Disclosure of Key Audit Matters (KAMs): Auditor Characteristics and the Impact of the COVID-19 Pandemic in Turkey

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ARTICLE INFO	ABSTRACT
	Purpose—This study examines the effects of auditor gender, auditor rotation, and the COVID-19 pandemic on the number of key audit matters (KAMs) and the length of disclosure in Turkey. Understanding the factors affecting the quality of KAM reporting is essential for the transparency of the audit process and the quality of information.
	Design/methodology/approach—The research analyzed the independent audit reports of 194 non-financial companies traded on Borsa Istanbul from 2017 to 2023. Models created based on panel data analysis were tested using the fixed effects method in the Stata program. The study used the number of KAMs (N_KAM) and the length of disclosure (KAM_LEN) as dependent variables.
	Findings - According to the results obtained, auditor gender has a positive and statistically significant effect on the number of KAMs and the length of disclosure. The COVID-19 period has significantly and negatively affected both dependent variables. No statistically significant impact of auditor rotation on the number of KAMs and the length of disclosure was detected.
	Discussion—The findings show that the gender of the auditor can increase the communication power and informativeness of the audit report. On the other hand, pandemic conditions limit KAM disclosures and reduce the informative capacity of the reports. These results offer important implications regarding the function of audit reports in crisis periods.

1. INTRODUCTION

Independent audit reports have a broad impact on evaluating the position of the entities in the financial system, internal control mechanisms, and compliance processes. In this context, audit reports play an essential role in increasing users' confidence in financial information and enabling them to make the right decisions. Therefore, by including more information in the audit report, it is possible to improve communication with the auditor and thus reduce expectations and information gaps between users and auditors (Kitiwong & Sarapaivanich, 2020: 1098). The International Auditing and Assurance Standards Board (IAASB) defines the expectation gap as "the difference between what users expect from the auditor and the financial statement audit and what the audit delivers" (IAASB, 2011). In this context, limiting audit reports to only "unqualified" or "adverse opinion" does not meet users' expectations of the entity and the audit process, thus creating an expectation gap. To reduce this gap, the IAASB issued the International Standards on Auditing (ISAs) in 2015, which regulates the reporting of Key Audit Matters.

Key audit matters (KAMs) are those areas of the audit that, in the auditor's professional judgment, are particularly at risk and should be reported. KAM disclosures enhance the communicative and informative quality of the auditor's report by providing greater transparency about the audit process (BDS 701, para. 2).

Although expanding the scope of audit reports and adding new sections, such as Key Audit Matters (KAMs), provides information, this increase has different implications in the literature. There is evidence that this increase can reduce the information gap (Cordoş & Fülöp, 2015: 130; Pinto & Morais, 2019: 148). On the other hand, some argue that a detailed audit report does not create direct value for information users but has more

of a symbolic meaning (Mock et al., 2013). Vanstraelen et al. (2012) argue that KAMs are only helpful when they contain information that is truly important to users.

Turkey has adopted the Key Audit Matters (KAM) practice and found a wide application area. In this context, the Public Oversight Authority (KGK) translated the ISA 701 standard published by the International Auditing and Assurance Standards Board (IAASB) into Turkish and put it into practice as BDS 701. *BDS 701, Disclosure of Key Audit Matters in the Independent Auditor's Report,* published in the Official Gazette dated March 09, 2017, and numbered 30002, entered into force for the accounting periods starting from January 1, 2017, for listed companies and January 1, 2018, for other companies subject to audit under the Turkish Commercial Code (BDS 701: 1).

Regulation (EU) No 537/2014 of the European Parliament and of the Council regulates the important information that should be included in audit reports. According to the Regulation, the audit report should include the risks of material misstatement, a summary of audit procedures performed to address those risks, and, where appropriate, significant observations (European Parliament & Council, 2014). This disclosure is similar to the Key Audit Matters (KAMs) disclosures required under ISA 701.

In the US, the Public Company Auditing Board (PCAOB) adopted a new audit report standard, AS 3101, on June 1, 2017. This standard requires disclosure of so-called Critical Audit Matters (CAM) in audit reports when the auditor expresses an unqualified opinion (PCAOB, 2017). This regulation is effective as of June 30, 2019, for publicly traded and large-scale companies and December 15, 2020, for other companies. Critical audit matters are those issues where the auditor encounters the most challenging and complex problems, has difficulty obtaining sufficient evidence, or has the most significant difficulty forming an audit opinion (DeFond & Zhang, 2014: 294).

The UK was one of the first countries in the EU to adopt the KAM standard (Fera et al., 2022: 198). The UK Financial Reporting Council (FRC) issued the revised International Standards on Auditing (ISA) 700 in 2013 (FRC, 2022), which has been adopted by all FTSE 100 companies included in the current study sample. When describing the audit process, auditors should provide an overall opinion and clearly indicate which risks were assessed and how they were addressed. They should also indicate in their reports which audit strategies they followed, how they identified the most significant risks, how the audit team was organized, and how resources were allocated.

When issuing the KAMs, auditors should consider the following issues (FRC, 2022: 3):

a)   Areas with a high or significant risk of material misstatement

b)   Accounting estimates that involve a high degree of uncertainty and the auditor's assessment of areas where management makes significant judgments

c)   The effects of significant events or transactions during the period on the audit

In this framework, identifying KAMs enables a more reliable and transparent assessment of financial reports. According to BDS 701, when the auditor is required to express an opinion other than an unqualified opinion, the auditor does not disclose the matter that led to that opinion in the Key Audit Matters section of the report (BDS 701, para. 12).

Revenue recognition is the most frequently addressed topic in KAM disclosures in Turkey (Akdoğan & Bülbül, 2019: 18; Özcan & Günlük, 2021: 22). Similarly, revenue recognition is the most emphasized key audit matter in Chinese and Thai studies (Suttipun, 2020: 33; Zeng et al., 2021: 174). Subsidiary/affiliate in the European Stock Exchange, biological assets in New Zealand, and management override and control in the UK are among the most frequently mentioned KAM issues and differ from other studies (Hategan et al., 2022: 897; Wuttichindanon & Issarawornrawanich, 2020: 566). KAMs may vary by sector and country, which shows that audit processes and risks differ according to each country's economic, legal, and sectoral characteristics.

