

Audit fees during the COVID-19 pandemic: empirical evidence from financial sector firms in Indonesia

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Abstract

Purpose – This study aims to investigate the impact of the COVID-19 pandemic on audit fees in Indonesia's financial sector. It explores how increased audit risk, regulatory demands and organizational changes influenced audit pricing during a period of global disruption.

Design/methodology/approach – The study employs panel data from 88 financial companies listed on the Indonesia Stock Exchange over the period 2018–2022. A two-stage least squares (2SLS) regression model is used to address potential endogeneity in auditor selection, particularly the engagement of Big 4 firms.

Findings – The results show a significant increase in audit fees during the COVID-19 pandemic, especially among companies audited by Big 4 accounting firms and those with greater financial complexity. These firms likely required more extensive audit procedures due to higher risk exposure and regulatory scrutiny. The findings support the view that audit pricing is sensitive to external shocks, with auditors adjusting their fees to reflect the additional effort and professional judgment required in uncertain environments.

Research limitations/implications – The analysis is limited to Indonesia's financial sector and may not be directly generalizable to other industries or countries. However, it offers a foundation for comparative studies and encourages further research on audit fee behavior in crisis settings, particularly in emerging markets.

Practical implications – The findings provide valuable insights for auditors, regulators and firms by highlighting how audit practices and pricing respond to crisis conditions. Regulators may use these insights to consider more flexible audit oversight, while audit firms can better anticipate resource allocation during periods of heightened uncertainty.

Social implications – This study highlights the broader societal importance of maintaining audit quality and transparency during times of crisis. As financial sector institutions play a key role in economic recovery and public trust, ensuring that their financial reporting is thoroughly audited helps safeguard investor confidence.

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Data availability statements: We obtained the data from the Indonesian Stock Exchange website, company websites, and annual reports. Additional calculations were performed by the authors. The data and necessary code are available upon request (in a good faith and fair use).

Author contributions: The authors have contributed to this manuscript as follows:

- Gatot Soepriyanto contributed to topic and idea generation, theoretical analysis, manuscript editing, dataset validation and robustness tests.

- Yesika Kristi was responsible for data collection, data analysis and manuscript writing.

- Jovanie Setiawan worked on the data collection, data analysis, manuscript writing and ensuring consistency.

All authors have reviewed and approved the final version of the manuscript.



and market stability. By showing that auditors responded to increased risk and complexity with greater audit effort – reflected in higher fees – this study reinforces the role of auditors in upholding public accountability. In emerging markets like Indonesia, where regulatory oversight and audit capacity are still developing, these findings underline the need for strong institutional support to ensure audit resilience during systemic shocks such as the COVID-19 pandemic.

Originality/value – This study contributes to the limited literature on audit fees in emerging markets, particularly during global crises. It offers an integrated theoretical framework combining auditing theory, risk management theory and organizational change theory, providing new perspectives on how external shocks influence audit pricing dynamics.

Keywords Indonesia, Audit, Financial sector, COVID-19, Audit fee

Paper type Research paper

1. Introduction

COVID-19 pandemic, declared a global health emergency by the World Health Organization in March 2020 (Cucinotta and Vanelli, 2020), has significantly disrupted economies worldwide, including Indonesia. The government implemented several containment measures such as lockdowns, travel restrictions, and “work from home” policies to curb the spread of the virus. These interventions had far-reaching economic consequences. Indonesia’s economic growth declined sharply from 5.02% in 2019 to 2.97% in 2020 (Putra Dinata and Putri Melati, 2023), and large-scale social restrictions forced many businesses to scale back operations and reduce labor costs (Putri, 2020). While these broad economic effects have been widely acknowledged, what remains less understood is how these disruptions particularly affected the auditing landscape in Indonesia, specifically the pricing of audit services.

Among the sectors hit hardest by the pandemic was Indonesia’s banking and financial sector. The sharp economic downturn led to increased credit risk, rising loan defaults, and a surge in financial distress across industries. Government-mandated credit restructuring programs, declining loan demand, and deteriorating asset quality put immense pressure on banks’ financial performance (Shabir *et al.*, 2023). As a result, audit engagements in the banking sector became more complex and burdened with elevated risk. Audit fees are generally determined by factors such as audit complexity, risk exposure, auditor effort, and client-specific conditions (Simunic, 1980; Hay *et al.*, 2010). The pandemic introduced higher audit risk through increased uncertainty, credit instability, and operational disruptions, all of which required more extensive audit procedures and justified an increase in audit fees. From a theoretical standpoint, auditing theory suggests that higher audit risk and complexity—such as those triggered by economic disruptions—lead to greater audit effort and higher fees (Simunic, 1980). Risk management theory supports this by emphasizing how uncertainty, like that introduced by the pandemic, intensifies the need for rigorous auditing procedures (Bromiley *et al.*, 2015). Additionally, organizational change theory explains how external shocks force both auditors and firms to rapidly adapt internal processes, often increasing audit scope and cost (Weick and Quinn, 1999). Auditors faced heightened uncertainty, requiring expanded audit procedures and greater professional judgment to ensure accuracy and compliance. These conditions translated into increased audit risk and higher audit fees.

