The impact of the Chinese stimulus program on earnings management

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Abstract

Purpose – The purpose of this paper is to investigate the impacts of the 2008 Chinese stimulus program on earnings management.

Design/methodology/approach – Using a sample period from 2004 to 2011 (per-stimulus period: 2004-2007 and post-stimulus period: 2008-2011), the authors compare the change in earnings management between the firms that received the stimulus funds and those that did not receive the stimulus funds.

Findings – The authors find that from the pre- to post-stimulus period, the recipient firms experienced a greater increase in downward accrual management and a greater decrease in real management than the non-recipient firms did. This result is primarily driven by the non-state-owned enterprises and firms using non-Big-Four auditors.

Originality/value – The results suggest that the earnings management level is ultimately determined by the underlying economic and political factors influencing managers' and auditors' incentives (Cohen, 2008; Ball *et al.*, 2003). Meanwhile, some mechanisms, such as high-quality audit (Eshleman and Guo, 2014) and state ownership (Wang and Yung, 2011) can also play a role in determining the level of earnings management.

Keywords Accrual management, Real management, Stimulus programme

Paper type Research paper

Introduction

This paper studies the effects of the 2008 Chinese stimulus program on firms' earnings management. This stimulus package was to inject 4tn Renminbi (RMB) (equivalent to US $586bn, about 12.5 per cent of the 2008 Chinese GDP) into the economy from November 2008 until the end of 2010. Although some papers study the effects of the stimulus on economy (Naughton, 2009), very few examine its impact on earnings management. It is interesting to investigate the implications of such an enormous government stimulus on managers' incentives to manipulate earnings and therefore the firms' earnings management level.

Prior research explains earnings management from capital market perspective and contract perspective (Healy and Wahlen, 1999). Managers are more likely to inflate earnings before they issue equity or debt (Hirshleifer *et al.*, 2004). By reporting good accounting performance, managers can attract capital providers and get better terms. On the other hand, both debt contract and managerial compensation contract are written in accounting numbers. To avoid debt contract violation, managers use accounting methods to help them abide by the contract (Demerjian, 2011). Managers are also motivated to increase earnings to

enhance their personal compensation, which usually is tied to accounting earnings. We argue that the 2008 stimulus program reduced the need to finance from the capital market and decreased the importance of debt covenant in monitoring the performance of the lender. Consequently, the firms that received the stimulus supports (hereafter recipient firms) are less likely to manage earnings upward than the firms that did not receive the stimulus supports (hereafter non-recipient firms).

The empirical results are consistent with our hypotheses. We find that from the pre- to post-stimulus period, the recipient firms experienced a greater decrease in real management than the non-recipient firms did. Meanwhile, we find that the recipient firms are more likely to engage in downward accrual management than the non-recipient firms did in the post-stimulus period.

This paper contributes to the literature in several ways. First, to the best of our knowledge, this is the first paper to study the effects of the government stimulus program on earnings management. Hao *et al.* (2018) examined the effects of the stimulus on accounting information quality in general. Second, it studies both accrual management and real management. The literature suggests the firms' use of real and accrual earnings management around important corporate events varies, depending on their ability to use and the relative costs of each type of management (Zang, 2012; Rangan, 1998; Cohen and Zarowin, 2010). This paper corroborates this conclusion by documenting an increase in downward accrual management and a decrease in real management for the recipient firms during the stimulus period when there is a change in the relative benefits/costs between different tools of earnings management. Third, recent research advances our understanding of the effects of the political costs, in particular, state ownership on accounting practices in China (Wang and Yung, 2011). This paper extends this literature by providing another piece of evidence that the ownership structure plays a role in determining the managers' reporting incentives. Last but not least, this paper substantiates the prior literature that the Big-Four auditors provide high-quality audit consistently. We find that the earnings quality of the recipient firms using Big-Four auditors is stable, without much variation between the pre- and post-stimulus periods. In contrast, in the post-stimulus period, the recipient firms using non-Big-Four auditors exhibited more income-decreasing accrual management and less real management, suggesting that non-Big-Four auditors play a limited role in mitigating the incentives to manipulate earnings to the managers' favor.

The remainder of the paper proceeds as follows. Section 2 reviews the literature and develops the main hypotheses. Section 3 describes the research methodology. Section 4 describes the sample-selection process and the data. Empirical results are presented in Section 5. Finally, we conclude the paper in Section 6.

2. Literature review and hypotheses development

2.1 Motives for earnings management

Healy and Wahlen (1999) suggested two motivations for earnings management. One is capital market perspective and the other is contracts perspective. In a market economy, managers considering profitable investment projects but facing financing constraints can issue equity or debt to acquire the needed capital. Managers, therefore, are motivated to manipulate earnings to impress capital providers with favorable accounting numbers to obtain financing more easily and on better terms (Hirshleifer *et al.*, 2004; Lee and Choi, 2016). Empirical research documents that managers tend to report positive (income-increasing) accruals before the capital issuance date (Shivakumar, 2000; Gaud *et al.*, 2007).

Accounting data are also used to help monitor and regulate the contracts between the firm and its stakeholders (Healy and Wahlen, 1999). Lending contracts usually use a variety

of financial covenants. The violation of such covenants is a negative signal of the corporate performance and the company's creditability. To avoid these undesirable effects and abide by the debt covenants, managers are motivated to engage in income-increasing earnings management (Lambert, 2001; Fields *et al.*, 2001). Mangers' compensation contracts are also based on accounting numbers. Bonuses are tied to earnings directly. Managers are therefore inspired to adopt income-increasing accounting methods to enhance their compensation arrangements and wealth. However, if earnings fall below the lower bound or rise above the upper bound designated by the bonus plan, managers are likely to engage in income-decreasing accounting methods to build "cookie jar" reserves (Healy, 1985).