Studies on KAM in the literature generally examine the factors affecting the number of topics reported (Abdelfattah et al., 2021; Moubarak & Elamer, 2024; Pinto & Morais, 2019; Rahaman et al., 2023; Shao, 2020; Sierra-García et al., 2019; Suttipun, 2020; Wuttichindanon & Issarawornrawanich, 2020; Zhang & Shailer, 2022). Some studies have conducted various research on the readability of the audit report (Bepari & Mollik, 2023; Keskin et al., 2020; Seebeck & Kaya, 2023; Velte, 2020).

COVID-19 caused a global health crisis as a pandemic that emerged in Wuhan, China, in 2019 and spread rapidly worldwide. This process has profoundly impacted both social and economic spheres and has caused significant changes in financial reporting and auditing processes (Albitar et al., 2021: 174-175). The physical restrictions imposed due to the pandemic made it difficult for auditors to be on-site to perform basic audit procedures such as inventory counts, property inspections, plant and equipment, and customer verifications. Quarantine and social distancing measures have made remote auditing mandatory and led auditors to use alternative methods. In this context, the importance of KAM disclosures has increased, and auditors are expected to emphasize the effects of COVID-19 on financial statements more. In this context, identifying and disclosing KAMs is very important for auditors and financial report users. Under extraordinary circumstances such as COVID-19, KAM disclosures may become even more critical, increasing audit transparency and strengthening financial reporting processes. Proper selection and disclosure of KAMs by auditors can make financial reports more reliable and improve companies' sustainability and risk management processes.

This study contributes to the literature by analyzing how KAM reporting is shaped in the context of transparency and informativeness and sheds light on the role of auditor demographics in shaping KAM during crises. One of the pioneering studies that quantitatively assesses the impact of auditors' gender, rotation, opinion, and company size on the number of KAMs and disclosures during a global health crisis provides an important perspective on auditing practices in emerging economies. The study utilizes data from 194 non-financial companies listed on Borsa Istanbul for 2017-2023 and a sample of 1358 company-years. These findings are expected to support stakeholders' decision-making processes and contribute to the development of auditing standards.

2. LITERATURE REVIEW AND RESEARCH HYPOTHESIS

2.1. International Studies

International literature has examined key audit matters, such as auditor characteristics, audit committee, audit quality, audit report delay, etc. Below are some selected studies on auditor characteristics and the COVID-19 pandemic.

Pinto & Morais (2019), using 2016 data of companies traded on the FTSE 100 (UK), CAC 40 (France), and AEX 25 (Netherlands) stock exchanges, found no statistically significant relationship between auditor tenure and leverage ratio and the number of KAMs. However, a positive relationship was found between the number of KAMs and the company's size.

Sierra-García et al. (2019) analyzed the companies' audit reports in the UK FTSE 100 index between 2013 and 2016. They found no statistically significant relationship between auditor rotation, return on assets ratio, BIG4, and the number of KAMs. However, they concluded that the number of KAMs is positively related to firm size and negatively related to the leverage ratio.

Wuttichindanon & Issarawornrawanich (2020), analyzing the 2016-2017 data of companies listed on the Stock Exchange of Thailand, found no significant relationship between auditor gender and the number of KAMs and disclosure length. On the contrary, a positive relationship was found between BIG4 audit firms and the number of KAMs and the length of disclosure.

Shao (2020), using data from listed companies in China between 2016 and 2018, found that female auditors reported more KAMs than their male counterparts. However, there was no difference between genders regarding the length of KAM disclosure.

Abu & Jaffar (2020) examined the 2016 data of 100 companies listed on the Malaysian Stock Exchange and found a positive relationship between company size and leverage ratio and the number of KAMs, but did not find a significant relationship between BIG4 audit firms and the number of KAMs.

Suttipun (2020), using data from 150 companies listed on the Thailand Stock Exchange from 2016 to 2018, found no statistically significant relationship between audit firm rotation, the number of KAMs, and disclosure length. However, a significant negative relationship was identified between the profitability ratio, the number of KAMs, and the length of disclosure.

Abdelfattah et al. (2021) found that the female auditor is positively related to the number of KAMs and the length of disclosure, based on data from the UK for 2013-2017. While there is no significant relationship

between auditor rotation and the number of KAMs and length of disclosures, entity size is positively associated with both variables.

Zhang & Shailer (2022) analyzed 693 company-year data from 2013-2016 in the United Kingdom and found a positive relationship between the number of KAMs and firm size and losses, but no significant relationship between the number of KAMs and leverage ratio and audit firm rotation.

Bepari et al. (2022) analyzed 2017-2018 data of companies listed on the Australian Securities Exchange (ASX 300) and found that female auditors reported more KAMs than their male counterparts.

Hategan et al. (2022), using a sample of companies listed on the primary market of European stock exchanges and covering the years 2019-2020, found no significant relationship between the number of KAMs and auditor rotation.

Fera et al. (2022) identified a negative relationship between the return on assets, leverage ratio, and the number of KAMs in their study using data from 118 companies listed on the Italian Stock Exchange for 2017-2019. On the other hand, they found a positive relationship between company size and the number of KAMs.

Rahaman et al. (2023), in their study analyzing 447 company-year data between 2018 and 2020 at the Dhaka Stock Exchange in Bangladesh, found no statistically significant relationship between auditor rotation, the number of KAMs, and the length of disclosure. In addition, while there is a positive relationship between the number of KAMs and the length of disclosure, there is no relationship between the leverage ratio and the number of KAMs or the length of disclosure.

