

沙賓法案對盈餘持續性之影響

高蘭芬*

國立高雄大學金融管理學系

林共進

賓州州立大學管理學院

陳安琳

國立中山大學企業管理學系

收稿日：2010 年 2 月 1 日；接受日：2010 年 8 月 17 日

摘要

在 2000 與 2001 年爆發一連串會計醜聞之後，美國政府在 2002 年七月迅速通過沙賓法案，以期提高管理階層與會計專業對財務報導的責任，並改善公司揭露之正確性與可靠性。本研究探討這些爆發的會計弊案是否與當時上市公司財務報導品質全面下降有關，並探討沙賓法案通過後，財務報導品質是否如主管機關所預期的上升。本研究採用盈餘持續性來衡量財務報導的品質，研究結果顯示，會計盈餘之組成(包括現金流量與應計項目)的持續性在法案通過前的確經歷全面性的下降，而在法案通過後有顯著的改善，因此，即使沙賓法案對企業所帶來高遵循成本引發不少質疑，本研究仍支持主管機關採行較嚴格的揭露要求，以改善公司治理環境及降低會計弊案產生的機會。

關鍵詞：盈餘持續性、沙賓法案、盈餘管理、盈餘品質、現金流量、應計項目

*通訊作者。電話：07-5919502，電子信箱：lanfeng@nuk.edu.tw。

Does Sarbanes-Oxley Act Affect Earnings Persistence?

Lanfeng Kao*

Department of Finance, National University of Kaohsiung

Dennis K. J. Lin

Smeal College of Business, Penn State University

Anlin Chen

Department of Business Management, National Sun Yat-Sen University

Received 1 February 2010; accepted 17 August 2010

Abstract

The Enron-type scandals lead to the passage of the Sarbanes-Oxley Act (SOX) in July 2002. SOX aims to improve the accuracy and reliability of corporate disclosure. In this paper, we investigate whether the scandals are related to the breakdown of the reliability of financial reporting and examine whether the quality of corporate disclosure improves after the passage of SOX. We use earnings persistence to detect whether there is a widespread loss in earnings quality before SOX and a recovery after SOX. We show that the persistence of earnings components (cash flows and accruals) experience widespread loss in the years before the passage of SOX and that the passage of SOX indeed improves the persistence of the earnings components. We recommend that regulations even costly are required to improve corporate governance and to prevent accounting frauds.

Keywords: Earnings persistence; Sarbanes-Oxley Act; Earnings management; Earnings quality; Cash flows; Accruals

* Corresponding author. Tel: 07-5919502. email: lanfeng@nuk.edu.tw.

1. Introduction

This paper explores the effectiveness of the Sarbanes-Oxley Act (hereafter SOX) in changing firms' incentives to manage reported earnings and to report more reliable and persistent accounting numbers. The SOX Act was signed into law on July 30, 2002 to make company audit committees, the auditing profession, and corporate management work together to reduce the risk of Enron-type scandals from recurring. It aims to reinforce corporate accountability and professional responsibility. However, the costs and benefits of the SOX have been debated since it passed in July 2002. The downside of SOX indicated by recent studies is it induces high direct and indirect compliance costs which hurt firm value (Zhang 2007; DeFond et al. 2007; Piotroski and Srinivasan 2008; Hostak et al. 2007). The costs of complying with the internal control requirements made under SOX are huge, so it is important to assess the benefits of SOX.

There are alternative explanations for the scandals that occurred in the US capital market. One possibility is there has been a pervasive failure of accounting checks in the period preceding SOX and the scandals represent a small group of firms that got caught. This seems to be the assumption behind the passage of the SOX act. An alternative explanation is the few accounting scandals are isolated events of accounting failures, but the accounting system as a whole is functioning well. The first purpose of the study is to examine whether the accounting system has really experienced an overall decline in reporting quality. If there has been a pervasive failure of the accounting system in the period preceding SOX, the paper further tests whether the objective of SOX to improve overall quality of financial disclosures has been achieved after the passage of the SOX.

Most of the recent SOX studies focus on the change in managerial discretion over financial reporting following the SOX. They speculate if SOX is effective in improving the quality of financial reporting, the managerial discretion to manipulate earnings (such as accrual-based earnings management activity, timing of reporting loss and meet/beat analysts' expectations) is expected to decline. However, the empirical results are mixed. For example, Lobo and Zhou (2006) found firms report lower discretionary accruals after SOX than in the period preceding SOX and incorporate losses more quickly than gains when they report income in the post-SOX period. However, Cohen et al. (2008) found the level of real earnings management significantly increased after the passage of SOX, although accrual-based earnings management decreased in the same period. The substitution

between accrual-based and real earnings management is consistent with Graham et al. (2005) and Zang (2006).

In this paper, we apply the change in persistence of reported earnings, instead of accrual-based earnings management used by other studies, to examine the effectiveness of the SOX Act in changing the firms' incentives to report more reliable and persistent accounting numbers. Earnings persistence is defined as the strength of linear relations of current earnings to subsequent-year earnings¹ (Sloan 1996; Xie 2001) and is a more direct measure for the effects of SOX than accrual-based earnings management for two reasons. First, earnings management is not only opportunistic (Rangan 1998; Teoh et al. 1998a, 1998b; Healy and Wahlen 1999) but also improves the ability of earnings to reflect economic value (Beaver and Engel 1996; Subramanyam 1996; Healy and Palepu 1993). As a result, the measures of earnings management, such as Jones (1991) model-estimated abnormal accruals or managing earnings to meet/beat analyst expectations, are not necessarily related to a decline in the quality and reliability of earnings. Second, accruals are not the only tool managers can use to manage earnings. Although cash flows are not as easily manipulated as accruals, they are not totally free of managerial manipulation. Prior literature documents firms substituting accrual-based and real earnings management activities (Graham et al. 2005; Zang 2006; Cohen et al. 2008). The substitution among different types of earnings management methods makes the Jones (1991) model-estimated abnormal accruals insufficient to reflect the whole picture of the change in overall earnings quality. Earnings persistence, defined as the predictability of current earnings to next-period earnings, reflects an overall effect of all kinds of earnings management activities on earnings quality and is thus a more direct measure of change in earnings quality in the pre- and post-SOX period.

