

Does Gender Matter in Audit? Evidence on Earnings Management and Audit Delay from Croatia

Toni Šušak

University of Split, University Department of Forensic Sciences, Croatia

Ivana Stapić

University of Split, University Department of Forensic Sciences, Croatia

Abstract

Background: There is an expanding body of research on the relationship between auditor gender and earnings management, based on the assumption that female auditors possess specific innate characteristics relevant to external audit quality. **Objectives:** To further existing knowledge, this study examines the moderating effect of audit delay and the difference between post-audit and pre-audit financial reporting quality as direct measures of audit quality and provides insight into opportunities for women in the Croatian audit market. **Methods/Approach:** This analysis used panel regression to estimate the research model and the modified Jones model as a measure of discretionary accruals. **Results:** In addition to highlighting Croatia as the country with the highest female audit partner participation in audit engagements, the analysis revealed that earnings management decreases following an audit conducted by male audit partners. The beneficial impact of female audit partners is documented after the moderating effect of audit delay is included, and during the first year of the COVID-19 pandemic. **Conclusions:** The findings suggest that female audit partners may utilise audit delay more effectively, enhancing oversight during periods of financial distress. At the same time, earnings management is generally reduced in audits conducted by male audit partners.

Keywords: accounting; audit adjustment; audit quality; audit report lag; audit timeliness; coronavirus; earnings quality; gender diversity; manipulation; pre-audit

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Introduction

External audit is considered among the most important corporate governance mechanisms, ensuring the disclosure of reliable financial information to the public. Besides verifying that financial statements comply with accounting standards and relevant national corporate legislation, they should also consider opportunistic activities the management board could undertake to present financial information more favourably to the public, known as earnings management. It could be defined as “the use of managerial discretion for selecting accounting methods and estimates with the intention of manipulating financial reporting outcomes” (Nekhili, Javed & Nagati, 2022, p. 233). This financial topic is marked as “the most challenging, debated and controversial” (Kliestik, Belas, Valaskova, Nica & Durana, 2021, p. 1452).

Despite being within the legal framework, such manipulative activities are often a transitional stage toward committing financial fraud (Perols & Lougee, 2011). Therefore, they sparked significant controversy over the last two and a half decades due to numerous high-profile accounting scandals worldwide (Clarke, 2005; Melis, 2005; Ball, 2009; Tanimura & Okamoto, 2013), which have eroded public trust in management and external auditors. As a burning issue in the contemporary business environment, earnings management is among the most researched accounting topics, and ongoing efforts are aimed at deepening understanding of its influential factors. Previous research suggests that “managers are concerned about their accrual-based earnings management because it can be easily detected by external auditors” (Bhuiyan, Rahman & Sultana, 2020, p. 4). Earnings management is often considered “an inverse proxy for audit quality” (Gandía & Huguet, 2021, p. 2645).

Among auditor's and auditing firm's characteristics that could impact audit quality such as auditor's IQ (Kallunki, Kallunki, Niemi, Nilsson & Aobdia, 2019), auditor's ideology (Goenner, Guo & Notbohm, 2024), auditor's busyness (Goodwin & Wu, 2016; Suzuki & Takada, 2024), auditor's risk tolerance (Pittman, Stein & Valentine, 2023), auditor's industry specialization (Minutti-Meza, 2013; Garcia-Blandon & Argiles-Bosch, 2018), non-audit fees (Lim & Tan, 2008), audit firm's size (Lennox, 1999), audit firm's tenure (Bell, Causholli & Knechel, 2015; Garcia-Blandon, Argilés-Bosch & Ravenda, 2020), gender has attracted substantial attention recently due to “the observable behavioral distinctions between the two genders, specifically in terms of risk aversion, overconfidence, information processing, ethical standards, gender inequality and discrimination within the accounting firms leading ranks (e.g. partnership)” (Mnif & Cherif, 2023a, p. 22).

The specificity of the audit profession lies in the constant equilibration between two seemingly implacable aspects – public and private interests. Auditors play a principal role in the reliability of publicly disclosed financial statements and, consequently, in public trust in corporate financial information. On the other hand, they must consider the profitability of their audit firm, an issue often misaligned with public interest. This could jeopardise the auditor's independence, the most important issue of the audit profession from the perspective of academics and practitioners. In the context of auditor's gender, Hardies et al. (2016) p. 8, in Owusu, Mansour Zalata, Omoteso & Elamer, 2022, p. 816) stated that: “...the behaviour of female auditors is more aligned with the quality-oriented aspect of the audit profession (i.e., serving the public interest), whereas the behaviour of male auditors is more aligned with the revenue-orientated aspect of the profession (i.e., providing good business for their firms)”.

Several goals were specified to make a scientific contribution to research on the relationship between auditor gender and earnings management. The first goal is to examine the moderating effect of audit delay on the basic relationship. The second goal is to apply the audit quality measure – the difference between audited and

unaudited information – for the first time as a measure of audit quality in research on the relationship between auditor gender and earnings management. The third goal is to provide insight into the opportunities for female audit partners in the Republic of Croatia's audit market by comparing it with other countries. The audit market in the Republic of Croatia is characterised by distinctive structural features, given, to the authors' knowledge, the highest participation of female auditors regarding audit partner positions in audit engagements.