Murphy et al. (2023), using the data of 205 companies in the UK FTSE 350 between 2018 and 2021, found that having a female auditor decreased the number of KAMs while increasing the KAM disclosure length. While there is no statistically significant change in the number of KAMs during the COVID period, there is an increase in KAM disclosure length. Moreover, no significant relationship was found between the change of auditor and the number of KAMs and the length of disclosure.

Rainsbury et al. (2023) analyzed the change in key audit matters (KAMs) by comparing the 2019 (pre-COVID-19) and 2020 (during COVID-19) audit reports of 50 companies on the New Zealand Stock Exchange. The study found an increase in the amount and length of KAMs in 2020 compared to 2019. It also found that accounting standards for inventories, property, plant, and equipment, impairment of assets, investment property, revenue from contracts with customers, and leases were heavily impacted by COVID-19.

Moubarak and Elamer (2024), using survey data of 235 auditors in Egypt during the COVID-19 period, found that female auditors reported more KAMs than their male counterparts. They also concluded that the number of KAMs increases with the increase in auditors' work experience.

2.2. National Studies

In the national literature, key audit matters have generally been addressed within the theoretical framework and through KAM disclosures in specific years. Empirical studies in this area are limited; some are presented below.

Arzova & Şahin (2020), in their study on financial institutions in BIST for the period covering the years 2017-2018, found that audit firms and auditors' opinions do not significantly affect key audit matters.

Yalçın (2020), in his study covering the years 2017-2019 of 171 enterprises in the manufacturing sector of Borsa Istanbul, found that fewer key audit matters are reported in the independent audit reports when the audit firm is one of the Big Four (BIG4), there is uncertainty about the going concern status of the audited entity, and there is a change in the audit firm.

Varıcı & Kalıpçı Çağıran (2021), in their 2019 study on 39 SMEs in Borsa Istanbul, found that the change of auditor did not have a significant effect on the number of key audit matters (KAMs). They also found a negative relationship between the type of auditor and the number of KAMs, and a positive relationship between the size of the company and the number of KAMs.

Considering the limited number of empirical studies in national literature, this study expands the scope of the literature with its sample size. It is also one of the pioneering studies that quantitatively assesses the effects of

factors such as auditor gender, health crises such as COVID-19, and company size on the number of KAMs and disclosures. In addition, Turkey's auditing practices, as a developing country, provide an example that can contribute to comparisons with other countries.

2.3. Research Hypothesis

2.3.1. Gender

Individual characteristics (such as age, gender, personality and appearance) are important factors that can influence the decisions made during the audit process and the content of audit reports (Church et al., 2008: 75). Although the terms sex and gender are often used interchangeably in the literature, recent studies make a clear distinction between these two concepts. While gender refers to biological characteristics, gender includes social and cultural constructs (Wuttichindanon & Issarawornrawanich, 2020: 568).

Research shows that women tend to be more risk averse than men (Ittonen & Peni, 2012: 2). In addition, women tend to give more importance to cognitive information processing and perform detailed and comprehensive analysis (Gold et al., 2009: 3). Similar findings have been obtained in studies conducted in the accounting and auditing profession (Finkelstein & D'Aveni, 1994). After the Sarbanes Oxley Act (SOX) regulation, female CEOs significantly reduced earnings management, while companies with male CEOs did not see a significant change in this practice (Zalata et al., 2022: 515). This suggests that women take a more risk-averse approach.

Although it has been suggested that female auditors are more risk-averse and ethical, some studies have found no significant behavioral differences between genders in high-profile jobs and leadership positions (Abdelfattah et al., 2021: 177).

To the extent that the detection and disclosure of KAMs is a function of auditors' personal risk attitudes, the gender of audit partners may play an important role in the detection and disclosure of KAMs.

Studies focusing on the impact of audit partner gender on KAM reporting found that female audit partners tend to report more KAMs than their male counterparts (Abdelfattah et al., 2021: 186; Bepari et al., 2022: 412). In another study, having a female auditor decreased the number of KAMs. However, it increased the length of KAM disclosure (Murphy et al., 2023: 13). Moreover, while there is no statistically significant change in the number of KAMs during the COVID period, there is an increase in KAM disclosure length. In this context, the following hypotheses are developed to evaluate the effect of audit partner gender on the number of KAMs and the length of disclosure.

H1: There is a significant relationship between female auditors and KAM.

H1A: A significant relationship exists between female auditors and the number of KAMs.

H1B: A significant relationship exists between the female auditor and the length of KAM disclosure.

2.3.2. Auditor Rotation

Regulators recommend Auditor rotation to protect the auditor's independence and ensure an objective assessment of the financial statements (Chen et al., 2023: 159). Thus, a more objective audit process is expected to be ensured by preventing excessive closeness between the client and the auditor. In addition, proponents of mandatory rotation argue that a new partner brings a fresh perspective to the audit and is therefore more likely to identify and correct financial reporting problems (Lennox et al., 2014: 1783). Auditors auditing clients for the first time may report on more key audit matters and provide more comprehensive disclosures than previous auditors. The main reason is that the new auditor performs a more rigorous examination to better understand the firm's financial structure, internal control mechanisms, and sectoral risks, and tends to address potential risk factors in a broader framework. However, mandatory rotation has been criticized for destroying the client-specific knowledge gained from auditor-client tenure and allowing opinion shopping[1] under the pretext of moving to a more independent auditor (DeFond & Zhang, 2014: 310).

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[1] This term refers to the effort made to apply to different auditors and obtain the desired opinion in order to obtain a certain result. In other words, it describes the process of reaching the desired audit opinion by changing the auditor.

The Sarbanes-Oxley Act of 2002, which was enacted after the Enron scandal, made it mandatory to reduce the rotation period of audit partners from seven years to five years in the US (AICPA, 2003). In Turkey, if an auditor serves for the same company for seven years within ten years, he/she must be replaced and cannot be reappointed until three years have elapsed in the same company (TTK, 2011, para. 400/2). Companies may change auditors in line with strategic decisions, even without a legal obligation. Such mandatory or voluntary auditor changes may affect the auditor's process of obtaining information about the entity. They may change the number of key audit matters (KAMs) and the length of disclosures related to these matters.