China launched the stimulus program in late 2008. This package was to inject 4tn RMB (US$586bn) into the economy through investment spending. The central government committed to directly fund 1.18tn RMB ($173bn) of the investment, about 30 per cent of the overall program. The rest of the stimulus funds were from the local governments (US $180bn) and bank lending (US$233bn) (Wong, 2011). To encourage investment spending, the central government approved some measures to ease financing, such as lowering the equity requirement for firms applying for the bank loan, encouraging issuance of corporate debt with the sponsorship of local governments and cutting interest rates. Bank credit experienced explosive growth since the announcement of the stimulus plan. In the first quarter of 2009, the total RMB bank loans outstanding increased by 4.6 tn RMB (US $674.4bn), even exceeding the total amount of the stimulus program. With the government direct investment and easy access to capital, the managers of the recipient firms have little incentives to manipulate earnings to attract capital providers.

As commercial banks were urged to increase lending, bank loan officers would like to provide more credits, because the tone of the top had sent a clear message that they would not be held responsible for future non-performing loans, so long as they support the investment plan (Naughton, 2009). Therefore, the negative consequences from the violation of debt covenants became much less severe, and the pressure to abide by the debt covenants was greatly relieved. Finally, with the government supports, the recipient firms are obligated to pursue new projects, and conduct research and development, as designated by the stimulus program. By doing so, the managers would continue to receive the government supports, maintain good relationships with the government and therefore secure their jobs. As these motives become dominant, the intention to enhance pecuniary compensation through earnings management plays a less important role.

Political costs include all expected cost (and lost benefits) owing to the potential adverse political policies involving antitrust, regulation, government subsidies, taxes and tariff (Watts and Zimmerman, 1978). Watts and Zimmerman (1978) contended that high political costs corporations are likely to reduce reported earnings to avoid the government attention, because the government is likely to associate the high profits with the monopoly power in the market and then launch wealth transfer policies which do not favor these corporations. The literature documents that firms engage in income-decreasing earnings management when they are exposed to heightened political scrutiny. For example, the oil company during the 1990 Persian Gulf Crisis (Han and Wang, 1998), the cable television companies during periods of Congressional scrutiny in the late 1980s and early 1990s (Key, 1997) and the Chinese real estate companies during the macroeconomic control in the early 2000s (Chen *et al.*, 2011) used accruals to reduce reported earnings. Following the similar line of reasoning, we expect that the recipient firms report low earnings to avoid the government or public attention and propose the following hypotheses:

H1a. From the pre- to post-stimulus period, the recipient firms experienced a greater decrease in upward accruals management than the non-recipient firms did.

H1b. From the pre- to post-stimulus period, the recipient firms experienced a greater increase in downward accruals management than the non-recipient firms did.

2.2 Accrual management and real management

Real activities manipulation refers to the purposeful changes in the timing or structuring of an operation, investment or financing transaction, aiming to alter accounting earnings in a particular direction. Some research suggests that managers substitute between real and accrual-based methods on the basis of the comparison of the costs involved (Cohen *et al.*, 2008; Nasir *et al.*, 2018; Wang *et al.*, 2010). However, there is a widespread belief that real earnings management has more severe negative consequences than accrual-based earnings management (Graham *et al.*, 2005; Zang, 2012; Rangan, 1998). Cohen and Zarowin (2010) found that real earnings management is more likely than discretionary accruals to be associated with earnings declines. In the context of the government stimulus, both the capital market and contract incentives to manage earnings upward are weakened. Although the managers tend to report low earnings through income-decreasing accrual management, they are also likely to reduce real activity management, especially when the latter has more significant negative impact on the future performance. In addition, the 2008 stimulus program is investment-oriented. The RMB 4tn program refers to a set of investments totaling RMB 4tn to be spent in a little more than two years. The central bank cut the interest rate five times in a short period from September to December 2008 (Areddy, 2008). The government lowered the tax rate and raised the threshold for tax levy in general. The Chinese State Administration of Taxation first implemented the value-added tax on January 1, 2009. With this reform, firms can deduct purchases for investment as well as for current operations for tax computation (Yan, 2011). All these measures were successful in encouraging investment, as the share of GDP that came from investment increased to above 50 per cent, a record high level in recent economic history (Matthews, 2016). Therefore, managers are less likely to boost earnings through the cut of discretionary expenditure and we propose the following hypothesis:

H2. From the pre- to post-stimulus period, the recipient firms experienced a greater decrease in real management than the non-recipient firms did.