The empirical results of the paper show the persistence of all earnings components (not only accruals but also cash flows) experience a widespread loss in the years before the passage of SOX when the severe corporate scandals occurred. This implies the whole accounting system experiences a significant decline in accounting quality in severe scandal periods and scandals are not isolated events. The persistence of earnings components rebounding after the passage of SOX indicate the SOX improved the quality of accounting disclosure. These results are

¹ There exist a variety of definitions of earnings persistence. Our study follows the one defined by Sloan (1996) and Xie (2001). This extent of earnings persistence is measured by predictability of current earnings to next-year earnings. However, this measure has a drawback of omitting the relationship between current earnings and earnings two year ahead and beyond.

consistent with recent research, which points out accruals-based earnings manipulation gradually increased in the pre-SOX period (Cohen et al. 2008) and managerial discretion activities decline after the passage of SOX (Lobo and Zhou 2006; Cohen et al. 2008; Bartov and Cohen 2007). Although Cohen et al. (2008) found the level of real earnings management significantly increases after the passage of SOX from the substitution of accrual-based earnings management, our findings support the contention of overall quality of earnings improving after SOX.

Our results contribute to the current literature on the debate about the benefits and costs of SOX, especially on the issue about the effect of SOX on the quality of corporate disclosure. Recent research uses the changes in earnings management (such as meeting/beating analyst expectations, accrual-based or real earnings) to examine the change of quality of reported earnings before and after SOX (Lobo and Zhou 2006; Cohen et al. 2008; Bartov and Cohen 2007). However, these types of managerial discretion are not direct measures of earnings quality. In this paper, we use earnings persistence to detect the SOX effects. Earnings persistence is a more direct measure than earnings management for the overall change in earnings quality after SOX. Our results convincingly prove there was a widespread loss of persistence of earnings in the period before the passage of SOX and the publicized scandals are not just isolated events. In addition, the passage of SOX resulted in improved persistence of earnings.

2. Literature and hypotheses development

The costs and benefits of the SOX have been a debate since it passed in July 2002. The downside of SOX indicated by recent studies is it induces high direct and indirect compliance costs which hurt firm value (Zhang 2007; DeFond et al. 2007) and reduce foreign listings on US exchanges (Piotroski and Srinivasan 2008; Hostak et al. 2007).

The benefits of SOX come mainly from improved accuracy and reliability of corporate disclosures. Section 201 of SOX aims to increase auditors' independence leading to higher quality audit reports. Section 302 states "The CEO and CFO of each issuer shall prepare a statement to accompany the audit report to certify the appropriateness of the financial statements and disclosures ... and that those financial statements and disclosures fairly present, in all material respects, the operations and financial condition of the issuer." This section came into effect almost immediately after the passage of SOX with huge penalties on violation. In addition, section 404 requires management to assess the effectiveness of internal

controls and disclose the assessment in the annual reports. The SOX 404 is expected to improve the company's internal controls over financial reporting and quality of the financial reporting. Lobo and Zhou (2006) found abnormal accruals are lower after SOX. Bartov and Cohen (2007) documented the propensity to meet/beat analyst expectations has declined significantly in the post-SOX period. Cohen et al. (2008) found accrual-based earnings management increases steadily from 1987 until the passage of SOX in 2002, followed by a significant decline after the passage of SOX. These results are consistent with the argument the passage of SOX really affects firms' financial reporting practices.

Sloan (1996) documented cash flows are more persistent than accruals, in terms of the relative strength of the linear relations of the earnings components to subsequent-year earnings. Much of the literature has interpreted the differential persistence as accruals involving a higher degree of subjectivity than cash flows and subjectivity implies possible manipulation (Richardson et al. 2006; Xie 2001; Dechow and Dichev 2002; Collins and Hribar 2000; Culvenor et al. 1999). Richardson et al. (2005) found less reliable accruals lead to lower earnings persistence. Cohen et al. (2008) found accrual-based earnings management, measured by Jones-type abnormal accruals, increases significantly during the severe scandal period and significantly declines after the passage of SOX. If the widespread increase and decrease of abnormal accruals in pre- and post-SOX periods documented by Cohen et al. (2008) are related to changes in the reliability of the reported earnings, we could expect to see a widespread decline in persistence of accruals during the years prior to the passage of SOX when severe scandals occurred and a recovery after the passage of SOX. Based on these arguments, we propose the following hypothesis:

H1: There is a widespread loss of persistence of the accrual component of current earnings in the period prior to the passage of SOX and a widespread recovery after the passage of SOX.

Next, we discuss the other component of earnings—cash flows. Although the cash flow component of earnings is thought to be more objective and not as easily manipulated as accruals, it is not totally free of managerial manipulation. Firms can not only manipulate accruals to boost reported earnings, but also employ certain techniques to improve reported cash flows from operations to achieve the same objective. For example, cutting prices at the end of the year to accelerate cash sales from the next year into the current year could increase cash flows from operations.

Changes in policy to defer the payment of accounts payables are another example. These managerial decisions generate unsustainable operating cash flows and thus lower the persistence of the cash flow component. As a result, we expect the persistence of cash flows decreases during the years before the passage of SOX if the accounting system as a whole does not function well at the time. However, since manipulating cash flows is more costly than manipulating accruals, we expect the loss in persistence for cash flows to be less than for accruals in the period prior to the passage of SOX. We also expect the persistence of cash flows to recover after SOX if the passage of SOX does increase the quality of financial reporting. Based on the above argument, we propose hypothesis 2:

H2: There is a widespread loss in persistence of the cash flow component of current earnings in the period prior to the passage of SOX and a widespread recovery after the passage of SOX. However, the loss in persistence for cash flows is less than for accruals.

3. Sample and descriptive statistics

3.1. Data selection and event periods

We obtain financial data from the Compustat annual database. The sample is restricted to only NYSE/AMEX firms. The sample period is from 1995 to 2006. Following Cohen et al. (2008), we divide sample periods into three event periods: (1) period prior to the occurrence of major corporate scandals (defined as the “Pre-SCA period”) covering 1995-1999, (2) period immediately preceding the passage of SOX (defined as “SCA period”) covering 2000 and 2001 when the major scandals occurs, and (3) periods after the passage of SOX (defined as “post-SOX period”) covering 2002-2006. The reason for this time cutting is Cohen et al. (2008) found accrual-based earnings management increases steadily from 1987 until the passage of SOX in 2002, reaches a high level in period immediately preceding SOX, and declines significantly after the passage of SOX.

We exclude financial institutions from our analysis (SIC codes between 6000 and 6999) and require at least 8 observations in each 2-digit SIC group per year. We remove firm-year observations with missing data on Compustat that are necessary to calculate earnings, cash flows and accruals. In our regression analyses, all components of earnings (assets-deflated) and growth of net operating assets (assets-deflated) are winsorized at +1 and -1 to eliminate the influence of extreme

outliers. Our final sample consists of 19363 firm-year observations from 1995 to 2006.

