audit report entitled "key audit matters". Each KAM must include an appropriate subheading, a description of it and why this matter is deemed to be a KAM, a description of the auditor's procedures of how this matter was addressed in the audit, and a reference to the related disclosure(s) in the financial statements (Chen et al. 2020; Pinto et al. 2020). This context, therefore, makes available data required to measure KAMs disclosure for our examinations. Additionally, as discussed earlier, China offers a setting to capture those charged with governance and communication with the auditor regarding defining and disclosing KAMs in line with CSA 1504 and ISA 701. These unique institutional and disclosure features provide us with a unique setting in which we can examine our research question on the relationship between the characteristics of the two-tier board structure (i.e., the board of directors and the supervisory board) and KAMs disclosure.

2.2 Theoretical foundation

The behavioral theory of corporate boards and governance posits that corporate boards are likely to be concerned with providing practical solutions to problems of coordination, communication, planning, control, and information processing (Van Ees et al. 2009). In this, there are four main behavioral assumptions that underline the behavioral theory of corporate boards and governance comprising: bounded rationality; satisficing behavior; routinization; and political bargaining (Elghuweel et al. 2017). Bounded rationality suggests that corporate boards' decision-making processes are likely to follow simplified decision-making rules. That is, corporate boards can be constrained by their cognitive and decision-making limitations. Consequently, poor and inefficient decisions by corporate boards can be attributed to not only managerial opportunism and self-serving behavior, but also fundamentally to cognitive biases and limitations. Top managers (e.g., corporate boards) could make decisions (e.g., financial estimates) based on a selection of information rather than the complete information available due to cognitive and information processing limitations. Such decisions, or their consequences, resulting from possible cognitive biases and incompetence can be defined as KAMs by the auditor and are likely to be discussed with those charged with governance.

Satisficing behavior suggests that corporate boards tend to choose practical options that are sufficient to meet current challenges instead of looking for the hypothetically optimal solution. That is, the divergence from the optimal solution is not necessarily due to opportunistic behavior only but, rather, since the organizational decisions are not necessarily optimal solutions. For example, corporate boards could take some decisions under the challenge to meet or beat the industry earnings. Such deliberate decisions to manage earnings are not necessarily driven by opportunistic behavior but to satisfy current needs or challenges. Either way, such behavior, or its consequences, can be defined as KAMs by the auditor and are likely to be discussed with those charged with governance.

In practice, routinization of decision-making is widely accepted and expected within many corporations. Similar to decision-making under bounded rationality and satisficing behavior, decisions made based on routines can also be biased and thereby result in inefficiencies or risks, especially within dynamic environments. Again, under the routinization assumption, divergence from optimal decisions cannot be attributed only to managerial opportunism but possibly also to inherent limitations associated with corporate boards' routines. Therefore, such behavior, or its consequences, can be defined as KAMs by the auditor and are likely to be discussed with those charged with governance.

Finally, the assumption of political bargaining of behavioral theory suggests that the objectives of corporate boards are likely to be achieved by different stakeholders constituting coalitions and sub-coalitions through negotiations and political bargaining. Thus, under this assumption, decisions pursued by the dominant coalition, rather than optimal decisions, are more likely to be made. As in the above assumptions, divergence from optimal decisions cannot be attributed only to managerial opportunism. However, the consequences of such behavior can be defined as KAMs by the auditor and are likely to be discussed with those charged with governance.

Overall, the theoretical framework based on a combination of the behavioral theory of corporate boards and governance, as well as the opportunistic and self-serving behavior postulated by agency theory provides premises to explain the relationship between the two-tier board structure attributes and KAMs disclosure.⁴ Such a framework is suitable and consistent with the call by Roberts et al. (2005, p. 6) for “greater theoretical pluralism and more detailed attention to board processes and dynamics.” Such a framework is adopted by some previous research (e.g., Elsayed and Elshandidy 2020).

Furthermore, while disclosure of KAM is the responsibility of the auditor after communicating with those charged with governance, conflicts and different incentives among managers, directors, investors, and auditors can exist during the process of determining KAMs. For example, managers can make accounting choices and decisions that align with their incentives (e.g., maximize their pay) through subjective decisions, complex accounts or estimates, which constitute KAMs (Rapley et al. 2021). Investors seek to receive reliable disclosures, but higher KAMs may raise questions about managerial incentives and financial reporting credibility, which ultimately affects investment decisions (Carver and Trinkle 2017; Rapley et al. 2021). On the other hand, board members aim to maximize their pay-offs by enhancing their reputation. As for auditors, while their motivations for disclosing KAMs include preserving their independence, minimizing litigation risk, and maintaining their reputation, preserving their clients by lowering KAMs is an incentive that cannot be overlooked (Chen et al. 2023). Collectively, the process of determining and disclosing

⁴ Agency theory underpins rational economics, optimizing and opportunistic behavior arising from information asymmetry between corporate agents and principals (Fama and Jensen 1983).

KAMs can be seen in the context of the economic incentives of each of the concerned parties where it can change the payoffs to each of the concerned parties.

2.3 Literature review

Longstanding research indicates the important role of corporate governance in improving both the financial reporting process and the independent auditor's work (Cohen et al. 2004; Elshandidy and Neri 2015). Therefore, corporate governance attributes are expected to influence audit outputs, including KAMs (e.g., Lin et al. 2020). There is, however, limited empirical evidence on the link between corporate governance attributes (particularly, the two-tier board structure) and KAMs in the literature. The extant evidence largely concerns the audit committee attributes and suggests significant associations with different measures of KAMs such as readability (e.g., Velte 2018).

In the Chinese context, especially considering the ineffectiveness of external corporate governance (Jiang and Kim 2020), a range of studies concern the two-tier board structure as an internal governance mechanism in relation to some financial reporting and audit outputs. For example, Firth et al. (2007) find that supervisory board size and board of directors' independence are negatively (positively) associated with discretionary accruals (earnings response coefficient). Lin et al. (2016) find that the size of the supervisory board is positively associated with informative earnings management.

This paper extends the prior research on the two-tier board structure and KAMs. Considering the evidence stems from previous studies that KAMs disclosure is related to financial reporting quality (Gold et al. 2020; Reid et al. 2019), KAMs disclosed by the auditor are likely to be influenced by governance attributes, particularly board structure (e.g., Fera et al. 2021), the calls of prior research (e.g., Abdelfattah et al. 2021; Velte 2018) for investigation of the determinants of KAMs disclosure in the two-tier structure, and that KAMs are defined through the matters discussed between those responsible for corporate governance and the independent auditor (ISA 701; Lin et al. 2020), we contribute to the literature by investigating the relationship between the two-tier board structure characteristics and KAMs disclosure. The two-tier board structure includes two boards: the board of directors and the supervisory board. Therefore, consistent with previous studies, we focus on CEO duality and the board of directors' size, independence, and meetings to capture the role of the board of directors. In addition, we focus on the supervisory board size and independence to capture the role of the supervisory board. Next, we formally formulate our study's hypotheses.

2.4 Hypothesis development

2.4.1 Board of directors' characteristics

2.4.1.1 CEO duality CEO duality occurs when the same person simultaneously holds the roles of the CEO and board of directors chairperson in the same firm. According to Fama and Jensen (1983), CEO duality increases the agency problem and results in a potential conflict of interest since whoever makes a decision also monitors it. As such, CEO duality gives the CEO excessive power over the process of decision-making, for example, due to the additional information possessed by the CEO compared to the rest of the board members (Chen and Al-Najjar 2012; Veprauskaitė and Adams 2013). Thus, CEO duality would result in cognitive biases and incompetence (Van Ees et al. 2009). In addition, duality is likely to

constrain the board of directors' independence and weaken internal control and corporate disclosure and transparency, affecting the reliability of the accounting system and increasing audit risks (Jizi and Nehme 2018; Tsui et al. 2001). Therefore, regulators recommend the separation of CEO and chairperson positions to enable a firm's board of directors to effectively monitor the CEO's performance and practices (Guo et al. 2013; Yang et al. 2011). In China, the separation of the position of CEO and chairperson is not mandatory (Peng et al. 2007).

The literature shows that the CEO's duality results in less effective monitoring and increases firm risk (Bliss et al. 2007; Feng et al. 2020). By studying the relationship between the two-tier board structure and earnings management, Lin et al. (2016) find that CEO duality is negatively related to informative earnings management. Similarly, Gulzar and Zongjun (2011) suggest that CEO duality is positively associated with earnings management. Previous studies (Gul and Leung 2004; Huafang and Jianguo 2007) suggest that CEO duality is negatively associated with corporate transparency and financial reporting quality. By examining the relationship between corporate governance and audit risk assessment, Fakhfakh and Jarboui (2022) find that duality is positively associated with audit risk. Alves (2023) suggests a positive relationship between CEO duality and managerial opportunistic behavior, which relates to a higher probability that an auditor would see a heightened client's audit risk (Bliss et al. 2011).

According to audit regulators, KAMs are matters arising from the audit of financial statements that are communicated or required to be communicated to those charged with governance and relate to accounts or disclosures that are material to the financial statements and involve especially challenging, subjective, or complex auditor judgment. Importantly, regulators indicate that once an auditor has specified these KAMs, they *must* be disclosed in the expanded auditor's report (IAASB, 2015; CSA 1504; ISA 701; PCAOB, 2017). The reasoning behind that is regulators aim that this disclosure can reduce information asymmetry and increase shareholders' scrutiny over areas of risk (Elsayed et al. 2023). Thus, as CEO duality is likely to negatively relate to corporate governance and increase the firm's inefficiencies and risks as in the above discussion, the auditor is expected to provide more KAMs disclosure as required by the regulators. This leads us to formulate our first hypothesis:

H1: *There is a positive association between CEO duality and the disclosure of KAMs.*

2.4.1.2 Board of directors' size Board size is widely considered an important mechanism for the effectiveness of corporate governance (Elshandidy and Neri 2015). However, the empirical findings of the impact of board size on the firm's performance and financial reporting quality are mixed. A strand of literature (e.g., Albitar 2015; Darussamin et al. 2018) suggests that larger boards are more efficient in executing their responsibilities since they have a wide range of expertise and experiences that can help make wise decisions and reduce information asymmetry and thence improve the financial reporting quality. Conversely, another strand of literature (e.g., Ahmed et al. 2006; Lipton and Lorsch 1992) suggests that a larger board of directors results in less ability to reach an agreement, and thus negatively affects governance.