2.3 State-owned enterprises and non-state-owned enterprises

The literature finds lower levels of earnings management among state-owned enterprises (hereafter SOEs) than privately-owned firms in China (Wang and Yung, 2011). Wang and Yung (2011) attributed this result to the extra protection that SOEs had received from the government owing to the special relationship between SOEs and the government. On the one hand, the government relies on these SOEs to provide employment and maintain social stability. On the other hand, it gives SOEs more financial and political support to help them undertake various social responsibilities (Chen *et al.*, 2011). In addition, SOEs have limited debt financing, and the possibility of debt covenant violation is minimal (Liu and Lu, 2002). Meanwhile, the SOEs have greater access to loans from state banks than non-SOEs when monetary policy is tightened (Chen *et al.*, 2011). Therefore, there is much less pressure on SOE managers to manipulate firm-specific information than their counterparts in privately-owned firms. Consequently, SOEs' earnings management strategies are less sensitive to any

macroeconomic change than non-SOEs are. Chen *et al.* (2011) argued that owing to different sensitivity to political costs, non-SOEs utilize more income-decreasing accruals than SOEs when there are greater political costs. Xu and Ji (2016) also found that different sectors responded with different earnings management behavior during the global financial crisis. On the basis of the foregoing research, we expect that the mitigation of upward-earnings management because of the stimulus program is marginal for SOEs and predict the following hypotheses:

> *H3.* From the pre- to post-stimulus period, a greater decrease in upward-earnings management and a greater increase in downward-earnings management experienced by the recipient firms than non-recipient firms can only be observed in the non-SOE sample, but not the SOE sample.

2.4 Big-Four auditors and non-Big-Four auditors
As discussed before, we expect that after the stimulus program, the incentives to manipulate earnings upward would decline, whereas incentives to manipulate earnings downward would increase owing to the government support for the recipient firms. It is interesting to investigate whether this decrease (increase) in income-increasing (decreasing) management varies between the recipient firms with a Big-Four auditor and the recipient firms with a non-Big-Four auditor. The quality of financial reporting audited by the Big-Four (i.e. PwC, Deloitte, EY and KPMG) is normally considered high. This high-quality audit is more valuable when the clients have strong incentives to manage earnings, as a high-quality auditor can ensure independence of the auditing procedures, reinforce the investor-protection mechanisms and effectively decrease the client's earnings management (Eshleman and Guo, 2014; Astami *et al.*, 2017). In contrast, the low-quality auditor may compromise the audit quality to attract and maintain the clients. Liu *et al.* (2011) argued that the adoption of International Financial Reporting Standards (IFRS) improves accounting quality for non-Big-Four auditees to a larger magnitude than for Big-Four auditees, because accounting quality from IFRS adoption is expected to be greater for adopters than low quality. Both high-quality audit and IFRS adoption are mechanisms to mitigate earnings management and improve accounting quality. They can substitute each other to some extent.

Following a similar line of reasoning, we suggest high-quality audit and the government supports are substitutes in reducing upward-earnings management. Therefore, the mitigation of upward-earnings management because of the government support that we predict in *H1a* and *H2* may not be true for the recipient firms with a Big-Four auditor.

> *H4.* From the pre- to post-stimulus period, a greater decrease in upward-earnings management and a greater increase in downward-earnings management experienced by the recipient firms than the non- recipient firms can only be observed in the non-Big-Four sample, but not in the Big-Four sample.

3. Research design
3.1 Accruals management measure
Accounting accruals can be decomposed into non-discretionary and discretionary accruals. The former results from the necessary accounting adjustment, whereas the latter represents the managerial discretion. Following Hribar and Collins (2002), we calculate total accruals (TA) as the difference between earnings before extraordinary items and operating cash flows. As per prior research (Cornett *et al.*, 2008), we use the modified Jones model, as

described in Dechow *et al.* (1995), to estimate discretionary accruals. First, we run the following cross-sectional ordinary least-squares regressions to estimate the coefficients a_0, a_1 and a_2:

$$TA_t/Assets_{t-1} = a_{0*}(1/Assets_{t-1}) + a_1{}^*(\Delta Sales_t/Assets_{t-1}) + a_2{}^*(PPE_t/Assets_{i,t-1})$$
$$+ e_t \quad (1)$$

where TA is earnings before extraordinary items minus operating cash flows, ΔSales is the change in sales and PPE is the value of property, plant and equipment. All variables are scaled by total assets at the beginning of the fiscal year to control for size effect. The coefficient estimates from equation (1) are used to estimate the firm-specific non-discretionary accruals (NDA$_t$) for our sample firms:

$$NDA_t = a_{0*}(1/Assets_{t-1}) + a_1{}^*(\Delta Sales_t - \Delta AR_t)/Assets_{t-1} + a_2{}^*(PPE_t/Assets_{i,t-1})$$
$$\quad (2)$$

where ΔAR is the change in accounts receivable, capturing the impacts of credits sales on the level of non-discretionary accruals (Dechow *et al.*, 1995).

Discretionary accruals is the difference between TA and non-discretionary accruals. Because both upward- and downward-earnings management are likely to occur in practice, we use the absolute value of discretionary accruals as our measure of accrual management, defined as $|DA_t| = |TA_t/Assets_{t-1} - NDA_t|$. To differentiate between the income-increasing and income-decreasing accruals management, we use Up_DA and Down_DA as dependent variables respectively. Up_DA is equal to DA if DA $>$ 0, and Down_DA is equal to -1^* DA if DA $<$ 0. We multiply the raw value of DA by -1, so that the bigger Down_DA represents a greater level of income-decreasing earnings management.

