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Audit report lag during the COVID-19 pandemic: A multi-country analysis

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ABSTRACT

This research investigates the impact of the COVID-19 pandemic on the promptness of audit reports. The COVID-19 epidemic has had a significant impact on several sectors, including accounting and auditing. The present study employed a dataset of 6652 multinational firms sourced from the Refinitiv Eikon and Datastream databases. We chose the year 2018 as the first reference point because there was no worldwide pandemic during that period. The global outbreak, which emerged in Wuhan, China, in December 2019, rapidly disseminated to many nations by March 2020. The regression analysis of a sample of 6652 worldwide enterprises indicates a positive correlation between the COVID-19 epidemic and the delay in issuing audit reports. This observation implies that the occurrence of such crises exacerbates the promptness of audit reports. Our study's findings indicate that governments' implementation of travel restrictions has a negative impact on the promptness of audit reports. Therefore, our results demonstrate resilience to endogeneity. Our findings add to the body of knowledge; this is the first study to look at how the COVID-19 epidemic has affected audit report latency globally. Second, while the promptness of audit reports is crucial for regulators and investors in a stable environment, it becomes even more crucial under unforeseen circumstances like the COVID-19 epidemic. Finally, the results of this study hold significant relevance for regulatory bodies and investors alike.

Contribution/Originality: This study is among a limited set of research endeavors that employed audit report lag during the COVID-19 pandemic among multi-country analysis. The primary finding of the paper is the identification of a direct correlation between audit report lag during the COVID-19 pandemic.

1. INTRODUCTION

The onset of the coronavirus pandemic occurred in December 2019 in Wuhan, China, and was then disseminated globally in 2020. The World Health Organization (WHO) declared in March 2020 that Coronavirus (hereafter referred to as COVID-19) is a global pandemic that impacts the lives of all individuals. The pandemic has had a significant impact on all capital markets due to the implementation of lockdown measures, either fully or

partially (Ashraf, 2020; Baker et al., 2020; Zhang, Hu, & Ji, 2020). The economic activities of businesses have seen a substantial downturn due to the COVID-19 outbreak (Baqaee & Farhi, 2022; Haga & Ittonen, 2021), leading to a notable reduction in stock prices and revenues. As a result, the level of information uncertainty rises, prompting information consumers to rely on external auditors to ensure the accuracy and reliability of financial reporting. This uncertainty may create challenges in retrieving sufficient and suitable audit evidence that helps auditors build an independent opinion regarding management judgments and estimates. The COVID-19 pandemic posed many challenges to auditors in submitting audit reports on time. Auditors were likely to be influenced by the COVID-19 environment, such as travel restrictions, and offices being shut down due to the lockdown, either partially or completely; therefore, auditors are not able to reach places on time. This may worsen the timeliness of the audit reports. Thus, we believe that an investigation into the effect of COVID-19 on audit report delays is interesting and worthwhile. Therefore, this study investigates the impact of the COVID-19 outbreak on audit report lag (hereinafter ARL).

Numerous studies in the literature have examined various factors influencing ARL, including the characteristics of auditors (Bamber, Bamber, & Schoderbek, 1993; Habib, Bhuiyan, Huang, & Miah, 2019) firm characteristics (Courtis, 1976; Davies & Whittred, 1980) and corporate governance (Abdelsalam & Street, 2007; Nelson & Shukeri, 2011). The aforementioned research has identified a substantial association between timeliness and factors such as auditors, corporate governance, and business characteristics. Researchers predict that the COVID-19 pandemic will affect auditors' ability to perform audit engagements and impact the firm's overall environment in different ways. These include alterations in information retrieval and internal control procedures pertaining to the generation of financial information (Deana & Tracy, 2020; Dohrer & Mayes, 2020; Ravi, 2020). This observation suggests that the COVID-19 epidemic has the potential to exacerbate the promptness of audit reports. Haga and Ittonen (2021) conducted a recent study examining the impact of organizational resilience of audit companies on the occurrence of audit report lag during the COVID-19 pandemic. The findings indicate that companies subjected to audits conducted by prominent and industry-specific auditors tend to submit their audit reports at an earlier stage compared to other firms. Haga and Ittonen (2021) study, albeit innovative, did not specifically examine the impact of the COVID-19 pandemic on audit delays. Hence, we contend that our work represents the inaugural endeavor to investigate this correlation.

The economy and financial market have been significantly affected by the COVID-19 epidemic. In a recent study conducted by Alkebsee, Azibi, Koutoupis, and Dimitriou (2023) it was observed that audit fees experienced a decline amidst the COVID-19 pandemic. The researchers attributed this reduction to a variety of factors. Firstly, the implementation of social distancing measures and travel restrictions in various contexts during the pandemic led to the adoption of remote work and social distancing as the prevailing norm. Consequently, auditors found that this shift resulted in increased effort and working hours. This case simplifies audit procedures by eliminating the need for auditors to physically inspect assets, leading to reduced audit fees. Financial market authorities and international standards mandate the establishment of a specific requirement pertaining to corporate disclosure and the audit process. These regulatory bodies have released updated recommendations about the factors that financial report preparers and auditors should take into account within the ongoing epidemic. An illustration of this may be seen in the Division of Corporate Finance of the Securities Exchange Commission in the United States, which offers further perspectives on the operational aspects of companies in relation to the COVID-19 pandemic. The Securities and Exchange Commission (SEC) has issued an order to extend the deadline for larger broker dealers to file their annual reports (Release No. 34-91128; SEC).