Recent studies have not found a significant relationship between auditor rotation and the number of KAMs. A study conducted in the United Kingdom found that auditor rotation is not associated with the number of KAMs and disclosure length (Abdelfattah et al., 2021: 186; Sierra-García et al., 2019: 238). Similarly, a study conducted in Bangladesh found no significant relationship between auditor rotation and the number of KAMs and length of disclosures (Rahaman et al., 2023: 685).

The literature on the effects of auditor rotation on the number of KAMs and disclosure length generally finds no relationship. However, by making a general assessment and considering national dynamics, the following hypotheses are developed:

H2: There is a significant relationship between auditor rotation and KAM.

H2A: There is a significant relationship between auditor rotation and the number of KAMs.

H2B: There is a significant relationship between auditor rotation and the length of KAM disclosure.

2.3.3. Covid-19 Pandemic

The COVID-19 pandemic has significantly impacted global economic conditions and the financial condition of businesses, which is also reflected in the audit process. The emergence of the COVID-19 pandemic has severely affected the work of accountants, auditors, and regulators, who have had to adapt quickly by finding solutions for high-level reporting and auditing standards (Hategan et al., 2022: 886). Significant changes were observed in financial reporting and auditing practices during this period when uncertainties increased. The ability of businesses to continue their operations was questioned (Murphy et al., 2023: 1). The COVID-19 pandemic has accelerated auditors' transition from traditional face-to-face interactions to remote audit procedures, which have led to more complex audits and new challenges in KAM reporting (Albitar et al., 2021: 2).

During the pandemic period, it is predicted that new KAMs may be disclosed in audit reports, changes may occur, and more emphasis will be placed on topic paragraphs (Kend & Nguyen, 2022: 802). A study in Australia observed that KAM topic areas such as asset valuation and revenue recognition were most affected by the COVID-19 pandemic (Kend & Nguyen, 2022: 813). A study of the New Zealand Stock Exchange found an increase in the number and length of KAMs during the COVID period in 2020 compared to the pre-COVID period in 2019 (Rainsbury et al., 2023: 42). It was also found that accounting standards for inventories, property, plant and equipment, asset impairment, investment property, revenue from contracts with customers, and leases have been heavily impacted by the COVID-19 pandemic. A study in the UK FTSE 350 found no statistically significant change in the number of KAMs during the COVID period, while KAM disclosure length increased (Murphy et al., 2023: 13). In this framework, the following hypotheses are developed to evaluate the effects of the COVID period on the number of KAMs and the length of disclosure:

H3: There is a significant relationship between the COVID period and KAM.

H3A: A significant relationship exists between the COVID period and the number of KAMs.

H3B: There is a significant relationship between the COVID period and the length of KAM disclosure

3. RESEARCH METHODOLOGY

3.1. Sample and Variables

The study encompasses 194 non-financial companies that are continuously traded on the BIST in Turkey. Data for the period between 2017 and 2023 was collected from independent audit reports published on the Public Disclosure Platform (KAP), a system supervised, regulated, and open to the public by the Capital Markets

Board of Turkey. This regulatory framework ensures that financial and audit-related information is a standard and reliable source of information.

Financial variables were obtained from the FINNET database. The number of Key Audit Matters (KAM), KAM disclosure lengths, and auditor characteristics were manually extracted from independent audit reports and processed in Excel for systematic analysis. KAM explanation lengths were determined by copying the relevant text into Microsoft Word and using the word count function.

To increase reliability, outliers in the manually collected variables were compared with the original reports and verified for accuracy. Additionally, to control for potential human errors, 20% of the sample was randomly selected and re-examined. Auditor gender information was obtained from the official websites of audit firms and cross-checked on public platforms, such as LinkedIn, to ensure its validity.

The organised data sources, structured recording process, and validation steps applied contribute to the overall validity and reliability of the document analysis. To analyse the research questions, multivariate regression models were applied using Stata software.

Among the 539 companies traded in Borsa Istanbul as of 2023, 152 companies in the financial sector were excluded from the analysis due to differences in financial structure and key sector-specific issues. In addition, companies with incomplete data and newly listed companies that have not yet completed seven years on the stock exchange are also excluded. The final sample consists of 194 companies that meet these criteria. The details of the sample selection are presented in Table 1.

Table 1. Sample

	Total
Borsa Istanbul Companies	539
Minus:	
Companies in the finance (financial) sector	152
	387
Minus:	
Those with incomplete data and new entrants to the stock market	193
Result	**194**

Source: (Borsa Istanbul, 2023)

Table 2 categorizes BIST companies into eight sectors: manufacturing, electricity-gas-water, construction-public works, wholesale-retail, transportation, technology, information-communication, and others. The manufacturing sector has the largest share with 140 companies (69.65 percent), while the technology sector has the second largest share with 16 companies (7.96 percent).

Table 2. Sectors Listed on Borsa Istanbul (BIST)

Sector Name	Number of Companies	Number of Observations	Percentage (%)
Manufacturing	140	420	69,65
Electricity, Gas, and Water	7	21	3.48
Construction and Public Works	5	15	2.49
Wholesale and Retail	13	39	6.47
Transportation	5	15	2.49
Technology	16	48	7.96
Information and Communication	5	15	2.49
Others*	10	30	4.98
Total	201	603	100

*Mining, agriculture, education, vocational, administrative-hotel sectors are included in the other group due to their low number

Table 3 shows the distribution and frequency of Key Audit Matters (KAMs) addressed in audit reports. A total of 2755 KAMs are categorized under different headings. In the study, revenue recognition (24.9%) is the most frequently reported KAM. This is because revenue is a critical element affecting enterprises' financial performance and involves significant uncertainty in accounting estimates. Trade receivables (15.9%) and property, plant, and equipment (14.0%) are the other most frequently reported KAM topics, respectively.

