EARNINGS MANAGEMENT
AND SECURITIES LITIGATION

A DISSERTATION

SUBMITTED TO THE GRADUATE SCHOOL OF BUSINESS

AND THE COMMITTEE ON GRADUATE STUDIES

OF STANFORD UNIVERSITY

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

Yvonne Yunfang Lu

May 2004

UMI Number: 3128426

I certify that I have read this dissertation and that in my opinion it is fully adequate, in scope and quality, as dissertation for the degree of Doctor of Philosophy.

William H. Beaver
(Principal Advisor)

I certify that I have read this dissertation and that in my opinion it is fully adequate, in scope and quality, as dissertation for the degree of Doctor of Philosophy.

Maureen F. McNichols

I certify that I have read this dissertation and that in my opinion it is fully adequate, in scope and quality, as dissertation for the degree of Doctor of Philosophy.

Karen K. Nelson

Approved for the University Committee on Graduate Studies

Abstract

This thesis examines the relation between earnings management and class action securities litigation. Using a database that covers virtually all class action securities lawsuits filed in federal courts from 1988 to 2000, the study finds strong evidence of earnings management by firms sued by shareholders for securities fraud. Specifically, accruals and revenue growth are abnormally high for these firms during alleged periods of manipulation, and tend to reverse subsequently. Moreover, the magnitude of accruals overstatement is the greatest for defendant firms subject to SEC accounting and auditing enforcement actions or having made accounting restatements, and least for defendant firms not facing any accounting allegation. Further, earnings management is found to have significant explanatory power for investors' loss of wealth upon corrective disclosure, as well as incidence of accounting-related allegations and lawsuit settlement amounts. Finally, employing a matched sample of sued and non-sued firms, the study examines the joint determination of firms' litigation risk and earnings management behavior. The analysis using a simultaneous-equations approach suggests that controlling for other factors, (1) securities litigation risk acts as an incentive for, rather than a deterrence against firms' earnings management using positive accruals; (2) firms' income-increasing earnings management does not increase the probability of getting sued by shareholders for securities fraud.

This study makes several contributions to the literature of earnings management in general, and revenue and accruals management in the securities litigation setting in particular. First, the thesis improves the methodology of measuring earnings management, by developing an alternative model of discretionary accruals using an

instrumental variable approach. Conceptually, this model overcomes the errors-in-variable problem present in widely-used accruals expectation models. Empirically, this model represents an improvement over existing models in terms of both specification and power in earnings management tests. The model also provides a measure of revenue management. Second, by documenting strong evidence of earnings management by a large sample of defendant firms, and a significant relation between earnings management and (1) shareholder damage, (2) existence of accounting allegations, and (3) lawsuit settlement amounts, this study has important implications for assessing merits of private securities litigation. Finally, the research is the first academic study to examine the joint determination of firms' earnings management behavior and securities litigation risk. The finding adds to the literature about incentives for earnings management as well as the literature about the disciplinary role of private securities litigation on accounting fraud.

Acknowledgments

Many people played important roles in my life, and it is impossible to mention them all by name here. However, I would like to especially thank a few who had the greatest influence over my academic experience, and particularly, the development of this thesis.

I am tremendously indebted to Bill Beaver, chair of my thesis committee, without whom this thesis will not be possible. Bill is the kind of mentor that many an aspiring Ph.D. candidate could only dream of. As a prominent scholar universally revered in the field, he has a wealth of knowledge, experience and insights, and he is always ready to freely offer his help and advice to me. I think my fear of disappointing Bill will be a constant propellant for me to try my best to succeed. I am deeply grateful to my thesis committee members, Maureen McNichols and Karen Nelson, who both contributed greatly to the thesis by offering feedback, suggestion and discussion. I also learned a great deal about conducting empirical research from doing research assistant work for both of them, as well as Bill.

Other accounting faculty members also played an important role in the development of this thesis, through PhD courses, workshops, and their helpful comments and suggestions during my workshop presentations. Special thanks go to Mohan Venkatachalam, Ron Kasznik, Mary Barth, and George Foster.

I also want to take the opportunity to thank my fellow Ph.D. students at Stanford for making my years at Stanford so much more enjoyable. Included among these are Susan Cohen and Liz Demers, who offered support and encouragement during my first two years in the doctoral program; Kenton Yee, who offered constant moral support, and freely dispensed his take on succeeding in academic accounting with a wry sense of humor; Kazbi Kothavala, with whom I huddle and commiserate about the challenges in the doctoral program; also my wonderful officemates over the years: Cheryl Druehl, Eric Wang and Yulin Long; and finally Xiaowei Li and Shujing Li, who offered me friendship and help with econometrics.