In Europe, the Council of the European Union declared an emergency crisis and extended the period of legal documentation (Annual Report and DAC 6). Most European Union states opted for the six-month deferral of reporting deadlines. Germany and Finland did not extend the deadlines. In Estonia, as a result of the COVID-19 pandemic, the deadline for submission of the annual report was reported (small companies by July 31, 2021,

medium-sized, large, and group comprised by October 31, 2021). In Luxemburg, the Government has extended certain deadlines under the General Extension Law. The annual report submission is concerned with this extension. In the UK, the Financial Reporting Council (FRC) and Financial Conduct Authority (FCA) jointly published a statement on the specific measures related to financial reporting during the COVID-19 crisis. According to this statement, the authority granted some flexibility regarding filing financial reports and provided an additional two months for the annual report (i.e., they extended the time for launching financial reports to six months rather than four) and only one month for the semester annual report (i.e., within 4 rather than three months of the financial half-year end date). In Australia, the Australian Securities and Investment Commission (ASIC) extends the deadline for listed and unlisted entities by one month under the requirements of Chapters 2M and 7 of the Corporation Act. In summary, such an extension during the COVID-19 pandemic aims to assist enterprises and auditors whose reporting process takes additional time because of the lockdown and travel restrictions between countries.

ARL is the time between the firm's fiscal year-end and date of the auditor's signature on the audit report. Audit reports are more timely, which increases the usefulness of investor decisions. ARL is a function of a client's characteristics and business risk. During the COVID-19 pandemic, business risk increased; therefore, auditors must consider such an unexpected event in the timeliness of their reports. Ravi (2020) points out that auditors should reconsider the risk of material misstatements and detection during the COVID-19 pandemic because of the economic volatility arising from the pandemic. This suggests that auditors must be mindful of new and increasing risks to their clients. A good risk assessment during a pandemic requires more procedures and efforts to assess the internal control environment (Radigan, 2021). Moreover, auditors need more time to understand the client's environment, such as capital structure, industry, and operations, as some industries have elevated risks due to the COVID-19 pandemic (Ravi, 2020). This suggests that the COVID-19 pandemic is more likely to lengthen the time between a firm's fiscal year-end and the date of the auditor signature. Based on that, this study tried to answer this question: Does Audit Report Lag change during the COVID-19 pandemic?

Based on a sample of 9,265 international firms, we examined the effect of the COVID-19 pandemic on the timeliness of audit reports. The regression results illustrate a positive association between the COVID-19 outbreak and ARL, suggesting that this pandemic created serious challenges for auditors; in turn, auditors failed to complete their audit engagement in a short time. In terms of economic magnitude, our results reveal that auditors delayed their reports during the pandemic by approximately nine days. Additionally, we investigate the effect of COVID-19 pandemic restrictions on the timeliness of audit reports using a proxy LOCKDOWN to determine whether the government forced a lockdown. Our results show that when the government announced a lockdown, either partially or completely, auditors delayed their reports by approximately 10 days.

Our study makes a significant contribution to the field of ARL research. This study is the first endeavor to examine the ramifications of the COVID-19 epidemic on the punctuality of audit reports. Furthermore, the findings of our study may have significant implications for regulators and politicians who are contemplating the possibility of granting corporations an extended period to file audited financial reports in the face of unforeseen circumstances. The promptness of audit reports has significant importance for investors and regulators during periods of stability, but assumes even more significance in unforeseen circumstances, such as the ongoing COVID-19 epidemic. Hence, the findings of our study hold significant relevance for professionals engaged in the process of revising audit standards. Regulatory organizations may be motivated to modify their international audit standards based on empirical facts regarding the impact of the COVID-19 pandemic on ARL.

The subsequent sections of this work are structured in the following manner. Section two of the paper examines the relevant literature and formulates the hypotheses. The third section elucidates the research methodology employed in the study. The empirical results are presented in Section four. Section five serves as the final conclusion of the paper.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Enterprises' timely dissemination of financial accounts is a critical element in the information market. The standard-regulating bodies of both the US and the EU have emphasized the need for promptly revealing financial reports (Financial Accounting Standards Board, 1980). In a same vein, regulatory bodies have emphasized the need for timely financial reporting. For instance, the Securities and Exchange Commission (SEC) has implemented a progressive decrease in the filing obligations for significant depositors who are experiencing rapid growth (Securities and Exchange Commission, 2004).

The number of days between the end of a company's financial year and the date of its auditor's report is ARL (Ashton, Willingham, & Elliott, 1987). ARL has occupied the academic community for more than 50 years. The first studies were those of Beaver (1968); Courtis (1976) and Gilling (1977). The former surveyed 204 listed companies in New Zealand, and the latter 187 companies ended up with an average of about 80 days required from the date of issuing the financial result until the issuance of the audit report. Many other studies have been conducted, such as Davies and Whittred (1980) and Ashton et al. (1987). The ARL issue is of great interest and many researchers have studied the impact of timely information and audit adequacy. Investors seek a short period of ARL, which drives audit-efficiency discussions. An extensive research topic is how a well-structured corporate governance system can ensure the credibility of financial statements through external auditors (Cohen, Krishnamoorthy, & Wright, 2004). There is a widespread acceptance of the correlation between accounting information and market reactions. Equally important are the timeliness of financial reports and the reaction of stock prices to earnings announcements (Chambers & Penman, 1984; Givoly & Palmon, 1982).

Enterprises dissemination of financial accounts is a critical element in the information market. The standard-regulating bodies of both the US and the EU have emphasized the need for promptly revealing financial reports (Financial Accounting Standards Board, 1980). In a same vein, regulatory bodies have emphasized the need for timely financial reporting. For instance, the Securities and Exchange Commission (SEC) has implemented a progressive decrease in the filing obligations for significant depositors who are experiencing rapid growth (Securities and Exchange Commission, 2004). The meta-analysis conducted by Habib et al. (2019) also documented the multifaceted impact of ARL. The researchers conducted their investigation by directing their attention towards three distinct areas, including audit features, corporate governance traits, and firm drivers. Nevertheless, they assert that the research outcomes differ due to the significant variability in the correlation between the factors that influence ARL between and within nations. The period of time between the end of a company's fiscal year and the insurance of the auditor's report is known as Audit Report Lag (ARL). The occurrence of Audit Report Lag (ARL) in Malaysia can be impacted by several factors, including the financial burden connected with the internal audit function (Uyob et al., 2022). The increased costs related to the upkeep of an internal audit function diminish the previously established, robust, and favorable relationship between the COVID-19 pandemic and the length of time it takes to provide audit reports. According to Harjoto and Laksmana (2023) their scientific inquiry focused on analyzing the impact of the COVID-19 pandemic on accounting, reporting, and auditing (ARL) procedures in emerging economies.