Table 3. Key Audit Matters: Topics, Numbers, and Percentages

Order	KAM Topic	Number of KAM	Percentage (%)
1	Revenue recognition	685	24,9
2	Trade receivables	439	15,9
3	Property, plant, and equipment (IAS 16)	385	14,0
4	Inventories	221	8,0
5	Investment property (IAS 40)	182	6,6
6	Inflation accounting (IAS 29)	144	5,2
7	Intangible assets and goodwill	140	5,1
8	Deferred tax assets	82	3,0
9	Financial liabilities	66	2,4
10	Related party transactions	34	1,2
11	Trade payables	33	1,2
12	Leases standard (IFRS 16) and right of use	33	1,2
13	Business combinations	25	0,9
14	Cash flow hedges	18	0,7
15	Derivative instruments	15	0,5
16	Others	253	9,2
Number of All KAMs		2755	100,0

In 2023, with the introduction of inflation accounting (TMS 29) in Turkey, this issue became more important in audit reports than in previous years. Inflation accounting, which was not addressed at all in previous years, was included in most of the KAMs for 2023 and stood out with a rate of 5.2%. Inflation accounting involves complex accounting processes that require the adjustment of non-monetary assets in the financial statements of entities using fair valuation methods. This arrangement has found wide coverage in audit reports and has shown different characteristics in terms of both implementation and reporting in the literature.

Other prominent items include inventories (8.0%), investment property (6.6%), and intangible assets and goodwill (5.1%). Less frequently reported KAM topics include deferred tax assets (3.0%), financial liabilities (2.4%), and related party transactions (1.2%). Table 4 presents the definitions, reference lists, and data sources of the variables used in the study.

Table 4. Definitions of Variables, Source, and Literature

Variable Name	Definitions	Literature	Data Source
Number of KAM (N_KAM)	Number of key audit matters included in the independent audit report	(Abdelfattah et al., 2021; Abu C Jaffar, 2020; Bepari et al., 2022; Moubarak & Elamer, 2024; Murphy et al., 2023; Pinto & Morais, 2019; Rahaman et al., 2023; Sierra-García et al., 2019; Varıcı & Kalıpçı Çağıran, 2021; Wuttichindanon & Issarawornrawanich, 2020; Zhang & Shailer, 2022)	Obtained manually from audit reports.
KAM Description Length (KAM_LEN	Natural logarithm of the length of disclosure of key audit matters	(Abdelfattah et al., 2021; Murphy et al., 2023; Rahaman et al., 2023; Wuttichindanon & Issarawornrawanich, 2020)	Obtained manually from audit reports.

Auditor Gender (GENDER)	It is a variable that takes the value one if the auditor conducting the audit activity is a woman and zero otherwise.	(Abdelfattah et al., 2021; Bepari et al., 2022; Bepari & Mollik, 2023; Chen et al., 2023; Moubarak & Elamer, 2024; Murphy et al., 2023; Shao, 2020; Wuttichindanon C Issaraworanawanich, 2020)	Obtained manually from audit reports and social networks (LinkedIn).
Auditor Rotation (AR)	It is a variable that takes the value one if the auditor conducting the audit activity has changed compared to the previous year, and zero otherwise.	(Abdelfattah et al., 2021; Bepari & Mollik, 2023; Hategan et al., 2022; Murphy et al., 2023; Rahaman et al., 2023; Sierra-García et al., 2019)	Obtained manually from audit reports.
COVID-19 Pandemic	It is a variable that takes the value 1 for years affected by the COVID-19 Pandemic (2020-2022) and 0 for other years (2017-2019, 2023).	(Alharasis et al., 2024; Moubarak & Elamer, 2024; Murphy et al., 2023; Rainsbury et al., 2023)	Derived from the literature.
Audit Firm Rotation (AFR)	It is a variable that takes the value of one if the entity has changed its audit firm compared to the previous year. and zero otherwise.	(Rahaman et al., 2023; Suttipun, 2020; Varıcı & Kalıpçı Çağıran, 2021; Yalçın, 2020; Zhang & Shailer, 2022)	Obtained manually from audit reports.
Auditor's Opinion (OPIN)	It is a variable that takes the value of one if the auditor's opinion in the independent audit report is not positive (e.g., conditional, negative, etc.) and zero if it is positive.	(Arzova C Sahin, 2020; Ferreira C Morais, 2020)	Obtained manually from audit reports.
Return on Assets (ROA)	Net Income / Total Assets	(Abdelfattah et al., 2021; Alharasis et al., 2024; Bepari et al., 2022; Bepari & Mollik, 2023; Suttipun, 2020; Zeng et al., 2021)	Obtained from the Finnet database.
Leverage ratio (LEV)	Total Liabilities / Total Assets	(Bepari & Mollik, 2023; Pinto & Morais, 2019; Rahaman et al., 2023; Wuttichindanon C Issaraworanawanich, 2020; Zeng et al., 2021; Zhang & Shailer, 2022)	Obtained from the Finnet database.
Big Four Audit Firms (BIG4)	It is a variable that takes the value one if the big four audit firms audit the company and zero otherwise.	(Abdelfattah et al., 2021; Alharasis et al., 2024; Ferreira C Morais, 2020; Rahaman et al., 2023; Wuttichindanon & Issaraworanawanich, 2020; Zeng et al., 2021)	Obtained manually from audit reports.
Loss (LOSS)	It is a variable that takes the value of 1 if the company has made a loss in the current period and zero otherwise.	(Abdelfattah et al., 2021; Bepari & Mollik, 2023; Zeng et al., 2021; Zhang & Shailer, 2022)	Obtained from the Finnet database.
Size (SIZE)	Natural logarithm of the company's total assets	(Abdelfattah et al., 2021; Alharasis et al., 2024; Bepari & Mollik, 2023; Geçici, 2024; Pinto & Morais, 2019; Rahaman et al., 2023; Varıcı & Kalıpçı Çağıran, 2021; Zeng et al., 2021; Zhang & Shailer, 2022)	Obtained from the Finnet database.

