

The Impact of the COVID-19 Pandemic on Quality of Financial Reports

Abstract

The Corona Virus Disease pandemic has significant adverse effects on the economy, health, and society that have hampered global economic growth. Taiwan is one of the countries impacted by this pandemic. The pandemic had an enormous influence on the world economy, making the role of financial report quality an even more critical issue. This study aims to examine and evaluate the impact of the COVID-19 pandemic on the quality of financial reports. In addition, it intends to examine and evaluate the differences between the impact of audit opinion and audit quality on the quality of financial reports before and after the COVID-19 pandemic. The quality of financial reports was measured using accruals and real earnings management proxies. This study adopts secondary data, i.e., annual financial reports and audit quality data of public listing firms on the Taiwan Stock Exchange (TSE). Furthermore, this study selected data from 2016 to 2021. This study proves that the COVID-19 pandemic affects the quality of financial reports. Furthermore, this study suggests that the COVID-19 pandemic strengthens the negative impacts of audit opinion on the quality of financial reports using accrual earnings management proxies. However, it also shows that audit quality did not impact the quality of financial reports proxied by accrual and real earnings management at the beginning of the COVID-19 outbreak.

JEL classification numbers:

Keywords: The Quality of Financial Reports, COVID-19 Pandemic, Audit Opinion, Audit Quality

1. Introduction

One of the biggest changes in the business environment is the emergence of the COVID-19 pandemic, which caused an unprecedented shock over the last two years, and has impacted the world. The COVID-19 pandemic is a new virus that spreads quickly across the world and attacks the human respiratory system. Accordingly, the pandemic has already become a severe one encountered by all countries. COVID-19 was initially detected near the year-end of 2019 in a city in China named Wuhan, and WHO confirmed it as a global pandemic in early March 2020 (Cucinotta & Vanelli, 2020; Balkhair, 2020; Šušak, 2020). According to WHO data, as of February 25, 2022, COVID-19 has infected more than 430 million people globally.

The COVID-19 pandemic's emergence affects everyone's health, which also affects economic growth. Albitar, Gerged, Kikhia, & Hussainey (2021) and Lassoued & Khanchel (2021) investigated that the pandemic has caused the biggest global health, economic, and social crisis, consequently leading to a slowdown in economic activity. Economic uncertainty creates weak economic activity, impacting almost every company's business confronting financial problems (PWC, 2020).

Many companies are concerned about their financial reports due to the economic slowdown affected by the COVID-19 pandemic. The continuing economic uncertainty affects the stakeholders' confidence in the company's financial performance. Stakeholders' trust in financial reports turns out to be the most vital point that management needs to pay attention to in understanding factors influencing the perception of financial report users on the financial condition of companies.

Therefore, accounting has become increasingly real and influential in realizing the financial responsibility of company managers through the output they produce, i.e., financial reports. Financial reports provide an overview and information on a company's financial results as internal and external parties require, serving as a consideration in business and economic decisions. Accounting services are frequently utilized by the company's external parties to assess the company's performance through the audit of financial reports and to convince users of financial reports that the financial reports are not manipulated by managers, which may further mislead them in making decisions.

The critical point in financial reports does not solely cover the results of the accounting numbers reported; e.g., the main concern is the aspect of reported profits. Although financial reports have been prepared based on established accounting standards, one point to be pointed out is the quality of the financial reports that meet such reporting objectives. In addition, the quality of financial reports includes two basic characteristics defined by the conceptual framework of FASB and IFRS, namely relevance and faithful representation (Beest, Braam, & Boelens, 2009; Gjoni-Karameta, Fejzaj, Mlouk, & Sila 2021).

Quality financial reports are prepared from audits performed effectively by qualified auditors since it is assumed that, in order to maintain credibility, the auditors become more careful in conducting the audit process to detect misstatements or all forms of fraud, either intentionally (fraud) or unintentionally (error). High-quality financial reports are required to maintain economic efficiency. Thus, maintaining accountability and transparency in financial reports is essential for every business.

Transparency is a critical component of a company's financial reporting to provide reliable information and restore trust in times of uncertainty (EY, 2020). One of the parties whose role is to provide reliable information to restore and increase the confidence of financial report users is the external auditor. The auditor plays the role, among others, of grasping the internal control of the company being audited to evaluate whether the company's financial reports have been presented fairly. In addition, due to the pandemic, the auditors were required to develop alternative procedures so that the audit evidence obtained could support the opinion they issued.

On the other hand, various policies have been implemented by many countries around the world, including Taiwan, to suppress or slow down the spread and death rate due to the COVID-19 pandemic. The government has implemented WHO's policies, such as social distancing, or later changed to physical distancing, school from home, work from home, and lockdown. As a result, accounting and auditing activities are also impacted, where the auditor's activities in conducting the audit process are hampered due to limited access and travel constraints. This situation prevents the auditor from collecting complete audit evidence and is a challenge to be faced by the auditor (Badawy, 2021). In fact, audit evidence is data that the auditors need as a material consideration when issuing an audit opinion. With sufficient and competent audit evidence, deviations in the financial statements can be detected, thereby maintaining audit quality.

The emergence of the COVID-19 pandemic has weakened the internal control environment. A weakened control environment creates situations in which companies, supply chains, and their customers are financially stressed and struggling, which may create opportunities for fraud, such as manipulating financial reports or misappropriation of assets (Deloitte, 2020). Although the fraud risk is not new, the COVID-19 pandemic has caused significant operational and financial disruptions, resulting in increased pressure on businesses and relevant stakeholders (Deloitte, 2020).

In addition, the accountant part is also unable to perform complete field operations. It is required to increase an attitude of professional skepticism due to the risk of the audit process carried out, either due to fraud or error. Since complete field operations could not be executed during the pandemic, the accountant is encouraged to complete the audit process through a remote audit, enabling a greater possibility of misstatements. The lack of direct interaction also enhances the opportunity for fraud as well as manipulation by management.

Thus, in this context, a research question proposed in this research includes: (1) whether the COVID-19 pandemic influences the quality of financial reports, (2) whether an audit opinion impacts the financial reports' quality before and after the COVID-19 pandemic, and (3) whether an audit quality impacts the financial reports' quality before and after the COVID-19 pandemic.

Some previous research has explored the effect of the COVID-19 pandemic on auditing and accounting literature. Those research mostly highlights the pandemic impact on the activities of professional accountants (Frumuşanu, Marin, & Martin, 2020; Papadopoulou & Papadopoulou, 2020), earnings management and financial reporting timeliness (Šušak, 2020), financial reporting quality (Badawy, 2021; Pham, Ho, Nguyen, Pham, & Bui, 2021), internal audit effectiveness from transitioning to remote audits (Eulerich, Wagener, & Wood, 2021), auditing quality (Albitar et al., 2021; Saleem, 2021), internal control systems (Zelie, 2021), auditing financial statements (Kaka, 2021).

Some differences are found between this research and previous research conducted in various countries regarding the pandemic. However, only a few research specifically investigated the conditions of companies' quality of financial reports impacted by the COVID-19 pandemic, strengthening the need for further research. The research gap found includes where this research was conducted on companies listed in Taiwan. In addition, the current COVID-19 pandemic has posed a difference in considering the auditor's attitude toward developing alternative procedures in their activities. This explains that different conditions may produce different research results. Thus, this study fills the gap by demonstrating empirical evidence and providing the research question's answers and seeks to examine how the pandemic affects financial report quality.

Sections of this study's remaining content are as follows: Section II describes the literature review and the hypothesis development. Section III describes the data sources, samples, and research design. Section IV discusses the research results and discussion. In the last section, we provide the conclusion and recommendation.

