Does Reversal of Asset Impairment Loss Matter? Evidence from China

Ming-Lei Chang* **Tze-Yu Yen**

Abstract

The purpose of this research is to investigate whether the reforms of asset impairment regulations affect the provision and functional role of impairment losses and reversals of listed firms in China. The results reveal that listed firms decrease the provision of long-term asset impairments, but increase the provision of current asset impairments and reversals following the implementation of new asset impairment regulations. This research also verifies that listed firms adjust impairment provisions and reversals policy for income smoothing and big-bath purposes. Under different earnings management incentives, this study also finds that special treatment (ST) and non-ST firms show different level of accounting policy adjustment.

Keywords: Asset Impairment; Earnings Management; Accounting Policy; China Accounting Standards

JEL classification: M41, M48

I. Introduction

This paper sets out to observe how the listed firms in China react to the new asset impairment regulations, and further to examine how firms adjust their asset impairment policy associated with earnings management. In 2007, New China Accounting Standards No. 8 (New - CAS No. 8): Impairment of Assets, which changed the regulations regarding the reversal of asset impairment regulations. The new standards state that current asset impairment losses can be reversed in the future, but prohibit the reversal of long-term asset impairment losses. This new policy differs from prior versions of China Accounting Standards (Old-CAS) and International Financial Reporting Standards (IFRS) in that it permits the reversal of impairment losses of current and long-term assets; this policy also differs from the U.S. Generally Accepted Accounting Principles (GAAP) in that it prohibits firms from reversing previously recognized long-term and current asset impairment.

China's new rule states that current asset impairment losses could be reversed in the future, but prohibits the reversal of long-term asset impairment losses. This unique regulatory environment provides a natural experimental setting for the empirical assessment of accounting policy associated with earnings management and regulatory reforms. This study aims to answer three questions: (1) Are there any significant differences in asset impairment provisions prior and subsequent to the New - CAS No. 8 (2) With regulatory authorities maintaining (prohibiting) the impairment reversals of current assets (long-term assets), is the functional role of asset impairment losses or reversals on earnings management strengthened

(weakened)? (3) Are there any differences in the answers to the first two questions when this study compares Special Treatment (ST) and non-ST firms, which have different incentives pertaining to earnings management?[1]

Financial reporting involves a high degree of complexity and discretion; as such, the potential for earnings management is also high. The provisions of asset impairment and reversal rely on the manager's subjective judgments in estimating the market value or future cash flows associated with the asset. When an executive has the incentive to attain earnings targets, an accounting item with more discretion and objective estimation is more likely to be employed as the tool of earnings management. Asset impairments and reversals are these types of accounting items. Most relevant studies have confirmed that asset impairment losses and reversals are related to earnings management (Zucca and Campbell, 1992; Riedl, 2004; Dai et al., 2005; Zhao, 2006; Dai et al., 2007).

Chen et al. (2004) collect data from 1998 to 1999 and examine the market valuation effect and firms' characteristics regarding voluntary asset write-down based on the 1998 accounting rules in China. Glaum et al. (2013) analyze compliance of asset impairment regulation for a large sample of European companies mandatorily applying IFRS. However, Chen's and Glaum's articles do not investigate how firms use asset write-down as a tool to manage earnings. Using data from 2003 to 2005 of listed firms in China, Zeng et al. (2011) analyze whether firms abnormally recognize the net asset impairment provision (total asset impairment provision minus its reversal) to avoid de-listing, or permit issuing of new shares under the old CAS (pre New-CAS No.8). However, Zeng's research does not analyze how the different types of asset impairment and reversal affect earnings management behavior. Zhang et al. (2010) examine data from 2002 to 2006 of listed firms and investigate whether the firms use the last change of transition period to charge additional long-term asset impairments and reversals. However, Zhang's study does not investigate whether or how firms adjust their long-term/current asset impairment and reversal policies following the adoption of New-CAS No.8. Zhou and Habib (2013) discuss the relation between asset impairment and earnings management; however, they do not examine earnings smoothing behavior and pay no attention to the influence of different earnings management motivations.

[1] A unique characteristic of the Chinese stock market is the ST system. The Chinese stock exchanges introduced this system on 22 April 1998 as part of a series of corporate governance reforms. In this system, a company is designated as a ST company if it satisfies one or more of the following criteria: (1) the company has negative net profits for two consecutive fiscal years; (2) the shareholders' equity in the company is lower than the registered capital (the par value of the share); (3) the auditor has issued the company a disclaimer or an adverse audit opinion for the current year; (4) the company's operations have been discontinued because of a natural disaster or serious accident and cannot be restored within 3 months; (5) the company is involved in a damaging lawsuit or arbitration; or (6) the company is bankrupt. Once a company receives the ST designation, additional controls are imposed on it. For example, ST companies are required to provide audited semiannual financial reports (Green et al., 2009).

This study analyzes the impact of New-CAS No.8 on the reversibility of asset impairment provision associated with the role played in earnings management pre- and post- New-CAS No.8 period (2004 to 2010). In addition, based on various types of earnings management incentives, this research compares ST and non-ST firms to analyze the impact of New-CAS No.8 adoption.

This study contributes to the accounting literature on earnings management and asset impairment policy in three ways. First, although numerous previous studies have examined impairment recognition (Elliott and Shaw, 1988; Zucca and Campbell, 1992; Francis et al., 1996; Rees et al., 1996; Riedl, 2004; Dai et al., 2005; Zhao, 2006; Dai et al., 2007; Chao and Horng, 2013), few studies have investigated the types of asset impairment loss and reversal policy based on the reversibility of asset impairment. Instead of focusing solely on the total amount of asset impairment and reversal, we analyze the impairment of long-term and current assets according to their reversibility. [2]

Second, previous asset impairment studies, at least in the U.S. context, have exhibited two shortfalls: (1) reversals are infrequently observed and (2) there may be significant measurement errors in the data (Zhang et al., 2010). In this study, provisions of asset impairment are divided into reversible and irreversible provisions. We manually collect eight types of asset impairment provision and reversal for each listed firm based on the footnotes in their financial statements to attain an accurate and clear understanding of these firms' asset impairment and reversal policies.[3]

Third, based on the regulations stipulated in New-CAS No. 8 as well as the reporting incentives of Chinese managers, who are influenced by the accounting contracting role more than they are influenced by the accounting information role, this research studies listed firms in China. Chen et al. (2009) analyze the relationship between the supervision mechanism and asset impairment reversals in China, and determine that this system motivates listed firms to manage earnings through asset impairment losses and reversals. He et al. (2012) report that the use of bright-line rules by Chinese securities regulators creates strong incentives for firms to manage earnings.[4] In consideration of the system used to supervise listed companies in

[2] Reversible assets include allowances for uncollectible accounts receivable, reductions of inventory, and reserves for short-term investment losses, and irreversible assets include long-term assets such as long-term investments, fixed assets, intangible assets, ongoing construction, and entrusted loans.

[3] Reliable financial data for each firm is available because of the detailed disclosure requirements of the Chinese Reporting Standards.

[4] For example, the daily stock price changes for ST firms are restricted to 5%, whereas a 10% restriction is imposed on non-ST firms. A firm that reports a loss in the year after becoming an ST firm is delisted. Furthermore, to issue equity, a firm must have reported a profit in each of the past three years. Accounting numbers thus play a crucial contracting role in China, thereby creating strong incentives for firms to manage earnings to meet regulatory earnings targets (He et al., 2012).

China, studies have generally regarded ST firms as having stronger motivation to manage earnings than non-ST firms (Lu, 1999; Zhao, 2006; Wang, 2007). This research investigates the difference between ST and non-ST companies to determine how the mechanism affects earnings management behavior through asset impairment provisions and reversals.

The remainder of this paper is organized as follows. Section II describes a literature review and the development of research hypotheses. Section III details the research design and research model. Section IV presents the empirical results. Section V concludes the paper.

II. Literature Review and Hypotheses Development

The Chinese Ministry of Finance began enforcing New-CAS No.8 in 2007. A major change is that once a long-lived asset impairment loss is confirmed, it cannot be reversed in the future. This stipulation divides the impairment reversal subjects into reversible current assets and irreversible long-term assets in order to prohibit managers from using reserves for earnings management. Under the old CAS that was enforced until 2006, all asset impairment losses could be reversed if asset values rose again. In summary, starting from 2007, CAS has moved closer to U.S. GAAP by imposing restrictions on long-term asset impairment reversals.

