The Impact of COVID-19 Pandemic on Audit Quality

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ABSTRACT
We examine the impact of COVID-19 pandemic on audit quality. The impact of COVID-19 on audit quality has been regulatory and investor concern. The pandemic created some new challenges for auditors, e.g., remote working, which can make it difficult to conduct on-site inspections and expose auditors to fraud threat. In addition, the pandemic has raised the complexity of financial reporting and the extent to which auditors must look for more information and perform more extensive testing, often under pressure of time and limited access to client facilities, which can compromise the integrity of audit evidence. We find that audit quality declined after the advent of COVID-19, as reflected by increased discretionary accruals in 2020 but recovered in later years. Going concern opinions increased with a lag, whereas financial restatements declined unaffected by the pandemic. Big 4 auditors proved more resilient, sustaining higher audit quality over the period. Our findings advance the understanding of the impact of systemic shocks on audit quality and emphasize the value of auditor capacity and institutional flexibility in sustaining assurance quality in crisis situations.

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1. Introduction

This paper examines the impact of COVID-19 pandemic on audit quality. The COVID-19 pandemic, caused by the worldwide outbreak of SARS-CoV-2 late last year 2019, has brought immense effects on the world economy and business operations. Confronted by elevated uncertainty and business disruption, numerous enterprises were compelled to adjust their business models, swiftly transitioning from conventional face-to-face to virtual and non-face-to-face ways of doing business. (McKinsey and Co 2020; Borkova and Temnova 2021; Stalmachová et al 2022)

Audit quality is a top priority for capital market stakeholders as it directly affects the credibility of financial statements and the efficiency of resource allocation. (CAQ 2021; Alfraih 2016) The pandemic has also placed further restrictions on the implementation of audit, including restricted access to client sites, limitations on physical verification, and an increased risk of financial misstatement due to the rapidly changing economic environment. These constraints have made audit firms employ diverse auditing practices, most of which utilize digital tools and remote technology. While these innovations have enabled auditors to meet their professional obligation during a challenging period, issues have been raised regarding whether or not audit evidence collected from non-standard sources is adequate and credible. (IFAC 2020; Jarva and Teresa Zeitler 2024)

Previous research indicates that audit quality is both auditor- and client-specific, as well as influenced by more general institutional environments (DeFond and Zhang 2014; Francis 2004). In this context, the COVID-19 pandemic constitutes a unique and exogenous shock to the audit environment that presents a natural context in which to study how shocks from outside interact with the connection between audit inputs and outputs.

In particular, the increased complexity in financial reporting and estimation uncertainty amidst the pandemic might have amplified information asymmetries between clients and auditors, and, as such, raised the audit risk and made it more challenging for the auditor to issue high-quality assurance.

This paper explores the extent to which audit quality has been affected by the COVID-19 pandemic by analyzing audit results during the pandemic period. Specifically, we examine whether the widespread application of non-face-to-face audit procedures and increased dependence on digital technologies have improved audit efficiency, or conversely, whether they have compromised audit quality by limiting the auditor from gathering adequate appropriate audit evidence. The paper contributes to the literature by providing cross-sectional evidence of the effect of technological adaptation and institutional crisis response on audit quality.

By answering these questions, this research contributes to our knowledge about the dynamic state of audit quality as a reaction to global disruptions and offers implications for regulators, standard-setters, and audit practitioners who are interested in ensuring audit integrity in an ever more digitalized and uncertain world.

The remainder of our study is organized as follows. Section 2 discusses how the COVID-19 pandemic impacted business and audit environment and Section 3 discusses prior studies related to the impact of COVID-19 on audit quality. Section 4 discusses audit quality measures and Section 5 describes data and methodology. Section 6 presents results of our tests and Section 7 concludes and provides directions for further research.

2. The Impact of COVID-19 Pandemic on Business and Audit Environment

The COVID-19 pandemic is a worldwide crisis marked by the spread of Coronavirus Infectious Disease-19, a disease induced by the SARS-CoV-2 virus that was first identified in

December 2019. The pandemic has significantly impacted the global economy and the environment of business practice. Overall, the COVID-19 pandemic has radically transformed the business practices of organizations, forcing them to review their strategies and seek new approaches to success in a constantly changing environment. (Naseer et al 2023; Kronblad and Pregmark 2024)

During the COVID-19 pandemic, many companies changed their business models from non-face-to-face to non-face-to-face, resulting in many changes in how their business operates, relying heavily on non-face-to-face and online businesses. These changes took many forms as businesses fight against the new reality of the pandemic. In certain industries, businesses moved to selling online, setting up virtual shops through which customers can buy products and services while sitting on their couches. In other industries, businesses changed their customer service interactions to phones and video calls. Some businesses went further and put in place automated systems designed for customer data tracking, enabling them to track customer behavior and fine-tune their plans and approaches. (Albitar et al 2021; Gong et al 2022)

Due to the impact of COVID-19, the audit process, which has relied heavily on traditional methods, has been shifted toward increasing non-face-to-face audit procedures. Some people are concerned that the quality of audits is declining after the COVID-19 pandemic, as it becomes difficult to perform procedures necessary to effectively conduct audits, such as inventory due diligence or on-site inspections of business locations. (PCAOB 2020; CAQ Report 2020; Jarva and Zeitler 2024)