My deepest gratitude goes to my family. I want to thank my parents for their unconditional and steadfast love. Without their blessing and moral support, I couldn't have left China and come to the U.S. to pursue my dream. I want to thank my grandmother, who never had the opportunity of education but nevertheless is the wisest woman I know. She has taught me to be strong and smile in the face of adversity. And how can I not mention my brother, Luke, who has always been there for me, and who has shown me that the best way to be good at something is to live it and breathe it and love it. I am deeply grateful to my husband and best friend, Kehong. Words can not describe my gratitude to him. Without his continued understanding, help, support, and love, my doctoral study and this thesis could not have been undertaken, much less completed. Finally, I would like to thank Mingming, our lovely daughter, for bringing Kehong and me so much joy in the last three years of our life at Stanford. She is a constant reminder that the world is full of new and exciting things waiting to be explored and experienced.

I dedicate this thesis to Peiquan Lu, my father, who taught me to always reach higher than I thought I possibly could.

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1 Introduction

1.1 Background and Summary

Recent high-profile debacles such as Enron and WorldCom have contributed to the public impression that accounting fraud is rampant in Corporate America. Upon revelation of accounting scandals, class action securities lawsuits almost always ensue. There has been a fierce debate over whether there's too much shareholder litigation. On one side of the debate are plaintiffs' lawyers, who contend that securities fraud is rampant in U.S. companies, and that private securities litigation is essential to protect investors and police companies. Due to the recent explosion of accounting fiascos and investors' concern that the government is not taking a strong enough role in deterring corporate corruption, the American public is increasingly taking this view. On the other side of the debate, critics of the private securities litigation contend that plaintiffs' attorneys have abused the legal system and filed "strike suits" to coerce settlements from companies. Given this controversy, especially in the epidemic of accounting frauds, it is important to examine the effectiveness of private securities litigation in targeting earnings manipulators.

In this thesis, I address the following questions: (1) Have firms sued by shareholders for securities fraud indeed engaged in earnings manipulation consistent with plaintiffs' complaints? (2) How does earnings management affect the likelihood of shareholder litigation? (3) Does earnings management by defendant firms partly explain investors' loss of wealth? (4) Does earnings management have any effect on lawsuit settlement amounts? (5) Is the existence of plaintiffs' allegations of accounting improprieties related to measures of earnings management? (6) How does litigation risk affect firm's earnings management behavior? While several previous studies have addressed some of these questions, the evidence is inconclusive. This paper aims to further study these questions and provide a deeper understanding of the relation between earnings management and shareholder lawsuits.

My investigation starts by examining whether firms sued by shareholders for GAAP violations have manipulated earnings. The empirical results reject the null hypothesis that defendant companies of securities litigations do not overstate earnings. The sample consists of 781 firms sued by shareholders for securities fraud during the period 1988-2000. My data source is the Class Action Securities Litigation Database provided by Woodruff-Sawyer & Co., which covers class action securities lawsuits since 1980, including virtually the entire population of federal shareholder lawsuits filed from 1988 to 2000. Compared with a control sample matched by earnings performance, defendant companies display positive and higher discretionary accruals during alleged manipulation periods. Defendant firms also undergo a sharp decline in abnormal accruals immediately after the class period. In short, evidence appears to be consistent with the notion that defendant firms overstate earnings using abnormal accruals and such accruals reverse subsequently.

The analysis of earnings management depends critically on proxies for abnormal accruals. Because revenue manipulation is frequently alleged to be used by defendant firms, it is problematic to apply the widely-used Jones (1991) model, which uses the changes in revenue as the most important determinant of nondiscretionary current accruals. To mitigate this errors-in-variable problem, Dechow et al. (1995), hereafter DSS (1995), propose a modification to the Jones (1991) model: instead of total change in revenue, change in cash sales (change in revenue less change in accounts receivable) is used as a determinant of expected accruals. The widely-used Modified Jones model proposed by DSS (1995) is still problematic because cash sales are not free of manipulation, and changes in receivables are not always discretionary.

Given a lack of suitable abnormal accruals model for studying earnings management in the litigation setting, I propose an accrual expectation model based on an instrumental variable (IV) method. My proposed model decomposes change in revenue into normal and abnormal components, thus providing a measure of revenue management. Because I determine expected accruals based on expected change in revenue, my IV model conceptually overcomes the errors-in-variable problem present in the Jones (1991) model.