No prior research has examined the relationship between auditor gender and earnings management in the Republic of Croatia. Following the approach of most prior research on the relationship between auditor gender and earnings management, the study used a sample of companies listed on the Zagreb Stock Exchange in the Republic of Croatia. However, unlike most other research, this study is conducted in a country with an underdeveloped stock market and a limited legal system. Furthermore, "Croatian economy (...) went through a long period of transition from a centrally planned to market-oriented one and had no preconditions for a greater degree of gender diversity development as some Western European countries had" (Pavić Kramarić, Aleksic & Pejić-Bach, 2018, p. 2). Also, previous research has shown that women hold fewer leadership positions despite being more educated. More precisely, they found that "women entrepreneurs face some difficulties, such as gender barriers" (Jusaj & Abazi-Alili, 2022, p. 213) and that "female graduates in Social Sciences constituted over half of the total PhD graduates each year, with percentages generally increasing over the six years, from 54% in 2016 to 61% in 2020" (Vrdoljak, 2023, p. 139).

Besides its scientific implications, this paper also has important practical implications for individuals responsible for human potential in audit firms regarding the evaluation of auditors' professional efficiency. It is also insightful for policymakers and regulatory bodies considering gender equality in the audit environment. The efforts of the European Union, as outlined in the Gender Equality Strategy 2020-2025 (European Commission, 2020), emphasise the importance of this research. The European Commission presented the Mentioned Strategy in March 2020 and sets objectives such as "closing gender gaps in the labour market" and "achieving equal participation across different sectors of the economy" (European Commission, 2020, pp. 7 and 9).

The research is organised as follows: the second section reviews relevant literature on the relationship between auditor gender and earnings management, as well as the theoretical background used to develop the hypothesis. The third section details the model used to estimate the level of earnings management, as well as the research model and statistical methodology used for estimation. The fourth section presents the results of the statistical analysis, while the fifth section provides an explanation of the results as well as final remarks.

Literature Review

The foundation of research on the relationship between auditor gender and earnings management is "gender-based differences in cognitive information processing, diligence, conservatism, overconfidence, and risk tolerance" (Ittonen et al., 2013, p. 206). "Gender differences may affect corporate reporting practices by causing differences in earnings quality (e.g., conservatism, earnings management)" (Khlif & Achek, 2017, p. 630) and "auditing practices through its effect on audit quality, audit efficiency (audit report lag), audit fees and auditor's attitudes towards risks" (Hardies et al. (2011); Hardies et al. (2015), Montenegro & Bras (2015), in Khlif and Achek, 2017, p. 631). Besides relying on the in-born characteristics, difference in audit quality is also explained by the "glass ceiling" phenomenon according to which "female auditors

are observed to face more difficulties, than do their male counterparts, to attain the leading positions (e.g. partnership) in the public-audit firms, which is regarded as a male-dominated environment worldwide" (e.g. Lennox & Wu, 2018; Garcia-Blandon, Argilés-Bosch & Ravenda, 2019; Hardies et al., 2021, in Mnif & Cherif, 2022, p. 1049), and that is the reason why they must "demonstrate an extra competence than do their male peers" (e.g. Hao et al., 2021, in Mnif & Cherif, 2022, p. 1049).

The most dominant theory used as the theoretical foundation of the previous research is the gender socialisation theory, which implies "that each gender brings different values and traits and that these may produce gendered decisions, judgments and behaviours" (Betz et al., 1989, in Nasution and Jonnergård, 2017, p. 333). According to this theory, "gender identity is established through the socialisation process during childhood" (Shawver & Clements, 2015, p. 558, in Setiawan, 2018, p. 350) and the characteristics attributed to males are "adventurous, assertive, aggressive, independent and task-oriented, whereas females are seen as more sensitive, gentle, dependent, emotional and people-oriented" (Crespi, 2003, p. 5, in Setiawan, 2018, p. 350). Opposing theory is the occupational socialisation theory, which implies that "gender differences related to ethics and values disappear when men and women are socialised within a work environment" (Posner & Munson, 1981; Gomez-Mejia, 1983; Lacy et al., 1983; Harris, 1990, in Owusu et al., 2022, p. 817). Other theoretical foundations mentioned in the research conducted by Soepriyanto, Krisky, Indra, and Zudana (2020) include the selectivity model, psychological theories of risk preferences, and sociological theories, all of which are based on gender differences.

The literature on the relationship between auditor gender and earnings management is mostly in favour of the notion that hiring female auditors reduces earnings management. Conversely, some papers report no significant relationship between those variables or find that male auditors conduct higher-quality audits than their female counterparts. The review of the most relevant research on this topic begins with Niskanen et al. (2011), who are among the pioneers in the research on the relationship between auditor gender and earnings management. While analysing the corporate environment of small and medium Finnish enterprises, they have discovered a positive relationship between auditor gender and earnings management, as measured by absolute discretionary accruals. After dividing the discretionary accruals by their sign, they have found that female auditors exhibit greater conservatism toward income-decreasing accruals. Ittonen et al. (2013) conducted a follow-up study in the Nordic corporate environment, focusing on Finland and Sweden. They have stated that, unlike the authors in the research, their analysis included the sample of companies listed on the stock market. Seemingly, enterprise size matters in this relationship, as the panel regression results showed a negative association between auditor gender and earnings management.

