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Corporate governance and financial reporting quality during the COVID-19 pandemic

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ABSTRACT

This paper analyzes whether COVID-19 affects the financial reporting quality of companies and whether corporate governance has a mitigating effect. Using data from UK listed companies, we show that the quality of companies' financial reporting has been lower during the pandemic. Specifically, companies have engaged in more earnings management through real activities during the pandemic. We also find that a larger board helps to mitigate the negative impact of COVID-19 on financial reporting quality, although we find no mitigating effect for board independence and CEO duality. This paper provides additional evidence on the impact of COVID-19 on financial reporting quality using a strong country-level governance setting. It is also the first study to analyze the mitigating effect of corporate governance on financial reporting quality during the COVID-19 pandemic. The results of this study provide useful suggestions to the practice.

1. Introduction

Financial reporting quality is crucial in maintaining the efficiency of financial markets because market participants, such as investors, lenders, and regulators, rely on financial reporting information to make decisions (Yeh et al., 2014). A series of studies has discussed the impact of the 2008 financial crisis on financial reporting quality (Cimini, 2015; Eng et al., 2019). Like the 2008 financial crisis, COVID-19 has caused significant disruption to the financial markets and the global economy, but the impact of COVID-19 on financial reporting quality is not yet clear. Until now, only a few studies managed to investigate this issue but none of them focused on a setting with strong country-level governance (Pham et al., 2021). Our paper uses data from the UK where country-level governance is strong will add to current literature.

Furthermore, corporate governance has always been a primary concern in the studies on financial crisis (Erkens et al., 2012). Several papers have analyzed, either empirically or theoretically, the role of corporate governance during the COVID-19 pandemic (Jebran and Chen, 2021; Khatib and Nour, 2021). However, it is still unknown whether corporate governance moderates the impact of COVID-19 on financial reporting quality. This paper is the first to address the mitigating effect of corporate governance on financial reporting quality during the pandemic, and it aims to contribute to the ongoing discussion of COVID-19 and enhance our understanding of corporate governance. Our study will also respond to the call of using accounting data to discuss the role of corporate governance in this COVID-19 crisis (Koutoupis et al., 2021).

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We first investigate the impact of COVID-19 on financial reporting quality. Previous research regarding the impact of financial crises on financial reporting quality has been inconsistent. Some scholars argue that companies would enhance their financial reporting quality to reduce information asymmetry and to enhance investor trust, which is important during a financial crisis (Arthur et al., 2015). Similarly, Filip and Raffournier (2014) show that European companies' financial reporting quality, measured by income smoothing and accruals quality, is higher during the 2008 financial crisis. They argue that increased litigation risk and monitoring from auditors during the crisis constrain earnings management. Their argument is also supported by Cimini (2015). However, other scholars claim that financial reporting quality is lower during a financial crisis (Chia et al., 2007). For example, Persakis and Iatridis (2015) show that financial reporting quality decreased during the 2008 financial crisis as companies manage their earnings more to alleviate the negative impact of the financial crisis. Using both accrual-based and real earnings management (REM) measures, Trombetta and Imperatore (2014) also report that there is more earnings management when a financial crisis becomes more extreme. They indicate that in order to survive, companies would significantly reduce R&D expenses or boost sales through unusual price discounts during the crisis, and this leads to lower financial reporting quality. Since financial reporting quality may be higher or lower during a crisis, it is important to investigate how COVID-19 affects the financial reporting quality. In our paper, we measure the financial reporting quality by REM as this has a significant impact on long-term firm value (Eng et al., 2019). REM means that companies deviate from their normal business practices, such as overproducing products or reducing R&D and advertising expenses, to manage their earnings (Roychowdhury, 2006). A higher level of REM suggests lower quality of financial reporting.

We further investigate whether corporate governance helps to mitigate the impact of COVID-19 on financial reporting quality. To our knowledge, no previous study has investigated this issue. We focus on three important aspects of corporate governance: board size, board independence, and CEO duality. Because previous literature deems boards of directors the core of corporate governance (Gillan, 2006), these three widely used measures related to board structure are chosen and analyzed in this paper. Board independence implies more effective monitoring and is often beneficial for firms (e.g., helping firms make better decisions during a crisis and avoid bankruptcy) (Erkens et al., 2012). However, a larger board size (implying more directors and better advising but less efficient communication) and the presence of CEO duality (implying more effective leadership but less effective monitoring) bring both advantages and disadvantages to firms (e.g., having both negative and positive impacts on firm value and firm performance) (Boone et al., 2007; Coles et al., 2008; Duru et al., 2016; Lu and Boateng, 2018). Based on the agency theory, we expect that a board providing more effective monitoring (i.e., a higher level of board independence, the absence of CEO duality, and arguably a larger board) (Alves, 2014; Lu and Boateng, 2018) should help to mitigate the negative impact of COVID-19 on financial reporting quality if any. Nevertheless, the stewardship theory suggests that CEO duality resulting in more effective leadership and plan implementation (Elsayed, 2007) may be helpful in improving firm performance and hence reducing the use of REM during the COVID-19 pandemic when timely action needs to be taken. Additionally, the presence of more directors in a larger board can be helpful in advising companies (Guest, 2009) during the pandemic, and this may result in better firm performance and less use of REM. Our research will add to the current literature by investigating the mitigating effect of corporate governance on financial reporting quality during the COVID-19 pandemic.

This study uses the UK data because of the following reasons. First, according to a report of the Organization for Economic Cooperation and Development (OECD), the UK economy was the hardest hit by the COVID-19 among G7 (Office for National Statistics, 2021). London Stock Exchange is also one of the largest stock markets in the world. Furthermore, the UK has strong country-level governance and often ranks very high in the Worldwide Governance Indicators issued by the World Bank (Malafronte and Pereira, 2021). As indicated earlier, none of current literature has investigated the impact of COVID-19 on financial reporting quality in a strong country-level governance setting. Hence, given the importance of the UK stock market, the large influence of COVID-19 on the UK, and the UK's strong country-level governance which helps to fill a research gap, this paper focuses on the UK setting.

