

# Discretionary Accruals and COVID-19: Evidence from China

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## Abstract

The purpose of this dissertation is to examine the effect of COVID-19 on corporate earnings management behaviour. The challenges caused by the pandemic have heavily affected the operation and business performance of companies. Based on 6,042 firm-year observations of companies listed in the Shanghai Stock Exchange and Shenzhen Stock Exchange from 2019 to 2020, this dissertation provides evidence that the use of discretionary accruals slightly increased during COVID-19. The directionality of earnings management is mixed and subject to changes in the post-pandemic business environment. Furthermore, this dissertation explores the relationship between firm characteristics and discretionary accruals during the pandemic. The results show that smaller firms are more likely to engage in positive earnings management to boost their income and attract investors during the pandemic. Profitable firms tend to use discretionary accruals for financial performance window-dressing. Also, I find high leveraged firms tend to manage their earnings to avoid excess monitoring from lenders and debt covenant violation. There is weak evidence that firms in the essential industry may engage in income-increasing earnings management. This dissertation extends limited literature on the use of discretionary accruals during the pandemic and provides insights for regulators to monitor opportunistic behaviors in the global COVID-19 epidemic situation.

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## Attestation of Authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

Yifei Yin

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## **Chapter 1. Introduction**

The sudden outbreak of coronavirus (COVID-19) in Wuhan, China, at the beginning of 2020 has severely affected people's life. With the rapid spread of the disease and stringent anti-epidemic measures, the global viral outbreak slowed down the economy and progressed into a worldwide health crisis and financial crisis (Hassen et al., 2020). Such an economic downturn may create incentives for managers to manipulate earnings to alleviate the negative impacts (Choi et al., 2011). This dissertation aims to investigate how COVID-19 affects earnings management behavior and how firm characteristics influence choices of earnings management during the pandemic.

Previous research has provided some evidence on corporate earnings management behavior during the economic recession period. Filip and Raffournier (2014) find that the market could tolerate unexpected performance during a crisis period, and thus managers are less motivated to manage earnings. According to Lasdi (2013), in the 2008 global financial crisis in Indonesia, real activity earnings management decreased due to information asymmetry. Moreover, Habib et al. (2013) find financially troubled companies tend to reduce income through earnings management during the period of the global financial crisis in New Zealand. Chia et al. (2007) state that although high-quality auditing constrains earnings management, service-oriented listed companies in Singapore manage earnings downward.

In this dissertation, I argue that earnings management behavior is prevalent during COVID-19 and the likelihood of a firm engaging in income-increasing earnings management is greater. On the one hand, firms may conduct more earnings management since earnings numbers are associated with economic values. Managers have incentives to manage earnings to avoid unexpected losses in stock prices and self-interest (Mohanram, 2003; Bergstresser & Philippon, 2006; Burns & Kedia, 2009). On the other hand, managers tend to adopt income-increasing earnings management for financial

performance window-dressing. Previous research suggests that income-increasing earnings management is employed to compensate for poor operational performance (Ahmad-Zaluki et al., 2011). In addition, missing earnings targets results in further losses besides the negative impacts of COVID-19. Firms may therefore inflate earnings to achieve analysts' forecasts and avoid losses (Degeorge et al., 1999).

This dissertation is based on a sample of 6,042 firm-year observations of Chinese A-share listed companies from 2019 to 2020. Following the study of Dechow et al. (1995), discretionary accrual is measured by the residual value of the modified Jones model. The measure of discretionary accruals is further taken as the dependent variable in my regression model. The regression model includes variables of measures of firm size, financial distress, and leverage. A dummy variable is defined according to the sample period, whether it is in 2020, to explore the earnings management behavior in the post-period of COVID-19 and how firms' characteristics influence earnings management during the pandemic.

This dissertation provides evidence that the choices of earnings management are varied by firm characteristics. I find firms report more discretionary accruals and conduct income-increasing earnings management during COVID-19, which is consistent with my hypothesis. Furthermore, I explore how firm characteristics influence the use of discretionary accruals during the pandemic. I find a negative relationship between firm size and signed value of discretionary accruals, which suggests that larger firms tend to manipulate earnings downward (income-decreasing) and smaller firms are likely to manage earnings upward (income-increasing). This dissertation provides evidence that financially troubled firms have fewer earnings management behavior. Surprisingly, profitable firms tend to engage more in earnings management during the pandemic. Also, I find leverage ratio is positively associated with the unsigned (absolute) value of discretionary accrual, which indicates that high-leveraged firms tend to engage more in

earnings management to avoid monitoring from lenders and tighter contract terms in renegotiation.

This dissertation contributes to the literature in the following perspectives. First, prior research that focused on earnings management during the financial crisis mainly concentrated on the 2008 global financial crisis (GFC). The 2008 GFC was caused by excess liquidity, unordered subprime mortgage, and risk management failure (Orlowski, 2008; Hellenier, 2011). Such contributing factors in the financial system and business environment are endogenously related to behavior. However, the COVID-19 pandemic is quite different from the 2008 GFC. COVID-19 is defined as a public health crisis that is caused by a virus rather than financial system issues. Therefore, I can isolate the effect of a financial crisis on corporate behavior using exogenous shock. Second, this dissertation contributes to enriching literature on managers' incentives for earnings management. This dissertation provides insights into managers' incentives to manage earnings in response to the adverse macroeconomic environment. Third, a recent study by Xiao and Xi (2021) investigates how corporate governance affects earnings management during COVID-19 in China. My dissertation will extend the literature on how firm-level factors influence the choice of earnings management during COVID-19.

This dissertation proceeds as follows. Section 2 introduces the background of COVID-19 and provides a review of literature on the motivation of earnings management. Section 3 discusses hypothesis development. Section 4 presents the sample and methodology employed in this dissertation. Section 5 shows descriptive statistics and regression analysis results. Section 6 concludes.

## **Chapter 2. Literature Review**

### **2.1 Institutional setting**

Coronavirus (COVID-19) is an infectious disease. The World Health Organization categorized COVID-19 as a pandemic on 11th March 2020. The outbreak of COVID-19 led to a global economic downturn since it damaged the real supply chain and manufacturing. According to former Federal Reserve Chair Ben Bernanke, the 2008 Global Financial Crisis was triggered within the economic system, for example, the interest rate and subprime mortgage, and then the collapse of the banking system hit the real economy, however in contrast to past economic crises, the issue has started outside the economy in public health (Ryssdal & Wiles, 2020). Furthermore, the impact of COVID-19 is significant, with the most affected countries of the United States of America, India, Brazil, France, and the United Kingdom experiencing a decline in the annual growth rate of GDP by 3.4%, 7.3%, 4.1%, 7.9%, and 9.4%, respectively (The World Bank, 2021). Moreover, a recent study by Raifman et al. (2021) finds half of the individuals in the U.S. with incomes less than 75,000 dollars a year became unemployed from April to November 2020. Keogh-Brown et al. (2021) modeled that with an infection rate of 48% and fatality rate of 1.5%, the U.K. government would suffer health-related economic costs of approximately 39.6 billion pounds from COVID-19 alone.