On the other hand, several technologies required to run a business in a digital and online environment have developed rapidly over the past few centuries, and the COVID-19 pandemic appears to have accelerated this trend further. Some view that unnecessary time was reduced by performing non-face-to-face audit procedures based on online and digital environments instead of visiting customers' business sites in person, thereby improving audit efficiency and improving audit quality. (Li et al 2023; Shen et al 2024)

3. Prior Research related to the Effect of COVID-19 on Audit Quality

The COVID-19 pandemic caused significant disruption in business operations worldwide. The pandemic also brought about fundamental changes in an unprecedented operational and economic environment of the audit profession. These sudden changes have raised certain questions about the impact on audit quality, which is considered a key element of financial reporting integrity.

Travel restrictions and lockdowns have forced an inevitable and rapid shift to remote audits. The shift to remote work, social distancing measures, and economic uncertainty have forced auditors to adapt traditional in person procedures to a virtual environment. Audit firms had to rely on technology to perform tasks previously performed in person, such as inventory counts and client meetings. This environment has also created significant uncertainty in financial reporting, further complicating areas such as going-concern determinations, asset impairment analysis, and fair value assessments. (CAQ Report 2020; Manufacturers Alliance 2021; Gong et al, 2022) Prior research on audit quality during the pandemic has shown mixed results. Some studies argue that physical and/or logistical constraints negatively affected audit quality, while others emphasize the mitigating role of auditor adaptability and technology.

Gong et al. (2022) examined the impact of stay at home orders in the United States on audit quality and found that the quality of audits completed after such mandates generally declined. However, because their sample was restricted to firms that filed Form 10-K reports within seven (or fourteen) days following the announcement of stay-at-home orders, their findings may not be

sufficient to generalize the long-term effects of COVID-19 on audit quality. Morris and Hoitash (2023) investigates how the COVID-19 pandemic and associated remote-work practices affected audit outcomes for public companies and find evidence that audit quality dropped during the early months of COVID-19. They also show a significant increase in the likelihood that annual reports were filed late, in part attributable to auditors' work being more difficult under remote conditions.

Similarly, Kend and Nguyen (2022), based on survey evidence and case analyses of Australian auditors, demonstrated that auditors faced significant challenges in maintaining audit quality in the post-COVID-19 environment. However, like Gong et al. (2022) and Morris and Hoitash (2023), their study covered only a relatively short observation window, limiting the ability to capture long-term effects. Moreover, because their evidence was drawn exclusively from Australian auditors, it may not be readily generalizable to other contexts, such as the United States.

Lin et al. (2025) conducted an empirical analysis of Chinese listed companies and documented that audit quality was significantly lower when auditors were located in regions directly affected by the pandemic. Unlike the prior two studies, the research design of Lin et al. (2025) covered a relatively longer time horizon, making it more suitable for exploring long-term effects of COVID-19. Nonetheless, the study's reliance on a sample restricted to Chinese listed firms similarly raises concerns about generalizability.

In contrast to these prior studies, this paper investigates firms in the United States, where the capital market is the largest in the world and the quality of financial audits is of particular importance, in order to assess the long-term effects of COVID-19 on audit quality. Whereas earlier studies consistently documented a general decline in audit quality immediately following the onset of the pandemic across many countries, this study focuses on how audit quality evolved after stay-at-home restrictions were substantially relaxed in 2022 and beyond. If audit quality continued to deteriorate after 2022, this would suggest that the decline cannot be attributed solely to the immediate disruptions of COVID-19. Conversely, if audit quality declined only in the immediate aftermath of the pandemic but subsequently recovered, the findings would provide stronger evidence of COVID-19's direct impact on audit quality.

4. Audit Quality Measures

Auditing is a process used to confirm the accuracy and reliability of financial statements. The quality of the audit has been increasingly crucial in recent years due to several infamous accounting scandals. Audit quality refers to the ability of auditors to detect and report material misstatements in financial statements. This literature review explores the concept of audit quality and factors that influence it.

Over the past 20 years, audit quality has been a primary focus of auditing research, yet its conceptual framework and connection to financial reporting quality remain unclear. Numerous proxies are employed to measure audit quality, but there is no agreement on the most appropriate or comparable measures. This review explores the definition of audit quality, its link to financial reporting quality, and provides a framework for evaluating commonly used proxies, offering guidance on their selection and interpretation.

Audit quality is viewed as an economic good influenced by both client demand and auditor supply. Client demand is driven by incentives like agency costs and regulatory requirements, as well as competencies such as audit committee strength and internal audit effectiveness. On the supply side, auditor incentives (e.g., reputation, litigation risks) and competencies (e.g., expertise, engagement effort) play critical roles. Regulatory interventions significantly shape both demand and supply factors, impacting audit quality. Most studies define audit quality as the likelihood of

detecting and reporting breaches in accounting systems, though this binary perspective underrepresents its broader value. High-quality audits not only ensure compliance with GAAP but also faithfully represent a firm's underlying economic reality, enhancing overall financial reporting quality.

