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Audit delay, corporate operational complexity, and computer-assisted audit techniques (CAATs)

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ABSTRACT

This study analyses the impact of corporate profitability, corporate leverage, firm size, firm age, and the use of computer-assisted audit tools (CAATs) on audit delay. It highlights the importance of auditors' digital readiness in managing corporate operational complexity. The method employed is panel data regression analysis using Eviews 13 software, with a sample consisting of 20 companies audited by KAP BAMS from 2020 to 2022. The results show that simultaneously all the independent variables have a significant effect on audit delay. However, on a partial basis, the profitability, leverage and CAAT variables do not have a significant impact. In contrast, firm size and firm age were found to significantly influence audit delay. A notable insight emerged that CAATs, which were expected to expedite the audit process, were instead positively associated with longer delays. This underscores the gap between technology adoption and auditor competence in practice. The study contributes to the literature by emphasising that audit technology is only effective when supported by user readiness and adequate digital infrastructure. The implications of the findings suggest that companies and auditors should pay particular attention to firm size, firm age and the utilisation of CAATs to minimise audit delays.

Introduction

Financial reports serve as a crucial instrument in ensuring corporate sustainability (Handoko & Marshella, 2020), particularly by providing relevant economic information to stakeholders (Fanny et al., 2019; Al-Ebel et al., 2020). Typically, published financial statements undergo an external audit process. The primary objective of this audit is to obtain legitimacy and reinforce public confidence in the reliability and accuracy of the presented financial statements (Fujianti & Satria, 2020). The relevance of such statements is highly dependent on their timely presentation (Puspaningsih & Larasati, 2024), with any delay in publication possibly diminishing their informational value and hindering effective decision-making (Machmuddah et al., 2020; Sulimany, 2023). One key factor contributing to delays in financial statement publication is audit delay, defined as the time gap between the financial statement recording date and the date the auditor issues an audit opinion (Endri et al., 2023; Ginting & Hidayat, 2019). The phenomenon of audit delay is a global issue faced by companies in both developing and developed countries (Suwardi & Saragih, 2023). Prolonged delays in financial statement publication due to audit delay can trigger adverse market reactions, potentially harming the company and tarnishing the reputation of the public accounting firm (Ginting & Hidayat, 2019).

Empirical studies have identified several factors contributing to audit delay. According to Endri et al. (2023), profitability is a key factor, which reflects how effectively a company generates profits (Fujianti & Satria, 2020). Businesses with high profitability levels tend to reduce audit delay duration, as positive financial information needs to be promptly disclosed to stakeholders (Fanny et al., 2019; Rohadi & Sulistiyo, 2022). This urgency encourages companies to publish their financial statements more quickly compared to firms with lower sales (Çelik et al., 2023).

Another factor which is assumed to influence audit delay is leverage, which reflects a company's ability to meet its financial obligations. A higher proportion of debt relative to total assets increases the risk of financial losses, prompting auditors to conduct more cautious and thorough examinations, ultimately extending the audit process duration (Handoko, et al., 2019). High leverage indicates significant financial risk and potential financial distress, which can delay financial reporting as companies seek to maintain creditor confidence in their ability to repay debt. Additionally, highly leveraged firms may attempt to obscure financial risks by postponing the

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publication of annual reports until or after the fiscal year-end (Fujianti & Satria, 2020). Consequently, leverage ratio exhibits a negative relationship with audit delay (Sulimany, 2023).

Firm size has also been shown to influence audit delay, playing a crucial role in determining the time required for financial report issuance. Larger entities typically have more effective internal control systems, enabling auditors to complete the audit process more efficiently (Machmuddah et al., 2020). Firm size is commonly measured using indicators such as total assets, revenue or equity. Larger companies tend to publish financial reports more promptly due to their extensive information resources and robust internal control systems, which help minimise errors in financial reporting and facilitate the audit process (Ginting & Hidayat, 2019). Moreover, large-scale firms often have a broader range of stakeholders, including investors, and are subject to stricter regulatory requirements that mandate audited financial reports to be published within a shorter timeframe compared to smaller firms (Fujianti & Satria, 2020; Ginting & Hidayat, 2019).

Firm age is also considered to be a determinant influencing audit delay. Older companies tend to have greater knowledge, capacity and experience than newly established firms, allowing them to provide more comprehensive and relevant information to auditors during the audit process (Reschiwati & Sitompul, 2019). This capacity contributes to the acceleration of audit completion, and overall reduces audit delay. Additionally, Ocak and Ozden (2018) suggest that larger firms often have more robust internal control systems and can exert pressure on auditors to complete the audit on time. With a more structured and organised framework, such firms are more likely to expedite the audit process, thereby minimising the risk of delays in financial reporting.

However, in the midst of ongoing technological advances, audit technologies such as the use of computer-assisted audit techniques (CAATs) have become increasingly relevant. Unlike traditional audit methods, CAATs enable auditors to analyse large volumes of data, often referred to as big data, to detect anomalies or inconsistencies within financial records (Kamal et al., 2020; Tarek et al., 2017). This real-time audit approach enhances auditors' efficiency and effectiveness in identifying issues and uncovering opportunities for business improvement and competitive advantage. Moreover, CAATs facilitate automated transaction analysis and continuous monitoring (Owino, 2021). Therefore, beyond operational factors influencing audit delay, the adoption of CAATs has been shown to accelerate the audit process, enabling auditors to mitigate potential delays more effectively.

Previous studies have predominantly employed multiple linear regression and logistic regression to analyse audit delay, while the use of panel data regression remains relatively rare. Such an approach offers advantages in addressing heterogeneity across entities and time effects, which conventional linear or logistic regression methods often fail to capture. In the context of audit delay research, panel data regression provides a more comprehensive analysis of the relationships between key variables, including corporate profitability, leverage, firm size, company age, and the adoption of CAATs. By considering variations across firms and over time, the model yields more robust and accurate results in identifying the determinants of audit delay. The approach also helps overcome the limitations of linear or logistic regression, which typically examine data in a static or one-dimensional manner, thereby offering deeper insights into the factors influencing audit delay.