As asset impairment estimation involves subjective judgment, thus providing an opportunity for managers to window dress their financial reports (Francis et al., 1996; Massoud and Raiborn, 2003; Riedl, 2004; Phillips, 2005). Compared to impairment of current assets whose useful life is less than one year, the impact of long-term asset impairment can last as long as the physical life of that asset. Firms can take the advantage of the asset's impairment and reversal as tools to manage earnings during that long-term asset existing period. For executives who want to take the advantage of "cookie jar reserves" of impairment losses and reversals, long-term assets are a better option than current assets. This is the one of the reasons why CAS regulators eliminated the reversal of long-term asset impairments.

II.1 Provisions of Asset Impairment

Research regarding asset impairment and earnings management has revealed that firms use asset impairment to engage in earnings management behaviors such as big-bath reporting and earnings smoothing. McNichols and Wilson (1988) observe that managers tend to record more asset impairment losses when annual earnings are high, indicating that asset impairment provisions are related to earnings smoothing. Zucca and Campbell (1992) find that the chance of a firm conducts earnings management by asset impairment provision is high when its previous performance is poor.

In addition, previous studies have observed a significant relation between asset impairment provisions and earnings management in China. Yu and Lee (2001) find that firms conduct

earnings management by using inventory devaluation reserves when they experience a deficit. Zhao (2006) investigates the correlation between asset impairment and earnings management among listed firms in China, and the results indicate that firms experiencing a deficit charge additional asset impairment reversals to increase earnings or report additional impairment losses for big-bath purposes; in addition, firms use asset impairment provisions and reversals to perform earnings smoothing. Ren (2006) observes that impairment losses provided in deficit years are significantly greater than those provided in the years without deficit, indicating that firms use asset impairment to conduct big-bath reporting. Jiang and Wang (2009) examine three industries with the highest ratio of accounts receivable from 2002 to 2005 to analyze provisions of bad debt reserves; they determine that avoiding the ST label and being delisted are the major factors that affect the level of bad debt reserves. Furthermore, Das et al. (2009) report that firms with poor sales performance in the first three quarters tends to conduct earnings management in the fourth quarter. Zhang et al. (2010) show that firms listed in Chinese stock exchanges recognized fewer impairment charges during the transition period (i.e., after the announcement of the new standard but before the effective date) than during preannouncement periods.

When regulation setters allow asset impairment to be reversed at least two advantages are associated with overstating impairment. First, depreciation and amortization expenses can be reduced during the economic life of an asset, thus improving future return on equity (ROE) and return on asset (ROA). Second, managerial discretion can be increased by creating a cookie-jar reserve, which can be released when required by reversing impairment charges. However, overstating asset impairment involves costs; specifically, overstating asset impairment reveals financial weaknesses, causes slack in debt covenants to be eliminated, and reduces current earnings. Thus, a trade-off exists between the benefits and costs of asset impairment decisions (Dietrich et al., 2001; Beatty and Weber, 2006; Zhang et al., 2010).

When impairment reversals are prohibited, overstating asset impairment can no longer be used to shift earnings among accounting periods by reversing impairment changes and, thus, becomes less attractive to managers (Zhang et al., 2010). When New-CAS No. 8 is enacted, the long-term asset impairment losses of listed firms cannot be reversed; therefore, after controlling for all other factors that affect the recognition of impairment losses, we hypothesize that the magnitude of long-term asset impairment declined after New-CAS No. 8 is enacted. Thus, our first hypothesis is expressed in the alternative form as follows:

Hypothesis 1-1: Firms recognize relatively less long-term asset impairment losses after the adoption of New-CAS No.8.

Hypothesis 1-2: Compared to non-ST firm, ST firms recognize relatively less long-term asset impairment losses after the adoption of New-CAS No8.

To take advantage of cookie jar reserve and reach earnings targets, recording current asset impairment losses and reversals became better options for earnings management. Thus, we hypothesize that firms use reversible current asset impairment losses to a greater extent after long-term asset impairment reversals are prohibited. Based on this argument, we express our second and third hypotheses in the alternative form as follows:

Hypothesis 2-1: Firms recognize relatively more current asset impairment losses after the adoption of New-CAS No.8.
Hypothesis 2-2: Compared to non-ST firms, ST firms recognize relatively more current asset impairment losses after the adoption of New-CAS No.8.

Hypothesis 3-1: Firms recognize relatively more current asset impairment reversals after the adoption of New-CAS No.8.
Hypothesis 3-2: Compared to non-ST firms, ST firms recognize relatively more current asset impairment reversal after the adoption of New-CAS No.8.

II.2 Reasons for Impairment Provisions and Reversals

Studies regarding factors that influence asset impairment provisions have focused on two dimensions: economic drivers and report drivers. Economic drivers are generally associated with disadvantageous changes in economic environments or industries. Thus, provisions of asset impairment are used to reflect the fair value of the asset. For example, Francis et al. (1996) reveal that the major factor affecting impairment loss provisions is the economic value of an asset.

Regarding report driver, the fair value of an asset is not reduced, but managers adjust asset write-offs and reversals to achieve earnings targets. Zucca and Campbell (1992) determine that firms exhibiting poor performance use asset impairment losses to reduce earnings for big-bath purposes, whereas firms with higher earnings recognize asset impairment losses to perform earnings smoothing. Rees et al. (1996) examine the correlation between asset impairment losses and abnormal accruals, and the results indicate that firms' impairment loss provisions are significantly and negatively correlated with abnormal accruals. Riedl (2004) finds that the relation between asset impairment provisions and report drivers become stronger after the adoption of SFAS No. 121.

Numerous empirical studies have indicated that using asset impairment and reversals as a tool for earnings management is severe in China (Lu, 1999; Zhao, 2006; Wang, 2007). Chen et al. (2004) show that, when firms experience deficits, they conduct big-bath reporting by providing asset impairment. Dai et al. (2005) analyze listed firms that experience deficits

from 2001 to 2003 to investigate how economic drivers and report drivers influence impairment loss provision. After controlling for economic factors, they obtain evidence that firms experiencing deficits use asset impairment losses to implement a big-bath strategy.

Base on prior research, we expect that the adoption of New-CAS No.8 would affect the accounting policies associated with earnings management and asset impairment losses provisions and reversals, we analyze earnings management from two aspects: big-bath reporting and earnings smoothing. We predict that the functional role of providing long-term asset impairment to attain earnings target is weakened following the adoption of New-CAS No.8. On the other hand, firms would change the role that current asset impairment losses and reversals playing in earnings management. We posit our fourth hypotheses in the alternative form as follows:

Hypothesis 4-1: Firms weaken the functional role of long-term asset impairment losses associated with earnings management after the adoption of New-CAS No.8.
Hypothesis 4-2: Firms change the functional role of current asset impairment losses associated with earnings management after the adoption of New-CAS No.8.
Hypothesis 4-3: Firms change the functional role of current asset impairment reversals associated with earnings management after the adoption of New-CAS No.8.

III. Sample and Research Design

III.1 Initial Sample

This study investigates the A-share market of the Shanghai and Shenzhen stock exchanges to analyze the policies regarding asset impairment provisions of listed firms in China. The required financial data are obtained from the China Center for Economic Research (CCER). Data on various types of asset impairment losses and reversals are manually collected from the footnotes of the sample firms' financial statements.

Our sample selection process is outlined in Table 1, Panel A. We start with all observations available on the CCER database (excluding Banking and Insurance) with non-missing asset data for the years 2004-2010; this initial data set includes 13,351 firm-years. We lose 476 observations because they lack data on asset impairments and reversals, and another 4,499 observations due to missing accounting number data. This leaves us with a final sample of 8,376 firm-years. The sample by year is shown in Table 1, Panel B.

The distribution of the sample firms according to industry is shown in Table 1, Panel C. Manufacturing industry takes greater percentage in our sample, with metal manufacturing constituting 13.37%, followed by the real estate exploitation management industry

constituting 8.86%. The sample distributions of the ST and non-ST firms are similar to that of the total sample, except the real estate exploitation management industry constituted 17.33% of the ST firms, but 7.80% of the non-ST firms.

