EARNINGS MANAGEMENT AND CORPORATE GOVERNANCE DURING COVID-19: EVIDENCE FROM THE EUROPEAN CAPITAL MARKET

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OPEN ACCESS

How to cite this paper: Ricapito, F. P. (2024). Earnings management and corporate governance during COVID-19: Evidence from the European capital market. *Corporate Board: Role, Duties and Composition, 20*(1), 42–55.
https://doi.org/10.22495/cbv20i1art4

ISSN Online: 2312-2722
ISSN Print: 1810-8601

Received: 07.03.2024
Accepted: 22.04.2024

JEL Classification: D53, M10, M41, M48
DOI: 10.22495/cbv20i1art4

Abstract

The objective of this paper is to analyse the impact of COVID-19 on the earnings manipulation of firms and whether corporate governance has a mitigating effect. The methodological approach consists of two steps: in the first stage, a pooled ordinary least squares (OLS) regression model has been implemented to compute the earnings management proxies, whereas in the second stage panel data regression analysis has been adopted to test the effects of corporate governance variables on the earnings management proxies themselves. Using data from STOXX Europe 600 as a proxy for the European capital market, it is found that the level of companies' earnings manipulation increased during the pandemic. In particular, companies have engaged in more accounting and real earnings management (REM) practices. The findings show that a larger board helps to mitigate the positive relationship between COVID-19 and earnings manipulation, whereas no mitigating effect for board independence, board diversity and chief executive officer (CEO) duality has been found. In addition, an industry analysis has been developed both for robustness purposes and in order to check which sectors have been most and least affected by the pandemic. In particular, the findings show how the most affected industries reported a higher level of earnings management, resulting in a worse reporting quality. This paper provides additional evidence on the impact of COVID-19 on earnings management using a strong multi-country level governance setting. The results of this study provide useful suggestions for business practice, investors and policymakers.

Keywords: Earnings Management, Corporate Governance, Discretionary Accruals, Real Earnings Management, COVID-19, STOXX Europe 600, Board Size

Authors' individual contribution: The Author is responsible for all the contributions to the paper according to CRediT (Contributor Roles Taxonomy) standards.

Declaration of conflicting interests: The Author declares that there is no conflict of interest.

1. INTRODUCTION

The detection of earnings manipulation practices is essential for keeping financial markets efficient since market participants, such as investors, lenders, and regulators, found their decisions on information contained in the financial statements (Yeh et al., 2014). Many studies investigated the impact of the financial crisis, which burst in Europe in 2008, on earnings management (Cimini, 2015; Eng et al., 2019). Both this crisis and COVID-19 generated significant disruption in financial markets and the global

economy, but how the latter has impacted earnings manipulation is not clear yet. Until now, only a few studies have focused on this topic in relation to corporate governance variables (Rahman et al., 2023; Garfatta et al., 2023). In addition, corporate governance has always been a primary concern in studies on financial crisis (Erkens et al., 2012).

Some papers have already analysed, either theoretically or empirically, the role of corporate governance during COVID-19 (Jebran & Chen, 2021; Khatib & Nour, 2021). However, whether corporate governance moderates the impact of COVID-19 on earnings management is still unknown. In this sense, the purpose of this paper is to investigate if and how corporate governance mitigates the pandemic effect on earnings manipulation, contributing to the ongoing discussion of COVID-19 and enhancing the understanding of corporate governance. To be more precise, this paper has the aim of investigating two major issues: the first one is the impact of COVID-19 on the level of earnings management, proxied by specific variables according to the previous literature, as a measure of financial reporting quality; the second one is if and how some specific corporate governance variables positively or negatively mitigate the potential effect of the pandemic on earnings manipulation's magnitude.

This study also responds to the call to use accounting data to discuss the role of corporate governance in this COVID-19 crisis (Hsu & Yang, 2022; Koutoupis et al., 2021). Firstly, the impact of COVID-19 on the magnitude of earnings management is addressed. Previous literature on the impact of financial crises on earnings manipulation proved contradictory. According to some scholars, firms are boosted to improve their financial information both to reduce information asymmetry and to enhance investor trust, which is essential during a financial crisis (Arthur et al., 2015). Filip and Raffournier (2014) and Cimini (2015) show how higher litigation risk and auditors' monitoring have improved the financial reporting quality of European companies, proxied by income smoothing and accruals quality, during the financial crisis because they constrained earnings management. However, other scholars claim that financial crises worsen earnings manipulation (Ming Chia et al., 2007). According to Persakis and Iatridis (2015), earnings manipulation increased during the financial crisis since companies wanted to mitigate its negative impact. Using both accrual-based and real earnings management (REM) measures, Trombetta and Imperatore (2014) underline that a higher level of earnings manipulation occurs when a financial crisis becomes more extreme. In fact, companies either have to reduce significant research and development (R&D) expenses or boost sales through extraordinary price discounts to survive during the crisis, and this leads to higher earnings management. Since financial crises can either improve or worsen the manipulation of earnings, the first step is to analyse how COVID-19 affects it. In this research, it is measured by both accrual-based (accrual earnings management — AEM) and real-based (REM) proxies. AEM means that companies recognize revenues and expenses during the period they are earned and incurred respectively. According to REM, companies manage their earnings by deviating from their normal business practices, such as overproducing products or reducing R&D and advertising expenses, having a significant long-term impact on firm value (Roychowdhury, 2006; Eng et al., 2019). A higher level of AEM and REM suggests higher earnings manipulation.

In the second step, whether corporate governance moderates the impact of COVID-19 on earnings management (proxied by AEM and REM) is addressed. To the best of our knowledge, no previous studies link corporate governance and earnings manipulation during COVID-19 in the European capital market context. This paper focuses on four aspects that previous literature considers as the core of corporate governance (Gillan, 2006): board size, board independence, board diversity and chief executive officer (CEO) duality. Independence and diversity in the board ensure more effective monitoring and are often beneficial for firms (Erkens et al., 2012). However, a larger board size (more directors and better advising but less efficient communication) and the presence of CEO duality (more effective leadership but less effective monitoring) give both advantages and disadvantages in terms of firm value and performance (Boone et al., 2007; Coles et al., 2008; Duru et al., 2016; Lu & Boateng, 2018). According to agency theory, a higher level of board independence (hence more effective monitoring), the absence of CEO duality and a larger board (Alves, 2014; Lu & Boateng, 2018) should mitigate the negative impact of COVID-19 on financial reporting quality (hence a higher level of earnings manipulation) if any. However, according to stewardship theory, the CEO's dual role can improve firm performance and reduce the probability of implementing earnings manipulation during COVID-19 because it results in more effective leadership and immediacy in implementing plans when timely actions need to be taken (Elsayed, 2007). Guest (2009) shows that a larger board may be useful in advising companies and this, in turn, may result in a better firm performance and less will to manipulate earnings.