3.2. Real management measurement

We follow the prior research (Roychowdhury, 2006; Cohen *et al.*, 2008) to define our measurements of real earnings management. As suggested by these papers, abnormally low levels of cash flows from operations and discretionary expenses and abnormally high levels of production costs are indicators of upward real activities manipulations. As per the literature (Cohen *et al.*, 2008), we use the following models to estimate abnormal cash flows (Abn_CFO), abnormal production costs (Abn_Prod) and abnormal discretional discretionary expenses (Abn_Discexp). In particular, we calculate Abn_CFO as residuals of the regression equation (3), which is estimated by the year and industry:

$$CFO_{it}/Assets_{i,t-1} = b_{1t}(1/Assets_{i,t-1}) + b_{2t}(Sales_{i,t}/Assets_{i,t-1})$$
$$+ b_{3t}(\Delta Sales_{i,t}/Assets_{i,t-1}) + \epsilon_{it} \quad (3)$$

where CFO is cash flow from operations.

We calculate Abn_Prod as residuals of the regression equation (4):

$$Prod_{it}/Assets_{i,t-1} = c_{1t}(1/Assets_{i,t-1}) + c_{2t}(Sales_{i,t}/Assets_{i,t-1})$$
$$+ c_{3t}(\Delta Sales_{i,t}/Assets_{i,t-1}) + c_{4t}(\Delta Sales_{i,t-1}/Assets_{i,t-1}) + \epsilon_{it} \quad (4)$$

where Prod is defined as the sum of cost of goods sold and change in inventory during the year.

Finally, we calculate Abn_Discexp as residuals of the regression equation (5):

$$\text{Discexp}_{it}/\text{Assets}_{i,t-1} = d_{1t}(1/\text{Assets}_{i,t-1}) + d_{2t}(\text{Sales}_{i,t-1}/\text{Assets}_{i,t-1}) + \epsilon_{it} \tag{5}$$

where Discexp is the sum of selling expenses, R&D expenses and general administrative expenses.

We also use the comprehensive measure of real management developed by Cohen *et al.* (2008). They compute REAL_RE as the sum of the three standardized individual components, i.e. REAL_EM = –standardized Abn_CFO + standardized Abn_Prod – standardized Abn_Discexp. A higher level of REAL_EM indicates a greater level of overall real earnings management.

3.3. Empirical design
To test *H1*, we use the following set of regressions, equation (6), to check the impact of the stimulus on accrual quality:

$$|\text{DA}_t| = \alpha_0 + \alpha_1\text{DI} + \alpha_2\text{DY} + \alpha_3\text{DI*DY} + \text{Controls} + \mu,$$

$$\text{Up\_DA} = \alpha_0 + \alpha_1\text{DI} + \alpha_2\text{DY} + \alpha_3\text{DI*DY} + \text{Controls} + \mu, \tag{6}$$

$$\text{Down\_DA} = \alpha_0 + \alpha_1\text{DI} + \alpha_2\text{DY} + \alpha_3\text{DI*DY} + \text{Controls} + \mu$$

When the dependent variable is $|\text{DA}_t|$, we use the whole sample to run the regression. When the dependent variable is Up_DA, the sample includes only the observations with positive discretionary accruals, (i.e. DA > 0). When the dependent variable is Down_DA, the sample includes only the observations with negative discretionary accruals (i.e. DA < 0). DI is the industry dummy, which is equal to 1 for the sectors that were heavily targeted by the 2008 stimulus program and 0 for the sectors that were excluded from the stimulus program. DY is the year dummy, which is equal to 1 for the post-bailout period (i.e. 2008-2010) and 0 for the pre-bailout period (i.e. 2004-2007). Consistent with existing studies, we include the size of the firm, leverage, sales growth, loss indicator, sales turnover rate, Big-Four auditor indicator and internal control index to control their effects on accruals quality. We also control for the industry and year effects. *H1* predicts that recipients of the stimulus program experience a greater decline in accrual management than the non-recipient firms, suggesting a significant negative coefficient on the interaction term, DI*DY.

To test *H2*, we use the following set of regressions [equations (7)]:

$$\text{REAL\_EM} = \beta_0 + \beta_1\text{DY}_t + \beta_2\text{DI}_i + \beta_3\text{DY}_t*\text{DI}_i + \text{Controls},$$

$$\text{Abn\_CFO} = \gamma_0 + \gamma_1\text{DY}_t + \gamma_2\text{DI}_i + \gamma_3\text{DY}_t*\text{DI}_i + \text{Controls},$$

$$\text{Abn\_Prod} = \delta_0 + \delta_1\text{DY}_t + \delta_2\text{DI}_i + \delta_3\text{DY}_t*\text{DI}_i + \text{Controls}, \tag{7}$$

$$\text{Abn\_Discexp} = \zeta_0 + \zeta_1\text{DY}_t + \zeta_2\text{DI}_i + \zeta_3\text{DY}_t*\text{DI}_i + \text{Controls}$$

If the message of government supports and protection sent from the stimulus can effectively reduce the managerial discretion and induce spending, we would expect the coefficient (β_3) on DY_t*DI_i to be negative when we use REAL_EM as the dependent variable. When we use each of the three components of REAL_EM, i.e. Abn_CFO, Abn_Prod and Abn_Discexp, as the dependent variable, we expect the coefficient $(\gamma_3, \delta_3$ and $\zeta_3)$ on DY_t*DI_i to be positive, negative and positive, respectively.

To test *H3*, we rerun equations (6) and (7), but for the SOE sample and non-SOE sample separately. Per *H3*, we expect that the significant coefficient of the interaction term, DI*DY, would only occur in the non-SOE sample, but not in the SOE sample.