Refer Table 1

III.2 Research Design

To clarify the impact of New-CAS No.8 on different types of asset impairment policy, we use four definitions as the dependent variables in Models (1) and (2) : *TIMP* represents the total amount of impairment losses deducting impairment reversals; *LIMP* and *SIMP* measure the impairment losses associated with long-term and current assets; and *SRVSA* represents reversals of current asset impairment. To test Hypotheses, Tobit models are designed as follows:

$$Y_{it} = \alpha_0 + \alpha_1 ST_{it} + \alpha_2 POST_{it} + \alpha_3 ST_{it} * POST_{it} + \alpha_4 \Delta GDP_{it} + \alpha_5 \Delta INDROA_{it} + \alpha_6 \Delta SALES_{it} + \alpha_7 \Delta OCF_{it} + \alpha_8 RET_{it} + \alpha_9 DEBT_{it} + \alpha_{10} SIZE_{it} + \varepsilon_{it} \quad (1)$$

$$Y_{it} = \beta_0 + \beta_1 POST_{it} * BATH_{it} + \beta_2 POST_{it} * SMOOTH_{it} + \beta_3 BATH_{it} + \beta_4 SMOOTH_{it} + \beta_5 ST_{it} + \beta_6 POST_{it} + \beta_7 ST * POST_{it} + \beta_8 \Delta GDP_{it} + \beta_9 \Delta INDROA_{it} + \beta_{10} \Delta SALES_{it} + \beta_{11} \Delta OCF_{it} + \beta_{12} RET_{it} + \beta_{13} DEBT_{it} + \beta_{14} SIZE_{it} + \varepsilon_{it} \quad (2)$$

Variables of Models (1) and (2) are defined in Table 1.

Refer Table 1

ST (ST firms): Since previous studies have verified that comparing with non-ST firms, ST firms have stronger incentive to use the provisions of asset impairment and reversals as the tools to manipulate earnings (Wang, 2000; Liang et al., 2007), we expect ST firms recognize more impairment losses and reversals, therefore, the coefficients of ST in equations (1) and (2) are positive; i.e., $\alpha_1, \beta_5 > 0$. ***POST***: New-CAS No.8 is adopted in 2007; the years including and subsequent to 2007 are noted as 1, otherwise 0. According to Hypothesis 1-1, when Y represents *LIMP*, α_2, $\beta_6 < 0$ are expected; when Y refers to *SIMP* or *SRVSA*, as the expectation in Hypothesis 2-1 and Hypothesis 3-1, α_2, $\beta_6 > 0$. ***ST*POST*** is the interaction term of *ST* and *POST*. According to Hypothesis1-2, when Y represents *LIMP*, α_3, $\beta_7 < 0$ is expected; when Y refers to *SIMP* or *SRVSA*, as the expectation in Hypothesis 2-2 and Hypothesis 3-2, we expect α_3 , $\beta_7 > 0$. When Y equals *TIMP,* we are not sure about the sign of *ST*, *POST* and *ST*POST*, because the integration effects of *LIMP*, *SIMP* and *SRVSA* are unknown.

BATH: The proxy for big-bath is equal to the change in firm i's pre-impairment and pre-reversals earnings from period t-1 to t, divided by total asset; when below the median of nonzero negative values of this variable, and 0 otherwise (Riedl, 2004). Since the value of

BATH is either negative or zero, if firms intend to conduct a big-bath, they would recognize more (less) long-term or current asset impairment (reversals of current asset impairment) when *BATH* is smaller, that is $\beta_3 < 0$ ($\beta_3 > 0$). In terms of the interaction term of *POST* and *BATH* (*POST* ∗ *BATH*), based on the expectation of Hypothesis 4-1, when Y represents *LIMP*, $\beta_1 > 0$ is expected; when Y refers to *SIMP* and *SRVSA*, as the prediction of Hypothesis 4-2 and Hypothesis 4-3, we expect β_1 to differ significantly from β_3.

SMOOTH: The proxy for earnings smoothing is equal to the change in firm i's pre-impairment and pre-reversals earnings from period t-1 to t, divided by total asset; when above the median of nonzero positive values of this variable, and 0 otherwise (Riedl, 2004). Since the value of *SMOOTH* is either positive or zero, firms that intend to conduct earnings smoothing generally recognize more (less) long-term or current asset impairment (reversals of current asset impairment losses) with the level of *SMOOTH*, that is $\beta_4 > 0$ ($\beta_4 < 0$). In terms of the interaction term of *POST* and *SMOOTH (POST* ∗ *SMOOTH)*, based on the expectation of Hypothesis 4-1, when Y represents *LIMP*, $\beta_2 < 0$ is expected; when Y refers to *SIMP* and *SRVSA*, as the prediction of Hypothesis 4-2 and Hypothesis 4-3, we expect β_2 to differ significantly from β_4.

To control the impact of the economic environment on asset impairment provisions, we measured the percentage change in Gross Domestic Product (**Δ*GDP***) of China from year t-1 to t. If firms face downturn in the economy, which leads to negative changes in GDP, firm asset may suffer concurrent reductions in value; which means that when Y represents *LIMP* or *SIMP,* the coefficient is negative, and $\alpha_4, \beta_8 < 0$ are expected; when Y refers to *SRVSA,* the coefficient is positive, i.e. $\alpha_4, \beta_8 > 0$ (Riedl, 2004).

To control the industry-specific effect, we define ***ΔINDROA*** as the median change of return on asset from period t-1 to t in firm i's industry, where industry is defined at the two-digit China Securities Regulatory Commission (CSRC) industry code.[5] Similar to the coefficient of Δ*GDP*, if firms are in a declining industry, their asset may suffer concurrent reductions in value, i.e. when Y represents *LIMP* or *SIMP*, the coefficients are negative, and $\alpha_5, \beta_9 < 0$ are expected; if Y is defined as *SRVSA*, the coefficient is positive, and $\alpha_5, \beta_9 > 0$ are expected (Francis et al.,1996; Riedl, 2004).

As for firm-specific factors, this study includes five measures: Δ*SALES*, Δ*OCF*, *RET, DEBT* and *SIZE*. ***ΔSALES*** is measured as the change in the firm's sales scaled by total asset. This variable is included to reflect the performance indicators of the relevant asset's recovery

[5] I also conduct the industry fixed effect to replace *ΔINDROA* in regressions estimation.

ability. Change in operating cash flows (***ΔOCF***) is calculated as the change in operating cash flows divided by total asset. Riedl (2004) uses *ΔOCF* to measure performance indicators of the asset recovery ability reflected under a cash basis, as firms with better operating cash flows will recognize less impairment losses and more reversals. Following Francis et al. (1996), we define stock rate of return (***RET***) and predict that firms with poor operating performance (lower ***RET***) would recognize more impairment losses and less impairment reversals. ***DEBT*** is measured as the debt to asset ratio. Prior researches point out that when firms have high liability ratios; managers are more likely to increase earnings through accounting estimation items, and to avoid violating regulations on debt covenants (Watts and Zimmerman, 1986; Defond and Jiambalvo, 1994). When Y represents *LIMP* or *SIMP*, the coefficients of *ΔSALES, ΔOCF, RET* and *DEBT* are expected to be negative, and when Y is defined as *SRVSA*, the coefficient would be positive. The firm size (***SIZE***) is measured by the natural logarithm of total asset. The relation between firm size and asset impairment is controversial, as such, we are uncertain as to what sign to expect regarding the SIZE coefficient.

IV. Empirical Results

IV.1 Descriptive Statistics

Table 3 panel A shows the mean and median of *TIMP, LIMP*, *SIMP* and *SRVSA*. After New-CAS No.8 is adopted, the mean and median of *TIMP*, *LIMP*, *SIMP* values decrease significantly; however, the *SRVSA* increases significantly (Panels A, C and D).[6] These results indicate that prohibition listed firms from reversals of long-term asset impairment, reduce the amounts of long-term asset impairment recognized as well as their current asset impairment. However, this reduction in current asset impairment losses does not reduce the reversals of impairment losses in current asset; by contrast, the reversals of current asset impairment increase significantly. Panel B of Table 3 shows the comparison across ST and non-ST firms: the means and medians of *TIMP*, *LIMP*, *SIMP* and *SRVSA* for ST firms are significantly greater than those for the non-ST firms in all sample periods.