In terms of the two-tier board structure, Feng et al. (2020) find that a larger board of directors is negatively associated with fraud. Fakhfakh and Jarboui (2022) suggest that the size of the board of directors is negatively related to audit risk. Furthermore, previous studies (Bazrafshan et al. 2016; Singh et al. 2018) suggest that a larger board of directors improves monitoring, reduces earnings management practices, enhances investment

efficiency, and increases firm performance. Ji et al. (2015a, b) find that firms with a larger board of directors are less likely to disclose internal control weaknesses. Conversely, another branch of studies (e.g., Azeez 2015; Shan and Xu 2012; Torchia and Calabro 2016) suggests that a smaller board is positively associated with corporate transparency, earnings informativeness, and firm performance. Chan et al. (2014) find that firms with a smaller board of directors are less likely to receive a modified auditor opinion.

Based on the preceding, a larger board size either provides a better exchange of skills and knowledge concerning significant accounting policies and estimates (resulting in lower KAMs) or results in less effective coordination to address the risk of material misstatements in areas such as significant management estimates and judgments audit risk (resulting in greater KAMs). While an auditor must disclose KAMs in the expanded auditor's report as required by the regulators (as discussed earlier), these different foci regarding the board of directors' size make it unclear whether an auditor is likely to provide lower or greater KAMs disclosure, which leads us to formulate the second hypothesis:

H2: *There is an association between the size of the board of directors and the disclosure of KAMs.*

2.4.1.3 Independence of the board of directors Board of directors independence is essential for monitoring executives and ensuring that they act in the interests of shareholders (Fama 1980; Hsu and Wu 2014). According to agency theory, independent directors can reduce agency conflict and increase financial reporting quality (Darussamin et al. 2018; Setia-Atmaja et al. 2011). They are also less prone to political bargaining lobbying pursuant to the behavioral theory of corporate boards and governance (Van Ees et al. 2009). Lan et al. (2013) indicate that the higher representation of independent directors is thought to be an indication of the strength of corporate governance, as independent board members are less aligned with management. Gulzar and Zongjun (2011) show that a more independent board of directors can better monitor management behavior and thus improve financial reporting quality.

Consistent with this view, Feng et al. (2020) find that the independence of the board of directors within a two-tier board structure increases monitoring function and, thus, is negatively associated with the fraud. Fakhfakh and Jarboui (2022) indicate that boards with more independent directors are associated with lower audit risk. Previous studies (e.g., Chen et al. 2013; Ji et al. 2015a, b) find that firms with a higher percentage of independent directors are less likely to disclose internal control weaknesses and to receive a modified auditor's opinion. Therefore, boards with more independent directors are likely to provide an effective monitoring function and enhance the financial reporting process, thereby enhancing corporate governance. This is likely to increase the financial reporting quality, reduce risks of material misstatement, and thence drive the auditors to disclose lower KAMs disclosure because they must communicate KAMs in the expanded auditor's report as required by the regulators (as discussed earlier). These arguments lead us to formulate the third hypothesis:

H3: *There is a negative association between the independence of the board of directors and the disclosure of KAMs.*

2.4.1.4 Board of directors' meetings Evidence is mixed concerning the impact of the frequency of board meetings on the financial reporting process, firm's performance, and audit outcomes. On the one hand, the frequency of the board of directors' meetings is a major

attribute of board effort and effectiveness (Ji et al. 2020). Board meetings are crucial for directors, especially independent directors, to obtain information as well as participate in decision-making and perform their monitoring roles (Adams and Ferreira 2012; Liu et al. 2016). Therefore, regulators often demand that firms hold a minimum number of meetings yearly, for example, in China, the board of directors is required to meet at least two times every year (Jiang and Kim 2015). On the other hand, the frequent board meetings are not necessarily an indication of board's proactive vigilance in oversighting the management but would rather resulting from management questionable activities and the existence of higher risks in Chinese setting particularly (e.g., Chen et al. 2006; Yuan and Tao 2014; Wang et al. 2019).

A body of literature (e.g., Brick and Chidambaran 2010; Xie et al. 2003) indicates that a higher frequency of board of directors' meetings is associated with better corporate governance, higher effectiveness to detect accounting misstatements and, thus, improving the quality of financial reporting. Another body of literature (Chen et al. 2006; Vafeas 1999) suggests that an increase in the number of board meetings negatively affects the firm's governance and performance, positively relates to fraudulent activities and, thus, lowers financial reporting quality. In China, prior research (e.g., Chen et al. 2006; Yuan and Tao 2014) finds that the frequency of board meetings relates to higher incidences of fraud, audit risk, and drives auditors to issue modified auditor opinions (Wang et al. 2019). Conversely, Chen et al. (2013) and Chan et al. (2014) find that firms that hold more board meetings are less likely to receive a modified auditor opinion.

Accordingly, higher frequent board meetings would result in the board's vigilance thereby downsizing significant unusual transactions (resulting in lower KAMs) or signals uncertainty and sending forewarning about possible misstatement risks (resulting in greater KAMs). While an auditor must disclose KAMs in the expanded auditor's report as required by the regulators (as discussed earlier), these competing arguments regarding the board of directors' meetings make it unclear whether an auditor is likely to provide lower or greater KAMs disclosure, which leads us to formulate the fourth hypothesis:

H4: *There is an association between the frequency of board of directors' meetings and the disclosure of KAMs.*

2.4.2 Supervisory board characteristics

2.4.2.1 Supervisory board size According to *China's Company Law*, a firm has to establish a supervisory board alongside its board of directors. Unless having a low number of shareholders, the supervisory board should consist of at least three members of shareholders' representatives and employees' representatives, provided that the employees' representatives represent at least one-third of the members (Tian 2009). Board directors and executives should not concurrently serve as supervisors (Xiao et al. 2004). Under Article 64 of the *Code of Corporate Governance for Listed Companies* in China, supervisors should be professionally knowledgeable or have adequate work experience in accounting and perform the supervisory function independently and effectively. In line with the behavioral theory of corporate boards and governance, this setting is likely to curb divergence from the optimal solution due to poor and inefficient decisions by corporate boards (Van Ees et al. 2009).

Firth et al. (2007) suggest that a larger supervisory board with more experience is likely to improve a firm's information quality. Lin and Liu (2009b) suggest that a larger supervisory board enhances the oversight over management activities. Feng et al. (2020)

find that the size of the supervisory board improves corporate governance and is negatively related to firms committing fraud. Lin et al. (2016) find that the size of the supervisory board is positively associated with informative earnings. Accordingly, a larger supervisory board is likely to bring in greater experience and enhance the monitoring function to curb risk of material misstatements in relation to accounts or disclosures, such as significant management estimates and judgments and reduce areas of high financial statement and audit risk. While an auditor must disclose KAMs in the expanded auditor's report as required by the regulators (as discussed earlier), this strong corporate governance and improved financial reporting process and quality would drive the auditor to provide lower KAMs disclosure. These arguments lead us to formulate the fifth hypothesis:

H5: *There is a negative association between the supervisory board size and the disclosure of KAMs.*

2.4.2.2 Supervisory board independence The supervisory board's ability to carry out its assigned function is subject to the extent of its independence (Dahya et al. 2002; Lee 2015). In line with the behavioral theory of corporate boards and governance, the independence of the supervisory board can be regarded as a useful governance mechanism to reduce divergence from optimal decisions that may be set out by the dominant coalition (Elghuweel et al. 2017). That said, it is worth noting that although the Chinese Company law restricts the supervisory board's membership to representatives of shareholders and employees and excludes directors and executives from concurrently serving as supervisors, this may not be a sufficient guarantee of its independence as at least one-third of members are employees (Wei and Geng 2008). The board of directors can use the salaries and benefits of these supervisors (i.e., employee representatives), as well as the close personal relationships with them, as a backdoor to infiltrate their supervisory functions, thereby negatively impacting the independence of the supervisory board (Lee 2014; Wei 2007). Besides, supervisors representing the shareholders are elected, and their salaries are determined through the shareholders' meetings. The independence of the supervisory board is also likely to be compromised if there are controlling shareholders (Chen 2005; Lee 2015).

Consistent with this notion, Ji et al. (2017) find that firms with higher supervisory board independence (measured by the percentage of non-paid supervisors) are more likely to have higher earnings quality. Ji et al. (2015a, b) find that firms with higher supervisory board independence are less likely to disclose internal control weaknesses. Yin et al. (2021) find that supervisory board independence improves the effectiveness of corporate governance and reduces stock price crash risk. Therefore, the independence of the supervisory board is likely to help in addressing challenging, subjective, or complex areas related to accounts or disclosures that are material to the financial statements. While an auditor must disclose KAMs in the expanded auditor's report as required by the regulators (as discussed earlier), this strong corporate governance and enhanced financial reporting quality context would drive the auditor to provide lower KAMs disclosure. These arguments lead us to formulate the sixth hypothesis:

H6: *There is a negative association between supervisory board independence and the disclosure of KAMs.*

3 Research design

3.1 Sample selection and data collection

Our sample includes all non-financial firms listed on the Shanghai and Shenzhen Stock Exchanges from 2017 through 2020. Therefore, our sample includes firms listed in Mainland China (A-shares), which were required to comply with CSA 1504 for fiscal years ending on or after December 30, 2017 (Zeng et al. 2020; Zhai et al. 2021).⁵

We collect KAMs data and the gender of the auditor from the Chinese Research Data Services (CNRDS) platform, and the rest of the data from the China Stock Market and Accounting Research (CSMAR) database. Table 1 presents our sample selection procedures and industry distribution. Panel A of Table 1 exhibits the composition, selection process, and yearly distribution of our sample. We begin with an initial sample of 14,964 company-year observations for which KAMs are available in the CNRDS database from 2017 to 2020. Then, we exclude 124 firm-year observations for firms in the B-share market, which issue their data in a currency different from the Chinese Yuan Renminbi. In line with previous studies (e.g., Abdelfattah et al. 2021; Zeng et al. 2020; Zhang and Shailer 2021), we drop 404 observations representing financial services firms (industry code: J) since these firms are subject to regulatory constraints, different accounting considerations and practices, and distinct financial reporting systems. Finally, we merge these observations with the necessary financial data from the CSMAR database. Our final sample with data sufficient to conduct our analyses comprises 10,857 firm-year observations, representing 3,397 firms for the period from 2017 through 2020.