Despite analysing the corporate environment, as in the previously mentioned research, Nasution and Jonnergård (2017) found no statistically significant relationship between auditor gender and earnings management. Also, they enriched their research by including the interactive effect between the auditor's and the chief financial officer's genders, which turned out to be insignificant with respect to earnings management as well. Yang, Liu, and Mai (2018) researched a sample of Chinese listed companies and found that male auditors provided higher audit quality. After dividing the discretionary accruals, there were no significant differences in audit quality between male and female auditors for income-increasing accruals. However, they found significantly higher audit quality among male auditors than among female auditors for income-decreasing accruals. Kung, Chang, and Zhou (2019) conducted their research in the Taiwanese corporate environment, which is specific because joint

auditors are mandated by law. They have found a negative relationship between the lead auditor's gender and earnings management when the lead auditor is a woman, regardless of the joint auditor's gender. Also, their results indicate that corporate incentives to engage in real earnings management rather than accrual earnings management are more substantial when both signing auditors are female. Soepriyanto et al. (2020) used a sample of companies listed on the Indonesian stock market and found no support for the hypothesis that a negative relationship exists between earnings management and the engagement of female auditors.

Pais and Machado (2021) sought to determine whether specific determinants, such as gender, experience, and education, are associated with audit quality using a sample of companies listed on a European stock exchange. Given that their results showed a positive relationship between auditor gender and audit quality, they presume that female auditors have a greater interest in audit quality than in the business of the audit firm. Owusu et al. (2022) researched a sample of companies listed on the British stock market. They investigated the trade-off between real earnings management and accruals-based earnings management by auditor gender. Results of their research indicate that the advantages of engaging female auditors, such as lower accrual earnings management, outweigh the disadvantages, such as increased real earnings management. Nekhili et al. (2022) examined gender diversity in the context of joint audits using a sample of companies listed on the French stock market. Based on the presumption of increased efficiency with higher gender diversity, they found a negative relationship between earnings management and gender-diverse audit partners. Also, their research supports the notion of a negative relationship between rotation from male to gender-diverse audit partners and earnings management.

Mnif and Cherif (2022) examined the moderating effect of audit partners' gender on the relationship between audit quality and auditor workload in a sample of Swedish listed companies. Their results indicate a negative relationship between an auditor's workload and audit quality, but also that this relationship becomes positive when the moderating effect of a female audit partner is included in the analysis. They corroborate the notion that female audit partners "have more tendency, as compared to their male counterparts, to preserve their partnership's position in the public-audit firms" (Mnif & Cherif, 2022, p. 1047). Mnif and Cherif (2023a) continue their research on female audit partners by analysing the relationship between their presence and accruals quality, using a sample of Swedish listed companies. They have also analysed the effects of auditor change and the specific attributes of female audit partners and concluded that their mere presence benefits the company's accrual quality. Mnif and Cherif (2023b) also examined the relationships among audit quality, female audit partners, and female participation on audit committees in a sample of companies listed on the Swedish stock market. Among other conclusions, their results indicated a positive influence of a female audit partner on the relationship between audit quality and female directorship in the audit committee, as well as that the positive relationship between audit quality and a female auditor is not dependent on the audit committee's gender composition.

Table 1 shows that the percentage of female auditors in relevant research on the relationship between earnings management and auditors' gender ranged from 8.6% to 23% in Europe. In contrast, in two papers based on Chinese and Taiwanese samples, the percentage was higher. Male auditors dominated these research samples, despite the research being primarily conducted in countries ranked among the top 5 of the 2023 Global Gender Gap Index (World Economic Forum, 2023). The Republic of Croatia was ranked 55th.

Table 1

Review of Female Auditor Representation in the Relevant Research

Author(s)	Time period	Sample companies	Female auditors (%)	Country's Global Gender Gap Index 2023 ranking
Niskanen et al. (2011)	1999-2006	Finnish private firms	21.1%	3 rd
Itonen et al. (2013)	2005-2007	Nordic stock market (Finland and Sweden)	11.81%	3 rd (Finland) 5 th (Sweden)
Nasution & Jonnergård (2017)	2008-2013	Swedish stock market	11%	5 th
Yang et al. (2018)	2010-2019	Chinese stock market	25.08% 35.32%**	107 th
Kung et al. (2019)	2010-2016	Taiwanese stock market	38.3% 34%**	n/a
Soepriyanto et al. (2020)	2010-2016	Indonesian stock market	11.7%	87 th
Pais & Machado (2021)	2015-2017	European stock market	8.6%	n/a
Owusu et al. (2022)	2009-2016	British stock market	9%	15 th
Nekhili et al. (2022)	2009-2016	French stock market	20.15%**	40 th
Mnif & Cherif (2022)	2010-2018	Swedish stock market	14.7%	5 th
Mnif & Cherif (2023a)	2010-2019	Swedish stock market	23%	5 th
Mnif & Cherif (2023b)	2010-2019	Swedish stock market	20%	5 th

**Yang et al. (2018), Kung et al. (2019), and Nekhili et al. (2022) carried out their research in environments where the legislation had required joint audits. Audit environments in some countries are specific – for instance, Yang et al. (2018) stated that “the second signed auditor (...) participated directly in the scene audit work of the audit items, is the first gatekeeper of audit risk control, has the greatest and most direct effect on the quality of the audit report, and is directly responsible for the audit risk” (p. 332).