This paper makes several contributions to the literature and practice. First, this paper provides additional evidence with respect to the impact of COVID-19 on financial reporting quality. Currently, very few studies have investigated this topic and none of them addressed this topic in a strong country-level governance setting (Pham et al., 2021). Hence, our paper, focusing on the UK with strong country-level governance, can help to enhance our understanding of companies' financial reporting quality during the COVID-19 pandemic. Furthermore, this paper is the first to investigate the mitigating effect of corporate governance on financial reporting quality during the COVID-19 pandemic and hence fills a research gap (Koutoupis et al., 2021). In addition, this study offers useful suggestions to practitioners. For example, our results, showing that UK companies have engaged in more real earnings management during the pandemic, suggest that investors and lenders need to be more vigilant in interpreting financial reporting results during this period. Since the UK regulators are currently amending important corporate governance regulations and debating the responsibility of directors on the board (Financial Times 2021), our results also provide timely advice and suggest that they should consider both the monitoring and advising roles of the board which are helpful during the COVID-19 pandemic.

The remainder of this paper is structured as follows. Section 2 reviews relevant literature and develops hypotheses. Section 3 describes methods and data. Section 4 presents our results and Section 5 concludes.

2. Literature and hypotheses

Currently, only a few papers have attempted to investigate the impact of COVID-19 on financial reporting quality. For example, using questionnaire survey data from Vietnam, Pham et al. (2021) argue that the financial reporting information becomes less value-relevant during the pandemic. Different from their paper which measures financial reporting quality based on survey data, our paper uses a widely adopted method (i.e., REM) to measure financial reporting quality and uses a larger sample. Focusing on Chinese companies, Xiao and Xi (2021) show that companies in the most affected areas engage in more accruals-based earnings management during the pandemic. However, these firms also significantly reduce the use of REM, implying higher financial reporting quality,

Table 1
Sample selection.

Sample selection	Total
UK listed firms from the FAME database (2018-2020)	8667
Less: financial firms (SIC 6000-6999)	(3435)
Less: missing data	(2110)
Final Sample for board size	3122
Less: missing BoardEx data	(1490)
Final Sample for CEO duality and board independence	1632

during the pandemic. The extant studies focus on China and Vietnam where country-level governance is weaker, and the results are mixed. Since financial reporting quality is heavily affected by country-level governance (Bonetti et al., 2016), our paper uses the UK setting with strong country-level governance should add to current literature.

Previous literature, mainly on the 2008 financial crisis, shows that crises could lead to higher or lower financial reporting quality. The higher risk and uncertainty during crises often result in higher information asymmetry. This is the same during the COVID-19 pandemic (Hsu and Liao, 2021). If companies exploit the higher information asymmetry, they are more likely to manage their earnings to influence their stakeholders (e.g., investors) and to alleviate the negative effect of the COVID-19 (Chia et al., 2007; Persakis and Iatridis, 2015). In this situation, we will observe more earnings management activities during the pandemic.

However, to reduce information symmetry and to increase investors' trust (Arthur et al., 2015), companies may also have greater incentives to improve their financial reporting quality during the COVID-19 pandemic. The increased scrutiny of auditors and regulators may also constrain the use of earnings management (Cimini, 2015; Filip and Raffournier, 2014), and hence result in higher financial reporting quality during the COVID-19 pandemic. Accordingly, we develop the following hypotheses:

Hypothesis 1a: Financial reporting quality is higher during the COVID-19 pandemic.

Hypothesis 1b: Financial reporting quality is lower during the COVID-19 pandemic.

The second part of this research aims to investigate the mitigating effect of corporate governance on financial reporting quality during the COVID-19 pandemic. To our knowledge, no research has been found that investigated this issue. A few scholars have investigated the role of corporate governance during the COVID-19 pandemic using stock market data. For example, Ding et al. (2021) report that board size and board independence do not have a mitigating effect on stock returns during the pandemic. Furthermore, Hsu and Liao (2021) show that corporate governance may not improve stock returns during the pandemic but can mitigate the negative impact of COVID-19 on stock price volatility (Koutoupis et al., 2021). survey literature on corporate governance and COVID-19 and indicate a lack of evidence derived from accounting data. Hence, our paper will fill this research gap.

As mentioned in the introduction, this paper focuses on board size, board independence, and CEO duality. According to the agency theory, if a board provides better monitoring (i.e., a board which is larger, is more independent, and lacks CEO duality), it can help to reduce information asymmetry and therefore ensure good financial reporting quality during the pandemic (Alves, 2014; Lu and Boateng, 2018). However, based on the stewardship theory, CEO duality which helps to implement plans promptly (Elsayed, 2007) may improve firm performance during the pandemic and therefore reduce the level of earnings management. Moreover, a larger board is often better in advising companies, particularly in complicated situations (Guest, 2009), and hence may be associated with higher financial reporting quality during the pandemic when the advising from the board is much needed. Accordingly, we develop the following hypothesis:

Hypothesis 2: Corporate governance has a mitigating effect on financial reporting quality during the COVID-19 pandemic.

3. Methodology and data

3.1. Data and sample

This paper focuses on the UK because it is one of the hardest hit economies by the COVID-19 pandemic (e.g., the reduction in gross domestic product (GDP) of the UK is the largest among G7) and its stock market is one of the largest in the world (Office for National Statistics, 2021). Furthermore, UK is known for having strong country-level governance and our research will add to current literature. We obtained financial data and board size data on UK listed companies from the FAME database. The sample period is from 2018 to 2020 to allow us to compare the pre-pandemic (i.e., 2018–2019) and pandemic periods (2020).¹ After excluding financial institutions and observations with missing data, our sample consists of 3,122 observations.

