CAMOUFLAGED INDICATORS OF EARNINGS MANAGEMENT

by

I. Kama*
N. Melumad**

Working Paper No 3/2013 June 2013

Research No. 02030100

* Faculty of Management, The Leon Recanati Graduate School of Business Administration, Tel Aviv University. Email: kamaitay@post.tau.ac.il

** Columbia University. Email: ndm4@columbia.edu

This paper was partially financed by the Henry Crown Institute of Business Research in Israel.

The Institute's working papers are intended for preliminary circulation of tentative research results. Comments are welcome and should be addressed directly to the authors.

The opinions and conclusions of the authors of this study do not necessarily state or reflect those of The Faculty of Management, Tel Aviv University, or the Henry Crown Institute of Business Research in Israel.

Camouflaged indicators of earnings management*

Itay Kama
Tel Aviv University
kamaitay@post.tau.ac.il

Nahum Melumad
Columbia University
ndm4@columbia.edu

Keywords: Earnings Management, Cash Management, Sarbanes-Oxley Act, Camouflaged Earnings Management

JEL Classification: M4, M41, M43

* We thank David Aboody, Yakov Amihud, Eli Amir, Tim Baldenius, Mary Barth, Philip Berger, Judson Caskey, Shira Cohen, David Disatchnik, Peter Easton, Eti Einhorn, George Foster, Trevor Harris, Carla Hayn, Jack Hughes, Sharon Katz, Urooj Khan, David Larcker, Charles Lee, Maureen McNichols, Doron Nissim, Bugra Ozel, Peter Pope, Joseph Piotroski, Gil Sadka, Brett Trueman, and Dan Weiss, as well as seminar participants at Columbia, Erasmus, Stanford, UCLA, and the Tel Aviv International Conference in Accounting, for helpful discussions and suggestions.

Camouflaged indicators of earnings management

Abstract

We argue that cash management reduces the effectiveness of the indicators commonly used to detect accrual-based earnings management. This concern is of interest because many influential papers on earnings management have utilized these indicators to reach their conclusions. Specifically, the values of indicators of accrual-based earnings management calculated in periods of increased cash management activities may not be comparable with the corresponding values calculated in other periods. Our results suggest that cash management activities have intensified following the legislation of the Sarbanes-Oxley Act, resulting in camouflaged indicators of earnings management. An immediate implication is that recent studies examining the impact of the Sarbanes-Oxley Act on earnings management might have reached erroneous conclusions. The identified decrease in the indicators of accrual-based earnings management utilized in those studies could have been the consequence of increased cash management rather than an actual decrease in accrual-based earnings management.

1. Introduction

The practice of earnings management has been discussed and documented extensively in both the academic and practitioner's literatures. The academic literature has studied earnings management through the manipulation of discretionary accruals (accrual-based earnings management), real transactions (real earnings management) or both.[1,2]

Following the highly publicized corporate failures of 2001–2002 and the subsequent passage of the Sarbanes-Oxley Act (SOX), financial reporting has fallen under greater scrutiny. Consequently, an important strand of literature has emerged examining the impact of this stricter enforcement of regulations on the practice of earnings management (e.g., Lobo and Zhou [2006], Cohen et al. [2008], Koh et al. [2008], and Cohen and Zarowin [2010]). This literature argues that, post SOX, firms have faced stronger incentives to avoid the detection of earnings management due to the higher-quality audit reports and the higher cost of detected earnings management. The general conclusion of the literature is that following SOX, firms have switched from accrual-based earnings management to the costlier, yet more difficult to detect, real earnings management.

The most common indicator of accrual-based earnings management is the lack of correspondence between accruals and sales. Specifically, the literature has frequently used discretionary accruals to examine accrual-based earnings management. Discretionary accruals are the difference between reported accruals and normal accruals, where normal accruals are primarily measured as a function of sales (as well as a function of receivables and gross property, plant and equipment). An earnings-increasing accrual-

[1] For manipulation of discretionary accruals, see, for example, McNichols and Wilson [1988], Jones [1991], Dechow, Sloan, and Sweeny [1995], Peasnell, Pope, and Young [2000], Dechow and Dichev [2002], Beaver, McNichols, and Nelson [2003], Kothari, Leone, and Wasley [2005], Peasnell, Pope, and Young [2005], Gore, Pope, and Singh [2007], Daniel, Dennis and Naveen [2008], and Dechow, Hutton, Kim, and Sloan [2012]. For real transactions, see Graham, Harvey, and Rajgopal [2005], Roychowdhury [2006], and Gunny [2011]. For both, see Cohen, Dey, and Lys [2008], Bartov and Cohen [2009], and Zang [2012].

[2] Earnings management typically has a negative connotation, though, in certain cases, it might be an activity that is rewarded by investors. A special case of earnings management is income smoothing; the literature has argued that certain practices of income smoothing could be desirable (e.g., Dye [1988], Fudenberg and Tirole [1995], Kirschenheiter and Melumad [2002], and Tucker and Zarowin [2006]).

based earnings management results in reported accruals that are higher than normal accruals.

If, as the literature argues, the incentives to avoid detection of accrual-based earnings management have increased post-SOX, another available option is to mask the common indicator of accrual-based earnings management by ensuring accruals are closely associated with changes in sales. One means of achieving that is to convert accruals into cash to mimic the accruals impact of a true sales increase or expense decrease. Converting accruals into cash decreases the difference between reported accruals and normal accruals, and thus decreases the effectiveness of the indicator (which is based on discretionary accruals) in detecting accrual-based earnings management.[3]

Converting accruals into cash is also applicable to other types of earnings management. In particular, employing a similar technique would make more difficult the detection of sales pull-in, which is one type of real earnings management. Specifically, the commonly used indicator in detecting sales pull-in (through lenient credit terms and/or price discount) is abnormal cash from operating activities (CFO). Abnormal CFO is the difference between reported CFO and normal CFO, where normal CFO is measured as a function of sales. A negative abnormal CFO indicates a possible real earnings management through sales pull-in. Converting accruals into CFO decreases the difference between reported CFO and normal CFO, and thus decreases the effectiveness of the indicator in detecting sales pull-in.[4]

[3] For ease of discussion and analysis, we consider earnings-increasing earnings management and the accompanying cash management of converting accruals into cash. We note that our discussion and analysis are equally applicable to earning-decreasing earnings management; in that case, the accompanying cash management converts cash into accruals.

[4] Two other types of real earnings management (in addition to sales pull-in), frequently referred to, are reducing discretionary expenses (as advertising and R&D), and overproducing to allocate more of the overhead to inventory. Clearly, the technique this study discusses is not applicable to these two types of real earnings management.

We use the label *camouflaged earning management through accruals conversion (AC) cash management* to describe the activity of converting accruals into cash—decreasing the effectiveness of the indicators of earnings management (either accrual-based or sales pull-in). Because such earnings management often distorts the normal association of cash and accruals relative to sales, AC cash management may result in (i) changes in CFO that follow the changes in sales more closely, and (ii) accruals that follow the changes in sales more closely. AC cash management would then result in camouflaged earnings management.

In this paper, we assert that in response to increased scrutiny and greater attention to cash and accruals relative to earnings and sales, firms increase their focus on cash management aimed at aligning these variables. The corporate failures of 2001–2002 and the subsequent SOX have resulted in much greater scrutiny of financial disclosures compared with earlier periods. As such, SOX constitutes an appealing means of testing our assertion. Specifically, our research hypothesis is that post-SOX, firms have increased AC cash management, resulting in camouflaged earnings management.

Of course, prudent cash management and, in particular, the alignment of cash and earnings are also common management practices. Such activities may be an appropriate response to the significant changes in the economic environment during the period considered rather than a means of addressing market concerns over the quality of reported earnings.[5] Furthermore, in recent years, investors have assigned greater weight to cash and thus created a stronger incentive for firms to manage cash.[6] In a recent important paper, Lee [2012] documents that financial distress, long-term credit rating, the existence

[5] These significant changes include the burst of the internet bubble, the higher frequency of losses for public firms, the attacks of September 11, and the worldwide recession.

[6] See, for example, DeFond and Hung [2003], Call, Chen, and Tong [2009], and Frankel, Levi, and Shalev [2010]. McInnis and Collins [2011] further argue that analysts' cash-flow forecasts increase the transparency and costs of accrual manipulations. Givoly, Hayn, and Lehavy [2009] offer an interesting opposite perspective and argue analysts' cash-flow forecasts are a straightforward extension of their earnings forecasts.

of analyst cash-flow forecasts, and a higher association between stock returns and CFO motivate companies to manage their cash flow, either by shifting items between cash-flow categories, or by timing certain transactions. Regardless of whether companies performed cash management to camouflage earnings management or to achieve one of the other objectives, such increased cash-management activities may—intentionally or unintentionally—have affected the key indicator of accrual-based earnings management, and the indicator of sales pull-in, and thus have limited their ability to detect earnings management. This limitation, of the common indicators of earning management, should be of particular interest because a large number of influential papers on earnings management have utilized those indicators, and their variants, to draw important inferences.[7]

For concreteness, we consider AC cash management through the factoring of receivables. We note that considering other types of AC cash management, such as current assets securitization or working capital management, will not change our analysis and conclusions. Examining factoring of receivables is appealing because it is a transaction many firms use regularly (e.g., Klapper [2006], Levi [2010]). Prior studies have only occasionally discussed the impact of factoring/securitization on the transparency of earnings management. McNichols [2000] points out that firms factoring/securitizing receivables end up having a lower estimate of discretionary accruals; Melumad and Nissim [2008] note that factoring/securitizing receivables reduces the information on sales management implicit in the receivables-to-sales ratio.[8] Relatedly, Peasnell, Pope, and Young [2000] indicate controlling for cash recovery from customers

[7] Dechow, Ge and Schrand (2010) indicate that almost 100 papers have used accrual models to extract discretionary accruals as a proxy for earnings management and earnings quality. Of course, not all research on earnings management utilizes accrual models. For example, in studying earnings management, Beneish, Lee, and Nichols [2011] and Dechow, Ge, Larson, and Sloan [2011] have examined forensic accounting principles, fraud detection, and accounting and auditing enforcement releases.

[8] Dechow and Shakespeare [2009], Barth and Taylor [2010], and Dechow, Myers, and Shakespeare [2010] discuss whether securitization of receivables serve as an earnings management tool.

is important in estimating expense accruals manipulation. They further introduce a "margin model" and suggest it is better able to detect expense manipulation. Interestingly, the potential use of factoring receivables to camouflage earnings management was noted, as early as in 1995, in a *BusinessWeek* article on Baush & Lomb.[9]

AC cash management is usually unobservable in the period performed. For example, firms exercise discretion on whether to disclose nonrecourse factoring activity (based on materiality). At times, some firms voluntarily disclose information about transactions involving AC cash management (especially when the amount involved is viewed as material). But such disclosure is not consistently applied and it usually involves aggregate information, making determining the amount attributable to AC cash management difficult. Revsine, Collins, and Johnson [2004] observe that "*the main issue [regarding factoring] is the level of disclosure in statement footnotes ... When the transfer is with recourse … SFAS No. 5 requires footnote disclosure of the contingent liability.* ***But there is no similar unequivocal disclosure requirement when receivables are sold without recourse*** *[emphasis in the original].*"[10] Even when there is a disclosure regarding factoring, it is only with respect to aggregate annual data without quarterly breakdown.