Audit quality has been defined differently by studies. Some have defined audit quality as the level of conformance to auditing standards, while others emphasized auditor independence, expertise, and professional judgment. For example, DeAngelo (1981) defined audit quality as the level to which an auditor can attest to the credibility of the financial reports, while Krishnan (2005) regarded it as the probability that an auditor will detect a material misstatement.

Prior research (DeFond and Zhang 2014, Francis 2004 etc.) has measured audit quality using a variety of proxies because "audit quality" itself is somewhat intangible and not directly observable. As in the prior research, we measure audit quality with four widely used proxy variables in the auditing literature: absolute abnormal accruals, going concern opinions, and financial restatements[1]. Each proxy reflects a different dimension of audit quality, as described below.

4.1 Discretionary accruals (*ABS_ACC*)

First, we use the absolute value of abnormal accruals (*ABS_ACC*) as a continuous proxy for audit quality. Higher levels of abnormal accruals generally indicate lower audit quality, as they may reflect opportunistic earnings management that auditor failed to detect. Absolute abnormal accruals are estimated using the following cross-sectional model, applied separately by industry (based on two-digit SIC codes) and year.

ABS_ACC, absolute abnormal accruals: calculated by estimating the model, modified from Jones (1991), below by industry and year.

$$TA_{i,t} = \alpha + \beta_1 + \Delta REV_{i,t} + \beta_2 PPE_{i.t} + \beta_3 ROA_{i,t-1} + \varepsilon_{i,t}$$

Where $TA_{i,t}$ is total accruals of firm i in year t.

$\Delta REV_{i,t}$ is firm i's change in sales revenue from year $t-1$ to year t.

$PPE_{i.t}$ is firm i's PPE in year t while $NI_{i,t}$ is firm i's net income in year t.

All variables are scaled by total assets at the beginning of year t.

4.2 Going Concern Opinions (*GOINGCONC*)

The variable *GOINGCONC* is an indicator variable equal to 1 if the audit report contains a going concern opinion, and 0 otherwise. A going concern opinion is issued when the auditor has substantial doubt about the firm's ability to continue as a going concern in the foreseeable future, typically within one year. Issuance of going concern opinions reflects auditor skepticism and professional judgment, particularly in identifying financial distress. As such, it serves as a proxy for audit quality, where the presence of a going concern opinion may indicate greater auditor diligence, especially in high-risk client situations.

GOINGCONC: 1 if of going concern opinion is issued, 0 otherwise.

[1] As an alternative measure of audit quality, we also considered modified audit opinions. Modified audit opinions indicate that the auditor has concerns regarding the fairness or reliability of the financial statements, which may signal heightened auditor scrutiny or issues related to financial reporting quality and audit quality. However, because the number of firms receiving modified opinions during our sample period was extremely small, we excluded the variable representing modified audit opinions from our analysis.

4.3 Financial Restatements (*RESTATE*)

We define *RESTATE* as a binary variable equal to 1 if the firm issues a financial restatement for its annual financial statements, and 0 otherwise. A restatement typically indicates a material error or misstatement in previously issued financial reports and is widely regarded as a signal of audit failure or reduced audit effectiveness. Restatement data are obtained from Audit Analytics. *RESTATE:* 1 if the firm issued restatement(s) for the year's financial statements, 0 otherwise.

5. Data and Research Model

Firm-level accounting data, including variables required to calculate discretionary accruals, as well as information on auditors, such as Big 4 affiliation and auditor changes, are collected from Compustat. Data on going concern opinions, restatements, audit firm characteristics, and audit fees are obtained from Audit Analytics.

To examine how audit quality changed following the onset of COVID-19, we use a three-year pre-COVID period (2017-2019) and compare it with a three-year post-COVID period (2020-2022). As an additional analysis, because the year 2020 represents a highly abnormal period due to the initial outbreak of the pandemic, we reconduct the analysis excluding 2020 and instead use data from 2021 to 2023 to investigate the longer term post-COVID effects. Consistent with prior literature on discretionary accruals, we exclude firms in the financial sector (SIC codes 6000–6999). The final sample comprises 26,296 firm-year observations.

To examine the impact of the COVID-19 pandemic on audit quality, we estimate the following regression model:

$$AQ_{it}=\beta_0+\beta_1 POST+\beta_2 Big4_{it}+\beta_3 AuditFees_{it}+\beta_4 AuditorChange_{it}+\beta_5 ClientSize_{it}+\beta_6 Leverage_{it}+\beta_7 Profitability_{it}+\beta_8 Loss_{it}+\beta_9 IndustryDummies+\epsilon_{it}$$

AQ: Measures such as discretionary accruals, going concerns, or restatements
POST: 1 if the fiscal years ending is in 2020 or later, and 0 otherwise.
Big4: 1 if the auditor is a Big 4 firm, and 0 otherwise.
Audit Fees: Log of audit fees paid
AuditorChange: 1 if auditor switched from previous period, and 0 otherwise.
ClientSize: Firm size (total assets).
Leverage: Debt-to-equity ratio.
Profitability: Return on assets (ROA).
Loss: 1 if the firm reported net losses for the year, and 0 otherwise.
IndustryDummies: Controls for industry-specific effects.