Refer Table 3

Table 4 lists the summary statistics for each variable in the regression model, and Table 5 shows the Pearson correlation coefficients for each variable. Firstly, the means of *TIMP*, *LIMP*, *SIMP* and *SRVSA* are 0.0481, 0.0082, 0.0399 and 0.0061, respectively. Secondly, the correlation coefficients of *LIMP* and *POST* are negative; indicating that firms tend to reduce long-term asset impairment provisions after New-CAS No.8 is implemented. In addition, the correlation coefficient of *SRVSA* is significantly positive after the standards are reformed. The

[6] To prevent the sample from being affected by extreme values, I winsorize all of the continuous variables in Models (1)-(2) at 1 percent and 99 percent.

correlation between *LIMP* and *ST*POST* is significantly negative, indicating that ST firms charge less long-term asset impairment provisions than non-ST firms does after New-CAS No.8 is adopted, as expected. The correlation of *SIMP* and *SRVSA* with ST**POST* is significantly positive and consistent with our expectations. The correlations between *SMOOTH* and *TIMP, LIMP, SIMP, SRVSA* are significantly positive, and the correlations between *BATH* and *TIMP, LIMP* and *SIMP, SRVSA* are significantly negative. These results provide preliminarily confirmation that asset impairment losses and reversals are tools used for earnings management. The variables *ΔINDROA* and *ΔSALES* are negatively correlated with *TIMP* and *LIMP*, and *ΔOCF is* positively correlated with *SRVSA*; these correlations are consistent with our expectations.[7]

Refer Table 4 and 5

IV.2 The Provisions on Asset Impairment and Reversals Pre- and Post- New-CAS No.8

Table 6 shows the regression results of Model (1). Firstly, when *Y* is *LIMP*, as hypothesized, the coefficient sign of *POST* is significantly negative. By contrast, when *SRVSA* is dependent variable, the coefficient sign of *POST* is significantly positive; indicating that listed firms tend to recognize less long-term asset impairment and greater reversal for current asset impairment after New-CAS No.8 is adopted. These results are consistent with Hypothesis 1-1 and Hypothesis 3-1; however, the results shown in Table 6 do not provide strong evidence supporting Hypothesis 2-1.

TIMP, *LIMP, SIMP* and *SRVSA* are positively correlated with ST at the 1% significance level. Consistent with our expectations, ST firms tend to provide more asset impairment losses and reversals. The coefficients of *ST*POST* are in line with our prediction which are significantly negative when Y is *LIMP*, but positive when Y is *SIMP* or *SRVSA,* indicating that limiting the reversals of long-term asset write-offs force ST firms to change their impairment losses recognition policies.

Most of the effects of the control variables are consistent with our predictions. The variable *ΔSALES* is negatively correlated with *TIMP*, *LIMP*, *SIMP* and *SRVSA*, this correlation is consistent with the expectation regarding impairment losses recognition behavior, but inconsistent with the expectation of impairment reversals recognition policy. This result implies that firms conduct earnings management by using reversals of impairment losses when operating performance is poor. The coefficient sign of *RET* is significantly negative

[7] Pearson's correlation coefficients between every two variables adopt in each model are less than 0.5, indicating that the variables exhibit no serious collinearity problems within the model designs. We also use variance inflation factors (VIFs) to examine whether collinearity problems exist between independent variables. The VIFs of the independent variables in this study ranged from 1 to 3, indicating that the research models exhibit no collinearity problems.

when Y is *TIMP* and *SIMP*, which is consistent with our expectation. Impairment losses and reversals are positively correlated with *DEBT*, indicating that firms are inclined to provide greater impairment losses and reversals when *DEBT* is higher. The correlation between *SIZE* and the amount of impairment losses is negative, indicating that smaller firms tend to provide more asset write-offs than do larger firms.

Refer Table 6

IV.3 Asset Impairment Policy and Earnings Management

Tables 7 to 10 list the regression results of Model (2). We obtain evidences that all of the sample firms use asset impairment losses and reversals to conduct big-bath reporting and earnings smoothing during the sample period; however, accounting policies regarding impairment provisions and reversals are adjusted after New-CAS No.8 is enacted. These results are consistent with Hypotheses 4-1, 4-2 and 4-3 for all sample firms. However, some differences are observed between ST and non-ST firms in the use of asset impairment losses and reversals as opportunistic tools.

From the big-bath reporting perspective: From Table 8 provides evidence indicating that Hypotheses1-1, 1-2 and 4-1 are supported in all sample firms and in both ST and non-ST subsamples; firms reduce their long-term asset impairment provisions (the coefficients of *POST* are significantly negative) and weaken the functional role of *LIMP* in big-bath reporting after the standards changed (the coefficients of *BATH* are significantly negative; however, the coefficients of *POST*BATH* become positive). These results indicate that, even among firms with strong motivation to engage in earnings management, such as ST firms, the role of *LIMP* in terms of big-bath reporting become less crucial after reversals of long-term asset impairment is prohibited.

Table 9 provides evidence indicating that Hypotheses 2-1, 2-2 and 4-2 are supported in all sample firms, and in both ST and non-ST subsamples. Although firms increase the current asset impairment provisions (the coefficients of *POST* are significant positive), firms still weaken the functional role of *SIMP* in big-bath reporting after the standards changed (the coefficients of *BATH* are significantly negative; however, the coefficients of *POST*BATH* become significantly positive).

Table 10 provides evidence indicating that Hypotheses 3-1, 3-2 and 4-3 are supported. All sample firms and ST firms tend to increase the reversals of current asset impairment (the coefficients of *POST* are positive), and change the functional role of *SRVSA* in big-bath reporting (the coefficients of *BATH* are significantly positive, whereas the coefficients of *POST*BATH* become significantly negative). By contrast, non-ST firms increase the

reversals of current asset impairment (the coefficients of *POST* are significantly positive); however, they do not emphasize the functional role of *SRVSA* in big-bath reporting regardless of standards reform.

From the earnings smoothing perspective: Table 8 provides evidence indicating that Hypothesis 4-1 is supported in all sample firms. These firms weaken the functional role of *LIMP* in earnings smoothing after New-CAS No.8 is enacted (the coefficients of *SMOOTH* are significantly positive; however, the coefficients of *POST*SMOOTH* become significantly negative). These results indicate that the role of *LIMP* in earnings smoothing become less crucial after reversals of long-term asset impairment is prohibited.

Table 9 provides evidence indicating that Hypothesis 4-2 is supported in all sample firms and in non-ST subsample. Non-ST firms change the functional role of *SIMP* in earnings smoothing after the standards reform is enacted. However, *SIMP* does not play a crucial role in earnings smoothing of ST firms. In Table 10, the results are consistent with Hypothesis 4-3 in all sample firms, however, the functional roles of *SRVSA* in earnings smoothing differ between ST and non-ST subsamples. The ST firms emphasize the functional role of *SRVSA* in earnings smoothing regardless of whether New-CAS No.8 is enforced (the coefficients of *SMOOTH* and *POST*SMOOTH* are significantly negative). However, Table 6 does not provide strong evidence that non-ST firms conduct earnings smoothing by *SRVSA*.

In summary, the results of this study are consistent with Hypotheses 1-1, 1-2, 2-1, 2-2, 3-1, 3-2, 4-1, 4-2 and 4-3 in all sample firms. We find that all sample firms do use asset impairment losses and reversals to conduct big-bath reporting and earnings smoothing in our sample period; however, the accounting policies related to impairment provisions and reversals are adjusted following the enforcement of New-CAS No.8. Our results confirm that post New-CAS No.8; the magnitude of firms' use of asset impairment provisions and reversals to manage earnings is mitigated. However, firms with a strong incentive to manage earnings (such as ST firms) still seek out ways to attain earnings targets. This helps to confirm the findings of Piotroski and Wong (2011), who argue that the use of bright-line accounting-based rules by the Chinese securities regulators creates strong incentives for firms to manage earnings.

Refer Tables 7 to 10

V. Conclusions

Using A-shares of the Shanghai and Shenzhen markets from 2004 to 2010 as our research sample, we analyze whether Chinese listed firms change their provision and reversal of long-term and current asset impairment as well as whether these firms adjust their accounting policies regarding asset impairment and reversal to attain earnings targets after New-CAS

No.8 is enacted in 2007.