This study examines audit delay and the operational complexity of companies audited by KAP BAMS (Kantor Akuntan Publik Bharata, Arifin, Mumajad & Sayuti) during the 2020–2022 period. The contribution from this audit firm was provided in the form of in-cash funding, which was realized through access and equipment provision, including facilitated access to the financial reports of audited companies. The value of the contribution was based on its effective utilisation throughout the research activities. The data were analysed using a descriptive quantitative approach with panel data regression to evaluate the determinants of corporate profitability, leverage, firm size, company age, and the adoption of CAATs in relation to audit delay. The selection of the most appropriate model, pooled least squares (PLS), fixed effects model (FEM), or random effects model (REM), was made to determine the optimal analytical approach.

Literature Review

Legitimacy Theory

Legitimacy theory proposes that companies continuously strive to align their operations with prevailing social norms and regulations to ensure that their activities are perceived as legitimate by the public. In other words, businesses seek public trust regarding the legality and ethical conduct of their operations. Legitimacy is crucial for companies, as it serves as a key factor in sustaining their business (Ginting & Hidayat, 2019). In the context of audit delay, legitimacy theory plays a significant role in understanding how delayed financial report publication can influence public perception of a company. Such delays may be interpreted as indicators of internal issues, such as weak managerial control or heightened financial risks, which can ultimately undermine the firm's legitimacy in the eyes of the public, investors and other stakeholders. To maintain legitimacy, companies must ensure that audits are completed in a timely manner, demonstrate transparency and adhere to societal expectations and norms (Fujianti & Satria, 2020). Failure to meet these expectations may lead to a decline in public trust, negatively impacting the company's reputation and long-term sustainability.

In non-public companies, legitimacy pressure does not stem from public investors, but rather from internal owners, financial institutions, local regulators, business partners, customers and key competitors (Corten et al., 2018). Accordingly, variables such as firm size and firm age in this study are closely related to legitimacy pressure: larger and more established companies have greater reputational stakes, which incentivise them to complete audits in a timely manner to maintain credibility in the eyes of their strategic stakeholders. In this context, legitimacy implies that companies typically strive to be perceived as responsible and accountable entities (Maama & Mkhize, 2020).

Agency Theory

Agency theory concerns the dynamics of interaction between company owners (shareholders) and agents (corporate management). Agents have the authority to manage business operations and make decisions on behalf of investors. The theory highlights conflicts that frequently arise between shareholders and management due to differing objectives, with managers often making decisions that benefit themselves rather than aligning with shareholder interests. The reliance on information provided by management creates information asymmetry, as investors are not directly involved in the company's operations (Bazhair & Alshareef, 2022). Managers, as agents, are entrusted with running the company; however, in practice, they may have incentives to take actions that maximise their personal interests, thereby exacerbating agency conflicts (Reschiwati & Sitompul, 2019).

Agency theory is also highly relevant in the context of financial reporting timeliness. The timely submission of financial reports serves as a crucial signal which reflects a company's financial health. If it delays its financial reporting, stakeholders such as investors or creditors may begin to doubt the management's effectiveness and the company's overall operations (Sulimany, 2023). Audit delay can be interpreted as an indication of internal issues, such as financial distress or managerial inefficiencies. Consequently, stakeholders might perceive that the company is facing significant challenges, which, in turn, could negatively influence their perception and investment decisions (Reschiwati & Sitompul, 2019).

Although non-public companies are not subject to capital market pressures, agency conflicts still exist in other forms. Mustapha et al. (2015) found that the larger the scale of a company and the more agents (employees) involved in its management, the greater the demand for external audits, due to an increased need for monitoring. Moreover, there are diverse interests between owners and financial statement users in non-public companies, such as directors, banks, tax authorities and suppliers (Corten et al., 2018; Vanstraelen & Schelleman, 2017). This heightened demand for assurance can incentivise faster audit completion to meet both internal and external expectations. From the agency theory perspective, audit delay reflects potential information asymmetry, in which management may intentionally postpone reporting in order to maintain bargaining power with suppliers or to conceal unfavourable financial conditions.

Hypothesis Development

Profitability and Audit Delay

Profitability reflects the extent to which a business entity can generate profits, which is influenced by factors such as revenue, total assets and capital (Handoko, et al., 2019). A high level of profitability indicates strong company performance, encouraging timely financial reporting. According to Fanny et al. (2019), firms with high profitability are perceived as delivering "good news," sending a positive signal to the market. Consequently, management tends to expedite financial reporting, leading to a faster audit process and minimising the likelihood of delays. Conversely, firms with low profitability are more likely to experience delays in financial reporting. Low profitability is often interpreted by investors as a sign of weak performance, prompting companies to be more cautious in disclosing their financial statements. In some cases, firms with lower profitability may initiate the audit process later, prolonging audit completion and contributing to audit delay (Fujianti & Satria, 2020). Previous studies have revealed a negative relationship between profitability and audit delay (Agre & Febrianto, 2023; Almutawa & Suwaidan, 2022; Çelik et al., 2023; Endri et al., 2023; Fanny et al., 2019; Fujianti & Satria, 2020; Handoko, Deniswara, et al., 2019; Sulimany, 2023; Su'un et al., 2020). However, this approach is largely derived from the context of publicly listed companies. In the context of non-public firms, the motivation for timely reporting is not necessarily driven by market reputation, but rather by internal efficiency, pressure from owners, or compliance with agreements made with creditors (Vanstraelen & Schelleman, 2017). This study takes that context into account and examines whether similar patterns still apply to non-public firms, where external pressures from capital markets are absent. The first hypothesis proposed is that:

H1: Profitability has a negative relationship with audit delay.