The COVID-19 virus was officially designated as a pandemic by the World Health Organization in March 2020, owing to its fast transmission and the documented occurrence of over 118,000 cases across 114 countries, with an ongoing potential for additional dissemination (Kaka, 2021). The impacts are substantial on individuals, communities, and the worldwide economy. The implementation of public health measures in nearly all nations around the globe has resulted in a disruption of the equilibrium between social and economic endeavors. There was an immediate economic consequence, characterized by a significant decline in the majority of stock indexes. As anticipated, there has been a notable change in the focus of several researchers towards investigating the impacts of the Coronavirus pandemic. The impact of the pandemic on corporate governance, firm performance, financial markets, abnormal stock returns, and the economy has been extensively investigated in various studies (Albulescu,

2021; Hu & Zhang, 2021; Koutoupis, Kyriakogkonas, Pazarskis, & Davidopoulos, 2021; Liu, Yi, & Yin, 2021; McKibbin & Fernando, 2020; Shen, Fu, Pan, Yu, & Chen, 2020). However, we have yet to investigate the impact of the COVID-19 pandemic on Audit Report Lag (ARL).

In exceptional circumstances, such as significant fraudulent activities, economic downturns, or pandemics, the audit department initiates and triggers the "alarm bell" as a response to the prevailing turmoil. The heightened level of market uncertainty, in conjunction with a decline in investor confidence, warrants heightened scrutiny. The auditor encounters exceptional obstacles and circumstances that have the potential to result in corporate insolvency or the manipulation of earnings (Albitar, Gerged, Kikhia, & Hussainey, 2020). We postulate that the financial crises of 2008 and the COVID-19 epidemic share certain common characteristics. Hence, the escalating need for assurance during the COVID-19 period results in heightened audit exertion, potentially resulting in an extended audit duration. Growing risk due to the pandemic has led firm executives to restructure their policies and organizational planning so that they can cope with emergencies (Shen et al., 2020). Deadlines in the external audit of companies are important, and the process of completion and reporting of the final opinion requires the observance of strict schedules. Audit evidence can be difficult to reconstruct if it does not appear timely. Additionally, users of financial statements require auditors to provide timely and relevant information. The COVID-19 pandemic has caused significant changes in our lives. Most countries impose strict restrictions on travel, many city areas are locked down, remote working is increasingly gaining ground, and in many cases, face-to-face contact is impossible. Unsurprisingly, this has an impact on audit conduct, as traditional methods of audit procedure completion are no longer feasible, necessitating remote completion. According to Kaka (2021) the advent of COVID-19 has created a climate of uncertainty and low priority in the completion of audit procedures. However, this contradicts auditors' basic responsibilities, which must ensure compliance with all auditing standards and regulations.

The COVID-19 epidemic has presented intricate obstacles to financial statement reporting and audit engagements. Auditors have encountered challenges in acquiring sufficient and relevant audit evidence as a result of travel limitations and the absence of client personnel. According to Harjoto and Laksmana (2023) the ongoing pandemic has necessitated auditors to modify the type, scope, and timeliness of their examinations, leading to increased audit fees and extended time frames for completing audit engagements. Scholarly examinations of the effects of the COVID-19 pandemic on audit fees, audit quality, and audit report latency have been conducted in many nations, including Malaysia (Uyob et al., 2022).

Major audit firms also note possible delays in reporting because of the pandemic. KPMG (2020) emphasizes that delays are expected due to travel restrictions and bans, while EY (2020) refers to delays in audit functions. Deloitte (2020) and PWC (2020) point out the actions that companies must take to prevent delays and reduce the risk of error and inaccuracy to maintain the trust of stakeholders. Furthermore, examining the pandemic's impact increases the time it takes for firms and auditors to evaluate it. Xu, Carson, Fargher, and Jiang (2013), studying the effects of a financial crisis, argue that auditors take precautionary measures by extending their audit effort.

Uncertainty and increased risk in the days of COVID-19 create a greater need for complex audit work, which takes more time to complete, and therefore, more time to audit. According to Saleem (2021) restrictions on social distance and movements make it difficult to obtain appropriate evidence during an audit, which may increase the likelihood of the auditor's opinion being delivered. Additionally, there is debate about the quality of financial statements and whether they can be prepared and audited over a limited period of time without compromising their reliability (Bryant-Kutcher, Peng, & Weber, 2013). As a result, we expect a positive relationship between audit report delays and the complexity of the current crisis period (El-Bannany, 2008). Most sectors suffer from a lack of liquidity and uncertainty regarding future economic growth. These conditions have led many companies to increase their business risks due to the current pandemic. According to Husain, Pasupati, and Quintania (2020) who studied audit delays during the COVID-19 period in Indonesia, emphasizing that ARL is now a separate issue for audit

firms and companies. Conclusions: Similar to the previous study, the Audit Analytics Staff (2020) blog reports that some audit reports were delayed in Europe and the United Kingdom.