Based on regression analysis, we note that a statistically significant correlation exists between the asset impairment provision/reversal and the adoption of New-CAS No.8 after controlling for other factors that can affect the level of asset impairment and reversal. From the sample data, we find evidence that the listed firms reduce *LIMP*, and increase *TIMP, SIMP* and *SRVSA* after New-CAS No.8 is implemented. In addition, all sample firms use impairment provisions and reversals to conduct big-bath and earnings smoothing during the sample period. However, following the new regulation limit regarding reversals of long-term asset impairments, listed firms adjust their reporting strategies by significantly weakening the functional role of *LIMP* in earnings management; they also adjust the functional roles of *SIMP* and *SRVSA* in terms of big-bath reporting and income smoothing.

Reidl (2004) argues that current assets are easier to evaluate for impairments relative to long-term assets due to potential differences in the liquidity of these assets. We find that firms not only reduce the functional role of *LIMP* in earnings management, but also diminish the role that *SIMP* plays in earnings management. From the viewpoint of discouraging earning management, our results suggest that firms mitigate the level of both current/long-term asset impairments and reversals to manage earnings after prohibiting long-term asset impairment. However, for firms with a strong motivation to manage earnings, the effects are somewhat limited.

Companies can use other method, such as asset disposal, to reverse the previously charged long-term asset impairment losses; future studies may explore the association among firms' asset impairment charges, asset disposal policy and earnings management. In addition, future research can further discuss whether and how the stakeholders make any adjustments to counteract the effects of earnings management from asset impairments and reversals.

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Table 1: Sample Selection and Sample Distribution

Panel A: Sample Selection

	Number of Observations
Total sample of A-share firms (excluding Banking and Insurance)	13,351
Less: Firms lacking requisite asset impairment and reversal	(476)
Less: Firms lacking requisite accounting number data	(4,499)
Total firm-year observations	8,376

Panel B: Sample by Year

	Number of Observations	%
2004	1,139	13.60%
2005	1,203	14.36%
2006	1,193	14.24%
2007	1,189	14.20%
2008	1,198	14.30%
2009	1,220	14.57%
2010	1,234	14.73%
Total firm-year observations:	8,376	100.00%

Panel C: Sample by Industry

Industry	Samples	%	ST	%	Non-ST	%
Agriculture, forestry, fisheries, husbandry	153	1.83%	18	1.94%	135	1.81%
Natural resource extraction	231	2.76%	26	2.80%	205	2.75%
Food processing	387	4.62%	54	5.81%	333	4.47%
Textile and apparel	282	3.37%	30	3.23%	252	3.38%
Furniture and paper-making	154	1.84%	18	1.94%	136	1.83%
Petroleum processing and coke oven	75	0.90%	4	0.43%	71	0.95%
Chemical manufacturing	617	7.37%	43	4.63%	574	7.71%
Plastic manufacturing	154	1.84%	16	1.72%	138	1.85%
Electrical appliance manufacturing	327	3.90%	42	4.52%	285	3.83%
Metal product manufacturing	1,120	13.37%	114	12.27%	1,005	13.50%
Medical device manufacturing	549	6.55%	56	6.03%	493	6.62%
Transportation	416	4.97%	73	7.86%	343	4.61%
Electronic and machinery manufacturing	277	3.31%	18	1.94%	259	3.48%
Biochemical pharmaceutics	163	1.95%	30	3.23%	133	1.79%
Steel manufacturing	29	0.35%	2	0.22%	28	0.38%
Electrical power and gas supply	423	5.05%	26	2.80%	397	5.33%
Home construction architecture	154	1.84%	5	0.54%	149	2.00%
Transportation	372	4.44%	8	0.86%	364	4.89%
Electronics and data communication	418	4.99%	54	5.81%	364	4.89%
Retail	633	7.56%	49	5.27%	584	7.84%
Real estate exploitation management	742	8.86%	161	17.33%	581	7.80%
General services	100	1.19%	15	1.61%	85	1.14%
Catering and tourism	138	1.65%	15	1.61%	123	1.65%
Publishing	98	1.17%	13	1.40%	85	1.14%
Others	364	4.35%	39	4.20%	325	4.36%
Total	8,376	100.00%	929	100.00%	7,447	100.00%

Table 2: Definition of Variables

Definitions of Y_{it}:		
$TIMP_{it}$	=	total amount of asset impairment reserves divided by total asset
$LIMP$	=	long-term asset impairment losses divided by total asset
$SIMP$	=	current asset impairment losses divided by total asset
$SRVSA$	=	Reversals of current asset impairment losses divided by total asset
Variables of Interest:		
ST_{it}	=	Dummy variable equal to 1 if the firm is labeled as an ST firm; otherwise 0.
$POST_{it}$	=	Dummy variable equal to 1 if the year of observation is 2007 or later; otherwise 0.
$BATH_{it}$	=	Proxy for "big-bath" reporting, equal to the change in firm i's pre-impairment and pre-reversals earnings from period t-1 to t divided by total asset when below the median of nonzero negative values of this variable, and 0 otherwise (Riedl, 2004).
$SMOOTH_{it}$	=	Proxy for "earnings smoothing" reporting, equal to the change in firm i's pre-impairment and pre-reversals earnings from period t-1 to t divided by total asset when above the median of nonzero positive values of this variable, and 0 otherwise (Riedl, 2004).
Control Variables		
ΔGDP_{it}	=	Growth rate of GDP in China
$\Delta INDROA_{it}$	=	Median change in firm i's industry ROA from period t-1 to t.
$\Delta SALE_{it}$	=	Change in sales divided by total asset
ΔOCF_{it}	=	Change in operating cash flow divided by total asset
RET_{it}	=	Stock return rate of firm *i* in year *t*
$DEBT_{it}$	=	Debt to asset ratio
$SIZE_{it}$	=	Natural logarithm of total asset

Table 3: Mean and Median of Asset Impairment Losses and Reversals

Panel A: Descriptive Statistics for Asset Impairment Losses and Reversals Pre (post=0) and Post (post=1) New-CAS No.8 Period

		Timp		*Limp*		*Simp*		*Srvsa*	
	N	Mean	Median	mean	median	mean	median	mean	median
post= 0 (04-06)	3535	0.0507	0.0150	0.0089	0.0000	0.0418	0.0124	0.0054	0.0000
post= 1 (07-10)	4841	0.0462	0.0146	0.0076	0.0000	0.0386	0.0114	0.0066	0.0000
Difference test		-1.78** (0.038)	-3.41*** (<0.001)	-1.78** (0.037)	-5.14*** (<0.001)	-1.43* (0.076)	-3.37*** (<0.001)	2.41*** (0.008)	14.02*** (<0.001)

Panel B: Descriptive Statistics for Asset Impairment Losses and Reversals of ST and Non-ST Firms Pre (post=0) and Post (post=1) New-CAS No.8 Period

			Timp		*Limp*		*Simp*		*Srvsa*	
		N	Mean	Median	mean	median	mean	median	mean	median
post= 0 (04-06)	ST	375	0.1293	0.0380	0.0249	0.0000	0.1044	0.0312	0.0157	0.0000
	Non-ST	3160	0.0414	0.0138	0.0070	0.0000	0.0344	0.0115	0.0043	0.0000
Difference test			7.76*** (<0.001)	10.47*** (<0.001)	5.56*** (<0.001)	4.70*** (<0.001)	6.83*** (<0.001)	9.83*** (<0.001)	5.17*** (<0.001)	1.03 (0.152)
post= 1 (07-10)	ST	554	0.1157	0.0324	0.0183	0.0000	0.0974	0.0248	0.0200	0.0001
	Non-ST	4287	0.0372	0.0130	0.0063	0.0000	0.0310	0.0106	0.0049	0.0000
Difference test			16.13*** (<0.001)	10.71*** (<0.001)	5.21*** (<0.001)	3.70*** (<0.001)	8.04*** (<0.001)	9.99*** (<0.001)	8.12*** (<0.001)	5.03*** (<0.001)

Panel C: Difference Test in Post =1 and Post = 0 of ST Firms

	Timp		*Limp*		*Simp*		*Srvsa*	
	Mean	Median	mean	median	mean	median	mean	median
Difference test	-0.96 (0.197)	-1.71** (0.043)	-1.69** (0.046)	-2.62*** (0.004)	-0.54 (0.296)	-1.51* (0.066)	1.50* (0.067)	5.20*** (<0.001)