I compare specification and power of my proposed model with extant models. Simulation shows that the proposed model is in general better specified than other frequently used discretionary accruals models when applied to random samples of firm periods. The proposed model also does not over-reject null hypothesis of no earnings management when applied to samples of firms with increasing or decreasing return on assets[1]. To compare the power of the models, I first apply the discretionary models to a sample of firm-quarters with artificially-injected positive earnings management. I find that my proposed discretionary accruals exhibit the highest power in detecting earnings management. Next, the competing models are applied to a sample of firms sued by shareholders for securities frauds who also have restated their financials or are subject to SEC accounting and auditing enforcement actions. Tests on this sample also show that the proposed IV model of current accruals has the most power in detecting earnings management. In short, the proposed IV model of discretionary accruals represents an

[1] Although firm performance may be correlated with some variables that cause earnings management, firm performance itself does not cause earnings management. In this test, samples are formed by randomly selecting firm-periods with increasing or decreasing return on assets. Since the partitioning variable (firm performance) does not cause earnings management, any rejection of the null hypothesis of no earnings management represents type I error.

improvement over extant models in detecting earnings management in terms of both specification and power.

The thesis proceeds to examine defendant firms' earnings management behavior during and around alleged manipulation periods, using abnormal accruals and abnormal change in revenue estimated from my proposed model as proxies for earnings management. In general, abnormal accruals and abnormal change in revenue exhibit a pattern of gradually increasing as the alleged period of manipulation approaches, and sharply reversing after the end of the manipulation period.

If levels of abnormal accruals and abnormal change in revenue capture the magnitude of earnings manipulation by defendant firms, we would expect the incidence of securities fraud litigation to be positively related to these measures. Multivariate logistic regressions on a matching sample of sued and not-sued firms suggest that firms are indeed more likely to be sued if they have high abnormal accruals and abnormal change in revenue. Furthermore, if investors are misled by this kind of earnings management, we would expect the loss of shareholder wealth upon corrective disclosure to be greater for firms with higher abnormal accruals and abnormal change in revenue during alleged period of manipulation. Using the three-day (day -1 to +1) market-adjusted returns surrounding the end of class period as a proxy for shareholder loss at the time of corrective disclosure, I demonstrate that shareholder loss is indeed positively related to abnormal current accruals, but is not significantly related to abnormal change in revenue during alleged manipulation period[2].

Furthermore, if higher abnormal accruals and abnormal change in revenue increase the likelihood of proving accounting fraud, they should be positively related to

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[2] Possible reasons for not finding significant relation between abnormal change in revenue and shareholder loss include the following. First, as a proxy for revenue management, abnormal change in revenue contains too much measurement error. Second, revenue management may be more transparent compared with accruals management and therefore have not misled the market.

incidence of accounting allegations and lawsuit settlement amounts. My empirical results support these hypotheses.

The finding that income-increasing earnings management is positively associated with firms' securities litigation risk makes intuitive sense but is also puzzling. At first glance, it is not surprising, because to the extent of violating GAAP, earnings management also violates securities laws, and hence is subject higher probability of shareholder lawsuits. However, it is at the same time puzzling given the finding of an influential paper by Kasznik (1999). Kasznik finds that motivated by concerns about securities litigation, firms manage earnings up toward management voluntary earnings forecast. If earnings management obviously increases litigation risk, then why would a rational manager engage in earnings management with the hope of reducing litigation risk? As such, it is far from obvious that earnings management should increase a firm's chance of being sued by its shareholders. In fact, because only about half of all securities lawsuits involve some allegations about accounting violation, but almost all are triggered by a precipitous drop in stock prices, managers may have an incentive to use earnings management to delay bad news and avoid a sudden drop in stock price. Although earnings management using accruals will eventually be reversed, if firms can make up for the accrual reversal with unusually good future performance, then such earnings management may never be detected. Therefore, it may be a rational strategy for firms to use earnings management to reduce litigation risk. However, it is an empirical question whether earnings management can really reduce litigation risk. These arguments suggest that earnings management and litigation risk are both endogenous, and therefore better studied using a simultaneous equations framework. Prior studies on the relation between earnings management and litigation risk have not considered this simultaneous relation between the two variables, and hence, the results from these studies may be subject to simultaneity bias. In chapter 4 of this thesis, I use a two-stage simultaneous equations approach to control for the endogeneity of both variables. My empirical results suggest that firms with higher litigation risk are likely to engage in larger amount of income-increasing earnings management. Further, after controlling for the simultaneity bias, I find that earnings management does not lead to higher probability of firm being sued by shareholders. This calls into question the previous finding that earnings management increases litigation risk. In short, although there is clear evidence that on average defendant firms of class action securities litigation have manipulated earnings upward using positive accruals, earnings management does not increase securities litigation risk.