The unobservability of AC cash management leads us to analyze its observable delayed effect on financial performance. Specifically, we examine the forward variation of cash flow from operating activities relative to sales, the forward variation of normal

[9] "According to internal B&L financial documents obtained by *BusinessWeek* ... B&L's internal financial documents clearly show the strain of efforts to pump up sales. Receivables rose about 25% in 1993 to hit $506 million. That equaled 90 days of sales, which accounting experts say is higher than the 45 to 60 days they'd expect. But in B&L's annual report, receivables were shown at just $385 million. Why? B&L "factored" $105 million worth of receivables, selling them to a third party to raise cash. B&L argues this is a normal practice that doesn't require disclosure" (*BusinessWeek*, October 23, 1995).

[10] Anecdotal evidence of hiding factoring is the case of SEC vs. Delphi: "From 2003 to 2004, Delphi hid up to $325 million in factoring, or sales of accounts receivable, in order to improperly boost non-GAAP pro forma measures of Delphi's financial performance that were relied upon by investors, analysts and rating agencies. Hiding this factoring allowed Delphi to overstate materially its 'Street Net Liquidity'… Delphi settled the charges, without admitting or denying the Commission's allegations." [Litigation Release No. 19891 (Oct. 30, 2006)]

accruals, and the forward variation of discretionary accruals.[11] Note we do not use these forward variations as additional indicators of earnings management, but rather as proxies of camouflaged earnings management through AC cash management.

Although earnings management coupled with AC cash management may be impossible to trace, we illustrate, via a parametric example, it increases both the forward variation of cash-to-sales and the forward variation of normal accruals, and decreases the forward variation of discretionary accruals. These three indicators later serve as proxies for AC cash management in our empirical analysis. Our analytical illustration considers three settings: (1) real earnings management through sales pull-in, which impacts the level of (net) sales; (2) accrual-based earnings management through the manipulation of allowance of sales returns, which impacts the level of (net) sales; and (3) accrual-based earnings management through the manipulation of accrued liability, which impacts the level of expenses. For each of these three settings, we present three scenarios: (a) a benchmark of a true improvement in earnings; (b) an earnings-management scenario mimicking the benchmark's true improvement in earnings; and (c) the earnings management of Scenario (b), coupled with camouflaged earnings management through AC cash management. Note Scenario (c) mimics the accruals (and cash) immediate impact of a true sales increase or expense decrease. Then, for each setting, we compare Scenario (c) with Scenario (b), illustrating that earnings management coupled with AC cash management increases the forward variation of cash-to-sales and the forward variation of normal accruals, while it decreases the forward variation of discretionary accruals.

It is important to point out that these three forward-variation effects of camouflaged earnings management through AC cash management cannot arise from real earnings

[11] Forward variation of a variable at a given point in time is its coefficient of variation over subsequent quarters.

management (such as cutting discretionary expenses or sales pull-in), from increased cash management independent of earnings management, or simply from decreased accrual-based earnings management without a related change in cash management. We further discuss the distinction between camouflaged earnings management through AC cash management and these other activities in section 2.

In the subsequent empirical analysis, we use the above three proxies for camouflaged earnings management through AC cash management as the dependent variables. Similar to recent studies looking at the effect of SOX on earnings management, our primary explanatory variables include a trend variable, a scandal period indicator variable, and a post-SOX period indicator variable. The empirical results establish that both cash-to-sales forward variation and normal accruals forward variation have significantly increased post-SOX, while discretionary accruals forward variation has significantly decreased. These results are all in line with, and support, our hypothesis that firms have increased their AC cash management post-SOX, resulting in camouflaged earnings management. We further examine our hypothesis using three subsamples of firms attempting to meet an earnings target, which prior literature has shown are more likely to engage in earnings management. These include firms attempting to avoid reporting an earnings loss, firms attempting to avoid reporting a negative change in earnings, and firms attempting to meet or beat analyst forecasts.[12] To control for bad news, we examine subsamples of firm-quarters with and without negative earnings and earnings decrease. Generally, the results for the different subsamples are qualitatively the same as those for the full sample.

The main contributions of our study are as follows. Our paper is the first to make and study the assertion that cash-management activity might distort the common indicators of earnings management, resulting in underestimation of earnings-management activity (i.e.,

[12] For an important discussion of that literature, see Beaver, McNichols, and Nelson [2007] and Durtschi and Easton [2005, 2009].

camouflaged earnings management). We propose that in response to SOX, firms may have also attempted to camouflage earnings management through AC cash management. We develop new proxies for camouflaged earnings management through AC cash management, and use these proxies to test our assertion. The empirical results support our hypothesis that, post-SOX, firms have increased their AC cash management, resulting in camouflaged earnings management. An immediate implication is that the interpretation of the empirical findings in prior studies regarding the impact of SOX on the indicator of accrual-based earnings management is possibly incomplete. Specifically, the identified change in the indicator of accrual-based earnings management post-SOX may have been the result of camouflaged earnings management through AC cash management, rather than the result of an actual decrease in accrual-based earnings management, as those studies suggest.

More broadly, we suggest that any comprehensive investigation of earnings management, not necessarily with respect to SOX, may benefit from considering the possibility of camouflaged earnings management through AC cash management. Ignoring this option may amount to the omission of an important correlated variable, and thus result in misleading inferences. Specifically, prior studies have utilized accrual models, based on the comparison of accruals and normal accruals, to detect accrual-based earnings management. The detected accrual-based earnings management could have been biased, most likely understated, due to ignoring the possibility of camouflaged earnings management. A similar bias might arise with respect to the indicator of sales pull-in.

The remainder of the study is organized as follows: section 2 presents an analytical illustration. Section 3 describes the empirical design. Section 4 discusses the sample and provides descriptive statistics on the main variables. Section 5 presents and discusses the empirical results, and section 6 concludes the study.

2. Analytical Illustration

We examine the impact of earnings management and cash management on key financial metrics by using the following parametric setting. Let S_{ij} denote the "normal" level of sales for month *j* of quarter *i*, (*j*=1,2,3 and *i*=1,2,3,4), and let $S_i \equiv S_{i1} + S_{i2} + S_{i3}$. Unless otherwise noted, sales growth is assumed to be zero.[13] Standard credit terms for both customers and vendors are 60 days. The firm holds an inventory level corresponding to next month's expected sales.[14] For simplicity, we assume the cost of goods sold (COGS) is variable, the selling, general and administrative expense (SG&A) is fixed, the firm has no property, plant, and equipment (PP&E) (e.g., all assets/facilities are rented/leased), there are no taxes, and income is distributed as dividend at year end.[15] Formally, we let *v* denote the (constant) COGS per dollar of sales and *F* denotes the total SG&A.

From the above assumptions and notation it follows that the net income in quarter *i* (Q_i) is $NI_i = S_i(1-v) - F$. The change in NI in quarter *i* relative to the previous quarter is $\Delta NI_i = NI_i - NI_{i-1}$. Similarly, ΔREC_i, ΔINV_i and ΔPAY_i denote the (quarter-over-quarter) change in receivables, inventories and payables, respectively. Therefore, the total accrual in Q_i is $ACC_i = \Delta REC_i + \Delta INV_i - \Delta PAY_i$. The cash from operating activities is $CFO_i = NI_i - ACC_i$, while $\Delta CFO_i = CFO_i - CFO_{i-1}$. Following the accounting literature (e.g., Jones [1991] and Dechow et al. [1995]), we distinguish between Normal Accrual (NA) and Discretionary Accrual (DA), where,

[13] That is, $S_{ij} = S_{km}$ and $S_i = S_k$ for all *i, j, k,* and *m*. The reason we maintain the subscript notation is to allow for easy reference to origin and consequence of changes in monthly sales.

[14] Our analysis immediately generalizes to a number of alternative assumptions, including arbitrary sales growth, any length of credit terms and different inventory policies.

[15] We have replicated the analysis of this section for the more general case that allows for PP&E, taxes, fixed manufacturing costs and increase in retained earnings. This complicates the notation considerably without affecting the qualitative observations.

$$\text{NA} = \alpha_1 \frac{1}{Assets} + \alpha_2 \frac{\Delta Sales - \Delta REC}{Assets} + \alpha_3 \frac{PPE}{Assets}$$

$$\equiv \gamma + \alpha_2'(\Delta Sales - \Delta REC), \text{ where } \gamma \equiv \alpha_1 \frac{1}{Assets} + \alpha_3 \frac{PPE}{Assets} \text{ and } \text{DA} = \text{ACC} - \text{NA}.$$

Replicating the analysis for a measure based on the performance-matched discretionary accruals, as proposed by Kothari et al. [2005], does not change qualitative insights.

We study three settings. The first setting considers *real earnings management through sales pull-in*. The second setting examines *accrual-based earnings management through the manipulation of allowance of sales returns*. Both types of manipulation impact the level of (net) sales. The third setting examines *accrual-based earnings management through the manipulation of accrued liability*. This type of manipulation impacts the level of expenses rather than the level of sales. For each setting we present three scenarios – (a) a benchmark of a true improvement in either sales or expenses, (b) an earnings management scenario attempting to mimic the benchmark's true improvement in earnings, and (c) a scenario involving the earnings management of scenario (b) coupled with camouflaging of that earnings management using *accrual conversion (AC) cash management* (such as factoring of receivables). Our primary interest is the comparison of Scenario (b) and Scenario (c).

2.1 SETTING 1 – REAL EARNINGS MANAGEMENT THROUGH SALES PULL-IN

We first consider the benchmark Scenario 1.a. We assume a transitory increase, δ, in Q1 sales, and thus there is no need to increase the end of period inventory level.[16] This leads to an immediate increase in NI, a partial increase in CFO in Q1, and a delayed increase in CFO in Q2 (due to the assumed credit terms). We assume, without loss of generality, that the sales increase is uniform throughout the quarter. The impact of this

[16] In the case of a permanent increase in sales, an increase in the level of steady-state inventory is required, but the analysis is otherwise analogous.

sales increase on the different financial metrics is presented in detail in Setting Summary 1.a below.

[Setting Summary 1.a about here]

In Scenario 1.b, the firm pulls in sales to Q1's third month from the first month of Q2 to increase sales and NI. We let β denote the percentage of S_{21} pulled into S_{13}. To mimic the true increase in sales and NI of Scenario 1.a, $\beta S_{21} = \delta$. For simplicity, we assume the increase in sales (above the "normal" S_1) comes out of inventory, and no change in production is necessary. We also assume the firm extends the credit terms to 90 days to those customers enticed into purchasing early.[17] The increase in Q1's sales and NI is offset by a similar decrease in next month's performance. By Q3, sales and NI return to normal levels. Note that this leads to increased variation in both sales and NI relative to the benchmark scenario, whereas the CFO level remains unchanged. Indeed, the discrepancy between the changes in NI and CFO is often viewed by the market as a red flag for potential earnings management and is sometimes used as a proxy for earnings quality. Even more relevant for our study is the observation that the ratio of the forward variation of CFO to the forward variation of sales decreases (see Row 2/Columns i1-i3 and Row 13/Columns i1-i3).[18] Further, the forward variation of DA increases compared with Scenario 1.a (see Row 15/Columns i1-i3.)[19] The impact of this sales manipulation on the different financial metrics is presented in detail in Setting Summary 1.b below.