The concept of "Audit Report Lag (ARL)" refers to the duration during which auditors are obligated to finalize their processes for a specific client. We conduct the collection from the end of the fiscal year to the official signing of the audit report. Handoyo and Maulana (2019) conducted the study that examined the many factors that impact the duration of audit report lag in financial statements, with a special focus on the banking industry. In this study, the data were selected by the purposive sampling technique, and the analysis was conducted utilizing multiple linear regression. Furthermore, Abdillah, Mardijuwono, and Habiburrochman (2019) conducted a study that investigated and evaluated several factors influencing the effectiveness of auditors in carrying out the audit process, as evidenced by the length of time required for submitting the audit report. The study uncovered a statistically significant negative impact on the rate of audit report issuance due to certain factors related to the efficacy of audit committees and a company's financial performance. However, the variable that represents the financial state of the business demonstrated a statistically significant positive influence on the duration required to release the audit report. Furthermore, Raweh, Kamardin, and Malik (2019) study presents empirical findings that establish a correlation between the features of audit committees and the timeliness of audit reports. The present study utilized a dataset of 255 firms that were listed in the Muscat Securities Market during the years 2013 and 2017. The results obtained from the multivariate analysis indicate a statistically significant and positive correlation between the size of the audit committee and the duration required to finalize the audit report. Moreover, research has shown that including financial knowledge within the audit committee decreases the length of the audit lag. Lai (2019) conducted a research study that investigated the possible consequences of a merger on the customer base of an audit business. The focus of this study mostly revolved around the assessment of the impact of mergers on report delay, audit fees, and audit quality. The objective of this research is to examine the impact of a merger between audit firms in Hong Kong on the duration of audit report lag in the property business. The results show a decrease in the time needed to submit audit reports for the consolidated company's client after the merger. In addition, consolidated corporations gain a significant portion of the market in the real estate industry, accounting for more than 50% of the market.

Durand (2019) aims to enhance our comprehension of the factors influencing audit report lag, a quantitative measure that quantifies the duration, in days, between a firm's fiscal year-end and the publication date of its auditor's report. This study aims to consolidate the existing literature on the subject under examination. This study presents findings that demonstrate a favorable association between the decrease in audit report lag and many characteristics, such as client size, positive earnings news, extended auditor tenure, and the supply of non-audit services. Furthermore, the study conducted by Firnanti and Karmudiandri (2020) aims to gather empirical data in order to establish a correlation between corporate governance, as measured by the characteristics of the board and audit committee (specifically, size, frequency of meetings, independence, and expertise), and the duration of time needed to release an audit report, commonly referred to as the audit report lag. We find no statistically significant impact of parameters like audit committee independence, experience, or leverage on the duration of the audit report lag. In their study, Lajmi and Yab (2022) investigated the influence of internal governance procedures on the duration required for the issuance of an audit report. The time required for audit report preparation is largely influenced by the level of attention and expertise exhibited by an audit committee, resulting in favorable outcomes. Chalu (2021) aims to investigate the factors that influence the duration of audit reports at Central Banks located in Sub-Saharan Africa. The audit mandate alone had a negative impact on the overall audit quality inside Central Banks.

The influence of the COVID-19 pandemic on ARL was found to be significant, as indicated by a study done in an emerging nation (Bajary, Shafie, & Ali, 2023). This study aimed to investigate the capacity of the internal corporate audit function to mitigate the impact of the COVID-19 pandemic on Advanced Research Laboratories (ARL). Nevertheless, the results of this study did not demonstrate any significant impact. According to Uyob et al.

(2022) a recent study done in Malaysia has indicated that Islamic banks experienced an extended amount of time in producing audit reports during the COVID-19 epidemic in comparison to the period prior to the pandemic. According to a study conducted in the United States, enforcing COVID-19 public health restrictions had a positive impact on audit fees and audit delays among auditors at the local office level (Harjoto & Laksmana, 2023). The present study utilized lockout data at the state level to evaluate the magnitude of public health limitations on auditor office premises.

The results of this study suggest that the introduction of lockdown measures resulted in a rise in audit fees and extended timeframes for the realization of audit engagements. Additionally, the study revealed that customers operating on smaller sizes exhibited a higher susceptibility to taking on a greater financial burden associated with audits and experiencing extended delays in the auditing process during the epidemic. Based on pre-pandemic studies done by Morris and Hoitash (2023) it was predicted that when auditors are more vulnerable to an illness similar to influenza, there will be a rise in the time it takes to produce audit reports and a decrease in the quality of audits.

Collectively, the aforementioned research suggests that the COVID-19 epidemic has had a significant impact on both the delay in issuing audit reports and the expenses associated with audits. Lockdown measures and public health restrictions have resulted in higher prices and longer deadlines for audit engagements. Moreover, the existing body of evidence suggests that the COVID-19 pandemic has had a significant and positive influence on the occurrence of audit report lag, which is defined as an extended period of time required to complete audit reports. The ongoing worldwide pandemic has compelled auditors to make adjustments to the characteristics, extent, and promptness of their exams, resulting in escalated audit prices and prolonged durations for the completion of audit engagements.

However, several studies have posited that the internal audit function possesses the capacity to somewhat mitigate the repercussions on audit report deliver delays.

We anticipate that the aforementioned factor will significantly impact the timely completion of the audit procedure and the execution of assessment, potentially leading to the postponement of the audit report (Albitar et al., 2020). Therefore, it is our contention that audit reports may have a deficiency in timeliness during periods of pandemics. Based on the available information, we propose the following hypothesis:

H: COVID-19 is positively related to ARL.

3. RESEARCH DESIGN

3.1. Data and Sample Selection

The current analysis utilized a dataset of 6652 multinational corporations obtained from the Refinitiv Eikon and Datastream databases. We selected 2018 as the first reference point because the pandemic was not yet present globally at that time. The pandemic, originating in Wuhan, China, in December 2019, quickly spread to other countries by March 2020. This necessitated exploring various scenarios to assess its impact on the timeliness of audited financial reports. By comparing ARL data from 2018 to subsequent years, we can analyze any significant changes in receivables turnover attributable to the pandemic's effects on business operations and financial reporting practices. After excluding companies with incomplete data, our final sample consisted of 13,822 firm-year pairs. We subjected the continuous variables to winorization at the 1st and 99th percentiles of their respective distributions to ensure consistency. In Panel A of Table 1, it can be observed that the manufacturing "industrials" sector constituted the largest portion of our sample, accounting for 20.12% of the total. The discretionary consumer industry followed closely, representing 13.72% of the sample. In Panel B, the United States was the dominant country in our sample, accounting for 32.11% of the total. Japan ranked second, with a proportion of 10.63%.