Leverage and Audit Delay

Financial leverage refers to the use of fixed-cost funding sources, such as long-term debt, bonds or bank loans, to finance corporate investments. Interest on these funds must be paid regardless of the company's profitability, so

when corporate earnings are low, fixed interest expenses reduce shareholder returns. However, interest expenses can also serve as a tax-deductible cost, providing a tax shield that enhances after-tax profit. Therefore, financial leverage measures the extent to which changes in earnings before interest and taxes (EBIT) affect earnings per share (EPS) (Handoko, et al., 2019). The leverage ratio reflects a company's ability to meet its financial obligations. Firms with high ratios face greater financial risk than companies with lower debt levels (Fujianti & Satria, 2020). Research by Yaacob and Mohamed (2021) indicates that highly leveraged businesses are more likely to experience audit delays, as auditors exercise greater caution and require additional time for verification. This finding aligns with previous studies (Bahri & Amnia, 2020; Fitri et al., 2021; Fujianti & Satria, 2020; Handoko, et al., 2019; Machmuddah et al., 2020; Nouraldeen et al., 2021; Sulimany, 2023; Su'un et al., 2020). However, most of these studies were conducted in the context of publicly listed companies or entities operating under capital market regulatory pressures. Therefore, this study repositions the leverage variable within the context of non-public firms to examine whether auditors' risk perceptions regarding debt remain relevant in contributing to audit delays when external market incentives are less prominent. This approach also aims to re-examine previous findings within a different institutional setting. It is therefore hypothesised that:
H2: Leverage has a positive relationship with audit delay.

Firm Size and Audit Delay

Firm size plays a crucial role in determining the speed of audit completion. Large-scale companies typically have more effective internal control systems, which reduce the auditor's burden in performing substantive testing. Additionally, large firms often have the leverage to pressure auditors to expedite the audit process, as they are motivated to protect their reputation and accelerate the publication of financial reports. Consequently, they tend to have shorter audit delays than smaller firms (Yaacob & Mohamed, 2021). Total assets are commonly used as a proxy for firm size. Previous studies have revealed a significant relationship between firm size and audit duration (Almutawa & Suwaidan, 2022; Fitri et al., 2021; Fujianti & Satria, 2020; Ginting & Hidayat, 2019; Machmuddah et al., 2020; Reschiwati & Sitompul, 2019; Yulianto, 2021; Nouraldeen et al., 2021). This study re-examines the relationship within the context of non-public firms to determine whether firm size remains a significant factor influencing audit delay in the absence of the strong external pressures typically present in publicly listed companies. Consequently, it is posited that:
H3: Firm size has a negative relationship with audit delay.

Firm Age and Audit Delay

The age of a company can also influence delays in the audit process. Firms that have been operating for a longer time are generally more proficient in collecting and managing data, allowing them to provide the necessary information more efficiently due to the level of their resources. Consequently, the audit process becomes faster (Reschiwati & Sitompul, 2019; Rohadi & Sulistiyo, 2022). Additionally, larger and more established firms often have the ability to pressure auditors to complete the audit within a stipulated timeframe, as they typically possess strong internal control systems (Ocak & Ozden, 2018). As a result, such firms can complete audits more swiftly and publish financial reports on time. Previous studies have consistently found a significant relationship between firm age and audit delay (Ocak & Ozden, 2018; Reschiwati & Sitompul, 2019; Rohadi & Sulistiyo, 2022). Moreover, most of these studies were conducted in the context of publicly listed or large-scale companies, where systems and resources are structurally well-established. In the context of non-public firms, however, firm age does not necessarily reflect operational efficiency if it is not accompanied by the professionalisation of management and systems. Therefore, this study re-examines the relationship between firm age and audit delay in non-public companies to assess whether long-standing experience continues to contribute to faster audit completion under more resource-constrained conditions. The associated hypothesis is that :
H4: Firm age has a negative relationship with audit delay.

CAATs and Audit Delay

Computer-assisted audit techniques (CAATs) serve as a crucial tool in modern auditing practices, particularly in today's technology-driven business environment. Advanced auditing methods increasingly rely on CAATs to enhance efficiency and accuracy in financial examinations (Omari et al., 2024). Several studies, including those of Kamal et al. (2020), Owino (2021) and Tarek et al. (2017), highlight that their implementation significantly improves audit effectiveness and efficiency. Their adoption has also been proven to reduce audit delay, especially when dealing with large volumes of data. Automated processes driven by CAATs outperform manual auditing in terms of speed and accuracy (Omari et al., 2024). This study incorporates CAATs as an external variable to assess their impact on audit delay, balancing internal company factors, such as profitability, leverage, firm size and firm age, with the external influence of audit technology adoption. Auditors, as direct users of CAATs, provide key

insights into their implementation and effectiveness in streamlining audit procedures. However, the literature on audit technology, particularly the use of CAATs, remains relatively limited in the context of non-public companies. Therefore, this study positions CAATs as an independent variable in order to empirically examine their impact. It is hypothesised that:
H5: CAATs have a negative relationship with audit delay.