Panel B of Table 1 shows the sample's industry distribution, and industries are classified according to China Securities Regulatory Commission (CSRC) guidelines. The manufacturing sector accounts for 70.55 per cent of the total observations, which accords with its being the largest sector in China. The rest of the sectors are relatively distributed consistently.

3.2 Regression Models

Following prior research on the two-tier board structure characteristics (e.g., Firth et al. 2007; Cho and Rui 2009) and KAMs disclosure (e.g., Abdelfattah et al. 2021; Burke et al. 2023; Gutierrez et al. 2018; Lennox et al. 2023; Pinto and Morais 2019; Sierra-García et al. 2019), we estimate the following two OLS regression models to examine our research hypotheses around whether two-tier board structure characteristics impact KAMs disclosure. Specifically, Eq. (1) examines the relationship between the two-tier board structure characteristics and the total number of KAMs disclosed in the expanded auditor report as our first measure of KAMs disclosure, while Eq. (2) examines the relationship between

⁵ We rerun our analyses after including firms with dual-listing in Mainland China's (Shanghai and Shenzhen) and Hong Kong's stock exchanges (A+H-shares) which were required to comply with CSA 1504 on or after December 15, 2016 and our results are qualitatively similar. Refer to Sect. 5.2 Robustness Checks for more details.

Table 1 Sample selection and industry distribution

Panel A: sample selection			
All firms on CNRDS that disclosed KAMs from 2017–2020			14,964
Less:			
Observations representing B-share firms			(124)
Observations representing the financial industry			(404)
Observations with missing data while merging with CSMAR			(3,579)
Final Sample firm-years			10,857
Yearly distribution			
2017			2,711
2018			2,823
2019			2,945
2020			2,378
Panel B: Sample distribution over industries			
Code	Industry name	<i>N</i>	%
A	Agriculture, forestry, animal husbandry, and fishery	114	1.05
B	Mining	201	1.85
C	Manufacturing	7,660	70.55
D	Production and supply of electric power, thermal power, gas and water	350	3.22
E	Construction	227	2.09
F	Wholesale and retail	428	3.94
G	Transport, storage and postal	285	2.63
H	Hotels and catering	19	0.18
I	Information transmission, software, and IT service	704	6.48
K	Real estate	209	1.93
L	Leasing and commercial service	110	1.01
M	Scientific research and technology service	137	1.26
N	Water conservancy, environment and public facility management	175	1.61
P	Education	9	0.08
Q	Health and social work	27	0.25
R	Culture, sports and entertainment	148	1.36
S	Diversified	54	0.50
	Total	10,857	100

the two-tier board structure characteristics and the length of KAMs content as our second measure of KAMs disclosure.

$$\begin{aligned}
 KAMs_NUM_{i,t} = & \beta_0 + \beta_1 DUALITY_{i,t} + \beta_2 BRDSIZE_{i,t} + \beta_3 BRDIND_{i,t} + \beta_4 BRDMEET_{i,t} + \beta_5 SUPSIZE_{i,t} + \\
 & \beta_6 SUPIND_{i,t} + \beta_7 SIZE_{i,t} + \beta_8 AREC_INVT_{i,t} + \beta_9 LOSS_{i,t} + \beta_{10} AUDFEE_{i,t} + \beta_{11} FEM_AUD_{i,t} + \\
 & \beta_{12} IMPR_{i,t} + \beta_{13} ROA_{i,t} + \beta_{14} BIG4_{i,t} + \beta_{15} GCO_{i,t} + \beta_{16} CURR_{i,t} + \beta_{17} LEV_{i,t} + \beta_{18} CFO_{i,t} + \\
 & \beta_{19} TENURE_{i,t} + \beta_{20} SWITCH_{i,t} + \beta_{21} AUDCHANGE_{i,t} + \beta_{22} INTAG_{i,t} + \beta_{23} NET_DTA_{i,t} + \\
 & \beta_{24} DEF_REV_{i,t} + \beta_{25} CLIST_{i,t} + IND + YEAR + \epsilon_{i,t}
 \end{aligned}$$

(1)

$$\begin{aligned}
KAMs_LENGTH_{i,t} = & \beta_0 + \beta_1 DUALITY_{i,t} + \beta_2 BRD_SIZE_{i,t} + \beta_3 BRD_IND_{i,t} + \beta_4 BRD_MEET_{i,t} + \beta_5 SUPS_SIZE_{i,t} \\
& + \beta_6 SUP_IND_{i,t} + \beta_7 SIZE_{i,t} + \beta_8 AREC_INVT_{i,t} + \beta_9 LOSS_{i,t} + \beta_{10} AUDFEE_{i,t} + \\
& \beta_{11} FEM_AUD_{i,t} + \beta_{12} IMPR_{i,t} + \beta_{13} ROA_{i,t} + \beta_{14} BIG4_{i,t} + \beta_{15} GCO_{i,t} + \beta_{16} CURR_{i,t} + \quad (2) \\
& \beta_{17} LEV_{i,t} + \beta_{18} CFO_{i,t} + \beta_{19} TENURE_{i,t} + \beta_{20} SWITCH_{i,t} + \beta_{21} AUDCHANGE_{i,t} + \\
& \beta_{22} INTAG_{i,t} + \beta_{23} NET_DTA_{i,t} + \beta_{24} DEF_REV_{i,t} + \beta_{25} CLIST_{i,t} + IND + YEAR + \varepsilon_{i,t}
\end{aligned}$$

Subscripts i and t denote firm and year, respectively. $KAMs_NUM$ is our dependent variable in Model 1, which is the total number of KAMs disclosed in the audit report, following previous expanded audit report studies. $KAMs_LENGTH$ is the dependent variable in Model 2, which is the natural logarithm of the total number of Chinese characters in the audit report's KAMs section following. Our independent variables capturing characteristics of the two-tier board structure include CEO duality ($DUALITY$), board of directors' size (BRD_SIZE), board of directors' independence (BRD_IND), board of directors' meetings (BRD_MEET), supervisory board size ($SUPS_SIZE$), and supervisory board's independence (SUP_IND). Refer to Appendix A for detailed definitions of variables.

We include a set of control variables that are shown to be important in prior research on corporate governance and KAMs disclosure, namely, firm size ($SIZE$), accounts receivable and inventory ($AREC_INVT$), reporting a loss ($LOSS$), audit fees ($AUDFEE$), and the presence of a female audit partner (FEM_AUD), assets impairment ($IMPR$), return on assets (ROA), Big four audit firms ($BIG4$), and going concern opinion (GCO), current ratio ($CURR$), leverage (LEV), operating cash flow (CFO), audit firm tenure ($TENURE$), switching audit firm ($SWITCH$), and auditor change ($AUDCHANGE$), intangible assets ($INTAG$), net deferred tax assets (NET_DTA), deferred revenues (DEF_REV), and firms with cross-listing ($CLIST$). Consistent with prior research, the present study predicts a positive (negative) association between $SIZE$, $AREC_INVT$, $LOSS$, $AUDFEE$, FEM_AUD , $IMPR$ (ROA , $BIG4$, and GCO), and KAMs disclosure (e.g., Abdelfattah et al. 2021; Pinto and Morais 2019; Rousseau 2021; Sierra-García et al. 2019). Variable definitions are provided in "Appendix A".

All regression models control for industry fixed effects (IND) and year fixed effects ($YEAR$) to control for heterogeneity in the disclosure of KAMs across industries and over time. All continuous variables are winsorized at the 1st and 99th percentiles to mitigate the impact of outliers.

4 Results

4.1 Descriptive Statistics

Table 2 shows the descriptive statistics for all variables used in the main analysis. The $KAMs_NUM$ range from a minimum value of 1 to a maximum value of 4, with a

Table 2 Descriptive statistics

Variable	N	Mean	Std. Dev	Min	Median	Max
<i>KAMs_NUM</i>	10,857	2.050	0.636	1.000	2.000	4.000
<i>KAMs_LENGTH</i>	10,857	6.836	0.528	1.792	6.880	8.511
<i>DUALITY</i>	10,857	0.309	0.462	0.000	0.000	1.000
<i>BRDSIZE</i>	10,857	8.411	1.603	5.000	9.000	14.000
<i>BRDIND</i>	10,857	0.377	0.053	0.333	0.364	0.571
<i>BRDMEET</i>	10,857	2.215	0.393	0.693	2.197	4.060
<i>SUPSIZE</i>	10,857	3.429	0.938	2.000	3.000	7.000
<i>SUPIND</i>	10,857	0.222	0.268	0.000	0.000	1.000
<i>SIZE</i>	10,857	22.309	1.267	19.908	22.141	26.219
<i>AREC_INVNT</i>	10,857	0.261	0.148	0.012	0.248	0.712
<i>LOSS</i>	10,857	0.105	0.306	0.000	0.000	1.000
<i>AUDFEE</i>	10,857	13.941	0.654	12.766	13.816	16.18
<i>FEM_AUD</i>	10,857	0.550	0.497	0.000	1.000	1.000
<i>IMPR</i>	10,857	0.945	0.228	0.000	1.000	1.000
<i>ROA</i>	10,857	0.034	0.080	-0.429	0.039	0.204
<i>BIG4</i>	10,857	0.053	0.224	0.000	0.000	1.000
<i>GCO</i>	10,857	0.014	0.117	0.000	0.000	1.000
<i>CURR</i>	10,857	2.349	2.122	0.331	1.671	13.871
<i>LEV</i>	10,857	0.418	0.197	0.064	0.408	0.940
<i>CFO</i>	10,857	0.052	0.064	-0.157	0.051	0.239
<i>TENURE</i>	10,857	7.600	5.530	0.000	7.000	30.000
<i>SWITCH</i>	10,857	0.110	0.313	0.000	0.000	1.000
<i>AUDCHANGE</i>	10,857	0.622	0.485	0.000	1.000	1.000
<i>INTAG</i>	10,857	0.047	0.048	0.000	0.035	0.323
<i>NET_DTA</i>	10,857	0.005	0.010	-0.042	0.004	0.042
<i>DEF_REV</i>	10,857	0.011	0.014	0.000	0.006	0.082
<i>CLIST</i>	10,857	0.025	0.155	0.000	0.000	1.000