We also collected the data on board independence and CEO duality from the BoardEx database to consider more aspects of corporate governance. Because of the large amount of missing data, the sample used to analyze board independence and CEO duality is

¹ Following previous literature on the 2008 financial crisis and earning management (Cimini, 2015; Filip and Raffournier, 2014), we use two-year data (i.e., 2018–2019) to establish the situation in the pre-pandemic period. For the pandemic period, only one-year accounting data is currently available. Hence, the data in 2020 is used for the pandemic period.

Table 2
Descriptive statistics.

Variables	N	Mean	Median	Std. dev.	Quartile 1	Quartile 3
<i>RM1</i>	3122	-0.404	-0.233	1.204	-0.751	0.103
<i>RM2</i>	3122	-0.004	0.000	0.043	0.000	0.000
<i>POST</i>	3122	0.302	0.000	0.459	0.000	1.000
<i>BDSIZE</i>	3122	1.792	1.792	0.477	1.609	2.079
<i>SIZE</i>	3122	11.430	11.089	2.465	9.522	13.100
<i>BM</i>	3122	0.343	0.000	0.550	0.000	0.521
<i>LEV</i>	3122	0.584	0.530	0.356	0.353	0.739
<i>ROA</i>	3122	0.036	0.051	0.176	-0.002	0.105
<i>LOSS</i>	3122	0.283	0.000	0.450	0.000	1.000
<i>GROWTH</i>	3122	0.075	0.032	0.376	-0.057	0.132
<i>BIG4</i>	3122	0.397	0.000	0.489	0.000	1.000
<i>CEOD</i>	1632	0.012	0.000	0.110	0.000	0.000
<i>INDB</i>	1632	23.224	0.000	30.487	0.000	55.560

The definitions of variables are as follows: *RM1* is an aggregate measure of real earnings management and defined as the sum of “abnormal cash flow from operations (*AB_CFO*) times negative one” and “abnormal discretionary expenses (*AB_DISX*) times negative one”. *RM2* is another aggregate measure of real earnings management and defined as the sum of “abnormal discretionary expenses (*AB_DISX*) times negative one” and “abnormal production costs (*AB_PROD*)”. *POST* equals 1 if the year is 2020 (i.e., the pandemic period) and 0 otherwise. *BDSIZE* is the natural logarithm of directors serving on a board. *SIZE* is the natural logarithm of total assets. *BM* is the book-to-market ratio. *LEV* is the total liabilities divided by beginning total assets. *ROA* is the operating profit divided by beginning total assets. *LOSS* equals 1 if a firm reported a loss and 0 otherwise. *GROWTH* is the annual change in net sales. *BIG4* equals 1 if a firm’s auditor is Deloitte, Ernst & Young, KPMG or PwC and 0 otherwise. *CEOD* equals 1 if the CEO is also the chairman of the board and 0 otherwise. *INDB* is the percentage of independent board members on a board.

smaller and consists of 1,632 observations. The sample selection process is shown in Table 1.

3.2. Econometric models

To measure financial reporting quality, we follow the methodology of previous literature (Cohen & Zarowin, 2010; Cheng et al., 2016) and first estimate the normal level of cash flow from operations (*CFO*), discretionary expenses (*DISX*), and production costs (*PROD*):

$$CFO_{it}/Asset_{it-1} = \alpha_1(1/Asset_{it-1}) + \alpha_2(SALE_{it}/Asset_{it-1}) + \alpha_3(\Delta SALE_{it}/Asset_{it-1}) + \varepsilon_{it} \quad (1)$$

$$DISX_{it}/Asset_{it-1} = \alpha_1(1/Asset_{it-1}) + \alpha_2(SALE_{it}/Asset_{it-1}) + \alpha_3(\Delta SALE_{it}/Asset_{it-1}) + \varepsilon_{it} \quad (2)$$

$$PROD_{it}/Asset_{it-1} = \alpha_1(1/Asset_{it-1}) + \alpha_2(SALE_{it}/Asset_{it-1}) + \alpha_3(\Delta SALE_{it}/Asset_{it-1}) + \alpha_4(\Delta SALE_{it-1}/Asset_{it-1}) + \varepsilon_{it} \quad (3)$$

where *CFO* is the cash flow from operations. *DISX* is the sum of a firm’s R&D expenses, advertising expenses, and selling, general, and administrative (SG&A) expenses. *PROD* is the sum of the cost of goods sold (COGS) and the change in inventories.

We then calculate the abnormal level of *CFO*, *DISX*, and *PROD* (i.e., *AB_CFO*, *AB_DISX*, and *AB_PROD*) by deducting their normal level from their actual level. We then construct *RM1* and *RM2*, to measure financial reporting quality:

$$RM1 = AB_CFO * (-1) + AB_DISX * (-1) \quad (4)$$

$$RM2 = AB_DISX * (-1) + AB_PROD \quad (5)$$

A higher value of *RM1* and *RM2* suggests a higher level of REM, and therefore lower financial reporting quality.