The Chinese economy was also significantly affected. With the first confirmed case in China identified at the end of December 2019, close to the Spring Festival holiday, many workers returned to their hometowns. This resulted in city-wide lockdowns restricting them from returning to their place of employment. Even after the lockdown, productivity was likely reduced due to the social distance and limited maximum capacity, which may have particularly impacted some sectors.

According to the National Bureau of Statistics of China, China's indices of GDP by industry in the first quarter of 2020. The most severely affected industry was the hotels

and catering services, which is -39.5%, followed by -17.5% of wholesale and retail trades (National Bureau of Statistics, 2022). The enormous shock on the hotels and catering services is due to restrictions on travel. For example, restaurants, entertainment, and public facilities were not allowed to serve customers at their full capacity, and tourists were likely required to take home quarantine after travel, depending on local policy. The data of tourism revenue for the Labour Day holiday (1st May – 5th May) reported a decline of 70.11 billion RMB, which dropped 59.6% compared with 2019 (Yang, 2020). For the National Day holiday (1st October – 7th October), the tourism revenue decreased 28.2% (183.1 billion RMB) from the past year (East Money Information CO., Ltd, 2020).

In the following sub-sections, this dissertation reviews the literature on several general motivations of earnings management in relation to (1) managers' self-interests in terms of compensation agreements and insider stock trading, (2) SEO and IPO activities, and (3) strategic plans.

## 2.2 Managers' self-interests

Schipper (1989) defines earnings management as:

"a purposeful intervention in the external financial reporting process, with the intent of obtaining some private gain (as opposed to, say, merely facilitating the neutral operation of the process" (p. 92).

Viewed through the agency theory proposed by Jensen and Meckling (1976), managers, therefore, are motivated to conduct earnings management while their personal bonuses or compensation or other self-interests are associated with earnings performance.

Indeed, the practice of earnings management is prevalent, while the wealth of managers is tightly associated with stock and option values. Burns and Kedia (2009) find that firms, where CEOs' option portfolios are highly responsive to stock price, tend to adopt aggressive accounting practices. Bergstresser et al. (2004) provide considerable evidence that firms make overly optimistic predictions about their defined pension plans return when executives exercise options among 7,075 firm-year observations from 1991

to 2001. Furthermore, Bergstresser and Philippon (2006) analyze a sample of 8,870 observations of publicly held corporations and find that firms where the CEO's compensation is comprised mainly of the stock option report higher accruals, and CEOs are more likely to exercise stock options and sell shares in years that report higher accruals. Beneish and Vargus (2002) provide extended evidence on earnings management and inside shares trading. Based on a sample of 21,678 firm-years from 3,906 firms, they find that biased accruals are associated with managers buying or selling shares. The activities of insider shares selling are increased in the period of high income-increasing accruals, and the stock return and earnings are poor in the following periods. Sawicki and Shrestha (2008) further provide consistent evidence that firms with insider shares buying activities manage earnings downward and firms with insider shares selling activities manage earnings upward. These findings imply that the abnormal accruals are partially attributable to opportunistic behavior through earnings management.

### 2.3 Seasoned Equity Offering, Initial Public Offering, and Debt Covenants

Healy and Wahlen (1999) defined earnings management as:

"Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers" (p. 368).

A later study by Beneish (2001) argues that the practice of earnings management is more than just misleading outsiders. Since Healy and Wahlen (1999) interpret a situation where the firm attempts to signal its strength as misleading, distinguishing whether managers attempt to mislead or to convey information to investors through earnings manipulation can be complex (Beneish, 2001). Whatever the purpose is, since managers know more about the company's financial status than investors and outsiders, they can use information asymmetry in pursuit of their aims.

For example, firms are found to boost their incomes through earnings management around the period of the initial public offering and seasoned equity offering. Ritter (1991) evaluates the performance of a sample of 1,526 initial public offerings on the New York Stock Exchanges and NASDAQ. The findings suggest that investment on the first day of going public will decline to only 83 cents to each dollar after a three-year holding. Also, Teoh et al. (1998a) present substantial evidence that firms generally report aggressive abnormal accruals, therefore resulting in high return on sales during the issue-year. However, these firms perform poorly in subsequent periods since abnormal accruals cannot be sustained. Ducharme et al. (2001) investigate the opportunistic earnings management behavior prior to the initial public offering. They find managers report overly optimistic firm value by engaging in earnings management before going public. Similarly, Rangan (1998) and Teoh et al. (1998b) firms around SEOs engage income-increasing earnings management by reporting abnormal accruals but having poor stock returns in the following years. Cohen and Zarowin (2010) reveal that although accrual earnings management becomes costly to engage around SEOs due to the Sarbanes-Oxley Act<sup>1</sup> (SOX), firms substitute from accrual to real earnings management<sup>2</sup>.

Moreover, debt covenants are restrictions given by lenders to limit the actions of borrowers, for example, to require borrowers to meet a certain level of performance objectives. DeFond and Jiambalvo (1994) studied the abnormal accruals related to debt covenant violations. An analysis of debt covenant violations reported by 94 firms between 1985 and 1988, they find managers inflate earnings while the violation, especially when auditors are less likely to monitor accountings choices closely. DeAngelo et al. (1994)

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<sup>1</sup> Sarbanes-Oxley Act is a law passed by U.S congress to protect investors from fraudulent financial statement. It enhances the regulation and monitoring over securities, and impose serious penalties to lawbreakers (Cohen and Zarowin, 2010)

<sup>2</sup> Real earnings management is another type of earnings management, which refers to purposeful actions taken by managers to meet or beat financial target in short-term, which is achieved by adapting operations and economic activities, for examples cutting R&D expenditure, boosting sales through discount events (Gunny, 2005; Zang, 2012)

argue that firms in financial distress have a greater tendency to strategically deflate their earnings to obtain better terms in contract renegotiations. Specifically, 87% of their sample firms report large negative accruals to engaging in contract renegotiations with lenders. Jaggi and Lee (2002) extend the studies above and conclude that when the choice of earnings management is needed to solve problems related to debt covenants, it will be determined by firms' financial status. If firms face temporary financial difficulties, managers inflate earnings to avoid debt covenant violations. However, managers of severely distressed firms intentionally reduce earnings and thus show even worse performance, which may lead to debt restructure and enable them to have better terms in contract renegotiation.

### 2.3 Strategic plans

Besides the motivation related to managers' self-interest and the use of information asymmetry, studies have shown that firms manage earnings to avoid disclosing income losses and decreases in earnings as well as to achieve or surpass the expectations of analysts. (Burgstahler & Dichev, 1997; Degeorge et al., 1999). In addition, according to a comprehensive survey of 401 financial executives, most surveyed executives consider earnings, especially earnings per share, as critical information for investors (Graham et al., 2005). A key performance indicator of a firm is the ability to hit financial targets, and firms are even willing to accept small economic value losses in exchange for achieving the earnings expectations of outsiders (Graham et al., 2005). Firms that miss a few cents below the target set by either inside firms or outsiders may decline their stock price unexpectedly, while firms that beat the target by a few cents tend to boost their stock price (Mohanram, 2003). In addition, in consequence of missing analysts' forecasts of stock price (0.5%), firms suffer substantial losses on stock returns of about -10% to -15% and even decline more later (Skinner & Sloan, 2002).