All continuous variables are winsorized at 1% on both tails. Variable definitions are provided in “Appendix A”

mean (median) of 2.050 (2) which, relatively, are consistent with prior research (e.g., Abdelfattah et al. 2021; Pinto and Morais 2019; Zeng et al. 2020). The mean, minimum and maximum values of *LENGTH* are 6.836, 1.792 and 8.511, respectively. The mean value of *DUALITY* is about 31 per cent, implying that a large proportion of CEOs also serve as chair of the board of directors. The average (maximum) number on the board of directors (*BRDSIZE*) is 9 (14), and the average proportion of independent directors (*BRDIND*) is 37.7 per cent. The board of directors meets on average 10 times per year (*BRDMEET* log value shows 2.215), with a minimum and maximum of 2 and 58 meetings a year, respectively. The average (maximum) number of members on the supervisory board (*SUPSIZE*) is 4 (7), and the average proportion of independent (non-paid) supervisors is 22.2 per cent. The sample shows mean values of *AREC_INVNT* (receivables and inventory) and *LOSS* are 0.270 and 0.102, respectively. On average, 94.5 per cent of our sample report an impairment loss of assets (*IMPR*). The mean (maximum) of *TENURE* is 7.600 (30) years, suggesting that many audit firms have a long tenure

period with audit clients (e.g., Burke et al. 2023; Pinto and Morais 2019). Table 2 also shows that about 11 per cent of our sample firms changed their audit firms (*SWITCH*), and 62.2 per cent of auditors' partners were changed (*AUDCHANGE*). The mean values of *INTAG* and *DEF_REV* are 4.7 and 1.1, respectively. Of the firms, 2.5 per cent have a cross-listing in Mainland China as well as Hong Kong (*CLIST*). Collectively, this implies that our sample descriptive statistics are consistent with prior studies on the KAMs disclosure (e.g., Burke et al. 2023; Gutierrez et al. 2018; Zeng et al. 2020).

Table 3 reports Pearson correlations for all variables employed in our main analysis. Importantly, the *KAMs_NUM* variable is significantly and positively correlated with *BRD_SIZE* (0.02) and *BRDMEET* (0.13), while it is negatively correlated with *SUPSIZE* (− 0.02) and *SUPIND* (− 0.03). Furthermore, *LENGTH* is positively correlated with *DUALITY* (0.03) and *BRDMEET* (0.09), while it is negatively correlated with *SUPSIZE* (− 0.03) and *SUPIND* (− 0.04). The correlation coefficients on the control variables show that *SIZE*, *AREC_INVT*, *LOSS*, *AUDFEE*, *IMPR*, *LEV*, *NET_DTA*, and *CLIST* are positively and significantly correlated with *KAMs_NUM* and *KAMs_LENGTH*. However, *ROA*, *CURR*, *CFO*, and *DEF_REV* are negatively and significantly correlated to *KAMs_NUM* and *KAMs_LENGTH*. *SWITCH* and *AUDCHANGE* are positively correlated with *KAMs*. *BIG4* (*GCO*) are positively (negatively) and significantly correlated with *LENGTH*. Collectively, the bivariate analysis gives initial support to our hypotheses and shows the importance of the set of control variables included in our regression models. The correlation coefficients further suggest that multicollinearity is not a concern in our regression analyses.⁶

4.2 Main Results

Table 4 presents the main results. Model (1) of Table 4 reports the regression results for Eq. (1), examining the association between the attributes of the two-tier board structure and KAMs disclosure measured by *KAMs_NUM* as the dependent variable. Model (2) of Table 4 shows the results for Eq. (2), where *KAMs_LENGTH* is the dependent variable.

Considering the board of directors, we find that the coefficient on *DUALITY* is positive and significant with *KAMs_NUM* ($t=2.197$, $p<0.05$) and *KAMs_LENGTH* ($t=2.719$, $p<0.01$). These results suggest that auditors convey a higher number and lengthier content of KAMs for firms with CEO duality. These results support H_1 , that expects a positive association between CEO duality and the disclosure of KAMs. Our tests, however, show trivial coefficients on *BRDSIZE* and *BRDIND*, suggesting that the size and independence of the board of directors are not related to the disclosure of KAMs. These findings, therefore, do not support H_2 , that expects an association between the size of the board of directors and KAMs disclosure, and H_3 , that expects an association between the independence of the board of directors and KAMs disclosure. We also observe that the coefficient on *BRDMEET* is positive and significant with *KAMs_NUM* ($t=4.188$, $p<0.01$) and *KAMs_LENGTH* ($t=4.567$, $p<0.01$). These findings indicate that the auditors report a greater number and lengthier content of KAMs when the board of directors holds more meetings. These results support H_4 , that expects a relationship between the board of directors' meetings and the disclosure of KAMs.

⁶ Throughout our regression analyses, we assess the effects of multicollinearity by calculating the variance inflation factors (VIFs) for each independent variable entered in the multivariate regressions. With VIFs less than 10, we conclude that multicollinearity is not a concern.

Table 3 Correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	
(1) <i>KAMs_</i>	1.00																											
<i>NUM</i>																												
(2) <i>KAMs_</i>		1.00																										
<i>LENGTH</i>			0.67																									
(3) <i>DUAL-</i>				1.00																								
<i>ITY</i>					0.02																							
(4) <i>BRD-</i>						1.00																						
<i>SIZE</i>							0.02																					
(5) <i>BRDIND</i>								1.00																				
(6) <i>BRD-</i>									1.00																			
<i>MEET</i>										0.13																		
(7) <i>SUP-</i>											1.00																	
<i>SIZE</i>												0.02																
(8) <i>SUPIND</i>													1.00															
(9) <i>SIZE</i>														1.00														
(10) <i>AREC-</i>															1.00													
<i>INVT</i>																0.10												
(11) <i>LOSS</i>																	1.00											
(12) <i>AUD-</i>																		1.00										
<i>FEE</i>																			1.00									
(13) <i>FEM-</i>																				1.00								
<i>AUD</i>																					1.00							
(14) <i>IMPR</i>																						1.00						
(15) <i>ROA</i>																							1.00					
(16) <i>BIG4</i>																								1.00				
(17) <i>GCO</i>																									1.00			
(18) <i>CURR</i>																										1.00		

Table 3 (continued)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	
(19) LEV	0.15	0.08	-0.12	0.13	0.01	0.32	0.18	0.16	0.52	0.23	0.20	0.43	-0.03	0.08	-0.36	0.09	0.20	-0.67	1.00									
(20) CFO	-0.11	-0.04	0.00	0.04	-0.01	-0.15	0.02	-0.01	0.03	-0.30	-0.18	0.03	0.02	-0.05	0.36	0.07	-0.06	0.09	-0.19	1.00								
(21) TEN- URE	0.00	0.01	-0.05	0.05	-0.04	-0.03	0.06	0.01	0.08	-0.04	-0.02	0.08	0.03	0.02	0.02	-0.06	-0.02	-0.06	0.01	0.03	1.00							
(22) SWITCH	0.03	0.01	-0.01	0.00	0.02	0.06	0.00	0.03	0.02	0.00	0.05	0.02	-0.01	-0.03	-0.08	0.02	0.06	-0.02	0.05	-0.01	-0.41	1.00						
(23) AUD- CHANGE	0.02	0.01	0.01	0.00	-0.01	0.01	-0.02	0.00	-0.02	-0.01	0.00	0.00	0.01	0.03	0.00	0.00	0.02	0.00	0.00	0.00	0.00	-0.06	0.24	1.00				
(24) INTAG	0.00	-0.02	-0.06	0.06	-0.02	0.05	0.06	0.04	0.06	-0.25	0.03	0.09	-0.01	-0.02	-0.05	0.05	0.03	-0.14	0.04	0.04	0.02	0.01	0.01	1.00				
(25) NET_ DTA	0.03	0.04	0.03	-0.03	-0.03	-0.02	-0.04	-0.08	0.21	0.14	-0.06	0.02	0.04	-0.13	-0.05	0.02	0.02	-0.02	0.05	-0.05	-0.06	0.01	-0.01	-0.15	1.00			
(26) DEF_ REV	-0.03	-0.03	-0.03	0.03	-0.02	-0.07	0.02	0.04	-0.12	-0.09	0.01	-0.12	-0.01	0.01	0.00	-0.02	-0.01	0.01	-0.02	0.05	0.00	-0.01	0.02	0.14	0.09	1.00		
(27) CLIST	0.04	0.02	-0.05	0.09	0.03	0.08	0.12	0.05	0.27	-0.09	-0.04	0.35	0.04	0.00	0.01	0.37	-0.02	-0.08	0.11	0.03	-0.01	0.01	-0.01	0.09	-0.06	0.00	1.00	

Bold numbers indicate significance based on two-tailed t-tests, at the 0.10 level or better. All continuous variables are winsorized at 1% on both tails. Variable definitions are provided in "Appendix A"

Table 4 Two-tier board structure characteristics and KAMs disclosure

Variable	Pred. Sign	(1) KAMs_NUM	(2) KAMs_LENGTH
<i>DUALITY</i>	+	0.0400** (2.197)	0.039*** (2.719)
<i>BRDSIZE</i>	?	0.003 (0.362)	0.000 (0.035)
<i>BRDIND</i>	-	- 0.202 (-1.044)	- 0.228 (-1.430)
<i>BRDMEET</i>	?	0.089*** (4.188)	0.075*** (4.567)
<i>SUPSIZE</i>	-	- 0.020* (-1.848)	- 0.014* (-1.701)
<i>SUPIND</i>	-	- 0.090*** (-2.687)	- 0.077*** (-2.992)
<i>SIZE</i>	+	0.040*** (3.062)	0.019* (1.832)
<i>AREC_INVIT</i>	+	0.146** (2.003)	0.140** (2.412)
<i>LOSS</i>	+	0.046 (1.428)	0.033 (1.229)
<i>AUDFEE</i>	+	0.124*** (5.867)	0.098*** (5.882)
<i>FEM_AUD</i>	+	- 0.022 (-1.501)	- 0.002 (- 0.156)
<i>IMPR</i>	+	0.139*** (4.891)	0.072*** (3.353)
<i>ROA</i>	-	- 0.653*** (-4.458)	- 0.168 (-1.052)
<i>BIG4</i>	-	- 0.181*** (-3.526)	0.011 (0.280)
<i>GCO</i>	-	- 0.304*** (-3.404)	- 0.492*** (-4.207)
<i>CURR</i>	?	- 0.005 (-1.004)	- 0.001 (- 0.284)
<i>LEV</i>	?	0.057 (0.789)	0.015 (0.241)
<i>CFO</i>	?	- 0.430*** (-3.616)	- 0.163 (-1.519)
<i>TENURE</i>	?	0.000 (-.268)	0.000 (0.264)
<i>SWITCH</i>	?	.042* (1.888)	- 0.005 (- 0.254)
<i>AUDCHANGE</i>	?	0.019 (1.554)	0.021** (2.120)
<i>INTAG</i>	?	0.201 (0.954)	0.070 (0.397)
<i>NET_DTA</i>	?	0.378 (0.437)	1.141 (1.509)