Drawing on previous literature (Alhadab and Clacher, 2018; Cheng et al., 2016; Katmon and Al Farooque, 2017), we use the following model to investigate the impact of COVID-19 on financial reporting quality and the mitigating effect of corporate governance during this pandemic:

$$RM_{it} = \alpha_0 + \alpha_1 POST_{it} + \alpha_2 GOV_{it} + \alpha_3 POST * GOV_{it} + \beta Controls_{it} + \gamma IndustryFE_{it} + \delta YearFE_{it} + \varepsilon_{it} \quad (6)$$

where *RM* refers to *RM1* or *RM2*. *POST* equals 1 if the year is 2020 (i.e., the pandemic period) and 0 otherwise. *GOV* refers to the corporate governance variables: *BDSIZE* is the natural logarithm of directors serving on a board; *CEOD* equals 1 if the CEO is also the chairman of the board and 0 otherwise; *INDB* is the percentage of independent board members on a board. *Controls* refer to control variables, including: *SIZE* (the natural logarithm of total assets), *BM* (book-to-market ratio), *LEV* (total liabilities divided by beginning total assets), *ROA* (operating profit divided by beginning total assets), *LOSS* (a dummy variable equals 1 if a firm reported a loss and 0 otherwise), *GROWTH* (annual change in net sales), and *BIG4* (a dummy variable equals 1 if a firm’s auditor is Deloitte, Ernst & Young, KPMG or PwC and 0 otherwise).

We follow previous literature to control variables which are likely to influence the quality of financial reporting (Alhadab and Clacher, 2018; Cheng et al., 2016; Katmon and Al Farooque, 2017). There is no general agreement on how firm size (*SIZE*), leverage (*LEV*), firm performance (*ROA*), growth opportunities (*BM* and *GROWTH*) and auditors (*BIG4*) affect companies’ financial reporting

Table 3

The impact of COVID-19 on REM and the mitigating effect of corporate governance.

Panel A. The impact of COVID-19 on REM and the mitigating effect of board size		
	(1) RM1	(2) RM2
POST	0.222*** (5.95)	0.003⁺ (1.60)
BDSIZE	0.042 (0.65)	0.005* (1.84)
POST* BDSIZE	-0.089⁺ (-1.39)	-0.006** (-2.03)
SIZE	0.065*** (4.82)	0.001*** (2.73)
BM	-0.087*** (-2.81)	-0.003** (-2.02)
LEV	-0.551*** (-6.74)	-0.018*** (-3.93)
ROA	-2.343*** (-13.46)	-0.022* (-1.90)
LOSS	0.209*** (4.23)	0.001 (0.38)
GROWTH	-1.466*** (-12.59)	-0.020*** (-3.77)
BIG4	-0.046 (-0.80)	-0.002 (-0.70)
Constant	-0.823*** (-4.65)	-0.011* (-1.87)
Industry fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Clustered	Firm	Firm
Observations	3122	3122
Adjusted R ²	0.451	0.062
Panel B. The impact of COVID-19 on REM and the mitigating effect of CEO duality		
	(1) RM1	(2) RM2
POST	0.232*** (5.04)	0.001 (1.10)
CEOD	0.065 (0.27)	-0.000 (-0.00)
POST* CEOD	0.154 (0.38)	0.005 (0.93)
SIZE	0.030* (1.95)	-0.000 (-0.69)
BM	-0.100*** (-2.91)	-0.004** (-2.10)
LEV	-0.402*** (-3.94)	-0.012* (-1.94)
ROA	-1.994*** (-10.32)	0.001 (0.16)
LOSS	0.186*** (3.34)	0.002 ⁺ (1.48)
GROWTH	-1.232*** (-10.04)	-0.009* (-1.77)
BIG4	0.021 (0.33)	0.001 (1.12)
Constant	-0.351* (-1.85)	0.009⁺ (1.57)
Industry fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Clustered	Firm	Firm
Observations	1632	1632
Adjusted R ²	0.478	0.061
Panel C. The impact of COVID-19 on REM and the mitigating effect of board independence		
	(1) RM1	(2) RM2
POST	0.246***	0.002⁺

(continued on next page)

Table 3 (continued)

Panel A. The impact of COVID-19 on REM and the mitigating effect of board size		
	(1) RM1	(2) RM2
	(4.29)	(1.34)
INDB	0.002 ⁺ (1.32)	0.000 ⁺ (1.33)
POST* INDB	0.000 (0.06)	-0.000 (-1.18)
SIZE	0.016 (0.90)	-0.000 (-0.82)
BM	-0.093*** (-2.72)	-0.003** (-2.09)
LEV	-0.400*** (-3.95)	-0.012* (-1.95)
ROA	-1.987*** (-10.22)	0.001 (0.16)
LOSS	0.187*** (3.32)	0.002 ⁺ (1.49)
GROWTH	-1.232*** (-10.03)	-0.009* (-1.76)
BIG4	0.006 (0.09)	0.001 (0.99)
Constant	-0.181 (-0.84)	0.010 ⁺ (1.54)
Industry fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Clustered	Firm	Firm
Observations	1632	1632
Adjusted R ²	0.479	0.061

All variables are defined in Table 2.

t-statistics are presented in parentheses. Robust standard errors clustered by firm are used.

*, **, *** indicate that a coefficient is statistically significant at the 10%, 5%, and 1% level, respectively (two-tailed). ⁺ indicates that a coefficient is statistically significant at the 10% level (one-tailed). The variance inflation factors (VIFs) here are all less than 10.

quality (Alhadab and Clacher, 2018; Cohen and Zarowin, 2010). Due to greater scrutiny from investors and regulators, firms which are larger, more leveraged, have better firm performance and have more growth opportunities are more likely to exhibit higher financial reporting quality (Anagnostopoulou and Tsekrekos, 2017). However, these firms also have greater incentives to manage earnings (Alhadab and Clacher, 2018). In addition, Big 4 auditors generally help to constrain earnings management (Cameran et al., 2014). Nonetheless, stringent scrutiny from Big 4 auditors may also lead to more real earnings management activities (Cohen and Zarowin, 2010). Finally, previous literature generally agrees that firms reporting losses (LOSS) are more likely to engage in earnings management (Alhadab and Clacher, 2018).