1.2 Contribution

This study makes several contributions to the literature of earnings management in general, and revenue and accruals management in the securities fraud litigation setting in particular. First, I develop an alternative model of discretionary accruals that presents a conceptual improvement over extant models. In particular, by using an instrumental variable approach, my model mitigates the errors-in-variable problem present in commonly used models. Second, I develop a revenue expectation model to measure revenue management. To my knowledge, this represents the first attempt in the academic literature to use a regression-based approach to partition revenue into normal components that are due to firms' operation and economic environment, and abnormal components that are due to management discretion. Third, to my knowledge, this paper employs the largest sample of firms sued for securities fraud in the accounting literature, and provides strong evidence of revenue and accruals manipulation by such firms. Furthermore, having obtained indicator variables for SEC enforcement actions, accounting restatements, and accounting allegations, I am able to draw statistical inferences on earnings management by subgroups of defendant firms. Fourth, by documenting the relation between measures of earnings management and (1) incidence of lawsuit filing, (2) loss of shareholder wealth upon corrective disclosures, (3) allegations of accounting improprieties, and (4) lawsuit settlement amounts, my study has potential implications for assessing litigation risk and merits of private securities litigation. Finally, to my knowledge, this paper is the first academic study to examine the joint determination of firms' earnings management behavior and securities litigation risk. I find that controlling for other factors, litigation risk has the effect of increasing, rather than deterring, firms' income-increasing earnings management. This finding adds to the literature about incentives for earnings management as well as the literature about the disciplinary role of private securities litigation on accounting frauds.

2 Detecting Earnings Management

2.1 Introduction

A major objective of this thesis is to examine evidence of earnings management by defendant firms. The measure of earnings management is therefore a key research design choice. Earnings management studies often use discretionary accruals estimated from regression-based expected accruals models as proxies for earnings management. An effective model of discretionary accruals should generate tests of earnings management with both low type I error and low type II error. In an influential paper examining the power and specification of widely-used discretionary accruals models, Dechow et al. (hereafter DSS, 1995, p. 193) finds that "the models all generate tests of low power for earnings management of economically plausible magnitudes (e.g., one to five percent of total assets)," and "all models reject the null hypothesis of no earnings management at rates exceeding the specified test-levels when applied to samples of firms with extreme financial performance." This deficiency in power and specification thus makes it difficult to interpret tests of earnings management based on commonly-used discretionary accruals models.

When studying earnings management in the case of securities litigation, the following two characteristics of defendant firms are worthy of special caution. First, defendant firms are frequently alleged to have manipulated revenue. However, the widely-used Jones (1991) model uses change in revenue as the determinant of nondiscretionary current accruals. In other words, this model assumes that sales revenue is unmanaged. Because of this assumption, the Jones (1991) model may fail to reject the null hypothesis that there is no earnings management when defendant firms manage earnings by manipulating sales revenue. Recognizing that revenue can be manipulated, DSS (1995) proposes a modification to the Jones (1991) model: change in cash sales (change in revenue less change in accounts receivable), rather than total revenue, is used as a determinant of nondiscretionary accruals. As will be shown shortly, this modification may introduce specification problem, because change in receivables is not always discretionary. For example, when a firm experiences legitimate growth in credit sales, the DSS' (1995) modified Jones model may falsely reject the null hypothesis of no earnings management. The second noteworthy point in testing earnings management by defendant firm is the following: there is a possible link between the occurrence of securities litigation and firms' financial performance. Some evidence indicates that managers conceal bad news from the market prior to shareholder litigation (see Arlen and Carney, 1992). As pointed out by McNichols (2000, pp. 322), several studies (e.g., DSS 1995, pp. 205–209) and Kasznik (1999, pp. 67–69)) conclude that discretionary accruals estimated from commonly-used accruals expectation models are correlated with firms' earnings performance. Because of this correlated-omitted-variable problem, tests of earnings management by defendant firms using commonly-used discretionary accruals models may suffer from specification problem.

Given the lack of a suitable discretionary accruals model to study earnings management by defendant firms of securities litigation, the objective of this chapter is to develop a discretionary-accrual model that is both well-specified and powerful. In particular, because revenue manipulation is frequently alleged in securities litigation, a model using change in revenue as a determinant of nondiscretionary accrual would have the error-in-variables (EIV) problem. To mitigate this EIV problem, I develop a revenue expectation model, which provides an estimate of unmanaged change in revenue. The estimated unmanaged change in revenue is then used as a determinant for nondiscretionary accruals in my accruals expectation model.

2.2 Related Prior Research on Measuring Earnings Management

Empirical studies of earnings management usually depend critically on a proxy for management discretion. Despite a huge body of literature documenting evidence of earnings management in many circumstances, interpretations of the evidence are controversial because of the problems found in those earnings management proxies (see review articles by Schipper (1989), Healy and Wahlen (1999), Dechow and Skinner (2000), and McNichols (2000).

As reviewed by McNichols (2000), there are two approaches to proxy for management discretion in accruals: the aggregate accruals approach and the specific accrual approach. Her analysis points out that models of aggregate accruals have severe problems of correlated omitted variables and low power. In particular, the most commonly used Jones (1991) type models are found to be correlated with performance and growth. Therefore, interpretations will be difficult for studies using these models and with partitioning variables correlated with performance and growth, such as lawsuits and equity offerings.