Table 4 (continued)

Variable	Pred. Sign	(1) KAMs_NUM	(2) KAMs_LENGTH
<i>DEF_REV</i>	?	- 0.090 (- 0.133)	- 0.195 (- 0.423)
<i>CLIST</i>	?	0.072 (0.912)	- 0.052 (- 0.847)
Intercept		- 0.724*** (-2.610)	4.795*** (21.329)
<i>YEAR</i> and <i>IND</i>		Included	Included
Observations		10,857	10,857
Adjusted R ²		9.07%	6.68%

Robust standard errors adjusted for clustering at the firm level. T-statistics in parentheses. Significance level: *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$, using two-tailed tests. Variable definitions are provided in "Appendix A"

Concerning the supervisory board, our results show that the coefficients on *SUPSIZE* are negatively significant in the tests of *KAMs_NUM* ($t = -1.848$, $p < 0.10$) and *KAMs_LENGTH* ($t = -1.701$, $p < 0.10$). These findings suggest that auditors convey a lower number and shorter content of KAMs for firms characterized by a larger supervisory board. These results support H_5 , that expects a negative association between the supervisory board size and the disclosure of KAMs. Furthermore, our results show that the coefficients on *SUPIND* are negative and significant in our tests of *KAMs_NUM* ($t = -2.687$, $p < 0.01$) and *KAMs_LENGTH* ($t = -2.992$, $p < 0.01$). These results imply that auditors convey a lower number and less lengthy content of KAMs for firms characterized by a more independent supervisory board. These findings support H_6 , that expects a negative association between the independence of the supervisory board and KAMs disclosure.

Our findings are in line with the behavioral theory of corporate boards and governance and agency theory, suggesting that CEO duality would result in cognitive biases and incompetence (Van Ees et al. 2009). Furthermore, the segregation of CEO and chairperson positions maintains the independence and effectiveness of the board of directors (Jermias and Gani 2014; Yang et al. 2011). Our results are also consistent with prior studies suggesting that duality is negatively associated with corporate transparency (e.g., Fakhfakh and Jarboui 2022; Gul and Leung 2004; Lin et al. 2016). Therefore, CEO duality is likely to negatively relate to corporate governance and increase the firm's inefficiencies and risk, driving auditors to disclose a greater number and lengthier content of KAMs.

Our findings regarding the size and independence of the board of directors are similar to those of Zhang and Shailer (2022), and accord with arguments against the effectiveness of the monitoring function played by the directors on the boards in the Chinese context (e.g., Gulzar and Zongjun 2011; Huyghebaert and Wang 2012). Our results on board meetings are consistent with a strand of prior research (e.g., Chen et al. 2006; Yuan and Tao 2014; Wang et al. 2019) suggesting that frequent board meetings in Chinese setting are not necessarily an indication of board's proactive vigilance in oversighting the management but would rather resulting from management questionable activities and the existence of higher risks, which drive auditors to disclose a greater number and lengthier content of KAMs.

Our results on the supervisory board's size and independence accord with the behavioral theory of corporate boards and governance as useful governance mechanisms to reduce divergence from optimal decisions that may be set out by the dominant coalition or due to

poor and inefficient decisions by corporate boards (Van Ees et al. 2009). These results are also consistent with Firth et al. (2007) and Feng et al. (2020) that a larger supervisory board size enhances monitoring effectiveness, transparency, and quality of financial reporting. This is a consequence of supervisors' contributions to improving information quality and reducing firm risk, which is likely to drive the auditor to disclose a lower number and less lengthy content of KAMs. Moreover, our results support prior research (e.g., Ji et al. 2015a, b; Yin et al. 2021) that the independence of the supervisory board increases the board's effectiveness to perform the supervisory function, increasing the financial reporting quality. That is, an auditor is likely to convey a lower number and content of KAMs in such a context.

The coefficients on the set of control variables employed in our analyses are consistent with our expectations. Specifically, KAMs disclosure is positively (negatively) associated with *SIZE*, *AREC_INV*, *AUDFEE*, *IMPR*, *SWITCH*, *AUDCHANGE*, (*ROA*, *BIG4*, *CFO*, and *GCO*).

5 Additional analyses and robustness checks

5.1 Additional analyses

KAMs disclosed by the independent auditor convey risks related to particular accounts or pervasively overall the financial statements (Camacho-Miñano et al. 2023). For further understanding of the type of KAMs disclosed by the auditor, consistent with prior research, we separate KAMs into account-level and entity-level KAMs (Lin et al. 2014). These types of KAMs are likely to raise concerns about financial reporting quality (Doyle et al. 2007). Therefore, we perform additional analysis to investigate the relationship between the two-tier board structure characteristics and KAMs disclosure after distinguishing between account-level and entity-level KAMs (Camacho-Miñano et al., 2023; Sierra-García et al. 2019).

Specifically, following Camacho-Miñano et al. (2023) and Sierra-García et al. (2019), we partition the KAMs employed in our main analyses into two types: account-level KAMs and entity-level KAMs. First, account-level KAMs are those related to accounts or specific items in the financial statements such as inventories, revenues, and intangibles. Second, entity-level KAMs are those related to firm risk as a whole, such as litigation, information technology, and other entity-level KAMs. Thus, given differences in nature and complexity, the former is regarded as less challenging or risky matters as compared to the latter (Gambetta et al. 2023). Consistent with previous studies (Lennox et al. 2023; Sierra-García et al. 2019), our descriptive statistics (untabulated for brevity) indicate that the mean values of account-level KAMs and entity-level KAMs are 2.035 and 0.013, respectively. That is, the KAMs are more attributable to account-level KAMs than entity-level KAMs.

We rerun our analyses after estimating Eqs. (3) and (4), where the KAMs-dependent variable in our main analysis is replaced by account-level KAMs and entity-level KAMs,

respectively. This estimation enables us to examine the association between the two-tier board structure attributes and these two types of KAMs disclosed by the auditor.

$$\begin{aligned}
 ACCT_KAMs_{i,t} = & \beta_0 + \beta_1 DUALITY_{i,t} + \beta_2 BRDSIZE_{i,t} + \beta_3 BRDIND_{i,t} + \beta_4 BRDMEET_{i,t} \\
 & + \beta_5 SUPSIZE_{i,t} + \beta_6 SUPIND_{i,t} + \beta_7 SIZE_{i,t} + \beta_8 AREC_INVT_{i,t} \\
 & + \beta_9 LOSS_{i,t} + \beta_{10} AUDFEE_{i,t} + \beta_{11} FEM_AUD_{i,t} + \beta_{12} IMPR_{i,t} \\
 & + \beta_{13} ROA_{i,t} + \beta_{14} BIG4_{i,t} + \beta_{15} GCO_{i,t} + \beta_{16} CURR_{i,t} + \beta_{17} LEV_{i,t} \\
 & + \beta_{18} CFO_{i,t} + \beta_{19} TENURE_{i,t} + \beta_{20} SWITCH_{i,t} + \beta_{21} AUDCHANGE_{i,t} \\
 & + \beta_{22} INTAG_{i,t} + \beta_{23} NET_DTA_{i,t} + \beta_{24} DEF_REV_{i,t} \\
 & + \beta_{25} CLIST_{i,t} + IND + YEAR + \varepsilon_{i,t}
 \end{aligned}
 \tag{3}$$

$$\begin{aligned}
 ENTITY_KAMs_{i,t} = & \beta_0 + \beta_1 DUALITY_{i,t} + \beta_2 BRDSIZE_{i,t} + \beta_3 BRDIND_{i,t} + \beta_4 BRDMEET_{i,t} \\
 & + \beta_5 SUPSIZE_{i,t} + \beta_6 SUPIND_{i,t} + \beta_7 SIZE_{i,t} + \beta_8 AREC_INVT_{i,t} \\
 & + \beta_9 LOSS_{i,t} + \beta_{10} AUDFEE_{i,t} + \beta_{11} FEM_AUD_{i,t} + \beta_{12} IMPR_{i,t} \\
 & + \beta_{13} ROA_{i,t} + \beta_{14} BIG4_{i,t} + \beta_{15} GCO_{i,t} + \beta_{16} CURR_{i,t} + \beta_{17} LEV_{i,t} \\
 & + \beta_{18} CFO_{i,t} + \beta_{19} TENURE_{i,t} + \beta_{20} SWITCH_{i,t} + \beta_{21} AUDCHANGE_{i,t} \\
 & + \beta_{22} INTAG_{i,t} + \beta_{23} NET_DTA_{i,t} + \beta_{24} DEF_REV_{i,t} \\
 & + \beta_{25} CLIST_{i,t} + IND + YEAR + \varepsilon_{i,t}
 \end{aligned}
 \tag{4}$$

Here, *ACCT_KAMs* is the total number of account-level KAMs and *ENTITY_KAMs* is the total number of entity-level KAMs disclosed in the expanded audit report. Independent and control variables are as presented earlier and defined in “Appendix A”.

Table 5 shows that the coefficient on *DUALITY* is positively significant ($t=2.216$, $p<0.05$) in the *ACCT_KAMs* test, whereas it is insignificant in the *ENTITY_KAMs* test. This implies that CEO duality is positively associated with account-level KAMs rather than entity-level KAMs. These results accord with Yuan and Tao (2014) and Fakhfakh and Jarboui (2022) that CEO duality is positively associated with audit risk and misreporting, which are often in areas related to account-level KAMs. The results also show that the coefficient on *BRDMEET* is positively significant ($t=4.402$, $p<0.01$) in *ACCT_KAMs*. This suggests that the disclosure of account-level KAMs is more likely for firms that hold a greater number of board of directors meetings.