Source: Created by the author

In the study, the impact of auditor characteristics and COVID-19 on key audit matters is tested using OLS regression analysis following the literature (Bepari & Mollik, 2023: 1198; Murphy et al., 2023: 11; Pinto & Morais, 2019: 152; Rahaman et al., 2023: 689).

3.2. Research Design

The impact of auditor characteristics and the COVID-19 pandemic on key audit matters (KAMs) was analyzed in Stata using multiple regression analysis. The research models consist of the following variables.

$$N\_KAM_{i,t} = \beta_0 + \beta_1 GENDER_{i,t} + \beta_2 AR_{i,t} + \beta_3 COVID_{i,t} + \beta_4 AFR_{i,t} \\ + \beta_5 OPIN_{i,t} + \beta_6 ROA_{i,t} + \beta_7 LEV_{i,t} + \beta_8 BIG4_{i,t} + \beta_9 LOSS_{i,t} \quad (1) \\ + \beta_{10} SIZE_{i,t} + \varepsilon_{i,t}$$

$$KAM\_LEN_{i,t} = \beta_0 + \beta_1 GENDER_{i,t} + \beta_2 AR_{i,t} + \beta_3 COVID_{i,t} + \beta_4 AFR_{i,t} \\ + \beta_5 OPIN_{i,t} + \beta_6 ROA_{i,t} + \beta_7 LEV_{i,t} + \beta_8 BIG4_{i,t} + \beta_9 LOSS_{i,t} \quad (2) \\ + \beta_{10} SIZE_{i,t} + \varepsilon_{i,t}$$

In the models, N_KAM stands for the number of key audit matters; KAM_LEN stands for the length of disclosure of key audit matters; GENDER stands for auditor gender; AR stands for auditor rotation; COVID stands for the Covid-19 pandemic period; AFR stands for audit firm rotation; OPIN stands for auditor opinion; ROA stands for return on assets; LEV stands for leverage; BIG4 stands for the big four audit firms; LOSS stands for operating loss; SIZE stands for the asset size of the firm; and⊚ stands for the error term.

4. DESCRIPTIVE AND EMPIRICAL ANALYSIS

Descriptive statistics of the variables used in the study are presented in Table 5. The average number of key audit matters (N_KAM) is 2.029, and the median value is 2. At least one and at most seven key audit matters were reported. The disclosure length of key audit matters is 458.351 on average and 415 on median. The minimum value of this variable is 81, and the maximum is 2016. The natural logarithm of KAM disclosure length (KAM_LEN) is calculated as a mean of 5.984 and a median of 6.028.

The proportion of female auditors in the variable representing auditor gender (GENDER) is 12%. In the auditor rotation (AR) variable, 38.7% of the reports had a change of auditor. The COVID variable shows that 42.9% of the data analyzed belongs to the pandemic period. Audit firm rotation (AFR) occurred in 20.7% of the reports, and the auditor's opinion (OPIN) was unfavorable in 6% of the reports.

Among the financial indicators, return on assets (ROA) and leverage ratio (LEV) are calculated as 6.7% and 55.1%, respectively. The Big Four Audit Firms (BIG4), one of the key variables of the study, reveals that these firms audited 52.1% of the sample. It was found that 20.1% of the companies incurred losses (LOSS), while company size (SIZE), a variable calculated by natural logarithm, has a mean value of 20.922 and a median value of 20.803.

Table 5. Descriptive Statistics

Variables	N	Mean	Median	SD	Min.	Max.
Number of Key Audit Subjects (N_KAM)	1358	2.029	2	1.059	1	7
KAM Description Length (number of words)	1358	458.351	415	254.788	81	2016
Natural Logarithm of KAM Description Length (KAM_LEN)	1358	5.984	6.028	.541	4.394	7.609
Auditor Gender (GENDER)	1358	.120	0	.325	0	1
Auditor Rotation (AR)	1358	.387	0	.487	0	1
COVID Pandemic (COVID)	1358	.429	0	.495	0	1
Audit Firm Rotation (AFR)	1358	.207	0	.405	0	1
Auditor's Opinion (OPIN)	1358	.060	0	.237	0	1
Return on Assets (ROA)	1358	.067	.056	.115	-.730	.995

Leverage Ratio (LEV)	1358	.551	.569	.277	.052	4.401
Big Four Audit Firms (BIG4)	1358	.521	1	.499	0	1
Loss (LOSS)	1358	.201	0	.401	0	1
Size (SIZE)	1358	20.922	20.803	2.015	16.206	27.680

Table 6 shows the correlations between variables and VIF values. It is accepted that the correlations between independent variables should not exceed 0.80 to avoid multicollinearity. The study calculated the highest correlation between the independent variables, r=0.631, between auditor rotation (AR) and audit firm rotation (AFR). This correlation does not exceed the 80 percent threshold, indicating no multicollinearity problem among the independent variables. Variance Inflation Factor (VIF) values were also examined to assess multicollinearity. The findings show that the highest VIF value is 1.94, and all variables have VIF values below 5. These results reveal that the independent variables do not cause multicollinearity in the regression analysis (Daoud, 2017: 5).