3.2. Descriptive statistics

Table 1 presents descriptive statistics for the sample. Panel A indicates the means (medians) of earnings (*EARN*) and cash flows from operations (*CFO*) are 0.034 and 0.089 (0.045 and 0.092), respectively. As expected, average total accruals (*ACCR*) are negative (-0.055) due to depreciation, and average abnormal accruals (*ABNAC*) are closed to zero (-0.005). The mean of growth of net operating assets (*GrNOA*) is 0.057. 15.1% and 38.4% of observations lie in severe corporate scandals period (*SCA*) covering years 2000 and 2001 and in post-SOX period (*SOX*) covering years 2002~2006. Panel B of Table 1 reports the Pearson correlations between selected variables. As expected, earnings are positively correlated with their components – cash flows, total accruals, normal accruals and abnormal accruals, and these earnings components are negatively correlated.

Table 1 Descriptive statistics and correlation among earnings, cash from operations, total accruals, abnormal accruals, and normal accruals

Panel A: Descriptive Statistics								
Variable ^a	N	Mean	Std. Dev.	Min.	Q1	Median	Q3	Max.
<i>EARN</i>	23846	0.034	0.123	-0.992	0.013	0.045	0.082	1.000
<i>CFO</i>	22734	0.089	0.113	-0.957	0.049	0.092	0.141	0.998
<i>ACCR</i>	22728	-0.055	0.093	-0.992	-0.086	-0.049	-0.017	0.945
<i>NAC</i>	22636	-0.050	0.053	-0.922	-0.071	-0.043	-0.022	0.519
<i>ABNAC</i>	22636	-0.005	0.082	-0.954	-0.033	-0.002	0.028	0.945
<i>GrNOA</i>	19616	0.057	0.182	-0.993	-0.023	0.033	0.113	1.000
<i>SCA</i>	22846	0.151	0.358	0	0	0	0	1
<i>SOX</i>	22846	0.384	0.486	0	0	0	1	1

Panel B: Contemporaneous Pearson Correlations ^b							
	<i>EARN</i>	<i>CFO</i>	<i>ACCR</i>	<i>NAC</i>	<i>ABNAC</i>	<i>GrNOA</i>	
<i>EARN</i>	1.000	0.674***	0.480***	0.273***	0.370***	0.231***	
<i>CFO</i>		1.000	-0.303***	-0.109***	-0.277***	0.007	
<i>ACCR</i>			1.000	0.489***	0.826***	0.291***	
<i>NAC</i>				1.000	-0.089***	0.100***	
<i>ABNAC</i>					1.000	0.268***	
<i>GrNOA</i>						1.000	

a:

$EARN_{t+1}$ = earnings before extraordinary items in year $t+1$ (Compustat item 18).

CFO_t = cash from operating activities in year t (Compustat item 308), as reported on the statement

of cash flows, minus cash portion of discontinued operations and extraordinary items in year t (Compustat item 124). This cash flow measure is recommended by Hribar and Collins (2002).

- $ACCR_t$ = Operating accruals in year $t = EARN_t - CFO_t$.
- $ABNAC_t$ = abnormal accruals in year t = residual values of the performance-controlling modified-Jones model estimated in cross-section for each two-digit SIC code and year combination
- NAC_t = normal accruals in year t = predicted values of the performance-controlling modified-Jones model estimated in cross-section for each two-digit SIC code and year combination;
- SCA = a dummy variable for severe scandal period. SCA is equal to 1 if the year is either 2000 or 2001.
- SOX = a dummy variable for post-SOX period. SOX is equal to 1 for year 2002, 2003, 2004, 2005 and 2006.
- $GrNOA_t$ = growth in NOA in year $t = NOA_t - NOA_{t-1}$. NOA_t = operating assets (excluding cash) – operating liabilities at the end of year $t = AR_t + INV_t + OTHERCA_t + PPE_t + INTANG_t + OTHERLTA_t - AP_t - OTHERCL_t - OTHERLTL_t$

where

- AR = accounting receivable (Compustat item 2),
- INV = inventories (Compustat item 3),
- $OTHERCA$ = other current assets (Compustat item 68),
- PPE = net property, plant, and equipment (Compustat item 8),
- $INTANG$ = intangibles (Compustat item 33),
- $OTHERLTA$ = other long-term assets (Compustat item 69),
- AP = accounts payable (Compustat item 70),
- $OTHERCL$ = other current liabilities (Compustat item 72), and
- $OTHERLTL$ = other long-term liabilities (Compustat item 75).

Variables $EARN$, CFO , $ACCR$, $ABNAC$, NAC and $GrNOA$ are scaled by average total assets (Compustat item 6).

b: The test is significant at the 10% (*), 5% (**), and 1% (***) level respectively.

4. Research design and empirical results

4.1. Tests for change in persistence of cash flow and accrual components of reported earnings over three event periods

Equation (1) is employed to test the hypotheses H1 and H2 which propose the persistence of two earnings components: cash flows and accruals is (1) less persistent in the SCA period relative to in the pre-SCA period and (2) improved in the post-SOX period. Two indicator variables (SCA and SOX) are used to divide the entire sample period into three sub-periods. The pre-SCA period is used as the

benchmark to examine the persistence of earnings components in the SCA and post-SOX periods relative to the pre-SCA period.

$$\begin{aligned}
 EARN_{t+1} = & \gamma_0 + \gamma_1 \times CFO_t + \gamma_2 \times ACCR_t + \gamma_5 \times SCA + \gamma_6 \times SOX \\
 & + \gamma_{15} \times (CFO \times SCA)_t + \gamma_{25} \times (ACCR \times SCA)_t \\
 & + \gamma_{16} \times (CFO \times SOX)_t + \gamma_{26} \times (ACCR \times SOX)_t \\
 & + \gamma_7 \times GrNOA_t + u_{t+1}
 \end{aligned} \tag{1}$$

where,

$EARN_{t+1}$ = earnings before extraordinary items (Compustat item 123) at year $t+1$, divided by average total assets (Compustat item 6).

CFO_t = cash flows from operating activities at year t (Compustat item 308), as reported on the statement of cash flows, minus the cash portion of discontinued operations and extraordinary items in year t (Compustat item 124), divided by average total assets (Compustat item 6). This cash flow measure is recommended by Hribar and Collins (2002).²

$ACCR_t$ = Operating accruals in year $t = EARN_t - CFO_t$.