2.Literature Review and Hypotheses Development

2.1 COVID-19 Pandemic and Quality of Financial Reports

The COVID-19 pandemic has significant adverse effects on economy, health, and society that have hampered global economic growth (Shen, Fu, Pan, Yu, & Chen, 2020; Albitar et al., 2021; Lassoued & Khanchel, 2021; Zhu & Song, 2021). Taiwan are among the countries affected by this pandemic. It has changed many elements of life, especially in the economic field, and it has significantly impacted business activities (Šušak, 2020), causing issues for the practice of accountants (auditors) (Saleem, 2021). The financial reporting quality is vital since it provides crucial information utilized as a user decision-making consideration. Since the COVID-19 pandemic has significantly impacted the global economy (Zhu & Song, 2021), the function of financial report quality has become a more crucial concern. This condition was likely to affect the financial reporting quality (Pham et al., 2021). Numerous businesses have experienced financial hardship due to the pandemic and may be severely reliant on funding from creditors and investors.

Since companies are concerned about their financial reports due to the weakening economy brought on by the pandemic, they are encouraged to practice earnings management during the crisis. Lassoued & Khanchel (2021) provides evidence that earnings management has increased during the pandemic period, where they practiced earnings management to improve efficiency and maintain company performance in uncertain conditions due to the pandemic. However, the practice of earnings management causes the financial information presented not to match the actual situation, which then triggers the low quality of financial reports (Yadollah, Mehdi, & Maryam, 2012). Even though this time, to avoid further losses up until bankruptcy during the pandemic, both users of financial reports and their management require high-quality financial reports in their decision-making process.

Lassoued & Khanchel (2021) examined the effect between the pandemic and earnings management practices in Europe companies. The study suggests that the financial reports decreased reliability during the pandemic. The findings suggest that the company's management practiced earnings management during the pandemic to rebuild financial report users' confidence, which was required to meet the company's profit targets and support the economic recovery. Ryu & Chae (2022) showed that the COVID-19 pandemic significantly and positively impacts on accrual earnings management. In other words, companies are more involved in earnings management practices after the COVID-19 pandemic than in pre-pandemic, which further indicates a decline in the financial reports quality during the pandemic.

Yan, Liu, Wang, Zhang, & Zheng (2022) discovered that the COVID-19 pandemic has significant and positive impacts on real earnings management (REM) and accrual earnings management (AEM). In addition, the study proved that the COVID-19 pandemic intensifies earnings management behaviors. Hsu & Yang (2022) show that the pandemic significantly positively impacted the financial reports' quality proxied by real earnings management. The findings revealed that the quality of companies' financial reports during the pandemic was lower than before the COVID-19 pandemic.

Based on this description, it can be concluded that the first hypothesis employed in the study is as follows:

H1: There are differences in the quality of financial reports before and after the COVID-19 pandemic started.

2.2 Audit Opinion and Quality of Financial Reports Before and After the COVID-19 Pandemic

Al-Thuneibat et al. (2011) stated that the information presented in the financial reporting is the responsibility of management. Management is accountable for ensuring that the information presented follows reporting requirements and frameworks and must prepare financial reports in line with the actual circumstances for users or other interested parties (IAASB, 2020). An audit is a process that employs outside parties to validate the financial statements in order to mitigate information asymmetry between shareholders and managers.

An audit provides the highest assurance in the form of an opinion made by the auditor. An audit opinion is a professional statement made by a public accountant or independent auditor following an evaluation of the fairness of the financial statements provided by a company. In addition, an audit opinion is a statement resulting from a judgment (MohammadRezaei et al., 2016). Auditors may discover irregularities and disclose audit findings in the form of material misstatements to the financial reports, along with evidence of client errors or fraud (IAASB, 2020).

An independent auditor is accountable for the issued opinion (Tsipouridou & Spathis, 2014) to ensure that the final report is accurate. The auditor's unqualified opinion confirms that the accounting information in the audited financial reports did not contain material misstatements. Thus, the audited financial reports' information can be trusted by investors and other users of financial reports (Tsipouridou & Spathis, 2014). An opinion issued by the auditor on the financial reports is expected to reflect the financial report's quality. A good audit opinion also means a good quality financial report and earnings management have a lower possibility.

Due to the COVID-19 pandemic outbreak, auditors must maintain and enhance their professional skepticism. It is because many companies experienced a decline in their financial performance due to the pandemic. It encourages the company to commit fraudulent practices such as earnings management (Rose, Rose, Suh, & Thibodeau, 2020), which reduces the financial report's quality (Yadollah et al., 2012). By maintaining and enhancing professional skepticism, the quality of the company's financial reports is expected to be reflected in the audit opinion on financial reports. Thus, it can provide relevant and reliable information about financial performance that users can use for decision-making (Herath & Albarqi, 2017).

The result of the research conducted by Tsipouridou & Spathis (2014) examined the association between audit opinion and accrual earnings management (AEM). Their investigation revealed that audit opinion is unrelated to accrual earnings management (AEM). Meanwhile, Gajevszky (2014) found that audit opinion negatively impacts accrual earnings management and also stated that audit opinion could play a role in reducing earnings management practices to improve the quality of financial reporting.

Moreover, a study by Herbohn & Ragunathan (2008) found that audit opinion had no significant impact on real earnings management. The study indicated the limitation of auditors' capacity to detect real earnings management action.

Based on this description, it can be concluded that the second hypothesis employed in this study is as follows:

H2: There are differences in the audit opinion impact on the quality of financial reports before and after the COVID-19 pandemic started.

2.3 Audit Quality and Quality of Financial Reports Before and After the COVID-19 Pandemic

An audit of a company's financial reports by an independent auditor aims to express a financial report's fairness opinions according to the financial reporting framework (Al-Thuneibat et al., 2011; IAASB, 2020), as well as to increase confidence in financial reports' users regarding the information presented in the financial reports. Johnson et al. (2002) stated that the audit function's ability to improve financial reports' quality depends on the auditor's detection and disclosure of material misstatements. Thus, more auditors who discover irregularities and disclose audit findings in the form of material misstatements in financial reports, supported by proof of client errors or fraud, will result in a higher quality audit.

During the current COVID-19 pandemic, it is crucial to create and focus on quality audits. This is because the pandemic creates economic uncertainty in the future (Altig et al., 2020), which has led to financial issues for numerous companies (PWC, 2020). Based on research (Saleem, 2021), the pandemic affected audit quality in Jordan, where auditors faced difficulty obtaining proper audit evidence from clients due to the implementation of social and travel restrictions in the country.

Given these circumstances, the earnings management practices likely have a gap in presenting financial reports that do not reflect the company's actual condition, which further can reduce the quality of financial reports (Yadollah et al., 2012). Auditors who can provide high audit quality can find earnings management carried out by managers. Therefore, a high audit quality will reduce the possibility of company earnings management, improve the quality of financial reports, and enable users of financial reports to make objective economic decisions based on high-quality information (Lin & Hwang, 2010; Alzoubi, 2018).

Several studies examining audit quality on the quality of financial reports have been carried out previously. For instance, Clinch, Stokes, & Zhu (2012) prove that audit quality plays a role in financial reporting information quality. Chen, Lin, & Zhou (2005) reveals that higher-quality auditors constrain the earnings management practices in Taiwanese companies. Alhadab & Clacher (2018) also prove that higher-quality auditors constrain accrual and real earnings management practices.

Research conducted by Kamolsakulchai (2015) and Qawqzeh, Endut, Rashid, & Mustafa (2019) the result for their findings found that the quality of financial reporting was positively influenced by audit quality. Similarly, Patterson et al. (2019) show that expected audit quality is positively related to financial reporting quality measured by the earnings response coefficient (ERC).