Table 6. Correlation Matrix and VIF

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	VIF
(1) N_KAM	1.000												-
(2) KAM_LEN	0.779	1.000											-
	(0.000)												
(3) GENDER	0.039	0.074	1.000										1.02
	(0.149)	(0.006)											
(4) AR	0.008	-0.034	-0.019	1.000									1.68
	(0.757)	(0.215)	(0.479)										
(5) COVID	-0.139	-0.137	-0.004	0.008	1.000								1.07
	(0.000)	(0.000)	(0.885)	(0.772)									
(6) AFR	-0.002	-0.012	-0.004	0.631	-0.031	1.000							1.68
	(0.946)	(0.666)	(0.881)	(0.000)	(0.254)								
(7) OPIN	0.005	-0.048	-0.007	0.023	0.002	0.033	1.000						1.04
	(0.856)	(0.075)	(0.799)	(0.394)	(0.947)	(0.231)							
(8) ROA	-0.137	-0.129	-0.010	-0.003	0.186	-0.013	-0.038	1.000					1.94
	(0.000)	(0.000)	(0.701)	(0.908)	(0.000)	(0.645)	(0.159)						
(9) LEV	0.042	0.131	0.059	0.016	0.033	-0.047	0.031	-0.463	1.000				1.40
	(0.125)	(0.000)	(0.031)	(0.549)	(0.220)	(0.082)	(0.247)	(0.000)					
(10) BIG4	-0.208	0.084	0.109	-0.063	-0.003	-0.088	-0.188	0.013	0.187	1.000			1.33
	(0.000)	(0.002)	(0.000)	(0.020)	(0.913)	(0.001)	(0.000)	(0.619)	(0.000)				
(11) LOSS	0.084	0.058	0.052	-0.029	-0.123	-0.016	-0.010	-0.594	0.250	-0.041	1.000		1.58
	(0.002)	(0.033)	(0.054)	(0.282)	(0.000)	(0.560)	(0.714)	(0.000)	(0.000)	(0.132)			
(12) SIZE	0.108	0.298	0.078	-0.058	0.097	-0.060	-0.083	0.007	0.181	0.444	-0.092	1.000	1.29
	(0.000)	(0.000)	(0.004)	(0.033)	(0.000)	(0.026)	(0.002)	(0.805)	(0.000)	(0.000)	(0.001)		

According to the regression analysis results in Table 7, the effects of the independent variables on the number of key audit matters (N_KAM) and the length of disclosure (KAM_LEN) were evaluated. Firstly, the regression model on the number of key audit matters (N_KAM) explains approximately 13% of the total variance in the dependent variable (R^2 = 0.1305). According to the model, auditor gender (GENDER) has a statistically significant and positive effect on the number of key audit matters (N_KAM) (β = 0.173; p = 0.038). Auditor rotation (AR) has no statistically significant effect on the number of key audit matters (N_KAM) (β = 0.064; p = 0.371). The COVID-19 variable has a statistically significant and negative effect on the number of key audit matters (N_KAM) (β = -0.316; p = 0.000).

Table 7. Multiple Regression Analysis Results

Panel: Key Audit Matters

Variables	Number of Key Audits (N_KAM)			KAM Description Length (KAM_LEN)		
	Coef.	*t*	*p-value*	*Coef.*	*t*	*p-value*
Constant	-.367	-1.19	0.236	4.189	26.50	0.000
Auditor Gender (GENDER)	.173	2.07	0.038	.087	2.04	0.042
Auditor Rotation (AR)	.064	0.89	0.371	-.032	-0.87	0.383
COVID-19 Pandemic	-.316	-5.64	0.000	-.171	-5.99	0.000
Audit Firm Rotation (AFR)	-.099	-1.16	0.248	.0231	0.53	0.598
Auditor's Opinion (OPIN)	-.178	-1.54	0.125	-.093	-1.58	0.114
Return on Assets (ROA)	-.871	-2.69	0.007	-.334	-2.02	0.043
Leverage Ratio (LEV)	.041	0.36	0.718	.113	1.93	0.054
Big Four Audit Firms (BIG4)	-.723	-11.68	0.000	-.096	-3.04	0.002
Loss (LOSS)	.038	0.45	0.654	.008	0.18	0.857
Size (SIZE)	.140	9.23	0.000	.090	11.63	0.000
Number of Observations	1358			1358		
Number of Companies	194			194		
F test	21.37			21.45		
Prob>F	0.0000			0.0000		
(Adjusted) R2	0.1305			0.1310		

***, ** and * indicate a significance level of 1%, 5% and 10%, respectively.

Secondly, the regression model on length of disclosure (KAM_LEN) explains approximately 13% of the total variance in the dependent variable (R^2 = 0.1310). In this model, auditor gender (GENDER) has a statistically significant and positive effect on length of disclosure (KAM_LEN) (β = 0.087; p = 0.042). Auditor rotation (AR) has no statistically significant effect on length of disclosure (KAM_LEN) (β = -0.032; p = 0.383). The COVID-19 variable has a statistically significant and negative effect on the length of disclosure (KAM_LEN) (β = -0.171; p = 0.000).

As a result of the regression analysis conducted in this study, the following findings were obtained by testing the hypotheses: Hypotheses H1A and H1B, which address the relationship between the auditor being a woman and KAM variables, were found to be positive, significant, and supported. Hypotheses H2A and H2B, which examine the relationship between auditor rotation and KAM variables, did not find a significant relationship, and therefore, the hypotheses were rejected. Finally, H3A and H3B hypotheses regarding the relationship between the COVID period and KAM variables were found to be negative and significant and were supported.

The additional analysis in Table 8 evaluates the effects on the number of key audit matters (N_KAM) and length of disclosure (KAM_LEN) separately for the COVID-19 period and the standard period. The regression model on the number of key audit matters (N_KAM) explains approximately 8.8% of the total variance in the dependent variable in the standard period and 16% in the COVID-19 period (R^2 = 0.0876; R^2 = 0.1600). In this analysis, we find that auditor gender (GENDER) has a statistically significant and positive effect on the number of key audit matters (N_KAM) in the standard period (β = 0.213; p < 0.10), but this effect is not significant in the COVID-19 period (β = 0.118; p > 0.10). In addition, auditor rotation (AR) has no statistically significant effect on the number of key audit matters (N_KAM) in both periods (Standard Period: β = 0.135; p > 0.10, COVID-19 Period: β = -0.007; p > 0.10).