Similarly, we repeat the regressions in equations (6) and (7) for the firms using Big-Four auditors and those using non-Big-Four auditors, respectively, to test *H4*. We expect that the significant coefficients of the interactions term, $DY_t *DI_i$ in each regression, as predicted in *H1* an *H2*, are primarily driven by the sample of firms using non-Big-Four auditors. Therefore, we expect that the predicted associations between each dependent variable (i.e. | DA|, Up_DA, Down_DA, REAL_EM, Abn_CFO, Abn_Prod and Abn_Discexp) and $DYt *DI_i$ would be significant only for the non-Big-Four auditees sample, but not for the Big-Four auditees sample.

4. Sample and data analysis

We extract all the A-shares stock return and accounting data from the China Stock Market and Accounting Research database. A-shares are denominated in Chinese currency and traded exclusively among Chinese citizens and domestic institutions. The control variable (DIB_Index) to proxy the internal control is obtained from DIB Internal Control and Risk Management Database. We delete observations with missing data and the observations with variables at the 1 per cent level.

The stimulus package identified priority areas to support. The guidance is vague, and the identification of the projects and firms to be stimulated is primarily at the government officials' discretion. The government's main focus for spending from the stimulus package was on mega-projects, primarily on large-scale infrastructure civil works, as well as for the reconstruction effort for post-earthquake Sichuan. Low carbon infrastructure was prioritized, with 8,000 kilometers of high-speed railway lines and grid modernization projects receiving significant allocations (World Bank, 2011). As all the infrastructure is mainly about transportation in this stimulus package, we choose transportation and warehousing (Sector F) as the stimulus recipient sector. We also include mining (Sector B) and information technology (Sector G) as the stimulus recipient sector. The mining sector is targeted by the stimulus, aiming to ease the bottleneck from the limited supply of energy, oil and ore. Meanwhile, a substantial amount of funds were invested to promote information technology. There are 1,367 firm-year observations from the recipient firms and 6,295 observations from the non-recipient firms.

We carry out our investigation by dividing the sample period into two: one is the period prior to the stimulus program (the pre-stimulus period, from 2004 to 2007) and other is after the introduction of stimulus program (the post-stimulus period, from 2008 to 2010). The entire sample includes 590 observations from recipient firms during the pre-stimulus period, 777 observations from recipient firms during the post-stimulus period, 11,642 observations from non-recipient firms during the pre-stimulus period and 3,151 observations from non-recipient firms during the post-stimulus period.

Table I, Panel B, presents the descriptive analysis of the sample. The absolute value of discretionary accruals shows a high standard deviation, suggesting a significant variation in accrual management. We find that the magnitude of Up_DA is much smaller than the magnitude of Down_DA, probably owing to more scrutiny for income-increasing accruals management. The median of Real_EM is 0.033, suggesting that a majority of the observations are engaged in real management to some extent. We further observe each component of real management. Finally, most observations show growth in sales revenue, 64.5 per cent observations are SOE observations and 7.2 per cent of our sample is Big-Four auditees. Table I, Panel C, reports yearly descriptive data.

Panel A: sample distribution

	Pre-stimulus period				Post-stimulus period			Total
Year	2004	2005	2006	2007	2008	2009	2010	2011	
Recipient firms	133	147	154	156	172	188	192	225	1,367
Non-recipient firms	666	692	744	747	786	845	873	942	6,295
Total	799	839	898	903	958	1,033	1,065	1,167	7,662

Panel B: whole sample descriptive data

Variable	N	Mean	Min	$p50$	Max	SD
DI	7,662	0.178	0	0	1	0.383
DY	7,662	0.551	0	1	1	0.497
DIDY	7,662	0.101	0	0	1	0.302
|DA|	7,662	0.528	0	0.165	1442	16.75
Up_DA	4,434	0.210	0	0.171	3.318	0.203
Down_DA	3,228	0.965	0	0.155	1442	25.79
Abn_CFO	7,662	0.343	−3.231	0.042	1723	19.78
Abn_PROD	7,662	−0.013	−617.1	0.005	454.7	9.041
Abn_Disexp	7,662	−0.011	−2.061	−0.030	152.3	1.776
REAL_EM	7,662	0.012	−171.4	0.033	22.68	1.987
Big4	7,662	0.072	0	0	1	0.259
Soe	7,662	0.645	0	1	1	0.479
Lev	7,662	0.533	0.059	0.517	1.548	0.259
Growth	7,662	0.236	−0.717	0.144	4.711	0.649
Size	7,662	21.55	18.93	21.43	25.71	1.229
Roe	7,662	0.052	−0.780	0.054	0.701	0.182
Loss	7,662	0.128	0	0	1	0.334
Turn	7,662	1.954	0.045	1.346	13.42	2.044
InvRec	7,662	0.314	0.004	0.271	1.254	0.241
DIB_INDEX	7,662	6.338	0	6.531	6.836	1.034

Panel C: yearly descriptive data

year	|DA|	Up_DA	Down_DA	Abn_CFO	Abn_PROD	Abn_Disexp	REAL_EM
2004	0.240	0.212	0.285	0.072	−0.004	−0.023	0.030
2005	0.239	0.229	0.254	0.031	0.049	−0.035	0.039
2006	0.239	0.207	0.284	0.062	0.002	−0.039	0.035
2007	0.316	0.204	0.418	0.125	−0.080	−0.044	0.028
2008	0.307	0.208	0.474	0.116	0.125	−0.039	0.041
2009	1.858	0.258	4.454	1.738	−0.084	0.123	−0.100
2010	0.278	0.186	0.369	0.119	−0.102	−0.026	0.022
2011	0.554	0.178	1.102	0.292	0.007	−0.021	0.019
Total	0.528	0.210	0.965	0.343	−0.013	−0.011	0.012

