The Covid-19 Outbreak, Corporate Financial Distress and Earnings Management

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Abstract

This study explores the association between the Covid-19 outbreak, corporate financial distress and earnings management practices in China. We investigate whether firms took advantage of the downturn in economic conditions during the pandemic to adjust their earnings using different earnings management techniques. Utilising a sample of 1,832 listed firms and underlying theoretical frameworks (i.e., positive accounting and signalling theory), we find that firms were more inclined to manage earnings during the pandemic period. They favoured using the *accrual-based* rather than the *real activity-based* earnings management technique. We also find that firms engaged more in income-increasing practices in the shadow of the outbreak. In addition, our results further demonstrate that financially distressed firms were involved in earnings management, particularly *accrual-based* earnings management. However, compared to privately owned firms, state-owned enterprises seem to be involved less in earnings management during the Covid-19 pandemic. Findings from this study raise some concerns for policymakers about the credibility of financial reporting information during Covid-19.

Keywords: Earnings management, Covid-19 pandemic, financial distress, China
JEL classification: G01; G30; H12; M41

1. Introduction

The global coronavirus (i.e., Covid-19) pandemic and the associated economic recession brought many severe challenges to companies around the world, posing a profound threat to the viability of many businesses (Barai and Dhar, 2021). The crisis is regarded as the century's largest health, economic and social crisis so far (The New Yorker, 2020). In addition to the human losses and the disease itself, Covid-19 slowed down global economic activities due to its extensive impacts and the different measures implemented by countries to control the disease's spread. It caused a significant negative impact on employment (high unemployment rate), reduced economic activity and created uncertainties in many financial markets (Zhang et al., 2020). Consequently, many firms faced financial distress and bankruptcy due to operational disruption (Lassoued and Khanchel, 2021).

The Covid-19 lockdowns had a profound effect on financial markets and corporate financial performance (Ruiz et al., 2020; Zhang et al., 2020). Managerial behaviours were inevitably affected by the pandemic. In response to the poor market environment during the pandemic, many managers were under high pressure; hence, they may have manipulated earnings or polished their financial statements by using accounting discretion to achieve their targets (Ali et al., 2022; Liu and Sun, 2022; Choi et al., 2011). Their firms may make use of accounting techniques to improve their deteriorating income statements and balance sheets during a crisis (Arnold, 2009; Laux and Leuz, 2010) or possibly during a pandemic (Ali et al., 2022; Chen et al., 2022; Liu and Sun, 2022; Rahman et al., 2022; He and Jianqun, 2021; Ozili, 2020;). Earnings management can be done through *accrual-based* earnings management (hereafter, AEM), and *real activity-based* earnings management (hereafter, REM) (Graham et al., 2005; Kim et al., 2018). AEM occurs when executives manage the accrual component of earnings, while REM can be conducted by changing business operational activities, which has a direct influence on a company's cash flow (Cimini, 2015). The financial report is an important basis for investors, analysts and stakeholders to make decisions, so it should be able to reflect the actual situation of firms. Arguably, there are numerous gaps in financial reporting that can provide space for executives to take part in earnings management (Azizah, 2021), especially because of the impact of Covid-19 social distancing on audit quality (Albitar et al., 2020). This leads to a lack of authenticity of accounting information and a lack of stability of enterprise development (Chen et al., 2022).

Theoretically, accrual accounting principles create flexibility for businesses to justify their accounting policy choices, thus generating opportunities for accountants and businesses to be involved in earnings management during uncertain times (Chen et al., 2022; He and

Jianqun, 2021). Substantial empirical studies have argued that businesses manage earnings through manipulating various investment, operational and financial activities (Xu et al., 2007) as well as discretionary expenditures (Roychowdhury, 2006). However, the purpose behind this behaviour appears to be controversial. Some studies believe that corporations have more incentives to manipulate earnings upward or to inflate earnings (Healy and Wahlen, 1999). Specifically, managers may be motivated to disclose financial reports with optimistic content to mitigate the effect of the crisis to maintain relationships with stakeholders during turbulent times (Lisboa and Kacharava, 2018). In terms of reassuring investors, managers can also smooth earnings to lower cost volatility from one period to another and show more stable earnings (Lisboa and Kacharava, 2018; Khanchel, 2011). On the contrary, managers manage earnings downward during a crisis to justify the losses caused by their previous poor management behaviour, thereby covering up the negative performance that may result in the dismissal of the manager (Liu and Sun, 2022); or to avoid any political sanctions such as higher taxes and stricter regulations, as well as supervision (Hamza and Zaatir, 2021); or even to accept a stimulus package or bailout funds (Lassoued, 2021; Ozili and Arun, 2020).

While many studies have surveyed earnings management practice during global financial crisis (Cimini, 2015; Filip and Raffournier, 2014; Kousenidis et al., 2013) and oil crises (Kjærlanda et al., 2021; Bugshan et al., 2020), there is a very limited number of studies on earnings management behaviour during the pandemic. Interestingly, more recent studies have started exploring the impact of Covid-19 on earnings management practices. For example, Abdul et al. (2021) examined the potential influence of the Covid-19 lockdowns on earnings management in the context of Iraq. Lassoued and Khanchel (2021) explored the relationship between the coronavirus outbreak and earnings management practices of European companies, while He and Jianqun (2021) examined the relationship between the Covid-19 outbreak and Chinese listed firms' earnings management practices, focusing on the moderating effect of corporate social responsibility. Also, Liu and Sun (2022) examined an impact of Covid-19 pandemic on earnings management in the USA. However, existing studies provide inconclusive and contradictory findings on the relationship between the crisis and earnings management, and none of them provide details on the differential effects on earnings management techniques and the moderating role of financial constraints, especially in China, where businesses have been significantly impacted by a large scale of lockdown imposed by the Chinese government. To fill this gap, this study examines the impact of the Covid-19 pandemic, with consideration given to corporate financial distress, and compares the effects on the *accrual-based* and *real activity-based* earnings management techniques in an emerging

market. The decision to explore the context of China stems from the devastating impact of the Covid-19 pandemic in this region. Also, China was among the first countries to be hit by the Covid-19 outbreak. Azizah (2021) mentioned that the 2019 coronavirus disease was first detected in Wuhan city, China, around late December 2019. It led to a downturn in the economy of China, which was depressed by around 7% (Song at al., 2021).

This study uses a large sample of 1,832 listed companies in China for the period from 2015 to 2021. To capture earnings management, we use different methods to measure AEM (i.e., the Modified Jones model by Dechow et al., 1995 and the cross-sectional model of Kothari et al., 2005), and REM is measured by the sum of the absolute values of the abnormal production costs, the abnormal cash flow from operations and the abnormal discretionary expenditures (Cohen et al., 2008; Roychowdhury, 2006). The results show that businesses were more inclined to get involved in earnings management during the pandemic than in the prior period. This finding could indicate that financial reporting information seems to have been less reliable during the Covid-19 pandemic. Further investigation suggests that companies were more in favour of income-increasing practices during the pandemic period. In addition, this study also finds that companies in a situation of financial distress tended to adopt more accrual-based earnings management. However, this behavior and practice was different in the case of state-owned enterprises compared to privately owned firms during the Covid-19 pandemic. These findings are robust to a series of robustness tests that consider different measures of earnings management and the impact of endogeneity issues.