Table 1. Sample distribution.

Distribution of our sample based on year					
Year	**Freq.**	**Percent**			
2018	2,310	16.71			
2019	2,478	17.93			
2020	3,131	22.65			
2021	3,762	27.22			
Panel A: Distribution of our sample based on industry					
Sector	Frequency	Percentage			
Energy	747	5.40			
Materials	1525	11.03			
Industrials	2781	20.12			
Consumer discretionary	1896	13.72			
Consumer staples	968	7.00			
Health care	1554	11.24			
Financials	454	3.28			
Information technology	1651	11.94			
Communication services	786	5.69			
Utilities	611	4.42			
Real estate	849	6.14			
Panel B: Distribution of our sample based on country					
Country	Frequency	Percentage	Country	Frequency	Percentage
Argentina	3	0.02	Malaysia	157	1.14
Australia	900	6.51	Malta	9	0.07
Austria	74	0.54	Mexico	16	0.12
Belgium	119	0.86	Monaco	4	0.03
Bermuda	39	0.28	Netherlands	156	1.13
Brazil	19	0.14	New Zealand	152	1.10
Cambodia	1	0.01	Norway	95	0.69
Canada	727	5.26	Oman	4	0.03
Cayman Islands	12	0.09	Panama	1	0.01
Chile	4	0.03	Philippines	9	0.07
Papua New Guinea	5	0.04	Poland	62	0.45
China	530	3.83	Portugal	26	0.19
United Kingdom	936	6.77	Puerto Rico	3	0.02
Cyprus	5	0.04	Russia	1	0.01
Czech Republic	6	0.04	Singapore	128	0.93
Denmark	133	0.96	South Africa	207	1.50
Faroe Islands	2	0.01	Spain	161	1.16
Finland	126	0.91	Sweden	419	3.03
France	302	2.18	Switzerland	276	2.00
Germany	405	2.93	Taiwan	333	2.41
Gibraltar	5	0.04	Thailand	5	0.04
United Arab Emirates	1	0.01	Ukraine	2	0.01
Guernsey	6	0.04	Hungary	12	0.09
Hong Kong	434	3.14	Macau	7	0.05
United States of America	4438	32.11	Uruguay	3	0.02
Indonesia	1	0.01	Jersey	16	0.12
Republic of Ireland;	123	0.89	S. Korea	453	3.28
Isle of man	7	0.05	Greece	18	0.13
Israel	21	0.15	Japan	1469	10.63
Italy	174	1.26	Luxembourg	60	0.43

3.2. Empirical Model

To test our hypothesis we employed Ordinary Least Squares (OLS) regression analysis to examine the effect of the COVID-19 pandemic on ARL.

$$ARL_{i,t} = \beta_0 + \beta_1 COVID + \beta_2 \text{AFEES}_{i,t} + \beta_3 \text{AUDOPIN}_{i,t} + \beta_4 \text{BIG4}_{i,t} + \beta_5 \text{OWN}_{i,t} + \beta_6 \text{ZSCORE}_{i,t} + \beta_7 \text{INV\_PROT}_{i,t} + \beta_8 \text{IAD}_{i,t} + \beta_9 \text{FSIZE}_{i,t} + \beta_{10} \text{DEBT}_{i,t} + \beta_{11} \text{BTM}_{i,t} + \beta_{12} ROA_{i,t} + \beta_{13} LOSS_{i,t} + \beta_{14} \text{BSIZE}_{i,t} + \beta_{15} \text{IDP}_{i,t} + Yeareffect + Industryeffect + \varepsilon_{i,t} \quad \dots (1)$$

The dependent variable in this study is ARL, which represents the audit report lag. ARL is defined as the duration between the fiscal end year of the business and the date on which the auditor signs the audit report. This study sets the independent variables, COVID-19, to 1, if the fiscal end-year is 2020 and to zero otherwise. In order to account for the independent influence of COVID-19 on ARL, our model incorporates a number of control factors that have been identified as being associated with ARL in previous studies (Bhuiyan & D'Costa, 2020; Blankley, Hurtt, & MacGregor, 2014; Habib, 2015; Habib & Huang, 2019; Haga & Ittonen, 2021). Initially, we account for variables associated with auditor attributes, such as total audit fees (AFEES), which constitute the logarithm of the whole audit fee. AUDOPIN is an indicator variable that represents the auditor's opinion on financial reposts. It is coded as 1 if the auditor's opinion is zero, and 0 otherwise. The variable BIG4 is assigned a binary value of 1 if the firm undergoes an audit conducted by one of the Big Four auditors, and a value of 0 otherwise. Furthermore, we incorporate external variables, such as ownership concentration (OWN), which is mathematically defined as the proportion of ownership concentration, specifically the free-float percentage. The ZSCORE formula is a multivariate metric utilized to assess the financial well-being of a firm and forecast the likelihood of insolvency within a two-year timeframe. The Shleifer and Vishny (1997) metric, denoted as INV_PORT, is assigned a value of 1 when the country's legal framework is categorized as a robust safeguard for investors, and 0 otherwise. The variable IAD is assigned a binary value of 1 if the business possesses an internal audit department, and a value of 0 otherwise. In addition, we incorporate company-specific attributes such as FSIZE, which denotes the size of a firm and is calculated as the logarithm of its total assets. We calculate debt, a measure of a company's leverage, by dividing its total obligations by its total assets. This is because a lack of flexibility leads to increased financial risk. Therefore, we postulate a positive correlation between the debt variable and ARL. Book-to-market (BTM) is the quotient obtained by dividing the book value by the market value. Return of Assets (ROA) stands for return on assets, LOSS is an indicator variable representing a negative profit declared by a corporation, and non-profitable enterprises are linked to a long ARL. To mitigate the influence of corporate governance quality, we incorporate the variable BSIZE, which denotes the quantity of directors serving on a board. The term "independent directors on the board (IDP)" refers to the ratio of independent directors present on a board. In this study, we use industry and company fixed effects as control variables. The Appendix 1 has a comprehensive description of all the variables.