This study aims to address a key research problem: How did the COVID-19 pandemic, as an external shock, influence audit fees in Indonesia’s financial sector? By doing so, it responds to a limited body of empirical work that connects pandemic-induced economic and regulatory uncertainty with changes in audit pricing, especially in emerging markets. This study investigates how the COVID-19 pandemic affected audit fees in Indonesia, focusing specifically on the financial sector. It seeks to understand how auditors responded to elevated audit risk and economic uncertainty, and how this influenced pricing decisions. The study is particularly relevant for regulators, auditors, and companies navigating the challenges of crisis-era audit practices.

To maintain financial system stability amid growing economic distress, the Financial Services Authority (OJK) introduced a series of countercyclical policies, most notably Regulation No. 11/POJK.03/2020, which included a national economic stimulus package (Soepriyanto *et al.*, 2022). These policies aimed to provide credit relief and restructuring for borrowers affected by the pandemic. However, from the auditor's perspective, these interventions added regulatory and operational complexity—especially as they evolved through further updates (48/POJK.03/2020 and 17/POJK.3/2021)—and required a more rigorous assessment of asset quality, financial sustainability, and compliance.

Within this context, the role of auditors became even more critical. An audit of financial statements is meant to provide assurance that a company's financial reporting is free from material misstatements due to fraud or error. To fulfill this role, auditors are expected to assess core business risks, including default probability, going concern issues, and weaknesses in internal controls (Reserve Bank of Australia, 2020). The COVID-19 pandemic heightened these risk areas substantially, prompting auditors to adjust audit plans and deploy more extensive procedures to uphold audit quality under crisis conditions (Albitar *et al.*, 2020; Bell *et al.*, 2001). One notable example in Indonesia is the case of Garuda Indonesia's financial distress, which illustrates how macroeconomic stress in the real sector resounded through to the financial sector, increasing audit challenges for banks and creditors (Guild, 2022). This case reinforces the broader issue that auditors faced during the pandemic: interconnected failures across industries demanded greater scrutiny of loan provisions, internal controls, and going concern assumptions—all of which increased audit workload and justified higher audit fees.

While there is limited direct evidence of audit failures during the COVID-19 pandemic in Indonesia, global studies suggest that audit processes were disrupted in several ways. Auditors reported difficulties in conducting remote audits, obtaining timely evidence, and evaluating internal control systems (Morris *et al.*, 2023; ICAEW, 2020). In Indonesia, the OJK echoed similar concerns, warning that the pandemic had compromised internal control environments and increased the likelihood of financial misstatements (OJK, 2020).

This study analyses a panel dataset comprising 88 financial sector companies listed on the Indonesia Stock Exchange, generating 363 firm-year observations from 2018 to 2022. To account for potential endogeneity in auditor selection—particularly the choice of Big 4 firms—a Two-Stage Least Squares (2SLS) regression approach is employed. The results provide robust evidence that audit fees increased significantly during the pandemic. The rise is especially pronounced among firms audited by Big 4 auditors and those with more complex financial structures. These findings reinforce the argument that elevated audit risk, coupled with increased regulatory scrutiny and operational uncertainty, drove auditors to allocate greater effort and resources, ultimately resulting in higher audit costs.

Compared to prior studies that largely focus on developed markets or general audit quality, this study offers a targeted contribution by exploring how audit fees adjusted in response to COVID-19 within Indonesia's regulated financial services environment. This provides a novel empirical insight into the relationship between heightened audit risk and audit pricing in a localized, high-risk context. This study addresses a key gap in the literature on how external shocks—particularly global health crises—affect audit pricing behavior in emerging markets. Although prior research has examined COVID-19's effects on audit quality (Yuniarwati and Ardana, 2023; Soepriyanto *et al.*, 2023), little is known about the fee implications for Indonesian audit clients. By focusing on the financial sector, this study offers insights into auditor decision-making in a high-risk environment and highlights how audit pricing can serve as a response to systemic risk.

The structure of this study is as follows: Section 2 presents a comprehensive analysis of the literature review, institutional background, and hypothesis development. Section 3 outlines the research design, including the sample selection process, variable assessment and empirical model. Section 4 reports the findings, including descriptive statistics and regression analysis, and explores robustness tests in the form of instrumental variables regression and Coarsened Exact Matching (CEM). Finally, Section 5 discusses the implications of the findings and concludes the study.