Our dependent variable, AQ_{it} represents the audit quality of firm i in year t, measured using one or more proxies such as discretionary accruals, going concern opinions, or financial restatements. Higher (or lower) values of these proxies indicate varying levels of audit quality, depending on the specific measure used.

The key explanatory variable of interest is *POST*, a binary indicator equal to 1 if the firm's fiscal year ends in 2020 or later, and 0 otherwise. This variable captures the period during and after the onset of the COVID-19 pandemic and is intended to isolate the effect of the pandemic on audit

quality. A significant coefficient on *POST* would suggest that audit quality changed during the COVID-19 period compared to the pre-pandemic period.

Several control variables are included in the model to account for factors that may influence audit quality. First, Big4, which is a binary variable for the firm audited by a Big 4 accounting firm (Deloitte, EY, KPMG, or PwC). Prior literature suggests that Big 4 auditors generally provide higher-quality audits. (Francis and Yu 2009). *AuditFees* are measured as the natural logarithm of audit fees paid by the client. Audit fees may reflect the scope and complexity of the audit, and higher fees may be associated with more thorough audit procedures. (Aobdia et al. 2024). *AuditorChange* is a dummy variable for the firm that changed its auditor from the previous year. Auditor changes can affect audit quality due to disruptions in auditor-client relationships or learning curves. (Jadiyappa et al. 2021; Ma et al. 2024) *ClientSize*, which is a measure of firm size, proxied by total assets. Larger firms may receive more scrutiny from auditors and are generally associated with better internal controls, which may influence audit quality.

Leverage, measured as the debt-to-equity ratio, used to capture the firm's financial risk. Highly leveraged firms may have greater incentives to manage earnings, which may challenge auditors' ability to ensure audit quality. (Le 2025) *Profitability*, measured as return on assets (ROA), captures the firm's financial performance. More profitable firms may be subject to different audit risks compared to less profitable or loss-making firms. Lastly, *Loss* is a binary variable that equals 1 if the firm reported a net loss for the fiscal year, and 0 otherwise. Firms reporting losses may be under greater pressure to manage earnings or face increased going concern risks, which can affect audit outcomes. In addition, we control for unobservable, industry-specific characteristics that may influence audit quality by including industry fixed effects.

6. Results

Table 1 presents the descriptive statistics for the variables used in the regression analyses covering the period from 2017 to 2022. The mean of absolute discretionary accruals (*ABS_ACC*), which serves as the first proxy for audit quality, is 1.95, with a standard deviation of 7.49, indicating substantial variation in discretionary accruals across firms. This dispersion suggests that while most firms exhibit relatively high levels of audit quality, a subset of firms display abnormally high accruals, reflecting potentially lower audit quality. The frequency of financial statement restatements (*RESTATE*) is 4.7%, indicating a relatively low occurrence. However, going concern opinions (*GOINGCONC*) appear more frequently, occurring in 14.1% of cases during the sample period, reflecting increased auditor concerns regarding clients experiencing financial distress.

From the auditors' perspective, 64% of audits were conducted by Big 4 accounting firms. The mean of the log of audit fees is 13.71, indicating that the average audit fee, prior to taking the natural logarithm, is approximately $2.4 million. Given a standard deviation of 1.516, the audit fee data exhibit substantial variation, reflecting the heterogeneity in client firm size. On average, approximately 5% of firms changed auditors in a given year. Regarding client characteristics, the mean log of total assets is 6.08, implying that the average total assets per firm are approximately $7.5 billion. Leverage, measured by total debts to total assets, is 0.58, and profitability (*ROA*) is slightly negative at -0.70, with half of the sample firms reporting annual losses. These descriptive statistics indicate that the sample includes both high- and low-quality audit clients, providing a balanced dataset suitable for analyzing the impact of COVID-19 on audit quality in a meaningful way.

Table 1. Descriptive Statistics (n=26,296)

Variable	Mean	Std. Dev.	25%	Median	75%
Dependent Variables					
ABS_ACC	1.953	7.485	0.073	0.238	0.925
RESTATE	0.047	0.213	0.000	0.000	0.000
GOINGCONC	0.141	0.348	0.000	0.000	0.000
Independent Variables					
POST	0.521	0.500	0.000	1.000	1.000
Big4	0.641	0.480	0.000	1.000	1.000
Audit fees	13.713	1.516	12.704	13.875	14.750
AuditorChange	0.053	0.224	0.000	0.000	0.000
ClientSize	6.080	2.863	4.306	6.323	8.068
Leverage	0.576	1.802	0.067	0.269	0.483
Profitability (ROA)	-0.695	3.389	-0.305	-0.007	0.058
Loss	0.517	0.500	0.000	1.000	1.000

Note: All continuous variables are winsorized at 1% and 99% of the distributions.