Panel D: Difference Test in Post =1 and Post =0 of Non-ST Firms

	Timp		*Limp*		*Simp*		*Srvsa*	
	Mean	Median	mean	median	mean	median	mean	median
Difference test	-1.94** (0.026)	-3.20*** (0.000)	-1.19 (0.117)	-4.59*** (<0.001)	-1.79** (0.036)	-3.16*** (0.001)	1.63* (0.052)	12.88*** (<0.001)

***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

Table 4: Descriptive Statistics of the Main Variables (N=8,376)

Variables[a,b]	Mean	S. D.	Q1	Median	Q3	Max.
TIMP	0.0481	0.1137	0.0047	0.0144	0.0378	0.9935
LIMP	0.0082	0.0323	0.0000	0.0000	0.00151	0.2819
SIMP	0.0399	0.1018	0.0003	0.0118	0.0310	0.8589
SRVSA	0.0061	0.0224	0.0000	0.0000	0.0021	0.1764
ST	0.1109	0.3140	0.0000	0.0000	0.0000	1.0000
POST	0.5780	0.4939	0.0000	1.0000	1.0000	1.0000
*ST*POST*	0.0661	0.2485	0.0000	0.0000	0.0000	1.0000
*POST*BATH*	-0.0097	0.0354	-0.1650	0.0000	0.0000	0.0000
*POST*SMOOTH*	0.0199	0.0609	0.0000	0.0000	0.0000	0.4983
BATH	-0.0164	0.0451	0.0000	0.0000	0.0000	0.0000
SMOOTH	0.0304	0.0736	0.0000	0.0000	0.0320	0.4983
ΔGDP	0.1677	0.0398	0.1570	0.1770	0.1810	0.2290
ΔINDROA	-0.0169	0.1182	-0.0600	-0.0150	0.0400	0.2100
ΔSALES	0.1099	0.2540	-0.0067	0.0712	0.1858	1.2802
ΔOCF	0.0063	0.1102	-0.0417	0.0058	0.0545	0.3904
RET	0.5228	1.0821	-0.2560	0.1660	1.1100	4.3300
DEBT	0.5536	0.2922	0.4000	0.5350	0.6600	2.5270
SIZE	21.5541	1.1887	21.0000	21.4260	22.0000	25.1300

a. Variables are defined in Table 2.
b. All continuous variables are winsorized at the 1st and 99th percentiles.

Table 5: Pearson Correlation Coefficients (n=8,376)

Variables[a,b]	*LIMP*	*SIMP*	*SRVSA*	*ST*	*POST*	*ST*POST*	*POST*BATH*	*POST*SMOOTH*	*BATH*	*SMOOTH*	*ΔGDP*	*ΔINDROA*	*ΔSALES*	*ΔOCF*	*RET*	*DEBT*	*Size*
TIMP	0.491 ***	0.961 ***	0.144 **	0.227 ***	-0.020 *	0.158 ***	-0.247 ***	0.095 ***	-0.430 ***	0.125 ***	-0.008	-0.025 **	-0.152 ***	-0.010	-0.036 ***	0.306 ***	-0.231 ***
LIMP		0.230 ***	0.041 ***	0.139 ***	-0.020 *	-0.083 ***	-0.105 **	0.084 ***	-0.183 ***	0.110 **	-0.024 **	-0.037 ***	-0.114 ***	-0.013	-0.006	0.155 **	-0.144 ***
SIMP			0.147 ***	0.209 ***	-0.016	0.150 ***	-0.242 ***	0.080 ***	-0.422 ***	0.105 ***	-0.002 ***	-0.016	-0.136 ***	-0.007	0.038 ***	0. 292 ***	-0.212 ***
SRVSA				0.191 ***	0.026 **	0.165 ***	-0.061 ***	0.154 ***	-0.056 ***	0.192 ***	-0.011	0.001	-0.093 ***	0.034 ***	0.024 **	0.114 **	-0.137 ***
ST					0.013	0.753 ***	-0.117 ***	0.241 ***	-0.144 ***	0.342 ***	0.022 ***	-0.024 **	-0.066 ***	0.006 ***	0.040 ***	0.342 **	-0.314 ***
POST						0.227 ***	-0.235 ***	0.279 ***	-0.010	0.063 ***	0.001	0.005	0.005 ***	-0.041 ***	0.236 ***	0.009	0.204 ***
*ST*POST*							-0.197 ***	0.363 ***	-0.115 ***	0.262 ***	0.027 **	-0.038 ***	-0.052 ***	-0.09	0.113 ***	0.231 **	-0.199 ***
*POST*BATH*								0.090 ***	0.745 ***	0.114 ***	0. 038 ***	0.023 **	0.158 ***	0.089 ***	0.056 ***	-0.163 ***	0.091 ***
*POST*SMOOTH*									0.119 ***	0.780 ***	0.042 ***	-0.021 *	0.122 ***	0.090 ***	0.243 ***	0.188 ***	-0.067 ***
BATH										0.151 ***	0.035 ***	0.035 ***	0.216 ***	0.111 ***	0.134 ***	-0.256 ***	0.175 ***
SMOOTH											0.039 ***	-0.011	0.138 ***	0.153 ***	0.193 ***	0. 271 ***	-0.150 ***
ΔGDP												-0.001	0.158 ***	-0.065 ***	-0.026	-0.007	-0.045 ***
ΔINDROA													0.048 ***	0.007	0.004	-0.047 ***	0.061 ***
ΔSALES														0.120 ***	0.117 ***	-0.017	0.181 ***
ΔOCF															0.055 ***	0.001	-0.004
RET																0.010	0.030 ***
DEBT																	-0.068 ***

a. Variables are defined in Table 2.
b. All continuous variables are winsorized at the 1st and 99th percentiles.

***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

Table 6: Tobit Regression Results for Model (1): Provisions of Asset Impairment Losses and Reversals

	Y=TIMP		*Y=LIMP*		*Y=SIMP*		*Y=SRVSA*	
Variables[a,b]	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)
Intercept	0.3386*** (12.82)	0.3465*** (14.20)	-0.0188 (-1.07)	-0.0155 (-0.95)	0.2680*** (11.12)	0.2846*** (12.78)	-0.0374*** (-3.74)	-0.0322*** (-3.51)
ST_{it}	0.0292*** (4.65)	0.0281*** (4.49)	0.0171*** (4.34)	0.0184*** (4.69)	0.0211*** (3.69)	0.0188*** (3.30)	0.0137*** (5.67)	0.0135*** (5.63)
$POST_{it}$	0.0033 (1.25)	0.0033 (1.24)	-0.0062*** (-3.51)	-0.0060*** (-3.37)	0.0027 (1.11)	0.0028 (1.15)	0.0082*** (7.93)	0.0081*** (7.88)
ST_{it}*$POST_{it}$	-0.0023 (-0.31)	-0.0017 (-0.22)	-0.0064* (-1.32)	-0.0070* (-1.44)	0.0027 (0.38)	0.0036 (0.51)	0.0036* (1.28)	0.0037* (1.29)
ΔGDP	-0.0059 (-0.19)	-0.0042 (0.14)	-0.0258 (-1.27)	-0.0265* (-1.31)	0.0071 (0.25)	0.0076 (0.27)	-0.0145 (-1.30)	-0.0133 (-1.18)
$\Delta INDROA_{it}$		0.0005 (0.05)		-0.0136** (-2. 04)		0.0056 (0.62)		0.0017 (0.44)
$\Delta SALE_{it}$	-0.0469*** (-9.44)	-0.0471*** (-9.64)	-0.0197*** (-5.95)	-0.0191*** (-5.85)	-0.0365** (-8.07)	-0.0357*** (-8.01)	-0.0096*** (-5.08)	-0.0102*** (-5.47)
ΔOCF_{it}	0.0016 (0.15)	0.0002 (0.02)	-0.0042 (-0.57)	-0.0047 (-0.65)	-0.0007 (-0.07)	0.0128 (0.13)	0.0142*** (3.44)	0.0143*** (3.46)
RET_{it}	-0.0030*** (-2.63)	-0.0031*** (-2.69)	0.0001 (0.19)	0.0002 (0.31)	-0.0031*** (-3.00)	-0.0032*** (-3.11)	0.0004 (0.85)	0.0004 (0.86)
$DEBT_{it}$	0.1085*** (24.78)	0.1060*** (24.56)	0.0234*** (8.55)	0.0224*** (8.21)	0.0940*** (23.55)	0.0920*** (23.36)	0.0054*** (3.32)	0.0050*** (3.11)
$SIZE_{it}$	-0.0168*** (-14.62)	-0.0166*** (-15.12)	-0.0003 (-0.42)	-0.0009 (-1.25)	-0.0139*** (-13.23)	-0.0137*** (-13.83)	0.0004 (1.63)	0.0004 (1.55)
Industry fixed effect	yes	no	yes	no	yes	no	yes	no
_Sigma	0.1072 (125.91)	0.1076 (125.91)	0.0593 (72.52)	0.0595 (72.52)	0.0976 (125.18)	0.0981 (125.17)	0.0356 (82.14)	0.0358 (82.18)
Sample size	8,376	8,376	8,376	8,376	8,376	8,376	8,376	8,376
Log Likelihood	6,182	6,149	1,692	1,654	6,794	6,754	4,828	4,798
Corr of Y_{it} and $\hat{Y}_{it}$	0.4102***	0.4039***	0.1447***	0.1296***	0.3869***	0.3787***	0.2135***	0.1818***

a. Variables are defined in Table 2.
b. All continuous variables are winsorized at the 1st and 99th percentiles.