[Setting Summary 1.b about here]

In Scenario 1.c, the firm attempts to mask its earnings management through AC cash management. For concreteness, we assume the firm factors receivables to replicate the

[17] To assess robustness, we examined a number of other variations, including: (i) more general pull-in assumptions, (ii) a scenario of no inventory, where any increase in sales requires increased production/ purchases, (iii) discounts for early purchases. The qualitative results remain the same.

[18] We define *forward variation* of a variable as its coefficient of variation (i.e. the ratio of standard deviation to the absolute mean) over the subsequent three quarters.

[19] When comparing DA variations, we assume $\alpha_2' << 0.5$; previous studies (e.g., Dechow, Richardson, and Tuna [2003]) provide strong support for this assumption.

cash impact of the true sales increase presented in Scenario 1.a.[20] Specifically, it pulls in βS_{21} and factors receivables in the amount of $\frac{1}{3}\beta S_{21}(1-v)$, replicating in Q1 the performance of a true transitory increase of βS_{21} in sales. As in Scenario 1.b, the increase in Q1's sales and NI is offset by a similar decrease in next month's performance. Unlike Scenario 1.b, the CFO in Q1 replicates the CFO of the true sales increase of Scenario 1.a. Most importantly, the three-quarter forward variation ratio of CFO to sales substantially increases compared with Scenario 1.b (and even compared with Scenario 1.a). Specifically, we compare Row 13/Columns i1-i3 in Setting Summary 1.c with Row 13/Columns i1-i3 in Setting Summary 1.b, while noting that Row 2/Columns i1-i3 in Setting Summary 1.c is the same as in Setting Summary 1.b. Finally, there is an identifiable impact on the forward variation of DA and NA. The forward variation of DA decreases compared with Scenario 1.b (see Row 15/Columns i1-i3 in Setting Summaries 1.b and 1.c), whereas the forward variation of NA increases due to the factoring (see Row 14/Columns i1-i3 in Setting Summaries 1.b and 1.c). The impact that this combination of sales manipulation and factoring has on the different financial metrics is presented in Setting Summary 1.c.

[Setting Summary 1.c about here]

2.2 SETTING 2 – ACCRUAL-BASED EARNINGS MANAGEMENT THROUGH THE MANIPULATION OF ALLOWANCE OF SALES RETURNS

We have replicated the above analysis for the setting of *accrual-based earnings management through the manipulation of allowance of sales returns*. The results are essentially identical to those reported for *real earnings management through sales pull-in* and are therefore not reported here.

[20] Examining factoring of receivables is appealing because it is a transaction regularly used by many firms (see, for example, Klapper [2006], Levi [2010]). Our notion of AC cash management is in line with Lee [2012] timing-based cash management.

2.3 SETTING 3 – ACCRUAL-BASED EARNINGS MANAGEMENT THROUGH THE MANIPULATION OF ACCRUED LIABILITY

In the benchmark Scenario 3.a, we assume a one-time decrease, δ, in Q1's SG&A. This leads to an immediate increase in NI and CFO in Q1. Setting Summary 3.a details the impact this expense decrease has on the different financial metrics.

[Setting Summary 3.a about here]

In Scenario 3.b, the firm manipulates the provision to reduce SG&A and increase NI. We let δ denote the decrease in accrued liability and the related SG&A expense, leading to a δ increase in NI.[21] We further assume these changes reverse in the following quarter[22] and by Q3 expenses and NI return to their normal levels. This creates increased variation in expenses and NI relative to the benchmark scenario, whereas the CFO level remains unchanged (see Row12/Columns i1-i3). The forward variation of DA increases compared with the benchmark scenario (see Row14/Columns i1-i3). The effect this sales manipulation has on the different financial metrics is presented in detail in Setting Summary 3.b.

[Setting Summary 3.b about here]

In Scenario 3.c, the firm attempts to camouflage its earnings management by factoring receivables to replicate the net cash impact of the true expense decrease of Scenario 3.a. Specifically, it factors the amount δ, replicating in Q1 the performance of a true transitory decrease δ in SG&A. As in Scenario 3.b, Q1's decrease in expenses and increase in NI reverses the following month. However, unlike Scenario 3.b, the CFO in Q1 replicates the Q1's CFO of the true expense decrease of Scenario 3.a. Most importantly, the three-quarter forward variation of CFO to sales increases compared with Scenario 3.b (and even compared with Scenario 3.a). Specifically, we compare Row

[21] To simplify notation, we include accrued liability in PAY.
[22] This assumption is made solely for ease of exposition. Relaxing it has no qualitative impact on our results.

12/Columns i1-i3 in Setting Summary 3.c with Row 12/Columns i1-i3 in Setting Summary 3.b, while noting that Row 2/Columns i1-i3 in Setting Summary 3.c is the same as in Setting Summary 3.b. As before, there is an identifiable impact on the variation of DA and NA. The forward variation of DA decreases compared with Scenario 3.b (see Row 14/Columns i1-i3), whereas the forward variation of NA increases due to factoring (see Row 13/Columns i1-i3). The combined impact of the SG&A manipulation and factoring on the different financial metrics is presented in detail in Setting Summary 3.c.

[Setting Summary 3.c about here]

2.4 DISCUSSION

In the above analysis we have illustrated the effect of camouflaged earnings management through AC cash management on the three-quarter forward variation of cash-to-sales, normal accruals, and discretionary accruals. While earnings management coupled with AC cash management may be difficult to trace, this combined activity leads to an increase in cash-to-sales and normal accruals forward variations, and a decrease in discretionary accruals forward variation, compared with earnings management that is not coupled with AC cash management.

It is important to distinguish between the impact of camouflaged earnings management through AC cash management and the impact of other related transactions. These transactions include: (i) cash management without a parallel earnings management, (ii) decreased accrual-based earnings management without a related change in cash management, and (iii) increased real earnings management. The impact of these three related transaction on cash-to-sales, normal accruals or discretionary accruals forward variations is different from that of camouflaged earnings management through AC cash management.

If AC cash management is performed without a parallel earnings management, then while the cash-to-sales forward variation may still rise, the discretionary accruals forward variation is likely to increase, rather than decrease, as a result of converting accruals into cash. Note also that if cash management is performed without changing accruals, then normal and discretionary accruals will not change at all.

If accrual-based earnings management declines without a related change in cash management, then either the cash-to-sales forward variation or the normal accruals forward variation is not likely to increase. In case the accrual-based earnings management was originally performed to affect expenses through provisions, then the cash-to-sales forward variation is likely to remain unaffected by the decline in the accrual-based earnings management, because sales and cash are unaffected. On the other hand, when accrual-based earnings management was performed to affect sales through provisions, the normal accruals forward variation is likely to decline, because the decrease in accrual-based earnings managements reduces the variability in sales and receivables, which are determinants of normal accruals.

If real earnings management increases, then either the normal accruals forward variation or the cash-to-sales forward variation is not likely to increase. When real earnings management is performed to affect expenses through the reduction of discretionary expenses, then the normal accruals forward variation is likely to remain unaffected, because sales and receivables, which are determinants of normal accruals, are unaffected. Alternatively, when real earnings management is performed to affect sales through sales pull-in then the cash-to-sales forward variation will not increase. Specifically, if a sales pull-in is performed through extended credit terms, then the cash-to-sales forward variation will decrease rather than increase, because sales are fluctuate across the periods while cash is affected less or unaffected at all (see also Setting

Summary 1.b). On the other hand, if sales pull-in is performed through price discounts, then the cash-to-sales forward variation is not likely to increase, because both sales and cash are similarly affected.

In our analysis we examine AC cash management through factoring; however, other types of AC cash management will yield similar results (e.g., current assets securitization, working capital management). While our discussion focuses on earnings-increasing earnings management and the accompanying cash management that converts accruals into cash, our analysis and inferences also apply to earning-decreasing earnings management and the accompanying cash management that converts cash into accruals (e.g., through working capital management).

3. Empirical Design

Our main research hypothesis is that post-SOX firms have increased their use of AC cash management, resulting in camouflaged earnings management. However, AC cash management, designed to mimic real sales-increasing (or expense-decreasing) transactions, is usually unobservable in the period performed. We therefore analyze the delayed effect of AC cash management on the forward variation of certain financial variables. Specifically, the analytical illustration detailed in Section 2 above examines the effect of camouflaged earnings management through AC cash management on: (i) the three-quarter cash-to-sales forward variation ratio (CTS), (ii) the three-quarter normal accruals forward variation [(FV(NA)], and (iii) the three-quarter discretionary accruals forward variation [(FV(DA)]. It suggests that camouflaged earnings management through AC cash management increases CTS and FV(NA) while decreasing FV(DA).

To examine whether camouflaged earnings management through AC cash management has indeed increased post-SOX, we use our proxies [CTS, FV(NA) or FV(DA)] as the dependent variable in the regression analysis described below. In line

with recent studies examining the effect of SOX on earnings management (e.g., Cohen et al. [2008]), we include as part of the explanatory variables a trend variable (TIME), a scandal period indicator variable (SCA), and a post-SOX period indicator variable (SOX). TIME is a trend variable equal to the difference between the current-year quarter and the first quarter of 1989. SCA is a dummy variable that takes on the value of 1 if the observation falls between the third quarter of 2001 and the second quarter of 2002, and zero otherwise. SOX is a dummy variable that equals 1 if the observation falls after the second quarter of 2002, and zero otherwise. The definition of the scandal and the post-SOX periods is consistent with Bartov and Cohen [2009], who also use quarterly data.[23]

In our robustness tests, we also examine our hypothesis using three earnings targets sub-samples: firms attempting to avoid earnings losses, firms attempting to avoid negative change in earnings, and a meet-or-beat analyst forecast sample. Prior studies argue that firms tend to manage earnings to meet these three earnings targets (see, for example, Burgstahler and Dichev [1997], Roychowdhury [2006]). We define (i) T1 as a dummy variable equal to 1 if quarterly earnings deflated by market capitalization of shareholders equity at prior quarter end is in the interval [0, 0.0025], and 0 otherwise; (ii) T2 as a dummy variable equal to 1 if the change in quarterly earnings deflated by market capitalization of shareholders equity at prior quarter end is in the interval [0, 0.0025], and 0 otherwise; and (iii) T3 as a dummy variable equal to 1 if the difference between actual earnings per share and consensus analyst forecast is in the interval [0, 0.01], and 0 otherwise.