Source: Authors' creation using papers included in the literature review and Global Gender Gap Index 2023 rankings from the World Economic Forum (2023).

In addition to analysing the relationship between auditor gender and earnings management, this research also includes audit delay as a moderating variable. Empirical evidence in the existing literature has supported the claim of a higher audit lag in audit engagements conducted by female audit partners (Ocak & Ozden, 2018; Hao et al., 2022, in Mnif & Cherif, 2023b). Possible explanation is “that female auditors, theorized as more risk averse, more conservative in finance-related concerns and have higher ethical norms, are likely to invest more effort (e.g., conduct additional audit tests and procedures), which leads to audit reporting delays longer” (Mnif & Cherif, 2023b, p. 6). Given their distinctive innate characteristics, it is likely that female auditors will utilize an additional period of audit delay more effectively than their male counterparts. Also, this research includes unaudited financial information that is rarely publicly disclosed, and comparing its value to that of audited financial information is considered “the most direct evidence on whether auditing has value” (DeFond & Zhang, 2014, p. 292). Taking that into account, the corporate setting of the Republic of Croatia can be considered unique because of the public availability of unaudited financial statements for companies listed on the stock market, which constitutes an additional scientific contribution of this research.

Considering the research goals and the notions from previous research, research hypothesis is established as follows:

H₁: There is a statistically significant negative moderating effect of audit delay on the relationship between female audit partners and the difference between post-audit earnings management and pre-audit earnings management.

Methodology

Research sample description

Similar to the approach used in Filipović, Bartulović, and Šušak (2022) and Šušak, Pavić, Kramarić, and Bartulović (2023), the entire population of public limited companies listed on the Zagreb Stock Exchange in the Republic of Croatia on 27th September 2022 (a total of 92 companies) was considered to be potentially included in the final research sample because the unaudited financial data, whose public disclosure according to DeFond and Zhang (2014) is rare, had to be made publicly available by these entities. Financial companies belonging to the sector K – Financial and insurance activities (17 companies) of the National Classification of Activities (Decision on the National Classification of Activities, 2007) were omitted from the sample, considering the differences regarding financial reporting that banks, insurance companies, funds, etc. have in comparison to other sectors.

Also, only activities with six or more observations were included in the sample because this is a prerequisite for calculating the modified Jones model (DeFond & Jiambalvo, 1994; Subramanyam, 1996, in Yang & Krishnan, 2005). Finally, companies with missing data were omitted from the sample, resulting in a final sample of 60 companies for the period from 2013 to 2021 (totalling 499 observations). Unbalanced panel data were constructed from manually collected information in publicly disclosed independent auditors' reports and annual financial statements. Data on gender refers to the gender of the audit engagement partner whose signature appears in an independent auditor's report. There were 26 observations in which two audit partners were engaged in an audit of a company. Mixed-gender auditor groups (17 observations) were excluded from the sample, and same-gender auditor groups (3 observations for all-male auditors and 6 for all-female auditors) were included in the analysis.

Earnings management measurement

The level of earnings management for audited and unaudited financial information was estimated with discretionary accruals calculated with presumably the most popular model, the modified Jones model, using the equation (Lobo & Zhou, 2001):

$$TACC_{it} = \alpha_1(1/A_{it-1}) + \alpha_2(\Delta REV_{it} - \Delta REC_{it}) + \alpha_3PPE_{it} + e_{it} \quad (1)$$

Where:

- "TACC_{it} = total accruals for firm i in year t divided by total assets for firm i at the end of year t-1;
- ΔREV_{it} = change in revenue for firm i in year t divided by total assets for firm i at the end of year t-1;
- ΔREC_{it} = change in net receivable for firm i in year t divided by total assets for firm i at the end of year t-1; and
- PPE_{it} = property, plant and equipment for firm i in year t divided by total assets for firm i at the end of year t-1" (Lobo & Zhou, 2001, p. 7).

Total accruals were calculated as the difference between net profit and cash flows from operations. “The Jones model is separately estimated for each industry (...) and year combination. (...) A measure of discretionary accruals is obtained as an error term from the estimated Jones model” (Niskanen et al., 2011, p. 781). Following the approach in previous research (Warfield et al., 1995; Gabrielsen et al., 2002; Barth et al., 2008, in Orazalin, 2020), absolute discretionary accruals were utilised, which are negatively correlated with financial reporting quality (Kim & Jeong, 2018).

Research model and statistical methods

The following regression model was generated for hypothesis testing:

$$\Delta aDA_{i,t} = \beta_0 + \beta_1 * GEND_{i,t} + \beta_2 * AUDEL_{i,t} + \beta_3 * GEND * AUDEL_{i,t} + \beta_4 * BIG4_{i,t} + \beta_5 * SALES_{i,t} + \beta_6 * LOSS_{i,t} + \beta_7 * ROA_{i,t} + \beta_8 * CFI_{i,t} + \beta_9 * LEV_{i,t} + \beta_{10} * SIZE_{i,t} + e_{i,t} \quad (2)$$

and the variable descriptions are included in Table 2.