Burgstahler and Dichev (1997) reveal that firms usually report slight increases in earnings and positive income instead of slight decreases in earnings and negative income, which suggests that earnings management is employed to avoid reporting decreases and losses in earnings. Similarly, Degeorge et al. (1999) state that the motivation of earnings management is mainly driven by two aspects, reporting profitability and achieving benchmarks. Also, the forecast error distribution can be explained by firms managing earnings to either "borrowing for a better today" or "saving for a better tomorrow (which is also known as cookie jar reserve)." In contrast to creating a "cookie jar" reserve mentioned above, "big-bath" accounting refers to firms that experience tough years, and the cost of being even worse is acceptable for managers (Mohanram, 2003). Fiechter and Meyer (2010) observed 383 bank-quarters during the 2008 Global Financial Crisis to see whether there was big-bath earnings management behavior. The results indicate that poor pre-managed banks report significant discretionary losses and are highly likely to report positive earnings in upcoming quarters. Therefore, given the circumstance of COVID-19, it is reasonable to doubt that managers could utilize a pandemic as an excuse to charge future expenses in the current period if current earnings are already far below expectation.

In contrast, later studies find managers may strategically manipulate earnings downward to obtain benefits. For example, Jones (1991) states that firms intentionally reduce earnings through accrual-based earnings management for economic benefit. By examining a sample of 23 firms in five different industries, Jones (1991) provides evidence that firms reduce profitability through earnings management to obtain relief benefits during import relief investigations. Besides, government subsidies are usually issued to financially troubled firms, and thus managers deflate earnings to secure government subsidies. Research by Jiang et al. (2018), using a sample comprised of all listed firms in China from 2004 to 2014, finds a significantly positive relationship between income-decreasing earnings management and subsidies from the government.

Their studies suggest that firms strategically manage earnings downward to obtain government subsidies.

### **Chapter 3. Hypothesis development**

The outbreak of COVID-19 has brought unprecedented challenges to China's economic development. In contrast to western countries, the Chinese government adopted tight COVID-19 curbs with city-wide lockdowns, which restrict flows of people and goods. Under the Zero-COVID policy, people are ordered to stay at home if confirmed cases are rising in the city. Even after the lockdown, productivity was likely reduced due to social distance and limited maximum capacity. Companies and factories are difficult to maintain normal operations. With the unprecedented logistic disruptions and stringent COVID measures, the productivity of firms is adversely affected, and economic activities are suppressed.

Given firm operation is negatively influenced during COVID-19. Therefore the use of discretionary accruals to manage earnings is expected to be prevalent. On the one hand, earnings numbers are associated with economic values. Firms that miss their earnings targets may bear unexpected losses in stock prices (Mohanram, 2003). Also, managers' compensation plans and other self-interest-related contracts may be associated with firms' performance. Therefore, managers tend to employ earnings management to achieve opportunistic purposes (Bergstresser & Philippon, 2006; Burns & Kedia, 2009). On the other hand, earnings fluctuations caused by business uncertainty during COVID-19 would cause economic losses to firms. Previous studies have discussed the importance of hitting financial targets and avoiding losses (Burgstahler & Dichev, 1997; Degeorge et al., 1999). Firms have already borne the losses due to the economic recession and, therefore, may boost their incomes to meet the targets as well as avoid further losses. Previous studies also provide evidence that firms tend to behave opportunistically on

earnings during the financial crisis. For example, Habib et al. (2013) found troubled financial firms intentionally reduced earnings during the period of the 2008 global financial crisis. Similarly, Chia et al. (2007) find that service-oriented firms in Singapore manage earnings downward during the Asian financial crisis. Therefore, I predict that managers tend to use discretionary accruals to manage earnings for their own purpose during COVID-19, and the first hypothesis will be:

**H1: The use of discretionary accruals to manage earnings is greater post-COVID-19.**

The second hypothesis discusses whether earnings management has a particular direction during COVID-19. To avoid earnings fluctuations under business uncertainty, firms can engage either in positive earnings management (income-increasing) or negative earnings management (income-decreasing). Although previous findings conclude that firms tend to report even lower earnings during recession periods to obtain government subsidies or take big-bath accounting practices (Mohanram, 2003; Chia et al., 2007; Habib et., 2013; Jiang et al., 2018), I argue that firms have greater incentives to boost incomes through income-increasing earnings management.

First, most companies may perform poorly during the recession, and thus there may be a tendency for managers to manipulate earnings upward to compensate for the negative impact of decreasing operational performance. Ahmad-Zaluki et al. (2011) find Malaysian IPOs firms inflate earnings to offset the underperformance of their operation and therefore meet the requirement of profit guarantees during the East Asian Crisis. Second, previous studies have discussed the importance of hitting financial targets and avoiding losses (Burgstahler & Dichev, 1997; Degeorge et al., 1999). Firms have already borne the losses due to the economic recession and, therefore, may boost their incomes

to meet the targets as well as avoid further losses. Third, debt covenants are restrictions given by lenders and are partially based on earnings (Dichev & Skinner, 2002). The pressure from debt covenants may motivate managers to inflate earnings to avoid violation.

Furthermore, the Chinese central government and local governments actively promote market recovery in regard to policies and domestic demands. In regard to the policies, besides the wide-range lockdown in the beginning of the pandemic (from January to April), the central government requires the lockdowns and quarantines must be precise and thus reduce the negative impact of confirmed cases. Additionally, according to the Ministry of Commerce of the People's Republic of China, more than 19 billion yuan of consumer vouchers were issued in more than 170 cities by May 2020 (People's Daily, 2020). The issue of vouchers aims to stimulate domestic consumption and thus recover the market. Therefore, firms may also boost their income in response to the market and convey positive information to the public that they are surviving the pandemic. Therefore, I provide the second hypothesis that:

## **H2: Firms tend to engage in positive earnings management post-COVID-19**

The last part of this dissertation will examine how firms' characteristics influence earnings management behavior during COVID-19. First, this dissertation will examine would smaller firms and bigger firms have different earnings management behavior during COVID-19. Larger-sized firms are hypothesized to have fewer earnings management behavior due to the following aspects. First, larger-sized firms are expected to suffer less from COVID-19 and have better resilience. Previous studies suggest that large enterprises have richer financial resources, for example, diversified business and supply chains, to deal with economic changes (Linnenluecke, 2017). Second, with the

increased monitoring during COVID-19, larger-sized firms may be scrutinized more closely by public enforcement. The China Security Regulatory Commission released a series of documents that require regulators to implement strict scrutiny on the capital market to ensure the stability of the market during COVID-19 (China Security Regulatory Commission, 2020a; China Security Regulatory Commission, 2020b). With the increased scrutiny of the capital market, larger-sized firms may face more restrictive governance from public enforcement as they are leaders in the market. Third, in such sensitive periods, firms of large size may consider costs of earnings management, for example, reputational risk. Prior studies documents that large firms enjoy the financial benefit from their great reputation (Sleuwaegen & Goedhuys, 2002), and thus they may consider the reputational risk if earnings management is detected (Kim & Rhee, 2003). Thus:

**H3a: Firm size is negatively associated with discretionary accruals during the pandemic.**

Firm distress would play a role in earnings management behavior during the pandemic. Distressed firms are negatively influenced by COVID-19. The COVID-19 pandemic and related measures implemented by the government to tackle the health crisis have led to acute liquidity problems in business. However, distressed firms may have difficulties finding financial support from financial institutions, given their poor performance. Therefore, distressed firms tend to manipulate earnings to gain support or mask their poor performance.