This paper contributes to the current literature by investigating the moderating effect of corporate governance on the magnitude of earnings manipulation during COVID-19. This study uses data from STOXX Europe 600 for the following reasons. First, the majority of studies on earnings management behaviour during the pandemic are conducted in a non-European context and at a single-country level (Aljawaheri et al., 2021; Xiao & Xi, 2021; Liu & Sun, 2022; Rahman et al., 2023). Therefore, the external validity of their findings is questionable, especially in Europe, which has been the first continent, after Eastern Asia, heavily hit by COVID-19 from 2020. In other words, it has been chosen a European sample because of the heavy effect the pandemic has brought in terms of deaths and economic conditions due to lockdowns, voluntary social distancing, supply chain disruptions and lower demand. Second, STOXX Europe 600 has been chosen both because it is the most representative index in Europe in terms of regulations on sustainable finance and financial reporting and because it represents large, mid and small capitalization companies across the 17 most important countries of Europe (Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, Norway, Netherlands, Poland, Portugal, the United Kingdom, Spain, Sweden and Switzerland).

This paper gives important contributions to the literature. First, it provides additional evidence regarding the impact of COVID-19 on earnings management. In fact, only a few studies focused on this topic and none of them addressed it in relation to a strong corporate governance setting like the European multi-country level. Second, this paper is one of the few that fills the research gap in investigating the mitigating effect of corporate governance on earnings manipulation during COVID-19 (Hsu & Yang, 2022; Koutoupis et al., 2021). Third, the fact that STOXX Europe 600 companies engaged in higher earnings manipulation during COVID-19 suggests that investors and lenders should be more cautious in interpreting financial reporting results during this period. Furthermore, since regulators are discussing amending important corporate governance regulations and debating the directors' responsibility on the board, they have to take into account the monitoring and advising roles of the board, which proved essential during the COVID-19 pandemic.

The rest of this paper is structured as follows. Section 2 focuses on the theoretical framework of both earnings management and corporate governance during crises, along with the statement of research hypotheses. Section 3 includes sample selection, main variables and regression models. Section 4 focuses on the empirical findings (descriptive statistics, correlation analysis, research results and additional tests). Section 5 displays the conclusions and the limitations of the study.

2. THEORETICAL FRAMEWORK AND RESEARCH HYPOTHESES

2.1. Earnings management during crises

Earnings manipulation during COVID-19 could be different from other crises because of several reasons. First, the pandemic has to do not only with economic but also with health and social dimensions. Second, all countries have been affected by this shock and more than half adopted lockdowns or other severe measures. Therefore, the worldwide economy has been threatened by the most serious economic crisis of the century. In this framework, firms registered a drop in their profits because of production interruption, lower consumer demand along with general lockdowns, social distancing and transport suspension (Aljughaiman et al., 2023; Garfatta et al., 2023). Carracedo et al. (2021) stress how environmental constraints such as the upward pressure of costs, a sharp decline in consumption and a sudden increase in raw materials prices challenged firms to survive. Therefore, managers may have pushed earnings upwards to report an acceptable level of losses in the eyes of stakeholders, so as to keep their confidence intact about the fact that the firm's position with respect to its competitors is not worse. However, the pandemic period could pave the way to big bath practices, given its negative impact on business activities and the important burdens resulting from a decline in revenues, asset impairments and litigation losses (Kustono et al., 2021). Big bath consists of exceptionally large negative discretionary accruals and may include restructuring of costs, asset impairments and litigation losses (Hope et al., 2018). According to Kjærland et al. (2021), this practice could occur if significant losses are unavoidable, so that firms report even worse earnings during the current period to enhance future earnings (Rusmin et al., 2013). This practice allows managers to clean up their accounts when operational performance is expected to be low (Saleh & Ahmed, 2005).

Another possible scenario is earnings management avoidance. In fact, given the harmful consequences of the pandemic on a firm's activities, earnings forecasts will decrease, and shareholders will expect low profits and dividends during the pandemic year. Therefore, there is little incentive to increase earnings. A case in point is when governments have proclaimed stimulus packages for distressed firms to alleviate the effect of the pandemic (Lassoued, 2022). These firms do not motivate themselves to increase their income in order to avoid political and regulatory scrutiny. Empirical evidence on earnings management during pandemic periods is very scarce and results are mixed. For example, Xiao and Xi (2021) investigated the relationship between the COVID-19 outbreak and Chinese-listed firms' earnings management practices. They found that Chinese firms, in the most severely affected regions, managed earnings through accruals than through real activity. Similarly, Aljawaheri et al. (2021) examined the impact of the COVID-19 lockdown on earnings manipulation in a sample of 87 firms listed on the Iraq Stock Exchange for the period from 2018 to 2020. The results indicate that companies exercise earnings manipulation to maintain earnings over a time series. Xiao and Xi (2021) conducted a study on Chinese companies, arguing that companies in the most affected areas implement more accruals-based earnings manipulation but significantly reduce the use of REM during the pandemic, resulting in better financial reporting quality. There is a previous literature, essentially on the 2007 financial crisis, according to which crises could lead to higher or lower earnings manipulation because of a higher risk and uncertainty that often result in higher information asymmetry. This is the same during COVID-19 (Hsu & Liao, 2022). In fact, the higher the information asymmetry, the more likely firms are boosted to manipulate their earnings to influence their stakeholders (e.g., investors) and to alleviate the negative effect of the pandemic (Ming Chia et al., 2007; Persakis & Iatridis, 2015). In this situation, it will be observed more earnings management activities during the pandemic. However, firms could also be more stimulated to reduce the magnitude of earnings management during COVID-19 in order to reduce information asymmetry and increase investors' trust (Arthur et al., 2015). Earnings manipulation may be constrained by the increased scrutiny of auditors and regulators (Cimini, 2015; Filip & Raffournier, 2014), hence resulting in better financial reporting during the COVID-19 pandemic. Consequently, the following hypotheses are developed:

H1a: The magnitude of earnings manipulation increased during COVID-19.

H1b: The magnitude of earnings manipulation decreased during COVID-19.

2.2. Corporate governance during crises

The second step of this paper investigates the mitigating effect of corporate governance on earnings manipulation during the pandemic. Few