Table 2
Variable description

Variable name	Variable code	Variable description	Variable calculation	Data source
Absolute discretionary accruals difference	ΔaDA	Difference between post-audit and pre-audit earnings management	$aDA_{aud} - aDA_{unaud}$	Concept based on Defond and Zhang (2014)
Post-audit absolute discretionary accruals	aDA_{aud}	Absolute value of discretionary accruals calculated with audited financial data	Estimation with the modified Jones model	Concept based on Defond and Zhang (2014)
Pre-audit absolute discretionary accruals	aDA_{unaud}	The absolute value of discretionary accruals was calculated with unaudited financial data	Estimation with the modified Jones model	Concept based on Defond and Zhang (2014)
Auditor gender	GEND	Dichotomous variable denoting the auditor's gender	1 = male; 0 = female	Pais and Machado (2021)
Audit delay	AUDEL	Duration of the period auditors use to create an independent auditor's report	Number of days passed from the 1 st January to the date of public disclosure of an independent auditor's report	Measure used in Mnif and Cherif (2023a) with modification
Big Four	BIG4	Dichotomous variable denoting affiliation of an audit firm to the Big Four	1 = audit firm affiliated to the Big Four; 0 = other audit firms	Niskanen et al. (2011)
Sales growth	SALES	The sales growth that the company achieved in the observed year	$(Sales\ in\ year\ t - sales\ in\ year\ t-1) / sales\ in\ year\ t-1$	Nasution and Jonnergård (2017)

Loss in a financial year	LOSS	A dichotomous variable denoting whether a company generated a loss in a financial year	1 = company had a loss; 0 = company did not have a loss	Mnif and Cherif (2022); Mnif and Cherif (2023a)
Return on assets	ROA	The profitability that the company achieved in the observed year	Net profit/total assets	Yang et al. (2018)
Cash flows	CF	Cash flows that the company achieved in the observed year	Operating cash flows/total assets	Soepriyanto et al. (2020)
Leverage	LEV	Short-term and long-term liabilities that the company had in the observed year	(Short-term liabilities + long-term liabilities)/total assets	Kung et al. (2019)
Company size	SIZE	Company size in the observed year	Natural logarithm of total assets	Owusu et al. (2022)

Source: Authors' work

Following the notion that “the most direct evidence on whether auditing has value comes from comparing the value of audited versus unaudited financial reports” (Defond & Zhang, 2014, p. 292), the difference between the absolute value of discretionary accruals calculated with audited financial data and the absolute value of discretionary accruals calculated with unaudited financial data was utilized as a dependent variable. A dichotomous variable denoting the gender of the audit partner was used as a test variable, as well as the measure of audit delay. The interaction effect between the variables gender of the audit partner and audit delay was included, following the notion in the last chapter of the literature review that differences in auditor gender characteristics could affect audit delay duration (Mnif & Cherif, 2023b). Thus, it is presumed that female auditors will utilize an additional time period of audit delay more effectively than their male counterparts.

Several control variables frequently used in previous research on earnings management and gender (Niskanen et al., 2011; Nasution, & Jonnergård, 2017; Yang et al., 2018; Kung et al., 2019; Soepriyanto et al., 2020; Owusu et al., 2022; Mnif & Cherif, 2022; Mnif & Cherif, 2023a) were incorporated to make the model more reliable – audit firm size (BIG4), sales growth (SALES), financial result (LOSS), profitability (ROA), cash flow (CF), leverage (LEV) and company size (SIZE). In accordance with the reputation hypothesis which presumes higher audit quality of the Big Four auditors (Mnif & Cherif, 2022) on the one side, and the previous research corroborating that “companies who are audited by one of the Big 4 auditors are less likely to manage earnings” (e.g. Becker et al., 1998; Francis et al., 1999; Van Tendeloo & Vanstraelen, 2008; Francis & Wang, 2008, in Soepriyanto et al., 2020, p. 310) on the other side, the sign of a regression coefficient for the relationship between audit firm size and the dependent variable is not presumed. Due to the more intense scrutiny larger companies undergo (Soepriyanto et al., 2020), it is expected that auditors will have less need to intervene in financial statements, thereby supporting the positive relationship with the dependent variable. Leverage was included because of the higher “motivation of earnings management by firms with a higher possibility of breaching debt covenants” (Soepriyanto et al., 2020, p. 310), and, thus, the prediction of a negative relationship with the dependent variable is made. More profitable firms are „less likely to engage in earnings manipulation“ (Lee et al. 2019, in Nekhili et al., 2022, p. 240), so the positive relationship with return on assets and the negative relationship with the loss variable

are expected. Since the „firms with lower cash flows are more likely use the discretionary accrual to cover the weakness“ (Soepriyanto et al., 2020, p. 310) and „manage revenues to avoid consequences from publishing poor numbers“ (Francis & Yu, 2009, in Mnif & Cherif, 2023a, p. 9 and 10), the positive relationship with the dependent variable is expected.