An alternative is to use the specific accruals approach. Studies adopting this approach develop estimates of the discretionary portion of specific accounts, such as bad debt allowance (e.g., McNichols and Wilson, 1988), loan loss provisions for banks (e.g., Beaver and Engel, 1996) and loss reserves for property casualty insurers (e.g., Beaver and McNichols, 1998). McNichols (2000) suggests that this approach has the following advantages. First, one can exploit knowledge about GAAP and the specific industry setting to better identify key factors that proxy for the nondiscretionary portion of the accrual. Second, the researcher can directly model the relation between the single accrual and its explanatory factors. This avoids measurement errors caused by forcing different accruals to relate to explanatory factors in the same way, a common problem in the aggregate accruals approach. However, the specific accrual approach also has its disadvantages. If it is not clear that managers use the specific accruals to manage earnings, then earnings management tests using this approach will have low power. Further, one single accrual usually captures only part of managers' discretion, and therefore does not provide evidence on the magnitude of earnings management. These disadvantages may be alleviated to some extent if researchers model a number of specific accruals instead of a single account. Close to this approach in spirit, Beneish (1997) develops a model to identify earnings management, based on factors including a number of financial statement ratios. Several of these ratios are based on specific accruals such as accounts receivables, inventory and accounts payable. Testing on a sample of firms identified by the SEC as GAAP violators, Beneish documents that his model outperforms extant discretionary accrual models in detecting earnings management. However, the Beneish model does not purport to measure discretionary accruals. Rather, his model estimates the likelihood of earnings management among firms with extreme performance.

Considering the trade-off between the aggregate accruals approach and the specific accruals approach, I choose to adopt the former approach and try to develop a better aggregate accruals expectation model. This is in part driven by my need to examine earnings management by firms not limited to a few specific industries.

2.3 Extant Models of Expected Accruals

2.3.1 Jones (1991) Model

In the Jones (1991) model, nondiscretionary accruals (NDA) are the expected values from regressing total accruals on change in sales revenue and level of gross property, plant and equipment (PPE). Discretionary accruals (DA) are just the residuals. More specifically, nondiscretionary accruals are estimated from the following cross-sectional regression[3]:

$$TAC_{it} = \alpha_0 + \alpha_1(\Delta REV_{it}) + \alpha_2(PPE_{it}) + \varepsilon_{it}, \qquad (2.1)$$

where TAC_{it}, ΔREV_{it} and PPE_{it} respectively is period-t total accruals, change in sales revenue, and property, plant and equipment. Each variable is divided by A_{it-1}, the beginning total assets. Total accruals are measured as changes in noncash current assets less change in current liabilities excluding current maturity of long-term debt, less depreciation expense. The residuals from the regression (2.1) are the Jones model discretionary accruals (DA).

An implicit assumption of the Jones (1991) model is that change in sales revenue is nondiscretionary. If there is earnings management through manipulation of revenue, then this model has an errors-in-variables (EIV) problem. The problem is most pronounced in the litigation setting, because defendant firms are frequently alleged to have engaged in revenue manipulation. More specifically, ΔREV_{it} measures non-manipulated change in revenue with error, and the measurement error is correlated with the variable of interest, i.e., the occurrence of accounting-based securities litigation. The EIV problem leads to inconsistent parameter estimates and biased measures of earnings management.

Furthermore, the Jones (1991) model also suffers from a simultaneity problem, which is independent from the EIV problem. This problem arises because in equation (2.1), both accruals and change in revenue are "jointly determined by the constraints

[3] Although the original model is presented in the form of time-series regression, I will show the cross-sectional version to facilitate comparison with the model I develop. The cross-section approach was introduced by DeFond and Jiambalvo (1994).

imposed by GAAP and double-entry bookkeeping" (Kang and Sivaramakrishnan 1995, p. 355). In other words, referring back to equation (2.1), we see that $E[\varepsilon_{it} \mid (\Delta REV_{it})/ A_{it-1}] \neq 0$. Consequently, OLS estimation would yield inconsistent coefficient estimates with incorrect standard errors.

2.3.2 Modified Jones (1991) Model

In view of the possibility that managers exercise discretion over sales revenue, DSS (1995) proposes a modification to Jones model to partly address the EIV problem in the original Jones (1991) model. In the DSS' (1995) modified Jones model, nondiscretionary accruals (NDA) are estimated as:

$$TAC_{it} = \alpha_0 + \alpha_1(\Delta REV_{it} - \Delta AR_{it}) + \alpha_2(PPE_{it}), \qquad (2.2)$$

where ΔAR_{it} is period-t change in accounts receivable, and all other variables are the same as in equation (2.1). The parameters α_0, α_1 and α_2 are estimated from equation (2.1). The only modification relative to the original Jones model is that to estimate NDA, change in sales is adjusted for the change in trade receivables.