Our results further show that the coefficient on *SUPSIZE* is negatively significant ($t=-2.024$, $p<0.05$) in the *ACCT_KAMs* test, implying that firms with a large supervisory board size are more likely to have fewer account-level KAMs rather than entity-level KAMs. Similarly, we find that the coefficient on *SUPIND* is negatively significant ($t=-2.709$, $p<0.01$) in the *ACCT_KAMs* test, implying that auditors are less likely to disclose account-level KAMs in firms with a higher proportion of independent supervisors. These results support our main findings that the size and independence of the supervisory board enhance the oversight effectiveness over the firm, especially on account-level matters (Chen et al. 2017). Collectively, consistent with prior research, our further analysis findings

Table 5 Two-tier board structure characteristics and account-level and entity-level KAMs

Variable	(1) ACCT_KAMs	(2) ENTITY_KAMs
<i>DUALITY</i>	0.042** (2.216)	0.000 (- 0.004)
<i>BRDSIZE</i>	0.002 (0.293)	0.002 (1.164)
<i>BRDIND</i>	- 0.219 (-1.084)	0.048 (1.207)
<i>BRDMEET</i>	0.097*** (4.402)	- 0.004 (- 0.812)
<i>SUPSIZE</i>	- 0.022** (-2.024)	0.001 (0.406)
<i>SUPIND</i>	- 0.094*** (-2.709)	0.004 (0.648)
<i>SIZE</i>	0.044*** (3.254)	- 0.005* (-1.869)
<i>AREC_INVNT</i>	0.198*** (2.650)	- 0.053*** (-3.550)
<i>LOSS</i>	0.041 (1.220)	0.012* (1.731)
<i>AUDFEE</i>	0.116*** (5.334)	0.009** (1.987)
<i>FEM_AUD</i>	- 0.026* (-1.694)	0.002 (0.926)
<i>IMPR</i>	0.136*** (4.732)	0.001 (0.217)
<i>ROA</i>	- 0.626*** (-3.868)	0.004 (0.096)
<i>BIG4</i>	- 0.173*** (-3.299)	- 0.014** (-2.215)
<i>GCO</i>	- 0.399*** (-3.846)	0.036 (1.325)
<i>CURR</i>	- 0.006 (-1.272)	0.001 (1.451)
<i>LEV</i>	0.023 (0.303)	0.035** (1.995)
<i>CFO</i>	- 0.400*** (-3.248)	- 0.030 (-1.235)
<i>TENURE</i>	0.000 (- 0.054)	0.000 (- 0.840)
<i>SWITCH</i>	0.037 (1.609)	0.001 (0.261)
<i>AUDCHANGE</i>	0.020 (1.625)	0.001 (0.243)
<i>INTAG</i>	0.120 (0.552)	0.054 (1.177)
<i>NET_DTA</i>	0.078 (0.087)	0.508*** (3.160)

Table 5 (continued)

Variable	(1) ACCT_KAMs	(2) ENTITY_KAMs
<i>DEF_REV</i>	- 0.037 (- 0.054)	- 0.070 (- 0.737)
<i>CLIST</i>	0.096 (1.130)	- 0.006 (- 0.725)
Intercept	- 0.727** (-2.567)	- 0.026 (- 0.454)
<i>YEAR</i> and <i>IND</i>	Included	Included
Observations	10,857	10,857
Adjusted R ²	8.48%	2.31%

Robust standard errors adjusted for clustering at the firm level. T-statistics in parentheses. Significance level: *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$, using two-tailed tests. Variable definitions are provided in "Appendix A"

show that the two-tier board structure attributes are more associated with account-level KAMs than entity-level KAMs.

Consistent with prior research (e.g., Abdelfattah et al. 2021), our main results show that there is a relationship between the two-tier board structure characteristics and KAMs disclosure as measured by the number and length of KAMs disclosure. Interestingly, auditors may consciously or unconsciously convey their feelings on the underlying risks through the tone of KAMs disclosure (Chen et al. 2020). Tone is not a measure of KAMs disclosure, whereas it captures the sentiment that the KAMs disclosure contains. While KAMs disclosure shows the information content in terms of the number and length of disclosed KAMs, tone reflects the feeling that the auditor communicates regarding the underlying risks in this disclosure (Henry 2008; Loughran & McDonald 2016). Thus, as further analysis, we analyze the risk-related nature of KAMs disclosure (i.e., auditor feelings while communicating KAMs disclosure) by examining the relationship between the two-tier board structure characteristics and expanded audit report tone.⁷ We estimate Eq. (5), where the KAMs-dependent variable in our main analysis is replaced by the tone of the expanded audit report.

$$\begin{aligned}
 KAMs_TONE_{i,t} = & \beta_0 + \beta_1 DUALITY_{i,t} + \beta_2 BRDSIZE_{i,t} + \beta_3 BRDIND_{i,t} \\
 & + \beta_4 BRDMEET_{i,t} + \beta_5 SUPSIZE_{i,t} + \beta_6 SUPIND_{i,t} \\
 & + \beta_7 SIZE_{i,t} + \beta_8 AREC_INVT_{i,t} + \beta_9 LOSS_{i,t} + \beta_{10} AUDFEE_{i,t} \\
 & + \beta_{11} FEM_AUD_{i,t} + \beta_{12} IMPR_{i,t} + \beta_{13} ROA_{i,t} + \beta_{14} BIG4_{i,t} \\
 & + \beta_{15} GCO_{i,t} + \beta_{16} CURR_{i,t} + \beta_{17} LEV_{i,t} \\
 & + \beta_{18} CFO_{i,t} + \beta_{19} TENURE_{i,t} + \beta_{20} SWITCH_{i,t} \\
 & + \beta_{21} AUDCHANGE_{i,t} + \beta_{22} INTAG_{i,t} + \beta_{23} NET_DTA_{i,t} \\
 & + \beta_{24} DEF_REV_{i,t} + \beta_{25} CLIST_{i,t} + IND + YEAR + \varepsilon_{i,t}
 \end{aligned} \tag{5}$$

where *KAMs_TONE* is measured as the difference between frequencies of negative and positive words scaled by the total word count of the audit report. This measure is obtained

⁷ We thank an anonymous reviewer for suggesting this analysis.

from WinGo database and identified according to Loughran and McDonald's (2011) word-lists (Abdelfattah et al. 2021; Lennox et al. 2023). Independent and control variables are presented earlier and defined in "Appendix A".

Table 6 reports the results of Eq. (5) on the *KAMs_TONE* of KAMs disclosure, wherein a consistent fashion with our main results, we find positive and significant coefficients on *DUALITY* ($t=2.783, p<0.01$) and *BRDMEET* ($t=5.211, p<0.01$), and negative and significant coefficients on *SUPSIZE* ($t=-3.116, p<0.01$) and *SUPIND* ($t=-2.397, p<0.05$). Collectively, these findings suggest that the two-tier board structure characteristics are not only associated with the KAMs disclosure as in our main analysis but also the tone communicating the underlying risks in this KAMs disclosure.

5.2 Robustness checks

We conduct several tests to examine the robustness of our results. We address any potential endogeneity concern that would arise from reverse causality or simultaneity, omitted variable, and self-selection bias by employing several procedures (e.g., Dahya et al. 2008; Farag and Mallin 2016; Lin et al. 2016). First, to address the possible simultaneity problem, following prior research (e.g., Zalata and Abdelfattah 2021), we re-estimate our main analysis after controlling for endogeneity using lagged independent variables ($y=t-1$), which technically works as a dynamic generalized method of moments estimation. Table 7 shows results that are similar to those reported in our main analysis, implying that our results are not prone to simultaneity concerns.

Second, to address the possibility of omitted variable, we employ the two-stage least squares (2SLS) statistical technique. Following prior research (e.g., Elsayed et al. 2022), we run two types of instrumental variables. The first (Models 1 and 3 of Table 8) uses the lagged values of the independent variables as instrumental variables. Considering the exclusion restriction (or so-called overidentifying restrictions), in the second (Models 2 and 4 of Table 8), we add an additional instrument, namely, the dominance of the state (*STATE*). Using this instrument is a rationale and supported by previous studies since it is likely to correlate with the endogenous variable (e.g., meet the validity requirement) because most listed Chinese companies are state-owned enterprises, and the government remains the largest shareholder in many of them (Liu et al. 2015; Ye and Li 2017). Moreover, it is unlikely to be associated with our dependent variable, except through the independent variable (e.g., meet the exclusion restriction).⁸ Collectively, the (2SLS) findings are consistent with the results of our main analyses. This implies that inferences driven by our analyses are not subject to omitted variables bias.

Third, prior research and ISA 701 suggest that KAMs are selected from the matters the auditor discussed with those charged with governance (Minutti-Meza 2021). In practical terms, this suggests that auditor-audit committee communications, as governed by ISA 260, can affect the KAMs (e.g., Velte 2018, 2020; Zhang and Shailer 2022). Accordingly, it is possible to argue that our sample could be systematically biased because of the role played by the audit committee. Thus, we employ Heckman's (1979) two-step estimation method to correct for self-selection bias resulting from audit committee attributes. In the

⁸ Specifically, we run first-stage F-statistic, Kleibergen-Paap Wald test, Hansen J test, and Wald test. Collectively, our unreported test results prove that our instruments are not weak and valid (i.e., the instruments are exogenous).