A panel model was estimated to support the decision to accept the hypothesis. For statistical analysis, R language and environment for statistical computing (R Core Team, 2025) was utilized along with specific R packages – the plm Package (Croissant & Millo, 2008; Croissant & Millo, 2018), the stargazer (Hlavac, 2022), lm test (Zeileis & Hothorn, 2002) and the car package (Fox & Weisberg, 2019), as well as PAST 4.03 (Hammer, Harper & Ryan, 2001). During estimation, several additional tests for selecting an appropriate model – cross-sectional dependence, serial correlation, and heteroskedasticity – were conducted (e.g., the Hausman test, the Pesaran CD test, the Breusch-Godfrey/Wooldridge test, and the Breusch-Pagan test). Based on the Hausman test results, the fixed-effects regression model was selected. After conducting the aforementioned tests, the conclusions regarding the hypothesis remained the same.

Results

Table 3 presents descriptive statistics for the variables included in the model. Several measures of descriptive statistics utilised in the study by Pavić Kramarić, Pejić Bach, Dumičić, Žmuk, and Mihelja Žaja (2018) are included in this study. The difference between the absolute values of discretionary accruals in audited and unaudited financial data was negative, indicating that, on average, the level of earnings management decreased after financial information was audited. The value of audit delay indicates that the independent auditor reports were, on average, publicly disclosed in the second half of April. As shown in Table 3, the number of observed enterprises varies across years because some observations were omitted due to missing data.

Table 3
Descriptive Statistics

Variable	N	Min	Max	Mean	Stand. dev
Δ aDA	473	-0.27	0.21	-0.002	0.03
AUDEL	463	43	320	111.13	36.92
BIG4	463	0	1	0.55	0.50
SALES	479	-0.99	36.93	0.17	1.83
LOSS	489	0	1	0.32	0.47
ROA	489	-2.44	0.40	-0.0002	0.15
CF	489	-1.05	0.66	0.05	0.10
LEV	489	0	2.32	0.44	0.28
SIZE	489	17.53	23.98	20.28	1.26

Note: $p < 0.1$; $p < 0.05$; $p < 0.01$

Source: Authors' work

Table 4 presents the number of male and female audit partners who conducted independent external audits annually across the entire research sample over the 9 years from 2013 to 2021. The table's last line shows that female audit partners accounted for nearly the same share as male audit partners (46.24%). During the period from 2014 to 2016, female audit partners were in the majority, and in 2017 and 2018, they were represented equally with their male counterparts. Representation

changed in the auditor's reports disclosed during the COVID-19 crisis, when male audit partners constituted the majority. The comparison with other countries in Table 1 indicates that the circumstances in the Croatian audit market are distinctive. As shown in Table 4, the number of enterprises varies by year due to missing observations.

Table 4
Descriptive Statistics – Audit Partners' Gender

Year	Observations	Male	%	Female	%
2013	41	25	60.98	16	39.02
2014	48	23	47.92	25	52.08
2015	44	20	45.45	24	54.55
2016	49	23	46.94	26	53.06
2017	52	26	50.00	26	50.00
2018	54	27	50.00	27	50.00
2019	54	31	57.41	23	42.59
2020	54	35	64.81	19	35.19
2021	56	33	58.93	23	41.07
Total	452	243	53.76	209	46.24

Source: Authors' work

Table 5 presents the correlation coefficients among the independent variables in the research model. The variance inflation factors for the same variables are reported in Table 6. Given that the values of 0.7 for correlation coefficients (Pallant, 2007, in Orazalin, 2020; Pavić Kramarić, Miletić and Kožul Blaževski, 2019) and 4 for variance inflation factors (Kuang, 2008) are considered as thresholds and that the highest statistically significant absolute value of correlation coefficient among independent variables is 0.49 and that the highest value of variance inflation factor is 1.63, the absence of the multicollinearity problem could be stated.

Table 5
Correlation Matrix

	GEND	AUDEL	BIG4	SALES	LOSS	ROA	CF	LEV	SIZE
GEND	1								
AUDEL	0.0002	1							
BIG4	0.39***	0.05	1						
SALES	0.06	-0.02	0.07	1					
LOSS	-0.04	0.25***	-0.10**	0.02	1				
ROA	0.05	-	0.07	0.04	-	1			
		0.33***			0.45***				
CF	0.03	-	0.03	0.04	-	0.49***	1		
		0.25***			0.36***				
LEV	-0.03	0.25***	-0.10**	-0.01	0.23***	-	-	1	
						0.33***	0.21***		
SIZE	0.24***	-	0.44***	-0.01	-	0.11**	0.25***	0.02	1
		0.27***			0.19***				

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Source: Authors' work

The results of the panel analysis utilised to calculate regression coefficients required for hypothesis testing are shown in Table 6. The results indicate that earnings management is lower by 0.041 after an audit conducted by male audit partners, compared to pre-audit earnings management. In contrast, earnings management is higher after audits conducted by female audit partners. The effects observed for male

audit partners in the regression model were reversed in the case of female audit partners. When the audit delay variable is included, an audit conducted by a male audit partner results in a difference of 0.0003 per day of delay. In contrast, for female audit partners, audit delay is associated with a proportional reduction in earnings management.