4. EMPIRICAL RESULTS

4.1. Descriptive Statistics

Table 2 presents the descriptive statistics of all variables used, with an average time between the firm's fiscal end year and the date of the auditor's signature (ARL) of 59.56 days. This statistic is lower than what was reported by Bajary et al. (2023) (99.81 days), using Malaysian listed firms. while it is higher than the average ARL reported by Lawal and Shinozawa (2022) (41.21 days) using Japanese data. The average COVID score was 0.283. The auditor's average qualified opinion was 0.793. 45.6% of our sample firms are audited by one Big Four auditor. The mean strategic investment made (STRINV) was 0. 16.908. The average OWN was 71.21, with a ZSCORE of 19.24. The mean INV_PROT and internal audit department (IAD) values were 0.417 and 0.47, respectively. The average firm size is 21.45 with a financial flexibility of 0.162. The BTM ratio was 1.146 on average. The mean ROA is 2.4%, while 14.3% of our sample firms report a negative profit. The average number of directors on the board was 3.22 with a proportion of independent directors of 0.286.

Table 2. Summary statistics.

Variable	Mean	St. dev.	p25	Median	p75
ARL	59.56	19.41	40	50	79
COVID	0.283	0.426	0.0	0.0	0.0
AFEES	13.52	1.501	12.47	13.442	14.506
AUDOPIN	0.794	0.308	1	1	1
BIG4	0.456	0.498	0.0	0.0	1
OWN	71.21	25.252	50.099	76.208	95.906
STRINV	16.908	2.66	1.099	15.073	16.671
ZSCORE	19.24	1189.328	2.285	4.428	8.549
INV_PROT	0.417	0.493	0.0	0.0	1
IAD	0.47	0.499	0.0	0.0	1
FSIZE	21.42	2.036	20.069	21.346	22.728
DEBT	0.162	0.18	0.014	0.114	0.258
BTM	1.146	366.731	1.057	1.824	3.565
ROA	0.024	0.286	0.01	0.038	0.076
LOSS	0.143	0.35	0.0	0.0	0.0
BSIZE	3.22	0.329	2.079	3.197	3.398
IDP	0.356	0.127	0.187	0.304	0.374

Note: All variables are defined in the Appendix 1.

The correlation matrix between all the variables included in our empirical model is presented in Table 3. The observed correlation coefficient (r = 0.015) between COVID-19 and ARL suggests a positive and statistically significant relationship. This implies that the COVID-19 crisis has resulted in a delay in the submission of audit reports. The absence of any coefficient over 0.50 among the independent variables indicates that our model does not exhibit any signs of collinearity.

Table 3. Pairwise correlations.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
ARL	1.000																	
COVID	0.015*	1.000																
AFEES	-0.203*	0.022*	1.000															
AUDOPIN	-0.091*	-0.111*	0.091*	1.000														
AUDRES	-0.001	0.013	-0.001	0.002	1.000													
BIG4	-0.085*	-0.027*	0.213*	0.097*	0.008	1.000												
BTM	0.004	-0.010	-0.019*	-0.002	0.000	-0.005	1.000											
OWN	-0.224*	-0.003	0.363*	0.076*	0.007	0.186*	-0.004	1.000										
STRINV	0.008	-0.008	-0.241*	-0.002	-0.000	-0.017*	0.000	-0.064*	1.000									
ZSCORE	0.003	0.004	-0.062*	-0.009	-0.000	-0.008	0.000	0.009	-0.002	1.000								
LOSS	0.103*	0.099*	-0.041*	-0.042*	-0.003	0.034*	-0.013	0.085*	-0.009	-0.001	1.000							
INV_PROT	-0.392*	-0.000	0.319*	0.072*	0.001	0.188*	-0.008	0.361*	-0.022*	-0.006	0.029*	1.000						
IAD	-0.134*	0.079*	0.553*	0.115*	0.008	0.180*	-0.005	0.365*	-0.026*	-0.008	0.011	0.145*	1.000					
DEBT	-0.045*	0.043*	0.277*	0.024*	-0.005	0.090*	-0.013*	0.156*	-0.013	-0.012	0.045*	0.095*	0.241*	1.000				
ROA	-0.063*	-0.014*	0.001	0.037*	0.000	-0.005	0.004	-0.035*	0.002	0.005	-0.322*	-0.052*	0.017*	-0.018*	1.000			
BSIZE	-0.112*	-0.045*	0.407*	-0.016	0.001	0.042*	-0.003	-0.006	-0.013	-0.043*	-0.109*	0.073*	0.099*	0.002	0.032*	1.000		
IDP	-0.184*	0.016	0.026*	0.085*	0.002	0.149*	0.001	0.415*	-0.273*	0.012	0.133*	0.235*	0.228*	0.128*	-0.077*	-0.433*	1.000	
FSIZE	-0.173*	0.046*	0.715*	0.052*	0.003	0.118*	-0.004	0.189*	-0.005	-0.007	-0.205*	0.063*	0.474*	0.223*	0.096*	0.502*	-0.228*	1.000

Note: All variables defined in the Appendix 1 * show significance at the 0.01 level.

4.2. Regression Results

Table 4 reports the results of the relationship between COVID-19 and ARL. The coefficient on COVID, in column 1, is positive and significant (coefficient=8.76, p<0.01). This finding implies that during the COVID-19 pandemic, auditors delayed the release of audit reports later than before the COVID-19 pandemic by around 9 days. Although securities authorities and regulatory bodies have extended the firm's fiscal end-year. Our findings support practitioner's expectations that such a pandemic will disrupt the timeliness of financial reports. However, our findings are in line with Agre and Febrianto (2023) and Bajary et al. (2023) who find that Indonesian firms experienced a delay in financial reports during COVID-19. On the other hand, our findings are inconsistent with those of Yen and Herusetya (2023) who find a negative association between ARL and COVID-19. In Column 2 of Table 3, we report the results of the firm-fixed effect, and we find the coefficient on COVID is positive and significant (coefficient=6.40, p<0.01). This enhances our baseline results and supports our hypothesis.