SCA = an indicator variable for severe corporate scandal period. SCA is equal to 1 for years 2000 and 2001 (SCA period); 0 otherwise.

SOX = an indicator variable for post-SOX period. SOX is equal to 1 for years 2002, 2003, 2004, 2005 and 2006 (post-SOX period); 0 otherwise.

$GrNOA_t$ = growth in net operating assets in year t (NOA_t), divided by average net operating assets.

NOA_t = operating assets (excluding cash) – operating liabilities at the end of year $t = AR_t + INV_t + OTHERCA_t + PPE_t + INTANG_t + OTHERLTA_t - AP_t - OTHERCL_t - OTHERLTL_t$, where AR is accounts receivable (Compustat item 2); INV is inventories (Compustat item 3); $OTHERCA$ is other current assets (Compustat item 68); PPE is net property, plant, and equipment (Compustat item 8); $INTANG$ is intangibles (Compustat item 33); $OTHERLTA$ is other long-term assets (Compustat item 69); AP is accounts payable (Compustat item 70); $OTHERCL$ is other current liabilities (Compustat item 72), and $OTHERLTL$ is other long-term liabilities (Compustat item 75).

Growth in net operating assets ($GrNOA$) is employed in the model to control

² Hribar and Collins (2002) argue a measure of cash flows obtained directly from the Statement of Cash Flow is more accurate than that obtained through the balance sheet approach.

for the effect of change in net operating assets due to change of accruals on the subsequent period earnings. Fairfield et al. (2003) point out accruals are not only a component of profitability, but also a component of growth in assets. The former makes accruals positively related to the dependent variable of equation (1), while the latter makes accruals negatively related to it, which results in a lower persistence of the accrual component of current earnings than the cash flow component. To control for the effect of asset growth related to accruals on the dependent variable in equation (1), *GrNOA* is added here.

Empirical results for persistence change over time are shown in Table 2. The results in column (1) show, on average, persistence of accrual component is lower than the cash flow component (0.73 vs. 0.48) during the sample period, after controlling for the growth effect of net operating assets. The results are consistent with prior research indicating cash flows are more persistent than accruals (Sloan 1996; Collins and Hribar 2000; Xie 2001).

The main results for our hypotheses H1 and H2 are shown in column (2) of Table 2. The four interaction terms in column (2) shows the persistence change of cash flows and accruals over time. First, we compare the persistence levels in the SCA period with those in the pre-SCA period. The coefficients of $CFO \times SCA$ and $ACCR \times SCA$ are -0.11 and -0.13, respectively, and are all significantly negative, implying the persistence of accrual component (*ACCR*) and cash flow components (*CFO*) is lower in the SCA period (years 2000 and 2001) relative to the pre-SCA period (1995-1999). However, the decrease in persistence for the accrual component is about 25%, while it is only 15% for the cash flow component. The sharp decrease in persistence of accruals in SCA period provides evidence of more severe managerial discretion and less reliable accruals in the SCA period than the pre-SCA period. As to the persistence of cash flows, although cash flows are not as easily manipulated as accruals, they are not free of manipulation. The persistence of cash flow component also decreases by 15% in SCA period instead of remaining unchanged.

Internal control requirements made under SOX apply to most public companies and induce huge compliance costs. We have to ensure Enron-type scandals are not isolated events but instead related to widespread failure of accounting system, and that the government actually needs to pass a costly act to remedy the whole accounting system. Our results in Table 2 give support to the needs for the passage of the SOX Act.

Table 2 Tests for change in persistence of cash flows and total accruals over 3 event periods (Using Pre-SCA as benchmark period)

Independent variable	Dependent Variable: $EARN(t+1)$					
	Column (1)		Column (2)		Column (3)	
	Parameter	t-value	Parameter	t-value	Parameter	t-value
<i>Intercept</i>	0.00	-1.91*	0.00	1.79*	0.01	2.71***
<i>CFO</i>	0.73	125.80***	0.73	74.92***	0.73	75.24***
<i>ACCR</i>	0.48	64.44***	0.51	44.55***	0.51	44.59***
<i>CFO*SCA</i>			-0.11	-6.25***	-0.11	-6.43***
<i>ACCR*SCA</i>			-0.13	-5.93***	-0.12	-5.73***
<i>CFO*SOX</i>			0.04	2.89***	0.04	2.80***
<i>ACCR*SOX</i>			-0.03	-2.10**	-0.04	-2.42**
<i>SCA</i>			-0.01	-2.48**		
<i>SOX</i>			-0.01	-4.11***		
<i>Y1996</i>					0.004	1.29
<i>Y1997</i>					-0.008	-2.79***
<i>Y1998</i>					-0.013	-4.47***
<i>Y1999</i>					0.000	0.08
<i>Y2000</i>					0.003	0.86
<i>Y2001</i>					-0.020	-6.12***
<i>Y2002</i>					-0.021	-6.68***
<i>Y2003</i>					-0.013	-4.09***
<i>Y2004</i>					-0.008	-2.71***
<i>Y2005</i>					-0.010	-3.37***
<i>Y2006</i>					-0.003	-0.81
<i>GrNOA</i>	-0.03	-9.32***	-0.03	-9.37***	-0.03	-8.03***
Adjusted R ²	46.50%		46.82%		47.12%	
N	19363		19363		19363	

Sample covers firm-year observations from 1995 to 2006.

Variable Definition:

- $EARN_{t+1}$ = earnings before extraordinary items in year $t+1$ (Compustat item 18).
 CFO_t = cash flows from operating activities in year t (Compustat item 308), as reported on the statement of cash flows, minus cash portion of discontinued operations and extraordinary items in year t (Compustat item 124). This cash flow measure is recommended by Hribar and Collins (2002).
 $ACCR_t$ = Operating accruals in year $t = EARN_t - CFO_t$.
 SCA = an indicator variable for severe scandal period. SCA is equal to 1 if the year is either 2000 or 2001; 0 otherwise.
 SOX = an indicator variable for post-SOX period. SOX is equal to 1 for year 2002, 2003, 2004, 2005 and 2006; 0 otherwise.
 $Y1996$ - $Y2006$ = year dummies.
 $GrNOA_t$ = growth in net operating assets (NOA) in year $t = NOA_t - NOA_{t-1}$.