***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively; one-tailed where signs are predicted, two-tailed otherwise.

Table 7 : Tobit regression Results for Model (2): The Relation between Provisions of Total Asset Impairment and Earnings Management

	Y=TIMP					
	All Sample		*Non-ST Firms*		*ST Firms*	
Variables[a,b]	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)
Intercept	0.2116*** (8.53)	0.2207*** (9.63)	0.2099*** (9.89)	0.2035*** (10.41)	0.3232*** (2.12)	0.3810*** (2.69)
$POST_{it}*BATH_{it}$	0.5081*** (10.01)	0.5077*** (10.00)	0.4026*** (8.28)	0.4057*** (8.35)	0.7929*** (4.31)	0.7955*** (4.30)
$POST_{it}*SMOOTH_{it}$	0.0184 (0.45)	0.0151 (0.45)	0.0469 (1.17)	0.0543 (1.36)	0.0033 (0.04)	0.0019 (0.02)
$BATH_{it}$	-1.2364*** (-30.84)	-1.2387*** (-30.94)	-1.1911*** (-31.68)	-1.1972*** (-31.88)	-1.2787*** (-8.36)	-1.2879*** (-8.36)
$SMOOTH_{it}$	0.1558*** (5.62)	0.1608*** (5.81)	0.2679*** (7.82)	0.2776*** (8.12)	0.0463 (0.62)	0.0623 (0.84)
ST	0.0173*** (2.78)	0.0147*** (2.36)				
$POST_{it}$	0.0043** (1.59)	0.0044** (1.64)	0.0039** (1.71)	0.0039** (1.71)	0.0166 (0.88)	0.0195 (1.02)
*ST*POST*	0.0017 (0.22)	0.0027 (0.34)				
ΔGDP_{it}	0.0074 (0.26)	0.0085 (0.30)	0.0359* (1.48)	0.0101 (0.36)	-0.2934* (-1.87)	-0.2847* (-1.80)
$\Delta INDROA_{it}$		0.0035 (0.38)		0.0374* (1.54)		0.0158 (0.28)
$\Delta SALE_{it}$	-0.0270*** (-5.75)	-0.0271*** (-5.89)	-0.0180*** (-4.28)	-0.0180*** (-4.36)	-0.0921*** (-4.10)	-0.0919*** (-4.14)
ΔOCF_{it}	0.0179** (1.75)	0.0189** (1.85)	0.0159** (1.73)	0.0171** (1.87)	0.0094 (0.21)	0.0134 (0.29)
RET_{it}	-0.0001 (-0.08)	-0.0001 (-0.10)	-0.0007 (-0.70)	-0.0007 (-0.83)	0.0037 (0.70)	0.0022 (0.41)
$DEBT_{it}$	0.0621*** (14.39)	0.0610*** (14.41)	0.0506*** (10.52)	0.0467*** (10.03)	0.0753*** (5.58)	0.0787*** (6.01)
$SIZE_{it}$	-0.0108*** (-10.45)	-0.0108*** (-10.45)	-0.0104*** (-11.13)	-0.0097*** (-11.19)	-0.0155** (-2.26)	-0.0158** (-2.40)
Industry fixed effect	yes	no	yes	no	yes	no
_Sigma	0.0996 (125.91)	0.0996 (125.92)	0.0805 (118.77)	0.0807 (118.77)	0.1882 (41.77)	0.1910 (41.76)
Sample size	8,376	8,376	7,447	7,447	929	929
Log Likelihood	6,792	6,766	7,549	6,758	180.33	166.48
Corr of Y_{it} and $\hat{Y}_{it}$	0.5312***	0.5276***	0.5063***	0.5020***	0.5147***	0.4927***

a. Variables are defined in Table 2.
b. All continuous variables are winsorized at the 1st and 99th percentiles.

***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively; one-tailed where signs are predicted, two-tailed otherwise.

Table 8: Tobit Regression Results of Model (2): The Relation between Long-Term Asset Impairment and Earnings Management

	Y=Limp					
	All Sample		*Non-ST Firms*		*ST Firms*	
Variables[a,b]	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)
Intercept	-0.0511*** (-2.91)	-0.0485*** (-2.98)	-0.0300** (-1.89)	-0.0302** (-2.06)	-0.0997 (-1.07)	-0.1054*** (-2.25)
$POST_{it}$*$BATH_{it}$	0.0672** (2.05)	0.0672** (2.05)	0.0727** (2.19)	0.0761** (2.30)	0.0287 (0.27)	0.0444 (0.42)
$POST_{it}$*$SMOOTH_{it}$	-0.0399** (-1.76)	-0.0395** (-1.74)	-0.0584** (-2.09)	-0.0588** (-2.11)	-0.1359** (-2.31)	-0.1322** (-2.30)
$BATH_{it}$	-0.2465*** (-9.68)	-0.2507*** (-9.86)	-0.2572*** (-10.18)	-0.2634*** (-10.45)	-0.1691** (-1.96)	-0.1856** (-2.15)
$SMOOTH_{it}$	0.0587*** (3.19)	0.0598*** (3.26)	0.1545*** (6.52)	0.1564*** (6.62)	0.0480 (1.05)	0.0384 (0.84)
ST	0.0141*** (3.39)	0.0149*** (3.61)				
$POST_{it}$	-0.0076*** (-3.92)	-0.0073*** (-3.77)	-0.0044*** (-2.53)	-0.0041*** (-2.35)	-0.0343*** (-2.91)	-0.0345*** (-2.94)
*POST*ST*	-0.0091** (-1.73)	-0.0096** (-1.82)				
ΔGDP_{it}	-0.0238 (-1.19)	-0.0245 (-1.23)	-0.0220 (-1.20)	-0.0232 (-1.27)	-0.0534 (-0.54)	-0.0283 (-0.29)
$\Delta INDROA_{it}$		-0.0130** (-1.98)		-0.0099** (-1.65)		-0.0375 (-1.10)
$\Delta SALE_{it}$	-0.0169*** (-5.11)	-0.0161*** (-4.95)	-0.0142*** (-4.55)	-0.0130*** (-4.24)	-0.0414*** (-2.94)	-0.0428*** (-3.09)
ΔOCF_{it}	-0.0022 (-0.31)	-0.0031 (-0.42)	-0.0024 (-0.34)	-0.0031 (-0.44)	0.0004 (0.01)	-0.0019 (-0.07)
RET_{it}	0.0004 (0.55)	0.0005 (0.65)	-0.0001 (-0.12)	0.00001 (0.01)	0.0012 (0.36)	0.0009 (0.30)
$DEBT_{it}$	0.0106*** (3.63)	0.0096*** (3.35)	0.0154*** (4.43)	0.0132*** (3.92)	0.0133* (1.64)	0.0141* (1.80)
$SIZE_{it}$	0.0014* (1.78)	0.0007 (0.97)	0.0005 (0.75)	-0.0001 (-0.11)	0.0024 (0.56)	0.0036 (0.90)
Industry fixed effect	yes	no	yes	no	yes	no
_Sigma	0.0583 (72.58)	0.0584 (72.70)	0.0498 (67.88)	0.0500 (67.96)	0.0984 (25.43)	0.0997 (25.50)
Sample size	8,376	8,376	7,447	7,447	929	929
Log Likelihood	1,773	1,738	1,938	1,899	55.85	44.81
Corr of Y_{it} and $\hat{Y}_{it}$	0.1782***	0.1686***	0.2159***	0.2019***	0.1152***	0.0830***

a. Variables are defined in Table 2.
b. All continuous variables are winsorized at the 1st and 99th percentiles.