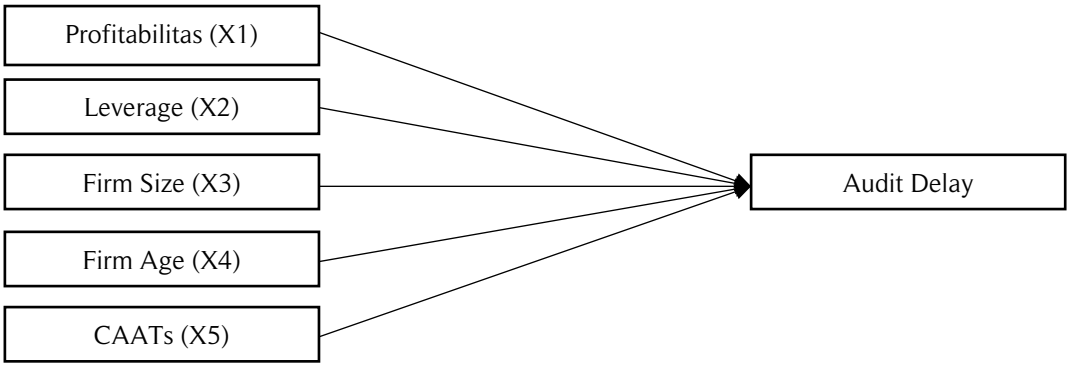

Figure 1: Research Framework

Research Methodology

For the quantitative analysis, panel data regression analysis was employed, with selection of the best model made by comparing pooled least squares (PLS), the fixed effects model (FEM), and the random effect model (REM), based on the suitability of the dataset characteristics. Panel data regression was chosen because the study integrates cross-sectional and time-series data, with the time-series data covering the period from 2020 to 2022, and the cross-sectional data related to firms audited by KAP BAMS during that timeframe. The data sources included financial reports and additional company information retrieved from official company websites to enhance the analysis.
A purposive sampling technique was used, whereby samples were selected based on specific criteria relevant to the research objectives. The sample was drawn from firms audited by KAP BAMS between 2020 and 2022, based on the following selection criteria: companies audited by KAP BAMS during the period 2020–2022; companies that had prepared complete financial statements as of December 31 for the years 2020, 2021 and 2022; and companies that use the Indonesian rupiah (IDR) as the currency in their financial reports. Based on these criteria, 20 firms meeting the requirements were selected as the study sample.

The study includes several independent variables, company profitability, financial leverage, firm size, company age and the adoption of CAATs, while the dependent variable is audit delay. This is defined as the time lag between the end of the company's accounting period and the issuance date of the independent auditor's report (Sulimany, 2023). Profitability is measured using return on assets (ROA), calculated by dividing net income by total assets (Endri et al., 2023; Rohadi & Sulistiyo, 2022). Leverage is assessed through the debt to equity ratio (DER), which represents the ratio of total debt to shareholder equity (Fujianti & Satria, 2020). Firm size is measured by the total assets held by the company each year throughout the study period (Endri et al., 2023), with company age determined by the number of years since its establishment (Reschiwati & Sitompul, 2019). The adoption of CAATs is evaluated using a binary-scale questionnaire (0 = No, 1 = Yes) distributed to public accounting firms (PAFs). This method allows for the identification of whether PAFs implement CAATs in their audit processes and to assess the correlation between CAAT adoption and audit delay. The research model used is formulated as follows:

$$In(AD_{it}) = \beta_0 + \beta_1\, In(PROF_{it}) + \beta_2\, In(LEV_{it}) + \beta_3\, In(SIZE_{it}) + \beta_4\, In(AGE_{it}) + \beta_5\, In(CAATs_{it}) + \epsilon_{it} \quad \ldots\ldots\ldots (1)$$

where:
AD_{it} = Audit delay for company i in period t
$PROF_{it}$ = Profitability of company i in period t
LEV_{it} = Leverage of company i in period t
$SIZE_{it}$ = Firm size of company i in period t
AGE_{it} = Company age of company i in period t
$CAATs_{it}$ = CAATs adoption by the auditor of company i in period t
β_0 = Intercept
$\beta_1, \beta_2, \beta_3, \beta_4$ = Coefficients of the independent variables
In = Natural logarithm
ϵ_{it} = Error term for company i in period t
i = Crosssectional data
t = Time series data for the period 2020-2022

Table 1. Operational Variables

Variable	Operational Definition	Measurement	Expected Relationship
Audit Delay	Number of days between fiscal year-end and the issuance date of the audit opinion	Number of days (calendar days)	–
Profitability	Company's ability to generate profit	Return on Assets (ROA = Net Income / Total Assets)	–
Leverage	Proportion of the company's financing that comes from debt	Debt to Equity Ratio (DER = Total Liabilities / Total Equity)	+
Firm Size	Size of the company based on total resources	Log of the total assets	–
Firm Age	Number of years since the company was established	Reporting Year – Year of Establishment	–
CAATs	Use of computer-assisted audit techniques in the external audit process	Score 0 (CAATs not used) or 1 (CAATs used)	–

The data analysis process in this study involved several steps:

1) Information related to corporate profitability, leverage, firm size, company age and audit delay was collected from the financial statements of companies audited by KAP BAMS during the 2020–2022 period. Data on CAAT adoption was obtained through questionnaires distributed to auditors or public accounting firms.
2) Descriptive statistics of each variable were presented.
3) Panel data model selection was conducted through a series of tests: the Chow Test to determine whether the pooled least squares (PLS) or fixed effects model (FEM) was more appropriate; the Hausman Test to choose between FEM and the random effects model (REM); and the Lagrange Multiplier (LM) Test to decide between PLS and REM.
4) Regression assumption tests were performed and the normality of residuals was evaluated using the Jarque-Bera test to ensure that the residuals followed a normal distribution pattern. A multicollinearity test was also conducted to identify any high correlations among the independent variables that may have affected the validity of the regression results. In addition, a heteroskedasticity test was conducted to check whether the variance of the error term was constant, with an autocorrelation test used to examine whether there was correlation among the residuals.
5) Significance tests were also conducted. An F-test and t-test assessed the significance of the effects of the independent variables on the dependent variable in the research model. Additionally, the adjusted R-squared value was reported as a measure of goodness-of-fit, which is relevant for panel data analysis.
6) The results were interpreted to draw conclusions based on the analysis. The variables which had the most significant impact on audit delay were identified and the policy or managerial implications of the findings discussed.