3.1 CASH-TO-SALES FORWARD VARIATION RATIO

Our first proxy for camouflaged earnings management through AC cash management is the cash-to-sales forward variation ratio (CTS). Cash is measured by cash from

[23] To test for robustness, we repeat our analysis without SCA as an explanatory variable. We also divide SOX into two sub-periods after the end of the second quarter of 2002. Results (not tabulated) are qualitatively the same.

operating activities (CFO). We use the ratio of CFO forward variation to sales forward variation to capture the strong economic association between these two variables, and to control for changes in the variation of CFO caused by changes in the variation of sales.[24] We define CTS as the three-quarter cash-to-sales forward variation ratio, CTS ≡ FCV(CFO)/FCV(sales), where FCV(CFO) is the three-quarter forward coefficient of variation (CV) of CFO; FCV(CFO)= FSTD(CFO)/Absolute[FMean(CFO)]; $FSTD(CFO)_t$= STD(CFO_t,CFO_{t+1},CFO_{t+2}); $FMean(CFO)_t$= Mean (CFO_t,CFO_{t+1},CFO_{t+2}). FCV(Sales) is the three-quarter forward coefficient of variation (CV) of sales and is measured similarly to FCV(CFO).[25]

In addition to using TIME, SCA and SOX as explanatory variables, we control for earnings (IB), accruals (ACC), book-to-market ratio (BM), market value (LMV), and capital expenditures. IB is the three-quarter forward mean income before extraordinary items (IBXI); IB_t=Mean ($IBXI_t$,$IBXI_{t+1}$,$IBXI_{t+2}$). ACC is the three-quarter forward mean accruals to total assets; ACC_t =Mean ($Accruals_t$/Total $Assets_{t-1}$,$Accruals_{t+1}$/Total $Assets_t$,$Accruals_{t+2}$/Total $Assets_{t+1}$). BM is the three-quarter forward mean book-to-market ratio; BM_t =Mean (book-to-$market_t$, book-to-$market_{t+1}$, book-to-$market_{t+2}$). LMV is the log of the market value of common equity at quarter end. Control variables for industry-specific effects and quarter-specific effects are also included.[26]

The pooled regression model is:

$$CTS = \alpha_0 + \alpha_1 TIME + \alpha_2 SCA + \alpha_3 SOX + Control\ Variables + \varepsilon \qquad (1)$$

In the analytical section we illustrate that camouflaged earnings management through AC cash management increases CTS. Our hypothesis is that camouflaged earnings

[24] See Huang [2009] for a discussion of CFO volatility measurement. Also note that when it comes to defining normal CFO, it is typically measured as a function of sales.

[25] To test for robustness, we also examine forward variation using the variance in the two or four subsequent quarters. Results (not tabulated) are qualitatively the same.

[26] We control for potential industry-specific effects using Kenneth French's 12-industry classification: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

management through AC cash management has increased significantly post-SOX, i.e., $\alpha_3 > 0$.

In addition to the pooled regression described in Equation (1), we run time series firm-by-firm regressions and calculate mean coefficients in a manner similar to Fama and MacBeth [1973]. Running firm-by-firm regressions improves our ability to analyze the behavior of CTS over time, because the CTS pattern (like earnings management and AC cash management) may vary across firms.[27]

The time-series regression model is:

$$CTS_{it} = \alpha_{0t} + \alpha_{1t}TIME_{it} + \alpha_{2t}SCA_{it} + \alpha_{3t}SOX_{it} + \text{Control Variables} + \omega_{it} \quad (2)$$

Note that for firm-by-firm regressions we do not need to include industry-specific effects as part of the control variables.

3.2 NORMAL ACCRUALS FORWARD VARIATION

In the analytical section we illustrate that camouflaged earnings management through AC cash management increases the forward variation of normal accruals [FV(NA)]. We define FV(NA) as the three-quarter forward variation of normal accruals. Consistent with recent studies (e.g., Cohen et al. [2008], Bartov and Cohen [2009], and Cohen and Zarowin [2010]), normal accruals (NA) and discretionary accruals (DA) are measured using the cross-sectional modified Jones model (Jones [1991] and Dechow et al. [1995]). FV(NA) is measured as the forward coefficient of variation of NA: $FV(NA)_t = STD(NA_t, NA_{t+1}, NA_{t+2})/Absolute[Mean(NA, NA_{+1}, NA_{+2})]$.[28]

We run the following regression model:

$$FV(NA) = \beta_0 + \beta_1 TIME + \beta_2 SCA + \beta_3 SOX + Control\ Variables + \eta \quad (3)$$

[27] We have also repeated our analysis for all indicators of AC cash management using two-way clustering based on Petersen (2009). Results (not tabulated) are qualitatively the same. In particular, the coefficients on SOX remain at the same significance levels.

[28] Replicating the analysis for a measure based on the performance-matched discretionary accruals, as proposed by Kothari et al. [2005], does not change qualitative insights.

where our hypothesis is $\beta_3 > 0$. Time, SCA and SOX are explanatory variables as defined above. The control variables include FCV(CFO), FCV(sales), IB, ACC, BM, LMV, mean capital expenditures divided by total assets, industry-specific effects and quarter-specific effects.

3.3 DISCRETIONARY ACCRUALS FORWARD VARIATION

In the analytical section we illustrate that camouflaged earnings management through AC cash management decreases the forward variation of discretionary accruals [FV(DA)]. We define FV(DA) as the three-quarter forward variation of discretionary accruals (DA). FV(DA) is measured as the forward standard deviation of DA; $FV(DA)_t=STD(DA_t,DA_{t+1},DA_{t+2})$. Note that DA is normalized to zero by construction and therefore STD(DA) is not normalized by the absolute mean.

The explanatory variables are identical to those defined in Equation (3). The regression model is:

$$FV(DA) = \gamma_0 + \gamma_1 TIME + \gamma_2 SCA + \gamma_3 SOX + Control\ Variables + \varphi \qquad (4)$$

where our hypothesis is that $\gamma_3 < 0$.

4. Sample Selection and Descriptive Statistics

The full sample used in this study consists of all firms with available financial data on Compustat during 1989-2008; note, however, that this also requires data for 2009 due to the employed methodology. We exclude financial institutions (1-digit SIC = 6) and public utilities (2-digit SIC = 49). We require that firms have a market value of equity above $10 million, share price above $1 at quarter end, and for comparability a fiscal year-end on December 31. To limit the effect of extreme observations, each quarter we rank the sample according to the variables in the regression models and remove the extreme one

percent of the observations on each side.[29] In addition, to facilitate a firm-by-firm analysis, we define a reduced sample that includes firms with sufficient information on Compustat pre- and post-SOX. Specifically, the reduced sample includes firms with information available on Compustat for: (i) at least half of the quarters between January 1, 1989 and June 30, 2001 (i.e., at least 25 quarterly observations), (ii) at least half of the quarters between January 1, 1994 and June 30, 2001 (i.e., at least 15 quarterly observations), (iii) all quarters between July 1, 2001 and June 30, 2002 (i.e., 4 quarterly observations), and (iv) at least half of the quarters between July 1, 2002 and December 31, 2008 (i.e., at least 13 quarterly observations).[30] Table 1 presents the number of observations for each year. The full and the reduced samples include 120,941 and 22,712 firm-quarter observations for 6,142 and 350 distinct firms, respectively.

[Table 1 about here]

Table 2 contains descriptive statistics for the main sample (Panel A) and the reduced sample (Panel B). The distribution of cash from operating activities (CFO) and sales are skewed to the right, as the means are larger than the medians in both samples. In both samples, the three-quarter forward coefficient of variation of CFO [FCV(CFO)] is higher than the three-quarter forward coefficient of variation of sales [FCV(sales)], indicating a higher variation of CFO. The differences in variation are presumably due to the differences between the accrual and the cash methods. The three-quarter forward variation ratio of CFO to sales (CTS) is also skewed to the right (as both the numerator and the denominator are right-skewed) and the means and medians are similar for the full and the reduced samples.

[29] To test for robustness, we replicate our analysis, using a broader sample, without the limitation of fiscal year-end on December 31. In addition, we eliminate extreme observations applying alternative procedures (delete the extreme half percent of the observations on each side or winsorizing). Results (not tabulated) are qualitatively the same.

[30] To test for robustness, we also use less restricted sample selection criteria, allowing the reduced sample to include firms with at least a third of the quarters before and after SOX. The empirical results (not reported) are qualitatively the same.

Normal accruals (NA) and discretionary accruals (DA) are calculated using the cross-sectional modified Jones model only for the full sample due to data constraints.[31] The mean and median discretionary accruals (DA) are equal to zero, by construction. Consistent with prior studies, the mean DA in absolute terms [ABS (DA)] equals 0.02. The three-quarter forward variation of normal accruals [FV(NA)] and discretionary accruals [FV(DA)] are skewed to the right as the means (1.50, 0.03) are larger than the medians (0.85, 0.02).

Consistent with prior studies, the distribution of the book-to-market ratios (BM) is skewed to the right as the means (0.60, 0.56) are larger than the medians (0.47, 0.47) in the full sample and the reduced sample, respectively. Firm size, on average, is smaller in the full sample than in the reduced sample, possibly due to survivorship bias. Also in line with prior studies, 4% of the full sample are suspect firm-quarters with an incentive to avoid losses (T1), 12% are suspect firm-quarters with an incentive to avoid earnings decreases (T2), and 22% are suspect firm-quarters with an incentive to meet-or-beat analyst forecast (T3).

[Table 2 about here]

Table 3 presents the Spearman and Pearson correlations for the main variables. As expected, there is a high correlation between CFO and sales (Pearson = 0.75; Spearman = 0.68). The correlation between FCV(CFO) and FCV(sales) is also meaningful (Spearman = 0.27), though lower than the correlation between CFO and sales; this presumably reflects the differences between the cash and the accrual methods, and is consistent with the different magnitudes of CV(CFO) and CV(sales) described in Table 2. The relatively

[31] Following prior studies (e.g., Jones [1991] and Dechow et al. [1995]), NA and DA are calculated using gross PPE, thus significantly restricting the number of available firm-quarter observations. To test for robustness, we repeat our analysis using net PPE instead of gross PPE (net PPE is highly correlated with gross PPE; Spearman correlation = 0.92), thereby more than doubling the sample. Results (not reported) are qualitatively the same.

high correlation between CFO [FCV(CFO)] and sales [FCV(sales)] underlines the importance of examining the ratio between the two variables.

The correlation between CTS and ACC is positive (Spearman = 0.22) because higher accruals result in higher CFO forward variation; the Spearman correlation between FCV(CFO) and ACC is 0.25. As for size effect, the log market value (LMV) is negatively correlated with FCV(sales) and FCV(CFO), as larger firms tend to be more stable; the Spearman correlation of LMV with FCV(CFO) and FCV(sales) is -0.28 and -0.20, respectively. As expected, the correlation between the forward variation of normal accruals [(FV(NA)] and the forward variation of discretionary accruals [(FV(DA)] is positive (Spearman = 0.20). The correlation of FV(DA) with CFO and sales is similar and negative (Spearman is about -0.3), due to the size effect. DA variation is positively correlated with CFO and sales variation; the Spearman correlation of FV(DA) with FCV(CFO) and FCV(sales) is 0.44 and 0.22, respectively. Again, size is negatively correlated with variation as the correlation between FV(DA) and LMV equals -0.29.