Table 8. Additional Regression Analysis Results for Standard and COVID Period

	Number of Key Audits (N_KAM)		KAM Description Length (KAM_LEN)	
	Standard Period	Covid Period	Standard Period	Covid Period
	Coef.	Coef.	Coef.	Coef.
Constant	.098	-1.554***	4.390***	3.625**
Auditor Gender (GENDER)	.213*	.118	.116**	.051
Auditor Rotation (AR)	.135	-.007	-.021	-.039
Audit Firm Rotation (AFR)	-.210*	.033	-.017	.075
Auditor Opinion (OPIN)	-.173	-.218	-.060	-.151*
Profitability Ratio (ROA)	-1.068**	-.756*	-.357	-.373
Leverage Ratio (LEV)	.004	.044	.123*	.054
Big Four Audit Firms (BIG4)	-.593***	-.902***	-.041	-.177***
Loss (LOSS)	.051	.021	.015	.004
Size (SIZE)	.115***	.185***	.078***	.112***
Number of Observations	776	582	776	582
F test	9.26	13.30	10.48	11.47
Prob>F	0.0000	0.0000	0.0000	0.0000
(Adjusted) R2	0.0876	0.1600	0.0992	0.1395

***, ** and * indicate a significance level of 1%, 5% and 10%, respectively.

In the regression analysis on KAM disclosure length (KAM_LEN), it explains approximately 9.9% of the total variance in the dependent variable in the standard period and 13.9% in the COVID-19 period (R^2 = 0.0992; R^2 = 0.1395). In this model, auditor gender (GENDER) has a statistically significant and positive effect on the length of disclosure (KAM_LEN) in the standard period (β = 0.116; $p < 0.05$), but this effect is not significant in the COVID-19 period (β = 0.051; $p > 0.10$). Auditor rotation (AR) has no statistically significant effect on disclosure length (KAM_LEN) in both periods (Standard Period: β = -0.021; $p > 0.10$, COVID-19 Period: β = -0.039; $p > 0.10$).

5. CONCLUSION AND DISCUSSION

This study examines the effects of auditor gender, auditor rotation, and COVID-19 on KAM disclosures in Turkey. The research analyzed the data of 194 non-financial companies listed on Borsa Istanbul for the period from 2017 to 2023.

Auditor gender (GENDER) has a positive and statistically significant effect on both the number of key audit matters (N_KAM) and disclosure length (KAM_LEN). This result indicates that female auditors include more key audit matters and have longer disclosures. It can be considered that female auditors conduct a more detailed review process or evaluate risk factors more thoroughly. The relationship between the number of KAMs (N_KAM) and auditor gender is similar to the findings of Abdelfattah et al. (2021), Bepari et al. (2022), Moubarak & Elamer (2024), and Shao (2020), but differs from Murphy et al. (2023) and Wuttichindanon & Issarawornrawanich (2020). The relationship between the length of KAM disclosure (N_KAM) and auditor gender is similar to the findings of Abdelfattah et al. (2021) and Murphy et al. (2023). Still, it differs from those of Shao (2020) and Wuttichindanon & Issarawornrawanich (2020).

Auditor rotation (AR) has no statistically significant effect on the number of key audit matters (N_KAM) and disclosure length (KAM_LEN). This suggests that the auditor change does not affect the reporting behavior on key audit matters. It can be said that auditor rotation is maintained as a standard practice within the framework of the entity's audit policies and procedures. The result of N_KAM and KAM_LEN with auditor rotation is like Hategan et al. (2022), Murphy et al. (2023), Rahaman et al. (2023), Sierra-García et al. (2019), and Varıcı & Kalıpçı Çağıran (2021). The COVID-19 pandemic period has a statistically significant negative effect on the number of key audit matters (N_KAM) and disclosure length (KAM_LEN). It is observed that auditors include fewer key audit matters and their disclosures are shorter during the pandemic period. This suggests

that auditors are more cautious in their reporting processes in uncertain environments or refrain from providing detailed information in certain areas due to uncertainty. Additionally, the remote conduct of audit processes during the pandemic and time constraints may have contributed to this outcome. While the effect of the COVID pandemic on KAM disclosure length (KAM_LEN) is similar to the study of Murphy et al. (2023), it reveals different results in terms of the number of KAMs (N_KAM).

Analyses conducted in both the standard and COVID-19 periods reveal that auditor gender has a significant impact on the length of disclosures, particularly in the standard period; however, this effect becomes less significant in the COVID-19 period. Auditor rotation did not significantly impact the number of key audit matters or disclosure length in either period.

Based on the findings of the study, some managerial conclusions can be drawn to improve the effectiveness of audit processes and the quality of reporting:

- Gender diversity should be encouraged: Based on the finding that female auditors tend to produce more detailed and risk-focused reports, audit firms should increase gender diversity in their teams, which will contribute positively to transparency and openness. Mixed audit teams can produce more balanced and comprehensive assessments with different perspectives.

- Auditor rotation processes should be structured: Although rotation has no significant effect on KAM, it is understood that the risk perceptions of newly appointed auditors are shaped similarly to those of the previous period, or that corporate audit policies are effectively maintained. Therefore, the rotation process should be considered not only as a legal requirement but also as a strong corporate knowledge transfer and pre-assessment process.

- Guidelines should be developed for crisis periods: The cautious approach, information gaps, and time pressure that arise in audit processes during extraordinary circumstances such as pandemics reduce KAM disclosures. Developing practical guidelines and crisis-focused audit frameworks, in addition to audit standards, during such periods can support informed decision-making processes.

- Internal control systems should be strengthened: Businesses must enhance their internal control systems in areas with high risk of error and manipulation, such as revenue recognition, valuation of trade receivables, and measurement of tangible fixed assets, which are the most common issues in KAMs. Ensuring transparency in these areas will both facilitate the audit process and increase stakeholder confidence.

This study contributes to the literature by showing that female auditors provide more detailed explanations and that the level of explanation decreases during extraordinary periods, while also presenting findings that serve as a guide for practitioners. Future studies could expand this literature by examining KAM reporting in different countries and sectors. Additionally, research focusing on psychological and behavioural factors influencing auditors' disclosure behaviour could provide new insights that support the current findings.

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