Table 6 Two-tier board structure characteristics and tone of KAMs disclosure

Variable	(1) KAMs_TONE
<i>DUALITY</i>	0.005*** (2.783)
<i>BRDSIZE</i>	0.000 (0.469)
<i>BRDIND</i>	0.000 (- 0.011)
<i>BRDMEET</i>	0.011*** (5.211)
<i>SUPSIZE</i>	- 0.003*** (-3.116)
<i>SUPIND</i>	- 0.008** (-2.397)
<i>SIZE</i>	0.002 (1.290)
<i>AREC_INVIT</i>	- 0.001 (- 0.182)
<i>LOSS</i>	- 0.001 (- 0.198)
<i>AUDFEE</i>	0.008*** (3.449)
<i>FEM_AUD</i>	0.000 (- 0.082)
<i>IMPR</i>	0.003 (1.084)
<i>ROA</i>	- 0.020 (-1.356)
<i>BIG4</i>	- 0.007 (-1.421)
<i>GCO</i>	- 0.075*** (-8.867)
<i>CURR</i>	- 0.001 (-1.360)
<i>LEV</i>	0.007 (0.980)
<i>CFO</i>	- 0.011 (- 0.933)
<i>TENURE</i>	0.000 (0.344)
<i>SWITCH</i>	0.002 (1.084)
<i>AUDCHANGE</i>	0.002* (1.711)
<i>INTAG</i>	0.039* (1.801)
<i>NET_DTA</i>	- 0.162* (-1.794)

Table 6 (continued)

Variable	(1) KAMs_TONE
<i>DEF_REV</i>	- 0.007 (- 0.112)
<i>CLIST</i>	- 0.035*** (-5.189)
Intercept	0.012 (0.430)
<i>YEAR</i> and <i>IND</i>	Included
Observations	10,575
Adjusted R ²	7.20%

Robust standard errors adjusted for clustering at the firm level. T-statistics in parentheses. Significance level: *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$, using two-tailed tests. Variable definitions are provided in "Appendix A"

Table 7 Two-tier board structure characteristics and KAMs disclosure after controlling for endogeneity using lagged independent variables

Variable	(1) KAMs_NUM	(2) KAMs_LENGTH
<i>DUALITY</i>	0.036* (1.694)	0.031** (2.150)
<i>BRDSIZE</i>	0.001 (0.114)	- 0.002 (- 0.331)
<i>BRDIND</i>	- 0.219 (-1.011)	- 0.220 (-1.518)
<i>BRDMEET</i>	0.097*** (3.910)	0.072*** (4.290)
<i>SUPSIZE</i>	- 0.020* (-1.652)	- 0.012 (-1.366)
<i>SUPIND</i>	- 0.121*** (-3.199)	- 0.110*** (-4.317)
<i>Control Variables</i>	Included	Included
<i>YEAR</i> and <i>IND</i>	Included	Included
Intercept	- 0.661** (-2.135)	4.929*** (22.412)
Observations	7,540	7,540
Adjusted R ²	9.38%	8.65%

Control variables are included as shown in Table 4. Robust standard errors adjusted for clustering at the firm level. T-statistics in parentheses. Significance level: *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$, using two-tailed tests. Variable definitions are provided in "Appendix A"

first-stage model, we run probit regression of the likelihood of the choice to have a good audit committee on the firm-level and auditor-level characteristics (i.e., those composing the control variables in our main analysis).

Consistent with prior literature (e.g., DeFond et al. 2005; Elsayed et al. 2022), we utilize audit committee size, independence, and meetings variables to construct an indicator of a

Table 8 Two-tier board structure characteristics and KAMs disclosure after controlling for endogeneity using 2SLS regression

Variable	(1) KAMs_NUM IV	(2) KAMs_NUM IV(a)	(3) KAMs_LENGTH IV	(4) KAMs_LENGTH IV(a)
<i>DUALITY</i>	0.049* (1.852)	0.049* (1.837)	0.048*** (2.699)	0.051*** (2.873)
<i>BRDSIZE</i>	0.006 (0.648)	0.004 (0.490)	- 0.001 (- 0.182)	- 0.001 (- 0.166)
<i>BRDIND</i>	- 0.197 (- 0.779)	- 0.335 (-1.355)	- 0.263 (-1.515)	- 0.276 (-1.572)
<i>BRDMEET</i>	0.184*** (5.128)	0.196*** (5.407)	0.111*** (4.234)	0.118*** (4.450)
<i>SUPSIZE</i>	- 0.024* (-1.811)	- 0.021 (-1.539)	- 0.020** (-2.157)	- 0.018* (-1.874)
<i>SUPIND</i>	- 0.151*** (-3.366)	- 0.168*** (-3.736)	- 0.148*** (-4.879)	- 0.155*** (-5.048)
<i>Control Variables</i>	Included	Included	Included	Included
<i>YEAR</i> and <i>IND</i>	Included	Included	Included	Included
Intercept	- 0.457 (-1.573)	- 0.367 (-1.256)	5.284*** (25.192)	5.280*** (24.749)
Observations	7,540	7,386	7,540	7,386
R ²	7.7%	7.6%	7.1%	7.1%
Wald-chi ²	326.47***	324.13***	333.58***	337.73***

This table reports the results two-stage least squares (2SLS) second stage regression models. Control variables are included as shown in Table 4. Robust standard errors adjusted for clustering at the firm level. Models 1 and 3 use the lagged values of the independent variables as instrumental variables. In Models 2 and 4, an additional instrument (STAT) is used. T-statistics in parentheses. Significance level: *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$, using two-tailed tests. Variable definitions are provided in "Appendix A"

good audit committee, *AC_good*. Specifically, *AC_good* is a dummy variable that takes the value of 1 if the firm's audit committee summary is greater than the sample median and 0 otherwise. In this respect, we construct an audit committee summary measure that is equal to the sum of the above-mentioned three audit committee variables (i.e., a scale ranging from 0 for lowest to 3 for highest). Each audit committee continuous variable is turned into a dichotomous variable that takes the value of 1 if it is greater than the sample median and 0 otherwise. In the second step, the inverse Mill's ratio (IMR) estimated from the probit model in the first step is included as an additional variable in our analyses. Results reported in Table 9, using Heckman's two-step self-selection correction model, are qualitatively similar to those reported under the main analysis, suggesting that our findings are not subject to self-selection bias resulting from the audit committee.

Fourth, to further assure that our results are not subject to the impact of the audit committee, and to address endogeneity concerns, we employ propensity score matching by establishing a treatment group (e.g., firms with *AC_good*) matched to a control group (e.g., firms without *AC_good*). First, we calculate each observation's propensity score using a logit model that predicts the likelihood of the existence of *AC_good* as a function of firm-level and auditor-level characteristics. Then, we employ propensity score matching without replacement, which means that each firm in the control group can only appear and match

Table 9 Two-tier board structure characteristics and KAMs disclosure after controlling for self-selection bias

Variable	(1) KAMs_NUM	(2)KAMs_LENGTH
<i>DUALITY</i>	0.040** (2.189)	0.038*** (2.696)
<i>BRDSIZE</i>	0.003 (0.365)	0.000 (0.049)
<i>BRDIND</i>	- 0.203 (-1.049)	- 0.231 (-1.443)
<i>BRDMEET</i>	0.089*** (4.193)	0.076*** (4.589)
<i>SUPSIZE</i>	- 0.020* (-1.849)	- 0.014* (-1.708)
<i>SUPIND</i>	- 0.090*** (-2.686)	- 0.076*** (-2.988)
<i>IMR</i>	0.430 (0.209)	1.382 (0.686)
<i>Control Variables</i>	Included	Included
<i>YEAR</i> and <i>IND</i>	Included	Included
Intercept	- 0.292 (- 0.141)	6.183*** (3.010)
Observations	10,857	10,857
Adjusted R ²	9.7%	7.3%

This table reports the results after controlling for self-selection bias using inverse Mill's ratio (IMR) estimated by Heckman's two-stage method. Control variables are included as shown in Table 4. Robust standard errors adjusted for clustering at the firm level. T-statistics in parentheses. Significance level: *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$, using two-tailed tests. Variable definitions are provided in "Appendix A"

one firm in the treated group (Ge and Lennox 2011). We retain only those pairs whose scores match within 0.01 (Donelson et al. 2017). Table 10 shows that our results from the propensity score matching technique are consistent and support our previous results.

Fifth, consistent with prior research on the audit committee and disclosure of KAMs (e.g., Abu and Jaffar 2020; Velte 2020; Zhang and Shailer 2022), we expand our models to control for the audit committee attributes, namely, the audit committee size (*ACSIZE*), independence of the audit committee (*ACIND*), and frequency of audit committee meetings (*ACMEET*). These variables are defined in "Appendix A". Our findings, presented in Table 11, hold similar to the main results.

As a final effort to address any possible endogeneity concern, consistent with prior research on corporate governance and disclosure of KAMs (e.g., Chen and Al-Najjar 2012; Florou et al. 2022; Shao 2020), we further expand our models beyond the above-mentioned audit committee attributes by adding three additional control variables that may affect the board structure variables and/or omitted variables. Consistent with the literature on corporate governance and disclosure of KAMs (e.g., Chen and Al-Najjar 2012; Florou et al. 2022; Shao 2020), we control for the financial experience of management members (*MGTEXP*), top 10 domestic auditors (*TOP10*), and concentrated ownership (*CONCOWN*). These variables are defined in "Appendix A". Our results, reported in Table 12, are similar

Table 10 Two-tier board structure characteristics and KAMs disclosure using matching technique

Variable	(1) KAMs_NUM	(2) KAMs_LENGTH
<i>DUALITY</i>	0.048** (2.460)	0.044*** (2.815)
<i>BRDSIZE</i>	0.003 (0.414)	0.003 (0.459)
<i>BRDIND</i>	- 0.275 (-1.318)	- 0.236 (-1.389)
<i>BRDMEET</i>	0.098*** (4.394)	0.081*** (4.711)
<i>SUPSIZE</i>	- 0.021* (-1.870)	- 0.015* (-1.703)
<i>SUPIND</i>	- 0.119*** (-3.354)	- 0.098*** (-3.443)
<i>Control Variables</i>	Included	Included
<i>YEAR and IND</i>	Included	Included
Intercept	- 0.734** (-2.477)	4.819*** (20.195)
Observations	2,024	2,024
Adjusted R ²	9.5%	7.6%

This table reports the results using matched sample of firms with the nearest strong and weak audit committee attributes. Control variables are included as shown in Table 4. Robust standard errors adjusted for clustering at the firm level. T-statistics in parentheses. Significance level: *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$, using two-tailed tests. Variable definitions are provided in "Appendix A"

to the main findings. Collectively, Tables 6, 7, 8, 9, 10 and 11 support our previous findings and suggest that it is unlikely for our findings to be driven by other endogeneity concerns.