Previous studies provide considerable evidence that distressed companies distort earnings to achieve different purposes. Chen et al. (2010) state that financially troubled companies boost their income to protect them from delisting and excessive scrutiny from public enforcement. Furthermore, distressed companies are found to manage earnings

downward because managers adopt big-bath accounting practices, and firms are likely to receive government subsidies during the crisis (Mohanram, 2003; Jiang et al., 2018). The use of earnings management seems to be a rational managerial choice for troubled firms during the pandemic because (i) managers may prepare for greater post-shock performance improvement (Habib et al., 2013), (ii) it is not necessary to pretend to be profitable since market expectation on firms' performance is low during bad times (Filip & Raffournier, 2014). Therefore, I make the consistent hypothesis that financially troubled firms have a greater tendency to engage in earnings management.

**H3b: Firm distress is positively associated with discretionary accruals during the pandemic.**

Third, the relationship between leverage and discretionary is expected to be positive. Previous studies provide considerable evidence in this area. On the one hand, firms have incentives to aggressively manage earnings to avoid debt covenant violations and adopt accounting practices to boost current income (Becker et al., 1998; Watts and Zimmerman, 1990). Jaggi and Lee (2002) state that firms' financial positioning affects the relationship between debt contracts and choice of earnings management. Managers may boost income if the financial difficulties are temporary. However, managers may report even lower earnings in pursuit of contract renegotiation. On the other hand, High leveraged firms transmit a negative signal to the public, and firms may therefore engage more in earnings management to mask their unfavorable financial performance to attract potential investors (Beatty & Weber, 2003; Ruwanti et al., 2019).

Given the background of COVID-19, firm performance is negatively affected. Poor performance may result in tighter contract terms or higher interest rates (Beatty & Weber, 2003). In other words, firms that miss certain requirements would increase the

cost while renegotiating contract terms. Therefore, managers in high-leveraged firms may manage earnings to mask their financial positioning and avoid potential risk from debt covenants during the pandemic. Thus, I hypothesize that:

**H3c: Leverage is positively associated with discretionary accruals during the pandemic.**

Finally, essential industries were identified to ensure basic livelihood needs and help key workers return to their workplace during community restrictions (Cybersecurity and Infrastructure Security Agency, 2020). According to the guidance provided by the Cybersecurity and Infrastructure Security Agency (CISA), the essential industries include government facilities and industries closely related to basic livelihood, for example, energy, food and agriculture, healthcare, and public health. Although the guidance is introduced based on the demand of U.S. society, the basic needs are similar across economies. Since these industries acquire advantages in returning to normality, I assume that these industries may exhibit profitability during the pandemic. However, a previous study by Filip and Raffournier (2014) find that the market tolerates underperformance during a crisis. Also, Degeorge et al. (1999) suggest that firms may save earnings for a better tomorrow. Therefore, it is plausible that essential-industry firms reduce earnings in response to other uncertainties of the unfinished pandemic. Thus, I hypothesize that:

**H3d: Essential industry is negatively associated with discretionary accruals during the pandemic.**

#### **Chapter 4. Sample and methodology**

#### 4.1 Sample Selection

The data is retrieved from the Refinitiv Eikon database. There is a total of 4,748 listed firms on Shanghai Stock Exchange and Shenzhen Stock Exchange from 2019 to 2020. Thus, the initial sample comprises 9,496 firm-year observations from 2019 to 2020. 2019 is defined as the pre-period of COVID-19. 2020 is the post-period of COVID-19 because the outbreak of the pandemic happened around the first quarter of 2020. The reason for not including 2021 in the post-period is that most of the companies did not yet report their financial statements while conducting this dissertation. The modified Jones model requires data on total assets, receivables, revenues, and property plant and equipment. The designed regression model comprises of debt-to-equity ratio and firm distress measured by Altman's Z-score using working capital, retained earnings, the market value of equity, and the book value of the liability. There are 1,380 firm-year observations removed because they have missing variables among lagged total assets, receivables, and property, plant, and equipment in the modified Jones model. To ensure consistency across two regressions, data are required to be available for all variables in both 2019 and 2020. Thus, there are 2,074 firm-year observations dropped with missing values of working capital and retained earnings while progressing the Altman's Z-score in the designed regression analysis. Therefore, the final sample comprises 6,042 firm-year observations that have full data from 2019 to 2020.

#### 4.2 Measurement for Earnings Management: Discretionary Accruals

Following Dechow et al. (1995), this dissertation uses the modified Jones model to measure discretionary accruals (*DACC*). The accrual-based accounting is based on the total accrual components of earnings, which are discretionary accruals and non-discretionary accruals. The non-discretionary accruals will be estimated through the

modified Jones model, where the discretionary accruals will be total accruals minus non-discretionary accruals.

- The Modified Jones Model is described in the following equation:

$$\frac{TA_{it}}{ASSET_{it-1}} = \alpha_i \left( \frac{1}{ASSET_{t-1}} \right) + \beta_1 \left( \frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{ASSET_{i,t-1}} \right) + \beta_2 \left( \frac{PPE_{i,t}}{ASSET_{i,t-1}} \right) + \varepsilon_{i,t}$$

In the above equation,  $TA_{it}$  (*Total accruals*) is calculated by using profit before tax minus net cash flow from operations.  $ASSET_{i,t-1}$  is the total assets in year t-1.  $\Delta REV_{i,t}$  (*Revenue*) is the change in operating revenue from year t to year t-1.  $\Delta REC_{i,t}$  (*Receivables*) is the change in account receivable from year t to year t-1.  $PPE_{i,t}$  (*Property, Plant and Equipment*) is the gross property plant and equipment in year t. Discretionary accruals (*DACC*) is the residual value of the equation<sup>3</sup>.