Table 6
Multivariate Regression Analysis with Variance Inflation Factors

Dependent variable:	Δ aDA	VIF
GEND	-0.041*** (0.014)	1.187399
AUDEL	-0.0002** (0.0001)	1.313883
BIG4	-0.007 (0.006)	1.524498
SALES	-0.001 (0.002)	1.016187
LOSS	-0.013*** (0.005)	1.317012
ROA	-0.077*** (0.015)	1.629836
CF	0.070*** (0.022)	1.431901
LEV	-0.036*** (0.011)	1.212941
SIZE	0.006 (0.007)	1.511357
GEND*AUDEL	0.0003*** (0.0001)	-

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Source: Authors' work

Several control variables are statistically significantly related to the difference in the absolute values of discretionary accruals between audited and unaudited financial data. A positive relationship was found with operating cash flows (CF), while negative relationships were found with loss in a financial year (LOSS), return on assets (ROA), and leverage (LEV). Except for the return on assets variable, these results are in line with expectations.

Table 7 presents robustness analyses conducted using the original Jones model (Orazalin, 2020). The statistical significance and signs of the regression coefficients estimated with the Jones model, as part of the robustness analysis, are similar to those estimated with the modified Jones model. Consequently, the previously drawn conclusions regarding statistically significant variables are reinforced. The results indicate that earnings management is lower by 0.031 after an audit conducted by male audit partners, compared to pre-audit earnings management. In contrast, earnings management is higher after audits conducted by female audit partners. When the moderating effect of the audit delay variable is included, an audit conducted by male audit partners results in a difference of 0.0002 for each day of delay. Audit delay has the opposite effect for the female audit partners, i.e. earnings management decreases with the same intensity for every day of audit delay. Several control variables are found to be statistically significant in explaining the difference between the absolute values of discretionary accruals in audited financial data and those in unaudited financial data. A positive relationship was found with operating

cash flow (CF), whereas negative relationships were found with loss in a financial year (LOSS), return on assets (ROA), and leverage (LEV).

Table 7

Robustness Analysis

Dependent variable:	Δ aDA
GEND	-0.031** (0.014)
AUDEL	-0.0002** (0.0001)
BIG4	-0.008 (0.006)
SALES	-0.001 (0.002)
LOSS	-0.009* (0.005)
ROA	-0.070*** (0.015)
CF	0.057*** (0.022)
LEV	-0.044*** (0.011)
SIZE	0.005 (0.008)
GEND*AUDEL	0.0002*** (0.0001)

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Source: Authors' work

Given that the analysis timeframe covers the COVID-19 pandemic crisis period, an additional regression analysis was conducted to determine whether auditor gender influences firms' opportunistic practices in such environments. The regression analysis is not included in the research for brevity. Following the approach used by Šušak, Pavić Kramarić & Bartulović (2023), the impact of COVID-19 was analysed separately for each of the three years in which external audits were conducted. Results show that earnings management in audited financial statements decreased on average by 0.021 relative to unaudited financial statements during audits conducted in 2020, the first year of the COVID-19 pandemic. In the following year, the results were in the opposite direction – earnings management in audited financial statements was, on average, 0.016 higher than in unaudited financial statements. The coefficient in the third year was not statistically significant. When the interaction variable between auditor gender and COVID-19 was included, results showed that the earnings management is lower on average by 0.021 after female audit partners carry out an audit compared to pre-audit earnings management, but only during the first year of COVID-19, in which audits were conducted on the financial statements for the financial year 2019. For the two remaining years, the results were not statistically significant.

Discussion and conclusion

The results support the research hypothesis, indicating that additional time period, i.e. audit delay, was utilised more efficiently in the audits carried out by the female audit partners in terms of decreasing earnings management compared to audits carried

out by their male counterparts, in which earnings management, on average, increased for each additional day of audit delay. This aligns with a robust body of theory suggesting that female auditors have specific innate characteristics and face more barriers in the labour market, which makes them generally more diligent than their male counterparts. It could also be assumed that male audit partners allocate additional time to maximising audit firms' revenues, as Hardies et al. (2016) and Owusu et al. (2022) suggest.

Conversely, when the basic relationship is considered, the results are contrastive: earnings management was reduced in audits conducted by male audit partners, whereas it increased in audits conducted by female audit partners. This aligns with the findings of Yang et al. (2018), who also found that male auditors provided higher audit quality. Results indicate that, despite the undisputable fact that "the importance of promoting gender equality to advance women's participation in independent auditing cannot be overstated" (International Federation of Accountants, 2024), the results highlight the importance of balancing diversity initiatives with performance-based criteria in the audit profession.

Considering the statistically significant results for the other variables in the model, they were in line with expectations, except for the return on assets variable. A higher level of cash flows decreases managerial motivation to engage in earnings management, as well as independent auditors' professional scepticism regarding clients' financial reporting and the need for audit adjustments. Conversely, negative financial results and higher leverage increase managerial incentives to engage in earnings management, as well as independent auditors' professional scepticism regarding clients' financial reporting and the need for audit adjustments due to a higher level of earnings management. The discrepancy between results and expectations in the case of return on assets could be due to the susceptibility of profitability to manipulation. Higher profitability could result from financial manipulation, suggesting a greater need for an auditor to intervene in the financial statements.