2. Literature review, institutional background and hypothesis development

2.1 COVID-19 pandemic and financial sector

The COVID-19 pandemic prompted widespread restrictions globally, including in Indonesia, where authorities implemented large-scale social restriction policies (PSBB) under Law No. 6 of 2018 on health quarantine (Hasrul, 2020). These measures, such as travel bans and limited business operations, significantly disrupted economic activity and affected key sectors including industry, trade, tourism, and services (Putri, 2020). The immediate impact was visible in firm-level operational disruptions, reduced workforce capacity, and increased business costs. In more vulnerable industries, such as aviation, the economic strain raised the risk of large-scale financial distress and potential bankruptcies. Declining company profits also affected investor sentiment, contributing to lower stock returns. Indonesia's GDP declined from 2.0% to 0.7% year-on-year in Q1 2021, driven largely by weakened household consumption (Nanang *et al.*, 2023). This contraction was attributed to rising unemployment and depleted savings, particularly among lower-income households.

To mitigate the economic fallout, the Indonesian government introduced countercyclical measures through PP No. 23/2020 and PP No. 43/2020, which established the National Economic Recovery Program (PEN). This initiative supported the financial sector through government capital placements, credit guarantees, and social safety net programs. Interest subsidies and credit restructuring schemes were central components of the PEN program, aiming to ease the financial burden on borrowers and maintain liquidity. Changes in monetary policy also played a role in shaping financial activity. As the central bank lowered interest rates to stimulate the economy, both deposit and credit behavior shifted. According to Chun and Ardaaragchaa (2024), declining lending rates were associated with lower demand for credit during this period.

The banking sector, in particular, experienced heightened risk exposure. Return on assets declined, reflecting growing credit risk and provisioning requirements. In addition, loan-to-deposit ratios fell due to reduced lending appetite and adjustments in bank strategies in response to shifting regulatory and market conditions (Wahyuni *et al.*, 2023). Given the central role of the financial sector in economic recovery, and its heightened exposure to credit, liquidity, and operational risks during the pandemic, the sector was arguably one of the most significantly affected. These conditions underscore the importance of investigating how such disruptions translated into greater audit complexity and increased audit fees.

2.2 Theoretical perspective on the impact of COVID-19 on audit fees

The COVID-19 pandemic has drastically reshaped the auditing landscape in Indonesia, leading to higher audit fees due to increased risks and complexities. Several theoretical frameworks, such as auditing theory, risk management theory, and organizational change theory, help explain these developments.

Auditing theory suggests that audit fees are influenced by the level of risk, complexity, and the scope of the audit. When financial misstatements are more likely, or when a company's operations are more complex, auditors must devote more time and effort, which ultimately raises fees (Simunic, 1980). During the pandemic, many Indonesian companies—particularly in industries like banking, travel, and retail—experienced severe operational disruptions, financial instability, and increased regulatory scrutiny. As a result, auditors faced heightened demands, including the need to evaluate going-concern issues, assess impairments of financial assets, and navigate evolving regulations, all of which contributed to higher audit costs (Porter, 2020). Furthermore, the shift to remote auditing added logistical challenges and required investment in new technologies, which further increased audit fees.

Risk management theory offers additional insights into the rising audit fees during COVID-19 by focusing on the uncertainty and risk mitigation efforts auditors had to undertake. The pandemic created unprecedented risks for businesses, including operational shutdowns, supply chain breakdowns, and a heightened chance of financial misstatements due to liquidity

problems or fraud (Bromiley *et al.*, 2015). As key players in risk management, auditors had to recalibrate their audit risk models to reflect these new challenges. This demanded more comprehensive and rigorous audit procedures, increased testing, and expanded efforts to mitigate the risks, resulting in higher fees. In Indonesia, where the economic downturn and regulatory changes from the Financial Services Authority (OJK) particularly affected businesses, auditors needed to exercise additional caution in their evaluations, further escalating audit costs.

Lastly, organizational change theory highlights how external shocks like the pandemic require companies and auditors alike to adapt rapidly. The shift to remote work and the acceleration of digital transformation introduced new risks for internal control systems (Weick and Quinn, 1999). Auditors had to modify their approaches to ensure that internal controls were still effective in these altered environments. This adaptation expanded the scope of audit work, requiring additional time and expertise, which contributed to increased fees. In conclusion, the combination of increased risks, operational complexities, and organizational changes brought by the COVID-19 pandemic led to higher audit fees in Indonesia, as explained by auditing, risk management, and organizational change theories.

2.3 Audit fees

Audit fees are charged to clients for the use of assurance services provided by public accounting firms. The audit fee is determined by the engagement attributes agreed upon by both parties, the auditees and auditors (Hay *et al.*, 2010). The audit costs are based on the audit effort carried out and the risks associated with litigation faced by the auditee (Simunic, 1980). Both auditors and auditees, however, aim to maximize their own interest. It is important to note that audit fees are subject to negotiation and agreement between the parties involved. This fragment describes the determinants that affect audit fees based on the two parties involved in the audit process: the auditor and the auditee. The audit fee is affected by the level of risk associated with the auditee's business, with higher risk resulting in higher fees (Dontaki, 2020). Musa *et al.* (2021) found that the size of the auditee company has a positive impact on audit fees, particularly in the financial sector, but a negative impact on the non-financial sector. The study explains that audit fees are positively associated with the size of audit companies or auditors in the financial sector. Additionally, the quality of the internal audit function has a positive effect on audit fees, as do company size, audit tenure, subsidiary, and auditor reliance on internal controls (Zain *et al.*, 2006).