Panel D: Pearson correlations

	|DA|	Up_DA	Down_DA	Abn_CFO	Abn_PROD	Abn_Disexp	REAL_EM	DI	DY	DIDY
|DA|	1									
Up_DA	1	1								
Down_DA	1	0	1							
Abn_CFO	0.993***	−0.494***	0.993***	1						
Abn_PROD	−0.696***	0.281***	−0.697***	−0.770***	1					
Abn_Disexp	0.993***	−0.337***	0.994***	0.986***	−0.670***	1				
REAL_EM	−0.962***	0.436***	−0.962***	−0.986***	0.864***	−0.952***	1			
DI	0.032***	0.104***	0.044**	0.029**	−0.010	0.033***	−0.026**	1		
DY	0.014	−0.014	−0.023	0.012	0	0.012	−0.009	0.016	1	
DI*DY	0.044***	0.055***	0.064***	0.040***	−0.0120	0.044***	−0.035***	0.721***	0.303***	1

Table I.
Sample distribution
and descriptive data

We present Pearson correlations in Table I, Panel D. The correlation between REAL_EM and Up_DA is significantly positive, suggesting that usually managers adopt both methods to inflate earnings. The correlation between REAL_EM and Down_DA is significantly negative, suggesting that when managers use real management, they are unlikely to adopt income-decreasing accrual management. The significant correlations among the three measurements of real management, Abn_CFO, Abn_PROD and Abn_Disexp are significantly correlated, suggesting that whenever there are incentives to manage earnings upward through real activities, managers would like to adopt all the means to that end.

5. Empirical results
5.1 Accrual management
Table II presents the results of equation (6). When the dependent variable is |DA| (and Down_DA), both coefficients on DI and DY are insignificant, suggesting that neither sector nor year alone affect the dependent variable. When the dependent variable is Up_DA, the coefficient on DI is marginally significant and positive, and the coefficient on DY is significantly negative, suggesting that the government supported sectors are slightly more likely to manage earnings upward than other sectors, but this manipulation is reduced during the period of the stimulus program. The variable of our interests is the interaction term, DI*DY. In Column 1, where the dependent variable is |DA|, the coefficient of DI*DY is significantly positive (2.461, $p < 5$ per cent), suggesting that the stimulus program has induced more accruals management. We decompose accruals management into upward management and downward management. We find that α_s is insignificant when Up_DA is the dependent variable, but significantly positive (5.329, $p < 5$ per cent) when Down_DA is the dependent variable. This suggests that the stimulus program does not necessarily mitigate upward-earnings management, but induces downward accruals management. Kirschenheiter and Melumad (2002) found that when firms perform poorly, managers may want to manage earnings down to take a big bath. In our context, when the recipient firms have the government protection, they may tend to take a "big bath" and leave more reserves to achieve good accounting performance for the future (Healy, 1985).

5.2 Real management
If the stimulus mitigates real management, we would expect the coefficient of DI*DY in equation (7) to be negative when REM_EM is the dependent variable. When we use each of the three components of real management, Abn_CFO, Abn_PROD and Abn_Disexp as the dependent variable, the coefficients of DI*DY are expected to be positive, negative and

	|DA|	Up_DA	Down_DA
DI	1.125 (0.845)	0.038* (1.786)	0.743 (–0.237)
DY	–1.090 (–1.346)	–0.059*** (–4.904)	–1.888 (0.950)
DI* DY	2.461** (2.448)	–0.023 (–1.484)	5.329** (–2.324)
Controls	Yes	Yes	Yes
Industry	Yes	Yes	Yes
Year	Yes	Yes	Yes
N	7,662	4,434	3,228
Adj. R^2	0.012	0.129	0.013

Table II.
Test the impact of the stimulus on accrual management

Notes: *T*-values are reported in parentheses; ***, ** and *indicate statistical significance at 1, 5 and 10 per cent levels, respectively

positive, individually. The results are presented in Table III. They are consistent with *H2* that the stimulus program has attenuated the real management in general, though the coefficient on DI*DY is not significant when the dependent variable is Abn_PROD. Table III reveals that the stimulus program weakens the aggressive recognition of revenue from questionable sales and induces more discretionary expenditure.

5.3 State-owned enterprises and non-state-owned enterprises

Table IV, Panel A, reveals that for the SOE sample, the change in accruals management from the pre- to post-stimulus period is not significantly different between the recipient firms and non-recipient firms, as the coefficient (α_3) of DI*DY is insignificant no matter which accrual management measure is used as the dependent variable. In contrast, for the non-SOE sample, α_3 is –0.030 ($p < 10$ per cent) but insignificant when the dependent variable is Up_DA and 12.07 ($p < 5$ per cent) when the dependent is Down_DA, suggesting that the recipient firms experience a greater increase in downward accruals management than their non-recipient counterpart from the pre- to post-stimulus period.