[Table 3 about here]

5. Empirical Results

5.1 SOX AND THE CASH-TO-SALES FORWARD VARIATION RATIO

Table 4 presents the effect of SOX on cash-to-sales forward variation ratio (CTS) in the full sample, the reduced sample, and the three earnings-target sub-samples. The three earnings targets sub-samples are: (i) firms attempting to avoid earnings losses, for which the indicator variable T1 is equal to 1, (ii) firms attempting to avoid negative change in earnings, for which the indicator variable T2 is equal to 1, and (iii) the meet-or-beat analyst forecast sample, for which the indicator variable T3 is equal to 1. We estimate the effect of SOX on CTS using regression equation (1) introduced in Section 3:

$$\text{CTS} = \alpha_0 + \alpha_1 \text{TIME} + \alpha_2 \text{SCA} + \alpha_3 \text{SOX} + \text{Control Variables} + \varepsilon \qquad (1)$$

Our main research hypothesis is that camouflaged earnings management through AC cash management has increased post-SOX. In the analytical section we illustrate that camouflaged earnings management through AC cash management increases CTS, and consequently (as shown in the empirical design section), a positive coefficient on SOX is consistent with an increase in camouflaged earnings management through AC cash management. That is, our assertion is that α_3 is positive.

For all samples (except the meet-or-beat analyst forecast sample), the coefficient on SOX is positive and significantly different from zero at the 0.01 level. That is, CTS increased post-SOX, which is consistent with our assertion that post-SOX firms have increased AC cash management, leading to camouflaged earnings management. As a robustness test, we repeated our analysis for a sub-sample of firm-quarters with bad news (negative earnings and earnings decrease) and a sub-sample of firms with no bad news. For both sub-samples, the results (not tabulated) are qualitatively similar to those of the full sample.

[Table 4 about here]

To better understand the effect of SOX on CTS, we investigate CTS on a firm-by-firm basis. Running the regression on a firm-by-firm basis allows coefficients to vary across firms, thus capturing firm-specific attributes. We run the following firm-by-firm time-series regressions for the reduced sample, and report average regression coefficients and the associated t-statistics in a manner similar to Fama and MacBeth [1973]:

$$\mathrm{CTS}_{it} = \alpha_{0t} + \alpha_{1t}\mathrm{TIME}_{it} + \alpha_{2t}\mathrm{SCA}_{it} + \alpha_{3t}\mathrm{SOX}_{it} + \text{Control Variables} + \omega_{it} \quad (2)$$

Table 5 presents the distribution of the firm-by-firm regression coefficients for the reduced sample and for the following three sub-samples of the reduced sample: (i) firms with a record for avoiding earnings losses, (ii) firms with a record for avoiding negative changes in earnings, and (iii) firms with a meet-or-beat analyst forecast record. A firm

with a record for avoiding earnings losses is defined as one with at least one instance of loss avoidance; a firm with a record for avoiding negative changes in earnings is defined as one with at least 5% of its observations being cases of earnings decrease avoidance, whereas a firm with a meet-or-beat analyst forecast record is defined as one with at least 5% of its observations being cases of meet-or-beat analyst forecast.[32] Note that for the firms identified in each of the three sub-samples we consider all available observations. We use these sub-samples to check for robustness because they potentially distinguish among firms based on differences in managerial incentives to engage in earnings management.

Results for all samples indicate that the coefficient on SOX is positive and significantly different from zero (at the 0.05 level or higher). Thus, they further support our hypothesis regarding the increase in CTS post-SOX. Together, the results in Table 4 and Table 5 strongly support our assertion that post-SOX firms have increased AC cash management, resulting in camouflaged earnings management.

[Table 5 about here]

5.2 SOX AND THE FORWARD VARIATION OF NORMAL ACCRUALS

Table 6 presents the effect of SOX on the forward variation of normal accruals [FV(NA)] for the full sample and the three earnings targets sub-samples: (i) avoid loss (T1=1), (ii) avoid earnings decrease (T2=1), and (iii) meet-or-beat analyst forecast (T3=1). We estimate the effect of SOX on [FV(NA)] using regression equation (3):

$$FV(NA) = \beta_0 + \beta_1 TIME + \beta_2 SCA + \beta_3 SOX + Control\ Variables + \eta \qquad (3)$$

For all samples (except the avoid-loss sample), the coefficient on SOX is positive and significantly different from zero at the 0.01 level. This result indicates that the forward variation of NA has increased post-SOX, and is consistent with our analytical illustration

[32] The cut-off of the sub-samples is arbitrary. It is used to allow for differentiation between the reduced sample and the corresponding sub-samples while maintaining sufficient number of firms.

where we argue that AC cash management increases the forward variation of NA. These results support our hypothesis that firms have increased their AC cash management post-SOX, resulting in camouflaged earnings management.

[Table 6 about here]

5.3 SOX AND THE FORWARD VARIATION OF DISCRETIONARY ACCRUALS

Our analytical illustration also suggests that camouflaged earnings management through AC cash management is associated with a smaller forward variation of discretionary accruals FV(DA). We investigate the effect of SOX on [FV(DA)] using regression equation (4):

$$\mathrm{FV(DA)} = \gamma_0 + \gamma_1 \mathrm{TIME} + \gamma_2 \mathrm{SCA} + \gamma_3 \mathrm{SOX} + \mathrm{Control\ \ Variables} + \varphi \qquad (4)$$

In Table 7, we present results for the full sample and the three earnings targets sub-samples (avoid loss, avoid earnings decrease, and meet-or-beat analyst forecast). We also test for robustness by considering two additional sub-samples with positive DA and negative DA. According to the Jones model (e.g., Jones [1991] and Dechow et al. [1995]), positive (negative) DA is associated with earnings management activity aimed at inflating (deflating) earnings.

All samples indicate that the coefficient on SOX is negative and significantly different from zero at the 0.01 level. That is, the regression results indicate a lower forward variation of discretionary accruals post-SOX, which is consistent with our assertion regarding higher AC cash management post-SOX.

[Table 7 about here]

The empirical results presented in Tables 4 and 5 for the forward variation ratio of CFO to sales, in Table 6 for the normal accruals forward variation, and in Table 7 for the discretionary accruals forward variation are all in line with and reinforce our hypothesis that earnings management post-SOX was coupled with AC cash management, resulting

in camouflaged earnings management. Also, in line with the analytical illustration, the combined changes in CTS, FV(NA), and FV(DA) cannot arise from real earnings management, increased cash management independent of earnings management, or decreased accrual-based earnings management without a related change in cash management.

6. Concluding Remarks

We argue that cash management that converts accruals into cash often reduces the transparency of possible earnings management. We assert that, in response to increased scrutiny and greater attention to cash versus earnings, firms increase their focus on cash management aimed at aligning cash and accruals with earnings and sales, which results in camouflaged earnings management. The increased scrutiny following the Sarbanes-Oxley Act provides an appealing means of testing our assertion. The empirical results reinforce our assertion that post-SOX firms have increased their AC cash management, resulting in camouflaged earnings management.

We recognize it may be difficult to disentangle the SOX effect from the effects of other economic events that have occurred during the same period.[33] The increased focus on cash management could have been a response to such economic events rather than a response to the increased scrutiny. But irrespective of the motivation behind cash management, our results suggest that increased cash-management activities have (intentionally or unintentionally) camouflaged earnings management.

An immediate implication of our study is that the decrease in accrual-based earnings management post-SOX, identified in prior studies, may have been the result of camouflaged earnings management, rather than the result of an actual decrease in accrual-based earnings management. Methodologically, we introduce new proxies for AC cash

[33] Note the same potential concern applies to Lobo and Zhou [2006], Cohen et al. [2008], Koh et al. [2008], and Bartov and Cohen [2009].

management that result in camouflaged earnings management. Incorporating these proxies in future earnings management research - not just ones specific to SOX- would be prudent, since ignoring the possibility of camouflaged earnings management may amount to omitting an important correlated variable, and thus could affect the analysis and its inferences.

REFERENCES

BARTH M., and D. TAYLOR. "In Defense of Fair Value: Weighing The Evidence on Earnings Management and Asset Securitizations." *Journal of Accounting & Economics* 49 (2010): 26–33.

BARTOV, E., and D. COHEN. "The 'Numbers Game' in the Pre- and Post-Sarbanes-Oxley Eras." *Journal of Accounting, Auditing & Finance* 24 (2009): 505–34.

BEAVER, B.H., M.F. McNICHOLS, and K.K. NELSON. "Management of the Loss Reserve Accrual and the Distribution of Earnings in the Property-Casualty Insurance Industry." *Journal of Accounting and Economics* 35 (2003): 347-76.

BEAVER, B.H., M.F. McNICHOLS, and K.K. NELSON. "An Alternative Interpretation of the Discontinuity in Earnings Distributions." *Review of Accounting Studies* 12 (2007): 525–56.

BENEISH, M.D., C. LEE, and D.C. NICHOLS. "From Fraud detection to Earnings Quality: Can Forensic Accounting Help Predict Stock Returns?" Working Paper, Indiana University, Stanford University, and Syracuse University, 2011.

BURGSTAHLER, D., and I. DICHEV. "Earnings Management to Avoid Earnings Decreases and Losses." *Journal of Accounting & Economics* 24 (1997): 99–136.

CALL, A., S. CHEN, and Y.H. TONG. "Are Analysts' Earnings Forecasts More Accurate when Accompanied by Cash Flow Forecast?" *Review of Accounting Studies* 14 (2009): 358–91.

COHEN, D., and P. ZAROWIN. "Accrual-based and Real Earnings Management Activities around Seasoned Equity Offerings." *Journal of Accounting & Economics* 50 (2010): 2–19.

COHEN, D., A. DEY, and T. LYS. "Real and Accrual-Based Earnings Management in the Pre and Post Sarbanes Oxley periods." *The Accounting Review* 83 (2008): 757–87.

DANIEL, N.D., D. J. DENNIS, and L. NAVEEN. "Do Firms Manage Earnings to Meet Dividend Thresholds?" *Journal of Accounting & Economics* 45 (2008): 2–26.

DECHOW, P.M., and I.D. DICHEV. "The Quality of Accruals and Earnings: The Role of Accrual Estimation Errors." *The Accounting Review* 77 (2002): 35–39.

DECHOW, P.M., W. GE, C.R. LARSON, and R.G. SLOAN. "Predicting Material Accounting Misstatements." *Contemporary Accounting Research* 28 (2011): 1-16.

DECHOW, P.M., W. GE, and C.M. SCHRAND. "Understanding Earnings Quality: A Review of The Proxies, Their Determinants and Their Consequences. *Journal of Accounting and Economics* 50 (2010):344-401.

DECHOW, P.M., A.P. HUTTON, J.H. KIM, and R.G. SLOAN. "Detecting Earnings Management: A New Approach." *Journal of Accounting Research* (2012): 275-334.

DECHOW, P.M., S.P. KOTHARI, and R. WATTS. "The Relation between Earnings and Cash Flows." *Journal of Accounting & Economics* 25 (1998): 133–68.

DECHOW, P.M., L.A., MYERS, and C. SHAKESPEARE. "Fair Value Accounting and Gains from Asset Securitizations: A Convenient Earnings Management Tool with Compensation Side-Benefits." *Journal of Accounting & Economics* 49 (2010): 2–25.