The results of the study contribute to the existing literature and practice in the following aspects. First, despite the increasing research on the corporate response to the Covid-19 pandemic (Chen at al., 2022; Rahman et al., 2022; He and Jianqun, 2021; Lassoued and Khanchel, 2021; Ding et al., 2020; Ruiz et al., 2020), our study contributes to earnings management literature by providing evidence that if a business was involved in earnings management during the outbreak, this was done through an *accrual-based* earnings management method or a *real activity-based* earnings management approach. In addition, we consider a new channel in our examination: whether firms would practise earnings management more under financial distress conditions compared to others. Second, prior studies suggest inconsistent findings regarding the impact of the pandemic on earnings management. For example, based on evidence from Indonesia, Azizah (2021) concluded that the extent of earnings management during the coronavirus pandemic was lower than that before the pandemic. However, Lassoued and Khanchel (2021) surveyed 2,031 listed companies from 15 European countries and found that the sample enterprises were more likely to manage earnings

during the pandemic than during the preceding period. Therefore, our study attempts to find a more definitive answer to the relationship between earnings management practice and the pandemic in an enormous emerging economy (i.e., China). Third, the study makes a significant contribution to practice, as findings from this study can inform practitioners, such as external auditors, investors and other stakeholders, to take extra care when using financial information from the period of the pandemic. Finally, this paper helps policymakers and investors investing in China gain better understanding of earnings management practices during the Covid-19 pandemic and take appropriate actions in evaluating the performance of businesses. Findings from this study highlights the importance of concentrating on the financial report's reliability during the Covid-19 pandemic. In another word, investors need to be more careful as firms seem to hide their true financial conditions during pandemic periods. Furthermore, the study emphasises the importance of paying more attention to earning management practices for firms with higher financial distress.

The rest of the paper is structured as follows. Section 2 discusses the related theories, literature and hypotheses development. Section 3 describes the research methodology and empirical design. Section 4 discusses the results and findings, while section 5 concludes the paper.

2. Literature review, theoretical framework and hypothesis development

2.1 Earnings management and reasons for engaging in earnings management

The definition of 'earnings management' has been debated by a large number of studies. According to Walker (2013) and Jones (2011), earnings management is defined as exploiting the flexibility of accounting rules to manage the measurement and presentation of the accounts for the preferable interests of preparers. Similarly, Healy and Wahlen (1999) pointed out that earnings management occurs when managers use ambiguities in specific accounting standards to portray a desired or biased picture of financial performance to either mislead certain stakeholders regarding the underlying corporate economic performance or influence contractual outcomes that depend on reported accounting figures. Healy and Wahlen (1999) also stated that judgement is used in financial reporting and in structuring transactions to alter financial reports to manipulate performance towards a desired, mostly predetermined target. Moreover, earnings management can be understood as the use of managerial discretion within the regulatory framework, in the selection practices of recognition and measurement of accounting elements, to deliberately achieve the most favourable interests of some stakeholders (Healy and Wahlen, 1999; Sweeney, 1994; Jones, 1991; Healy, 1985).

Prior studies have suggested that companies have many reasons and motivations for getting involved in earnings management, such as to meet capital market expectations (Healy and Wahlen, 1999; Burgstahler and Eames, 1998), maximise compensation contracts (Guidry et al., 1999; Holthausen et al., 1995; Healy, 1985) or satisfy regulators and avoid political costs (Beatty et al., 1995; Collins et al., 1995; Cahan, 1992; Petroni, 1992; Jones, 1991; Watts and Zimmerman, 1978). This motivates us to explore whether businesses that are facing challenges from an unprecedented event (i.e., the Covid-19 pandemic) will use earnings management to manage their bottom lines.

2.2 The impact of the Covid-19 pandemic on organisational behaviour

The 2019 coronavirus outbreak was an unprecedented event, and none of the other crises over the last few decades are comparable to the economic crisis caused by the Covid-19 pandemic. It was sudden and caused by non-economic factors which had an intense economic and social effect all over the world (Šušak, 2020). Several studies have documented an increase in earnings manipulation during financial and economic crises (Koowattanatianchai, 2018; Flores et al., 2016; Da Silva et al., 2014). Such behaviour is motivated by the need to attract and retain investors (Cimini, 2015). While other studies have suggested that companies are more likely to reduce earnings management practices during a crisis, earnings management has become less preferable due to poor corporate performance (Chintrakarn et al., 2018) or possibly because of the global Covid-19 pandemic, which made managers more cautious in managing companies (Azizah, 2021).

Under pressure from the operating environment (for example, the significant impact of the Covid-19 pandemic), management may have intentionally adopted specific accounting policies to achieve their goals (such as, retaining bonus targets or avoiding political costs). It is expected that the changes in the operational environment will change the incentives of managers regarding earnings management practices (Silva et al., 2014). Fields et al. (2001) argued that senior executives exercise accounting discretion to meet or exceed the company's earnings target, so as to maximise the present value of their compensation and bonuses. Bergstresser and Philippon (2006) also stated that the bonus plan offers incentives for executives to manipulate earnings. However, it is unknown whether the changes in the business environment due to the Covid-19 pandemic had any impact on earnings management incentives, since motivations for earnings manipulation practices derive primarily from incentives of capital markets, contracts and political expenses (Healy and Wahlen, 1999; Watts and Zimmerman, 1978).

Interestingly, the literature has recently documented the effect of the pandemic on audit work, which impacts the verification of accounting information and the quality of financial reporting (Illuzzi et al., 2020). Ritonga and Suyanto (2021) and Sonu et al. (2017) found that both time and resources allocated for auditing decreased during the crisis, so the audit risk increased during this period. Similarly, during a pandemic, the risk of material misstatements increases, since local governments will prioritise dealing with the economy and public health (World Bank, 2020).

As the world was hit by the Covid-19 pandemic, various countries were forced to curtail their economic activities. To prevent the wider spread of the pandemic, many countries implemented lockdown policies to restrict the movement of people and goods, causing global demand, production and distribution to be hampered in the business world. As a result, economic development was depressed in almost all countries (Azizah, 2021). China implemented the first blockade from 23 January to 8 April 2020, which resulted in the disruption of corporate activities in China. The cessation in China's supply of raw materials and capital goods had an influence on domestic production activities in the first quarter of 2020. In addition, the Covid-19 pandemic had an impact on the export and import sectors, followed by a chain effect on household consumption and investment decisions, leading investors to be likely to delay investments due to uncertain market conditions (Azizah, 2021).

Positive accounting theory (PAT) attempts to explain the rationale for management's choice of accounting policies and how management responds to the environmental changes (such as changes in accounting regulations). Thus, PAT can be applied to explain managerial decisions in relation to earnings management (Watts and Zimmerman, 1990). Specifically, the dispute over motivations for corporations to practise earnings manipulation was originally developed in positive accounting theory because businesses are essentially driven by contractual issues, such as compensation contracts (Gaver et al., 1995), debt contracts (DeFond and Jiambalvo, 1994) and political costs (Watts and Zimmerman, 1986).

Consistent with positive accounting theory, recent research suggests that firms will try to maximise their chances of survival while minimising transaction costs. Therefore, the Covid-19 pandemic followed by the economic recession may have meant that companies in various countries had contractual incentives to stabilize their operation (Roychowdhury, 2006; Dichev and Skinner, 2002; Sweeney, 1994; Watts and Zimmerman, 1990), or capital market incentives (Roychowdhury, 2006; Graham et al., 2005), compensation incentives (Bergstresser and Philippon, 2006; Healy, 1985) and incentives to avoid government regulation and political costs (Watts and Zimmerman, 1986). Thus, enterprises may be more motivated to carry out

earnings management activities to cover up their inefficiency and mistakes in the context of Covid-19; maintain favourable leverage ratios, market share and competitiveness; maintain their credit rating and the confidence of investors; and achieve performance goals (Ali et al., 2022; Chen et al., 2022; Liu and Sun, 2022). Thus, we propose the first hypothesis, as follows:

> ***H_1***: *Due to the Covid-19 pandemic, firms are more likely to engage in earnings management.*

2.3 The impact of financial distress on earnings management

Prior studies have debated whether firms in financial distress will get involved more in earnings management （Li et al., 2020). Conceptually, financial distress happens when a company's liquidated total assets are less than the total amount of creditor claims (Chen et al., 1995). Existing literature finds that the decision-making processes and behaviours of the management may be influenced when companies are in financial distress (Iatridis and Kadorinis, 2009). This is due to the fact that when a listed company falls into financial difficulties, its earnings may fall short of investors' expectations, resulting in the decline of its share price and company value（Campa & Camacho-Miñano, 2015).