Table IV, Panel B, reveals that for the SOE sample, there is no difference in the change in real management from the pre- to post-stimulus period between the recipient and non-recipient firms, as the coefficient (α_3) of DI*DY remains insignificant when we use a variety of real management measures as the dependent variable. In contrast, for the non-SOE sample, α_3 is 8.092 ($p < 5$ per cent) when the dependent variable is Abn_CFO, 0.773 ($p < 5$ per cent) when the dependent variable is Abn_Disexp and –0.749 ($p < 5$ per cent) when the dependent variable is REAL_EM, suggesting that the recipient firms experience a greater decrease in real management than their non-recipient counterparts after the stimulus program.

SOEs have been under the government protection, and their managers have less pressure to manage earnings upward all the time during our whole sample period. Therefore, the additional government supports from the stimulus program has little incremental impact on their level of earnings management. In contrast, non-SOEs that received the stimulus funds would be greatly relieved from this government support and show significant decrease in upward-earnings management. Therefore, the impact of the stimulus program to reduce the incentives to manage earnings upward for the SOEs is not as significant as it is for non-SOEs.

5.4 Big-Four auditors and non-Big-Four auditors

Table V, Panel A, reveals that for the Big-Four sample, the change in accruals management from the pre- to post-stimulus period is not significantly different between the recipient firms and non-recipient firms, as the coefficient (α_3) of DI*DY is insignificant no matter

	Abn_CFO	Abn_PROD	Abn_Disexp	REAL_EM
DI	1.157 (0.735)	–0.086 (–0.120)	0.153 (1.086)	–0.107 (–0.678)
DY	–1.241 (–1.296)	0.322 (0.738)	–0.115 (–1.334)	0.116 (1.211)
DI*DY	2.685** (2.259)	–0.461 (–0.849)	0.258** (2.425)	–0.239** (–2.000)
Controls	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
N	7,662	7,662	7,662	7,662
Adj. R^2	0.010	0.013	0.012	0.010

Table III.
Test the impact of the stimulus program on real management

Panel A. Test the impact of the stimulus on accrual management between the SOE and non-SOE samples

	SOE			Non-SOE		
	|DA|	Up_DA	Down_DA	|DA|	Up_DA	Down_DA
DI	0.022 (0.272)	0.042 (1.634)	0.120 (−0.622)	−0.126 (−0.034)	0.012 (0.300)	−1.186 (0.155)
DY	−0.056 (−1.146)	−0.063*** (−4.382)	0.041 (−0.346)	−2.341 (−0.979)	−0.054** (−2.392)	−3.954 (0.731)
DIDY	0.062 (1.067)	−0.017 (−0.941)	0.074 (−0.530)	7.169** (2.362)	−0.030 (−0.865)	12.070** (−2.093)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
N	4,941	3,024	1,917	2,721	1,410	1,311
Adj. R^2	0.156	0.132	0.230	0.012	0.125	0.008

Panel B. Test the impact of the stimulus program on real management between the SOE and non-SOE samples

	SOE				Non-SOE			
	Abn_CFO	Abn_PROD	Abn_Disexp	REAL_EM	Abn_CFO	Abn_PROD	Abn_Disexp	REAL_EM
DI	0.046 (0.748)	−0.124 (−1.156)	0.016 (1.321)	−0.015 (−1.272)	−0.558 (−0.126)	0.836 (0.419)	0.025 (0.064)	0.078 (0.176)
DY	−0.036 (−0.973)	0.044 (0.685)	0.000 (0.045)	0.005 (0.654)	−2.580 (−0.913)	0.411 (0.322)	−0.261 (−1.032)	0.231 (0.815)
DIDY	0.043 (0.978)	−0.049 (−0.625)	−0.004 (−0.452)	−0.004 (−0.503)	8.092** (2.255)	−1.836 (−1.132)	0.773*** (2.406)	−0.749** (−2.079)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	4,941	4,941	4,941	4,941	2,721	2,721	2,721	2,721
Adj. R^2	0.184	0.063	0.326	0.126	0.011	0.025	0.012	0.012

Table IV.
Test the impact of
the stimulus
program on accrual
management and
real management
between the SOE and
non-SOE sample

Panel A. Test the impact of the stimulus on accrual management between the Big-Four and non-Big-Four samples

	Big4			Non Big4		
	|DA|	Up_DA	Down_DA	|DA|	Up_DA	Down_DA
DI	-0.162*** (-3.202)	-0.104** (-2.254)	-0.074 (0.653)	1.043 (0.741)	0.043* (1.939)	0.658 (-0.202)
DY	-0.086*** (-2.629)	-0.086*** (-2.688)	-0.028 (0.424)	-1.194 (-1.360)	-0.058*** (-4.582)	-2.146 (1.002)
DIDY	-0.004 (-0.113)	0.037 (1.117)	-0.036 (0.472)	2.713** (2.465)	-0.031* (-1.783)	5.636** (-2.303)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
N	552	358	194	7,110	4,076	3,034
Adj. R²	0.254	0.224	0.516	0.012	0.126	0.013

Panel B. Test the impact of the stimulus program on real management between the Big-Four and non-Big-Four samples

	Big4				Non Big4			
	Abn_CFO	Abn_PROD	Abn_Disexp	REAL_EM	Abn_CFO	Abn_PROD	Abn_Disexp	REAL_EM
DI	0.059* (1.741)	-0.089** (-2.277)	-0.006 (-0.248)	-0.007 (-0.850)	1.047 (0.629)	-0.053 (-0.070)	0.132 (0.885)	-0.093 (-0.559)
DY	-0.014 (-0.623)	-0.013 (-0.531)	0.022 (1.413)	-0.006 (-1.165)	-1.335 (-1.286)	0.314 (0.663)	-0.123 (-1.317)	0.123 (1.179)
DI*DY	-0.029 (-1.224)	0.033 (1.191)	-0.007 (-0.409)	0.006 (0.934)	2.964** (2.279)	-0.510 (-0.859)	0.289** (2.481)	-0.265** (-2.028)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	552	552	552	552	7,110	7,110	7,110	7,110
Adj. R²	0.599	0.592	0.587	0.639	0.010	0.013	0.012	0.010