Hasan, Kassim, & Hamid (2020) demonstrated that audit quality significantly moderated the correlation between audit committees and financial reporting quality measured by real earnings management (REM). Pham et al. (2021) demonstrate that internal control effectiveness, Big four, and non-Big four audit firms positively and significantly influence financial reporting quality. Furthermore, the study revealed that the Corona Virus Disease pandemic had strongly influenced the value of Vietnam companies' financial reports. Meanwhile, Olthof (2017) and Yasser & Soliman (2018) found that the audit quality measured by audit firm size does not affect the level of earnings management. Yasser & Soliman (2018) also stated that the audit firm size could not play a role in constraining earnings management practices.

Based on this description, it is possible to conclude that the third hypothesis employed in the study is as follows:

H3: There are differences in the audit quality impact on the quality of financial reports before and after the COVID-19 pandemic started.

Figure 1 demonstrates the conceptual framework describing the research direction in detail. Based on the description of the research objectives and literature review, this research has specified three hypotheses to be examined.

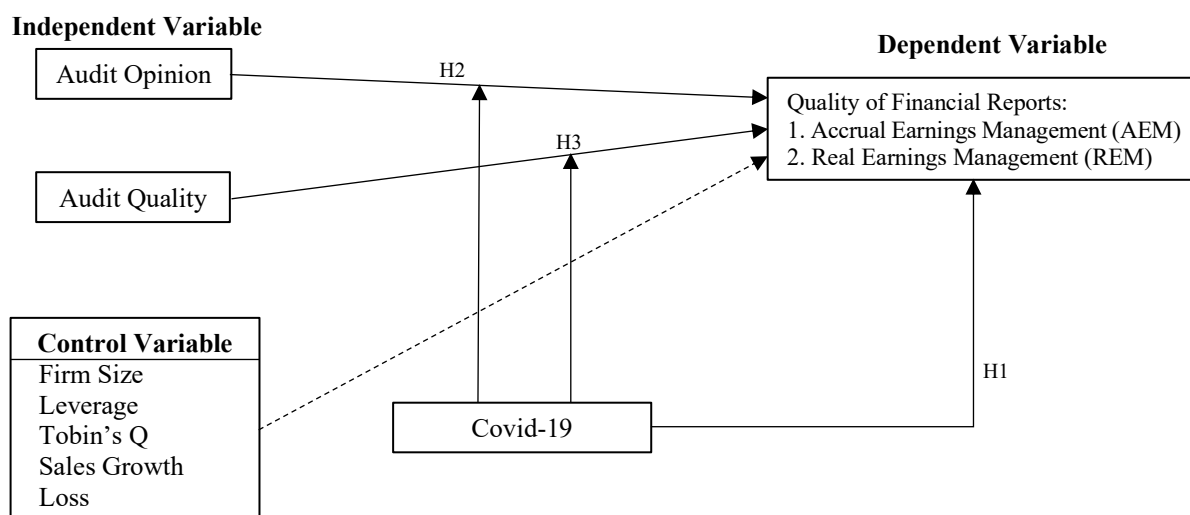


Figure 1: Conceptual Framework

3. Research Methodology

3.1 Source of Data and Sample Selection

This study adopts secondary data, i.e., annual financial reports and audit quality data of public listing firms on the Taiwan Stock Exchange (TSE). This study obtained all the needed data from the TEJ or Taiwan Economic Journal database. Furthermore, this study selected data from 2016 to 2021.

Table 1 presents the procedures for sampling and the total final sample used in this study. The total initial sample from 2016 to 2021 was 5,836 samples. This study excluded the financial industry and Taiwan Depository Receipt (TDR) (264 samples) since these firms possess special characteristics that differ from the other industries in general, such as different legal and regulatory reporting requirements and accrual characteristics (Baxter & Cotter, 2009; Mollik et al., 2013; Chung, Huang, Huang, & Lan, 2022). Moreover, firms with missing or incomplete data used during the study period were also excluded (526 samples). Thus, the total final sample obtained was 5,046 samples.

Table 1: Sample Selection

Description of Sample Selection	Number of Samples
Initial samples of public firms listed on the TSE from 2016 to 2021	5,836
Less:	
(1) The Financial Industry and Taiwan Depository Receipt (TDR)	(264)
(2) Sample with missing or incomplete data	(526)
Total final sample in the selected period (2016-2021)	5,046

Table 2 shows the distribution of final samples by industry from 2016 to 2021, with a total final sample of 5,046 valid sample firms. Among them, the electronic parts and components industry contributed the highest at 11.30%, followed by the semiconductor industry at 9.04%.

Table 2: Final Sample Distribution by Industry

	Industry Sector	Number of Firms (2016-2021)	Number of Samples (2016-2021)	Percentage
01.	Cement	6	36	0.71%
02.	Foods	22	132	2.62%
03.	Plastics	20	120	2.38%
04.	Building Material	46	276	5.47%
05.	Automobile	32	192	3.80%
06.	Textiles	39	234	4.64%
07.	Trading and Consumer	17	102	2.02%
08.	Elec. Parts & Component	95	570	11.30%
09.	Electric and Machinery	43	258	5.11%
10.	Biotechnology and Medical	31	186	3.69%
11.	Elec.Appliance and Cable	13	78	1.55%
12.	Chemical	26	156	3.09%
13.	Glass and Ceramics	5	30	0.59%
14.	Pulp/Paper	6	36	0.71%
15.	Iron and Steel	29	174	3.45%
16.	Rubber	11	66	1.31%
17.	Shipping and Transportation	10	60	1.19%
18.	Computer and Periphera	58	348	6.90%
19.	Semiconductor	76	456	9.04%
20.	Communication and Internet	40	240	4.76%
21.	Optoelectronic	65	390	7.73%
22.	Elec. Products Dist.	18	108	2.14%
23.	Gas and Electricity	6	36	0.71%
24.	Tourism	12	72	1.43%
25.	Information Service	11	66	1.31%
26.	Other Electronic	34	204	4.04%
27.	Others	70	420	8.32%
	Total	841	5,046	100.00%

3.2 Variable Definitions

3.2.1 Dependent Variable

The dependent variable used in this study included the quality of financial reports proxied by earnings management. As in previous research (Jiang, Zhu, & Huang, 2013; Chiang, He, & Shiao, 2015; Xiao & Xi, 2021), accrual and real earnings management methods are used to measure earnings management. Further details of the two measurement methods are as follows:

(1) Accrual Earnings Management (AEM)

The accrual earnings management (AEM) in this study was measured using DA (discretionary accruals), which refers to the Kothari et al. (2005) model. The model of Kothari et al. (2005) added Return on Asset (ROA), an indicator for calculating the company's performance, in the Modified Jones model to detect earnings management. Since the study was focused on the nominal value of discretionary accruals, the discretionary accruals used in it are their absolute values, not their positive or negative (Balsam, Krishnan, & Yang, 2003).