scholars analysed the relationship between corporate governance and COVID-19 through stock market data. According to Ding et al. (2021), board size and board independence do not mitigate stock returns during the pandemic. Hsu and Liao (2022) show that corporate governance mitigates the negative effect of COVID-19 on stock price volatility, but do not improve its return. This paper wants to bridge the research gap found by Koutoupis et al. (2021), according to which there is a lack of evidence from accounting data on the relationship between corporate governance and COVID-19. As mentioned in the introduction, this paper takes into account board size, board diversity, board independence and CEO duality. Following the agency theory, a larger and more independent board with no CEO dual role ensures better monitoring, to reduce information asymmetry and earnings manipulation (Alves, 2014; Lu & Boateng, 2018). On the other hand, according to the stewardship theory, CEO duality may be useful for prompt planning implementation (Elsayed, 2007) and this, in turn, may improve firm performance by reducing 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 a lower level of earnings management during the pandemic when the advising from the board is much needed. Directors' independence is really important in a crisis period. Their expertise and experience make the decision-making process more efficient. Yeh et al. (2011) found that G7 countries' financial institutions with a higher number of independent board managers performed better during the 2007 financial crisis because their presence in risk and audit committees reduced excessive risk-taking behaviours. Arora (2018) argues that financially linked independent directors are able to provide valuable information, advice and key resources that are crucial for reemergence from bankruptcy. Studies also highlighted that firms that went bankrupt had fewer independent boards (Daily & Dalton, 1994). Dowell et al. (2011) argue that the greater the proportion of board independence, the lower will be the possibility of bankruptcy. However, van Essen et al. (2015) document no significant influence of independent directors on the performance of 26 European countries during the global financial crisis. CEO duality represents the situation in which the CEO is also the board chair. The chairman of the board must oversee and is responsible for the CEO's decisions and his/her hiring, firing and compensation. Therefore, if the two roles belong to the same person, he/she is more powerful, paving the way for potential opportunistic behaviours. Some scholars investigated the role of CEO duality during crises. Grove et al. (2011) find a negative relationship between CEO duality and performance in pre-crisis, and this association is insignificant during the crisis. This negative association derives from the risky strategies of the CEO, which resulted in poor financial performance. Daily and Dalton (1994) investigate the probability of bankruptcy of firms, finding that this is higher in CEO duality cases rather than in those where the CEO is not the board chairman. However, van Essen et al. (2015) argue that CEO duality can raise performance during crises because dual roles allow to raise a unified voice and avoid ambiguity regarding who is in charge. Dowell et al. (2011) also supported this view by arguing that CEO duality can benefit firms by their greater speed of decision-making, which is favourable during crises. However, their empirical results provide partial support for their view that CEOs' power could increase survival. Other studies focus on the linkage between CEO's certain features and performance during crises in the financial sector. In particular, Ho et al. (2016) document that banks led by overconfident CEOs experienced a greater decline in operating performance, a significant drop in stock prices, increased loan defaults, and a higher propensity of CEO turnover during the Russian and global financial crisis. Fahlenbrach and Stulz (2011) find that the alignment of bank CEOs' interests with those of shareholders led to worse performances during the financial crises since bank CEOs did not reduce their shareholdings, which led to extreme wealth losses. Board diversity has been recognized by the literature as a double-edged sword (Milliken & Martins, 1996) since it has both positive and negative effects on board outcomes. However, previous research underlined its relevance during crises. Rost and Osterloh (2010) find that banks with heterogeneous top management teams (TMTs) can reduce the adverse shock of financial distress because management diversity represents a diverse group of stakeholders. DesJardine et al. (2019) emphasize how an organization system should be oriented to mechanisms such as employee diversity, broad stakeholder engagement, and involvement of customers and indigenous groups outside and inside the board of directors. In this way, the company will receive diverse points of view to solve complex strategic problems and increase the TMT's capability to generate complex strategies necessary to cope with an uncertain environment (Carpenter, 2002; Ferrier, 2001; Hambrick et al., 1996). However, Hambrick et al. (1996) highlighted that a heterogeneous TMT has a slower reaction to complex environments with respect to a homogeneous TMT, since a diverse board has different views and a lot of time is required to conciliate different conflicting opinions in order to find the best strategy to implement. Consequently, the following hypothesis is developed:

H2: The magnitude of earnings manipulation is moderated by corporate governance during COVID-19.

3. DATA AND METHODOLOGY

3.1. Sample selection

The original sample consists of 600 companies from 17 European countries, all of them listed on the STOXX Europe 600 stock market index during the period 2018–2021. Therefore, there have been two pre-pandemic years (i.e., 2018 and 2019) and two pandemic years (i.e., 2020 and 2021). As previously mentioned, this is the most representative index for the European stock market and all its components comply with regulations on sustainable finance and financial reporting introduced in the last few years. In addition, this sample represents 90% of the free float market capitalization of the European stock market. To perform the analysis, data have been collected from Thomson Reuters, a database containing company non-financial and financial information. The Thomson Reuters database has built and validated corporate governance variables at the company level in Europe, with information taken from annual

reports, corporate social responsibility (CSR) reports, stock exchange filings and company websites. From the initial sample of 600 firms, 141 financial firms (banks, insurance, investment funds, etc.) have been excluded since they significantly differ with respect to: asset structure and financial leverage (Fama & French, 1992); accounting standards and practice (Frias-Aceituno et al., 2013); and stronger sector-specific disclosure and corporate governance regulation and supervision (Barth et al., 2004). After excluding all firms with missing values, it has arrived at a final sample of 406 firms, hence a balanced panel data of 1624 firm-year observations.

3.2. Earnings management proxies

There have been used both accounting-based, through discretionary accruals (AEM), and real-based (REM) proxies for earnings management as dependent variables. Following previous literature, two different regressions for the two types of earnings management, AEM and REM, have been run (Kim et al., 2012).

3.2.1. Accrual earnings management proxy

Drawing on Beck (2018), Cohen et al. (2019), Cohen and Malkogianni (2021) and Ferreira et al. (2013, 2020), this paper calculates AEM through the modified Jones' model (Dechow et al., 1995), since the classic Jones' (1991) model implicitly assumes that revenues are non-discretionary, which could lead to biased estimates of discretionary accruals when earnings are, in fact, managed through revenues. First, total accruals ($TACC_{i,t}$) of firm *i* at time *t* are defined:

$$TACC_{i,t} = NE_{i,t} - CFO_{i,t} \quad (1)$$

where, $NE_{i,t}$ and $CFO_{i,t}$ are the net earnings and operating cash flows of firm *i* at year *t*, respectively.

Following Dechow et al. (1995), discretionary and non-discretionary accruals are separated into two steps. Firstly, the coefficients α_1, α_2 and α_3 are estimated through the following equation.

$$\frac{TACC_{i,t}}{TA_{i,t-1}} = \alpha_0 + \alpha_1\left(\frac{1}{TA_{i,t-1}}\right) + \alpha_2\left(\frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{TA_{i,t-1}}\right) + \alpha_3\left(\frac{PPE_{i,t}}{TA_{i,t-1}}\right) + \varepsilon_{i,t} \quad (2)$$

where,

- $TA_{i,t-1}$ — total assets of observation *i* at year *t* – 1;
- $\Delta REV_{i,t}$ — revenues at year *t* minus revenues at year *t* – 1 for observation *i*;
- $PPE_{i,t}$ — gross property, plant and equipment in year *t* for observation *i*;
- $\Delta REC_{i,t}$ — receivables at year *t* minus receivables at year *t* – 1 for observation *i*;
- $\varepsilon_{i,t}$ — error term.