Reflecting on the financial crisis in the early 2000s, it was found that audit fees were under pressure to be lower in banking companies due to high levels of business risk (Chen *et al.*, 2018). However, research conducted in the same year showed that the risks held by companies during the financial crisis of the 2000s did not have a significant impact on audit fees (Chen *et al.*, 2019). Similarly, the costs of audits have risen during the COVID-19 pandemic due to the need for additional procedures and incentives for auditors (Musa *et al.*, 2021). Auditors may perform supplementary procedures, such as re-performance procedures, business continuity assessments, and COVID-19 assessments. Challenges may arise for auditors when verifying company data due to remote communication with clients. Prior to the pandemic, auditors were able to conduct fieldwork at clients' offices to request documents directly and more efficiently. Additionally, the validity of the company's data or documents provided may be at risk.

This study aligns with previous research indicating that audit costs rise during a pandemic in Oman due to increased complexity and risk (Al-Qadasi *et al.*, 2022). However, there is limited evidence to confirm similar effects within Indonesia's financial sector. Our study seeks to address this gap by examining how COVID-19 impacted audit fees specifically in Indonesia's banking industry—a sector with distinct regulatory structures and heightened public scrutiny. This research differs from the Oman study in both contextual and methodological aspects.

Contextually, while the Oman study examines audit fees across a broader market, our study focuses specifically on the banking sector in Indonesia, where regulatory frameworks, financial risks, and the role of Big 4 auditors are distinct. In Indonesia, the banking sector faces unique regulatory pressures and increased scrutiny, especially during COVID-19, making the impact of auditor choice on audit fees more pronounced in this context. Conceptually, both studies explore how COVID-19 increases audit complexity and fees, particularly due to heightened audit risk and the need for more scrutinized financial reporting. While both studies examine the role of Big 4 auditors in navigating these complexities, our study improves the analysis by addressing the endogeneity of Big 4 auditor choice using company size as an instrumental variable. Methodologically, the Oman study uses OLS regression, while our study applies Two-Stage Least Squares (2SLS) regression to correct for potential biases, enhancing the robustness of the findings. Thus, while both studies align in their focus on the impact of COVID-19 on audit fees, our approach offers more reliable causal inference by addressing endogeneity and focusing on a specific sector with unique regulatory dynamics.

It is known that companies in the banking sector face increased risks during the pandemic due to the “Credit Crunch” (Darjana *et al.*, 2022). This topic has received little attention in Indonesia, despite the pandemic’s ongoing effects. Indeed, due to the risks associated with the COVID-19 pandemic, it is expected that audit fees will increase as auditors have to devote more time and effort to their work (Al-Qadasi *et al.*, 2022). Consequently, this may lead to an escalation in the audit rate to compensate for the increased risk, resulting in increased fees. In a similar vein, auditors may find it necessary to devote more resources to technological advances to facilitate remote auditing and to address the associated threats posed by the ongoing epidemic. In addition, in such exceptional situations, auditees may express a desire for improved audit quality, resulting in increased financial compensation. Nevertheless, auditees experiencing financial hardship during the COVID-19 pandemic may ask auditors to reduce their fees. As such, the following alternative hypothesis has been formulated:

H_A . The COVID-19 outbreak leads to an increase in audit fees for financial sector firms.

3. Research methodology

3.1 Data and sample selection

This study employs panel data constructed from secondary sources, primarily audited financial statements and annual reports of companies in the financial sector listed on the Indonesia Stock Exchange (IDX). The reports were collected from company investor relations pages and the IDX website. The period of analysis spans from 2018 to 2022, enabling comparison of audit fees before, during, and after the COVID-19 pandemic. The sample focuses exclusively on the financial sector, which has been identified as one of the most vulnerable during the pandemic (Soepriyanto *et al.*, 2022). Income in this sector is heavily dependent on commission-based services, including payment systems and financial technology activities, which were particularly exposed during periods of economic uncertainty. Moreover, banks and financial institutions faced heightened credit risk during the pandemic due to tightening liquidity and credit contraction, often referred to as the “credit crunch” (Darjana *et al.*, 2022).

Out of 106 financial sector entities listed on the IDX in 2022, 88 companies were selected based on the availability of complete audit fee disclosures and relevant financial data over the five-year study period. This yielded a balanced panel comprising 363 firm-year observations. Firms with incomplete or missing audit fee disclosures were excluded to maintain consistency in the dataset. The sample selection process and distribution are presented in Table 1.