Following previous literature using panel data to investigate financial reporting quality (Alhadab and Clacher, 2018; Cheng et al., 2016), our model includes industry and year fixed effects to control for unobserved industry and time effects. We also follow previous literature (Alhadab and Clacher, 2018) to use robust standard errors clustered at the firm level to deal with heteroscedasticity. Furthermore, we use the mean centering technique to resolve the multicollinearity issue (Shieh, 2011).

3.3. Descriptive statistics

Descriptive statistics of all variables are presented in Table 2. The mean of *BDSIZE* is 1.792. CEO duality exists in 1.2% of the sample firms. The average percentage of independent board members on a board in the sample is 23.224.

4. Results

4.1. Main results

Our main results are presented in Pane A of Table 3, where the dependent variables in regressions (1) and (2) are *RM1* and *RM2*, respectively. The coefficient of *POST* in both regressions is significant and positive, indicating that the pandemic period is positively associated with the level of real earnings management. In other words, UK listed companies' financial reporting quality is lower during the pandemic compared to the pre-pandemic period. This may be because companies manage their earnings to avoid further negative reaction of investors during the pandemic (Persakis and Iatridis, 2015). This may also be because companies try to survive by boosting their sales using unusually low prices or by cutting their R&D or advertising expenses during the pandemic (Trombetta and Imperatore, 2014).

Table A1
Robustness tests: the impact of COVID-19 on REM and the mitigating effect of board size (same firms over the sample period).

	(1)	(2)
	RM1	RM2
POST	0.191***	0.003*
	(5.01)	(1.88)
BDSIZE	0.040	0.004 ⁺
	(0.51)	(1.32)
POST* BDSIZE	-0.091⁺	-0.005*
	(-1.41)	(-1.83)
SIZE	0.059***	0.000
	(3.89)	(1.11)
BM	-0.069**	-0.002 ⁺
	(-2.15)	(-1.58)
LEV	-0.464***	-0.017***
	(-4.79)	(-3.18)
ROA	-2.246***	-0.009
	(-10.60)	(-0.80)
LOSS	0.221***	0.002 ⁺
	(4.25)	(1.33)
GROWTH	-1.635***	-0.015***
	(-11.30)	(-2.83)
BIG4	-0.019	0.001
	(-0.29)	(0.67)
Constant	-0.634***	0.000
	(-3.39)	(0.02)
Industry fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Clustered	Firm	Firm
Observations	2466	2466
Adjusted R ²	0.476	0.050

All variables are defined in Table 2.

t-statistics are presented in parentheses. Robust standard errors clustered by firm are used.

*, **, *** indicate that a coefficient is statistically significant at the 10%, 5%, and 1% level, respectively (two-tailed). ⁺ indicates that a coefficient is statistically significant at the 10% level (one-tailed). The VIFs here are all less than 10.

In 2020, UK is one of the hardest hit economies by the COVID-19 pandemic due to strict lockdown measures (Office for National Statistics, 2021). This significantly increases risk and uncertainty in the market and in companies. Overall, our result suggests that the higher information asymmetry and poorer firm performance during the pandemic (Hsu and Liao, 2021) lead to lower financial reporting quality of UK firms. Our result is different from that of Xiao and Xi (2021) showing a lower level of REM in Chinese companies during the pandemic. This may be because the stronger country-level governance (i.e., stronger investor protection) in the UK constrains companies' use of accruals-based earnings management and hence they turn to more costly REM (Enomoto et al., 2015).

Furthermore, the negative coefficient of the interaction term, *POST*BDSIZE*, suggests that a larger board size can mitigate the negative impact of COVID-19 on financial reporting quality. This may be because a larger board provides better monitoring (Boone et al., 2007; Lu and Boateng, 2018) that helps to constrain firm's earnings management during the pandemic, consistent with the agency theory. This may also be because a larger board consists of more directors (Coles et al., 2008; Guest, 2009) that help firms cope with the pandemic, such as through helpful and creative strategies, without making a large sacrifice of long-term firm value through real earnings management.

Regarding control variables, consistent with prior studies (Alhadab and Clacher, 2018; Cheng et al., 2016), we find that larger firms (see *SIZE*) and firms reporting losses (see *LOSS*) are associated with a higher level of real earnings management. Moreover, *BM*, *LEV*, *ROA*, and *GROWTH* are negatively associated with REM. In line with previous literature (Anagnostopoulou and Tsekrekos, 2017), the results suggest that firms with better performance (see *ROA*), more growth opportunities (see *BM* and *GROWTH*) and higher leverage (see *LEV*) are more likely to have a better quality of financial reporting due to the higher level of monitoring from regulators and investors.

We further investigate whether board independence and CEO duality also have a mitigating effect during the pandemic. However, the results in Table 3 (Panels B and C) suggest that board independence and CEO duality may not alleviate the negative impact of COVID-19 on financial reporting quality.

4.2. Robustness and additional tests

4.2.1. Robustness tests

To mitigate endogeneity problems, we re-estimate the regression using a sample consisting of the same firms over our sample

Table A2

Additional tests: industry analysis.