Next, we also compare the persistence in the post-SOX period (2002-2006) with the benchmark period (pre-SCA period, 1995-1999) in column (2) of Table 2. The coefficient of $CFO \times SOX$ is 0.04 and significantly positive, indicating the persistence of cash flows not only rebounds after the passage of SOX but exceeds the level in the pre-SCA period. However, the coefficients of $ACCR \times SOX$ are -0.03 and significantly negative, implying even though the passage of SOX improves the persistence of accruals, the persistence does not rebound to the pre-SCA level.

Column (3) in Table 2 includes several year dummies instead of variables SCA and SOX only to control for the yearly differences in earnings. The results are similar to those in column (2).

4.2. Using the sub-sample to test for persistence change of earnings components from SCA to the post-SOX period

Table 2 in the previous section uses the pre-SCA period as a benchmark to check the persistence change of accruals and cash flows. It does not provide direct results for comparing the persistence between the SCA period and the post-sox period. In this section, we use a partial sample covering observations from years 2000-2006 (SCA and post-SOX only) to directly check the effects of SOX on earnings persistence. The empirical results are shown in Table 3.

Results in column (2) of Table 3 show the coefficients of interaction terms $CFO \times SOX$ and $ACCR \times SOX$ are 0.15 and 0.10 (significant at the 0.01 level), indicating both earnings components are more persistent after the passage of the SOX relative to the SCA period. The persistence of cash flows and accruals are 0.62 and 0.38, respectively, in the period before the passage of SOX (SCA period), and increase to 0.77 (= 0.62+0.15) and 0.48 (= 0.38+0.10) in the post-SOX period. Persistence of cash flows and accruals are inflated by 24% and 26%, respectively. The results imply there is less undesired manipulation of cash flows and accruals after the passage of SOX relative to the SCA period and support our hypotheses: the passage of SOX is associated with overall higher persistence of earnings components. Column (3) in Table 3 includes year dummies to control for the yearly differences in earnings and gives similar results to those in column (2).

Table 3 Tests for change in persistence of cash flows and total accruals from SCA period to Post-SOX period (using SCA as benchmark period)

Independent variable	Dependent Variable: $EARN(t+1)$					
	Column (1)		Column (2)		Column (3)	
	Parameter	t-value	Parameter	t-value	Parameter	t-value
<i>Intercept</i>	-0.01	-4.66***	-0.00	-1.97**	0.01	2.57**
<i>CFO</i>	0.73	97.15***	0.62	39.55***	0.62	39.62***
<i>ACCR</i>	0.45	44.89***	0.38	19.41***	0.38	19.72***
<i>CFO*SOX</i>			0.15	8.71***	0.15	8.49***
<i>ACCR*SOX</i>			0.10	4.34***	0.09	3.92***
<i>SOX</i>			0.00	-0.45		
<i>Y2001</i>					-0.023	-6.61***
<i>Y2002</i>					-0.024	6.08***
<i>Y2003</i>					-0.015	-3.95***
<i>Y2004</i>					-0.011	-2.88***
<i>Y2005</i>					-0.013	-3.44**
<i>Y2006</i>					-0.005	-1.37
<i>GrNOA</i>	-0.03	-5.63***	-0.02	-3.83***	-0.03	-5.68***
Adjusted R ²	48.06%		48.45%		48.78%	
N	10894		10894		10894	

Sample covers only observations from 2000 to 2006 (Including SCA and Post-SOX periods and excluding Pre-SCA period).

Variable Definition:

- $EARN_{t+1}$ = earnings before extraordinary items in year $t+1$ (Compustat item 18).
- CFO_t = cash flows from operating activities in year t (Compustat item 308), as reported on the statement of cash flows, minus cash portion of discontinued operations and extraordinary items in year t (Compustat item 124). This cash flow measure is recommended by Hribar and Collins (2002).
- $ACCR_t$ = Operating accruals in year $t = EARN_t - CFO_t$.
- SOX = an indicator variable for post-SOX period. SOX is equal to 1 for year 2002, 2003, 2004, 2005 and 2006; 0 otherwise.
- $Y2001-Y2006$ = year dummies.
- $GrNOA_t$ = growth in net operating assets (NOA) in year $t = NOA_t - NOA_{t-1}$.

4.3. Additional tests on persistence changes – decomposing total accruals into normal and abnormal parts

Accruals are commonly decomposed into normal and abnormal parts. Jones (1991)-type models are often used to estimate the normal part of accruals. The residuals between totals accrual and estimated normal accruals are defined as abnormal accruals. Jones (1991) model-estimated abnormal accruals are often termed by prior research as ‘discretionary’ and used as a proxy for degree of earnings management (for example, Jones 1991; Subramanyam 1996; Erickson and Wang 1999). Low persistence of total accruals documented by prior research is attributed to the discretionary abnormal accruals. Contrary to abnormal accruals, the normal part of total accruals are thought of as ‘non-discretionary’ and seldom discussed in studies on earnings quality.

Although accrual-based earning management is common, recent research documents managers taking real economic actions as an alternative to managing earnings (Graham et al. 2005; Cohen et al. 2008). Graham et al. (2005) conducted surveys of more than 400 executives and found managers would rather take economic actions than make within-GAAP accounting choices to manage earnings. Possible real actions include delaying the beginning of a new project, providing incentives for customers to buy more products in advance, postponing an accounting charge, etc. Some real actions could change the normal levels of sales and property plant and equipment (*PPE*). As we know, normal accruals estimated from Jones-type models are based on the relationships between accruals and sales and between accruals and *PPE*. Once some real actions boost the sales number and delay capital expenditures, the correlation between accruals and sales or between accruals and *PPE* will decrease. This will cause the normal accruals based on the modified Jones model to be less informative for predicting next-period earnings.

In this section, we decompose total accruals into normal and abnormal parts and examine whether the persistence of the normal and abnormal accrual components of current earnings also encounters a loss before SOX and recovers after SOX. To decompose the normal and abnormal parts of accruals, this study uses a cross-section specification of the modified-Jones model (Dechow et al. 1995). Prior years return on assets (ROA_{t-1}) is also included in the modified Jones model as an additional independent variable to control for the effect of prior firm performance

on estimation of abnormal accruals (Kothari et al., 2005)³. The model employed is as follows:

$$ACCR_{it} / TA_{it-1} = a_1(1 / TA_{it-1}) + a_2((\Delta REV_{it} - \Delta AR_{it}) / TA_{it-1}) + a_3(PPE_{it} / TA_{it-1}) + a_4 ROA_{it-1} + e_{it} \quad (2)$$

where $ACCR_{it}$ is total accruals measured as the difference between earnings and cash flow operations. TA_{it-1} is beginning-of-year total assets. ΔREV_{it} is the change in sales revenues in year t , ΔAR_{it} is the change in accounts receivable in year t , PPE_{it} is gross property, plant, and equipment in year t , and ROA_{it-1} is return on assets in year $t-1$. The abnormal accruals are estimated with equation (2) for each two-digit industry code for each year from 1995 to 2006. We require a minimum of 8 observations for each two-digit SIC code and year combinations. The predicted values of equation (2) are denoted as normal accruals and the residuals as abnormal accruals.