The DSS' modified Jones (1991) model assumes that all change in credit sales represents earnings management. As pointed out by Kang (1999) and Beneish (1998), this construction makes the model misspecified for firms with growth or shrinkage in credit sales, regardless whether earnings management occurs. Suppose earnings management does not occur in the sample we test, then NDA should be based on $\alpha_1(\Delta REV_{it})$. However, the modified Jones model dictates that the fitted values are $\alpha_1 (\Delta REV_{it} - \Delta AR_{it})$. Therefore, NDA is understated when $\Delta AR_{it} > 0$ and overstated when $\Delta AR_{it} < 0$. In the litigation setting, if defendant firms tend to experience nondiscretionary increase in credit sales during class period, then NDA will be understated and DA will be overstated, thus leading to erroneous inferences.

The above model misspecification can be easily overcome by a slight modification: one can use equation (2.2) instead of (2.1) for estimating α_0, α_1 and α_2. Beneish (1998) has demonstrated the conceptual and empirical superiority of this version over the original modified Jones (1991) model intended by DSS (1995). Kasznik (1999) also adopts this modification in estimating his extended modified Jones model. Since this modified version is conceptually superior to the original setup by DSS (1995), I estimate the modified Jones model using this version and refer to it as the modified Jones (1991) model for want of a more suitable name. However, even with this adjustment in estimation procedure, this model may still be flawed, because cash sales may still be subject to manipulation[4].

2.3.3 Term-Adjusted Modified Jones (1991) Model

Teoh, Wong and Rao (1998), hereafter TWR (1998), adopts an extension to the modified Jones model, by excluding depreciation from the model. Specifically, nondiscretionary current accruals (NDCA) are the expected values from:

$$CAC_{it} = \beta_0 + \beta_1(\Delta REV_{it} - \Delta AR_{it}), \tag{2.3}$$

where CAC_{it} is period-t current accruals deflated by beginning total assets, and the β's are coefficients estimated from

$$CAC_{it} = \beta_0 + \beta_1(\Delta REV_{it}) + \nu_{it}. \tag{2.4}$$

In his review of the TWR (1998) study, Beneish (1998) finds that excluding depreciation from the model is "appealing because managing earnings via depreciation is either transparent or economically implausible. Transparent, because the effect of

[4] One common example is the recognition of software licensing revenue: for a multi-period license, it is not appropriate to recognize all the revenue up-front even if all cash is received.

changes in useful lives or in the depreciation methods is a required disclosure. Implausible, if timing capital expenditures to make earnings management through depreciation is less transparent, implies that managers forego profitable opportunities." TWR's term-adjusted modified Jones model has the same misspecification problem as that of DSS' (1995) modified Jones model. Following the suggestion by Beneish (1998), I also estimate the coefficients from equation (2.3) instead of (2.4). I further allow the equation to have an intercept to avoid the potential bias caused by forcing the intercept to be zero when it is not. To summarize, in the rest of this paper, discretionary current accruals (DCA) from the term-adjusted modified Jones model is the residual from the following regression:

$$CAC_{it} / A_{it-1} = \alpha_0 + \alpha_1 (1/A_{it-1}) + \alpha_2 (\Delta REV_{it} - \Delta AR_{it}) / A_{it-1} + \upsilon_{it}. \quad (2.5)$$

2.3.4 KS (1995) Model and Term-Adjusted KS Model

Kang and Sivaramakrishnan (1995), hereafter KS, offers an alternative approach where the simultaneity and the EIV problems are mitigated by using an instrumental variable (IV) approach. More specifically, nondiscretionary total accrual balance is estimated from the following regression:

$$TACB_{it} = \theta_0 + \theta_1 (\delta_1 REV_{it}) + \theta_2 (\delta_2 EXP_{it}) + \theta_3 (\delta_3 PPE_{it}) + \mu_{it}, \quad (2.6)$$

where $\delta_1 = AR_{it-1}/REV_{it-1}$, $\delta_2 = OCAL_{it-1}/EXP_{it-1}$, and $\delta_3 = DEP_{it-1}/PPE_{it-1}$.

In equation (2.6), $TACB_{it}$ is the total balance of noncash current assets less current liabilities less depreciation expense, EXP_{it} is total operating expense before depreciation and interest, AR_{it-1} is prior-period balance of accounts receivable, $OCAL_{it-1}$ is prior period balance of other current assets and liabilities (i.e., noncash current assets less current liabilities less receivables), DEP_{it-1} is prior-period depreciation expense. All variables are divided by beginning total assets.