This panel structure allows for the examination of both cross-sectional and time-series variations in audit fees, facilitating analysis of how the pandemic influenced pricing dynamics over time. COVID-19 pandemic variables were supplemented using data from the World Health Organization (WHO), while financial variables and disclosures were cross-verified

Table 1. Sample selection and distribution

Panel A: Sample selection						Number of firms
Listed financial firms on the IDX (2018–2022)						106
Less: Firms with incomplete financial and audit fee data*						(18)
Final sample						88
Panel B: Distribution of firm-year observations by year						
Year	2018	2019	2020	2021	2022	Total
Number	64	68	74	79	78	363
Note(s): * This study includes only firms with complete audit fee data for the full period from 2018 to 2022						
Source(s): Constructed by authors						

with IDX records and company websites where necessary. Below is a sample selection and distribution for this study.

This research used data sourced from the WHO website to examine characteristics pertaining to the COVID-19 pandemic. Financial statement control variables and annual reports were collected from the Indonesia Stock Exchange website. To access additional reports not available on the Indonesia Stock Exchange, the websites of relevant sample firms were consulted.

3.2 Empirical model

The empirical model in this study is consistent with Al-Qadasi *et al.* (2022), who also examines the relationship between the COVID-19 pandemic and audit fees in Oman. The empirical model uses a general audit fee model which is consistent with previous studies (e.g. Simunic, 1980; Musa *et al.*, 2021). The data will then be tested using the following model:

$$LNADFEE = \beta_0 + \beta_1 \text{COVID19}_{it} + \beta_{2-7} \text{CONTROLS}_{it} + \varepsilon_{it}$$

Where:

LNADFEE = The natural log of audit fee paid by listed companies for audit.

COVID19 = Dummy variable in which a firm is assigned 1 if the accounting period ended on or after 31 December 2019 and 0 otherwise.

CONTROLS = Control for a set of variables that have previously been found to have an influence on audit fees, such as audit opinion, Big4 audit firm, profitability, debt level and growth.

The main objective of our study is to analyze the effect of the COVID-19 pandemic on audit fees. As such, the primary variable of interest in this model is COVID-19 (*COVID19*). A positive coefficient for COVID-19 on audit fees (*LNADFEE*) is expected if the pandemic affects the external audit and the auditors respond accordingly. Regarding control variables (*CONTROLS*), we include a set of variables that have previously been found to influence audit fees (Joshi *et al.*, 2000; Naser and Nuseibeh, 2008). To control for the effect of firm size, risk, and complexity, we use *OPINI* (if the external auditor issued qualified audit opinion or not), *BIG4* (clients audited by Big four public accounting firms, namely: Deloitte, PwC, EY, KPMG, or not), *LOSSGAIN* (client’s financial performance shows profit or loss), and *DEBT* (debt to assets ratio, to evaluate the extent to which the company’s assets are financed by debt). The return on assets (*ROA*) is used to determine the company’s ability to generate profits using

its assets. Additionally, we use growth (*GRWT*) to assess the company's growth based on sales from the previous period and the current period.

This research aligns with previous work by [Al-Qadasi et al. \(2022\)](#). The control variables—*ROA*, *GRWT*, and *LOSSGAIN*—are related to a firm's operational performance and its ability to efficiently generate profits from its activities. Firms with higher profitability often pay more in audit fees, as higher profits typically require more rigorous audit procedures to ensure the accurate recognition of revenue and expenses, which in turn demands more audit time ([Hay et al., 2010](#)). The *DEBT* variable represents audit risk, which is a critical factor in determining audit fees. The higher the debt, the greater the risk, and this has become especially important due to the increasing number of lawsuits against auditors globally. Additionally, this research includes *OPINI* and *BIG4* as audit-related control variables, both of which are expected to have a positive relationship with audit fees. Audit opinion affects audit fees, as the risk of issuing a modified opinion requires more extensive testing and verification, increasing audit effort and costs ([Hay et al., 2010](#)). Modified opinions signal potential issues, prompting auditors to conduct additional procedures, which in turn raises fees. Big 4 audit firms (Deloitte, PwC, Ernst and Young, KPMG) typically charge higher fees due to their reputation for quality, extensive resources, and complex client base ([Francis, 2004](#)). The higher fees reflect the added assurance and rigor associated with Big 4 audits, valued especially in highly regulated sectors like finance.