Previous research has demonstrated that financially distressed companies have a strong incentive to manage their earnings to meet certain goals, thereby misleading stakeholders about their underlying financial performance (Campa and Camacho-Miñano, 2015; Zang, 2012; Graham et al., 2005). According to Rosner (2003), companies that go bankrupt ex-post but do not appear distressed ex-ante conduct income-increasing earnings management practices. In addition, evidence from China suggests that under the current delisting rules and guidance in China, companies that want to keep their listing status but are in financial distress may have strong motivations to manage their earnings (Du and Lai, 2018; Chu et al., 2011; Jiang and Wang, 2008; Ding et al., 2007). Some studies have shown that Chinese listed companies tend to carry out earnings manipulation to avoid losses, particularly a three-year consecutive loss under the specific context of China (Haw et al., 2005; Chen et al., 2001).

When an enterprise has the intention to manage its bottom-line items due to financial distress, this can be done by applying different accounting practices, such as accrual earnings management, or real earnings management through real operation activities or transactions (Dinh et al., 2016; Mao and Renneboog, 2015; Zang, 2012; Gunny, 2010; Cohen et al., 2008; Roychowdhury, 2006). Particularly, Jaggi and Lee (2002) found that the severity of financial distress influences the choice of upward or downward discretionary accruals, and Saleh and

Ahmed (2005) found that managers of struggling enterprises are more likely to adopt income-decreasing accruals. Liu et al. (2011) also showed that the approaches for managing earnings in Chinese listed companies have converted gradually from accrual-based earnings management, which is typically easy to conduct but is more likely to be detected, to real earnings manipulation, which is less likely to be detected. However, not many studies have investigated the impact of financial distress on the choice between real earnings management and accrual earnings management, and the lack of such research is unexpected, since financial distress may change the trend from accrual to real earnings manipulation, as discussed above. That is because this is an extreme financial situation, in which corporate behaviours, including earnings management practices, can be distorted (Graham et al., 2005).

According to the perspective of signalling theory, companies strive to tackle information problems by sending signals to the market (Morck et al., 1990). For example, executives can smooth earnings to reduce information asymmetry and disclose more information about the company's cash flows and future earnings (Tucker and Zarowin, 2006). In these cases, discretion improves the informativeness of earnings (Ben rejeb attia et al., 2013). Accounting figures can be viewed as signals that aim at reducing informational asymmetry exacerbated by the crisis (Oskouei and Sureshjani, 2021; Lakhal and Dedaj, 2020).

The coronavirus pandemic is regarded as the century's largest economic, health and social crisis around the world. During the Covid-19 pandemic, investor confidence declined significantly, and most of the listed companies experienced downward pressure on their share prices (Lassoued and Khanchel, 2021). The Covid-19 lockdowns had a significant impact on price volatility in financial markets and corporate profitability (Barai and Dhar, 2021; Ruiz et al., 2020), which to some extent contributes, indirectly, to financial distress suffered by companies. The financial difficulties experienced by companies provide motivation for managers to manipulate earnings (Habib et al., 2013).

In addition, if a company gets into financial distress, its executives can expect to have their bonuses cut, be replaced or suffer reputation loss (Liberty and Zimmerman, 1986; Gilson, 1989). According to PAT, earnings manipulation can be explained by the opportunistic intention of executives, who consciously manipulate earnings to show financial reporting in their favour (Lassoued, 2021; Azizah, 2017;). Thus, conventional wisdom suggests that executives have motivations to cover up such a deteriorating performance by utilising accounting choices that increase earnings. Thus, our second hypothesis is:

H_2: *Due to the Covid-19 pandemic, firms in a condition of financial distress are more likely to engage in earnings management.*

3. Methodology

3.1 Data and sample

The data of this study is collected from the China Stock Market and Accounting Research (CSMAR) database. The sample period is determined as follows: the pre-pandemic phase is from 2015 to 2019, during which the pandemic crisis had not yet emerged (Lassoued and Khanchel, 2021). For the pandemic period, we consider the whole years of 2020 and 2021. The first case of this particular coronavirus disease occurred at the end of December 2019 in China, and the disease spread widely to various nations around the world in a very short period (Azizah, 2021). The confirmation of the first case by the World Health Organization (WHO) took place on 31 December 2019. The beginning of the pandemic period in Europe was in January. Thus, the pandemic's impact was not reflected in the financial statements of the 2019 fiscal year, which were solely based on events occurring in 2019 until 31 December.

For our research, all A-share companies in China listed on the Shanghai and Shenzhen stock exchange markets were considered as an initial sample. After excluding financial firms, our sample comprised 3,518 listed companies. We then removed companies with missing data, leaving a final sample of 1,832 companies for the period from 2015 to 2021, with 8,590 firm-year observations.

3.2 Measurement of variables

3.2.1 Accrual earnings management

Prior studies (Lassoued and Khanchel, 2021; Li et al., 2020) have used discretionary accruals to measure accrual earnings management practices. Such a discretionary component differs from non-discretionary accruals because it is subject to managers' manipulation from their opportunistic behaviour. In this study, we follow Lassoued and Khanchel (2021) and Gill-de-Albornoz and Illueca (2005) to estimate accrual earnings management (*AEM*) using the Modified Jones model (Dechow et al., 1995). Since discretionary accruals can be positive or negative, we use the absolute value of the residual as a proxy for *AEM* to prevent the offset effect of the positive and negative figures of earnings management. Thus, earnings manipulation can be reflected more precisely (Yung and Root, 2019; Cohen et al., 2008). A

higher *AEM* indicates that companies conduct a higher level of earnings management through discretionary accruals.

$$TACC_{it}/TA_{it-1} = \alpha_{1i}\ 1/TA_{it-1} + \alpha_{2i}\ (\Delta REV_{it} - \Delta REC_{it})\ /TA_{it-1} + \alpha_{3i}\ PPE_{it}/TA_{it-1} + \varepsilon_{it} \quad (1)$$

where $TACC_{it}$ = total accruals for firm *i* in year *t*; $TA_{it}-1$ = total assets at the beginning of the period; $\Delta REVit$ = change in total sales; ΔREC_{it} = change in accounts receivables; and PPE_{it} = gross property, plant and equipment.

3.2.2 Real earnings management

A company can also manage its earnings through its operations (i.e., sales, production and expenses) besides the adjustment in discretionary accruals (Roychowdhury, 2006). First, it can inflate its sales income by providing more lenient credit terms or price discounts. This typically results in an unusually low cash flow from operations (CFO). The gap between the normal level of CFO and the actual CFO can be captured by abnormal CFO (ab_CFO). The normal levels of CFO are calculated as follows (Roychowdhury, 2006; Kim et al., 2012; Kuo et al., 2014).

$$CFO_t / TA_{t-1} = \beta_0 + \beta_1\ (1/ TA_{t-1}) + \beta_2\ (Sales_t /TA_{t-1}) + \beta_3 (\Delta Sales_t/ TA_{t-1}) + \varepsilon_t \quad (2)$$

where CFO represents cash flow from operations; TA is total assets; Sales is net sales; and ΔSales is the change in sales.

Second, earnings can be managed through the production level. Generally, a higher production level reduces the fixed costs per unit (Roychowdhury, 2006). In this case, the cost of goods sold (COGS) is unusually low, and the operating margin rises accordingly. The production costs (PROD) are defined as the sum of COGS and changes in inventory during the period. Therefore, abnormal production costs (ab_PROD) are calculated by subtracting the normal production costs (calculated using the following estimation model) from the actual production costs (Kuo et al., 2014; Kim et al., 2012; Roychowdhury, 2006).

$$PROD_t/TA_{t-1} = \beta_0 + \beta_1\ (1/TA_{t-1}) + \beta_2\ (Sales_t /TA_{t-1}) + \beta_3\ (\Delta Sales_t/TA_{t-1}) + \beta_4\ (\Delta Sales_{t-1}/TA_{t-1}) + \varepsilon_t \quad (3)$$

Third, management can boost reported earnings by cutting discretionary expenditures, such as expenditures on research and development, advertising and general administration. This unusual reduction in spending can be detected by the abnormal discretionary expenditures metric (ab_DISEXP) – that is, the difference between an abnormally low level of discretionary

expenses and the normal discretionary expenses estimated from the following model (Kuo et al., 2014; Kim et al., 2012; Roychowdhury, 2006):

$$DISEXP_t/TA_{t-1} = \alpha_0 + \alpha_1(1/TA_{t-1}) + \beta\,(Sales_{t-1}/TA_{t-1}) + \varepsilon_t \quad (4)$$

where DISEXP refers to discretionary expenses for year *t*.