Table 2 provides Pearson correlations between variables. Several important relationships emerge. First, the absolute discretionary accruals, *ABS_ACC*, is positively correlated with going concern opinions, *GOINGCONC*, (0.146, $p < 0.01$), indicating that firms with low audit quality due to the high amounts of absolute discretionary accruals are more likely to be flagged with going concern uncertainty. This aligns with the notion that distressed firms face greater incentives for opportunistic reporting, resulting in low quality of audit. Big 4 status shows strong negative correlations with *ABS_ACC* (-0.098, $p < 0.01$), and *RESTATE* (-0.049, $p < 0.01$), consistent with the expectation that Big 4 auditors deliver higher-quality audits. Client size is highly correlated with audit fees (0.890, $p < 0.01$) and Big 4 auditors (0.633, $p < 0.01$), highlighting that large clients are both more likely to engage Big 4 auditors and pay higher fees. Profitability is negatively associated with *ABS_ACC* (-0.424, $p < 0.01$) and *GOINGCONC* (-0.346, $p < 0.01$), confirming that poor-performing firms are more likely to adopt aggressive accruals, lowering audit quality.

Table 2. Spear Correlation

Variable		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1)	*ABS_ACC*										
(2)	*RESTATE*	**0.013**									
(3)	*GOINGCONC*	**0.146**	**0.035**								
(4)	*POST*	**0.015**	**-0.040**	**-0.015**							
(5)	*Big4*	**-0.098**	**-0.049**	**-0.354**	-0.011						
(6)	*Audit fees*	**-0.135**	0.010	**-0.465**	**0.030**	**0.663**					
(7)	*AuditorChange*	0.001	**0.036**	**0.028**	-0.009	**-0.101**	**-0.063**				
(8)	*ClientSize*	**-0.158**	**-0.022**	**-0.556**	**0.028**	**0.633**	**0.890**	**-0.057**			
(9)	*Leverage*	**0.333**	**0.026**	**0.314**	**-0.016**	**-0.160**	**-0.229**	-0.005	**-0.311**		

(10)	*Profitability*	**-0.424**	**-0.019**	**-0.346**	**0.024**	**0.205**	**0.317**	0.001	**0.403**	**-0.615**	
(11)	*Loss*	**0.082**	**0.031**	**0.342**	**0.062**	**-0.228**	**-0.380**	**0.044**	**-0.481**	**0.108**	**-0.224**

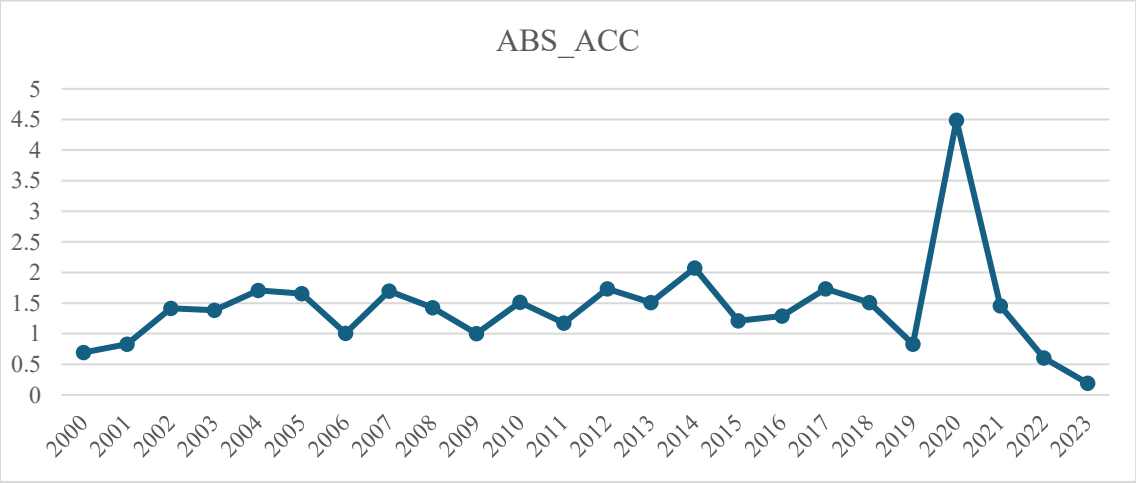
Figure 1 displays the annual trends in audit quality proxies from 2000 to 2023. Discretionary abnormal accruals (*ABS_ACC*) were generally stable until 2019, but spiked sharply in 2020, consistent with deteriorated audit quality immediately after the COVID-19 shock. Since 2020, discretionary abnormal accruals have steadily fallen to very low levels by 2023, suggesting that audit quality, which had declined immediately after the onset of COVID-19, has significantly improved.

Going-concern opinions dropped in 2020, then surged to their highest level in 2022 before dropping again in 2023. This trend is consistent with the Audit Analytics Report (2022) and the Corporate Counsel (2022), which reported that both the number and percentage of firms receiving going concern opinions reached a historic low during fiscal year 2020. However, following the onset of COVID-19 in 2020, an increasing number of firms began to exhibit recurring losses, which likely contributed to the sharp rise in going concern opinions in 2021 and particularly in 2022. Moreover, this pattern aligns with prior research (Subramanyam and Wild, 1996) showing that low earning quality tends to manifest in a delayed increase in going concern opinions, suggesting a deterioration in audit quality precedes such audit outcomes by several years.