Panel A. More affected vs. less affected industries (Full sample)				
	Less affected industries		More affected industries	
	RM1	RM2	RM1	RM2
POST	0.275*** (4.60)	0.001 (0.33)	0.204*** (4.40)	0.005** (2.55)
BDSIZE	0.094 (0.91)	0.010** (2.53)	0.052 (0.74)	0.001 (0.42)
POST* BDSIZE	-0.027 (-0.25)	-0.007⁺ (-1.43)	-0.126* (-1.84)	-0.004⁺ (-1.57)
SIZE	0.048** (2.25)	0.002** (2.31)	0.070*** (4.81)	0.001** (2.09)
BM	-0.028 (-0.60)	-0.003* (-1.73)	-0.090** (-2.52)	-0.003* (-1.85)
LEV	-0.610*** (-4.83)	-0.015** (-2.56)	-0.517*** (-4.92)	-0.022*** (-3.14)
ROA	-2.543*** (-10.14)	-0.026 ⁺ (-1.53)	-2.341*** (-10.20)	-0.017 ⁺ (-1.62)
LOSS	0.292*** (3.92)	-0.000 (-0.02)	0.178*** (2.87)	0.002 (0.93)
GROWTH	-1.577*** (-7.66)	-0.027*** (-2.95)	-1.324*** (-9.50)	-0.013** (-2.40)
BIG4	-0.005 (-0.06)	-0.002 (-0.77)	-0.042 (-0.61)	0.000 (0.16)
Constant	-0.618*** (-2.73)	-0.009 ⁺ (-1.49)	-0.761*** (-4.76)	-0.007 (-1.19)
Year fixed effects	Yes	Yes	Yes	Yes
Clustered	Firm	Firm	Firm	Firm
Observations	1481	1481	1641	1641
Adjusted R ²	0.407	0.068	0.468	0.073
Note: Less affected industries: agricultural production, retail, wholesale, telephone communications, business services (advertising), engineering, accounting, research, management, and related services.				
More affected industries: oil and gas, construction, manufacturing, transportation, hotels, theaters, educational services, social services (such as child day care services and residential care).				
Panel B. Most affected vs. least affected industries (subsample)				
	Least affected industries		Most affected industries	
	RM1	RM2	RM1	RM2
POST	0.128 (1.00)	-0.002 (-0.81)	0.099** (2.06)	0.001 (0.23)
BDSIZE	0.027 (0.17)	0.001 (0.23)	0.068 (0.71)	-0.002 (-0.43)
POST* BDSIZE	-0.027 (-0.19)	-0.007 (-0.92)	-0.106⁺ (-1.42)	0.001 (0.28)
SIZE	-0.012 (-0.41)	0.001 ⁺ (1.42)	0.062*** (3.31)	0.001 ⁺ (1.49)
BM	0.059 (0.78)	-0.001 (-0.38)	-0.103** (-2.37)	-0.003* (-1.66)
LEV	-0.456 ⁺ (-1.56)	-0.015 ⁺ (-1.53)	-0.431*** (-3.39)	-0.025*** (-2.78)
ROA	-2.675*** (-5.23)	-0.035 ⁺ (-1.46)	-2.524*** (-8.69)	-0.031* (-1.72)
LOSS	0.020 (0.12)	-0.004 (-0.69)	0.136* (1.84)	0.000 (0.03)
GROWTH	-2.617*** (-2.92)	-0.035 ⁺ (-1.29)	-1.936*** (-9.41)	-0.025*** (-2.60)
BIG4	0.317* (1.82)	0.003 (0.67)	-0.107 ⁺ (-1.30)	-0.000 (-0.03)
Constant				
Year fixed effects	Yes	Yes	Yes	Yes
Clustered	Firm	Firm	Firm	Firm
Observations	314	314	1167	1167
Adjusted R ²	0.538	0.121	0.531	0.102

Note: Least affected industries: retail and telephone communications. Most affected industries: construction, manufacturing, hotels, and theaters.. All variables are defined in Table 2.

t-statistics are presented in parentheses. Robust standard errors clustered by firm are used.

*, **, *** indicate that a coefficient is statistically significant at the 10%, 5%, and 1% level, respectively (two-tailed). + indicates that a coefficient is statistically significant at the 10% level (one-tailed). The VIFs here are all less than 10.

Table A3

Additional tests: market competition.

	Low competition market		High competition market	
	RM1	RM2	RM1	RM2
POST	0.231*** (4.31)	0.001 (0.32)	0.206*** (3.85)	0.005* (1.86)
BDSIZE	0.165** (1.99)	0.002 (0.45)	-0.049 (-0.51)	0.008* (1.96)
POST* BDSIZE	-0.187** (-2.04)	-0.004 (-0.98)	0.037 (0.40)	-0.007* (-1.86)
SIZE	0.071*** (4.23)	0.002** (2.26)	0.058*** (2.86)	0.001+ (1.96)
BM	-0.096** (-2.32)	-0.003+ (-1.45)	-0.096** (-2.31)	-0.003* (-1.81)
LEV	-0.389*** (-3.96)	-0.017*** (-2.97)	-0.747*** (-5.74)	-0.019*** (-2.72)
ROA	-2.510*** (-10.64)	-0.035** (-2.21)	-2.307*** (-9.50)	-0.012 (-0.76)
LOSS	0.202*** (3.09)	-0.000 (-0.11)	0.207*** (2.79)	0.001 (0.48)
GROWTH	-1.239*** (-8.82)	-0.015*** (-2.68)	-1.722*** (-9.76)	-0.025*** (-2.89)
BIG4	-0.057 (-0.70)	-0.004 (-1.08)	-0.037 (-0.46)	-0.000 (-0.00)
Constant	-0.937*** (-4.49)	-0.016* (-1.84)	-0.592** (-2.40)	-0.013+ (-1.53)
Industry fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Clustered	Firm	Firm	Firm	Firm
Observations	1588	1588	1534	1534
Adjusted R ²	0.465	0.057	0.457	0.070

All variables are defined in Table 2.

t-statistics are presented in parentheses. Robust standard errors clustered by firm are used.

*, **, *** indicate that a coefficient is statistically significant at the 10%, 5%, and 1% level, respectively (two-tailed). + indicates that a coefficient is statistically significant at the 10% level (one-tailed). The VIFs here are all less than 10.

period (Cameran et al., 2014). The result shown in Table A1 in the Appendix is again in line with our main findings.