Equation (2) is estimated every year from 2018 to 2021 and by the two-digit Standard Industrial Classification (SIC) (DeFond & Jiambalvo, 1994; Peasnell et al., 2000) through ordinary least squares (OLS) regression. Secondly, non-discretionary accruals (*NDA*) are estimated as follows.

$$NDA_{i,t} = \alpha_1\left(\frac{1}{TA_{i,t-1}}\right) + \alpha_2\left(\frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{TA_{i,t-1}}\right) + \alpha_3\left(\frac{PPE_{i,t}}{TA_{i,t-1}}\right) \quad (3)$$

where, all the variables on the right side of the equation are defined as above and α_1, α_2 and α_3 are the industry and year-specific parameters obtained through the OLS estimator of α_1, α_2 and α_3 in Eq. (2). The discretionary accruals are then obtained by subtracting Eq. (3) from Eq. (2), that is the difference between total accruals and *NDA*.

$$DA_{i,t} = \hat{\varepsilon}_{i,t} = \left(\frac{TACC_{i,t}}{TA_{i,t-1}}\right) - NDA_{i,t} \quad (4)$$

In other words, *DA* represents the residual of Dechow et al.'s (1995) model and is the proxy of AEM that is going to be used as the dependent variable in the final regression model.

3.2.2. Real earnings management proxy

Real earnings management is measured following Cohen et al. (2008) and Roychowdhury (2006) through the computation of: abnormal levels of operating cash flows (*AB_CFO*); abnormal production costs (*AB_PROD*); abnormal discretionary expenses (*AB_EXP*). Like AEM, the abnormal levels of the three REM measures are the residuals of the relevant models estimated every year (from 2018 to 2021) and by the two-digit SIC. As a result, a combined measure of these three variables is computed.

Abnormal operating cash flows

Using Roychowdhury's (2006) model, it is firstly computed the actual level of operating cash flows.

$$\left(\frac{CFO_{i,t}}{TA_{i,t-1}}\right) = \alpha_0 + \alpha_1\left(\frac{1}{TA_{i,t-1}}\right) + \alpha_2\left(\frac{S_{i,t}}{TA_{i,t-1}}\right) + \alpha_3\left(\frac{\Delta S_{i,t}}{TA_{i,t-1}}\right) + \varepsilon_{i,t} \quad (5)$$

where,

- $CFO_{i,t}$ — operating cash flows of firm *i* at year *t*;
- $TA_{i,t-1}$ — total assets of firm *i* at year *t* – 1;
- $S_{i,t}$ — sales of firm *i* at year *t*;
- $\Delta S_{i,t}$ — sales at year *t* minus sales at year *t* – 1 of firm *i*;
- $\varepsilon_{i,t}$ — error term.

Using the estimated coefficients α_1, α_2 and α_3 from Eq. (5), the normal level of operating cash flows $NCFO_{i,t}$ is computed below.

Abnormal operating cash flows (*ABN_CFO*) are computed by subtracting Eq. (6) from Eq. (5).

$$\left(\frac{NCFO_{i,t}}{TA_{i,t-1}}\right) = \alpha_1\left(\frac{1}{TA_{i,t-1}}\right) + \alpha_2\left(\frac{S_{i,t}}{TA_{i,t-1}}\right) + \alpha_3\left(\frac{\Delta S_{i,t}}{TA_{i,t-1}}\right) \quad (6)$$

$$ABN\_CFO_{i,t} = \hat{\varepsilon}_{i,t} = \frac{CFO_{i,t}}{TA_{i,t-1}} - \frac{NCFO_{i,t}}{TA_{i,t-1}} \quad (7)$$

Abnormal production cost

Roychowdhury (2006) defines production cost as the sum of the cost of goods sold and the change in inventory ($PROD_{i,t} = COGS_{i,t} + \Delta INV_{i,t}$). Therefore, it is firstly computed the actual level of $COGS_{i,t}$ and $\Delta INV_{i,t}$ as follows.

$$\left(\frac{COGS_{i,t}}{TA_{i,t-1}}\right) = \alpha_0 + \alpha_1\left(\frac{1}{TA_{i,t-1}}\right) + \alpha_2\left(\frac{S_{i,t}}{TA_{i,t-1}}\right) + \varepsilon_{i,t} \quad (8)$$

$$\left(\frac{\Delta INV_{i,t}}{TA_{i,t-1}}\right) = \alpha_0 + \alpha_1\left(\frac{1}{TA_{i,t-1}}\right) + \alpha_2\left(\frac{\Delta S_{i,t}}{TA_{i,t-1}}\right) + \alpha_3\left(\frac{\Delta S_{i,t-1}}{TA_{i,t-1}}\right) + \varepsilon_{i,t} \quad (9)$$

where, $COGS_{i,t}$ — the cost of goods sold by firm *i* at year *t*, $\Delta S_{i,t-1}$ — sales at year *t* – 1 minus sales at year *t* – 2 of firm *i*.

Using the estimated coefficients α_1, α_2 and α_3 from Eq. (8) and (9), the normal level of cost of goods sold ($NCOGS_{i,t}$), change in inventory ($\Delta NINV_{i,t}$) and actual production costs are estimated by summing Eq. (8) and (9) are computed below.

Using the estimated coefficients $\alpha_1, \alpha_2, \alpha_3$ and α_4 from Eq. (12), the normal level of production costs ($NPROD_{i,t}$) is also presented below.

$$\left(\frac{NCOGS_{i,t}}{TA_{i,t-1}}\right) = \alpha_1\left(\frac{1}{TA_{i,t-1}}\right) + \alpha_2\left(\frac{S_{i,t}}{TA_{i,t-1}}\right) \quad (10)$$

$$\left(\frac{\Delta NINV_{i,t}}{TA_{i,t-1}}\right) = \alpha_1\left(\frac{1}{TA_{i,t-1}}\right) + \alpha_2\left(\frac{\Delta S_{i,t}}{TA_{i,t-1}}\right) + \alpha_3\left(\frac{\Delta S_{i,t-1}}{TA_{i,t-1}}\right) \quad (11)$$

$$\left(\frac{PROD_{i,t}}{TA_{i,t-1}}\right) = \alpha_0 + \alpha_1\left(\frac{1}{TA_{i,t-1}}\right) + \alpha_2\left(\frac{S_{i,t}}{TA_{i,t-1}}\right) + \alpha_3\left(\frac{\Delta S_{i,t}}{TA_{i,t-1}}\right) + \alpha_4\left(\frac{\Delta S_{i,t-1}}{TA_{i,t-1}}\right) + \varepsilon_{i,t} \quad (12)$$

$$\left(\frac{NPROD_{i,t}}{TA_{i,t-1}}\right) = \alpha_1\left(\frac{1}{TA_{i,t-1}}\right) + \alpha_2\left(\frac{S_{i,t}}{TA_{i,t-1}}\right) + \alpha_3\left(\frac{\Delta S_{i,t}}{TA_{i,t-1}}\right) + \alpha_4\left(\frac{\Delta S_{i,t-1}}{TA_{i,t-1}}\right) \quad (13)$$

Abnormal production costs (*ABN_POD*) are computed by subtracting Eq. (13) from Eq. (12).

$$ABN\_PROD_{i,t} = \hat{\varepsilon}_{i,t} = \frac{PROD_{i,t}}{TA_{i,t-1}} - \frac{NPROD_{i,t}}{TA_{i,t-1}} \quad (14)$$

Abnormal discretionary expense

It is the sum of a firm's R&D expenses, advertising expenses, and selling, general, and administrative (SG&A) expenses. As with previous proxies, it is modelled as a linear function of sales. Therefore, it is firstly computed the actual level of discretionary expense (*DISEXP*) as follows.