#### 4.3 Regression model

The following equation is designed to examine the effect of firm characteristics on earnings management during COVID-19.

$$\begin{aligned} DACC_{i,t} = & \alpha + \beta_0 POST_{i,t} + \beta_1 SIZE_{i,t} + \beta_2 DISTRESS_{i,t} + \beta_3 LEVERAGE_{i,t} \\ & + \beta_4 ESSENTIAL_{i,t} + \beta_5 SIZE_{i,t} * POST + \beta_6 DISTRESS_{i,t} * POST \\ & + \beta_7 LEVERAGE_{i,t} * POST + \beta_8 ESSENTIAL * POST_{i,t} + \varepsilon_{i,t} \end{aligned}$$

$DACC_{i,t}$  is the discretionary accrual, which is the outcome from the modified Jones model. I also perform regression analysis on the absolute value of discretionary accruals termed  $|DACC_{i,t}|$ . Following Hribar and Nichols (2007), the original value of discretionary accruals ( $DACC_{i,t}$ ) is better at testing the direction of discretionary accruals,

<sup>3</sup> Previous studies suggest that the level of discretionary accruals could vary across different industries (DeFond & Jiambalvo, 1994). To avoid bias, an industrial fixed effect is included in the model based on the Global Industry Classification Standard (GICS). A total of 22 industries are identified for the sample.

for example, whether firms manipulate discretionary accruals to boost income or reduce income. The absolute value of discretionary accruals ( $|DACC_{i,t}|$ ) is better at investigating the relationship between specific firm characteristics and discretionary accruals regardless of directional prediction and the magnitude of the use of discretionary accruals (Hribar & Nichols, 2007). Therefore, the first hypothesis will be tested based on the absolute value of discretionary accruals, and the second hypothesis will be examined by using the original value of discretionary accruals.  $DACC_{i,t}$  in positive represents that firm  $i$  boost earnings through discretionary accruals in year  $t$ . In contrast, a negative value of  $DACC_{i,t}$  indicates that firm  $i$  reduces earnings through discretionary accruals during year  $t$ . Thus, I will separate the sample into two sub-groups,  $DACC < 0$  and  $DACC > 0$ , to further investigate the relationship between firm characteristics and discretionary accruals.  $Post$  is a dummy variable coded as 1 if for the year 2020, 0 for the year 2019 (the cut-off point is according to the COVID-19 outbreak).

The firm-level characteristics will consist of the following variables.  $SIZE$  is measured as the natural logarithm of the firm's total asset.  $DISTRESS$  is measured by Altman's Z-score (Altman, 1968). Altman's Z-score is well-known for measuring financial distress, particularly for publicly traded firms. It is calculated by following equation:  $Z\text{-score} = 1.2 (\text{Working capital}/\text{Total assets}) + 1.4 (\text{Retained Earnings}/\text{Total Assets}) + 3.3(\text{EBIT}/\text{Total Assets}) + 0.6(\text{Market Value of Equity}/\text{Book Value of Liability}) + 1.0 (\text{Sales}/\text{Total Assets})$ . The higher value of the score represents companies in better financial positioning, and the lower value of the score indicates that firms are in financial trouble. Thus, to test my hypothesis  $H3b$ , the results in regression analysis are expected to be negatively associated with discretionary accruals. In other words, financially troubled firms have more managerial earnings manipulation.  $LEVERAGE$  is the ratio of total debt to total equity. A positive relationship between leverage and discretionary accruals is expected since previous studies have found that increased leverage induces

the use of discretionary accruals (Beatty & Weber, 2003; Ruwanti et al., 2019). *ESSENTIAL* is a dummy variable coded as 1 if firms are identified as essential industries according to Cybersecurity and Infrastructure Security Agency (CISA). These industries include public facilities and critical infrastructure that maintain basic livelihood during COVID-19. All variables are winsorized at the top 1 and bottom 1 percentage to control for outliers.

## **Chapter 5. Results**

### 5.1 Descriptive statistics

Panel A of Table 1 presents the descriptive statistics of variables in regression analysis. The mean value of *DACC* equals 0 since this dissertation measures discretionary accruals as the residual value from the modified Jones model as the value of discretionary accruals, and the data are clustered around the mean (standard deviation = 0.115). Since this dissertation requires the data must have non-missing data in both 2019 and 2020, the dummy variable of *POST* reports both mean and median values of 0.500. The mean value of *ESSENTIAL* is 0.225, which means 680 out of 3021 (22.5%) firms fall into the essential industry. Of these firms, 267 firms (39%) are in the chemistry industry, and 122 (18%) are in the critical manufacturing industry. A large percentage of the chemistry industry is mainly taken by pharmaceutical and medical firms. The maximum value of *DISTRESS* is considerable. I further noticed that the 95<sup>th</sup> percentile has a value of 17.965. Firms within the top 5% of *DISRESS* have higher working capital, retained earnings, or market value of equity and a smaller book value of liability than others. These factors result in a great value of *DISTRESS* according to the formula of Altman's Z-score. It may result from firms downsizing their debt structure during COVID-19 (Varghese & Haque, 2021), but investors still hold growth prospects for these companies.

Panel B of Table 1 presents the correlation matrix of all variables. The results indicate that there is no collinearity between variables. The absolute correlation coefficients between variables are all smaller than 0.8, and thus, the multicollinearity is not likely a major concern in analysis. Surprisingly, *DISTRESS* is significantly positively correlated with *DACC*, which implies that un-distressed firms tend to manipulate earnings. *SIZE* is significantly positively correlated with *DACC*. It suggests that larger size of firms engages more in earnings management to meet market expectation or analysts' target (Noor et al., 2015). *Distress* is negatively correlated with *SIZE* and *LEVERAGE*, which implies that larger-sized firms rarely become financially distressed firms, and firms with better financial situation have lower leverage. *SIZE* is positively correlated with *LEVERAGE* suggesting that larger sized firms have higher leverage ratio.

**Table 1. Descriptive Statistics & Correlation Matrix**

Panel A. Descriptive Statistics								
<i>Variable</i>	<i>Mean</i>	<i>Std. Dev</i>	<i>Medium</i>	<i>25%</i>	<i>75%</i>	<i>Min.</i>	<i>Max.</i>	<i>N</i>
<i>DACC</i>	0.000	0.115	0.003	-0.036	0.04	-1.488	3.443	6,042
<i>/DACC/</i>	0.062	0.096	0.039	0.017	0.075	0.000	3.443	6,042
<i>POST</i>	0.500	0.500	0.500	0.000	1.000	0.000	1.000	6,042
<i>ESSENTIAL</i>	0.225	0.418	0.000	0.000	0.000	0.000	1.000	6,042
<i>SIZE</i>	15.467	1.266	15.328	14.558	16.207	12.958	19.361	6,042
<i>DISTRESS</i>	5.356	7.069	3.147	1.734	5.930	-1.038	45.824	6,042
<i>LEVERAGE</i>	0.490	0.683	0.315	0.124	0.557	0.000	4.556	6,042

  

Panel B. Correlation Matrix						
	(1)	(2)	(3)	(4)	(5)	(6)
<i>DACC (1)</i>	1					
<i>POST (2)</i>	0.0067	1				
<i>SIZE (3)</i>	0.0522***	0.0319***	1			
<i>DISTRESS (4)</i>	0.109***	0.0068	-0.296***	1		
<i>LEVERAGE (5)</i>	-0.0419***	-0.281***	0.324***	-0.320***	1	
<i>ESSENTIAL (6)</i>	-0.0022	0.000	0.0979***	0.0167	0.0145	1