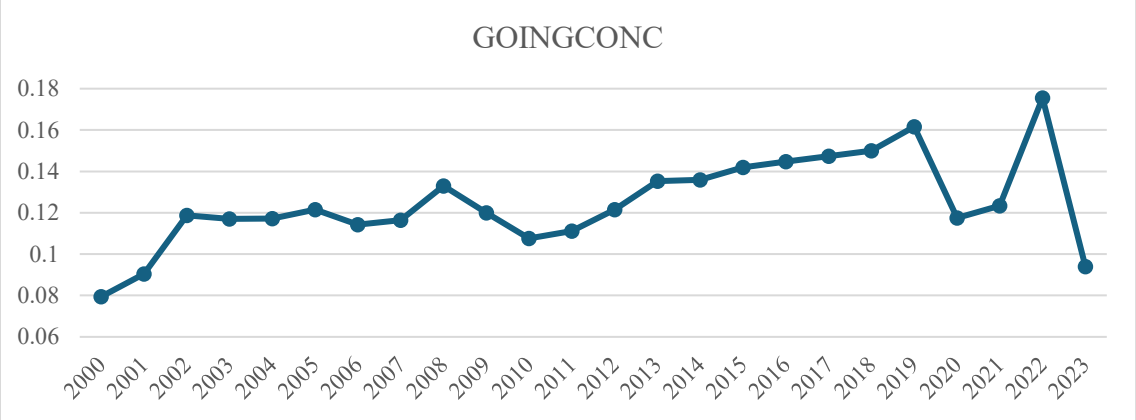
Since 2006, restatements have declined steadily, which can be attributed to the important role played by internal control reporting under the Sarbanes-Oxley Act (SOX). Furthermore, as market expectations regarding restatements have shifted, firms have increasingly taken internal actions to address potential errors before they occur. The emphasis on reputational costs and litigation risks associated with restatement announcements also has led to a significant decline in the number of restatements. (Collins et al., 2009). Restatements appear to have been largely unaffected by the COVID-19 pandemic.

Figure 1. Trends in Audit Quality Measures (2000-2023)

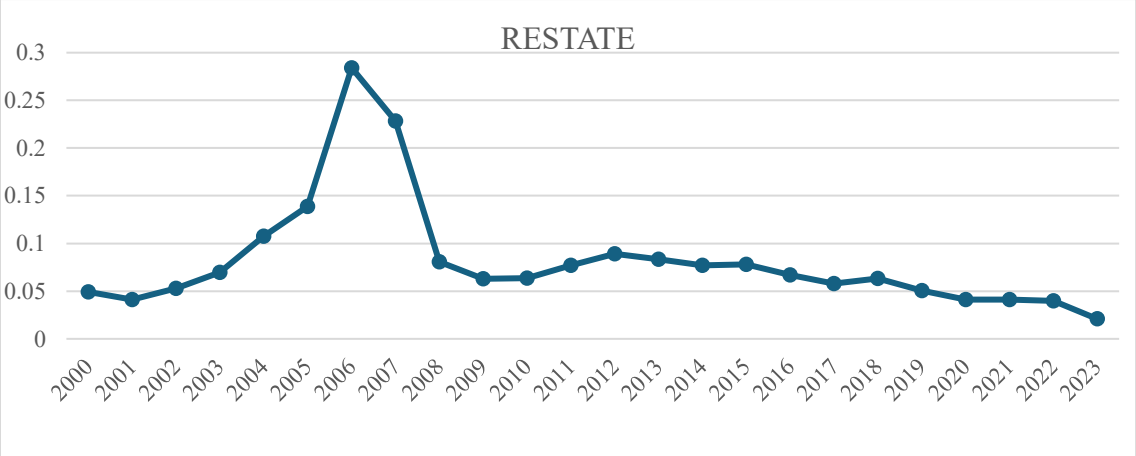
Panel A: Mean of Abnormal Accruals



Panel B: Going Concern Opinions



Panel C: Restatements



Overall, the evidence suggests that COVID-19 triggered a temporary drop in audit quality measured by discretionary abnormal accruals, while going-concern reporting rose during the later pandemic years, restatements continued their long-run decline, unaffected by the pandemic.

Table 3 presents the main results of this paper, examining the effect of COVID-19 by comparing pre- and post-pandemic periods, including the crisis year 2020. For *ABS_ACC*, the *POST* indicator is positive and highly significant ($\beta = 0.516$, $p < 0.01$). This result indicates that discretionary accruals increased substantially after COVID-19, suggesting a deterioration of audit quality in the immediate after the pandemic. For *GOINGCONC*, *POST* is insignificant due to the mixed effect of going-concern opinions before and after the pandemic. This paradox may reflect delays in identifying going-concern issues following periods of remote auditing. For *RESTATE*, *POST* is negative and significant ($\beta = -0.019$, $p < 0.01$), indicating that the number of restatements decreased even after the onset of COVID-19. Taken together, Table 3 suggests that COVID-19 led to higher discretionary accruals, which in turn reduced audit quality. However, it did not result in an increase in auditors' issuance of going-concern opinions.