In this study, the method of Kothari et al. (2005) discretionary accruals model referred to a study conducted by Chung et al. (2022), which used the following measurement estimation model:

$$DA_{it} = \frac{TAC_{it}}{A_{it-1}} - \left[\beta_0 + \beta_1 \frac{1}{A_{it-1}} + \beta_2 \frac{\Delta REV_{it} - \Delta AR_{it}}{A_{it-1}} + \beta_3 \frac{PPE_{it}}{A_{it-1}} + \beta_4 ROA_{it-1} \right] \quad (1)$$

where: TAC_{it} is the total accruals (net income less cash flows from operations) of firm i in period t ; ROA_{it-1} is the Return on Asset of firm i in period $t-1$; ΔREV_{it} is the change in total revenue (the total revenue of firm i in period t less the total revenue in period $t-1$); ΔAR_{it} is the change in receivables (the total receivables of firm i in period t less the total receivables in period $t-1$); PPE_{it} is property, plant, and equipment of firm i in period t ; A_{it-1} is total assets of firm i in period $t-1$; and ε_{it} is the residual term of the discretionary accruals (DA) of firm i in period t , takes the DA's absolute value ($|DA|$) to measure this study's dependent variable proxy by accrual earnings management (AEM).

(2) Real Earnings Management (REM)

This study used a measurement model created by Roychowdhury (2006), where earnings management was combined with three proxies: abnormal operating cash flow (ABRL_CFO), abnormal discretionary expenses (ABRL_DISCREX), and abnormal production costs (ABRL_PRDC) (Cohen, Dey, & Lys, 2008). The estimation models for the three REM proxies are described in Appendix A.

Furthermore, this study considers the method suggested by previous studies (Cohen & Zarowin, 2010; Chiang et al., 2015; Tulcanaza-Prieto & Lee, 2022; Wang, Liu, & Jhang, 2022) to determine the company's real earnings management values. This study carried out that method by calculating the accumulation of abnormal operating cash flow (ABRL_CFO), abnormal discretionary expenses (ABRL_DISCREX), and abnormal production costs (ABRL_PRDC), which is also called comprehensive measurement (Cohen & Zarowin, 2010).

Before calculating the accumulation, abnormal discretionary expenses (ABRL_DISCREX) and abnormal operating cash flow (ABRL_CFO) should be multiplied by a negative (-1) to avoid real earnings management being impacted by values that are both positive and negative that cancel each other out.

$$REM = (\varepsilon_{it}^{ABRL_CFO} \times (-1)) + \varepsilon_{it}^{ABRL_PRDC} + (\varepsilon_{it}^{ABRL_DISCREX} \times (-1)) \quad (2)$$

3.2.2 Independent Variable

3.2.2.1 COVID-19 (CVD19)

This study uses a dummy variable to measure the COVID-19 variable. Take the value of 1, which indicates the post-COVID-19 pandemic period (2016-2018), and 0, for those indicating the pre-COVID-19 pandemic period (2019-2021).

3.2.2.2 Audit Opinion (ADOPN)

In this study, audit opinion was measured based on the opinion assessment provided by the auditor who audits the company's financial reports, taking the value of 1 if the auditor's opinion is considered unqualified and 0 otherwise, utilizing dummy variables.

3.2.2.3 Audit Quality (ADQ)

DeAngelo (1981) stated that the size of an audit firm could be used to measure audit quality. Thus, in this study, the size of the audit firm is a proxy for audit quality. Then, it was measured by a dummy variable with values of 1 for companies' financial reports audited by Big4 auditors and 0 for those audited by non-Big4 auditors (Chen et al., 2005; Clinch et al., 2012; Hasan et al., 2020; Lassoued & Khanchel, 2021).

3.2.3 Control Variable

Following previous studies (Chen et al., 2005; Francis & Wang, 2008; Choi & Pae, 2011; Mollik et al., 2013; Cardona, 2018; Albawwat & Harasees, 2019; Hasan et al., 2020; Xiao & Xi, 2021; Ryu & Chae, 2022); this study employed several control variables, including firm size (SIZE), leverage (LEV), profitability (TOBIN'S Q), sales growth (SALGROWTH), and loss. The measurement of the control variables is described in Appendix B.

3.3 Empirical Models

This study uses multiple regression analysis to test hypotheses 1, 2, and 3. Two empirical models were used to test hypotheses 1, 2, and 3 as follows:

Model 1: to test hypothesis 1 about differences in the quality of financial reports before and after the COVID-19 pandemic.

$$QFR (|DA| \text{ or } REM)_{i,t} = \beta_0 + \beta_1 CVD19_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 TBQ_{i,t} + \beta_5 SALGROWTH_{i,t} + \beta_6 LOSS_{i,t} + \varepsilon_{i,t} \quad (3)$$

Model 2: to test hypotheses 2 (3) about the differences in audit opinion (audit quality) impact on the quality of financial reports before and after the COVID-19 pandemic.

$$QFR (|DA| \text{ or } REM)_{i,t} = \beta_0 + \beta_1 ADOPN_{i,t} + \beta_2 ADQ_{i,t} + \beta_3 ADOPN_{i,t} * CVD19_{i,t} + \beta_4 ADQ_{i,t} * CVD19_{i,t} + \beta_5 CVD19_{i,t} + \beta_6 SIZE_{i,t} + \beta_7 LEV_{i,t} + \beta_8 TBQ_{i,t} + \beta_9 SALGROWTH_{i,t} + \beta_{10} LOSS_{i,t} + \varepsilon_{i,t} \quad (4)$$

4. Research Result and Discussion

4.1 Descriptive Statistics

Table 3 presents the results of the descriptive statistical tests of all variables in this study, consisting of dependent, independent, and control variables. All continuous variables in this study were processed with winsorization at a 1% level to determine the effect of the extreme values of the variables on the regression results in this study. The full samples for each variable amounted to 5,046 samples obtained from 841 public listing firms on the Taiwan Stock Exchange (TSE) in six years (2016-2021).

Table 3 Panel A presents the results of the descriptive statistical tests of the full samples. $|DA|$ has a minimum value of 0.001, a maximum value of 0.328, a standard deviation of 0.059, and a mean value for the full samples of 0.056, implying the average of the companies' level of accrual earnings management observed in this study was 5.6%. The REM has a minimum value of -0.934, a maximum value of 0.700, a standard deviation of 0.257, and a mean value for the full samples of -0.002. The mean value of REM indicates a negative value of 0.002, implying the average of the companies' level of real earnings management by lowered earnings observed in this study was 0.2%.

Furthermore, since this study aims to examine changes in the quality of financial reports before and after the COVID-19 pandemic, this study also presents different descriptive statistical test results for the pre and post-COVID-19 pandemic periods in Panel B and C of Table 3.

Panel B and C of Table 3 present that the mean values of $|DA|$ before and after the COVID-19 pandemic are different, reaching 0.051 and 0.060, respectively. It indicates that the mean value of $|DA|$ increased after the beginning of the COVID-19 pandemic. Similarly, the mean values of REM before and after the COVID-19 pandemic are different, reaching -0.006 and 0.002, respectively. It indicates that the REM's mean value increased after the beginning of the COVID-19 pandemic.

The mean value of Size, Lev, Tobin's Q, and Salgrowth was also increasing after the beginning of the COVID-19 pandemic. Meanwhile, the loss variable's mean value was unchanged before and after the COVID-19 pandemic.