DECHOW, P.M., S. RICHARDSON, and I. TUNA "Why are Earnings Kinky? A Reexamination of the Earnings Management Explanation." *Review of Accounting Studies* 8 (2003): 335–84.

DECHOW, P.M., and C. SHAKESPEARE. "Do Managers Use Securitization Volume and Fair Value Estimates to Hit Earnings Targets?" *The Accounting Review* 84 (2009): 99–132.

DECHOW, P.M., R.G. SLOAN, and A. SWEENY. "Detecting Earnings Management." *The Accounting Review* 70 (1995): 193–225.

DEFOND, M., and M. HUNG. "An Empirical Analysis of Analysts' Cash Flow Forecasts." *Journal of Accounting & Economics* 35 (2003): 73–100.

DURTSCHI, C., and P. EASTON. "Earnings Management? Erroneous Inference Based on Earnings Frequency Distributions." *Journal of Accounting Research* 47 (2009): 1249–81.

DURTSCHI, C., and P. EASTON. "Earnings Management? The Shapes of the Frequency Distributions of Earnings Metrics Are Not Evidence *Ipso Facto*." *Journal of Accounting Research* 43 (2005): 557–92.

DYE, R. "Earnings Management in an Overlapping Generations Model." *Journal of Accounting Research* 26 (1988): 195–235.

FAMA, E. F., and J. MACBETH. "Risk, Return, and Equilibrium: Empirical Tests." *Journal of Political Economy* 81 (1973): 607–36.

FUDENBERG, D., and J. TIROLE. "A Theory of Income and Dividend Smoothing Based on Incumbency Rents." *Journal of Political Economy* 103 (1995): 75–93.

FRANKEL, R.M., H. LEVI, and R. SHALEV. "Managing Reported Operating Cash Flow: An Empirical Investigation of Fourth Quarter Working Capital Decreases." Working Paper, Washington University, 2010.

GORE, P., P.F. POPE, and A.K. SINGH. "Earnings Management and the Distribution of Earnings Relative to Targets: UK Evidence." *Accounting and Business Research* 37 (2007): 123-150.

GIVOLY, D., HAYN, C., and R. LEHAVY. "The Quality of Analysts' Cash Flow Forecasts." *The Accounting Review* 84(2009): 1877-1912.

GRAHAM, J. R., C. R. HARVEY, and S. RAJGOPAL. "The Economic Implications of Corporate Financial Reporting." *Journal of Accounting & Economics* 40 (2005): 3-73.

GUNNY, K. "The Relation Between Earnings Management Using Real Activities Manipulation and Future Performance: Evidence from Meeting Earnings Benchmarks." *Contemporary Accounting Research* 27 (2010): 855-88.

HUANG, A.G. "The Cross Section of Cash Flow Volatility and Expected Stock Returns." *Journal of Empirical Finance* 16 (2009):409–29.

JONES, J.J. "Earnings Management during Import Relief Investigations." *Journal of Accounting Research* 29 (1991): 193–228.

KIRSCHENHEITER, M., and N. MELUMAD. "Can Big Bath and Earnings Smoothing Co-exist as Equilibrium Financial Reporting Strategies?" *Journal of Accounting Research* 40 (2002): 761–96.

KLAPPER, L. "The Role of Factoring for Financing Small and Medium Enterprises." *Journal of Banking & Finance* 30 (2006): 3111-30.

KOH, K., D. MATSUMOTO, and S. RAJGOPAL. "Meeting Analyst Forecast in the Post-Enron World: Early Evidence on Stock Market Rewards and Managerial Actions." *Contemporary Accounting Research* 25 (2008): 1067–98.

KOTHARI, S.P., J.L. LEONE, and C.E. WASLEY. "Performance Matched Discretionary Accrual Measures." *Journal of Accounting & Economics* 39 (2005): 163–97.

LEE, L.F. "Incentives to Inflate Reported Cash from Operations Using Classification and Timing." *The Accounting Review* (2012): 1-33.

LEVI, H. "Accounts Receivable Financing and Information Asymmetry." Working Paper, Baruch College, 2010.

LOBO, G., AND J. ZHOU. "Did Conservatism in Financial Reporting Increase after the Sarbanes-Oxley Act? Initial Evidence." *Accounting Horizons* 20 (2006): 57–74.

McINNIS, J., and D.W. COLLINS. "The Effect of Cash Flow Forecast on Accrual Quality and Benchmark Beating." *Journal of Accounting & Economics* 51 (2011): 219-39.

McNICHOLS., M.F. "Research Design Issues in Earnings Management Studies." *Journal of Accounting & Public Policy* 19 (2000): 313–45.

McNICHOLS., M.F., and G.P. WILSON. "Evidence of Earnings Management From the Provisions For Bad Debts." *Journal of Accounting Research* 26 (1988): 1-31.

MELUMAD N., and D. NISSIM. "Line-Item Analysis of Earnings Quality." *Foundations & Trends in Accounting* 3 (2008): 87–221.

PEASNELL, K.V., P.F. POPE, and S. YOUNG. "Detecting Earnings Management Using Cross-sectional Abnormal Accruals Models." *Accounting and Business Research* 30 (2000): 313-326.

PEASNELL, K.V., P.F. POPE, and S. YOUNG. "Board Monitoring and Earnings Management: Do Outside Directors Influence Abnormal Accruals." *Journal of Business Finance and Accounting* 32 (2005): 1311-1346.

PETERSEN, M. "Estimating Standard Errors in Finance Panel Data Sets: Comparing Approaches." *The Review of Financial Studies* 22 (2009): 435-80

REVSINE, L., D. COLLINS and W.B. JOHNSON. Financial Reporting and Analysis. 3rd ed. Prentice Hall, 2004.

ROYCHOWDHURY, S. "Earnings Management through Real Activities Manipulation." *Journal of Accounting & Economics* 42 (2006): 335–70.

TUCKER, J., and P. ZAROWIN. "Does Income Smoothing Improve Earnings Informativeness?" *The Accounting Review* 81 (2006): 251-70.

ZANG, A. "Evidence on the Tradeoff between Real Manipulation and Accruals Manipulation." *The Accounting Review* (2012): 675-303.

Setting Summary 1.a – Real and transitory sales growth

		Quarter$_i$			
		i=1	**i=2**	**i=3**	**i=4**
1	**Sales**	$S_1+\delta$	S_2	S_3	S_4
2	**ΔSales**	δ	$-\delta$	0	0
3	**NI**	$S_1(1-v) + \delta(1-v) - F$	$S_2(1-v) - F$	$S_3(1-v) - F$	$S_4(1-v) - F$
4	**ΔNI**	$\delta(1-v)$	$-\delta(1-v)$	0	0
5	**Receivables**	$S_{12}+S_{13}+\frac{2}{3}\delta$	$S_{22}+S_{23}$	$S_{32}+S_{33}$	$S_{42}+S_{43}$
6	**ΔReceivables**	$\frac{2}{3}\delta$	$-\frac{2}{3}\delta$	0	0
7	**Inventory**	$S_{21}v$	vS_{31}	vS_{41}	vS_{51}
8	**ΔInventory**	0	0	0	0
9	**Payable**	$(S_{12}+S_{13})v + \frac{2}{3}\delta v$	$(S_{22}+S_{23})v$	$(S_{32}+S_{33})v$	$(S_{42}+S_{43})v$
10	**Δ Payable**	$\frac{2}{3}\delta v$	$-\frac{2}{3}\delta v$	0	0
11	**ACC**	$\frac{2}{3}\delta(1-v)$	$-\frac{2}{3}\delta(1-v)$	0	0
12	**CFO**	$S_1(1-v) + \frac{1}{3}\delta(1-v) - F$	$S_2(1-v) + \frac{2}{3}\delta(1-v) - F$	$S_3(1-v) - F$	$S_4(1-v) - F$
13	**ΔCFO**	$\frac{1}{3}\delta(1-v)$	$\frac{1}{3}\delta(1-v)$	$-\frac{2}{3}\delta(1-v)$	0
14	**NA**	$\gamma+\alpha_2'\frac{1}{3}\delta$	$\gamma-\alpha_2'\frac{1}{3}\delta$	γ	0
15	**DA**	$[\frac{2}{3}(1-v)-\alpha_2'\frac{1}{3}]\delta-\gamma$	$[\frac{2}{3}(1-v)+\alpha_2'\frac{1}{3}]\delta-\gamma$	$-\gamma$	0

Setting Summary 1.b – Real earnings management (sales pull-in)

		Quarter$_i$			
		i=1	**i=2**	**i=3**	**i=4**
1	**Sales**	$S_{11}+S_{12}+(S_{13}+\beta S_{21})$	$(1-\beta)S_{21}+ S_{22}+S_{23}$	$S_{31}+ S_{32}+S_{33}$	$S_{41}+ S_{42}+S_{43}$
2	**ΔSales**	βS_{21}	$-2\beta S_{21}$	βS_{21}	0
3	**NI**	$(S_1+ \beta S_{21})(1-v) - F$	$(S_2- \beta S_{21})(1-v) - F$	$S_3(1-v) - F$	$S_4(1-v) - F$
4	**ΔNI**	$\beta S_{21}(1-v)$	$-2\beta S_{21}(1-v)$	$\beta S_{21}(1-v)$	0
5	**Receivables**	$S_{12}+(S_{13}+\beta S_{21})$	$S_{22}+S_{23}$	$S_{32}+S_{33}$	$S_{42}+S_{43}$
6	**ΔReceivables**	βS_{21}	$- \beta S_{21}$	0	0
7	**Inventory**	$(1-\beta)S_{21}v$	$S_{31}v$	$S_{41}v$	$S_{51}v$
8	**ΔInventory**	$-\beta S_{21}v$	$v\beta S_{21}$	0	0
9	**Payable**	$(S_{12}+S_{13})v$	$v(S_{22}+S_{23})$	$(S_{32}+S_{33})v$	$(S_{42}+S_{43})v$
10	**Δ Payable**	0	0	0	0
11	**ACC**	$\beta S_{21}(1-v)$	$-\beta S_{21}(1-v)$	0	0
12	**CFO**	$S_1(1-v) - F$	$S_2(1-v) - F$	$S_3(1-v) - F$	$S_4(1-v) - F$
13	**ΔCFO**	0	0	0	0
14	**NA**	γ	$\gamma-\alpha_2'\beta S_{21}$	$\gamma+\alpha_2' \beta S_{21}$	0
15	**DA**	$\beta S_{21}(1-v)- \gamma$	$-(1-v-\alpha_2') \beta S_{21}- \gamma$	$- \alpha_2' \beta S_{21}- \gamma$	0