For control variables, firms audited by Big 4 exhibit relatively lower frequency of restatements and going concern opinions, consistent with prior research. (Francis and Yu, 2009) However, there was no significant difference in discretionary accruals (*ABS_ACC*). Audit fees are negatively associated with accruals, consistent with greater audit effort constraining earnings

management and improving audit quality. Consistent with prior studies (Lewellen and Resutek, 2019; Chan et al., 2004), leverage increases accruals, while profitability reduces them. Also, leverage and losses significantly increase the number of going-concern opinions, while profitability decreases it. (Geiger et al, 2018).

Table 3. Regression Results for the Impact of Covid-19 Pandemic on Audit Quality (2017-19 vs. 2020-22)

Variable	*ABS_ACC*		*RESTATE*		*GOINGCONC*	
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
POST	0.516***	(6.52)	-0.019***	(-6.85)	-0.002	(-0.56)
Big4	0.018	(0.18)	-0.037***	(-8.67)	-0.036***	(-4.40)
Audit fees	-0.212***	(-2.92)	0.024***	(9.54)	0.040***	(8.07)
Auditor Change	0.047	(0.26)	0.030***	(4.03)	-0.005	(-0.53)
Firm Size	0.122**	(2.32)	-0.008***	(-5.71)	-0.072***	(-24.72)
Leverage	0.476***	(4.53)	0.002	(1.17)	0.022***	(10.86)
Profitability	-0.793***	(-13.18)	0.000	(0.01)	-0.006***	(-4.95)
Loss	-0.291***	(-2.78)	0.018***	(5.17)	0.063***	(12.26)
Intercept	2.291**	(2.08)	-0.228***	(-5.90)	-0.029	(-0.44)
Industry FE	Yes		Yes		Yes	
N	26,296		26,296		26,296	
Adjusted R^2	0.249		0.015		0.357	

Note: *, **, *** indicate statistical significance at 10 percent, 5 percent, and 1 percent, respectively, using two-sided tests. This table provides regression results testing the impact of Covid-19 pandemic on audit quality. Standard errors are clustered by company.

Table 4 provides another test by excluding 2020, which was uniquely disruptive. For *ABS_ACC*, *POST* is now significantly negative ($\beta = -0.638$, $p < 0.01$), suggesting that after the initial shock, discretionary accruals declined. This reversal implies that the elevated accruals observed in Table 3 were concentrated in 2020 rather than persisting long-term.

For *GOINGCONC*, *POST* is positive and significant ($\beta = 0.008$, $p < 0.05$), suggesting audit quality, as measured by the going concern opinion, appears to have deteriorated with a time lag following the onset of COVID-19. For *RESTATE*, *POST* remains significantly negative ($\beta = -0.024$, $p < 0.01$), showing that restatements continued to decline even beyond 2020. Furthermore, the findings suggest that although 2020 was marked by significant disruption and heightened accruals, audit oversight has partially recovered in the longer-term post-pandemic period, with greater attention given to going-concern assessments.

Table 4. Regression Results excluding Year 2020 (2017-19 vs. 2021-23)

Variable	*ABS_ACC*		*RESTATE*		*GOINGCONC*	
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
POST	-0.638***	(-11.43)	-0.024***	(-8.57)	0.008**	(2.11)
Big4	-0.046	(-0.61)	-0.034***	(-8.23)	-0.039***	(-4.81)
Audit fees	-0.148**	(-2.44)	0.023***	(9.12)	0.041***	(8.27)
Auditor Change	-0.020	(-0.14)	0.029***	(3.94)	-0.001	(-0.14)
Firm Size	0.059	(1.37)	-0.008***	(-6.15)	-0.072***	(-24.92)
Leverage	0.281***	(2.92)	0.003*	(1.84)	0.023***	(10.43)
Profitability	-0.741***	(-11.92)	0.001	(1.29)	-0.007***	(-5.07)
Loss	-0.616***	(-7.60)	0.015***	(4.20)	0.063***	(11.95)
Intercept	2.732***	(3.18)	-0.207***	(-5.06)	-0.063	(-1.00)
Industry FE	Yes		Yes		Yes	
N	24,920		24,920		24,920	
Adjusted R^2	0.284		0.015		0.361	

Note: *, **, *** indicate statistical significance at 10 percent, 5 percent, and 1 percent, respectively, using two-sided tests. This table provides regression results testing the impact of Covid-19 pandemic on audit quality excluding year 2020. Standard errors are clustered by company.

Table 5 presents the regression results analyzing the impact of the COVID-19 pandemic on audit quality, focusing on whether and how the effect differs between Big 4 and non-Big 4 auditors. Consistent with the results in Table 3, the coefficient on *POST* is still significantly positive (β=0.872, $p<0.01$), indicating that overall audit quality deteriorated in the post-COVID period as firms exhibited higher levels of discretionary accruals. However, the interaction term *POST*Big4* is significantly negative (β=-0.553, $p<0.01$), suggesting that the increase in accruals post-COVID is significantly smaller for firms audited by Big 4 auditors. In other words, Big 4 auditors appear to have maintained better audit quality under the challenges posed by the pandemic, mitigating the rise in accrual-based earnings management.

The table also shows that Big 4 auditors are more likely to issue going concern opinions overall, but their reporting behavior remained unchanged during the pandemic despite increased economic uncertainty. Similarly, while financial restatements declined after COVID-19 and were less common among Big 4 clients, the pandemic did not significantly impact this existing trend.