Following Kim et al. (2012), Kuo et al. (2014) and Bozzolan et al. (2015), REM is calculated as below.

$$REM = -ab\_CFO + ab\_PROD - ab\_DISEXP \quad (5)$$

This REM represents the firm's overall real activity-based earnings management level. Similar to AEM, a higher REM indicates that more earnings management has been undertaken through operational changes.

3.2.3 Financial distress

When the current assets and current debt do not match, or when a company's cash flow is insufficient to pay off its existing liabilities, the company will be in danger of going bankrupt (Li et al., 2020). We follow prior studies that use the *Z-score*, proposed by Altman (1968), to measure financial distress. This proxy is regarded as the most commonly used financial health proxy (Bugeja, 2015) and is computed as follows:

$$Z\text{-score}_{it} = 1.2\,X_1 + 1.4\,X_2 + 3.3\,X_3 + 0.6\,X_4 + 1.0\,X_5 \quad (6)$$

where $Z\text{-score}_{i,t}$ measures financial distress; X_1 is the ratio of working capital to total assets; X_2 is the ratio of retained earnings to total assets; X_3 is the ratio of EBIT to total assets; X_4 is the ratio of the market value of equity to total liabilities; and X_5 is the ratio of sales to total assets. A higher Z-score implies a greater likelihood of bankruptcy for a firm (*DISTRESS*).

3.3 Empirical model

To examine the impact of the Covid-19 pandemic on earnings management, we use the ordinary least square (OLS) with robust standard errors on the pooled panel sample. The model is specified as follows:

$$EM_{it} = \beta_{1i}\,PAND\_COVID + \sum_{i=1}^{n=16} FIRM\ CONTROL \quad (7)$$

EM refers to earnings management proxies, which are subdivided into *AEM* and *REM*. We take the absolute value of *AEM* and *REM* as they represent the extent of EM. Definitions and

measurements of all variables are presented in Table 1. The main variable of interest is *PAND_COVID*, which takes the value of 1 if the observation is from the pandemic period of 2020, and 0 otherwise.

We include a vector of firm-level control variables (*FIRM CONTROL*). We first include a financial (book) leverage variable (*LEV*): this measures the risk of violating debt contracts, which is the ratio of total debt and total assets. Prior studies indicate that executives inflate earnings to avoid violating debt covenants (Ben rejeb attia et al., 2013; Press and Weintrop, 1990). We next add firm performance (*ROA*: the ratio of income before extraordinary items to the total asset) to the model (Lassoued and Khanchel, 2021). This reflects the firm's motivation to adopt accounting policies that can reduce current earnings or smooth earnings to conceal their good financial conditions. Instead, poorly performing companies may tend to manage earnings to boost their income. The firm size (*Size*), measured by the log of total assets, is also considered, since large companies may have more accounting treatments for transactions. Thus, they are more able to manipulate earnings than small companies, especially when they have the intention to cut political costs (Nelson et al., 2002; Ben rejeb attia et al., 2013; Barka and Hamza, 2020). We also control the audit quality (*Big4*), which measures the control constraints on accounting manipulation. A better quality of audit services is helpful to restrict the management tendency to manage earnings (Kim et al., 2003). Big4 is a dummy variable that takes 1 if the auditor is from the Big4 accounting firms, and 0 otherwise.

Growth opportunities (*Growth*) is also introduced as a control variable, since companies with growth potential are likely to raise capital for future investments. Therefore, the management of such companies seem to have greater motivations to manipulate earnings if they have an intention to raise capital (Teoh et al., 1998). We also include state-owned enterprises (*SOE*), which is a dummy variable that takes 1 if the state-owned equity is greater than 51%, and 0 otherwise. The *SOE* is considered as a control variable, since Leuz et al. (2003) stated that earnings manipulation is less frequent in economies with better law enforcement and stronger outside investor rights. The Market-to-book (*MTB*) ratio, measured by the market capitalisation at the end of the fiscal year divided by the book value of common equity, is included. Prior studies indicate that firms presenting growth in their operations tend to have large values of accruals (Burgstahler, Hail, and Leuz, 2006; Othman and Zeghal, 2006; Larcker and Richardson, 2004; McNichols, 2000).

We also use a series of control variables in line with previous earnings management studies and Chinese contexts, especially the corporate governance information (e.g., Kim et al., 2018; Bozzolan et al., 2015; Martínez-Ferrero et al., 2015; Kuo et al., 2014; Kim et al., 2012; Cheng

et al., 2010): *Top10* (the company's largest ten shareholders' ownership percentage); *Tobin Q* (the ratio between the market value of an enterprise's physical assets and its replacement value); *Duality* (a dummy variable that takes 1 if the CEO is also the chairman, and 0 otherwise); *IND* (the ratio of the number of independent directors to the total number of directors); *Board* (the logarithm of the number of board members); *Audit size* (the number of members of the audit committee, to indicate the size of the audit committee); *Fee* (the natural logarithm of annual audit fees that companies paid); *Age* (the number of years since the establishment of the corporation); and *OCF* (the cash flow from operations scaled by the total assets).

[**Insert Table 1**]

4. Results

4.1. Descriptive statistics and correlation matrix

Table 2 presents the descriptive statistics for the key variables. To mitigate the impact of outliers, the continuous variables are winsorised at the 1% level. After obtaining the absolute value, earnings management proxies, namely *AEM* and *REM*, have a mean (median) value of 0.055 (0.038) and 0.125 (0.091), respectively. The mean of financial distress (*DISTRESS*) is 0.289, which means around 30% of the firm-year observations in our sample are under financial distress. Turning to the main control variables, the total debt reported to total assets (LEV) is 0.458. Less than one-tenth of our sample is audited by one of the Big4 auditors (9%). The average rate of growth is 12.9%. Table 3 presents the correlation matrix among all independent variables. Results show no severe multicollinearity issues, which is further supported by the unreported low variance inflation factor (VIF).

[**Insert Table 2 & 3**]

4.2 The Covid-19 pandemic and earnings management

Table 4 reports regression results for the impacts of the pandemic crisis on earnings management. We find that while *PAND_COVID* has a significant and positive association with *AEM*, it shows a significant and negative effect on *REM*. Economically, during the Covid-19 period, firms increased their discretionary accruals (AEM) by 0.4% and reduced their real earnings management (REM) by 1.1%. The findings hold after we control industry fixed effects (columns 3 and 6). These results suggest that managers may have been more inclined to manipulate their companies' earnings through *AEM* than *REM* during the pandemic. Since the

Covid-19 outbreak was an unexpected (health crisis) event, and given that *REM* requires management to manipulate the operational, financial and investment activities throughout the financial year, it is difficult for managers to manage earnings through *REM*. Furthermore, among the most affected companies, it is more difficult and more costly, and more easily detectable, to manipulate cash flow through operational, financial and investment activities (Xiao et al., 2021).

In addition, since we use absolute value for the measurement of *AEM* and *REM* in our model to represent the extent of EM, the results can also indicate that Chinese companies manipulated more earnings compared to before the pandemic. These findings corroborate those of Xiao et al. (2021), which suggested that Chinese enterprises managed earnings during the pandemic. Abdul et al. (2021) found the same evidence for their Iraqi sample. However, the results are inconsistent with those of prior studies conducted on European countries during other crises. For example, Filip and Raffournier (2014) concluded that earnings manipulation decreased during the sub-prime crisis. Similar findings were obtained by Arthur et al. (2015) and Kousenidis et al. (2013). One plausible explanation for this divergence in findings is the nature of the crisis itself. Indeed, the impact of the unprecedented crisis triggered by the coronavirus pandemic on earnings management practices appears to be different from the impact during a financial crisis.