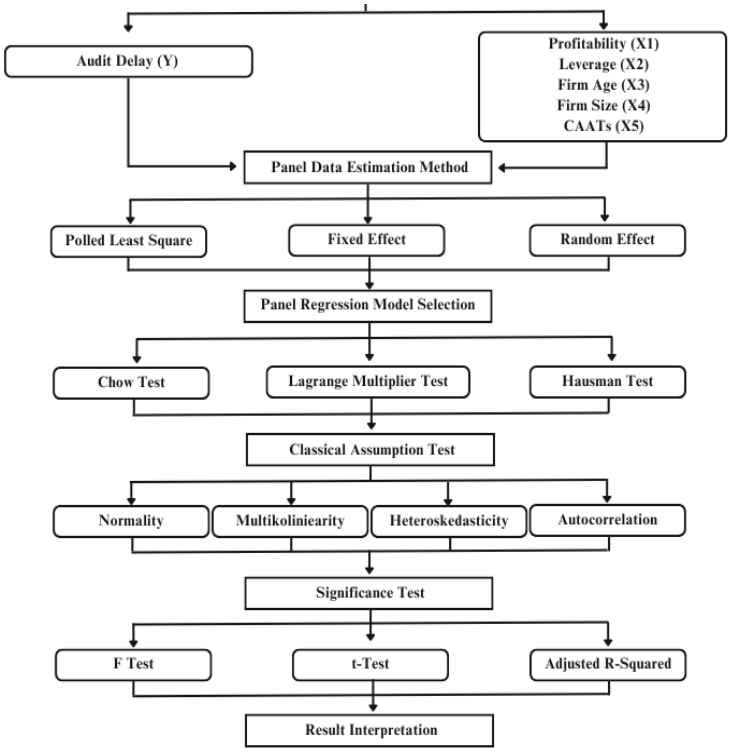

Figure 2: Flowchart

Results and Discussion

Table 2. Descriptive Statistics Data

	X1_PROF	X2_LEV	X3_SIZE	X4_AGE	X5_CAAT	Y_AD
Mean	0.520751	2.946878	4.63E+09	48.45000	0.333333	128.0458
Median	0.503300	3.004733	4.23E+09	43.50000	0.000000	132.8875
Maximum	0.972919	4.947548	9.86E+09	98.00000	1.000000	229.5748
Minimum	0.118526	1.022088	79451784	5.000000	0.000000	13.99479
Std. Dev.	0.274887	1.169143	2.88E+09	27.56528	0.475383	51.52812
Skewness	0.215114	-0.053688	0.244777	0.250798	0.707107	-0.116848
Kurtosis	1.734050	1.659626	1.905941	1.890333	1.500000	2.334796
Jarque-Bera	4.469315	4.520333	3.591571	3.707394	10.62500	1.242776
Probability	0.107029	0.104333	0.165997	0.156657	0.004930	0.537198
Sum	31.24504	176.8127	2.78E+11	2907.000	20.00000	7682.746
Sum Sq. Dev.	4.458217	80.64686	4.90E+20	44830.85	13.33333	156653.7
Observations	60	60	60	60	60	60

Based on the descriptive statistics, the average profitability (X1_PROF) is 0.520751, with a standard deviation of 0.274887, indicating moderate variation among the observations. Leverage (X2_LEV) has an average of 2.946878 and a distribution that tends to be symmetric, as reflected by a skewness of -0.053688. Firm size (X3_SIZE) has an average asset value of 4.63 billion (IDR), with a significant variation of 2.88 billion, indicating considerable differences in company size within the sample. The average company age (X4_AGE) is 48.45 years, with a relatively high variation (standard deviation of 27.56528). The adoption of CAATs (X5_CAAT) has an average score of 0.3, indicating a relatively low level of adoption, with a distribution that is positively skewed (skewness of 0.707107). Audit delay (Y_AD) is an average of 128.05 days, with a standard deviation of 51.53 days, indicating a relatively wide dispersion of data. The Jarque-Bera values for all the variables suggest that the data distribution is not significantly different from normal (probability > 0.05), except for X5_CAAT ($p = 0.004$). The total number of observations was 60, ensuring adequate data coverage for statistical analysis.

Fit Test Model

Table 3. Chow Test Results

Effect Test	Statistic	d.f	Prob.
Cross-section F	1.209817	(19,35)	0.0304
Cross-section Chi-square	30.291757	19	0.0482

The results of the Chow test shown in Table 3 indicate that the probability value for the cross-section is 0.04, which is lower than 0.05. Therefore, the fixed effects model (FEM) was appropriate. Table 4 presents the results of the Hausman test:

Table 4. Hausman Test Result

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.000000	5	1.0000

The Hausman test results show a cross-section random probability of 1.0000, which is greater than the critical value of 0.05. Therefore, the model selected for the study was the random effects model (REM). For this research, the Lagrange Multiplier test was not conducted, as the model selection process for the panel data primarily relied on the Chow test to distinguish between the common effects model (CEM) and the fixed effects model (FEM). If the Chow test favoured the FEM, the Hausman test was subsequently employed to compare it with the REM, rendering the LM test unnecessary.

Classical Assumption Test

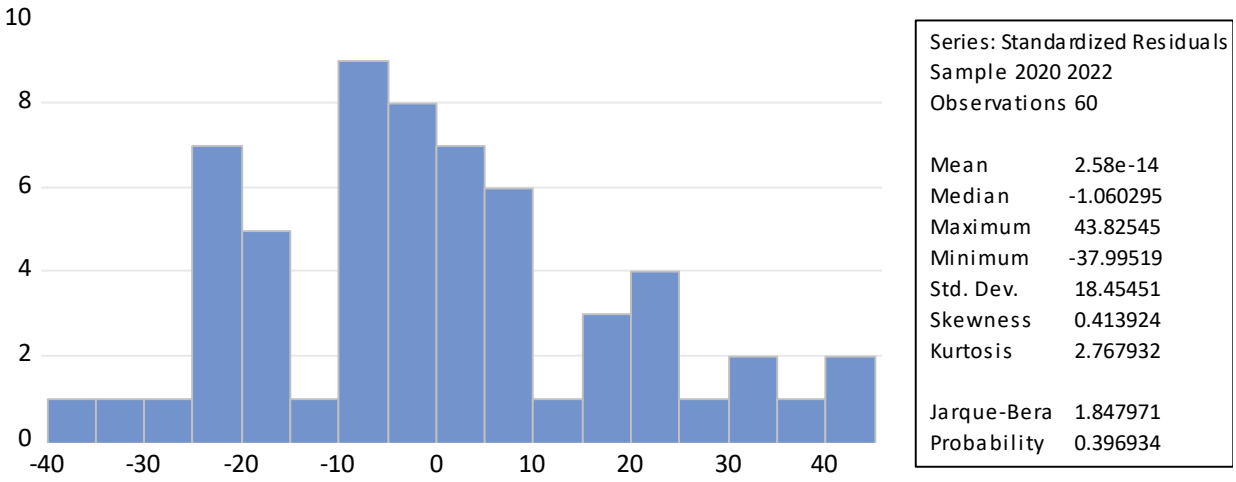

Figure 3: Normality Test Results

The probability value from the Jarque-Bera normality test is 1.84, which is greater than 0.05, confirming that the data in the study meet the normality assumption.