4.2.2. Additional tests

Industry analysis. Since the COVID-19 pandemic affects different industries differently, we divide the full sample into “more affected industries” and “less affected industries” based on technical reports on UK companies (Anayi et al., 2021; Office for National Statistics, 2020). Panel A of Table A2 in the Appendix shows that overall, companies in both groups engaged in more real earnings management during the pandemic and board size has a mitigating effect.² The results are generally consistent with our main findings in Section 4.1. To further investigate the influence of industry, we consider a subsample to focus on “the most affected industries” where the negative impact of COVID-19 is obvious and “the least affected industries” where the positive impact of COVID-19 is obvious (Anayi et al., 2021; Office for National Statistics, 2020). That is, in the subsample analysis, we exclude industries where there are both positive and negative impacts of COVID-19 (i.e., those industries where the net impact of COVID-19 is not clear). As shown in Panel B of Table A2 in the Appendix, companies in the most affected industries (i.e., construction, manufacturing, hotels, and theaters) exhibit a higher level of earnings management through adjusting cash flow from operations and discretionary expenses. However, companies in least affected industries (i.e., retail and telephone communications) are not associated with a higher level of REM during the pandemic. Since retailers are one of the few businesses which can continue to operate in the UK during the lockdown and more demands on

² The result (column 2 of Panel A, in Table A2) also shows that firms in industries which are less affected by the COVID-19 are not significantly associated with a higher level of RM2 during the pandemic. This may be because compared to firms more affected by the pandemic, these firms have less pressure to use all methods to manage their earnings. In this situation, these firms chose to manage their earnings through reducing discretionary expenses and offering price discounts rather than through overproduction which is harder to implement during a crisis (Trombetta and Imperatore, 2014).

Table A4
Additional tests: financial constraints.

	High leverage		Low leverage	
	RM1	RM2	RM1	RM2
POST	0.304*** (4.74)	0.006* (1.75)	0.155*** (3.79)	0.000 (1.14)
BDSIZE	0.032 (0.32)	0.008* (1.74)	0.058 (1.02)	-0.000 (-0.59)
POST* BDSIZE	-0.253** (-2.50)	-0.014*** (-2.60)	0.038 (0.46)	-0.000 (-0.88)
SIZE	0.093*** (4.64)	0.002* (1.90)	0.015 (1.03)	-0.000 (-0.67)
BM	-0.130* (-1.96)	-0.002 (-0.52)	-0.018 (-0.62)	0.000 (0.61)
LEV	-0.231** (-2.10)	-0.019** (-2.43)	-0.754*** (-4.82)	-0.000 (-0.19)
ROA	-2.386*** (-8.93)	-0.037* (-1.68)	-2.058*** (-12.44)	-0.000 ⁺ (-1.55)
LOSS	0.266*** (3.26)	0.001 (0.37)	0.145*** (2.66)	0.000 (0.10)
GROWTH	-1.800*** (-10.09)	-0.036*** (-3.51)	-1.134*** (-8.76)	-0.000*** (-3.60)
BIG4	-0.021 (-0.21)	-0.002 (-0.39)	-0.053 (-0.97)	-0.000 (-0.81)
Constant	-0.824*** (-3.35)	-0.009 (-0.86)	-0.151 (-0.84)	0.000 (0.49)
Industry fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Clustered	Firm	Firm	Firm	Firm
Observations	1561	1561	1561	1561
Adjusted R ²	0.462	0.080	0.467	0.019

All variables are defined in Table 2.

t-statistics are presented in parentheses. Robust standard errors clustered by firm are used.

*, **, *** indicate that a coefficient is statistically significant at the 10%, 5%, and 1% level, respectively (two-tailed). ⁺ indicates that a coefficient is statistically significant at the 10% level (one-tailed). The VIFs here are all less than 10.

telephone communication services during the lockdown provide new opportunities for the telephone communication industry, these two industries which are less affected by the COVID-19 pandemic may have less pressure to manage their earnings.

Market competition and financial constraints. Furthermore, we examine whether market competition and companies' financial constraints influence the results. We first use the Herfindahl–Hirschman Index (HHI) to measure market competition (Bassemir and Novotny-Farkas, 2018), and a higher value of HHI suggests a lower level of competition. We also use leverage to measure companies' financial constraints (Farre-Mensa and Ljungqvist, 2016), and higher leverage implies a lower degree of financial constraints. We then split our sample into two subsamples based on HHI (Table A3 in the Appendix) and leverage (Table A4 in the Appendix). Consistent with our main findings, Table A3 in the Appendix shows that both low and high competition firms have lower financial reporting quality during the pandemic, and generally a larger board helps to mitigate the negative impact of COVID-19 on financial reporting quality.³ Additionally, Table A4 in the Appendix reports that both high and low leverage firms engaged in more real earnings management during the pandemic.⁴ However, the mitigating effect of board size on financial reporting quality only appears in firms with higher leverage (i.e., firms with a lower degree of financial constraints). For financially constrained firms, larger boards may not effectively reduce companies' real earnings management behaviors during the pandemic. This may be because the severe negative impact of the COVID-19 and the financial constraints together make survival become the most important thing for the companies (Trombetta and Imperatore, 2014).

Brexit. UK officially withdrew from the European Union (i.e., Brexit) on 31 January 2020 around the time when the COVID-19 pandemic started. To consider the impact of Brexit, we follow the study of Seebeck and Vetter (2021) and divide the full sample into "industries which are more affected by Brexit" and "industries which are less affected by Brexit". Table A5 in the Appendix shows

³ The result (column 2 of Table A3) also shows that low competition firms are not associated with a higher level of RM2 during the pandemic. Consistent with previous literature (Trombetta and Imperatore, 2014), the result suggests that managing earnings through overproduction may not be companies' first option during a crisis due to the implementation difficulty.

⁴ The result in column 4 of Table A4 shows that low leverage firms are not associated with a higher level of RM2 during the pandemic. The result here again suggests that during the pandemic, firms are more likely to manage earnings through lowering prices rather than through overproduction. This is because the former is easier and faster to adopt (Trombetta and Imperatore, 2014).