**Notes:** *DACC* is calculated by using the modified Jones model to measure earnings management. The equation is described as follows:

$$\frac{TA_{it}}{ASSET_{it-1}} = \alpha_i \left( \frac{1}{ASSET_{t-1}} \right) + \beta_1 \left( \frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{ASSET_{i,t-1}} \right) + \beta_2 \left( \frac{PPE_{i,t}}{ASSET_{i,t-1}} \right) + \varepsilon_{i,t}$$

Where  $TA_{it}$  (Total accruals) is calculated by using profit before tax minus net cash flow from operations.  $ASSET_{it-1}$  is the total assets in year t-1.  $\Delta REV_{i,t}$  is the change in operating revenue from year t-1 to year t.  $\Delta REC_{i,t}$  is the change in account receivable from year t-1 to year t.  $PPE_{i,t}$  is the gross property plant and equipment in year t.  $DACC$  is the residual value of the modified Jones model.  $POST$  is a dummy variable coded as 1 if the firm-year observation is from 2020 and 0 if the firm-year observation comes from 2019.  $DACC > 0$  indicates that firms manipulate earnings upward, and  $DACC < 0$  represents firms managing earnings downward.  $SIZE$  is measured using the log value of total assets.  $DISTRESS$  is measured by Altman's Z-score, which equals to 1.2 (Working capital/Total assets) + 1.4 (retained earnings/ Total assets) + 3.3(EBIT/ Total assets) + 0.6(Market value of equity/book value of liability) + 1.0 (Sales/ Total assets).  $Leverage$  is the ratio of total debt to total equity.  $ESSENTIAL$  is a dummy variable coded as 1 if firms are identified as essential according to Cybersecurity and Infrastructure Security Agency (CISA).

\*, \*\*, and \*\*\* represents significance at level of .05, .01 and .001, respectively

**Table 2. Essential Industry and Non-Essential Industry**

Essential Industry	
Chemical	267
Communications	25
Critical Manufacturing	122
Energy	85
Financial Services	18
Food and Agriculture	56
Health care Public Health	8
Transportation	60
Water and Wastewater System	24
Professional Services	15
Total	680
Non-essential Industry	
	2341

## 5.2 Univariate analysis

Table 3 includes the t-test results of all variables. There is no significant difference in discretionary accruals between the pre and post-period of the pandemic (mean difference is 0.00674 and *p-value* is 0.6018). Surprisingly, *SIZE* is higher during the post-period of COVID-19. The increased total assets could be a result of the overstocked products. He et al. (2020) uses synthetic index compilation and big data to conduct

accounting indexes that capture periods before and after COVID-19 in China. They find that the inventory index shows a significant upward trend during the pandemic due to road blockades. According to the Ministry of Commerce of the People's Republic of China, in 2019, the total amount of transactions in e-business reached 34.81 trillion yuan, including 10.63 trillion yuan (a growth of 16.5% from 2018) in online retail sales (Ministry of Commerce of the People's Republic of China, 2020). Such explosive growth may cause firms to keep seeking opportunities to expand the business, and thus more products are ready for market before COVID-19. However, the e-business relies heavily on the courier business. The road blockade and quarantine policies issued by local governments increased the cost of transportation. Overall, the negative impact of COVID-19 may result in overstocking of inventory and thus, an increase in total assets. *LEVERAGE* is significantly lower in the post-period of the pandemic, consistent with Varghese and Haque (2021). Their findings state that the impact of COVID-19 reduced the optimal level of corporate leverage on U.S. public firms, and thus firms de-leverage for financial stability.

**Table 3. Univariate Test Results**

	Pre	Post	Mean diff.(Post - Pre)	t-value	p-value
<i>DACC</i>	-0.00770	0.000770	0.00154	0.522	0.602
<i> DACC </i>	0.0624	0.0624	0.0000309	0.0125	0.990
<i>DACC &gt; 0</i>	0.0581	0.0610	0.00297	0.784	0.433
<i>DACC &lt; 0</i>	-0.0672	-0.0638	0.00336	1.0808	0.280
<i>SIZE</i>	15.426	15.506	0.0808*	2.485	0.013
<i>DISTRESS</i>	5.507	5.903	0.396	1.193	0.233
<i>LEVERAGE</i>	68.999	29.816	-39.184***	-22.375	0.000

**Notes:** *DACC* is calculated by using the modified Jones model to measure earnings management. The equation is described as follows:

$$\frac{TA_{it}}{ASSET_{it-1}} = \alpha_i \left( \frac{1}{ASSET_{t-1}} \right) + \beta_1 \left( \frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{ASSET_{i,t-1}} \right) + \beta_2 \left( \frac{PPE_{i,t}}{ASSET_{i,t-1}} \right) + \varepsilon_{i,t}$$

Where  $TA_{it}$  (Total accruals) is calculated by using profit before tax minus net cash flow from operations.  $ASSET_{it-1}$  is the total assets in year t-1.  $\Delta REV_{i,t}$  is the change in operating

revenue from year t-1 to year t.  $\Delta REC_{i,t}$  is the change in account receivable from year t-1 to year t.  $PPE_{i,t}$  is the gross property plant and equipment in year t.  $DACC$  is the residual value of the modified Jones model.  $POST$  is a dummy variable coded as 1 if the firm-year observation is from 2020 and 0 if the firm-year observation comes from 2019.  $DACC > 0$  indicates that firms manipulate earnings upward, and  $DACC < 0$  represents firms managing earnings downward.  $SIZE$  is measured using the log value of total assets.  $DISTRESS$  is measured by Altman's Z-score, which equals to  $1.2 (\text{Working capital}/\text{Total assets}) + 1.4 (\text{retained earnings}/\text{Total assets}) + 3.3(\text{EBIT}/\text{Total assets}) + 0.6(\text{Market value of equity}/\text{book value of liability}) + 1.0 (\text{Sales}/\text{Total assets})$ .  $Leverage$  is the ratio of total debt to total equity.  $ESSENTIAL$  is a dummy variable coded as 1 if firms are identified as essential according to Cybersecurity and Infrastructure Security Agency (CISA).

\*, \*\*, and \*\*\* represents significance at level of .05, .01 and .001, respectively

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### 5.3 Regression analysis

Table 4 presents the regression results with the signed and absolute value of  $DACC$ , respectively. The dependent variables of columns (1) and (3) are the signed value of discretionary accruals, and the dependent variables of columns (2) and (4) are the unsigned (absolute) value of discretionary accruals. By separating firms into two groups of  $DACC > 0$  and  $DACC < 0$ , columns (5) and (6) report the regression results of testing whether firm characteristics have a different relationship with positive and negative discretionary accruals during the pandemic.

To address my first hypothesis that the use of discretionary accruals to manage earnings is greater during COVID-19, I use the absolute value of  $DACC$  following the study of Hribar and Nichols (2007), which state that the absolute value of discretionary accrual is the best measure of the extent to which companies manage earnings through using accruals.