Table 5. Correlation Test Results

	X1_PROF	X2_LEV	LOG_X3_SIZE	X4_AGE	X5_CAAT
X1_PROF	1.000000	-0.008220	-0.151917	-0.134683	0.017494
X2_LEV	-0.008220	1.000000	0.131803	-0.017884	0.102479
LOG_X3_SIZE	-0.151917	0.131803	1.000000	0.381937	-0.119858
X4_AGE	-0.134683	-0.017884	0.381937	1.000000	-0.084073
X5_CAAT	0.017494	0.102479	-0.119858	-0.084073	1.000000

Based on the correlation test results shown in Table 5, there is no correlation between the independent variables exceeding 0.8, indicating that the model is free from multicollinearity.

Table 6. Variance Inflation Factors (VIFs)

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
c	80.05756	17.11111	NA
X1_PROF	64.15721	4.737512	1.018899
X2_LEV	3.531562	7.569473	1.014562
LOG_X3_SIZE	6.61E-19	4.178644	1.154375
X4_AGE	0.007202	4.763739	1.150195
X5_CAAT	21.81593	1.554277	1.036185

The centered VIF values for all the variables are below 10, leading to the conclusion that the model used does not suffer from multicollinearity.

Table 6. Heteroscedasticity Test Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
c	31.37494	34.79425	0.901728	0.3712
X1_PROF	0.696748	5.459335	0.127625	0.8989
X2_LEV	-1.718262	1.284407	-1.337786	0.1866
LOG_X3_SIZE	-0.433392	1.620073	-0.267514	0.7901
X4_AGE	-0.074238	0.058444	-1.270230	0.2094
X5_CAAT	2.502679	3.129059	0.799818	0.4273

The heteroscedasticity test results indicate that all the variables have a probability greater than 0.05, confirming that the model does not suffer from heteroscedasticity.

Table 7. Autocorrelation Test Result

Weight Statistics			
R-squared	0.874138	Mean dependent var	103.2341
Adjusted R-squared	0.862485	S.D. dependent var	48.21308
S.E. of regression	17.87890	Sum squared resid	17261.37
F-statistic	75.00851	Durbin-Watson stat	1.659972
Prob(F-statistic)	0.000000		

The Durbin-Watson test result of 1.6 falls within the acceptable range of -2 to 2, indicating that the study model does not suffer from autocorrelation.

Panel Data Regression Estimation Result

Table 8. Panel Data Regression Output with Random Effects Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
c	-291.3431	58.93057	-4.943836	0.0000
X1_PROF	17.51497	9.535707	1.836778	0.0717
X2_LEV	2.479601	2.201143	1.126506	0.2649
LOG_X3_SIZE	15.17637	2.747912	5.522872	0.0000
X4_AGE	1.468588	0.102451	14.33453	0.0000
X5_CAAT	-3.110026	5.145350	-0.604434	0.5481

The regression equation derived from Table 8 is as follows:

$$Y = -291.3 + 17.51X_1 + 2.47X_2 + 15.17X_3 + 1.46X_4 - 3.11X_5 + \varepsilon$$

The constant value of -291.3 indicates that when all independent variables (company profitability, company leverage, company size, company age, and CAATs adoption) are zero, the projected audit delay starts at -291.3 days.

The regression coefficient for profitability (X1) is 17.51, suggesting that, assuming other variables remain constant, an increase of 1 unit (or 100%) in X1 will extend the audit delay by 17.51 days. The positive sign (+) on this coefficient indicates that higher company profitability is associated with a longer audit completion time.

The regression coefficient for leverage (X2) is 2.47, meaning that if other variables remain unchanged, a 1-unit increase in X2 will extend the audit delay by 2.47 days. This positive value suggests that higher leverage ratios correlate with prolonged audit durations.

The regression coefficient for company size (X3) is 15.17, implying that, holding other variables constant, an increase of 1 unit in X3 will lengthen the audit delay by 15.17 days. This positive relationship indicates that larger-scale companies tend to experience longer audit delays.

The regression coefficient for company age (X4) is 1.46, showing that when other variables remain unchanged, a 1-unit increase in X4 (e.g., an additional year in company age) will extend the audit delay by 1.46 days. The positive coefficient suggests that older companies tend to experience longer audit durations.

The regression coefficient for the CAATs variable (X5) is –3.11, indicating that, if other factors remain constant, companies that utilise CAATs experience a reduction in audit delay by approximately 3.11 days. This negative value suggests that firms conducting audits with CAATs tend to complete the audit process in a shorter time.

Hypothesis Testing

Table 9. Testing the Determination Coefficient

R-squared	0.874138
Adjusted R-squared	0.862485

As seen in Table 9, the adjusted R-squared value of 0.862485 indicates that approximately 86% of the variation in audit delay can be explained by the independent variables analysed in the study, namely profitability, leverage, company size, company age, and CAATs adoption. On the other hand, the remaining 11% of the variation in audit delay is attributed to other factors not included in the regression model.

Table 10. F Statistics Test Result

F-statistic	75.00851
Prob(F-statistic)	0.000000

Based on Table 10, the probability value of 0.0000, which is lower than the 0.05 threshold, indicates that overall, the independent variables of company profitability, leverage, company size, company age, and the use of CAATs, have a statistically significant joint impact on audit delay.

Table 11. T Statistics Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
c	-291.3431	58.93057	-4.943836	0.0000
X1_PROF	17.51497	9.535707	1.836778	0.0717
X2_LEV	2.479601	2.201143	1.126506	0.2649
LOG_X3_SIZE	15.17637	2.747912	5.522872	0.0000
X4_AGE	1.468588	0.102451	14.33453	0.0000
X5_CAAT	-3.110026	5.145350	-0.604434	0.5481

Based on the t-test results, the X1 variable (profitability) has a t-statistic value of 1.836778, which is lower than the t-table value of 2.001717484, with a probability of 0.0717, exceeding the 0.05 significance threshold. This indicates that profitability does not have a significant impact on audit delay.