[**Insert Table 4**]

4.3 The impact of Covid-19 on EM in different directions

We are also concerned with the direction of earnings management (upward versus downward). As the absolute values of *AEM* and *REM* could be in both directions (i.e., either income increasing or income decreasing), the effect of the pandemic on upward earnings management and downward earnings management will be examined separately in this section. The results are presented in Table 5. The first two columns display the results of accrual-based earnings management in both upward (*Upward AEM*) and downward (*Downward AEM*) directions. As shown, the coefficient of the income-increasing regression of accrued earnings management is positive and significant at the 1% level, and its coefficient is 0.007. However, the pandemic had no significant effect on downward accrual-based earnings management.

From the regression results of the third and fourth columns, we find that the income-increasing regression of real earnings management (*Upward REM*) is insignificant, while the pandemic has a significantly positive impact on downward real earnings management

(*Downward REM*), which is significant to the extent of 1%, and its coefficient is 0.017. The findings suggest that during the pandemic, firms were more likely to adopt income-increasing discretionary accruals to manage earnings upward. Given that the profitability of most enterprises was influenced by the Covid-19 crisis because of the suspension of activities during general lockdowns, it is possible that they then had the motivation to manage earnings upwards to improve their reported performance in order to restore the confidence of investors and stakeholders (Arthur et al., 2015), to reduce the likelihood of violating earnings-based debt covenants (DeFond and Jiambalvo, 1994) and to signal that their condition was not worse than their competitors and consequently avoid a large deterioration of their share price (Ozili, 2020; Lisboa and Kacharava, 2018). Furthermore, the result indicates that firms may have been more inclined to undertake income-decreasing real earnings management during the pandemic crisis. Companies deflate earnings to justify their previous bad practices by lowering returns, and even to avoid any political sanctions such as higher taxes and tighter regulation (Hamza and Zaatir, 2021). Moreover, the losses reported by enterprises can be regarded as a signal of distress, so they can get stimulus packages or bailout money (Lassoued, 2021; Ozili and Arun, 2020).

[**Insert Table 5**]

4.4 Channel analysis: financial distress risk

We further explore the channel in which the pandemic can affect earnings management practices. We expect that corporate financial distress (*DISTRESS*) is likely to moderate the association between Covid-19 and *AEM/REM*. To do so, we add the interaction terms between *DISTRESS* and *PAND_COVID*. Table 6 shows a significantly positive association between *DISTRESS* and *AEM*, which suggests that firms under a condition of financial distress are engaged in accrual-based earnings management. This result is consistent with several prior studies in the context of emerging economies; especially, in China, due to the pressure of delisting rules from regulators, firms in financial distress have more incentives to engage in earnings management (Li et al., 2020). However, Table 6 also shows a negative and significant coefficient of interaction between Covid-19 pandemic and financial distress on accrual-based earnings management (*AEM*), but a negative and insignificant coefficient on real earnings management (*REM*). The results imply that during the pandemic, firms in financial distress tended to engage less in AEM activities. In order to understand the reason why firms in financial distress were less engaged in earnings management during the pandemic period, we

conducted a further test to see whether this behaviour was impacted by ownership structure (i.e., state ownership vs private ownership), since state ownership has been found to have significant impact on earnings management practice in China (Dong et al., 2020; Ding et al., 2007). The results are discussed in the following section. In addition, we find that the observed negative effect of the pandemic on *REM* was cancelled out for financially distressed firms.

[**Insert Table 6**]

4.5 The impact of state ownership

Prior studies document the influences of the level of state ownership on the behaviour and performance of Chinese firms (Dong et al., 2020; Ding et al., 2007). We therefore next examine whether this ownership factor follows through into the earnings management response to the pandemic. Our analysis sheds further light on the results related to financial distress since firms with a high degree of state ownership may be unlikely to go bankrupt. To carry our this analysis, we classified the full sample into two sub-samples including state-owned enterprises (SOEs) and privately owned enterprises (POEs). The results are reported in Table 7 (Panel A: SOEs and Panel B: POEs). We generally find that the positive effect of the health crisis on both *AEM* (model 1 and 5) and *REM* (model 3 and 7) is indifferent between SOEs and POEs. However, we further find that the moderating effect of financial distress on the association between the pandemic and *AEM* is more pronounced in the SOEs than POEs (negative and significant coefficient of interaction between PAND_COVID and DISTRESS in the case of state-owned firms – model 2, but not significant in the case of privately owned firms – model 6). This implies a protective role of the governments on the SOEs' default positions; thereby, SOEs are less likely to engage in *AEM* activities even during the pandemic (Ding et al., 2007). However, for POEs, the result shows that the health crisis is likely to increase a firm's AEM regardless of insolvency situations. Regarding *REM*, we find that the financial distress of POEs has no role in the impact of the crisis. Meanwhile, the negative effect of the pandemic is more pronounced in the financially distressed SOEs.

[**Insert Table 7**]

4.6 Alternative measures of earnings management

To ensure the robustness of our primary findings, we performed a robustness test using alternative measures of earnings management. In particular, with regard to accrual earnings management, we used the cross-sectional model, as suggested by Kothari et al. (2005) (*AEM1*).

In terms of real earnings management, our alternative measures include each component (*R_CFO*; *R_PROD* and *R_DISEXP*) and the sum of the standardised three real earnings management proxies (*REM1*)（Cohen at al., 2008). See definitions and measurements of all these variables in Table 1.

The results are presented in Table 8. We find results that are consistent with our main test – that *PAND_COVID* has a significant and positive impact on accrued earnings management, and is negatively associated with real earnings management. These results support our earlier findings on the significant effect of the pandemic on accrual-based earnings management, implying that during the pandemic, firms were more likely to manage earnings through *AEM*. These results once again suggest that under the challenges caused by the Covid-19 pandemic, firms in China used the accrual earnings management technique to manage earnings upward in order to demonstrate their sound financial capability, with the aim of avoiding public scrutiny and the pressure of being delisted by the government (Liu and Lu, 2007).

[**Insert Table 8**]

5. Conclusion

The Covid-19 pandemic had a catastrophic impact on global health and economic systems. Businesses saw a drop in profitability because of the pandemic, as most economic activities were suspended during lockdown measures. This paper examines the impact of the Covid-19 pandemic on the earnings management practices in a sample of listed companies in China. This is an important issue, given the relevance of the authenticity and reliability of accounting information to stakeholders during troubling periods.

Based on a sample of 1,832 companies listed on the Shanghai and Shenzhen stock exchanges during the pre-pandemic period, from 2015 to 2019, and the pandemic period (2020-2021), with 8,590 firm-year observations conducted, we examined the earnings management practice using both accrual earnings management and real earnings management techniques. Our findings reveal that the quality of financial reporting by Chinese companies tended to be lower during the pandemic. Listed companies affected by the pandemic were more likely to engage in AEM than REM. In particular, the results indicate that Chinese listed companies were more likely to engage in upward earnings management during the Covid-19 pandemic, which can be explained by the argument that businesses tried to show acceptable levels of losses and thus mitigate the impact of the pandemic in the eyes of investors and stakeholders. This is consistent with the finding of Lassoued and Khanchel (2021) that companies manage

earnings upward by mitigating the reported losses level to rebuild the confidence of stakeholders and thus support economic recovery. Furthermore, the results also indicate that financially distressed firms engaged in earnings manipulation, especially accrual-based earnings management. However, this behaviour seems to be less prevalent during the Covid-19 pandemic, especially in the case of state-owned enterprises. The findings were robust after considering the factors that may influence the incentives and behaviours of earnings management. In detail, we used the corresponding company-level variables, such as debt performance, opportunity growth, board independence and audit quality. Furthermore, we also used other alternative proxies as dependent variables and panel data fixed effects to ensure the robustness of our results.