Table 3: Descriptive Statistics

Panel A: Full Sample (n = 5,046)							
Variables	Mean	Std. Dev.	Min.	Max.	Q1	Median	Q3
Dependent Variable							
QFR (DA)	0.056	0.059	0.001	0.328	0.018	0.038	0.072
QFR (REM)	-0.002	0.257	-0.934	0.700	-0.117	0.029	0.146
Independent Variable							
ADOPN	1.000	0.037	0.000	1.000	1.000	1.000	1.000
ADQ	0.900	0.305	0.000	1.000	1.000	1.000	1.000
Control Variable							
SIZE	16.027	1.372	13.376	20.102	15.062	15.856	16.784
LEV	43.514	18.143	5.830	86.320	30.358	43.840	56.253
TBQ	1.193	0.788	0.350	4.990	0.720	0.950	1.360
SALGROWTH	6.631	32.099	-67.860	191.520	-7.593	3.095	14.790
LOSS	0.160	0.370	0.000	1.000	0.000	0.000	0.000
Panel B: Pre-COVID-19 Pandemic Period (n = 2,523)							
Variables	Mean	Std. Dev.	Min.	Max.	Q1	Median	Q3
Dependent Variable							
QFR (DA)	0.051	0.054	0.001	0.328	0.017	0.036	0.067
QFR (REM)	-0.006	0.253	-0.934	0.700	-0.121	0.025	0.142
Independent Variable							
ADOPN	1.000	0.049	0.000	1.000	1.000	1.000	1.000
ADQ	0.900	0.306	0.000	1.000	1.000	1.000	1.000
Control Variable							
SIZE	15.943	1.359	13.376	20.102	14.990	15.749	16.648
LEV	42.428	17.903	5.830	86.320	28.910	42.660	55.160
TBQ	1.138	0.760	0.350	4.990	0.690	0.900	1.310
SALGROWTH	6.061	31.051	-67.860	191.520	-5.650	2.600	12.380
LOSS	0.160	0.371	0.000	1.000	0.000	0.000	0.000
Panel C: Post-COVID-19 Pandemic Period (n = 2,523)							
Variables	Mean	Std. Dev.	Min.	Max.	Q1	Median	Q3
Dependent Variable							
QFR (DA)	0.060	0.062	0.001	0.328	0.019	0.041	0.078
QFR (REM)	0.002	0.262	-0.934	0.700	-0.111	0.032	0.150
Independent Variable							
ADOPN	1.000	0.020	0.000	1.000	1.000	1.000	1.000
ADQ	0.900	0.305	0.000	1.000	1.000	1.000	1.000
Control Variable							
SIZE	16.110	1.380	13.376	20.102	15.129	15.942	16.885
LEV	44.601	18.319	5.830	86.320	31.890	44.910	57.700
TBQ	1.248	0.811	0.350	4.990	0.770	1.000	1.440
SALGROWTH	7.200	33.110	-67.860	191.520	-9.610	3.600	18.040
LOSS	0.160	0.370	0.000	1.000	0.000	0.000	0.000

Note: This table presents the descriptive statistical tests of all variables in this study. Panel A presents the results of the descriptive statistical tests of the full samples. Panel B and Panel C presents the results of the descriptive statistical tests for the pre-COVID-19 period sample and post-COVID-19 period sample, respectively. All continuous variables in this study were processed with winsorizing at a 1% level. Definition of variables: $|DA|$ is the absolute value of discretionary accruals calculated from the Kothari et al. (2005) model. *REM* is real earnings management, calculated from the Roychowdhury (2006) model. *ADOPN* is an audit opinion that If the auditor's opinion is considered unqualified, the value is 1; otherwise, it is 0. *ADQ* is audit quality; the value is 1 if the company's financial reports are audited by the Big4 audit firm and 0 otherwise. *SIZE* is the firm size determined using the natural log of total assets. *LEV* is the financial leverage determined by dividing total liabilities and assets. *TBQ* is

4.2 Correlation Analysis Test

The results of the correlation analysis test by Pearson are shown in Tables 4 and 5. Tables 4 and 5 show that the highest coefficient value for each variable is no greater than 0.7 (Chung et al., 2022). Furthermore, the variance inflation factor (VIF) is less than 10. It means there are no severe collinearity problems with the model used in this study.

Table 4: Pearson Correlation Analysis for Accrual Earnings Management

Variables	DA	ADOPN	ADQ	SIZE	LEV	TBQ	SALGROWTH	LOSS
DA	1.000							
ADOPN	-0.010 (0.479)	1.000						
ADQ	0.000 (0.975)	-0.013 (0.367)	1.000					
SIZE	-0.072 *** (0.000)	0.010 (0.461)	0.091 *** (0.000)	1.000				
LEV	0.112 *** (0.000)	-0.007 (0.629)	-0.043 *** (0.002)	0.294 *** (0.000)	1.000			
TBQ	0.094 *** (0.000)	0.022 (0.112)	0.075 *** (0.000)	-0.123 *** (0.000)	-0.219 *** (0.000)	1.000		
SALGROWTH	0.182 *** (0.000)	-0.048 *** (0.001)	0.015 (0.297)	0.045 *** (0.001)	0.076 *** (0.000)	0.150 *** (0.000)	1.000	
LOSS	0.058 *** (0.000)	-0.012 (0.385)	-0.054 *** (0.000)	-0.215 *** (0.000)	0.113 *** (0.000)	-0.129 *** (0.000)	-0.173 *** (0.000)	1.000

Note: This table presents the Pearson correlation analysis matrix for accrual earnings management.

*, **, *** Denote statistical significance at the 0.10, 0.05, and 0.01 levels (2-tailed), respectively.

Table 5: Pearson Correlation Analysis for Real Earnings Management

Variables	REM	ADOPN	ADQ	SIZE	LEV	TBQ	SALGROWTH	LOSS
REM	1.000							
ADOPN	0.022 (0.120)	1.000						
ADQ	-0.139 (0.000)	-0.013 (0.367)	1.000					
SIZE	0.128 *** (0.000)	0.010 (0.461)	0.091 *** (0.000)	1.000				
LEV	0.247 *** (0.000)	-0.007 (0.629)	-0.043 *** (0.002)	0.294 *** (0.000)	1.000			
TBQ	-0.428 *** (0.000)	0.022 (0.112)	0.075 *** (0.000)	-0.123 *** (0.000)	-0.219 *** (0.000)	1.000		
SALGROWTH	-0.097 *** (0.000)	-0.048 *** (0.001)	0.015 (0.297)	0.045 *** (0.001)	0.076 *** (0.000)	0.150 *** (0.000)	1.000	
LOSS	0.210 *** (0.000)	-0.012 (0.385)	-0.054 *** (0.000)	-0.215 *** (0.000)	0.113 *** (0.000)	-0.129 *** (0.000)	-0.173 *** (0.000)	1.000

Note: This table presents the Pearson correlation analysis matrix for real earnings management.

*, **, *** Denote statistical significance at the 0.10, 0.05, and 0.01 levels (2-tailed), respectively.

4.3 Regression Result

Table 6 shows the first regression model results in Equation (1) for Hypothesis 1. The empirical result of the first hypothesis, in both columns of Table 6, indicated the proxy variable for the quality of financial reports, where accrual earnings management and real earnings management were employed to examine the impact of the COVID-19 pandemic on the quality of financial reports.

Column (1) reveals that the COVID-19 (CVD19) variable representing the period after the pandemic had a coefficient value of 0.008 (t-stat= 4.756) with a p-value (0.001) smaller than 0.01. It means that the COVID-19 pandemic significantly and positively impacted the quality of the financial reports proxied by accrual earnings management.

Subsequently, the regression result found that all control variables employed in this model affected the accrual earnings management. Only the SIZE variable significantly and negatively impacts the quality of the financial reports proxied by accrual earnings management, while the other control variables (LEV, TBQ, SALGROWTH, and LOSS) contributed a significant and positive impact.

Furthermore, Column (2) demonstrates that the COVID-19 variable representing the period after the COVID-19 pandemic had a coefficient value of 0.016 (t-stat= 2.490) with a p-value (0.013) smaller than 0.05. This result suggests that the COVID-19 pandemic significantly and positively impacted the quality of the financial reports proxied by real earnings management.

Subsequently, the regression result indicated that all control variables employed in this model affected real earnings management. TBQ and SALGROWTH variables significantly negatively impact real earnings management, while other control variables (SIZE, LEV, and LOSS) contributed a significant positive effect.