Setting Summary 1.c – Real earnings management (sales pull-in) + factoring

		Quarter$_i$			
		i=1	**i=2**	**i=3**	**i=4**
1	**Sales**	$S_{11}+S_{12}+(S_{13}+\beta S_{21})$	$(1-\beta)S_{21}+ S_{22}+S_{23}$	$S_{31}+ S_{32}+S_{33}$	$S_{41}+ S_{42}+S_{43}$
2	**ΔSales**	βS_{21}	$-2\beta S_{21}$	βS_{21}	0
3	**NI**	$(S_1+ \beta S_{21})(1-v) – F$	$(S_2- \beta S_{21})(1-v) – F$	$S_3(1-v) – F$	$S_4(1-v) – F$
4	**ΔNI**	$\beta S_{21} (1-v)$	$-2\beta S_{21}(1-v)$	$\beta S_{21}(1-v)$	0
5	**Receivables**	$S_{12}+S_{13}+\beta S_{21}- \frac{1}{3} \beta S_{21}(1-v)$	$S_{22}+S_{23}$	$S_{32}+S_{33}$	$S_{42}+S_{43}$
6	**ΔReceivables**	$\beta S_{21} - \frac{1}{3} \beta S_{21}(1-v)$	$-[\beta S_{21} - \frac{1}{3} \beta S_{21}(1-v)]$	0	0
7	**Inventory**	$(1-\beta)S_{21}v$	$S_{31}v$	$S_{41}v$	$S_{51}v$
8	**ΔInventory**	$-\beta S_{21}v$	$\beta S_{21}v$	0	0
9	**Payable**	$(S_{12}+S_{13})v$	$(S_{22}+S_{23})v$	$(S_{32}+S_{33})v$	$(S_{42}+S_{43})v$
10	**Δ Payable**	0	0	0	0
11	**ACC**	$\frac{2}{3} \beta S_{21}(1-v)$	$- \frac{2}{3} \beta S_{21}(1-v)$	0	0
12	**CFO**	$S_1(1-v) – F+ \frac{1}{3} \beta S_{21}(1-v)$	$S_2(1-v) - F- \frac{1}{3} \beta S_{21}(1-v)$	$S_3(1-v) – F$	$S_4(1-v) – F$
13	**ΔCFO**	$\frac{1}{3} \beta S_{21}(1-v)$	$- \frac{2}{3} \beta S_{21}(1-v)$	$\frac{1}{3} \beta S_{21}(1-v)$	0
14	**NA**	$\gamma+\alpha_2' \frac{1}{3} \beta S_{21}(1-v)$	$\gamma- \alpha_2' \beta S_{21}(\frac{4}{3} - \frac{1}{3} v)$	$\gamma+\alpha_2' \beta S_{21}$	γ
15	**DA**	$(\frac{2}{3} - \alpha_2' \frac{1}{3})\beta S_{21}(1-v)- \gamma$	$- \frac{2}{3} [1-v- \alpha_2'(2- \frac{1}{2} v)]\beta S_{21}- \gamma$	$- \alpha_2' \beta S_{21}- \gamma$	$- \gamma$

Setting Summary 3.a – Real and transitory expense decrease

		Quarter$_i$			
		i=1	**i=2**	**i=3**	**i=4**
1	**Sales**	S_1	S_2	S_3	S_4
2	**ΔSales**	0	0	0	0
3	**SG&A**	F - δ	F	F	F
4	**Δ SG&A**	- δ	Δ	0	0
5	**NI**	S_1(1-v)-(F-δ)	S_2(1-v)-F	S_3(1-v)-F	S_4(1-v)-F
6	**ΔNI**	δ	-δ	0	0
7	**ΔReceivables**	0	0	0	0
8	**ΔInventory**	0	0	0	0
9	**ΔPayable**	0	0	0	0
10	**ACC**	0	0	0	0
11	**CFO**	S_1(1-v)-F+δ	S_2(1-v)-F	S_3(1-v)-F	S_4(1-v)-F
12	**ΔCFO**	δ	-δ	0	0
13	**NA**	γ	Γ	γ	γ
14	**DA**	-γ	-γ	-γ	-γ

Setting Summary 3.b – Accrual-based earnings management (decrease provisions)

		Quarter$_i$			
		i=1	**i=2**	**i=3**	**i=4**
1	**Sales**	S_1	S_2	S_3	S_4
2	**ΔSales**	0	0	0	0
3	**SG&A**	F - δ	F +δ	F	F
4	**Δ SG&A**	- δ	2δ	0	0
5	**NI**	S_1(1-v)-(F-δ)	S_2(1-v)-(F+δ)	S_3(1-v)-F	S_4(1-v)-F
6	**ΔNI**	δ	-2δ	δ	0
7	**ΔReceivables**	0	0	0	0
8	**ΔInventory**	0	0	0	0
9	**ΔPayable**	-δ	Δ	0	0
10	**ACC**	δ	-δ	0	0
11	**CFO**	S_1(1-v)-F	S_2(1-v)-F	S_3(1-v)-F	S_4(1-v)-F
12	**ΔCFO**	0	0	0	0
13	**NA**	γ	Γ	γ	γ
14	**DA**	δ- γ	-δ-γ	-γ	-γ

Setting Summary 3.c – Accrual-based earnings management (decrease provisions) + Factoring

		Quarter$_i$			
		i=1	**i=2**	**i=3**	**i=4**
1	**Sales**	S_1	S_2	S_3	S_4
2	**ΔSales**	0	0	0	0
3	**SG&A**	F - δ	F +δ	F	F
4	**Δ SG&A**	- δ	2δ	0	0
5	**NI**	S_1(1-v) - (F-δ)	S_2(1-v)-(F+δ)	S_3(1-v)-F	S_4(1-v)-F
6	**ΔNI**	δ	-2δ	δ	0
7	**ΔReceivables**	-δ	Δ	0	0
8	**ΔInventory**	0	0	0	0
9	**ΔPayable**	-δ	Δ	0	0
10	**ACC**	0	0	0	0
11	**CFO**	S_1(1-v)-F+δ	S_2(1-v)-F-δ	S_3(1-v)-F	S_4(1-v)-F
12	**ΔCFO**	δ	-2δ	δ	0
13	**NA**	α_2'δ+γ	-α_2'δ+γ	γ	γ
14	**DA**	- α_2'δ -γ	α_2'δ –γ	-γ	-γ

TABLE 1

*Sample Selection**

	Full Sample	Reduced Sample
Year	N	N
1989	3,123	601
1990	3,574	757
1991	3,849	840
1992	4,382	904
1993	4,937	1,045
1994	5,545	1,192
1995	6,038	1,227
1996	6,909	1,246
1997	7,535	1,239
1998	7,238	1,255
1999	7,061	1,262
2000	6,841	1,295
2001	6,473	1,356
2002	6,054	1,348
2003	6,590	1,276
2004	7,035	1,260
2005	7,087	1,261
2006	7,240	1,189
2007	7,068	1,125
2008	6,362	1,034
Observations	120,941	22,712
Firms	6,142	350

*Note: The full sample includes all firms with complete financial data available on Compustat with market value of equity over $10 million, minimum share price of $1 at quarter end and a December 31 fiscal year end. We exclude financial institutions (1-digit SIC = 6) and public utilities (2-digit SIC = 49). We also remove the extreme one percent of the observations (on both sides) for each variable. The reduced sample includes firms with sufficient information on Compustat before and after the Sarbanes-Oxley (SOX) Act (at least 25 quarterly observations before June 30, 2001, four quarterly observations between July 1, 2001 and June 30, 2002 and at least 13 quarterly observations after July 1, 2002).

TABLE 2

*Descriptive Statistics**

Panel A: Full Sample

Variable	N	Mean	Std Dev	25th Pctl	Median	75th Pctl
CFO	120,941	43.46	144.94	-0.11	4.30	25.64
Sales	120,941	352.44	940.27	16.13	60.01	242.58
FCV(CFO)	120,941	1.47	2.37	0.38	0.75	1.56
FCV(Sales)	120,941	0.13	0.13	0.05	0.09	0.16
CTS	120,941	16.35	18.72	4.12	9.27	20.73
DA	56,924	0.00	0.03	-0.02	0.00	0.02
ABS(DA)	56,924	0.02	0.02	0.01	0.02	0.03
FV(NA)	56.924	1.50	2.18	0.47	0.85	1.54
FV(DA)	56,924	0.03	0.02	0.01	0.02	0.04
IB	120,941	19.69	82.97	-0.43	1.93	11.57
ACC	120,941	-0.02	0.03	-0.03	-0.01	-0.00
BM	120,941	0.60	0.52	0.28	0.47	0.75
LMV	121,057	5.78	1.81	4.39	5.67	7.01
T1	120,941	0.04	0.20	0.00	0.00	0.00
T2	110,037	0.12	0.34	0.00	0.00	0.00
T3	71,433	0.22	0.41	0.00	0.00	0.00

Panel B: Reduced Sample

Variable	N	Mean	Std Dev	25th Pctl	Median	75th Pctl
CFO	22,712	64.44	150.94	2.53	14.89	58.68
Sales	22,712	532.42	1,005.47	55.14	175.98	523.74
FCV(CFO)	22,712	1.14	1.78	0.35	0.63	1.21
FCV(Sales)	22,712	0.10	0.10	0.04	0.07	0.12
CTS	22,712	15.92	17.36	4.74	9.68	20.05
IB	22,712	33.41	87.05	1.56	7.74	29.70
ACC	22,712	-0.01	0.02	-0.02	-0.01	-0.00
BM	22,712	0.56	0.41	0.31	0.47	0.69
LMV	22,712	6.51	1.75	5.24	6.53	7.81
T1	22,712	0.03	0.18	0.00	0.00	0.00
T2	20,982	0.18	0.39	0.00	0.00	0.00
T3	12,422	0.25	0.43	0.00	0.00	0.00

*Notes:

1. The table presents descriptive statistics for the full sample (Panel A) and the reduced sample (Panel B).

2. Definitions of variables:

- CFO – cash from operating activities
- Sales – sales (net)
- FCV(CFO) – three-quarter forward coefficient of variation (CV) of CFO;
  FCV(CFO)=FSTD(CFO)/Absolute[FMean(CFO)];
  $FSTD(CFO)_t=STD(CFO_t,CFO_{t+1},CFO_{t+2})$;
  $FMean(CFO)_t=Mean\ (CFO_t,CFO_{t+1,}CFO_{t+2})$
- FCV(Sales) – three-quarter forward coefficient of variation (CV) of sales; measured similarly to FCV(CFO)
- CTS – three-quarter forward variation ratio of cash-to-sales, measured as FCV(CFO) divided by FCV(sales)
- DA – discretionary accruals, using the cross-sectional modified Jones model
- ABS (DA) – DA in absolute terms
- FV(NA) – three-quarter forward variation of normal accruals (NA); NA measured using the cross-sectional modified Jones model; FV(NA) measured as the forward coefficient of variation of NA;
  $FV(NA)_t=STD(NA_t,NA_{t+1},NA_{t+2})/Absolute[Mean(NA,NA_{+1,}NA_{+2})]$
- FV(DA) – three-quarter forward variation of discretionary accruals (DA), $FV(DA)_t$ measured as $STD(DA_t, DA_{t+1},DA_{t+2})$
- IB – three-quarter forward mean income before extraordinary items (IBXI); $IB_t=Mean\ (IBXI_{t,}IBXI_{t+1},IBXI_{t+2})$
- ACC – three-quarter forward mean of accruals to total assets; $ACC_t=$ $Mean(Accruals_t/Total\ Assets_{t-1,}Accruals_{t+1}/Total\ Assets_t,Accruals_{t+2}/Total\ Assets_{t+1})$
- BM – three-quarter forward mean book-to-market ratio; BM_t = Mean (book-to-$market_{t,}$ book-to-market $_{t+1}$, book-to-market $_{t+2}$)
- LMV – log of market value of common equity at quarter end
- T1 – a dummy variable that equals 1 if quarterly earnings deflated by market capitalization of shareholders equity at prior quarter end is in the interval [0, 0.0025], and 0 otherwise
- T2 – a dummy variable that equals 1 if the change in quarterly earnings deflated by market capitalization of shareholders equity at prior quarter end is in the interval [0, 0.0025], and 0 otherwise
- T3 – a dummy variable that equals 1 if the difference between actual earnings per share and consensus analyst forecast is in the interval [0, 0.01], and 0 otherwise.