The results in column (2) report that  $POST$  is positively associated with the absolute value of discretionary accruals ( $|DACC_{i,t}|$ ). The coefficient is significant at 5% confidence level. Consistent with the first hypothesis, it means that the use of discretionary accruals (either positive or negative earnings management) slightly increased during COVID-19. However, after including interaction variables,  $POST$  is not

significantly associated with  $|DACC_{i,t}|$  in column (4). One plausible explanation is that there is variation in the role firm characteristics play in earnings management during the pandemic, and thus any earnings management effect is subject to control for changes in the post-pandemic business environment.

I further explore whether firms tend to engage in positive earnings management (income-increasing earnings management) during the pandemic. The coefficient of *POST* in column (1) is not significant. However, in column (3), the coefficient of *POST* becomes significant and positive after interaction variables are added (coefficient of 0.0869 is significant at .05). As this contrasts with the results for *DACC*, it again suggests that earnings management is subject to control for changes in the post-pandemic business environment. Such a result is consistent with my hypothesis that firms engage income-increasing earnings management to compensate for poor operational performance during the pandemic. The choice of income-increasing earnings management may reduce the risk of earnings fluctuations induced by environmental uncertainty and thus convey positive signals to stakeholders. From the perspective of capital market pressure, firms that fail to meet certain earnings targets may face the risk of delisting. For example, listed companies will receive warnings if net profit is less than one hundred million yuan and if companies with net profits of less than one hundred million yuan for two consecutive years will be forced to delist.

To provide further insight, I divide firms into two groups: firms with positive discretionary accruals and firms with negative discretionary accruals. I find that *POST* is only significant in  $DACC > 0$ , where the coefficient is 0.117 and significant at .05. This suggests that firms manage earnings upward before increasing the use of discretionary accruals in the post-pandemic period. There is no significant change in the use of discretionary accruals for firms that adopt income-decreasing earnings management in

the pre and post-period of the pandemic. Thus, the overall results provide weak evidence that firms inflate incomes through earnings management in post period of COVID-19.

The third hypothesis is to examine how firm characteristics influence the use of discretionary accruals during the pandemic. For *H3a*, the result in column (3) is consistent with the hypothesis. I find that smaller-sized firms report higher discretionary accrual (income-increasing) in post-pandemic, but larger-sized firms report lower discretionary accruals (income-decreasing) in post-period pandemic (coefficient value of *SIZE\*POST* is -0.00632, which is significant at .05 level). In the sub-group test of *DACC*>0, the negative coefficient on *SIZE\*POST* is more significant than with *DACC*. It strengthens the finding of smaller-sized firms that report higher discretionary accruals during post period of the pandemic. However, in the sub-group test of *DACC*<0, the coefficient on *SIZE\*POST* is insignificant. The overall results indicate that smaller firms suffer more during COVID-19 and thus conduct income-increasing earnings management. Several explanations are possible for such findings. Smaller-sized firms have fewer financial resources in respect of diversified business structure and financial support. It would be difficult for firms to expand business diversity in the recession period. Therefore, smaller firms boost their income through earnings management to attract investors and obtain financial support ((Linnenluecke, 2017). As for larger firms, a plausible explanation for income-decreasing earnings management is that firms adopt the practice of cookie jar reserve to mitigate the uncertainties of COVID-19.

For *H3b*, the coefficient of *DISTRESS\*POST* is insignificant with *DACC*, which provides no evidence to the hypothesis that distressed firms tend to manage earnings upward or downward in this period. However, the coefficient of *DISTRESS\*POST* is positive and statistically significant with */DACC/*. Such a finding suggests that profitable firms tend to conduct more earnings management, which is contrary to my hypothesis. According to Security Times China (2021), the Chinese government granted a total of

211.6 billion yuan to 98% of listed firms. Therefore, distressed firms are not necessary to manage earnings to secure government subsidies since most of the listed firms benefit from policies. As for un-distress or profitable firms, a good financial positioning provides managers more flexibility on earnings management since they are relatively less affected. On the one hand, these firms may choose to adopt cookie jar reserve accounting practices to save money and alleviate uncertainties in subsequent periods, and thus appear to have more earnings management. On the other hand, managers can inflate earnings to strengthen their financial disclosure, which enables firms to attract investors and obtain advantages in the depressed stock market.

*LEVERAGE\*POST* is positively associated with the absolute value of discretionary accruals (coefficient value of 0.0673 is statistically significant at .001 level). It implies that firms with higher leverage engage more in earnings management than lower-leveraged firms during COVID-19. On the one hand, firms are negatively influenced during the pandemic, which may further affect their debt covenant. Poorly performed firms may have difficulties meeting a certain level of performance required by their debt covenant, which may result in tighter contract terms or debt violation. To avoid violation and renegotiation, high-leveraged firms would manage earnings to mask their financial positioning. I find weak evidence that could support this explanation since the coefficient of *LEVERAGE\*POST* in the sub-group test of  $DACC > 0$  is significantly positive. It suggests that higher-leveraged firms tend to inflate earnings through earnings management to enhance performance. On the other hand, managers in high-leveraged firms may realize the risk of staying in high leverage positioning since the optimal level of leverage is reduced on average during the pandemic (Varghese & Haque, 2021). To maintain financial stability, managers massively conduct earnings management<sup>4</sup>.

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<sup>4</sup> This dissertation is limited to provide explanation that *LEVERAGE\*POST* is significant in the sub-group test of  $DACC > 0$  and  $DACC < 0$ . Further research is expected to look into this.

The coefficient of *ESSENTIAL\*POST* is only significant and positive in the subgroup test of  $DACC < 0$ . The result provides weak evidence that firms in the essential industry engage income-increasing earnings management during the post-period of the pandemic. Since essential industries may have advantages in policies (i.e., earlier to return normality), these firms tend to disclose better performance to convey positive information to the public.

**Table 4. Regression Results**

	(1) DACC	(2)  DACC	(3) DACC	(4)  DACC	(5) DACC>0	(6) DACC<0
<i>POST</i>	-0.00190 (-0.61)	0.00638* (2.49)	0.0869* (2.21)	0.0260 (0.80)	0.117* (2.28)	0.0389 (0.98)
<i>SIZE</i>	0.00986*** (7.40)	-0.0125*** (-11.32)	0.0130*** (6.81)	-0.0122*** (-7.75)	-0.00674** (-2.73)	0.0163*** (8.39)
<i>DISTRESS</i>	0.00221*** (9.50)	0.0000238 (0.12)	0.00215*** (6.31)	-0.000372 (-1.31)	0.000845* (2.03)	0.00173*** (4.66)
<i>LEVERAGE</i>	-0.00632* (-2.53)	0.0139*** (6.68)	-0.00840** (-3.17)	0.0107*** (4.90)	0.00636 (1.79)	-0.0134*** (-5.20)
<i>ESSENTIAL</i>	-0.00179 (-0.39)	-0.00151 (-0.40)	-0.00605 (-1.05)	0.000870 (0.18)	-0.00358 (-0.48)	-0.00735 (-1.26)
<i>SIZE*POST</i>			-0.00632* (-2.45)	-0.00307 (-1.44)	-0.00972** (-2.90)	-0.00194 (-0.74)
<i>DISTRESS*POST</i>			0.000258 (0.55)	0.00145*** (3.70)	0.00202*** (3.46)	-0.000759 (-1.51)
<i>LEVERAGE*POST</i>			0.0165 (1.34)	0.0673*** (6.58)	0.0953*** (5.79)	-0.0387** (-3.21)
<i>ESSENTIAL*POST</i>			0.00843 (1.20)	-0.00492 (-0.84)	0.00468 (0.51)	0.0153* (2.16)
<i>_Cons</i>	-0.160*** (-7.76)	0.247*** (14.40)	-0.205*** (-6.99)	0.245*** (10.08)	0.155*** (4.04)	-0.315*** (-10.53)
N	6042	6042	6042	6042	3163	2879