Similarly, the X2 variable (leverage) has a t-statistic value of 1.126506, also lower than the t-table value of 2.001717484, with a probability of 0.2649, which is greater than 0.05. This suggests that leverage does not significantly influence audit delay.

Conversely, the X3 variable (company size) demonstrates a t-statistic value of 5.522872, exceeding the t-table value of 2.001717484, with a probability of 0.0000, which is below 0.05. This confirms that company size has a significant effect on audit delay.

Additionally, the X4 variable (company age) has a t-statistic value of 14.33453, far surpassing the t-table value of 2.001717484, with a probability of 0.0000, which is lower than 0.05. This indicates that company age has a significant impact on audit delay.

Finally, the variable X5 (use of CAATs) has a t-statistic value of -0.604434, which is lower than the critical t-table value of 2.0017, and a probability of 0.5481, which is greater than 0.05. This indicates that the use of CAATs does not have a statistically significant effect on audit delay.

Effect of Probability on Audit Delay

Based on the analysis results, the first hypothesis that profitability has a significant impact on audit delay is not be accepted. This finding is consistent with studies conducted by Saputra et al. (2020), Ginting and Hidayat (2019) and Apriyana and Rahmawati (2017), which also concluded that a company's level of profitability does not substantially affect audit delay. In other words, even when a company is highly profitable, this does not necessarily lead to faster financial reporting or a shorter audit delay period. The absence of a significant relationship between profitability and audit delay is considered reasonable in this study, given that the research objects are not publicly listed companies. Therefore, profitability reports do not influence public perception, and profitability-related information is generally limited to internal parties. This finding contrasts with several previous studies that have shown a negative relationship between profitability and audit delay (Agre & Febrianto, 2023; Almutawa & Suwaidan, 2022; Çelik et al., 2023; Endri et al., 2023; Fanny et al., 2019; Fujianti & Satria, 2020; Handoko, et al., 2019; Sulimany, 2023; Su'un et al., 2020). The theoretical assumptions underlying these studies should be reconsidered, particularly in the context of private companies, where ownership is more concentrated and the relationships between owners and managers are often more informal, reducing the urgency to report promptly. Therefore, the market pressure mechanisms assumed in studies of public firms may not be fully applicable. This findings suggest that the assumed role of profitability as a driver of audit timeliness should be reevaluated by taking into account ownership structure and governance characteristics. Future research could explore whether management's motivation in private firms differs in responding to financial performance in terms of reporting, and whether other factors such as owner preferences or operational flexibility also contribute to audit delay.

Effect of Leverage on Audit Delay

The analysis results indicate that the hypothesis proposing that leverage significantly influences audit delay can neither be accepted. This finding aligns with the study by Fujianti and Satria (2020), which found that leverage, as an indicator of the debt-to-equity ratio, does not contribute to audit delay. This is because auditors tend to focus more on a company's profitability as the primary factor in assessing audit risk. As entities responsible for financial reporting quality, auditors prioritise analytical procedures that are directly related to profitability, as this aspect is more relevant to stakeholders compared to leverage ratios. Saputra et al. (2020) further explain that leverage does not have a significant impact on audit delay because, in audit practice, the examination procedures for debt balances

in financial statements follow standard procedures, regardless of whether a company has high or low leverage. The audit process for corporate liabilities requires thoroughness and a high degree of caution, making leverage variations insignificant in influencing audit duration. The insignificance of leverage in relation to audit delay is considered reasonable in this study, as the subjects observed are not publicly listed entities. Therefore, the size of a company's debt does not directly affect public perception or create external pressure on management. Information related to leverage structure tends to be internal and is typically accessed only by specific parties such as creditors and company management. This finding also serves as a reflection for future research to consider more contextual theoretical approaches.

Effect of Firm Sze on Audit Delay

The hypothesis testing results in this study confirm that firm size has a significant influence on audit delay. It is generally measured based on total assets, with a higher asset value increasing the likelihood of a company being classified as a large-scale entity. Larger companies tend to have stronger internal control systems, which should facilitate a faster audit process by enhancing auditor efficiency (Fitri et al., 2021; Yaacob & Mohamed, 2021). However, despite finding a significant relationship between firm size and audit delay, this study reveals a positive correlation. In other words, larger firms experience longer audit durations. This phenomenon can be explained by the higher complexity of operations and financial reporting in such companies. Firms with substantial assets typically have more intricate business structures, a higher volume of financial transactions, and stricter regulatory requirements, necessitating more extensive audit procedures and, consequently, longer audit completion times. Although large firms employ more personnel and utilize advanced technology, these factors may not be sufficient to mitigate the complexity of their operations, potentially leading to delays in the timely submission of financial reports (Fitri et al., 2021). This finding is supported by previous studies, including those of Almutawa and Suwaidan (2022), Fujianti and Satria (2020), Ginting and Hidayat (2019), Machmuddah et al. (2020), Reschiwati and Sitompul (2019), Nouraldeen et al. (2021) and Yulianto (2021). In the context of non-public companies, this finding provides an important additional insight. Unlike public companies, which face capital market pressures and report obligations to external investors, non-public ones experience more limited external pressure. Consequently, even though large-scale non-public companies may possess adequate infrastructure and technology, these resources are not necessarily utilised optimally to expedite the audit process, as the lower level of external pressure allows for greater tolerance of delays. This synthesis suggests that the relationship between firm size and audit delay must be understood contextually. The complexity of large firms cannot be counteracted solely by internal capacity if there is no strong external drive for timeliness. This also highlights that within non-public companies audit delays in large firms are not merely the result of weak internal systems, but rather stem from a lack of regulatory and market urgency to complete the audit process in a timely manner.