Additional analysis of the relationship between auditor gender and earnings management during the COVID-19 pandemic has shown that audits conducted during the first year of the pandemic were more effective in terms of audit adjustments and reduced earnings management, with this effect even more pronounced in audits conducted by female auditors. In these audits, the effect of reduced earnings management was twice as significant as in audits conducted by male auditors, where the positive effect of the COVID-19 crisis on audit quality was cancelled out. This is in line with the findings of the research conducted by Šušak, Pavić Kramarić & Bartulović (2023, p. 41), whose "findings indicated that the presence and higher share of female directors on management boards were beneficial for curtailing earnings management but only for the financial statements disclosed during the first year of the COVID-19 pandemic". These results corroborate the beneficial impact of women on the quality of financial reporting during financial crises, both as part of top management responsible for preparing financial statements and as part of the external oversight mechanism responsible for verifying the reliability of financial information.

Generally, research on the relationship between auditor gender and earnings management is fundamental, given the "glass ceiling" problem female auditors face worldwide and the European Union's efforts toward gender equality. In that context, this paper is valuable in several ways. It deepens existing research on the relationship between auditor gender and earnings management by including audit delay as a moderating variable, providing insight into the capacity of auditors of different

genders to utilise the available audit delay time efficiently. Due to the atypical availability of unaudited financial data in the Republic of Croatia, the dependent variable in this research is the difference between post-audit earnings management and pre-audit financial statements, which provides more precise insight into the effects of the audit process on earnings management. Furthermore, the Republic of Croatia is a specific audit environment, with high female audit partner participation in audit engagements, who are almost equally represented as male audit partners. When considering other countries used as a research sample in the papers on the relationship between auditor gender and earnings management included in the literature review, even those with high gender equality such as Sweden which "is categorised as a feminine society where individuals are encouraged to strive for quality of life rather than material success" (Nasution & Jonnergård, 2017, p. 346), the percentage of female participation is not even close to its level in the Republic of Croatia, which renders the environment valuable in terms of additional insights to the existing research. The importance of research is even higher considering that the results of the previous research were inconclusive, and the concerns raised by Soepriyanto et al. (2020), "that the positive traits of female top managers may not transmit to the overall audit process" because of the small proportion of female audit partners in their research sample (p. 305). Taking everything into account, the Croatian audit market could be considered encouraging in terms of the appointment of female audit partners compared to other countries.

The data are somewhat paradoxical given that Croatia is not even near the top-ranked countries of the Global Gender Gap Index 2023 rankings (World Economic Forum, 2023), which were corporate environments analysed in the majority of previous research, and that its economy did not have "preconditions for a greater degree of gender diversity development as some Western European countries" (Pavić Kramarić, Aleksic & Pejić-Bach, 2018, p. 2). Partly, the earlier research samples' time periods could be cited as a reason, but the research perspective that included later time periods did not shift drastically. This suggests that the positive impact of female auditors on earnings management was mainly observed in countries with lower female auditor participation. In contrast, in countries with higher participation, this effect was generally inapplicable. There are many potential explanations for this finding, which should be thoroughly researched in the future. Conceivably, female auditors in developed countries such as Sweden and Finland undergo more rigorous selection, resulting in the appointment of high-achieving female auditors with more pronounced positive innate female-specific traits and considerably higher efficiency than the rest of the female auditor population. To gain additional insight into this question, future research should use performance-matched samples of audit partners. For instance, the equal percentages of the most efficient male and female auditors, as well as their earnings management, should be included in a sample and compared.

This research also has several limitations. Firstly, the research is conducted using data from only one country, limiting its generalizability. Given that this is the case in most previous research on auditor gender and earnings management, future research should utilise samples from multiple countries. Generalisation to the broader Croatian context is also limited by potential differences in characteristics between non-listed and listed enterprises, as observed in the study. Furthermore, earnings management is not directly observable, and different constructs are used to measure it. Although the measures used in this research are among the most popular, they also have certain shortcomings. Thus, alternative measures could be used in future research to strengthen these conclusions. Also, the sample of this research included

companies listed on the stock market, following the predominant approach in this kind of research. Future research could include more small and medium enterprises in the sample to determine whether differences are driven by company size. However, the availability of unaudited financial data for these companies could pose an obstacle.

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About the authors

Toni Šušak, PhD, M. Econ., M. Law is an Assistant Professor at the University of Split, University Department of Forensic Sciences. He received his master's degree in economics from Faculty of Economics Split, as well as Master's degree in Law from Faculty of Law Split and a PhD at Faculty of Economics Split. His main research interests are forensic accounting, audit, corporate finance, and corporate law. The author can be contacted at toni.susak@forenzika.unist.hr.

Ivana Stapić, M. Forens., received her master's degree in Forensics from the University of Split, University Department of Forensic Sciences. Her previous work experience was in private companies and includes areas such as accounting and finance. Her main research interests are forensic accounting and audit. The author can be contacted at ivana.stapic00@gmail.com.