***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively; one-tailed where signs are predicted, two-tailed otherwise.

Table 9 : Tobit Regression Results of Model (2): The Relation between Current Asset Impairment and Earnings Management

	Y=Simp					
	All Sample		*Non-ST Firms*		*ST Firms*	
Variables[a,b]	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)
Intercept	0.1568*** (6.91)	0.1750*** (8.34)	0.1542*** (8.01)	0.1559*** (8.78)	0.2206* (1.57)	0.3193*** (2.43)
$POST_{it}$*$BATH_{it}$	0.4679*** (10.09)	0.4647*** (10.01)	0.3513*** (8.02)	0.3531*** (8.02)	0.8039*** (4.47)	0.7954*** (4.64)
$POST_{it}$*$SMOOTH_{it}$	0.0001 (0.03)	0.0024 (0.08)	-0.0012 (-0.03)	-0.0045 (-0.12)	-0.0660 (-0.76)	-0.0645 (-0.74)
$BATH_{it}$	-1.1137*** (-30.42)	-1.1135*** (-30.42)	-1.0511*** (-30.85)	-1.0550*** (-30.99)	-0.2320*** (-8.72)	- 1.2335*** (-8.64)
$SMOOTH_{it}$	0.1238*** (4.88)	0.1269*** (5.01)	0.1712*** (5.51)	0.1779*** (5.74)	0.0672 (0.98)	0.0772 (1.12)
ST	0.0111** (1.96)	0.0076* (1.33)				
$POST_{it}$	0.0043** (1.73)	0.0045** (1.81)	0.0054*** (2.11)	0.0055*** (2.12)	0.0300* (1.71)	0.0340** (1.93)
*ST*POST*	0.0077* (1.29)	0.0089* (1.26)				
ΔGDP_{it}	0.0198 (0.77)	0.0202 (0.78)	0.0458** (2.08)	0.0460** (2.08)	0.2358* (1.62)	0.2347* (1.59)
$\Delta INDROA_{it}$		0.0084 (0.98)		0.0049 (0.68)		0.0387 (0.73)
$\Delta SALE_{it}$	-0.0176*** (-4.10)	-0.0167*** (-3.96)	-0.0096*** (-2.53)	-0.0089*** (-2.37)	-0.0726*** (-3.50)	-0.0701*** (-3.40)
ΔOCF_{it}	0.0189** (2.03)	0.0203** (2.17)	0.0164** (2.08)	0.0177** (2.08)	0.0131 (0.31)	0.0005 (0.44)
RET_{it}	-0.0001 (-0.06)	-0.0003 (-0.29)	-0.0005 (-0.51)	-0.0006 (-0.65)	0.0021 (0.42)	0.0005 (0.10)
$DEBT_{it}$	0.0536*** (13.58)	0.0529*** (13.64)	0.0380*** (8.70)	0.0347*** (8.21)	0.0690*** (5.52)	0.0725*** (5.96)
$SIZE_{it}$	-0.0087*** (-8.72)	-0.0089*** (-9.35)	-0.0081*** (-9.52)	-0.0077*** (-9.58)	-0.0123** (-1.94)	-0.0143** (-2.33)
Industry fixed effect	yes	no	yes	no	Yes	no
_Sigma	0.0907 (125.21)	0.0910 (125.20)	0.0728 (118.14)	0.0731 (118.13)	0.1736 (41.46)	0.1769 (41.43)
Sample size	8,376	8,376	7,447	7,447	929	929
Log Likelihood	7,381	7,345	8,118	8,087	238.98	220.85
Corr of Y_{it} and $\hat{Y}_{it}$	0.5129***	0.5071***	0.4839***	0.4783***	0.5169***	0.4876***

a. Variables are defined in Table 2.
b. All continuous variables are winsorized at the 1st and 99th percentiles.

***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively; one-tailed where signs are predicted, two-tailed otherwise.

Table 10: Tobit Regression Results of Model (2): The Relation between Reversals of Current Asset Impairment and Earnings Management

	Y=SRVSA					
	All Sample		*Non-ST Firms*		*ST Firms*	
Variables[a,b]	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)
Intercept	-0.0460*** (-4.55)	-0.0400*** (-4.37)	-0.0386*** (-4.52)	-0.0328*** (-4.20)	-0.0071 (-0.11)	0.0059 (0.10)
$POST_{it}$*$BATH_{it}$	-0.0580*** (-2.67)	-0.0570*** (-2.63)	-0.0074 (-0.36)	-0.0050 (-0.24)	-0.1970*** (-2.35)	-0.2245*** (-2.63)
$POST_{it}$*$SMOOTH_{it}$	-0.0004 (-0.14)	-0.0020 (-0.11)	0.0444 (1.13)	0.0457 (1.19)	-0.0436*** (-2.80)	-0.0465*** (-2.98)
$BATH_{it}$	0.0235* (1.32)	0.0230* (1.29)	0.0085 (0.52)	0.0090 (0.55)	0.1302** (1.78)	0.1408** (1.88)
$SMOOTH_{it}$	-0.0670*** (-6.03)	-0.0675*** (-6.08)	0.0426 (1.31)	0.0357 (1.10)	-0.0990*** (-7.34)	-0.1008*** (-7.48)
ST	0.0100*** (3.89)	0.0097*** (3.77)				
$POST_{it}$	0.0067*** (6.06)	0.0067*** (6.07)	0.0067*** (7.18)	0.0068*** (7.29)	0.0184*** (2.93)	0.0171*** (2.66)
*ST***POST*	0.0096* (1.34)	0.0085* (1.32)				
ΔGDP_{it}	-0.0160* (-1.44)	-0.0150* (-1.34)	-0.0106 (-1.11)	-0.0102 (-1.06)	-0.0538 (-0.84)	-0.0643 (-0.98)
$\Delta INDROA_{it}$		0.0017 (0.42)		0.0052* (1.61)		0.0347* (-1.46)
$\Delta SALE_{it}$	-0.0120*** (-6.37)	-0.0130*** (-6.67)	-0.0101*** (-5.91)	-0.0103*** (-6.16)	-0.0302*** (-3.08)	-0.0308*** (-3.17)
ΔOCF_{it}	0.0087** (2.12)	0.0087** (2.12)	0.0088*** (2.39)	0.0088*** (2.38)	0.0065 (0.34)	0.0057 (0.29)
RET_{it}	-0.0004 (-0.56)	-0.0004 (-0.56)	-0.0004 (-0.99)	-0.0003 (-1.03)	0.0010 (0.43)	0.0011 (0.49)
$IDEBT_{it}$	0.0017 (0.97)	0.0014 (0.84)	0.0011 (0.56)	0.0007 (0.34)	-0.0002 (-0.03)	-0.0014 (-0.24)
$SIZE_{it}$	0.0012*** (2.78)	0.0011*** (2.68)	0.0011*** (2.83)	0.0009*** (2.58)	-0.0009 (-0.03)	-0.0011 (-0.40)
Industry fixed effect	yes	no	yes	no	yes	no
_Sigma	0.0352 (82.19)	0.0354 (82.23)	0.0283 (77.53)	0.0284 (77.61)	0.0697 (26.82)	0.0718 (26.76)
Sample size	8,376	8,376	7,447	7,447	929	929
Log Likelihood	4,880	4,850	5,097	5,075	240.57	219.55
Corr of Y_{it} and $\hat{Y}_{it}$	0.2542***	0.2276***	0.1772***	0.1640***	0.2724***	0.1957***

a. Variables are defined in Table 2. b. All continuous variables are winsorized at the 1st and 99th percentiles.

***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively; one-tailed where signs are predicted, two-tailed otherwise.

Authors

Ming-Lei Chang*

Associate Professor, Discipline of Accounting, College of Management, Yuan Ze University, Taiwan, minglei@saturn.yzu.edu.tw

Tze-Yu Yen

Assistant Professor, Department of Finance, National Chung Cheng University, Taiwan.

*Corresponding Author