3. See Table 1 for sample selection.

TABLE 3

*Correlations**

		1	2	3	4	5	6	7	8	9	10	11
1.	CFO		0.75	-0.10	-0.09	-0.08	-0.04	0.69	-0.07	0.52	-0.05	-0.13
2.	Sales	0.68		-0.08	-0.11	-0.03	0.02	0.62	-0.05	0.56	-0.02	-0.14
3.	FCV(CFO)	-0.35	-0.13		0.26	0.54	0.14	-0.08	0.08	-0.18	0.08	0.20
4.	FCV(Sales)	-0.29	-0.30	0.27		-0.27	-0.01	-0.08	0.00	-0.17	0.09	0.21
5.	CTS	-0.11	0.10	0.68	-0.47		0.15	-0.06	0.10	-0.12	0.03	0.09
6.	ACC	-0.21	0.01	0.25	0.03	0.22		0.07	-0.07	0.01	0.17	-0.09
7.	IB	0.63	0.67	-0.23	-0.26	-0.02	0.15		-0.11	0.43	-0.01	-0.15
8.	BM	-0.05	0.05	0.16	-0.03	0.15	-0.05	-0.15		-0.31	-0.00	-0.03
9.	LMV	0.62	0.78	-0.28	-0.20	-0.10	0.01	0.63	-0.32		-0.11	-0.27
10.	FV(NA)	-0.20	-0.10	0.25	0.12	0.13	0.28	-0.06	-0.01	-0.16		0.12
11.	FV(DA)	-0.29	-0.27	0.44	0.22	0.22	-0.03	-0.28	-0.05	-0.29	0.20	

*Note: The table presents average quarterly Pearson (above diagonal) and Spearman (below diagonal) correlations. See Table 2 for definition of variables.

TABLE 4

*SOX and the Cash-to-sales Forward Variation Ratio (CTS)**

Sample	Time	SCA	SOX	Adj-R^2 N
Full sample	-2.43*** -5.26	-82.10*** -3.09	96.97*** 4.58	0.06 120,941
Reduced sample	-2.65*** -2.77	-144.42*** -2.77	214.76*** 4.89	0.10 22,712
Avoid loss (T1=1)	-7.04*** -3.38	3.81 0.04	270.81*** 3.03	0.07 4,920
Avoid earnings decrease (T2=1)	-4.15*** -6.12	-75.37* -1.76	81.07*** 2.57	0.10 12,984
Meet-or-beat analyst forecast (T3=1)	0.02 1.62	-78.32 -1.20	-66.18 -1.19	0.07 15,581

*Notes:

1. The table presents results of estimating the effect of SOX on the three-quarter cash-to-sales forward variation ratio for the full sample, the reduced sample, and three earnings targets sub-samples. It presents coefficients and associated t-statistics for Equation 1:

$$CTS = \alpha_0 + \alpha_1 TIME + \alpha_2 SCA + \alpha_3 SOX + \text{Control Variables} + \varepsilon \quad (1)$$

2. Definitions of variables:

- TIME – a trend variable equal to the difference between the current year quarter and the first quarter of 1989
- SCA – a dummy variable that equals 1 if the observation falls within the third quarter of 2001 through the second quarter of 2002, and zero otherwise
- SOX – a dummy variable that equals 1 if the observation is after the end of the second quarter of 2002, and zero otherwise.

3. Control variables include: IB, ACC, BM, LMV, mean capital expenditures divided by total assets, industry-specific effects and quarter-specific effects.

4. See Table 1 for sample selection and Table 2 for the definitions of other variables.

5. Coefficient estimates are multiplied by 100.

6. *, **, *** denote significance at the 0.10, 0.05 and 0.01 levels, respectively.

TABLE 5

*SOX and CTS - firm-by-firm analysis******

Sample	Variable	Mean	t-value	Median	Std Dev
	Time	2.93	0.97	2.85	56.48
Reduced sample	SCA	-134.52**	-1.97	-92.23	1,274.86
(350 firms)	SOX	211.76***	2.71	174.07	1,460.07
	Adj-R^2	0.23	27.68	0.22	0.15
	Time	0.87	0.24	2.42	57.13
Firms with avoid loss record	SCA	-108.61	-1.35	-117.65	1,267.57
(250 firms)	SOX	271.43***	2.85	188.33	1,508.05
	Adj-R^2	0.22	23.47	0.22	0.15
	Time	2.59	0.75	2.66	59.32
Firms with avoid earnings decrease record	SCA	-130.39*	-1.87	-63.15	1,195.11
(294 firms)	SOX	200.52**	2.35	121.52	1,463.34
	Adj-R^2	0.24	25.02	0.23	0.16
	Time	2.46	0.50	7.77	70.51
Firms with meet-or-beat analyst forecast record	SCA	-181.56**	-2.39	-60.39	1,076.42
(201 firms)	SOX	193.19**	1.95	200.41	1,405.96
	Adj-R^2	0.25	21.54	0.25	0.17

*Notes:

1. The table presents the distribution of coefficients for firm-by-firm regressions in estimating the effect of SOX on the three-quarter cash-to-sales forward variation ratio (CTS). The first sample is the reduced sample. The second sample includes all available information for firms with a loss avoidance record, the third sample includes all available information for firms with an earnings decrease avoidance record, and the fourth sample includes all available information for firms with a meeting or beating analyst forecast record. A firm with a record for avoiding earnings losses is defined as one with at least one instance of loss avoidance; a firm with a record for avoiding negative changes in earnings is defined as one with at least 5% of its observations being cases of earnings decrease avoidance, whereas a firm with a meet-or-beat analyst forecast record is defined as one with at least 5% of its observations being cases of meet-or-beat analyst forecast. The sample includes firms with sufficient information on Compustat before and after the Sarbanes-Oxley (SOX) Act. The model is:

$$CTS_{it} = \alpha_{0t} + \alpha_{1t} TIME_{it} + \alpha_{2t} SCA_{it} + \alpha_{3t} SOX_{it} + \text{Control Variables} + \omega_{it} \qquad (2)$$

2. Definitions of variables:

- TIME – a trend variable equal to the difference between the current year quarter and the first quarter of 1989
- SCA – a dummy variable that equals of 1 if the observation falls within the third quarter of 2001 through the second quarter of 2002, and zero otherwise
- SOX – a dummy variable that equals 1 if the observation is after the end of the second quarter of 2002, and zero otherwise.

3. Control variables include: IB, ACC, BM, LMV, mean capital expenditures divided by total assets, and quarter-specific effects.

4. See Table 1 for sample selection and Table 2 for the definitions of other variables.

5. Coefficient estimates are multiplied by 100.

6. *, **, *** denote significance at the 0.10, 0.05 and 0.01 levels, respectively.

TABLE 6

*SOX and the Forward Variation of Normal Accruals (NA)**

Sample	Time	SCA	SOX	Adj-R^2 N
Full Sample	-0.30*** -3.91	-31.93*** -6.21	17.30*** 4.82	0.09 56,924
Avoid loss (T1=1)	0.38 0.96	-45.07** -2.16	1.13 0.06	0.10 2,308
Avoid earnings decrease (T2=1)	-0.53*** -2.75	-25.07* -1.71	25.94*** 2.83	0.09 7,347
Meet-or-beat analyst forecast (T3=1)	-1.00*** 2.99	-9.24 -0.74	32.12*** 2.76	0.08 6,583

*Notes:

1. The table presents results of estimating the effect of SOX on the three-quarter forward variation of normal accruals [FV(NA)] for the full sample and various earnings targets sub-samples. It presents coefficients and associated t-statistics for Equation 3:

$$FV(NA) = \beta_0 + \beta_1 TIME + \beta_2 SCA + \beta_3 SOX + \text{Control Variables} + \eta \quad (3)$$

2. Definitions of variables:

- TIME – a trend variable equal to the difference between the current year quarter and the first quarter of 1989
- SCA – a dummy variable that equals1 if the observation falls within the third quarter of 2001 through the second quarter of 2002, and zero otherwise
- SOX – a dummy variable that equals 1 if the observation is after the end of the second quarter of 2002, and zero otherwise.

3. Control variables include: FCV(CFO), FCV(sales), IB, ACC, BM, LMV, mean capital expenditures divided by total assets.

4. See Table 1 for sample selection and Table 2 for the definitions of other variables.

5. Coefficient estimates are multiplied by 100.

6. *, **, *** denote significance at the 0.10, 0.05 and 0.01 levels, respectively.

TABLE 7

*SOX and the Forward Variation of Discretionary Accruals (DA)**

Sample	Time	SCA	SOX	Adj-R^2 N
Full Sample	0.01*** 17.82	-0.49*** -10.27	-0.65*** -19.59	0.18 56,924
Avoid loss (T1=1)	0.01*** 2.30	-0.50** -2.53	-0.67*** -3.95	0.19 2,308
Avoid earnings decrease (T2=1)	0.01*** 6.04	-0.27** -1.95	-0.62*** -7.25	0.18 7,347
Meet-or-beat analyst forecast (T3=1)	0.00 1.25	-0.14 -1.36	-0.46*** -4.09	0.16 6,583
Positive discretionary accruals (DA>0)	0.01*** 11.81	-0.53*** -7.78	-0.59*** -12.85	0.19 28,903
Negative discretionary accruals (DA < 0)	0.01*** 14.15	-0.50*** -7.37	-0.75*** -15.60	0.19 28,021

*Notes:

1. The table presents results of estimating the effect of SOX on the three-quarter forward variation of discretionary accruals [FV(DA)] for the full sample and various earnings targets sub-samples. It presents coefficients and associated t-statistics for Equation 4:

$$FV(DA) = \gamma_0 + \gamma_1 TIME + \gamma_2 SCA + \gamma_3 SOX + Control\ Variables + \varphi \quad (4)$$

2. Definitions of variables:

- TIME – a trend variable equal to the difference between the current year quarter and the first quarter of 1989
- SCA – a dummy variable that equals 1 if the observation falls within the third quarter of 2001 through the second quarter of 2002, and zero otherwise
- SOX – a dummy variable that equals 1 if the observation is after the end of the second quarter of 2002, and zero otherwise.

3. Control variables includes: FCV(CFO), FCV(sales), IB, ACC, BM, LMV, mean capital expenditures divided by total assets.

4. See Table 1 for sample selection and Table 2 for the definitions of other variables.

5. Coefficient estimates are multiplied by 100.

6. *, **, *** denote significance at the 0.10, 0.05 and 0.01 levels, respectively.