Table 7 presents the results of the second regression model on the empirical model of Equation (2). Columns (1) and (3) of Table 7 indicate the empirical results of the second hypothesis in this study. In column (1), the audit opinion variable with COVID-19 variable (ADOPNxCVD19) had a coefficient value of -0.131 (t-stat= -2.133) with a p-value (0.033) smaller than 0.05, meaning that the audit opinion significantly and negatively impacted the quality of financial reports proxied by accrual earnings management (|DA|) in the post-COVID-19 pandemic.

Further, in Column (3), the audit opinion variable with COVID-19 variable (ADOPNxCVD19) had a coefficient value of 0.308 (t-stat= 1.264) with a p-value (0.206) greater than 0.05, meaning that the audit opinion had a positive and insignificant impact on the quality of the financial reports proxied by real earnings management (REM) in the post-COVID-19 pandemic.

Based on the previous explanation, the audit opinion significantly and negatively impacted the quality of financial reports proxied by accrual earnings management (|DA|) after the COVID-19 pandemic. Moreover, the audit opinion did not affect the quality of the financial reports proxied by real earnings management (REM) after the COVID-19 pandemic. This shows no significant change in the difference in the financial reports quality (REM) between the companies receiving unqualified and non-unqualified opinions in the post-COVID-19 pandemic.

Table 6: Regression Result of COVID-19 on Quality of Financial Reports

Variables	Accrual earnings management			Real earnings management		
	DA			REM		
	(1)			(2)		
	Coeff.	t-stat	p-value	Coeff.	t-stat	p-value
Constant	0.090	8.918	< 0.001 ***	-0.199	-4.965	< 0.001 ***
CVD19	0.008	4.756	< 0.001 ***	0.016	2.490	0.013 **
SIZE	-0.004	-6.769	< 0.001 ***	0.015	5.900	< 0.001 ***
LEV	0.000	9.233	< 0.001 ***	0.002	9.348	< 0.001 ***
TBQ	0.007	6.228	< 0.001 ***	-0.120	-28.395	< 0.001 ***
SALGROWTH	0.000	12.312	< 0.001 ***	0.000	-2.182	0.029 **
LOSS	0.010	4.295	< 0.001 ***	0.112	12.224	< 0.001 ***
Adjusted R ²		0.070			0.235	
F-statistic		64.120 ***	P<0.01		258.783 ***	P<0.01
N	5,046					

Note: This table presents the results of the analysis of the impact of the COVID-19 pandemic on the quality of financial reports measured by both accrual and real earnings management.

*, **, *** Denote statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.

All continuous variables in this study were processed with winsorizing at a 1% level.

Definition of variables: |DA| is the absolute value of discretionary accruals calculated from the Kothari et al. (2005) model. REM is real earnings management, calculated from the Roychowdhury (2006) model. CVD19 is a period of COVID-19 outbreak. Take the value of 1 if the year after the COVID-19 outbreak (2019-2021) and 0 if the year before the COVID-19 outbreak (2016-2018). SIZE is the firm size determined using the natural log of total assets. LEV is the financial leverage determined by dividing total liabilities and assets. TBQ is the company's profitability measured

Columns (2) and (4) of Table 7 demonstrate the empirical results of the third hypothesis in this study. In column (2), the audit quality variable with COVID-19 variable (ADQxCVD19) had a coefficient of -0.007 (t-stat= -1.423) with a p-value (0.155) greater than 0.05, meaning that audit quality had a negative and insignificant effect on the quality of the financial reports proxied by accruals earnings management (|DA|) in the post-COVID-19 pandemic.

Furthermore, Column (4) of Table 7 demonstrates the audit quality variable with COVID-19 variable (ADQxCVD19) had a coefficient value of -0.019 (t-stat= -0.924) with a p-value (0.356) greater than 0.05, meaning that audit quality had a negative and insignificant impact on the quality of the financial reports proxied by real earnings management (REM) in the post-COVID-19 pandemic.

Based on the previous explanation, these results indicated no significant difference in the quality of financial reports (for both proxies of accrual and real earnings management) between companies audited by the Big four and non-Big four in the post-COVID-19 pandemic.

Table 8 shows the regression results from the interaction of the ADOPNxCVD19 and ADQxCVD19 coefficients on the quality of financial reports tested simultaneously. The results suggested no significant change in the ADOPNxCVD19 and ADQxCVD19 coefficient results on the quality of financial reports. It means there are no differences in the regression results of the model before and after including the two coefficient interactions, ADOPNxCVD19 and ADQxCVD19.

Table 7: Regression Result of Audit Opinion and Audit Quality on Quality of Financial Reports

Variables	Accrual earnings management						Real earnings management					
	DA						REM					
	(1)			(2)			(3)			(4)		
	Coeff.	t-stat	p-value	Coeff.	t-stat	p-value	Coeff.	t-stat	p-value	Coeff.	t-stat	p-value
Constant	0.076	3.023	0.003 ***	0.086	8.175	< 0.001 ***	-0.362	-3.631	< 0.001 ***	-0.164	-3.960	< 0.001 ***
ADOPN	0.014	0.614	0.539				0.164	1.786	0.074 *			
ADQ				0.006	1.496	0.135				-0.080	-5.469	< 0.001 ***
CVD19	0.138	2.257	0.024 **	0.014	2.891	0.004 ***	-0.292	-1.200	0.230	0.033	1.669	0.095
ADOPN× CVD19	-0.131	-2.133	0.033 **				0.308	1.264	0.206			
ADQ× CVD19				-0.007	-1.423	0.155				-0.019	-0.924	0.356
SIZE	-0.004	-6.779	< 0.001 ***	-0.004	-6.790	< 0.001 ***	0.015	5.885	< 0.001 ***	0.017	6.825	< 0.001 ***
LEV	0.000	9.263	< 0.001 ***	0.000	9.280	< 0.001 ***	0.002	9.334	< 0.001 ***	0.002	8.954	< 0.001 ***
TBQ	0.007	6.248	< 0.001 ***	0.007	6.169	< 0.001 ***	-0.121	-28.475	< 0.001 ***	-0.118	-27.897	< 0.001 ***
SALGROWTH	0.000	12.113	< 0.001 ***	0.000	12.313	< 0.001 ***	0.000	-1.958	< 0.001 ***	0.000	-2.193	0.028 **
LOSS	0.010	4.288	< 0.001 ***	0.010	4.271	< 0.001 ***	0.112	12.268	< 0.001 ***	0.110	12.181	< 0.001 ***
Adjusted R2		0.070			0.070			0.235			0.245	
F-statistic		48.689***	P< 0.01		48.409***	P< 0.01		195.244***	P< 0.01		206.192***	P< 0.01
N	5,046											

Note: This table presents the results of the analysis of the impact of the audit opinion and audit quality on the quality of financial reports measured by both accrual and real earnings management.

*, **, *** Denote statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.

All continuous variables in this study were processed with winsorizing at a 1% level.

Definition of variables: |DA| is the absolute value of discretionary accruals calculated from the Kothari et al. (2005) model. REM is real earnings management, calculated from the Roychowdhury (2006) model. ADOPN is an audit opinion that If the auditor's opinion is considered unqualified, the value is 1; otherwise, it is 0. ADQ is audit quality; the value is 1 if the company's financial reports are audited by the Big4 audit firm and 0 otherwise. CVD19 is a period of COVID-19 outbreak. Take the value of 1 if the year after the COVID-19 outbreak (2019-2021) and 0 if the year before the COVID-19 outbreak (2016-2018). SIZE is the firm size determined using the natural log of total assets. LEV is the financial leverage determined by dividing total liabilities and assets. TBQ is the company's profitability measured by Tobin's Q. SALGROWTH is the sales growth rate. LOSS is companies experiencing losses that take the value 1 if the company obtained negative net income and 0 otherwise.