Table A5
Additional tests: Brexit sensitivity by industry.

	Less affected industries		More affected industries	
	RM1	RM2	RM1	RM2
POST	0.205*** (4.28)	0.003 ⁺ (1.34)	0.255*** (4.25)	0.003 ⁺ (1.42)
BDSIZE	0.081 (0.95)	0.008** (2.28)	0.037 (0.37)	0.002 (0.56)
POST* BDSIZE	-0.047 (-0.59)	-0.009** (-2.23)	-0.165* (-1.66)	-0.002 (-0.55)
SIZE	0.058*** (3.49)	0.001** (2.15)	0.085*** (4.34)	0.002** (2.35)
BM	-0.063 ⁺ (-1.64)	-0.003* (-1.90)	-0.068 ⁺ (-1.54)	-0.001 ⁺ (-1.29)
LEV	-0.517*** (-5.31)	-0.018*** (-3.11)	-0.725*** (-4.94)	-0.018** (-2.58)
ROA	-2.305*** (-11.29)	-0.024* (-1.67)	-2.674*** (-8.61)	-0.017 (-1.15)
LOSS	0.216*** (3.58)	0.001 (0.22)	0.247*** (3.19)	0.001 (0.53)
GROWTH	-1.484*** (-9.65)	-0.025*** (-3.17)	-1.343*** (-6.99)	-0.011** (-2.30)
BIG4	-0.037 (-0.59)	-0.001 (-0.45)	-0.040 (-0.41)	-0.002 (-0.46)
Constant	-0.605*** (-3.36)	-0.006 (-1.01)	-0.992*** (-4.55)	-0.011** (-2.21)
Year fixed effects	Yes	Yes	Yes	Yes
Clustered	Firm	Firm	Firm	Firm
Observations	1781	1781	1341	1341
Adjusted R ²	0.452	0.081	0.419	0.044

Note: Less affected industries: agricultural production, telephone communications, business services (advertising), engineering, accounting, research, management, transportation, theaters, educational services, social services, and related services.

More affected industries: food and drink manufacturing, metals, oil and gas, hotels and restaurants, wholesale and retail trade, chemicals, technology, and construction.

All variables are defined in Table 2.

t-statistics are presented in parentheses. Ro=bust standard errors clustered by firm are used.

*, **, *** indicate that a coefficient is statistically significant at the 10%, 5%, and 1% level, respectively (two-tailed). ⁺ indicates that a coefficient is statistically significant at the 10% level (one-tailed). The VIFs here are all less than 10.

that POST is positively associated with the level of REM for both groups. The result suggests that UK companies engaged in more REM during the pandemic regardless of the impact of Brexit on them. The result is again consistent with our main findings in Section 4.1.

5. Conclusion

This is the first study to analyze the mitigating role of corporate governance on financial reporting quality during the COVID-19 pandemic. By examining the real earnings management behavior of companies, we find that the financial reporting quality is lower during the pandemic. This may be because companies use real earnings management to avoid further negative reaction of investors (Persakis and Iatridis, 2015) or to survive during the crisis (Trombetta and Imperatore, 2014). In addition, we show that a larger board helps to mitigate the negative impact of COVID-19 on financial reporting quality. This may be because of the better monitoring and advising provided by a larger board (Boone et al., 2007; Coles et al., 2008; Guest, 2009; Lu and Boateng, 2018). However, we do not find significant evidence on the mitigating effect of board independence and CEO duality.

Our paper adds to the ongoing discussion of COVID-19 and presents important evidence that a larger board can help alleviate the negative impact of COVID-19 on financial reporting quality. Since good financial reporting quality helps financial market participants, such as investors and lenders, make proper decisions and helps to improve the efficiency of financial markets, our results provide useful insight for policymakers and investors. For example, due to more real earnings management activities during the pandemic, investors and lenders should be more careful when interpreting financial reporting results. Companies can also improve their corporate governance (particularly regarding board size) to ensure high quality of financial reporting during the pandemic. Furthermore, UK regulators are now in the process of amending corporate governance regulations, which are regarded as an important reform of corporate governance, and the responsibility of directors on the board is under debate (Financial Times 2021). Our results encourage regulators to consider both the monitoring and advising roles of the board which are particularly crucial during a crisis like the COVID-19 pandemic and help regulators evaluate whether current regulations regarding board structure (e.g., board independence and CEO duality) are effective in ensuring high financial reporting quality during the pandemic.

This study is subject to some limitations. First, because data on accounting variables are annual, we treat the year 2020 as the pandemic period. Since the pandemic becomes a fact a little later (e.g., in the UK, the first COVID-19 case was confirmed on 31 January

2020 and the stay-at-home order was announced on 23 March 2020), our results may not fully present the impact of the pandemic. Similarly, it is possible that other contemporary events, such as Brexit, may affect our results. Furthermore, this paper focuses on the UK data and this single-country approach allows us to prevent results from being affected by other country-level factors (Cameran et al., 2014). Our results would be relevant to countries that have similar institutional settings (e.g., country-level governance or legal enforcement) and have similar experience of COVID-19 as the UK. However, we acknowledge that the findings may be different in other countries which are affected by the pandemic differently and with different institutional settings. Our research provides early evidence on this topic, and future research is recommended to use data from other countries. Currently, only one-year accounting data is available. When data for more years becomes available, it is recommended to further investigate the impact of COVID-19 on financial reporting quality, including any time-lag effect.

CRedit authorship contribution statement

Yu-Lin Hsu: Conceptualization, Methodology, Writing – original draft, Writing – review & editing, Formal analysis, Visualization, Project administration. **Ya-Chih Yang:** Methodology, Software, Formal analysis, Visualization.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix

Tables A1–A5.

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