Effect of Firm Age on Audit Delay

The study findings indicate that firm age has a significant and positive correlation with delays in the audit process. The Auditing Standards (SA) implemented in Indonesia since January 1, 2013, specifically SA 700, paragraphs A25-A26, state that audit reports must explicitly mention that the audit process follows the guidelines established by the Indonesian Institute of Certified Public Accountants (IAPI) (Yendrawati & Mahendra, 2018). These regulations emphasise that auditors are required to maintain professionalism and comply with prevailing standards, regardless of how long a company has been in operation. Furthermore, not only long-established businesses, but also newly founded companies, often face pressure to report their financial conditions in a timely manner. This pressure may come from various stakeholders, including those demanding financial transparency, and the Financial Services Authority (OJK), which strictly monitors compliance with financial reporting regulations. The significant positive relationship between firm age and audit delay suggests that the longer a company has been in operation, the longer it takes to complete the audit process. Several factors contribute to this phenomenon, including increased organisational complexity over time; the accumulation of extensive historical financial data requiring thorough analysis; and more comprehensive and intricate operational procedures, all of which collectively extend audit completion time. This study provides the insight that a firm's long-standing presence does not necessarily ensure efficiency in the audit process or timely financial reporting. In the context of non-public companies, these findings are particularly noteworthy. Such companies often have more flexible structures, but tend to be less digitised compared to public companies, resulting in the accumulation of manual systems and legacy practices in record-keeping that pose specific obstacles to audit efficiency. Reporting pressures from regulators such as the OJK may be more lenient, depending on the sector and business scale, so the incentive to expedite audits is not always consistently present. Consequently, long-established companies may exhibit greater audit delays due to inherited legacy systems and resistance to adopting the latest reporting technologies. These findings align with previous research that has established a correlation between firm age and audit delay, as evidenced in studies by Ocak and Ozden (2018), Reschiwati and Sitompul (2019) and Rohadi and Sulistiyo (2022).

Effect of CAAT Adoption on Audit Delay

The hypothesis analysis in this study reveals that the implementation of CAATs does not have a significant effect on audit delay. The finding contrasts with those of Vitali and Giuliani (2024), who emphasise that audit technology now plays a central role in enhancing the efficiency and effectiveness of the audit process. Similarly, Samagaio and Diogo (2022) and Saputra et al. (2024) highlight that CAATs have emerged in recent years as a strategic solution for reducing fraud risk and automating the processes of data collection, analysis and interpretation. This technological support enables auditors to analyse large-scale data, identify trends and anomalies, and ultimately improve audit quality (Purnamasari et al., 2024). In the digital era, CAATs are considered an essential tool to mitigate the risk of audit delay. However, in the context of non-public companies, the insignificance of their effect may be attributed to the uneven level of implementation by public accounting firms (KAP) during the observation period. This raises a critical question about audit readiness for digital transformation. An article in *Internal Audit 360°* revealed that internal auditors feel unprepared to face next-generation technologies, highlighting a competency gap in audit-related technology (Liu, 2020). The lack of practical IT skills among auditors affects their ability to interpret technical evidence, which can impact audit effectiveness (Curtis, 2022). Adequate technical skills and knowledge of audit technology are essential for accelerating the audit process (KPMG International, 2023). These insights suggest that audit technology alone is insufficient; it must be accompanied by organisational readiness, adequate support systems, and strategic alignment between audit technology and operational realities. This limited adoption has hindered the full realization of the potential of CAATs to accelerate the audit process. This presents an interesting finding that underscores the importance of measuring the degree of adoption and organisational readiness, rather than merely the presence of technology. Therefore, future research is encouraged to explore these factors more comprehensively.

Conclusion

The study has analysed the influence of profitability, leverage, firm size, firm age, and the use of CAATs on audit delay. Panel data regression was used, utilising EViews 13 software to process the data accurately. The sample consisted of 20 companies audited by the public accounting firm KAP BAMS during the period 2020–2022. With a broad scope of observations, this study aims to provide insights for auditors and stakeholders to enhance the efficiency of the audit process. The hypothesis analysis reveals that collectively, all the independent variables have a significant impact on audit delay. However, when evaluated individually, only firm size and firm age demonstrate a significant effect, whereas profitability, leverage, and CAATs do not have a meaningful impact.

The findings offer strategic insights for various stakeholders. For auditors and public accounting firms, the collective effect of the independent variables on audit delay underscores the importance of holistic improvements in the audit process. From the perspective of audited companies, the significant influence of firm size and age on audit delay indicates the necessity to strengthen internal governance systems and improve the readiness of systematic data provision to expedite financial examination processes. Regulators may encourage the adoption of audit technology through guidelines or minimum standards to ensure audit quality and efficiency, particularly for large or well-established firms. For investors, understanding the determinants of audit delay, including the role of technology, can aid in assessing the quality of financial reports without perceiving audit delays solely as an indicator of poor performance. Academics are encouraged to explore the interactions of factors influencing audit delay in non-public entities, especially considering the significant collective impact of the variables observed in this study. Future research should further investigate the underlying causes of the varied levels of CAATs adoption among smaller firms. The study also enriches the academic literature by highlighting the role of technology in auditing and opens avenues for further research on the interaction between technological factors and firm characteristics affecting audit delay.

Several limitations are acknowledged that may affect the generalizability and interpretation of the findings. First, the small sample size of 20 firms over a limited three-year period, resulting in 60 observations, restricts broader applicability. This limitation mainly arises from stringent inclusion criteria regarding data availability and consistency from companies audited by KAP BAMS. Second, the sample exclusively comprises non-public entities, a segment often underrepresented in audit delay research. Third, the use of CAATs remains limited within the observed years. Although providing unique insights within this specific context, the findings may not be directly transferable to publicly listed companies. Future studies could address these limitations by including larger and more diverse samples, encompassing both public and non-public entities. Exploring more granular measurements of CAATs adoption, such as in firms with more consistent technology use, could also yield richer insights. Longitudinal studies with extended timeframes would also provide a stronger understanding of how these factors evolve and influence audit delay over time.

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