Table 8: Regression Result of Audit Opinion, Audit Quality, COVID-19, and Quality of Financial Reports

Variables	Accrual earnings management			Real earnings management		
	DA			REM		
	(1)			(2)		
	Coeff.	t-stat	p-value	Coeff.	t-stat	p-value
Constant	0.071	2.798	0.005 ***	-0.316	-3.163	0.002 ***
ADOPN	0.015	0.641	0.522	0.153	1.676	0.094 *
ADQ	0.006	1.508	0.132	-0.079	-5.439	< 0.001 ***
CVD19	0.146	2.372	0.018 **	-0.277	-1.139	0.255
ADOPN × CVD19	-0.132	-2.146	0.032 **	0.309	1.278	0.201
ADQ × CVD19	-0.008	-1.440	0.150	-0.019	-0.934	0.350
SIZE	-0.004	-6.801	< 0.001 ***	0.017	6.807	< 0.001 ***
LEV	0.000	9.310	< 0.001 ***	0.002	8.941	< 0.001 ***
TBQ	0.007	6.189	< 0.001 ***	-0.118	-27.974	< 0.001 ***
SALGROWTH	0.000	12.115	< 0.001 ***	0.000	-1.974	0.048 **
LOSS	0.010	4.264	< 0.001 ***	0.111	12.224	< 0.001 ***
Adjusted R2		0.070			0.246	
F-statistic		39.212 ***	P<0.01		165.823 ***	P<0.01
N	5,046					

Note: This table presents the results of the interaction of the ADOPN×CVD19 and ADQ×CVD19 coefficients on the quality of financial reports tested simultaneously.

*, **, *** Denote statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.

All continuous variables in this study were processed with winsorizing at a 1% level.

Definition of variables: |DA| is the absolute value of discretionary accruals calculated from the Kothari et al. (2005) model. REM is real earnings management, calculated from the Roychowdhury (2006) model. ADOPN is an audit opinion that If the auditor's opinion is considered unqualified, the value is 1; otherwise, it is 0. ADQ is audit quality; the value is 1 if the company's financial reports are audited by the Big4 audit firm and 0 otherwise. CVD19 is a period of COVID-19 outbreak. Take the value of 1 if the year after the COVID-19 outbreak (2019-2021) and 0 if the year before the COVID-19 outbreak (2016-2018). SIZE is the firm size determined using the natural log of total assets. LEV is the financial leverage determined by dividing total liabilities and assets. TBQ is the company's

4.4 Discussion

4.4.1 COVID-19 Pandemic and Quality of Financial Reports

According to results presented in Table 6, it was revealed that the COVID-19 pandemic significantly and positively impacted the quality of the financial reports proxied by accrual and real earnings management. This result signified that the higher the number of COVID-19 pandemic cases, the higher the possibility of practicing accrual and real earnings management.

The conclusion implied that the COVID-19 pandemic has increased earnings management actions and urged managers to utilize accrual and real earnings management to manipulate earnings, leading to decreased quality of financial reports. This proves that the COVID-19 pandemic triggered the companies in this study to increase both accrual and real earnings management practices to reduce the pandemic's impact on the companies.

This result confirms the evidence of Lassoued & Khanchel (2021), suggesting that earnings management increased during the COVID-19 pandemic. The company's management practiced earnings management to improve efficiency and maintain company performance in uncertain times and conditions due to the COVID-19 pandemic. In addition, to rebuild financial report users' confidence, which was required to meet the company's profit targets and support the economic recovery.

Furthermore, the results aligned with the study of Hsu & Yang (2022), Ryu & Chae (2022), Yan et al. (2022), which discovered that the COVID-19 pandemic positively affected earnings management. Yan et al. (2022) also revealed that the COVID-19 pandemic has intensified accrual and real earnings

management practices used by managers to manipulate upward earnings.

4.4.2 Audit Opinion and Quality of Financial Reports Before and After the COVID-19 Pandemic

The research findings revealed that audit opinion significantly and negatively impacted the quality of financial reports proxied by accrual earnings management. This finding implied that in the post-COVID-19 pandemic, companies with unqualified opinions could reduce discretionary accrual manipulation and improve the quality of financial reports.

The results are consistent with the study by Gajevszky (2014), which discovered that audit opinion negatively impacts accrual earnings management and also stated that audit opinion could play a role in reducing earnings management practices to improve the quality of financial reporting. Furthermore, the results are inconsistent with Tsipouridou & Spathis (2014), indicating that audit opinion is unrelated to earnings management proxied by discretionary accruals.

Moreover, audit opinions with a positive coefficient direction had no significant impact on the quality of financial reports proxied by real earnings management in the post-COVID-19 pandemic. It indicated that the better the opinion received did not consistently reduce the real earnings management in the post-COVID-19 pandemic period. The auditor's ability might be unable to detect and discover irregularities in earnings management practices through real activities manipulation performed in the company's financial reports.

The results aligned with a study by Herbohn & Ragunathan (2008), which discovered that audit opinion had no significant impact on real earnings management, indicating the limitation of auditors' capacity to detect real earnings management action.

4.4.3 Audit Quality and Quality of Financial Reports Before and After the COVID-19 Pandemic

Based on the findings, the audit quality proxied by audit firm size with a negative coefficient direction had no significant impact on the financial report's quality proxied by both accrual and real earnings management in the post-COVID-19 pandemic. It denoted that the high quality of audit did not consistently reduce earnings management, resulting in decreased financial report quality in the post-COVID-19 pandemic period.

It might be caused by the companies utilizing audit services with high reputations that were merely aimed at attracting investors. Companies audited by the Big four may not necessarily be able to limit or reduce the practices of accrual and real earnings management in the post-COVID-19 pandemic. Furthermore, it is similar to the findings by Yasser & Soliman (2018), who found that the audit firm size could not play a role in constraining earnings management practices.

Apart from that, some auditors might also possess low integrity, although they come from audit firms with high reputations. The results indicated no significant difference in the quality of financial reports for both proxies of accrual and real earnings management between companies audited by the Big four and non-Big four in the post-COVID-19 pandemic; thus, it did not support the third hypothesis.

Nevertheless, the results are aligned with the study by Olthof (2017) and Yasser & Soliman (2018), which does not prove the significant results of the audit quality proxied by audit firm size affect earnings management. In addition, the findings suggest that the Big four audit firms do not affect earnings management because the Big four firms' audit quality is lacking.

The results are unaligned with the study by Kamolsakulchai (2015), which found that audit quality positively affected the quality of financial reporting as measured by earnings management. Furthermore, the result could not prove the findings by Lin & Hwang (2010) and Ryu & Chae (2022), which discovered that the higher the audit quality as measured by audit firm size, the lower the earnings management that occurred in the company. Then they also found that the Big four auditors could effectively control earnings management. Meanwhile, the result also could not prove the findings by Chen et al. (2005), which reveals that higher-quality auditors constrain the earnings management practices in Taiwan Companies.

In addition, the findings are irrelevant to the agency theory, in which the existence of Big four auditors cannot mitigate the agency problems involving the agents and principals to reduce earnings management practices in the post-COVID-19 pandemic period.