To date, studies on the Covid-19 outbreak have mostly focused on the market reactions to the pandemic. Currently, studies on the relationship between the Covid-19 pandemic and earnings management practices, and the impact of the pandemic on corporate financial reporting, are limited, particularly in China. Furthermore, existing research provides inconclusive and contradictory conclusions on the relationship between the pandemic and the earnings management practices of Chinese listed companies. This study, therefore, draws on evidence from Chinese listed companies during the Covid-19 pandemic to debate whether earnings quality was lowered during the period of the pandemic.

The findings from this study have several implications for practice and academia. They provide valuable insights which may be of assistance to investors, fund providers, academics and auditors, as well as all other parties interested in understanding the quality of financial reports. In that context, investors and lenders should be especially careful, since companies seem not to reflect their true financial conditions during pandemic periods in their financial statements. Auditors should be aware that, in future periods of intense crisis, they should scrutinise financial information in more detail, with particular attention to changes in accruals. The findings also provide deeper insights into the reliability of accounting information.

The findings of the research could also be valuable for regulators and standards setters who need to learn how the coronavirus pandemic crisis may have influenced the quality of financial reporting. The research has found that corporations had the motivation to increase earnings to attract potential investors. In this regard, given the presence of such behaviour, standards setters should be aware that a set of stand-alone accounting standards is insufficient to limit misrepresentation of financial information resulting from earnings management. A limitation of our research is that the conclusions are drawn from evidence from Chinese listed companies. In view of the different national conditions in emerging countries and developed countries,

differences in corporate governance and accounting standards could have an impact on the earnings management practices of emerging markets. Therefore, future research could examine the international market (a cross-country study).

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Table 1.

Variable Definitions

*Table presents the definitions and measurements of all variables. *, ** and *** Indicate statistical significance at the 10%, 5% and 1% levels. See Table 1 for full variable definitions*

Variable	Abbreviation	Description	References
Dependent variable			
Earnings management proxies	*AEM*	Discretionary accruals estimated using the cross-sectional model of Dechow et al. (1995). (As model 1)	Dechow et al. (1995)
	AEM1	Discretionary accruals estimated using the cross-sectional model of Kothari et al. (2005). AEM1 **(DA1)** (As model 10)	Kothari et al. (2005)
	REM	Real activity-based earnings management. REM= −ab_CFO + ab_PROD – ab_DISEXP	Roychowdhury, (2006); Kim et al. (2012); Kuo et al. (2014)
	REM1	Real activity-based earnings management.	Cohen at al. (2008)
	R_CFO	Real activity-based earnings management. $CFO_t / TA_{t-1} = \beta 0 + \beta 1 (1/ TA_{t-1}) + \beta 2 (Salses_t / TA_{t-1}) + \beta 3 (\Delta Salses_t / TA_{t-1}) + \varepsilon t$	Cohen at al. (2008)
	R_PROD	Real activity-based earnings management. $PROD_t / TA_{t-1} = \beta 0 + \beta 1 (1/ TA_{t-1}) + \beta 2 (Salses_t / TA_{t-1}) + \beta 3 (\Delta Salses_t / TAt-1) + \beta 4 (\Delta Salses_t\text{-}1 / TA_{t-1}) + \varepsilon t$	Cohen at al. (2008)
	R_DISEXP	Real activity-based earnings management. $DISEXP_t / TA_{t-1} = \alpha 0 + \alpha 1 (1/TA_{t-1}) + \beta (Salses_{t-1}/TA_{t-1}) + \varepsilon t$	Cohen at al. (2008)
Independent variable			
The pandemic period	PAND_COVID	Dummy variable that takes 1 if the observation is from the first quarter of 2020 to the fourth quarter of 2020, and 0 otherwise.	Lassoued and Khanchel (2021)
Financial distress	DISTRESS	Measured by the Z-score with components of X1-X5. X1 is the ratio of working capital to total assets; X2 is the ratio of retained earnings to total assets; X3 is the ratio of EBIT to total assets; X4 is the ratio of the market value of equity to total liabilities, and X5 is the ratio of sales to total assets. The higher Z-score implies more likelihood of bankruptcy for a firm	Altman (1968),
Firm-level control variables			
Leverage	LEV	Total debt by total assets.	Ben rejeb attia et al. (2013); Press and Weintrop (1990)

Market -to- Book ratio	MTB	The firm's market value to its book value.	Larcker and Richardson (2004); Zang (2012)
Firm Age	Age	Number of years since the establishment of the firm.	Kim et al. (2012) ; Kuo et al. (2014)
Board size	Board	The logarithm of the number of board members.	Kim et al. (2018)
Duality	Duality	Dummy variable that takes 1 if the CEO and the chairman is the same person, and 0 otherwise.	Cheng et al. (2010); Kim et al. (2012)
Board independence	IND	The number of independent directors divided by the total number of directors.	Kuo et al. (2014); Kim et al. (2018);
Audit committee size	Audit size	The number of members of the Audit Committee.	Bozzolan et al. (2015); Martínez-Ferrero et al. (2015)
Audit fee	Fee	The natural logarithm of annual audit fees that firms paid.	Kim et al., (2012)
Firm performance	ROA	The firm's net income versus total asset.	Lassoued and Khanchel (2021)
OCF	OCF	The cash flow from operations scaled by the total assets.	Burgstahler and Dichev, 1997
Firm size	Size	Log of total assets.	Gong et al. (2013); Barka and Hamza (2020)
Audit quality	Big4	Dummy variable that takes 1 if the firm's auditor is one of the BIG 4 accounting firms, and 0 otherwise.	Becker et al. (1998)
Growth opportunities	Growth	Change in total sales in quarter t and quarter t − 1 scaled by total sales in quarter t – 1.	Teoh et al. (1998)
Property right nature	SOE	Dummy variable that takes 1 if the state-owned equity is greater than 51%, and 0 otherwise.	Leuz et al. (2003)
Top 10 ownership	Top 10	The firm's largest ten shareholders' ownership percentage.	Bolton et al. (2006); Leuz et al.(2003)
Tobin Q	Tobin Q	The ratio between a firm's physical asset's market value and its replacement value.	Kuo et al. (2014); Kim et al. (2018)

Table 2. **Descriptive Statistics**

*Table presents the descriptive statistics of all variables employed. *, ** and *** Indicate statistical significance at the 10%, 5% and 1% levels. See Table 1 for full variable definitions.*

stats	N	mean	sd	min	P25	p50	P75	max
AEM	8590	0.055	0.055	0.000	0.017	0.038	0.074	0.266
AEM1	8590	0.046	0.048	0.000	0.014	0.031	0.061	0.230
REM	8590	0.125	0.118	0.000	0.042	0.091	0.165	0.570
REM1	8590	0.077	0.077	0.000	0.023	0.053	0.102	0.395
R_CFO	8590	0.054	0.051	0.000	0.018	0.039	0.074	0.259
R_PROD	8590	0.058	0.058	0.000	0.018	0.040	0.076	0.285
R_DISEXP	8590	0.050	0.059	0.000	0.014	0.035	0.059	0.349
PAND_COVID	8590	0.339	0.474	0.000	0.000	0.000	1.000	1.000
LEV	8590	0.458	0.198	0.076	0.306	0.452	0.605	0.907
ROA	8590	0.000	0.001	-0.003	0.000	0.000	0.001	0.002
Size	8590	22.716	1.380	20.155	21.729	22.517	23.541	26.808
Big4	8590	0.090	0.286	0.000	0.000	0.000	0.000	1.000
Growth	8590	0.129	0.405	-0.609	-0.050	0.072	0.214	2.592
SOE	8590	0.456	0.498	0.000	0.000	0.000	1.000	1.000
Duality	8590	0.232	0.422	0.000	0.000	0.000	0.000	1.000
Board	8590	2.142	0.196	1.609	1.946	2.197	2.197	2.708
IND	8590	0.376	0.053	0.333	0.333	0.364	0.429	0.571
Top10	8590	0.589	0.152	0.235	0.479	0.593	0.703	0.919
MTB	8590	0.660	0.271	0.115	0.452	0.665	0.873	1.216
Age	8590	2.316	0.842	0.000	1.609	2.708	2.996	3.296
Tobin Q	8590	1.979	1.394	0.822	1.145	1.504	2.214	8.663
Audit size	8590	1.187	0.186	1.099	1.099	1.099	1.099	1.609
Fee	8590	14.137	0.720	12.899	13.653	13.998	14.506	16.694
OCF	8590	0.055	0.066	-0.142	0.017	0.053	0.094	0.246
DISTRESS	8590	0.289	0.453	0.000	0.000	0.000	1.000	1.000

Table 3.