With respect to the control variables, we find that ARL is short for firms that pay high audit fees, firms with unqualified audit opinions, firms with strategic investments, firms that operate under strong investor protection, large firms with good performance, and firms with large boards that are highly independent. ARL is longer for firms that replace their auditors and for firms with negative profit and IAD.

Table 4. Results of the relationship between COVID-19 and ARL.

ARL	Column (1) OLS	Column (2) firm-fixed effects	Column (3) OLS
COVID	8.76***(3.88)	6.40***(4.89)	-
LOCKEDOWN	-	-	9.987***(5.11)
AFEES	-0.661***(-3.99)	1.290***(4.29)	-.563(-1.39)
AUDOPIN	-1.898***(-3.41)	-5.530***(-11.81)	-2.914***(-4.20)
BIG4	0.970***(3.54)	-2.461***(-6.03)	-0.185(-0.40)
BTM	-0.004(-1.11)	0.000(0.22)	0.000(0.53)
OWN	-0.085***(-9.09)	-0.027(-1.64)	-0.044**(-2.20)
STRINV	-2.761***(-4.51)	0.184(0.40)	0.208(0.13)
ZSCORE	-0.001(-0.74)	0.003(0.94)	0.000(0.07)
LOSS	1.970***(4.50)	0.356(1.17)	1.704***(2.78)
INV_PROT	-9.513***(-30.02)	0.001(0.21)	-9.994***(-19.13)
IAD	5.853***(16.16)	-0.607(-0.93)	3.840***(6.16)
DEBT	-0.833(-1.07)	2.067*(1.95)	-4.173***(-3.22)
ROA	-12.096***(-10.61)	-4.098***(-3.65)	-9.338***(-5.45)
BSIZE	-2.949***(-5.19)	-1.806**(-2.36)	-5.505***(-5.89)
IDP	-25.218***(-18.57)	-2.611(-1.14)	-27.483***(-12.13)
FSIZE	-1.336***(-9.93)	-0.808*(-1.96)	-1.284***(-7.32)
Constant	111.660***(45.06)	64.056***(6.99)	104.654***(24.51)
Year	Yes	Yes	Yes
Industry	Yes	No	Yes
R	0.209	0.035	0.212
Observation	13822	13822	4843

"**Note:** This table reports the ordinary least squares (OLS) and firm-fixed effect regression results of the relationship between COVID-19 and audit report lag. Robust *t*-statistics (clustered at the firm level) are reported in brackets. *, **, *** denote a two-tailed *p*-value of less than 0.10, 0.05, and 0.01, respectively. Variable definitions are provided in the Appendix"

4.3. Additional Test

In order to examine the impact of COVID-19 on the promptness of audit reports, we conducted a study to determine if auditors working in a setting where the government implemented either partial or complete lockdown experienced a longer delay in submitting their reports compared to auditors working in non-lockdown environments. To achieve this, we created a binary variable, indicating 1 if the country faced travel restrictions and 0 otherwise. The following OLS regression was employed:

$$ARL_{i,t} = \beta_0 + \beta_1 LOCKDOWN + \beta_2 \text{AFEES}_{i,t} + \beta_3 \text{AUDOPIN}_{i,t} + \beta_4 \text{BIG4}_{i,t} + \beta_5 \text{OWN}_{i,t} + \beta_6 \text{ZSCORE}_{i,t} + \beta_7 \text{INV\_PROT}_{i,t} + \beta_8 \text{IAD}_{i,t} + \beta_9 \text{FSIZE}_{i,t} + \beta_{10} \text{DEBT}_{i,t} + \beta_{11} \text{BTM}_{i,t} + \beta_{12} ROA_{i,t} + \beta_{13} LOSS_{i,t} + \beta_{14} \text{BSIZE}_{i,t} + \beta_{15} \text{IDP}_{i,t} + Yeareffect + Industryeffect + \varepsilon_{i,t} \quad \ldots (2)$$

The independent variable, denoted as LOCKDOWN, is utilized to assess the impact of COVID-19. It is assigned a value of 1 if both the company and auditor are situated in a nation where the government has implemented travel restrictions, or zero otherwise. Equation 1 defines the model for the other variable. Column 3 of Table 4 presents the findings of the additional tests. The COVID coefficient exhibited a strongly positive and statistically significant relationship (coefficient=9.987, p<0.01). The aforementioned coefficient suggests that auditors and corporations function under the context of partial or total lockdown measures, extending the duration of the ARL. Put simply, companies situated in negligent settings submit their financial statements ahead of those situated in high healthcare settings by around 10 days. This study provides more evidence in support of our primary finding that the COVID-19 epidemic had a detrimental impact on the punctuality of financial reporting.

5. ROBUSTNESS

5.1. Propensity Score Matching (PSM) analysis

According to our baseline results, the positive effect of COVID-19 on ARL could be attributed to systematic differences in the characteristics of firms that operated during the COVID-19 crises (treatment) and firms that operated before the COVID-19 outbreak (control). To address this potential issue, we compare two groups of firms. We conducted a comparative investigation of the timeliness of audit reports between firms operated under the COVID-19 pandemic and firms that did not demand that both groups be similar to each other in terms of other firm characteristics. Following Armstrong, Jagolinzer, and Larcker (2010) we apply PSM analysis to effectively compare the two groups and to control for differences in firm characteristics. The application of PSM analysis requires matching the treatment and control groups to check match quality. Panel A of Table 4 displays the match quality, demonstrating that, except for the investor protection (INV_PROT) variable, all covariates are insignificant, suggesting a high quality matching process. Second, we regressed our empirical model for the matched sample to examine the effect of COVID-19 on ARL. Panel B of Table 5 reports the results of the PSM analysis; the coefficient of COVID is positive and significant (coefficient=6.495, p<0.01). These findings support our main results and indicate that they are robust to endogeneity concerns.