4. Empirical results and discussion

4.1 Descriptive statistics

The descriptive data are shown in [Table 2](#), including the total number of observations (363). The *LNADFEE* has a mean value of 20.63, which equal to 2.1 Billion Rupiah of audit fee amount (equal to 132,300 USD). *COVID19* has an average value of 0.64, or 64% of the sample, during the Covid-19 pandemic, which runs from 2020 to 2022. The mean value for *OPINI* is 0.06, indicating that 6% of the sample had a modified opinion. The mean value of *BIG4* is 0.46, which indicates 46% of our sample was audited by Big four public accounting firms. The average result for *LOSSGAIN* across the sample is 0.12, indicating that 12% of our

Table 2. Descriptive statistics

Variables	Obs	Mean	S.D	Min	Q1	Median	Q3	Max
LNADFEE	363	20.63	1.30	17.77	19.74	20.72	21.34	23.96
ADFEE (Rp)	363	2.078	3.264	52	375	0.99	1.847	25.550
COVID19	363	0.64	0.48	0.00	0.00	1.00	1.00	1.00
OPINI	363	0.06	0.24	0.00	0.00	0.00	0.00	1.00
BIG4	363	0.46	0.50	0.00	0.00	0.00	1.00	1.00
LOSSGAIN	363	0.12	0.32	0.00	0.00	0.00	0.00	1.00
DEBT	363	0.82	4.23	0.00	0.43	0.70	0.83	81.00
ROA	363	0.04	0.38	−0.27	0.00	0.02	0.03	7.09
GRWT	363	0.20	7.42	−100.04	−0.09	0.03	0.15	63.59

Note(s): *LNADFEE*: the natural log of total fees paid to the external auditor for statutory audit; *ADFEE*: audit fee amount in millions Indonesian Rupiah (Rp), which equals, on average 63 USD; *COVID19*: an indicator variable equals 1 if the accounting period is ended on or after 31/12/2019, 0 otherwise; *OPINI*: an indicator variable equals 1 if the external auditor issued qualified audit opinion, 0 otherwise; *BIG4*: an indicator variable equals 1 if the external auditor of a firm is Deloitte, Ernst and Young, KPMG, or PricewaterhouseCoopers, 0 otherwise; *LOSSGAIN*: an indicator variable equals 1 if the firms incurred loss for the current year, 0 otherwise; *DEBT*: the total debt divided by total assets; *ROA*: the net income divided by total assets; *GRWT*: the changes in current revenues (sales) scaled by previous year revenues (sales)

Source(s): Authors' analysis using data from IDX-listed financial firms. Constructed by authors

sample experienced losses from 2018 to 2022. The mean value of *DEBT* in the finance sector is 0.82, with *ROA* has a mean value of 0.04 and *GRWT* has mean value of 0.20.

4.2 Correlation

Table 3 displays the correlation of the variables. There is no significant correlation between any two independent variables as the correlation coefficients are below the threshold value of 1. Most of the results are close to 0.000. The correlation between each variable that reaches 0.4 is as follows: *OPINI* to *LOSSGAIN* with 0.371 and *LOSSGAIN* to *DEBT* with 0.141. Additionally, *OPINI* to *BIG4* has a correlation of -0.210 , *BIG4* to *LOSSGAIN* has a correlation of -0.131 , and finally, *LOSSGAIN* to *ROA* has a correlation of -0.106 .

4.3 Regression results

Table 4 presents the results of the association between COVID-19 pandemic period and audit fee. This study used the OLS approach with a robust standard error to adjust for the possible association of heteroscedasticity and autocorrelation.

The coefficient of determination, R^2 , has a value of 0.403, indicating our estimated model fits well and significantly explains audit fee variance. There is a significant positive relationship between COVID-19 and audit fees, with a p -value of 0.000, which is less than the α value of 1%, indicating that companies in the COVID-19 period have experienced an increase in audit fees when compared to the earlier period. The results are consistent with previous research conducted by Al-Qadasi *et al.* (2022), that suggests auditors during the COVID-19 pandemic are more likely to respond to associated risks by increasing audit fees. This is also supported by the findings of Harjoto and Laksmana (2023), who reported an increase in total audit fees during COVID-19 lockdown, and Musa *et al.* (2021), who found a statistically significant positive association between the COVID-19 pandemic and audit fees. In general, this results present initial evidence indicating that auditors tend to react to the epidemic by raising audit fees as a means of addressing the anticipated heightened audit risk and complexity.

Finally, regarding the control variable, *OPINI* has no association with audit fees, while *BIG4* has a positive association (significant at 1% level). The control variables *LOSSGAIN* have a negative but insignificant relationship with audit fees, while the *ROA* and *GRWT* variable has a positive but insignificant impact. Finally, *DEBT* variable has a significant and positive association on audit fees (significant at 1% level).