The regression results for three earnings components are shown in Tables 4 and 5. Tables 4 and 5 are similar to Tables 2 and 3 except total accruals ($ACCR$) are decomposed into normal accruals (NAC) and abnormal accruals ($ABNAC$). The first column of Table 4 shows, on average, persistence of two accruals components is lower than the cash flow component and abnormal accruals are the least persistent for entire sample period (0.73 vs. 0.55 vs. 0.44), after controlling for the growth effect of net operating assets. The results are consistent with prior research (Sloan 1996; Collins and Hribar 2000; Xie 2001).

³ Kothari et al. (2005) argue that accruals of firms that have experienced unusual performance are expected to be systematically non-zero. Kothari et al. (2005) point out two possible ways to control for performance in estimating abnormal accruals. (1). Performance-controlling approach: A performance variable such as ROA could be included as an additional independent variable in the traditional Jones-type regression. (2). Performance-matched approach: performance-matched discretionary accruals can be calculated by subtracting the ROA -matched control firm's discretionary accruals from the treatment firm's discretionary accruals. Although Kothari et al. (2005) find that the latter is superior to the former, we have two reasons to use the former. First, the identification of match firms is arbitrary and subjectively. Second, we propose that there exists widespread change of earnings quality during the scandal period and after the passage of SOX. Based on the argument, matched firm's discretionary accruals based on match firm's earnings performance may not depict the normal relationship between performance and accruals.

Table 4 Tests for change in persistence of three earnings components over 3 event periods (Using Pre-SCA as benchmark period)

Independent variable	Dependent Variable: <i>EARN</i> (<i>t</i> +1)					
	Column (1)		Column (2)		Column (3)	
	Parameter	t-value	Parameter	t-value	Parameter	t-value
<i>Intercept</i>	0.00	2.05**	0.01	4.49***	0.01	4.63***
<i>CFO</i>	0.73	125.26***	0.73	74.48***	0.73	74.81***
<i>NAC</i>	0.55	45.67***	0.60	31.58***	0.60	31.53***
<i>ABNAC</i>	0.44	51.87***	0.46	35.21***	0.46	35.30***
<i>CFO*SCA</i>			-0.11	-6.04***	-0.11	-6.24***
<i>NAC*SCA</i>			-0.22	-6.25***	-0.21	-6.00***
<i>ABNAC*SCA</i>			-0.09	-3.48***	-0.09	-3.41***
<i>CFO*SOX</i>			0.04	2.99***	0.04	2.91***
<i>NAC*SOX</i>			-0.04	-1.36	-0.05	-1.84*
<i>ABNAC*SOX</i>			-0.03	-1.50	-0.03	-1.55
<i>SCA</i>			-0.01	-3.74***		
<i>SOX</i>			-0.01	-3.34***		
<i>Y1996</i>					0.004	1.19
<i>Y1997</i>					-0.009	-2.80***
<i>Y1998</i>					-0.013	-4.42***
<i>Y1999</i>					0.001	0.36
<i>Y2000</i>					-0.001	-0.34
<i>Y2001</i>					-0.025	-6.84***
<i>Y2002</i>					-0.020	-5.88***
<i>Y2003</i>					-0.012	-3.58***
<i>Y2004</i>					-0.008	-2.54**
<i>Y2005</i>					-0.011	-3.37***
<i>Y2006</i>					-0.003	-1.05
<i>GrNOA</i>	-0.03	-8.73***	-0.03	-8.75***	-0.03	-8.92***
Adjusted R ²	46.68%		47.02%		47.30%	
N	19363		19363		19363	

Sample covers observations from 1995 to 2006.

Variable Definition:

- EARN*_{*t*+1} = earnings before extraordinary items in year *t*+1 (Compustat item 18).
*CFO*_{*t*} = cash flows from operating activities in year *t* (Compustat item 308), as reported on the statement of cash flows, minus cash portion of discontinued operations and extraordinary items in year *t* (Compustat item 124). This cash flow measure is recommended by Hribar and Collins (2002).
*ABNAC*_{*t*} = abnormal accruals in year *t* = residual values of the performance-controlling modified-Jones model estimated in cross-section for each two-digit SIC code and year combination
*NAC*_{*t*} = normal accruals in year *t* = predicted values of the performance-controlling modified-Jones model estimated in cross-section for each two-digit SIC code and year combination;
SCA = an indicator variable for severe scandal period. *SCA* is equal to 1 if the year is either 2000 or 2001; 0 otherwise.
SOX = an indicator variable for post-SOX period. *SOX* is equal to 1 for year 2002, 2003, 2004, 2005 and 2006; 0 otherwise.
Y1996-*Y2006* = year dummies.
*GrNOA*_{*t*} = growth in net operating assets (NOA) in year *t* = *NOA*_{*t*} - *NOA*_{*t*-1}.

The results for persistence change are displayed in column (2) of Table 4. The coefficients of the interaction terms $CFO \times SCA$ and $CFO \times SOX$ are -0.11 and 0.04 (significant at 0.01 level), indicating the persistence of the cash flow component of current earnings in the SCA period is significantly lower than in the pre-SCA period, whereas the persistence after the passage of SOX not only rebounds but exceeds the pre-SCA period. The results are the same as those in Table 2. The column (2) of Table 4 also shows that the coefficients of $NAC \times SCA$ and $ABNAC \times SCA$ are -0.22 and -0.09, respectively and both are significantly negative at 0.01 level. The results imply that both normal and abnormal accruals are significantly less persistent in the SCA period relative to in the pre-SCA period. In addition, the coefficients of $NAC \times SOX$ and $ABNAC \times SOX$ are not significantly different from zero (the coefficients are -0.04 and -0.03, respectively) indicating that persistence of two accruals components rebounds after SOX and make the persistence move back to the pre-SCA level.