Unlike other extant accrual prediction models, the KS (1995) model estimates the balance sheet account balances, not changes in balance sheet accounts (accruals). More specifically, the dependent variable in the Jones (1991) model is total accruals, which is an income statement or a "flow" concept, while the dependent variable in the KS model is "accrual balance"[5], a balance sheet or a "stock" concept. Therefore, rather than estimating the discretionary component of earnings during a period, the KS model estimates the discretionary component of the "accrual balance." To illustrate the distinction, consider the following simplified case. A company started business in period 1. It overstated its earnings in period 1 and 2 by $100 and $200, respectively, and understated its earnings in period 3 and 4 by $200 and $100, respectively. If both the Jones (1991) model and the KS (1995) model measure this discretion perfectly, then the Jones model would suggest that the company's discretionary accruals in year 1 through 4 were $100, $200, -$200 and -$100, respectively. In contrast, the KS model would suggest that the company's discretionary "accruals balance" for the same four periods were $100, $300, $100, and $0, respectively. For this reason, one should be cautious when interpreting the results using the KS (1995) model. For the above example, we can only say the KS (1995) model shows that the "accrual balance" was overstated by $100 at the end of period 3; the KS (1995) model does not indicate that earnings was overstated by $100 in period 3. The KS (1995) model is based on the idea that receivables are related to revenues[6], inventory and other current assets and liabilities are related to expenses, and

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[5] "The term accrual balance is a misnomer because it includes depreciation, which is not a balance sheet account. We use this term for want of a better one." (KS 1995, footnote 8)

[6] The following illustrates how KS model links accrual balance, a stock concept, to revenue and expenses, which are flow concepts. For example, KS (1995) assumes that in the absence of earnings management, the accounts receivable turnover ratio is given by:
$AR_t/REV_t = \theta_1 AR_{t-1}/REV_{t-1} + \upsilon_t$. This equation can be also written as:
$AR_t = \theta_1(AR_{t-1}/REV_{t-1})^* REV_t + \varphi_t$. Prior-period accounts receivable turnover ratio

depreciation is related to PPE. KS (1995) uses prior period turnover ratios δ_1, δ_2 and δ_3 to control for firm-specific differences in turnover ratios. To mitigate the EIV and simultaneity problems, KS uses an instrumental variable approach. All the regressors in (2.6) are first regressed on the instrument set, which includes an intercept, and once-lagged values of all three regressors[7]. The fitted values are then used in equation (2.3) to estimate the nondiscretionary portion of $TACB_t$.

Conceptually, the KS (1995) model aims to overcome the EIV, omitted variables and simultaneity problems present in the Jones (1991) model. Empirically, KS (1995), Kang (1999) and Thomas and Zhang (1999) document that the KS (1995) model outperforms the Jones (1991) model in both specification and power. However, I find it hard to argue that the instrumental variables (i.e., the lagged values of the regressors in equation 2.6) are free of manipulation themselves, especially in the litigation setting, where earnings manipulation usually last several reporting periods. Also note that the variable predicted by the KS (1995) model is a balance sheet concept. However, most researchers of earnings management are interested in the discretionary component of income during a certain period, rather than the discretionary components of balance sheet accounts at a point of time.

To facilitate a comparison with discretionary current accrual models, I also specify a term-adjusted version of the KS (1995) model. In other words, rather than modeling "total accrual balance" (TACB), the following equation models expected "current accrual balance," CACB:

(AR_{t-1}/REV_{t-1}) is then denoted as δ_1.

[7] This is the Kang's (1999) adapted version of the KS (1995) model. In the original KS (1995) model, the instrument set includes twice and thrice lagged values of the three regressors. The original KS (1995) model also excludes tax-related assets, liabilities and expenses from the variables.

$$CACB_{it} = \theta_0 + \theta_1 (\delta_1 REV_{it}) + \theta_2(\delta_2 EXP_{it}) + \mu_{it}, \quad (2.6a)$$

where $\delta_1 = AR_{it-1}/REV_{it-1}$ and $\delta_2 = OCAL_{it-1}/EXP_{it-1}$. $CACB_{it}$ is the balance of noncash current assets less current liabilities. All other variables in (2.6a) have the same definition as in equation (2.6).

2.4 An Alternative Model to Measure Earnings Management

Recent earnings management studies have often used discretionary accruals estimated from regression-based expected accruals models as proxies for earnings management. However, in addition to managing accruals, companies could also manage components of earnings that are not necessarily reflected in accruals. For example, to artificially inflate earnings, a company could prematurely recognize revenue from a multi-period contract. When cash is received up front for such a contract, accrual models will not capture this kind of earnings management.

Therefore, in addition to abnormal accruals, I introduce abnormal change in revenue as a measure of earnings management by firms sued for securities fraud. Abnormal change in revenue is estimated from the revenue model, and abnormal accruals are estimated from the instrumental variable (IV) model of current accruals. Both models are discussed in the following subsections.