Table 5. Results of PSM analysis.

Panel A: Covariates matching				
Variable	**Treated**	**Controls**	**Difference**	**T-stat.**
AFEES	14.063	14.060	0.003	0.110
AUDOPIN	0.935	0.934	0.001	0.260
BIG4	0.461	0.466	-0.006	-0.510
BTM	3.997	4.322	-0.325	-0.690
OWN	74.916	75.558	-0.642	-1.180
STRINV	0.255	0.249	0.006	0.970
ZSCORE	7.880	8.605	-0.725	-0.910
LOSS	0.243	0.231	0.012	1.240
INV_PROT	0.284	0.303	-0.019	-1.760*
IAD	0.783	0.777	0.006	0.610
DEBT	0.204	0.201	0.004	0.970
ROA	0.024	0.027	-0.003	-0.830
BSIZE	2.185	2.189	-0.004	-0.520
IDP	0.268	0.269	-0.000	-0.010
FSIZE	22.125	22.117	0.008	0.220
Panel B: Results of PSM				
ARL	Column			
COVID	3.495***(2.91)			

Panel A: Covariates matching				
Variable	**Treated**	**Controls**	**Difference**	**T-stat.**
AFEES	-0.769***(-3.31)			
AUDOPIN	0.815(0.99)			
BIG4	1.584***(4.14)			
BTM	-0.018**(-2.22)			
OWN	-0.082***(-3.37)			
STRINV	-3.292(-1.50)			
ZSCORE	-0.002(-1.05)			
LOSS	1.737***(3.02)			
INV_PROT	-9.201***(-19.97)			
IAD	5.457***(10.63)			
DEBT	-3.098***(-2.84)			
ROA	-11.890***(-6.31)			
BSIZE	-2.527***(-2.87)			
IDP	-26.617***(-11.83)			
FSIZE	-0.723***(-3.66)			
Constant	97.029***(23.08)			
Year& industry	Yes			
R^2	0.166			
Obs.	2,408			

"**Note:** This table reports the propensity score matching (PSM) matching analysis results of the relationship between COVID-19 and audit report lag. Robust *t*-statistics (clustered at the firm level) are reported in brackets. *, **, *** denote a two-tailed *p*-value of less than 0.10, 0.05, and 0.01, respectively. Variable definitions are provided in the Appendix 1".

6. CONCLUSION

The present study investigates the impact of the COVID-19 epidemic on the duration of audit report lag. Our analysis of a sample of multinational companies revealed a significant correlation between the COVID-19 pandemic and ARL. These findings suggest that COVID-19 negatively impacts the promptness of audit reports, which aligns with professional predictions about its impact on the quality of financial reporting and auditing. In order to substantiate our findings, we conducted additional research to examine the impact of the primary measure implemented by governments, namely the lockdown, on mitigating the consequences of the ongoing epidemic. The utilization of lockdown measures serves as an indicator of the abrupt difficulties encountered by enterprises and auditors in response to the COVID-19 epidemic. According to the regression analysis, companies operating in a travel-restricted environment tend to postpone their audited financial reports by around six days compared to companies that do not have any travel restrictions. These data exhibit resilience against endogeneity issues when employed with the PSM model.

Our results contribute to the literature as follows: First, it is the first attempt to investigate the impact of the COVID-19 pandemic on the timeliness of audit report lag internationally. Second, as the timeliness of audit reports is very important for investors and regulators in a stable situation, it is more important for them in unexpected events, such as the COVID-19 pandemic. Therefore, our results are particularly informative for practitioners involved in audit standards amendments. We provide empirical evidence of the effect of the COVID-19 pandemic on ARL, which could be a fundamental motive for regulatory bodies to adjust international audit standards.

However, our study focuses on international firms, so the findings may not be applicable to firms in specific regions or industries. The measurement of lockdown as a proxy for COVID-19, reflecting the challenges faced by auditors during the pandemic, assumes that travel restrictions accurately capture the impact of lockdowns on audit report timeliness. While lockdowns may vary in intensity and duration across regions. However, we recommend researchers focus on these regions that have intensive lockdowns rather than those that do not. Further, research may consider specific industries, such as the hospitality and entertainment industries, to check the impact of the pandemic on the timeliness of financial reports.

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Appendix 1. Measurement of variables.

Variable	Description
ARL	Number of days between the firm's fiscal end-year to the date of auditor signature on the audit report.
COVID	An indicator variable coded 1 if the firm-year observation is in 2020 and zero otherwise.
AFEES	A natural logarithm of total audit fees.
AUDOPIN	A dummy variable is coded 1 if the auditor's opinion is unqualified, and zero otherwise.
Big4	A dummy variable, 1 if the auditor is from the big four, zero otherwise
OWN	The percentage of ownership concentration: Free float percentage.
STR_INV	Refers to strategic investment made by the firm measured by the logarithm of 1 plus the total strategic investment.
ZSCORE	The Z-score is a multivariate formula that measures the financial health of a company and predicts the probability of bankruptcy within two years. The Z-score combines five common business ratios using a weighting system calculated by Altman to determine the likelihood of bankruptcy. Typically, a score below 1.88 indicates that a company is likely heading for or is under the weight of bankruptcy. Conversely, companies that score above 2.99 are less likely to experience bankruptcy. A score between 2.99-1.88 is questionable.
INV_PROT	A Shleifer and Vishney measure coded 1 if the law country is classified as strong rules to protect investors, 0 otherwise.
IAD	A dummy variable coded 1 if the firm has an internal audit department, 0 otherwise.
FSIZE	A natural logarithm of total assets.
DEBT	A total long-term debt to total assets.
BTM	Book to market ratio.
ROA	Return on assets.
LOSS	A dummy variable coded 1 if a firm reported a loss in the financial reports.
BSIZE	The number of directors on the board.
IDP	A proportion of independent directors on the board.