Table 5. Regression Results on the Impact of the COVID-19 Pandemic on Audit Quality by Big 4 Auditors (2017-19 vs. 2020-22)

Variable	*ABS_ACC*		*RESTATE*		*GOINGCONC*	
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
POST	0.872***	(5.79)	-0.014***	(-2.72)	-0.007	(-0.97)
Big4	0.318**	(2.43)	-0.033***	(-6.00)	-0.041***	(-4.25)
*POST*Big4*	-0.553***	(-3.19)	-0.007	(-1.19)	0.009	(1.01)
Audit fees	-0.211***	(-2.91)	0.024***	(9.55)	0.040***	(8.07)
Auditor Change	0.061	(0.34)	0.030***	(4.05)	-0.005	(-0.56)
Firm Size	0.120**	(2.28)	-0.008***	(-5.73)	-0.072***	(-24.72)
Leverage	0.476***	(4.53)	0.002	(1.17)	0.022***	(10.86)
Profitability	-0.795***	(-13.20)	-0.000	(-0.02)	-0.006***	(-4.94)
Loss	-0.285***	(-2.73)	0.018***	(5.19)	0.063***	(12.23)
Intercept	2.114*	(1.91)	-0.231***	(-5.95)	-0.026	(-0.40)
Industry FE	Yes		Yes		Yes	
N	26,296		26,296		26,296	
Adjusted R^2	0.249		0.015		0.357	

Note: *, **, *** indicate statistical significance at 10 percent, 5 percent, and 1 percent, respectively, using two-sided tests. This table provides regression results testing the impact of Covid-19 pandemic on audit quality by Big 4 auditors. Standard errors are clustered by company.

7. Conclusion

In this paper, we examine the impact of the COVID-19 pandemic on audit quality using a large sample of U.S. firm-year observations from 2017 to 2023. By comparing audit quality before and after the pandemic, we evaluate whether audit quality was affected by the COVID-19 pandemic shock. Audit quality is measured using three well-established proxies: absolute abnormal accruals, going concern opinions, and financial restatements.

We find that audit quality declined temporarily at the start of COVID-19 in 2020, as evidenced by the significant rise in discretionary accruals. This implies that auditors could not limit earnings management during the early period of the pandemic, perhaps due to interruptions in audit procedures and limitations in gathering sufficient audit evidence remotely. However, when 2020 is excluded from the analysis, the trend is the other way around, discretionary accruals decrease notably in subsequent years, implying that audit quality recovered in the longer term as auditors adapted to the new setting.

Going concern opinions, in contrast, did not increase immediately in the early pandemic but showed a lagged increase in 2022, possibly due to a time lag in realization and disclosure of financial stress. Financial restatements, in contrast, continued their long-run declining trend even after the arrival of COVID-19.

Our findings indicate that discretionary accruals increased in the immediate after the COVID-19 pandemic and that going concern opinions rose with some delay. However, our analyses do not fully explain why these changes occurred. We conjecture that the dramatic shifts in both metrics reflect the unprecedented economic disruption and heightened uncertainty faced by firms and auditors during the pandemic.

Firms might have been compelled to rely more extensively on judgment and estimation, particularly in revenue recognition, collectability assessments, inventory valuation, and

impairment testing, while also facing incentives to manage earnings either upward to avoid covenant violations and reassure investors, or downward through 'big bath' write offs. The complexity of accounting for various government support programs might have further amplified accrual adjustments.

At the same time, auditors might have encountered severe liquidity pressures, operational disruptions, covenant breaches, and asset impairments across many client firms, prompting more conservative evaluations of financial viability and, consequently, a higher incidence of going concern opinions. However, because our study does not provide empirical evidence directly supporting these conjectures, further research is needed to substantiate these mechanisms.

Interestingly, our results highlight the role of audit firm characteristics in moderating the impact of the pandemic on audit quality. Big 4 auditors seem to have had more stable audit quality in the face of pandemic-driven pressures. The post-COVID accruals spike was significantly smaller for companies audited by Big 4 auditors, suggesting better monitoring and better capacity to adapt to remote auditing settings. Additionally, Big 4 auditors continued to issue more going concern opinions and were associated with fewer restatements, consistent with their reputation for issuing higher audit quality.

Despite the insights offered, there are certain limitations of this study. First, even though we examine a fairly long post-COVID observation period, it is possible that the effect of the pandemic might still be evolving, particularly with advancements in digital audit technologies. Future research should examine even longer time horizons to see whether these changes are permanent or temporary.

Second, our audit quality proxies, while well-liked in the literature, are indirect and potentially affected by firm-specific influences exogenous to audit processes. Future research can be improved by incorporating qualitative data, such as survey data or interview-based observations from auditors, to complement quantitative evidence.

In conclusion, this study provides evidence that the COVID-19 pandemic led to an initial decline in audit quality, but that audit oversight improved in later years. The findings also emphasize the importance of auditor characteristics, such as Big 4 affiliation, in mitigating the adverse effect of worldwide disruptions on audit performance. These findings have implications for audit firms, regulators, and standard-setters seeking to promote audit integrity in an increasingly digital and uncertain world.

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