$$\left(\frac{DISEXP_{i,t}}{TA_{i,t-1}}\right) = \alpha_0 + \alpha_1\left(\frac{1}{TA_{i,t-1}}\right) + \alpha_2\left(\frac{S_{i,t-1}}{TA_{i,t-1}}\right) + \varepsilon_{i,t} \quad (15)$$

where, $S_{i,t-1}$ — level of sales of firm *i* at year *t* – 1

Using the estimated coefficients α_1 and α_2 from Eq. (15), the normal level of discretionary expense ($NDISEXP_{i,t}$) is computed:

$$\left(\frac{NDISEXP_{i,t}}{TA_{i,t-1}}\right) = \alpha_1\left(\frac{1}{TA_{i,t-1}}\right) + \alpha_2\left(\frac{S_{i,t-1}}{TA_{i,t-1}}\right) \quad (16)$$

Abnormal discretionary expenses (*ABN_DISEXP*) are computed by subtracting Eq. (16) from Eq. (15).

$$ABN_{DISEXP\,i,t} = \hat{\varepsilon}_{i,t} = \frac{DISEXP_{i,t}}{TA_{i,t-1}} - \frac{NDISEXP_{i,t}}{TA_{i,t-1}} \quad (17)$$

Finally, it is estimated the combined measure of REM by aggregating the three individual proxies, *ABN_CFO, ABN_PROD* and *ABN_DISEXP*. To measure the direction of each REM variable, the combined measure (*REM*), is calculated as:

$$REM_{i,t} = ABN_{CFO\,i,t} - ABN_{PROD\,i,t} + ABN\_DISEXP_{i,t} \quad (18)$$

3.3. Factors affecting earnings management practices

Following the previous literature (Alhadab & Clacher, 2018; Cheng et al., 2016; Katmon & Al Farooque, 2017), panel data regression methods to assess the impact of COVID-19 on the magnitude of earnings manipulation and the mitigating effect of corporate governance during this pandemic are applied. Since there have been defined two proxies for earnings management, two models are implemented as follows.

$$AEM_{i,t} = \alpha_0 + \alpha_1 COV_{i,t} + \alpha_2 GOV_{i,t} + \alpha_3 COV_{i,t} GOV_{i,t} + \beta_k controls_{i,t} + \varepsilon_{i,t} \quad (19)$$

$$REM_{i,t} = \alpha_0 + \alpha_1 COV_{i,t} + \alpha_2 GOV_{i,t} + \alpha_3 COV_{i,t} GOV_{i,t} + \beta_k controls_{i,t} + \varepsilon_{i,t} \quad (20)$$

where,

• $AEM_{i,t}$ — proxy for accounting-based earnings management (that is discretionary accruals);

• $REM_{i,t}$ — proxy for real-based earnings management;

• $COV_{i,t}$ — dummy variable that equals 1 if the year is 2020 or 2021 (i.e., the pandemic period) and 0 otherwise;

• $GOV_{i,t}$ — governance variables.

The first explanatory variable of this study is COVID-19 ($COV_{i,t}$), the other explanatory variables are those of corporate governance ($GOV_{i,t}$), which are: $BSIZE_{i,t}$, that is the number of directors serving on the board; $BIND_{i,t}$, that is the percentage of independent board members on the board; $CEOD_{i,t}$, that is a dummy variable equal to 1 if the CEO is also the chairman of the board and 0 otherwise; $BDIV_{i,t}$, that is the percentage of board diversity in terms of gender and cultural background.

Drawing from previous literature (Alhadab & Clacher, 2018; Cheng et al., 2016; Katmon & Al Farooque, 2017; Vitolla et al., 2020), the following control variables have been chosen: $SIZE_{i,t}$, that is the natural logarithm of total assets; $MTB_{i,t}$, that is the market-to-book value of equity; $LEV_{i,t}$, that is the ratio between total liabilities and total assets; $ROA_{i,t}$, that is the ratio between the operating profit and the beginning total assets; $ROA_{i,t}$, that is a dummy variable equal to 1 if a firm reported a loss and 0 otherwise; $GROWTH_{i,t}$, that is the annual change in net sales; $BIG4_{i,t}$, that is a dummy variable equal to 1 if the firm's auditor is Deloitte, Ernst & Young, PricewaterhouseCoopers (PwC) or KPMG and 0 otherwise. There is no general agreement on how these variables affect companies' earnings management (Alhadab & Clacher, 2018; Cohen & Zarowin, 2010; Aljughaiman et al., 2023). Due to greater scrutiny from investors and regulators, firms which are larger and more leveraged should have better firm performance and more growth opportunities. On one hand, they are more likely to exhibit lower earnings manipulation (Anagnostopoulou & Tsekrekos, 2017). On the other hand, these firms also have greater incentives to manipulate earnings (Alhadab & Clacher, 2018). In addition, Big 4 auditors generally help to constrain earnings management (Cameran et al., 2014). Nonetheless, scrupulous scrutiny from Big 4 auditors may also lead to more REM manipulation (Cohen & Zarowin, 2010). Finally, previous literature generally agrees that firms reporting losses (*LOSS*) are more likely to engage in earnings management (Alhadab & Clacher, 2018).

4. EMPIRICAL FINDINGS

4.1. Descriptive statistics and correlation analysis

Table 1 presents the descriptive statistics of all variables. The mean board size is 11.291. CEO duality exists in 25.6% of the sample firms. The average percentages of independent board members, board diversity and presence of a risk management committee are 65.185, 33.884 and 56.3, respectively. In addition, the sample has a mean AEM value of 0.041 (median 0.043), hence indicating an income-increasing accrual policy. The mean of the REM measure is 0.015 (median 0.016), indicating that, on average, the firms in the sample conduct a small degree of REM.

Table A.1 (see Appendix A) presents the correlation matrix for the dependent, explanatory as well as control variables. Many coefficients are statistically significant, but the highest value is equal to 0.365 (the correlation between board independence and board diversity). Therefore, the fact that all the correlation coefficients are below ±0.8 or ±0.9 suggests that multicollinearity is not an issue when estimating Eq. (19) and (20), so the explanatory variables chosen for the analysis are likely to proxy for different underlying factors.