Adjusted R<sup>2</sup>    0.0173            0.0335            0.018            0.0402            0.0426            0.084

**Notes:** *DACC* is calculated by using the modified Jones model to measure earnings management. The equation is described as follows:

$$\frac{TA_{it}}{ASSET_{it-1}} = \alpha_i \left( \frac{1}{ASSET_{t-1}} \right) + \beta_1 \left( \frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{ASSET_{i,t-1}} \right) + \beta_2 \left( \frac{PPE_{i,t}}{ASSET_{i,t-1}} \right) + \varepsilon_{i,t}$$

Where  $TA_{it}$  (Total accruals) is calculated by using profit before tax minus net cash flow from operations.  $ASSET_{it-1}$  is the total assets in year t-1.  $\Delta REV_{i,t}$  is the change in operating revenue from year t-1 to year t.  $\Delta REC_{i,t}$  is the change in account receivable from year t-1 to year t.  $PPE_{i,t}$  is the gross property plant and equipment in year t. *DACC* is the residual value of the modified Jones model. *POST* is a dummy variable coded as 1 if the firm-year observation is from 2020 and 0 if the firm-year observation comes from 2019.  $DACC > 0$  indicates that firms manipulate earnings upward, and  $DACC < 0$  represents firms managing earnings downward. *SIZE* is measured using the log value of total assets. *DISTRESS* is measured by Altman's Z-score, which equals to 1.2 (Working capital/Total assets) + 1.4 (retained earnings/ Total assets) + 3.3(EBIT/ Total assets) + 0.6(Market value of equity/book value of liability) + 1.0 (Sales/ Total assets). *Leverage* is the ratio of total debt to total equity. *ESSENTIAL* is a dummy variable coded as 1 if firms are identified as essential according to Cybersecurity and Infrastructure Security Agency (CISA).

\*, \*\*, and \*\*\* represents significance at level of .05, .01 and .001, respectively

## Chapter 6. Conclusion

This dissertation examines the impact of COVID-19 on corporate earnings management behavior and discusses the influence of firm characteristics on the practice of discretionary accruals. I find weak evidence that firms conduct more earnings management in the post-period of COVID-19. This finding suggests that the adverse impact of COVID-19 on firms results in managers managing earnings to overcome financial difficulties and achieve their own purposes. Furthermore, the results show that firms tend to inflate income through earnings management in the post-period of COVID-19. Such a choice of earnings management could be either an attempt to achieve financial targets or compensation for inadequate performance (Burgstahler & Dichev, 1997; Degeorge et al., 1999; Ahmad-Zaluki et al., 2011). This dissertation provides mixed evidence that the use of discretionary accruals is subject to changes in the post-pandemic business environment.

Both findings are contrary to previous studies that firms are restricted in earnings management and tend to reduce earnings during crisis periods (Habib et al., 2013; Lasid, 2013; Filip & Raffournier, 2014). On the one hand, the motivation of earnings management during COVID-19 may differ from the previous crisis period. The current recession is caused by public health instead of problems within the financial system. Firms may believe that once COVID-19 is resolved, the daily operations, as well as the macroeconomy, will return to normal. Therefore, the practice of earnings management is likely capable of overcoming temporary financial difficulties. On the other hand, previous studies suggest that income-decreasing earnings management can help firms obtain government subsidies (Jones, 1991; Jiang et al., 2018). However, such adoption is not necessary during COVID-19 since nearly all listed firms received government subsidies during the pandemic.

I further explore how firm characteristics influence earnings management behavior during COVID-19. First, I find that larger-sized firms tend to manage earnings downward, and smaller-sized firms are more likely to manage earnings upward during COVID-19. Large firms potentially adopt the practice of cookie jar reserve to alleviate uncertainties in the following periods. Smaller firms may have relatively fewer financial resources, and thus they conduct income-increasing earnings management to attract investors and obtain financial support during the pandemic.

Second, I find that distressed firms conduct fewer earnings management, but firms in better financial positioning conduct more earnings management during COVID-19. One plausible explanation is that better-performed firms enable managers more flexibility in earnings management. Managers can either report better earnings performance to attract investors and obtain advantages in stock markets or save money in response to uncertainties from the ongoing pandemic. Another reason could be that government subsidies cover nearly all listed firms, and thus distressed firms are not

necessary to manage earnings to secure government subsidies, as previous studies suggested (Jones, 1991; Jiang et al., 2018).

Third, higher-leveraged firms engage in more earnings management, and lower-leveraged firms engage in fewer earnings management during COVID-19. Although previous studies suggest that high-leveraged firms have less flexibility to engage in earnings management, a recent study by Varghese and Haque (2021) finds the optimal level of corporate leverage is reduced on average to maintain financial stability during the pandemic. My finding partially supports such finding since there is no significant evidence for the direction but magnitude of the use of earnings management. For those firms that remain in high leverage ratio, managers may conduct earnings management to exhibit good performance to lenders and thus avoid debt covenant violation or tighter contract terms in contract renegotiation.

Finally, this dissertation provides weak evidence that firms in essential industries manipulate earnings upward during the pandemic. Essential industries are identified to maintain basic livelihood during the period of the pandemic. Therefore, essential industries may have advantages in policies. For example, workers may return workplace earlier. Firms may transmit a positive signal to the public that basic livelihood needs are guaranteed.

Despite the fact that the impact of COVID-19 has received considerable attention, this paper contributes to the following perspectives. First, prior studies of the impact of the financial crisis on discretionary accruals are mainly focused on the 2008 global financial crisis. This paper provides insights into the effects of COVID-19 on discretionary accruals since the current financial recession is induced by public health instead of financial system problems, which leads to different motivations and behaviors of earnings management. Second, this dissertation extends the literature on the relationship between Chinese listed firm characteristics and earnings management during

the pandemic. Third, under the Zero-COIVD policy, the Chinese business environment still faces uncertainties of the pandemic. My dissertation may provide insights to regulators to ensure the quality of earnings during the pandemic.

There are a few limitations to this dissertation. First, this dissertation uses the discretionary accrual model, which does not consider earnings manipulation through real earnings activities. Second, this dissertation includes data from 2019 and 2020 only. However, the pandemic is still going on. Further research may retrieve more years to investigate the earnings persistency and quality for firms that engage in earnings management in subsequent periods.

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