Correlation Matrix.

*Table presents the correlation matrix of independent variables employed. * denotes statistical significance at the 5%. See Table 1 for full variable definitions.*

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1.	*PAND_COVID*	1																	
2.	*LEV*	-0.0268*	1																
3.	*ROA*	0.0188	-0.3653*	1															
4.	*Size*	-0.0011	0.5076*	0.0124	1														
5.	*Big4*	-0.0003	0.1031*	0.0408*	0.3670*	1													
6.	*Growth*	-0.1055*	0.0247*	0.2231*	0.0450*	-0.0137	1												
7.	*SOE*	-0.0625*	0.2256*	-0.0865*	0.3085*	0.1309*	-0.0658*	1											
8.	*Duality*	0.0446*	-0.0979*	0.0283*	-0.1610*	-0.0618*	0.0321*	-0.2964*	1										
9.	*Board*	-0.0424*	0.1147*	0.006	0.2528*	0.0547*	-0.0370*	0.2378*	-0.1906*	1									
10.	*IND*	0.0322*	0.0266*	-0.0143	0.0472*	0.0646*	0.0083	-0.0358*	0.1044*	-0.5084*	1								
11.	*Top10*	0.0315*	-0.0315*	0.2205*	0.2393*	0.2165*	0.0833*	-0.0007	0.0227*	0.0303*	0.0412*	1							
12.	*MTB*	0.0323*	0.3997*	-0.1842*	0.5934*	0.1447*	-0.0483*	0.2486*	-0.1283*	0.1479*	0.0017	0.0969*	1						
13.	*Age*	-0.0425*	0.2808*	-0.1856*	0.3428*	0.0678*	-0.0622*	0.4458*	-0.2465*	0.1536*	-0.0321*	-0.3417*	0.2032*	1					
14.	*Tobin Q*	0.0156	-0.2970*	0.1939*	-0.4115*	-0.0907*	0.0455*	-0.1754*	0.0817*	-0.1081*	0.0173	-0.0570*	-0.8085*	-0.0999*	1				
15.	*Audit size*	-0.0332*	0.1447*	-0.021	0.2079*	0.0559*	-0.003	0.2243*	-0.1528*	0.2561*	-0.0320*	0.0083	0.1223*	0.2321*	-0.0647*	1			
16.	*Fee*	0.0267*	0.3692*	-0.0456*	0.7866*	0.4658*	0.0139	0.1839*	-0.1043*	0.1747*	0.0710*	0.2536*	0.4363*	0.2108*	-0.2990*	0.1367*	1		
17.	*OCF*	0.0886*	-0.1868*	0.4175*	0.0236*	0.0521*	0.0451*	-0.0663*	0.0069	0.0335*	-0.0106	0.1659*	-0.1328*	-0.1132*	0.1476*	0.0002	0.0358*	1	
18.	*DISTRESS*	-0.0314*	0.6336*	-0.3765*	0.4482*	0.0735*	-0.0470*	0.1961*	-0.0844*	0.1182*	0.0377*	0.0116	0.5355*	0.2147*	-0.3569*	0.1234*	0.3106*	-0.1700*	1

Table 4. **The impact of the pandemic on earnings management.**

*Table presents the effects of Covid-19 pandemic on the earning management activities. Models 1 and 3 exclude firm-clusters while Models 2 and 4 include firm-clusters. *, ** and *** Indicate statistical significance at the 10%, 5% and 1% levels. P-values are reported in the square brackets. See Table 1 for full variable definitions.*

	Panel A: Discretionary accruals EM			Panel B: Real activity-based EM		
VARIABLES	[1] *AEM*	[2] *AEM*	[3] *AEM*	[4] *REM*	[5] *REM*	[6] *REM*
PAND_COVID	0.004***	0.004***	0.004***	-0.011***	-0.011***	-0.011***
	[0.000]	[0.001]	[0.004]	[0.000]	[0.000]	[0.000]
LEV	-0.041***	-0.041***	-0.044***	0.039***	0.039***	0.034***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.001]	[0.004]
ROA	-20.240***	-20.240***	-20.817***	12.776***	12.776***	12.025***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.001]	[0.002]
Size	0.006***	0.006***	0.007***	0.002	0.002	0.004
	[0.000]	[0.000]	[0.000]	[0.416]	[0.597]	[0.219]
Big4	0.001	0.001	0.002	0.007	0.007	0.009
	[0.798]	[0.880]	[0.589]	[0.140]	[0.365]	[0.268]
Growth	0.012***	0.012***	0.012***	0.048***	0.048***	0.047***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
SOE	-0.011***	-0.011***	-0.010***	-0.017***	-0.017***	-0.015***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.001]
Duality	0.002*	0.002	0.001	0.007*	0.007	0.004
	[0.083]	[0.229]	[0.586]	[0.052]	[0.195]	[0.396]
Board	-0.012***	-0.012**	-0.012**	-0.008	-0.008	-0.007
	[0.000]	[0.024]	[0.030]	[0.302]	[0.506]	[0.593]
IND	-0.027**	-0.027	-0.027	0.070**	0.070*	0.074*
	[0.033]	[0.156]	[0.165]	[0.013]	[0.086]	[0.071]
Top10	0.030***	0.030***	0.029***	0.028***	0.028*	0.028*
	[0.000]	[0.000]	[0.000]	[0.005]	[0.068]	[0.069]
MTB	-0.031***	-0.031***	-0.031***	-0.038***	-0.038***	-0.038***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.003]	[0.002]
Age	0.003***	0.003**	0.001	0.011***	0.011***	0.006
	[0.000]	[0.021]	[0.456]	[0.000]	[0.001]	[0.127]
Tobin Q	0.007***	0.007***	0.008***	0.011***	0.011***	0.011***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Audit size	-0.006**	-0.006	-0.006	0.025***	0.025**	0.024**

	[0.044]	[0.190]	[0.167]	[0.000]	[0.033]	[0.040]
Fee	-0.002	-0.002	-0.002	-0.005*	-0.005	-0.006
	[0.189]	[0.389]	[0.400]	[0.061]	[0.225]	[0.214]
OCF	0.159***	0.159***	0.159***	-0.022	-0.022	-0.023
	[0.000]	[0.000]	[0.000]	[0.476]	[0.589]	[0.561]
Constant	-0.025*	-0.025	-0.043*	0.071**	0.071	0.038
	[0.079]	[0.268]	[0.062]	[0.042]	[0.199]	[0.491]
Firm clustered	**No**	**Yes**	**Yes**	**No**	**Yes**	**Yes**
Industry fixed effect	**No**	**No**	**Yes**	**No**	**No**	**Yes**
Observations	8,590	8,590	8,590	8,590	8,590	8,590
R-squared	0.175	0.175	0.185	0.097	0.097	0.104
Wald Chi 2 [p-value]	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***

Table 5. **The impact of the Covid-19 on EM in different directions.**

*Table presents the effects of Covid-19 pandemic on the earning management activities in different directions (i.e., upward and downward EM). All models include firm-clusters *, ** and *** Indicate statistical significance at the 10%, 5% and 1% levels. P-values are reported in the square brackets. See Table 1 for full variable definitions.*