Table 1. Descriptive statistics

Variables	*N*	*Mean*	*Median*	*SD*	*Q1*	*Q3*	*Min*	*Max*
$AEM_{i,t}$	1624	0.041	0.043	0.368	-0.115	0.372	-0.195	1.235
$REM_{i,t}$	1624	0.015	0.016	0.310	-0.213	0.425	-0.336	1.012
$COV_{i,t}$	1624	0.5	0.5	0.502	0	1	0	1
$BSIZE_{i,t}$	1624	11.291	11,112	3.654	9	13.128	2	30
$BIND_{i,t}$	1624	65.185	66.671	24.394	50.146	84.625	0	100
$CEOD_{i,t}$	1624	0.256	0	0.437	0	1	0	1
$BDIV_{i,t}$	1624	33.884	33.331	18.422	20	46.151	5.472	93.452
$SIZE_{i,t}$	1624	17.145	17.043	1.695	15.315	17.738	8.253	21.462
$MTB_{i,t}$	1624	2.567	1.658	3.138	6.937	29.472	0.516	88.421
$LEV_{i,t}$	1624	0.532	0.583	0.223	0.164	1.562	0.030	1.976
$ROA_{i,t}$	1624	4.563	4.547	10.236	-4.634	10.562	-31.646	186.525
$LOSS_{i,t}$	1624	0.127	0.118	0.436	0	1	0	1
$GROWTH_{i,t}$	1624	0.456	0.408	2.112	-0.163	0.563	-0.357	0.973
$BIG4_{i,t}$	1624	0.814	1	0.268	1	1	0	1

4.2. Results, discussion and additional test

The results of the regression analysis are summarized in Table 2. The first model shows the results of accounting-based earnings management, while the second one reports those of real-based earnings management. However, it is necessary to discuss a few diagnostic tests implemented in both models separately. Firstly, we have determined whether fixed effects, random effects or pooled data specification has to be used to estimate the results. Table 2 shows that pooling the data is not suitable (p-value of the Lagrange multiplier test < 0.01) and that using fixed effects is preferred to REM (p-value of the Hausman test < 0.01) in both models. Furthermore, the Pesaran and the modified Wooldridge

tests are both significant at better than 0.01, indicating that cross-sectional dependence and heteroskedasticity are issues in the two models. The Lagrange multiplier test for serial correlation is not significant at 0.1, suggesting that there is no first-order correlation in both models. Given these results, AEM and REM are estimated using fixed effects, and the standard errors are corrected as per Driscoll and Kraay (1998).

To check for potential multicollinearity issues, the variance inflation factor (VIF) test has been conducted in both models; in both cases, its value is below 2, indicating that multicollinearity is not an issue in the analysis (Farrar & Glauber, 1967). The next part of this section discusses the results. The variable *COV* has a positive and statistically significant coefficient. Hence, the pandemic period is positively related to the magnitude of both accrual and REM. As a consequence, firms in the sample increased earnings manipulation practices during the pandemic period with respect to the pre-pandemic one. The first possible reason could be that firms manipulate earnings in order to avoid a further negative response from investors during the pandemic (Hsu & Yang, 2022; Persakis & Iatridis, 2015; Garfatta et al., 2023). Another possible explanation is that companies try to survive by pushing upward their sales through unusually low prices or through the cutting of their R&D or advertising expenses during the pandemic (Trombetta & Imperatore, 2014; Aljughaiman et al., 2023). Europe has been the hardest hit continent by COVID-19 from an economic point of view because of the strict lockdown measures adopted by almost all its countries. Therefore, this led to a significant increase in risk and uncertainty, both at macro level (financial markets) and at micro level (companies).

In line with Hsu and Liao (2022), the results suggest how higher information asymmetry and bad firm performance during COVID-19 led to a higher magnitude of earnings management by European firms. In addition, the interaction term *COV * BSIZE* (Panel A of Table 2) is negative and statistically significant, indicating how a larger board size could mitigate the positive relationship between COVID-19 and earnings manipulation. One possible reason is that a larger board assures better monitoring (Boone et al., 2007; Lu & Boateng, 2018; Hsu & Yang, 2022; Garfatta et al., 2023), which is essential to constrain firm's earnings management during the pandemic, consistently with the agency theory. Another possible explanation is that when the board is larger, there are more directors (Coles et al., 2008; Guest, 2009) who may propose new creative and effective strategies to help firms cope with the pandemic without sacrificing the long-term firm value through earnings manipulation.

For what matters control variables, in line with prior studies (Alhadab & Clacher, 2018; Cheng et al., 2016; Rahman et al., 2023), the results show that larger firms (*SIZE*) and those reporting losses (*LOSS*) are associated with a higher level of earnings management. Moreover, *MTB, LEV, ROA*, and *GROWTH* are negatively related to both measures of earnings management. Consistently with previous literature (Anagnostopoulou & Tsekrekos, 2017; Liu & Sun, 2022; Rahman et al., 2023), the results show that firms with better performance (*ROA*), more growth opportunities (*MTB* and *GROWTH*) and higher leverage (*LEV*) tend to have a lower degree of earnings manipulation because of the higher monitoring level from regulators and investors. Regarding the other three explanatory variables (board independence, CEO duality and board diversity), none of them is statistically significant (Panels B, C and D of Table 2), hence they may not mitigate the negative impact of COVID-19 on earnings management. One possible explanation can be related to the sample taken into account in this research. In particular, all European listed companies, even more so those belonging to the highest market capitalization class like the STOXX Europe 600 Index, follow the rules provided by the code of corporate governance. In other words, essentially all European listed companies have adopted the recommendations of ensuring no conflicts of interest in the board (board independence), both equal gender and different background and skills' representations (board diversity), along with the separation between CEO and chairman of the directors' board (CEO duality). Therefore, their adoption no longer represents innovative decisions undertaken by those firms listed in the capital markets, so these kinds of information/decisions are already absorbed or even taken for granted by the market, that is to say, the listed firms' decisions of splitting CEO and chairman of the board of directors among two different people, of increasing the board independence level and of fostering gender/skills' diversity are not per se sufficient conditions for dealing with a powerful exogenous shock like the pandemic. In fact, nowadays the markets take for granted the fact that listed companies have already adopted these decisions for the purpose of complying with the more stringent rules European institutions have imposed on corporate governance mechanisms.

Table 2. Regression results: The impact of COVID-19 on AEM and REM and the mitigating effect of corporate governance (Part 1)

Independent variable	*AEM*	*REM*
Panel A: The impact of COVID-19 on AEM and REM and the mitigating effect of board size		
COV	0.228*** (5.92)	0.196*** (5.07)
BSIZE	0.039** (2.01)	0.042* (1.88)
*COV * BSIZE*	-0.082** (-2.05)	-0.069** (-1.98)
SIZE	0.062*** (2.82)	0.035*** (2.46)
MTB	-0.083*** (2.98)	-0.054*** (2.59)
LEV	-0.538*** (-6.63)	-0.485*** (-6.08)
ROA	-2.357*** (-13.48)	-1.944** -(12.07)
LOSS	0.201*** (5.46)	0.125*** (4.57)
GROWTH	-1.452*** (-12.34)	-1.023*** (-11.07)
BIG4	-0.042 (-0.78)	-0.023 (-0.54)

Table 2. Regression results: The impact of COVID-19 on AEM and REM and the mitigating effect of corporate governance (Part 2)