Table 5 uses a partial sample to test for the persistence change of the earnings components from SCA to post-SOX period using SCA period as a benchmark. The results of column (2) in Table 5 show the coefficients of $CFO \times SOX$, $NAC \times SOX$ and $ABNAC \times SOX$ are 0.15, 0.19 and 0.06, and all are significantly positive. Apparently, the passage of SOX is associated with the persistence improvement of three earnings components.

Our results are consistent with Cohen et al. (2008), which document accrual-based earnings management increases steadily from the pre-SCA to SCA period, followed by a significant decline in the post-SOX period. Our results show a level change in abnormal accruals in pre- and post-SOX periods observed by Cohen et al. (2008) coincides with a persistence change in abnormal accruals. Although Cohen et al. (2008) found real management activities significantly increase from substitution of accrual-based earnings management and propose earnings quality may not improve after the passage of SOX, our results still show the persistence of all earnings components have improved after the passage of SOX.

Table 5 Tests for change in persistence of three earnings components from SCA period to Post-SOX period (using SCA as benchmark period)

Dependent Variable: $EARN(t+1)$						
Independent variable	Column (1)		Column (2)		Column (3)	
	Parameter	t-value	Parameter	t-value	Parameter	t-value
<i>Intercept</i>	-0.00	-1.76*	-0.01	-1.75*	0.01	2.43**
<i>CFO</i>	0.73	96.79***	0.62	39.51***	0.62	39.55***
<i>NAC</i>	0.51	31.34***	0.38	12.17***	0.39	12.49***
<i>ABNAC</i>	0.42	36.64***	0.37	16.47***	0.37	16.65***
<i>CFO*SOX</i>			0.15	8.24***	0.15	8.38***
<i>NAC*SOX</i>			0.19	5.11***	0.16	4.50***
<i>ABNAC*SOX</i>			0.06	2.40**	0.06	2.30**
<i>SOX</i>			0.003	1.23		
<i>Y2001</i>					-0.023	-6.61***
<i>Y2002</i>					-0.019	-4.34***
<i>Y2003</i>					-0.010	-2.42**
<i>Y2004</i>					-0.007	-1.64
<i>Y2005</i>					-0.009	-2.31**
<i>Y2006</i>					0.002	-0.50
<i>GrNOA</i>	-0.03	-5.19***	-0.03	-4.82***	-0.03	-5.17***
R^2	48.17%		48.61%		48.91%	
<i>N</i>	10894		10894		10894	

Sample covers only observations from 2000 to 2006 (Including SCA and Post-SOX periods and excluding Pre-SCA period).

Variable Definition:

- $EARN_{t+1}$ = earnings before extraordinary items in year $t+1$ (Compustat item 18).
- CFO_t = cash flows from operating activities in year t (Compustat item 308), as reported on the statement of cash flows, minus cash portion of discontinued operations and extraordinary items in year t (Compustat item 124). This cash flow measure is recommended by Hribar and Collins (2002).
- $ABNAC_t$ = abnormal accruals in year t = residual values of the performance-controlling modified-Jones model estimated in cross-section for each two-digit SIC code and year combination
- NAC_t = normal accruals in year t = predicted values of the performance-controlling modified-Jones model estimated in cross-section for each two-digit SIC code and year combination;
- SOX = an indicator variable for post-SOX period. SOX is equal to 1 for year 2002, 2003, 2004, 2005 and 2006; 0 otherwise.
- $Y2001$ - $Y2006$ = year dummies.
- $GrNOA_t$ = growth in net operating assets (NOA) in year $t = NOA_t - NOA_{t-1}$.

5. More explanations on abnormal accruals

5.1. *Does the persistence change of abnormal accruals reflect the quality change of reporting earnings?*

Our results show the persistence of abnormal accruals increases after the passage of SOX. Does this increase imply the improvement of earnings quality? The answer is yes.

Abnormal accruals are often used as a proxy for degree of earnings management (for example, Jones 1991; Subramanyam 1996; Erickson and Wang 1999). Earnings management could be used not only to mislead the investors (opportunistic) but to improve the ability of earnings to reflect economic value (Watts and Zimmerman 1986; Healy and Palepu 1993). If the motivation of earnings management is opportunistic, the one-year-ahead earnings implication of abnormal accruals components of accounting earnings is expected to be quite low. On the other hand, if the managers use abnormal accruals to convey private information about the future cash flows to outside investors (Field et al. 2001), the persistence of abnormal accruals should increase.

SOX aims to reinforce corporate accountability and professional responsibility in corporate disclosure. Our result shows the persistence of abnormal accruals component significantly raises after the passage of SOX. This indicates that opportunistic motivation of earnings management has been hindered after the passage of SOX, thus the persistence and quality of earnings have improved.

5.2. *Alternative abnormal accruals models*

Prior literature on earnings management has addressed several measurements of abnormal accruals. For example, the cross-sectional or time series Jones model (Jones 1991), the cross-sectional or time series modified Jones model (Dechow et al. 1995), the modified Jones model with book-to-market ratio and cash flows as additional independent variables (Larcker and Richardson 2004), the modified Jones model with either current year or prior year return on assets (*ROA*) included as an additional independent variable, performance-matched discretionary accruals estimated from the modified Jones model (Kothari et al. 2005), and the Beneish (1997, 1999) unweighted and weighted probabilities of earnings manipulation. Among those measures, the traditional Jones-type and performance-matched discretionary accruals ones are most often used to detect the extent of earnings

management.

The model used in this study is the cross-sectional modified Jones model with prior year return on assets (*ROA*) included as an additional independent variable. In this section, we use alternative abnormal accruals measures including measures from the Jones (1991) model, modified Jones model (Dechow et al. 1995) and performance-matched discretionary accruals model (Kothari et al. 2005) to test the robustness of empirical results. The results based on alternative measures are quite similar to those presented in Section 4 and our conclusion remains unchanged.

6. Conclusion

This paper examines whether there is a widespread loss in the persistence of earnings components in the period before the passage of the Sarbanes-Oxley Act and a recovery after the passage of SOX.

The Enron-type scandals lead to the passage of SOX with SOX aiming to improve the accuracy and reliability of corporate disclosure. As a result, we need to know whether the scandals are related to the widespread breakdown of the reliability of financial reporting and examine whether the quality of corporate disclosure has improved after the passage of the SOX Act.