Table 3. Correlation matrix

	COVID19	OPINI	BIG4	LOSSGAIN	DEBT	ROA	GRWT
COVID19	1.000						
OPINI	0.096	1.000					
BIG4	-0.088	-0.210	1.000				
LOSSGAIN	0.099	0.371	-0.131	1.000			
DEBT	0.034	-0.002	0.069	0.141	1.000		
ROA	-0.067	-0.050	-0.039	-0.106	-0.019	1.000	
GRWT	-0.063	-0.009	0.002	-0.049	-0.014	-0.044	1.000

Note(s): *COVID19*: an indicator variable equals 1 if the accounting period is ended on or after 31/12/2019, 0 otherwise; *OPINI*: an indicator variable equals 1 if the external auditor issued qualified audit opinion, 0 otherwise; *BIG4*: an indicator variable equals 1 if the external auditor of a firm is Deloitte, Ernst and Young, KPMG, or PricewaterhouseCoopers, 0 otherwise; *LOSSGAIN*: an indicator variable equals 1 if the firms incurred loss for the current year, 0 otherwise; *DEBT*: the total debt divided by total assets; *ROA*: the net income divided by total assets; *GRWT*: the changes in current revenues (sales) scaled by previous year revenues (sales)

Source(s): Computed by authors using study data

Table 4. OLS robust regression results

LNADFEE	Coefficient	Robust Std err	t-stat	$p > t $	[95% conf. Interval]	
COVID19	0.159	0.041	3.910	0.000***	0.078	0.239
OPINI	0.028	0.065	0.400	0.668	−0.101	0.158
BIG4	0.786	0.175	4.490	0.000***	0.438	1.133
LOSSGAIN	−0.048	0.076	−0.640	0.525	−0.199	0.102
DEBT	0.007	0.002	4.030	0.000***	0.003	0.010
ROA	0.023	0.006	0.390	0.696	−0.010	0.014
GRWT	0.006	0.001	0.440	0.662	−0.002	−0.003
Constant	20.166	0.086	234.880	0.000***	19.995	20.336
Observations	363					
R^2	0.403					
F-stat	7.87***					

Note(s): *LNADFEE*: the natural log of total fees paid to the external auditor for statutory audit; *COVID19*: an indicator variable equals 1 if the accounting period is ended on or after 31/12/2019, 0 otherwise; *OPINI*: an indicator variable equals 1 if the external auditor issued qualified audit opinion, 0 otherwise; *BIG4*: an indicator variable equals 1 if the external auditor of a firm is Deloitte, Ernst and Young, KPMG, or PricewaterhouseCoopers, 0 otherwise; *LOSSGAIN*: an indicator variable equals 1 if the firms incurred loss for the current year, 0 otherwise; *DEBT*: the total debt divided by total assets; *ROA*: the net income divided by total assets; *GRWT*: the changes in current revenues (sales) scaled by previous year revenues (sales)

*** $p < 0.01$, ** $p < 0.05$

Source(s): Computed by authors using study data

4.4 Endogeneity in the form of potential reverse causality

Our findings are consistent with prior studies suggesting that COVID-19 has a positive impact on audit fees (Al-Qadasi *et al.*, 2022, Musa *et al.*, 2021). However, we recognize that endogeneity in the form of reverse causality is an important consideration in our setting to the extent that firms audited by Big 4 firms are more likely to experience higher audit fees due to the increased complexity of their financial reporting. In contrast, higher audit fees may also incentivize firms to choose Big 4 auditors due to their reputation and perceived audit quality.

To control for possible endogeneity related to “unobservable” and/or the direction of causality, we employ an instrumental variable approach using log total assets (*LOGTA*) as our instrument for Big 4 auditor choice. We expect that firm size (*LOGTA*) is strongly positively associated with the likelihood of hiring a Big 4 auditor. However, there is no reason to expect that *LOGTA* should directly affect the audit fee outcomes for the firm, other than through its effect on the choice of auditor. Prior studies, such as Chen *et al.* (2024), have used this instrument to address endogeneity in their models.

In the first-stage model, we regress Big 4 auditor choice on *LOGTA* and other control variables, including COVID-19 status, audit opinion, leverage, and growth. We use the predicted value from the first-stage regression model to calculate the instrumented (predicted) Big 4 auditor choice. We next rerun the model after replacing the Big 4 auditor choice with the predicted value from the first-stage regression. The second-stage regression results are presented in Table 5 panel B, showing that after addressing endogeneity, the relationship between COVID-19 and audit fees remains robust and significant.

Our results continue to show a significantly positive coefficient on COVID-19 in models assessing audit fee adjustments in the context of the pandemic. These findings reinforce the notion that the direction of causality is more likely to run from Big 4 auditor choice to audit fees, with *LOGTA* acting as a valid instrument to account for endogeneity in our analysis.

Table 5. Instrumental variable (Two-stage least squares) regression

Panel A: First stage regression results						
BIG4	Coefficient	Std err	t-stat	p> t	[95% conf. Interval]	
LOGTA (<i>Instrument</i>)	0.065	0.008	7.670	0.000***	0.048	0.082
COVID19	−0.039	0.050	−0.780	0.437	−0.1337	0.059
OPINI	−0.408	0.108	−3.78	0.000***	−0.619	−0.196
LOSSGAIN	−0.084	0.081	−1.040	0.298	−0.243	0.075
DEBT	0.009	0.006	1.510	0.131	−0.003	0.020
ROA	−0.078	0.063	−1.230	0.219	−0.203	0.047
GRWT	−0.001	0.003	−0.370	0.714	−0.008	0.005
Constant	−1.457	0.263	−5.54	0.000***	−1.974	−0.940
Observations	363					
R ²	0.195					
F-stat	12.259***					