Table V.
Test the impact of
the stimulus
program on accrual
management and
real management
between the Big-Four
and non-Big-Four
samples

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which accrual management measure we use as the dependent variable. In contrast, for the non-Big-Four sample, α_3 is $-0.031(p < 10$ per cent) when the dependent variable is Up_DA and $5.636(p < 5$ per cent) when the dependent variable is Down_DA, indicating that the receipt of the stimulus funds can actually mitigate upward accrual management and also induce downward accrual management at the same time. Overall, the stimulus program does not affect the level of accruals management for the recipient firms using Big-Four auditors. However, the recipient firms using non-Big-Four auditors are more likely to report a lower accounting performance after they get the government stimulus than their counterparts that are using Big-Four auditors.

Similarly, we find that only the recipient firms using non-Big-Four auditors experienced a significant decrease in real management after the introduction of the stimulus program, as the coefficients of DI*DY are all significant at the predicted direction when the dependent variables are Abn_CFO, Abn_Disexp and REAL_EM, individually for the non-Big-Four auditees sample. Both panels of Table V reveal that the stimulus program does not significantly change the level of earnings management for the recipient firms using the Big-Four auditors, suggesting that the consistent high-quality audit offered by the Big-Four ensures the consistency in their clients' reporting quality, no matter the clients' earnings management incentives. In contrast, firms using non-Big-Four auditors are more likely to engage in severe earnings management when managers have strong incentives to do so.

To check the sensitivity of our results, we also use a different criteria as suggested by Wang *et al.* (2017) to identify the stimulus-recipient firms and non-recipient firms and run both equations (6) and (7) for the whole sample – for the SOEs sample and non-SOEs sample individually, and for the Big-Four sample and non-Big-Four sample individually, the tone of all the results remains similar.

6. Conclusion

This paper compares the change in the level of earnings management between the firms receiving the government's supports and those not receiving such supports from the 2008 stimulus program from the pre- to post-stimulus period. We find that the recipient firms are more likely to engage in downward accrual management and less likely to conduct real management than the non-recipient firms in the post-stimulus period.

We further decompose our whole sample into the SOE sample and non-SOE sample and conduct the same set of analysis for each sample separately. We find that the tendency to report low accounting performance after receiving the government stimulus support occurred only for the non-SOE sample, but not for the SOE sample. We suggest that SOEs have always been protected by the government, and therefore the stimulus program has marginal incremental impact to affect SOEs' earnings management strategy.

We also decompose our whole sample into the Big-Four sample and non-Big-Four sample. We find that for the Big-Four sample, the receipt of the government stimulus does not affect the level of earnings management. However, for the non-Big-Four sample, the receipt of the government stimulus induces more income-decreasing accrual management and less real management. Such a finding shows the consistent high-quality audit provided by the Big-Four auditors. They do not vary their quality control standard and compromise the audit quality with the government fiscal policy.

Our paper is consistent with the prior research that earnings quality, especially earnings management, is endogenous and ultimately determined by the underlying economic and

political factors influencing managers' and auditors' incentives (Cohen, 2008). Meanwhile, some mechanism, such as high-quality audit (Eshleman and Guo, 2014) and state ownership (Wang and Yung, 2011), can also play a role in determining the level of earnings management.

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Appendix

Variables	
|DA|	The absolute value of discretionary accruals obtained from the modified Jones model
Up_DA	Discretionary accruals obtained from modified Jones model if discretionary accruals >0
Down_DA	The absolute value of discretionary accruals obtained from the modified Jones model if discretionary accruals < 0
Abn_CFO	The level of abnormal cash flows from operations
Abn_PROD	The level of abnormal production costs, where production costs are defined as the sum of cost of goods sold and the change in inventories
Abn_Disexp	The level of abnormal discretionary expenses, where discretionary expenses are the sum of administration expense and selling expense
REAL_EM	REAL_EM = –standardized Abn_CFO + standardized Abn_PROD – standardized Abn_Abn_Disexp
DI	Dummy variable, which is equal to 1 for industries that were heavily targeted by the stimulus program (i.e. mining, transportation and warehousing, information technology), 0 for industries that were targeted by the stimulus program
DY	Dummy variable, which is equal to 1 if year = 2008-2010 and 0 if year = 2004-2007
Size	The natural logarithm of end-of-year total assets
Lev	The end-of-year total liabilities divided by the end-of-year total assets
Growth	The percentage change in sales
Loss	Dummy variable, which is set equal to 1 if last year net income <0 and 0 otherwise
Roe	Earnings before extraordinary items/Equity$_{t-1}$
Turn	Sales divided by the last year assets
InvRec	InvRec = (Inventories + Account receivable)/Assets$_{t-1}$
DIB_INDEX	Internal Control Index, obtained from DIB Internal Control and Risk Management Database URL: http://irmd.dibcn.com:8082/irmd/common/login.jsp

Table AI.
Variable definitions

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