5. Conclusion and Recommendation

The COVID-19 pandemic has resulted in the biggest global health, economic, and social crisis, leading to a slowdown in economic activity (Albitar et al., 2021; Lassoued & Khanchel, 2021). Considerable economic uncertainty has weakened economic activities and driven the global economy toward the

negative zone (PWC, 2020). It also leads almost all companies to a financial crisis that worsens their business performance.

As company administrators, managers are demanded to perform their duties optimally. Accordingly, this situation encourages them to take advantage of earnings management practices (Rose et al., 2020), such as manipulating financial reports to improve efficiency and maintain the company's performance amid uncertain conditions due to the COVID-19 pandemic.

This study aims to investigate and examine the impact of the COVID-19 pandemic on the quality of financial reports measured by accrual and real earnings management in Taiwan-listed firms. It is to prove the differences between the quality of financial reports before and after the COVID-19 pandemic. In addition, this study intends to investigate the impact of audit opinion and audit quality on the quality of financial reports before and after the COVID-19 pandemic.

This study's empirical evidence found differences in financial reports' quality before and after the COVID-19 pandemic. It confirms that the COVID-19 pandemic significantly and positively impacted the quality of financial reports proxied by accruals and real earnings management. It means that there is a significant increase in practice accrual and real earnings management performed by companies after the COVID-19 pandemic compared to before the pandemic. Further, it indicates a decrease in the quality of financial reports during the COVID-19 pandemic.

This study also proves that audit opinion significantly negatively impacts the quality of financial reports proxied by accrual earnings management after the COVID-19 pandemic. It implies that after the beginning of the COVID-19 pandemic, companies receiving unqualified opinions could reduce discretionary accrual manipulations and subsequently improve the quality of financial reports.

Furthermore, this study discovered that audit opinion did not affect the quality of financial reports proxied by real earnings management in the post-COVID-19 pandemic. It indicated that the better the opinion received did not consistently reduce the real earnings management in the post-COVID-19 pandemic period. The auditor's ability might be unable to detect and discover irregularities in earnings management practices through real activities manipulation performed in the company's financial reports.

Audit quality also has no impact on the quality of financial reports proxied by both accrual and real earnings management in the post-COVID-19 pandemic. According to these results, there is no significant change in the quality of financial reports between companies audited by the Big four and non-Big four audit firms before and after the COVID-19 pandemic. It might be caused by the companies utilizing audit services with high reputations that were merely aimed at attracting investors. Companies audited by the Big four may not necessarily be able to limit or reduce the practices of accrual and real earnings management in the post-COVID-19 pandemic. In addition, the findings are irrelevant to the agency theory, in which the existence of Big four auditors cannot mitigate the agency problems involving the agents and principals to reduce earnings management practices in the post-COVID-19 pandemic period.

This study's limitations. First, this study only examined Taiwan companies listed on the Taiwan Stock Exchange and was conducted for six years, from 2016 to 2021. Further research can conduct more observations and increase the number of research objects by expanding the scope of research to other countries with similar conditions for comparisons. Second, this study only used two independent variables (audit opinion and audit quality) to investigate and examine the dependent variable (financial reports' quality). Further research can add other variables besides those in research, such as corporate governance, auditor switching, audit committees, or other variables that can affect and predict the quality of financial reports.

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Appendix A: REM Estimation Models

The estimation models for the three REM proxies are as follows:

- (a) The first estimation model, the discretionary cash flow model (ABRL_CFO), can be estimated as (Equation (5)) as follows:

$$\frac{CFO_{it}}{A_{it-1}} = \beta_0 + \beta_1 \frac{1}{A_{it-1}} + \beta_2 \frac{Sales_{it}}{A_{it-1}} + \beta_3 \frac{\Delta Sales_{it}}{A_{it-1}} + \varepsilon_{it}^{ABRL_CFO} \quad (5)$$

Where:

CFO_{it} = operating cash flow of the firm i in period t;

$Sales_{it}$ = sales or revenue of firm i in period t;

$\Delta Sales_{it}$ = changes in sales or revenue, (the sales or revenue of firm i in period t less the sales or revenue of firm i in period t-1);

A_{it-1} = total assets of firm i in period t-1;

$\varepsilon_{it}^{ABRL_CFO}$ = the residual term of the abnormal operating cash flow levels of firm i in period t.

- (b) The second estimation model, the discretionary production cost model (ABRL_PRDC), can be estimated as (Equation (6)) as follows:

$$\frac{PRDC_{it}}{A_{it-1}} = \beta_0 + \beta_1 \frac{1}{A_{it-1}} + \beta_2 \frac{Sales_{it}}{A_{it-1}} + \beta_3 \frac{\Delta Sales_{it}}{A_{it-1}} + \beta_4 \frac{\Delta Sales_{it-1}}{A_{it-1}} + \varepsilon_{it}^{ABRL_PRDC} \quad (6)$$

Where:

$PRDC_{it}$ = Production costs, calculated by the sum of the cost of goods sold (COGS) and change in inventory of firm i in period t;

$Sales_{it}$ = sales or revenue of firm i in period t;

$\Delta Sales_{it}$ = changes in sales, (the sales or revenue of firm i in period t less the sales or revenue of firm i in period t-1);

$\Delta Sales_{it-1}$ = changes in sales or revenue, (the sales or revenue of firm i in period t-1 less the sales or revenue of firm i in period t-2);

A_{it-1} = total assets of firm i in period t-1;

$\varepsilon_{it}^{ABRL_PRDC}$ = the residual term of the abnormal production costs levels of firm i in period t.

- (c) The third estimation model, the discretionary expenses model (ABRL_DISCREX), can be estimated as (Equation (7)) as follows:

$$\frac{DISCREX_{it}}{A_{it-1}} = \beta_0 + \beta_1 \frac{1}{A_{it-1}} + \beta_2 \frac{Sales_{it-1}}{A_{it-1}} + \varepsilon_{it}^{ABRL_DISCREX} \quad (7)$$

Where:

$DISCREX_{it}$ = the total of Research and Development expenses (R&D) and Sales, General, & Administration expenses (SG&A) of firm i in year t;

$Sales_{it-1}$ = sales or revenue of firm i in period t-1;

A_{it-1} = total assets of firm i in period t-1;

$\varepsilon_{it}^{ABRL_DISCREX}$ = the residual term of the abnormal discretionary expenses levels of firm i in period t.

Appendix B: Variable Definitions

Variable	Definition
$QFR (DA \text{ or } REM)_{i,t}$	= the quality of financial reports is a proxy by earnings management. The DA absolute value and REM (real earnings management), calculated from the Kothari et al. (2005) model, and Roychowdhury (2006) model, respectively, are used to measure earnings management;
$ADOPN_{i,t}$	= audit opinion is using a dummy variable. If the auditor's opinion is considered unqualified, the value is 1; otherwise, it is 0;
$ADQ_{i,t}$	= audit quality is using a dummy variable, the value is 1 if the financial reports of the company are audited by the Big4 audit firm and 0 otherwise;
$CVD19_{i,t}$	= a dummy variable, the value 1 if the year after the COVID-19 outbreak (2019-2021) and 0 if the year before the COVID-19 outbreak (2016-2018);
$SIZE_{i,t}$	= firm size is determined using the natural log of total assets of firm i in year t ;
$LEV_{i,t}$	= the financial leverage is determined by dividing total liabilities and total assets;
$TBQ_{i,t}$	= the sum of the equity's market value (MVE), total liabilities, and preferred stock is then divided by the company's total assets;
$SALGROWTH_{i,t}$	= sales growth rate by calculating (current net operating income less previous net operating income) and then the result divided by previous net operating income;
$LOSS_{i,t}$	= loss is using a dummy variable with the value 1 if the company obtained negative net income and 0 otherwise.