Next, as mentioned earlier, the CSA 1504 mandate of the expanded audit report was effective in 2016. There were two phases for compliance with the requirements of CSA 1504 for different types of firms. In the first phase, KAMs disclosure was only by firms cross-listed in the Mainland China A-share market and Hong Kong H-share market (AH firms) for fiscal periods ending on or after December 15, 2016. In the second phase, only firms listed in Mainland China A-shares became required to comply with the CSA 1504 for fiscal years ending on or after December 30, 2017. Our sample includes all non-financial firms listed on the Shanghai and Shenzhen Stock Exchanges from 2017 to 2020. By so doing, our sample includes firms listed in Mainland China A-shares, i.e., excluding the first phase, which is important for our research design to take account of any possible effect that could arise in the first adoption year from transition difficulties (Zeng et al. 2020; Zhai et al. 2021). We, however, rerun our analyses after including the first year in which CSA1504 was effective, i.e., including the first phase starting in 2016 in our sample (91 AH firms). Our results (untabulated for brevity) are qualitatively similar after including the first year of adopting the expanded auditor's report in China. Finally, we account for the potential impact of the COVID-19 pandemic by

Table 11 Two-tier board structure characteristics KAMs disclosure after controlling for audit committee size, independence, and meetings

Variable	(1) KAMs_NUM	(2) KAMs_LENGTH
<i>DUALITY</i>	0.040** (2.200)	0.039*** (2.730)
<i>BRDSIZE</i>	0.003 (0.373)	0.000 (0.051)
<i>BRDIND</i>	- 0.201 (-1.037)	- 0.226 (-1.413)
<i>BRDMEET</i>	0.089*** (4.192)	0.075*** (4.569)
<i>SUPSIZE</i>	- 0.020* (-1.853)	- 0.014* (-1.698)
<i>SUPIND</i>	- 0.090*** (-2.687)	- 0.076*** (-2.982)
<i>ACSIZE</i>	0.000 (- 0.010)	- 0.034 (- 0.920)
<i>ACIND</i>	- 0.126 (- 0.248)	0.194 (0.432)
<i>ACMEET</i>	0.022 (1.368)	0.010 (0.770)
<i>Control Variables</i>	Included	Included
<i>YEAR</i> and <i>IND</i>	Included	Included
Intercept	- 0.752* (-1.646)	4.74*** (11.905)
Observations	10,855	10,855
Adjusted R ²	9.70%	7.30%

This table reports the results after expanding our models to control for audit committee attributes. Control variables are included as shown in Table 4. Robust standard errors adjusted for clustering at the firm level. T-statistics in parentheses. Significance level: *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$, using two-tailed tests. Variable definitions are provided in “Appendix A”

rerunning our examination after excluding 2020 from our analysis. Our results (untabulated) remain similar to those reported in our main analysis.⁹

6 Conclusion

This study adds to ongoing research on the expanded audit reporting by providing evidence on the association between the characteristics of the two-tier board structure (board of directors and supervisory board) and KAMs disclosure by the independent auditor. Using a sample of Chinese listed companies from 2017 to 2020, we find that auditors disclose a larger number of KAMs and provide lengthier content disclosure content for boards of

⁹ Consistent with prior research (e.g., Firth et al. 2007; Cho and Rui 2009), we rerun our main analysis employing the number of meetings without log transformation and obtain consistent results (untabulated for brevity).

Table 12 Two-tier board structure characteristics KAMs disclosure after accounting for financial experience of management members, top 10 domestic auditors, and concentrated ownership

Variable	(1) KAMs_NUM	(2) KAMs_LENGTH
<i>DUALITY</i>	0.043** (2.349)	0.039*** (2.695)
<i>BRDSIZE</i>	0.002 (0.262)	0.000 (- 0.029)
<i>BRDIND</i>	- 0.203 (-1.051)	- 0.228 (-1.440)
<i>BRDMEET</i>	0.085*** (3.997)	0.073*** (4.451)
<i>SUPSIZE</i>	- 0.020* (-1.850)	- 0.014* (-1.715)
<i>SUPIND</i>	- 0.091*** (-2.693)	- 0.078*** (-3.057)
<i>ACSIZE</i>	- 0.001 (- 0.021)	- 0.038 (-1.035)
<i>ACIND</i>	- 0.116 (- 0.230)	0.194 (0.433)
<i>ACMEET</i>	0.022 (1.391)	0.010 (0.747)
<i>MGTEXP</i>	0.026 (1.535)	0.010 (0.798)
<i>TOP10</i>	0.027 (1.624)	0.098*** (7.484)
<i>CONCOWN</i>	- 0.001** (-2.283)	0.000 (- 0.909)
<i>Control Variables</i>	Included	Included
<i>YEAR</i> and <i>IND</i>	Included	Included
Intercept	- 0.702 (-1.538)	4.821*** (12.133)
Observations	10,855	10,855
Adjusted R ²	9.8%	8.1%

This table reports the results after expanding our models beyond audit committee attributes to control for financial experience of management members, top 10 domestic auditors, and concentrated ownership. Control variables are included as shown in Table 4. Robust standard errors adjusted for clustering at the firm level. T-statistics in parentheses. Significance level: *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$, using two-tailed tests. Variable definitions are provided in "Appendix A"

directors characterized by the CEO's dual role and holding more meetings. However, auditors disclose fewer KAMs and less lengthy content of KAMs for supervisory boards characterized by larger size and higher independence. In our further analysis, when we separate the KAMs into account-level KAMs and entity-level KAMs, we find that CEO duality and the board of directors' meeting frequency are positively associated with account-level KAMs. In terms of the supervisory board, our results show that the supervisory board size and independence are negatively related to account-level KAMs. Our further analysis also shows evidence that these two-tier board structure characteristics are associated with the

tone of KAMs disclosure in a consistent fashion. Our robustness tests, addressing endogeneity concerns, yield results that are consistent with those of our main analysis, suggesting that the two-tier board structure characteristics are related to KAMs disclosure.

Collectively, our results make several contributions to the literature on expanded auditor reporting, particularly KAMs disclosure. The empirical evidence provided in this paper should be of interest to regulatory bodies, policymakers, auditors, multinational firms, and users of financial reports considering the rapid growth of China's economy that is gaining global recognition. Furthermore, given that other transitional and emerging markets exhibit some similar characteristics to China (e.g., poor market and legal infrastructure), our findings can be generalized to these countries. Consistent with prior research in the field, this paper is subject to some limitations (for example, we could not obtain the data to examine the influence of supervisory board meetings) that might be viewed as promising avenues for future research.

Appendix A: Variable definitions

Variable name	Definition
<i>Dependent variables</i>	
<i>KAMs_NUM</i>	= The total number of key audit matters disclosed in the key audit matters section of the audit report
<i>KAMs_LENGTH</i>	= Natural logarithm of the total number of Chinese characters in the key audit matters section (i.e., description of KAMs and auditor's response to KAMs)
<i>ACCT_KAMs</i>	= The total number of account-level key audit matters mentioned in the KAMs section of the audit report
<i>ENTITY_KAMs</i>	= The total number of entity-level key audit matters mentioned in the KAMs section of the audit report
<i>KAMs_TONE</i>	= The difference between frequencies of negative and positive words scaled by the total word count of the audit report
<i>Independent variables</i>	
<i>DUALITY</i>	= A dummy variable that equals 1 if the CEO is also the chairman of the board of directors and 0 otherwise
<i>BRDSIZE</i>	= The total number of directors on the board of directors
<i>BRDIND</i>	= The proportion of independent directors on the board of directors
<i>BRDMEET</i>	= The natural logarithm of number of board of directors' meetings
<i>SUPSIZE</i>	= The total number of supervisors on the supervisory board
<i>SUPIND</i>	= The proportion of unpaid supervisors on the supervisory board
<i>Control and instrumental variables</i>	
<i>SIZE</i>	= Natural logarithm of the firm's total assets
<i>AREC_INV</i>	= Sum of accounts receivable and inventory divided by total assets
<i>LOSS</i>	= A dummy variable that equals 1 if the firm's net income is negative and 0 otherwise
<i>AUDFEE</i>	= Natural logarithm of total audit fees paid by the client to the external auditor
<i>FEM_AUD</i>	= A dummy variable that equals 1 if the auditor report is signed by at least one female audit partner and 0 otherwise

Variable name	Definition
<i>IMPR</i>	= A dummy variable that equals 1 if the firm reports any impairment in its assets and 0 otherwise
<i>ROA</i>	= Net income divided by total assets
<i>BIG4</i>	= A dummy variable that equals 1 if the firm is audited by a Big 4 audit firm and 0 otherwise
<i>GCO</i>	= A dummy variable that equals 1 if the auditor issues a going concern modified opinion in the audit report of the previous year and 0 otherwise
<i>CURR</i>	= The ratio of total current assets divided by total current liabilities
<i>LEV</i>	= Total liabilities divided by total assets
<i>CFO</i>	= Operating cash flow divided by total assets
<i>TENURE</i>	= The total number of consecutive years the same audit firm audits a firm
<i>SWITCH</i>	= A dummy variable that equals 1 if the firm changed the audit firm during the year and 0 otherwise
<i>AUDCHANGE</i>	= A dummy variable that equals 1 if the audit partner is changed and 0 otherwise
<i>INTAG</i>	= Intangible assets divided by total assets
<i>NET_DTA</i>	= Deferred tax assets minus deferred tax liabilities divided by total assets
<i>DEF_REV</i>	= Deferred revenues divided by total assets
<i>CLIST</i>	= A dummy variable that equals 1 if the firm is cross listed in Hong Kong Stock Exchange and 0 otherwise
<i>ACSIZE</i>	= The total number of audit committee members
<i>ACIND</i>	= The proportion of independent directors on the audit committee
<i>ACMEET</i>	= The total number of audit committee meetings
<i>MGTEXP</i>	= A dummy variable that equals 1 if current directors, supervisors and senior executives have financial background and 0 otherwise
<i>TOP10</i>	= A dummy variable that equals 1 if a firm is audited by a domestic Top 10 audit firm, and 0 otherwise
<i>CONCOWN</i>	= Percentage of the top ten shareholders' ownership interests in a firm
<i>STATE</i>	= A dummy variable that equals 1 if a firm is a state-owned enterprise (SOE) and 0 otherwise
<i>YEAR</i>	= Year fixed effects indicator variables
<i>IND</i>	= Industry fixed effects indicator variables

Declarations

Conflict of interest None.

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Authors and Affiliations

Emad Noureldeen^{1,5} · Mohamed Elsayed^{2,5}  · Ahmed A. Elamer^{3,6,7} · Jianming Ye⁴

✉ Mohamed Elsayed
m.elsayed@qub.ac.uk

Emad Noureldeen
emad.noureldeen@lancaster.ac.uk

Ahmed A. Elamer
ahmed.elamer@brunel.ac.uk

Jianming Ye
jmye@xmu.edu.cn

- ¹ Management School, Lancaster University, Lancaster, UK
- ² Queen's Business School, Queen's University Belfast, Belfast, UK
- ³ Brunel Business School, Brunel University London, London, UK
- ⁴ Institute for Financial and Accounting Studies, Xiamen University, Xiamen, China
- ⁵ Accounting Department, Mansoura University, Mansoura, Egypt
- ⁶ UNEC Accounting and Finance Research Center, Azerbaijan State University of Economics, Baku, Azerbaijan
- ⁷ Gulf Financial Center, Gulf University for Science and Technology, Mubarak Al-Abdullah Area/West Mishref, Kuwait