Our results contribute to the current studies related to the effect of SOX on the quality of corporate disclosure. Recent research uses the changes in managerial discretion (such as meeting/beating analyst expectations, accrual-based or real earnings management, measure of conservatism) to examine the change in quality of reported earnings before and after SOX (Lobo and Zhou 2006; Cohen et al. 2008; Bartov and Cohen 2007). However, this is not a direct measure of the effect of SOX on changes in earnings quality. In this paper, we use earnings persistence to detect the SOX effects. Earnings persistence is a more direct measurement than traditional earnings management measures and can examine the overall change of earnings quality before and after SOX.

The empirical results show that the persistence of earnings components (cash flows and accruals) experiences a widespread loss in the years before the passage of SOX. The results imply that publicized Enron-type scandals in that time period are not just isolated events. In addition, the passage of SOX improves the persistence of the earnings components.

References

- Bartov, E., and D. A. Cohen. 2007. Mechanisms to meet/beat analyst earnings expectations in the pre- and post-sarbanes-oxley eras. Working paper, New York University.
- Beaver, W., and E. E. Engel. 1996. Discretionary behavior with respect to allowance for loan losses and the behavior of security prices. *Journal of Accounting and Economics* 22 (1-3): 177-206.
- Beneish, M. D. 1997. Detecting GAAP violation: Implications for assessing earnings management among firms with extreme financial performance. *Journal of Accounting and Public Policy* 16 (3): 271-309.
- Beneish, M. D. 1999. The detection of earnings manipulation. *Financial Analysts Journal* 55 (5): 24-36.
- Cohen, D. A., A. Dey, and T. Z. Lys. 2008. Real and accrual-based earnings management in the pre- and post-Sarbanes Oxley periods. *The Accounting Review* 83 (3): 757-787.
- Collins, D. W., and P. Hribar. 2000. Earnings-based and accrual-based market anomalies: One effect or two?. *Journal of Accounting and Economics* 29 (1): 101-123.
- Culvenor, J., J. M. Godfrey, and G. Byrne. 1999. Modeling total accruals in an international environment: The impact of alternative measures of PPE. *Journal of International Accounting, Auditing and Taxation* 8 (2): 289-313.
- Dechow, P. M., and I. D. Dichev. 2002. The quality of accruals and earnings: The role of accrual estimation errors. *The Accounting Review* 77 (Supplement): 35-59.
- Dechow, P. M., R. G. Sloan, and A. P. Sweeney. 1995. Detecting earnings management. *The Accounting Review* 70 (2): 193-225.
- DeFond, M. L., M. Hung, E. Karaoglu, and J. Zhang. 2007. Was the Sarbanes-Oxley Act good news for corporate bondholders? Working Paper, University of Southern California.
- Erickson, M., and S. Wang. 1999. Earnings management by acquiring firms in stock for stock mergers. *Journal of Accounting and Economics* 27 (2): 149-176.
- Fairfield, P. M., J. S. Whisenant, and T. L. Yohn. 2003. Accrued earnings and growth: Implications for future profitability and market mispricing. *The Accounting Review* 78 (1): 353-371.
- Field, T., T. Lys, and L. Vincent. 2001. Empirical research on accounting choice. *Journal of Accounting and Economics* 31 (1-3): 255-307.
- Graham, J. R., C. R. Harvey, and S. Rajgopal. 2005. The economic implications of corporate financial reporting. *Journal of Accounting and Economics* 40 (1-3): 3-73.
- Healy, P. M., and K. G. Palepu. 1993. The effect of firms' financial disclosure policies on stock prices. *Accounting Horizons* 7 (1): 1-11.
- Healy, P. M., and J. Wahlen. 1999. A review of the earnings management literature and its implications for standard setting. *Accounting Horizons* 13 (4): 365-384.
- Hostak, P., E. Karaoglu, T. Lys, and Y. G. Yang. 2007. An examination of the impact of the Sarbanes-Oxley Act on the attractiveness of US capital markets to foreign firms. Working Paper, University of Massachusetts Dartmouth.
- Hribar, P., and D. W. Collins. 2002. Errors in estimating accruals: Implications for empirical research. *Journal of Accounting Research* 40 (1): 105-134.
- Jones, J. 1991. Earnings management during import relief investigations. *Journal of Accounting Research* 29 (2): 193-228.

- Kothari, S. P., A. J. Leone, and C. Wasley. 2005. Performance matched discretionary accrual measures. *Journal of Accounting and Economics* 39 (1): 163-197.
- Larcker, D. F., and S. A. Richardson. 2004. Fees paid to audit firms, accrual choices, and corporate governance. *Journal of Accounting Research* 42 (3): 625-656.
- Lobo, G. J., and J. Zhou. 2006. Did conservatism in financial reporting increase after the Sarbanes-Oxley Act? Initial evidence. *Accounting Horizons* 20 (1): 57-73.
- Piotroski, J. D., and S. Srinivasan. 2008. Regulation and bonding: The Sarbanes-Oxley Act and the flow of international listings. *Journal of Accounting Research* 46 (2): 383-425.
- Rangan, S. 1998. Earnings management and the performance of seasoned equity offerings. *Journal of Financial Economics* 50 (1): 101-122.
- Richardson, S. A., R. G. Sloan, M. T. Soliman, and I. Tuna. 2005. Accrual reliability, earnings persistence and stock prices. *Journal of Accounting and Economics* 39 (3): 437-485.
- Richardson, S. A., R. G. Sloan, M. T. Soliman, and I. Tuna. 2006. The implications of accounting distortions and growth for accruals and profitability. *The Accounting Review* 81 (3): 713-743.
- Sloan, R. G. 1996. Do stock prices fully reflect information in accruals and cash flows about future earnings? *The Accounting Review* 71 (3): 289-315.
- Subramanyam, K. R. 1996. The pricing of discretionary accruals. *Journal of Accounting and Economics* 22 (1-3): 249-281.
- Teoh, S. H., I. Welch, and T. J. Wong. 1998a. Earnings management and the underperformance of seasoned equity offerings. *Journal of Financial Economics* 50 (1): 63-99.
- Teoh, S. H., I. Welch, and T. J. Wong. 1998b. Earnings management and long-run market performance of initial equity offerings. *Journal of Finance* 53 (6): 1935-1974.
- Watts, R., and J. Zimmerman. 1986. *Positive Accounting Theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Xie, H. 2001. The mispricing of abnormal accruals. *The Accounting Review* 76 (3): 357-373.
- Zang, A. 2006. Evidence on the tradeoff between real manipulation and accrual manipulation. Working Paper, University of Rochester.
- Zhang, I. X. 2007. Economic consequences of the Sarbanes-Oxley Act of 2002. *Journal of Accounting and Economics* 44 (1-2): 77-115.