Independent variable	*AEM*	*REM*
Constant	-0.812*** (-4.48)	-0.725* (-1.91)
Mean VIF	1.46	1.87
LM-poolability test	< 0.01	< 0.01
Hausman test	< 0.01	< 0.01
Pesaran cross-sectional dependence test	< 0.01	< 0.01
Modified Wooldridge test	< 0.01	< 0.01
Serial correlation test	0.26	0.38
F-test for overall significance	< 0.01	< 0.01
N	1624	1624
R^2	0.451	0.402
Panel B: The impact of COVID-19 on AEM and REM and the mitigating effect of board independence		
COV	0.244*** (5.23)	0.223*** (5.07)
BIND	0.003 (1.01)	0.001 (1.15)
*COV * BIND*	0.000 (0.58)	0.001 (0.97)
SIZE	0.015 (0.90)	0.003 (0.76)
MTB	-0.091*** (2.71)	-0.075*** (2.65)
LEV	-0.394*** (-3.86)	-0.256*** (-3.54)
ROA	-1.952*** (-10.16)	-1.634*** (-9.54)
LOSS	0.187*** (3.27)	0.125*** (3.08)
GROWTH	-1.215*** (-10.02)	-0.982*** (-9.23)
BIG4	0.007 (0.14)	0.003 (0.29)
Constant	-0.175 (-0.75)	-0.104* (-1.94)
Mean VIF	1.25	1.38
LM-poolability test	< 0.01	< 0.01
Hausman test	< 0.01	< 0.01
Pesaran cross-sectional dependence test	< 0.01	< 0.01
Modified Wooldridge test	< 0.01	< 0.01
Serial correlation test	0.23	0.32
F-test for overall significance	< 0.01	< 0.01
N	1624	1624
R^2	0.478	0.466
Panel C: The impact of COVID-19 on AEM and REM and the mitigating effect of CEO duality		
COV	0.233*** (5.12)	0.216*** (4.97)
CEOD	0.055 (0.25)	0.016 (0.34)
*COV * CEOD*	0.136 (0.46)	0.102 (0.52)
SIZE	0.027* (1.94)	0.016 (0.35)
MTB	-0.104*** (2.93)	-0.099*** (3.12)
LEV	-0.457*** (-4.07)	-0.325* (-3.92)
ROA	-1.932*** (-10.54)	-1.454*** (-9.87)
LOSS	0.179*** (3.38)	0.144*** (3.16)
GROWTH	-1.156*** (-9.97)	-0.974* (-8.25)
BIG4	0.026 (0.27)	0.015 (0.32)
Constant	-0.392* (-1.89)	-0.243* (-1.83)
Mean VIF	1.29	1.32
LM-poolability test	< 0.01	< 0.01
Hausman test	< 0.01	< 0.01
Pesaran cross-sectional dependence test	< 0.01	< 0.01
Modified Wooldridge test	< 0.01	< 0.01
Serial correlation test	0.20	0.31
F-test for overall significance	< 0.01	< 0.01
N	1624	1624
R^2	0.423	0.442
Panel D: The impact of COVID-19 on AEM and REM and the mitigating effect of board diversity		
COV	0.205*** (5.02)	0.191*** (4.98)
BDIV	0.067 (0.59)	0.033 (0.82)
*COV * BDIV*	0.004 (0.16)	0.001 (0.34)
SIZE	0.028* (1.98)	0.011* (1.94)
MTB	-0.091*** (-3.78)	-0.075*** (-3.95)
LEV	0.327*** (3.57)	0.293*** (3.26)
ROA	-1.896*** (-10.21)	-1.325*** (-9.68)
LOSS	0.204*** (5.09)	0.183*** (4.98)
GROWTH	-1.192** (-10.03)	-0.967* (-9.74)
BIG4	0.031 (0.39)	0.017 0.57
Constant	-0.103 (-0.65)	-0.146* (-2.03)
Mean VIF	1.12	1.31
LM-poolability test	< 0.01	< 0.01
Hausman test	< 0.01	< 0.01
Pesaran cross-sectional dependence test	< 0.01	< 0.01
Modified Wooldridge test	< 0.01	< 0.01
Serial correlation test	0.25	0.37
F-test for overall significance	< 0.01	< 0.01
N	1624	1624
R^2	0.412	0.429

*Note: *, **, *** Significantly different from zero at the 0.10, 0.05, and 0.01 levels, respectively. t-statistics are presented in parentheses. LM-poolability is the Breusch-Pagan Lagrange multiplier test's p-value. Hausman is the Hausman test's p-value. Pesaran is the Pesaran cross-sectional dependence test's p-value. Modified Wooldridge is the modified Wald test's p-value. Serial correlation is the Lagrange multiplier test's p-value. The F-test is the p-value for a test of overall significance. R^2 is the regression's coefficient of determination. N is the number of observations used to estimate the model, using fixed effects.*

Furthermore, in order to test the sensitivity of the regressions, it has been conducted an industry analysis by splitting the sample into two subsamples: "the most affected industries", where the negative impact of the pandemic is clear; the "least affected industries", where the positive impact of the pandemic is clear (Anayi et al., 2020). All the firms where the COVID-19 impact is not clear have been excluded. As shown in Table 3, companies belonging to the category of most affected industries (construction and manufacturing) show a higher magnitude of both accounting and REM, for instance through operating cash flows and discretionary expenses manipulation, along with a significant mitigating effect of board size. However, those belonging to the category of least affected industries (healthcare, retail and telecommunications) report a lower level of AEM and REM during the pandemic and a non-significant mitigating effect of board size. Among the possible explanations, are: the necessity of finding a vaccine and/or cure to recover from COVID-19 by healthcare companies as fast as possible; the fact that retail is one of the few markets that continued to fully operate in European countries during COVID-19; the demand increase for telephone communication services due to social distance and lockdown measures. Therefore, these three sectors have found new growth opportunities, to have less pressure to manipulate their earnings. In addition, the "most affected industries" were fostered to a higher earnings manipulation because of the financial constraints they had to deal with. In other words, they have been forced to increase their leverage since the most important thing for them was to survive and earnings manipulation strategies, such as adjusting cash flows from operations, discretionary expenses or accruals, have been implemented in order to hide as much as possible this choice.

Table 3. Additional regression: industry analysis

Independent variable	*Most affected*		*Least affected*	
	AEM	*REM*	*AEM*	*REM*
COV	0.266*** (2.18)	0.187*** (2.07)	0.210 (0.99)	0.124 (0.87)
BSIZE	0.089** (2.02)	0.056* (1.98)	0.039 (0.15)	0.015 (0.33)
*COV * BSIZE*	-0.126** (-2.87)	-0.104** (-2.58)	-0.076 (-0.67)	-0.054 (-0.55)
SIZE	0.068** (3.16)	0.044*** (3.07)	0.029 (0.82)	0.026 (0.88)
MTB	-0.105*** (2.58)	-0.086** (2.39)	-0.064 (0.88)	-0.048 (0.77)
LEV	-0.447*** (-3.81)	-0.425** (-3.25)	-0.428* (-1.85)	-0.411* (-1.82)
ROA	-2.614*** (-5.87)	-2.125*** (-5.56)	-2.426*** (-5.73)	-1.987*** (-4.91)
LOSS	0.151** (2.88)	0.112*** (2.54)	0.085 (0.96)	0.042 (0.73)
GROWTH	-2.593*** (-5.78)	-2.037*** (-5.06)	-2.368*** (-6.54)	-1.983** (-5.87)
BIG4	-0.018 (-0.75)	-0.011 (-0.82)	-0.007 (-0.43)	-0.004 (-0.26)
Constant	-0.683*** (-4.76)	-0.592* (-3.88)	-0.625 (-0.77)	-0.572 (-0.64)
Mean VIF	1.20	1.48	1.73	1.78
LM-poolability test	< 0.01	< 0.01	< 0.01	< 0.01
Hausman test	< 0.01	< 0.01	< 0.01	< 0.01
Pesaran cross-sectional dependence test	< 0.01	< 0.01	< 0.01	< 0.01
Modified Wooldridge test	< 0.01	< 0.01	< 0.01	< 0.01
Serial correlation test	0.19	0.23	0.15	0.20
F-test for overall significance	< 0.01	< 0.01	< 0.01	< 0.01
N	408	408	620	620
R^2	0.502	0.486	0.516	0.504