Panel B: Second stage regression results						
LNADFEE	Coefficient	Std err	t-stat	p> t	[95% conf. Interval]	
Instr. BIG4	4.493	0.481	9.340	0.000***	3.55	5.436
COVID19	0.316	0.128	2.468	0.001**	0.065	0.567
OPINI	1.783	0.435	4.100	0.000***	0.930	2.636
LOSSGAIN	−0.094	0.303	−0.310	0.755	−0.688	0.499
DEBT	−0.021	0.021	−0.990	0.323	−0.063	0.021
ROA	0.025	0.237	0.100	0.917	−0.440	0.489
GRWT	0.010	0.012	0.830	0.406	−0.013	0.033
_cons	18.289	0.298	61.46	0.000***	17.706	18.873
Observations	363					
R ²						
Chi-square	94.320***					

Note(s): LNADFEE: the natural log of total fees paid to the external auditor for statutory audit; COVID19: an indicator variable equals 1 if the accounting period is ended on or after 31/12/2019, 0 otherwise; OPINI: an indicator variable equals 1 if the external auditor issued qualified audit opinion, 0 otherwise; BIG4: an indicator variable equals 1 if the external auditor of a firm is Deloitte, Ernst and Young, KPMG, or PricewaterhouseCoopers, 0 otherwise; LOGTA: natural logarithm of firm’s total assets; LOSSGAIN: an indicator variable equals 1 if the firms incurred loss for the current year, 0 otherwise; DEBT: the total debt divided by total assets; ROA: the net income divided by total assets; GRWT: the changes in current revenues (sales) scaled by previous year revenues (sales)

***p < 0.01, **p < 0.05

Source(s): Computed by authors using study data

4.5 CEM robustness analysis

To ensure the robustness of our main findings, we conducted a Coarsened Exact Matching (CEM) robustness analysis, following the methodology proposed by Blackwell *et al.* (2010). This approach helps to address potential sample selection bias by balancing the treatment and control groups on key covariates. We used the COVID-19 variable as the treatment and implemented the CEM procedure in Stata to match companies based on several control variables, including audit opinion, Big 4 affiliation, profitability (gain/loss), leverage, return on assets (ROA), and sales growth. Our results (unreported) from the CEM analysis are qualitatively similar to the main regression analysis, indicating that the findings are consistent and robust. These results further strengthen the validity of the study’s conclusions. However, due to space limitations, we have not included the full CEM regression table in the manuscript. The detailed results are available upon request.

5. Summary and conclusion

This study examines the relationship between audit fees and the COVID-19 pandemic, focusing on financial sector companies listed on the Indonesia Stock Exchange. Using data from audited financial reports before, during, and after the pandemic, and incorporating relevant control variables, the findings confirm that audit fees increased during the pandemic period. The results are in line with previous studies (Al-Qadasi *et al.*, 2022; Musa *et al.*, 2021; Harjoto and Laksmana, 2023), showing that Big 4 audit firms were more likely to raise audit fees, while company financial performance did not significantly influence fee changes. This reflects how the pandemic heightened audit complexity and risk, especially in the financial sector.

From a practical standpoint, this study gives auditors a better picture of how audit risks and workload can shift during a crisis. The increase in audit fees, especially for clients audited by Big 4 firms or those with complex financial situations, suggests that auditors in Indonesia—similar to those in the UK and Canada—need to be more prepared to reassess risks and adapt audit procedures under uncertain conditions (FRC, 2021; CPA Canada, 2020). In this context, local auditors may also benefit from using digital tools and strengthening internal coordination when remote audits become necessary.

For regulators like the OJK, the findings highlight the need for flexible but steady oversight. During periods like the pandemic, regulators in other countries such as the U.S. (PCAOB, 2020) released special audit guidance to help maintain audit quality while recognizing the realities of fieldwork disruption and increased reporting risks. Similar initiatives in Indonesia could assist auditors navigate complex reporting environments during economic shocks.

There are also implications for education and professional development. Institutions and professional bodies could consider integrating crisis-based audit simulations or training modules, much like those offered by CPA Australia (2020), to better prepare future auditors for handling unexpected disruptions in the audit process.

From a theoretical perspective, this study builds on auditing theory, risk management theory, and organizational change theory to explain why and how audit fees react to external disruptions like the COVID-19 pandemic. While much of the previous research focuses on developed markets, this study adds new insights from Indonesia as an emerging market, where institutional responses and regulatory conditions may differ.

This study is not without limitations. It focuses solely on the financial sector in Indonesia, which may limit generalizability. However, the insights may still be useful for countries with similar economic characteristics, regulatory frameworks, and governance systems.

Future research could explore other sectors or additional variables—such as audit procedures or key audit matters—to further understand how audit fees respond to crisis conditions.

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Further reading

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