	Panel A: Discretionary accruals EM		Panel B: Real activity-based EM	
	[1]	[2]	[3]	[4]
VARIABLES	*Upward AEM*	*Downward AEM*	*Upward REM*	*Downward REM*
PAND_COVID	0.007***	0.003	0.004	-0.017***
	[0.000]	[0.130]	[0.126]	[0.000]
LEV	0.001	0.001	0.044***	0.021
	[0.807]	[0.891]	[0.000]	[0.256]
ROA	107.110***	-74.172***	-22.082***	41.388***
	[0.000]	[0.000]	[0.000]	[0.000]
Size	0.006***	-0.004***	0.005*	-0.002
	[0.000]	[0.001]	[0.061]	[0.713]
Big4	0.001	0.003	-0.010*	0.013
	[0.478]	[0.453]	[0.081]	[0.249]
Growth	-0.006**	0.034***	0.039***	0.060***
	[0.033]	[0.000]	[0.000]	[0.000]
SOE	-0.003**	0.001	0.006	-0.031***
	[0.037]	[0.575]	[0.158]	[0.000]
Duality	0.002	0.000	0.002	0.005
	[0.137]	[0.868]	[0.560]	[0.464]
Board	-0.006*	0.002	-0.022**	0.004
	[0.090]	[0.597]	[0.024]	[0.817]
IND	-0.004	0.002	0.017	0.069
	[0.728]	[0.901]	[0.619]	[0.258]
Top10	0.014***	0.019***	0.005	0.041*
	[0.007]	[0.009]	[0.717]	[0.070]
MTB	-0.007*	0.011*	-0.020*	-0.033*
	[0.085]	[0.069]	[0.089]	[0.065]
Age	0.004***	0.001	0.007**	0.010**
	[0.000]	[0.680]	[0.010]	[0.019]
Tobin Q	0.002*	0.005***	0.001	0.006*
	[0.073]	[0.000]	[0.667]	[0.077]
Audit size	0.000	-0.002	0.021*	0.023

	[0.973]	[0.601]	[0.051]	[0.167]
Fee	-0.003***	-0.000	-0.007*	0.002
	[0.009]	[0.998]	[0.097]	[0.723]
OCF	-0.041***	0.042***	-1.061***	0.804***
	[0.000]	[0.004]	[0.000]	[0.000]
Constant	-0.087***	0.102***	0.108**	-0.064
	[0.000]	[0.000]	[0.015]	[0.429]
Firm clustered	**Yes**	**Yes**	**Yes**	**Yes**
Observations	5,639	2,951	4,587	4,003
R-squared	0.686	0.723	0.408	0.315
Wald Chi 2 [p-value]	0.000***	0.000***	0.000***	0.000***

Table 6. **Channel Analysis: Covid-19 Pandemic, Financial Distress Risk, and Earnings Management Activities**

*Table presents the channel analysis on corporate financial distress risk. *, ** and *** Indicate statistical significance at the 10%, 5% and 1% levels. All models include firm-clusters. P-values are reported in the square brackets. See Table 1 for full variable definitions.*

VARIABLES	[1] *AEM*	[2] *REM*
PAND_COVID* x *DISTRESS	-0.008***	-0.009
	[0.009]	[0.129]
PAND_COVID	0.007***	-0.008**
	[0.000]	[0.017]
DISTRESS	0.009***	-0.000
	[0.000]	[0.956]
Control variables	Yes	Yes
Firm clustered	Yes	Yes
Constant	-0.016	0.068
	[0.462]	[0.223]
Observations	8,590	8,590
R-squared	0.178	0.097
Wald Chi 2 [p-value]	0.000***	0.000***

Table 7. **The impact of state ownership**

*Table presents the effects of state ownership on the association between the Covid-19 pandemic on the earning management activities, as well as the moderating impact of corporate financial distress. All models include firm-clusters. *, ** and *** Indicate statistical significance at the 10%, 5% and 1% levels. P-values are reported in the square brackets. See Table 1 for full variable definitions.*

	Panel A: State-owned enterprises				Panel A: Private-owned enterprises			
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
VARIABLES	*AEM*	*AEM*	*REM*	*REM*	*AEM*	*AEM*	*REM*	*REM*
PAND_COVID	0.004**	0.007***	-0.009**	-0.002	0.004**	0.007***	-0.013***	-0.013***
	[0.039]	[0.003]	[0.028]	[0.679]	[0.032]	[0.002]	[0.001]	[0.004]
PAND_COVID* x *DISTRESS		-0.007**		-0.017**		-0.008		0.001
		[0.048]		[0.017]		[0.127]		[0.890]
DISTRESS		0.002		-0.006		0.018***		0.005
		[0.551]		[0.381]		[0.000]		[0.576]
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm clustered	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.026	-0.027	0.075	0.060	-0.084**	-0.069*	-0.066	-0.062
	[0.375)	[0.364)	[0.220)	[0.323)	[0.032)	[0.081)	[0.524)	[0.554)
Observations	3,920	3,920	3,920	3,920	4,670	4,670	4,670	4,670
R-squared	0.122	0.123	0.109	0.111	0.187	0.193	0.107	0.108
Wald Chi 2 [p-value]	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***

Table 8.

Alternative measures of earnings management.

*Table presents the effects of Covid-19 pandemic on the earning management activities using alternative measures of EM. All models include firm-clusters. *, ** and *** Indicate statistical significance at the 10%, 5% and 1% levels. P-values are reported in the square brackets. See Table 1 for full variable definitions.*

VARIABLES	[1] AEM1	[2] REM1	[3] R_CFO	[4] R_PROD	[5] R_DISEXP
PAND_COVID	0.005**	-0.006***	-0.001	-0.005***	-0.006***
	[0.021]	[0.001]	[0.294]	[0.002]	[0.000]
LEV	-0.029***	0.017**	0.023***	0.029***	-0.008
	[0.000]	[0.033]	[0.000]	[0.000]	[0.252]
ROA	-18.265***	-0.064	9.408***	-0.523	2.794
	[0.000]	[0.982]	[0.000]	[0.801]	[0.194]
Size	0.004***	-0.001	-0.000	0.004***	-0.006***
	[0.000]	[0.755]	[0.918]	[0.003]	[0.001]
Big4	0.000	0.003	0.002	-0.001	0.000
	[0.873]	[0.564]	[0.577]	[0.792]	[0.930]
Growth	0.013***	0.039***	0.023***	0.023***	0.014***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
SOE	-0.006***	-0.013***	-0.003	-0.005**	-0.012***
	[0.000]	[0.000]	[0.123]	[0.040]	[0.000]
Duality	0.002	0.010***	0.002	0.004*	0.004
	[0.313]	[0.003]	[0.314]	[0.076]	[0.144]
Board	-0.008*	-0.006	-0.006	-0.017***	0.014*
	[0.089]	[0.424]	[0.252]	[0.002]	[0.073]
IND	-0.017	0.012	0.016	-0.005	0.044*
	[0.256]	[0.643]	[0.357]	[0.782]	[0.078]
Top10	0.017***	0.017*	0.006	0.013*	0.012
	[0.003]	[0.082]	[0.319]	[0.059]	[0.211]
MTB	-0.035***	-0.026***	-0.015***	-0.019***	-0.017**
	[0.000]	[0.001]	[0.005]	[0.001]	[0.020]
Age	0.004***	0.007***	0.003***	0.005***	0.005**
	[0.001]	[0.000]	[0.005]	[0.001]	[0.011]

Tobin Q	0.005***	0.002	0.003***	0.004***	0.002
	[0.000]	[0.232]	[0.008]	[0.000]	[0.225]
Audit size	-0.005	0.003	0.003	0.004	0.006
	[0.159]	[0.710]	[0.528]	[0.427]	[0.375]
Fee	-0.000	0.000	-0.005***	-0.007***	0.010***
	[0.954]	[0.904]	[0.004]	[0.002]	[0.000]
OCF	0.112***	0.074***	-0.021	0.011	0.065***
	[0.000]	[0.000]	[0.325]	[0.519]	[0.000]
Constant	-0.011	0.068*	0.113***	0.065***	-0.018
	[0.538]	[0.055]	[0.000]	[0.008]	[0.592]
Firm clustered	Yes	Yes	Yes	Yes	Yes
Observations	8,590	8,590	8,590	8,590	8,590
R-squared	0.143	0.082	0.089	0.077	0.070
Wald Chi 2 [p-value]	0.000***	0.000***	0.000***	0.000***	0.000***