*Note: *, **, *** Significantly different from zero at the 0.10, 0.05, and 0.01 levels, respectively. Most affected industries: construction and manufacturing. Least affected industries: healthcare, retail and telecommunication. t-statistics are presented in parentheses. LM-Poolability is the Breusch–Pagan Lagrange multiplier test's p-value. Hausman is the Hausman test's p-value. Pesaran is the Pesaran cross-sectional dependence test's p-value. Modified Wooldridge is the modified Wald test's p-value. Serial correlation is the Lagrange multiplier test's p-value. The F-test is the p-value for a test of overall significance. R2 is the regression's coefficient of determination. N is the number of observations used to estimate the model, using fixed effects.*

5. CONCLUSION

This is the first study that investigates the moderating role of corporate governance mechanisms on earnings management during COVID-19 in the European capital market. Through the analysis of how firms deal with both accounting-based and real-based earnings manipulation, it has been shown that the degree of earnings management practices increased during the pandemic. Among the possible reasons, there is, on one hand, the will to avoid further negative reactions from investors (Persakis & Iatridis, 2015; Rahman et al., 2023; Liu & Sun, 2022) and, on the other, the need to survive during the crisis (Trombetta & Imperatore, 2014). Moreover, the models show how a larger board helps to mitigate the positive relationship between COVID-19 and earnings manipulation. In fact, if the board is larger, it is likely to have a better monitoring and advising process (Boone et al., 2007; Coles et al., 2008; Guest, 2009; Lu & Boateng, 2018; Hsu & Yang, 2022; Garfatta et al., 2023). However, it is not found any significant evidence on the mitigating effect of board independence, CEO duality and board diversity. This paper contributes to the ongoing discussion of COVID-19's effects on the economy by providing important evidence that a larger board can help alleviate the positive association between COVID-19 and earnings management. In particular, it is one of the few papers that addresses the relationship between earnings management and corporate governance at the European multi-country level. Moreover, this paper is one of the few that fills the research gap in investigating the mitigating effect of corporate governance on earnings manipulation during the pandemic (Koutoupis et al., 2021; Hsu & Yang, 2022). These results give useful insights to regulators, policymakers and investors, since a lower degree of earnings management helps stakeholders make proper decisions, as well as improve the efficiency of financial markets. In particular, due to more accounting and REM activities during the pandemic, investors and lenders should pay more attention to the interpretation of financial

reporting results. Companies can also improve their corporate governance (in particular the board size) to ensure high-quality financial reporting during COVID-19. In addition, one of the key responsibilities of policymakers is to improve governance mechanisms that are really crucial during uncertain situations like this pandemic. In fact, countries with poor corporate governance suffer more from crises than those with more developed ones (Johnson et al., 2000). In this sense, the results encourage regulators to take into account the direct responsibility of directors on the board both in their monitoring and advising roles, which are essential during a crisis like this, so that they can gauge whether current regulations regarding board structure (e.g., board independence and CEO duality) are effective in ensuring lower or no earnings management practices. Moreover, since information asymmetry is one of the reasons that lead to a higher level of earnings manipulation, regulators and firms should increase information dissemination in order to significantly curb information transparency and increase governance mechanisms' efficiency. This paper is not without limitations. First, it has been considered a developed context, the European market, leaving out emerging economies that are characterized by different institutional settings. Since the effect of COVID-19 is different within developed and emerging economies, it is difficult to define the most appropriate governance mechanisms in each context. Future research may address this issue by comparing samples of both developed and emerging markets, which may provide useful results. Second, there are many external factors, other than corporate governance mechanisms, which can affect firms' decisions during the pandemic such as government policies. Finally, there have been used two of the most well-established models as proxies for discretionary accruals. However, their validity is criticized because of the variables' complexity used in prior research (Dechow et al., 2010). Since the literature proposes alternative earnings quality measures, such as earnings smoothing, conservatism and loss avoidance (Onesti & Romano, 2012; Cheng & Kung, 2016), future works can ascertain if the main results of this paper remain unchanged if one used them or not for detecting earnings management practices.

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APPENDIX A

Table A.1. Correlation matrix

Variables	$AEM_{i,t}$	$REM_{i,t}$	$COV_{i,t}$	$BSIZE_{i,t}$	$BIND_{i,t}$	$CEOD_{i,t}$	$BDIV_{i,t}$	$SIZE_{i,t}$	$MTB_{i,t}$	$LEV_{i,t}$	$ROA_{i,t}$	$LOSS_{i,t}$	$GROWTH_{i,t}$	$BIG4_{i,t}$
$AEM_{i,t}$	1													
$REM_{i,t}$	0.196	1												
$COV_{i,t}$	0.221*	0.216*	1											
$BSIZE_{i,t}$	0.231*	0.205*	0.014*	1										
$BIND_{i,t}$	-0.263**	-0.245**	-0.016*	0.186**	1									
$CEOD_{i,t}$	0.113**	0.106**	-0.011*	-0.141**	0.102**	1								
$BDIV_{i,t}$	-0.034**	-0.025**	0.128**	0.234***	0.365***	0.121*	1							
$SIZE_{i,t}$	0.240	0.233	0.049	0.215	-0.139*	0.007	-0.023**	1						
$MTB_{i,t}$	0.321	-0.121*	0.016	-0.183*	0.112**	0.074**	0.045	-0.211**	1					
$LEV_{i,t}$	0.113**	0.121**	0.208**	0.013	-0.087*	0.102*	-0.034**	0.283*	0.302**	1				
$ROA_{i,t}$	0.241**	0.252**	0.156*	0.232***	0.188***	0.116**	0.156***	0.102*	0.231**	0.297**	1			
$LOSS_{i,t}$	0.034**	0.029**	0.097*	-0.054*	-0.103*	0.043	-0.091*	0.156**	0.179*	0.203**	-0.283**	1		
$GROWTH_{i,t}$	-0.112	-0.135	0.086*	0.013	0.045	0.023	0.082*	0.154**	0.196**	0.142*	0.231***	0.245**	1	
$BIG4_{i,t}$	-0.231**	-0.243**	0.138*	0.045	0.023	0.065	0.102	0.153	0.113	0.098	0.104	0.059	0.034	1

*Note: *, **, *** Significantly different from zero at the 0.10, 0.05, and 0.01 levels, respectively.*