2.4.1 A Revenue Expectation Model

I estimate abnormal change in revenue as total change in revenue minus normal change in revenue. Normal changes in revenue are estimated from the following model:

$$\Delta REV_{it} = \theta_0 + \theta_1 INDCHREV_{it} + \theta_2 \Delta EMPLOYEE_{it} + \theta_3 \Delta CFO_{it} + \xi_{it}. \quad (2.7)$$

The first determinant of ΔREV is INDCHREV, three-digit-SIC industry median of change in sales revenue. It captures the economy and industry-wide fluctuations in supply and demand. The second regressor in equation (2.7) is change in number of employees (ΔEMPLOYEE). This measure captures a company's productivity and scale, and therefore should be a natural determinant for ΔREV. Finally, the last control variable in the revenue expectation model is change in operating cash flows (ΔCFO). This variable captures the effect of firm's operating activity on sales in the following ways. For example, cash salaries and bonuses paid to a sales person affects her incentive to make sales; cash received from a customers reflects the on-going relationship between the customer and the firm, and thus affects the tendency to make more sales to the customer; cash paid to a supplier is related to sales through the firm's management of inventory flow. Of course, the relation between the three determinants (INDCHREV, ΔEMPLOYEE, and ΔCFO) and ΔREV is not necessarily contemporaneous. Equation (2.7) represents a reduced-form representation of this relation.

This revenue expectation model serves two purposes. First, the prediction errors from regression (2.7) provide a measure of revenue management. Second, the predicted values from regression (2.7) represent the normal changes in revenue, which are used as a determinant for the expected current accruals. More specifically, regression (2.7) purges ΔREV of measurement errors that are correlated with managed accruals, and thus alleviating the errors-in-variable problem previously discussed.

2.4.2 A Model of Expected Current Accruals

To measure accrual management, I extend the models by Jones (1991), DSS (1995) and Teoh et al. (1998). DSS (1995) tests several expected accruals models, including the Jones (1991) model and the modified Jones (1991) model, and conclude there are two major problems with all these models: (1) they are not well-specified when applied to sample of firm-years experiencing extreme financial performance, and (2) they produce earnings management tests with relatively low power for earnings management of economically plausible magnitude. Among the models tested, DSS (1995) finds that the modified Jones model is the most effective, albeit still suffering from the same two problems. TWR (1998) extends the modified Jones model proposed by DSS (1995) by focusing on current accruals instead of total accruals. Beneish (1998) argues that excluding depreciation from abnormal accruals models is "appealing because managing earnings via depreciation is either transparent or economic implausible."

My model further extends TWR's (1998) term-adjusted modified Jones model. More specifically, normal current accruals are predicted values from the following cross-sectional regression:

$$CAC_{it} = \gamma_0 + \gamma_1 PCHREV_{it} + \gamma_1 \Delta EMPLOYEE_{it} + \gamma_2 \Delta CFO_{it} + \zeta_{it}, \qquad (2.8)$$

where PCHREV is normal change in revenue estimated from the revenue model, i.e., predicted values from equation (2.7).

My model differs from TWR's (1998) term-adjusted modified Jones (1991) model in the following ways. First, instead of change in cash sales, I use estimated normal change in revenue (PCHREV) from the revenue model as a determinant of current accruals. By excluding change in receivables, TWR (1998)'s term-adjusted modified Jones model relaxes the assumption in the Jones (1991) model that all changes in revenues are nondiscretionary. However, even with this adjustment in estimation procedure, this model may nevertheless suffer from the following problems: cash sales may still be subject to manipulation, and change in credit sales may not be totally due to discretion. To treat this error-in-variable problem, I implement an instrumental variable (IV) approach to first purge the abnormal portion from the changes in revenue, and then use the normal portion of the changes in revenue as an explanatory variable for current accruals.

Second, I also include the following additional explanatory variables: change in operating cash flows (ΔCFO) and change in number of employees (ΔEMPLOYEE). Previous studies (e.g. Dechow, 1994) find that ΔCFO is negatively correlated with accruals, even absent management discretion. Finally, ΔEMPLOYEE controls for the effect of employee-driven changes in revenues and expenses on current accruals that are not already captured by the normal changes in revenue.

2.4.3 Model Estimation

2.4.3.1 Estimation of the Revenue Model

For ease of exposition, all models discussed so far (see Section 2.3, Section 2.4.1 and Section 2.4.2) are expressed in cross-sectional annual version. However, because the period of alleged earnings management by defendant firms of class action securities litigation is often shorter than a year, quarterly data is needed in order to examine the validity of such claims. Henceforward, I estimate the revenue expectation model and all the accruals expectation models using pooled time-series and cross sectional quarterly data.

In the revenue model, abnormal change in revenue is total change in revenue minus normal change in revenue. Normal change in revenue is estimated from the following equation, using data for all non-litigation Compustat firm-quarters matched by two-digit SIC code. Note that equation (2.9) is the quarterly version of equation (2.7). Quarterly dummies (D1, D2 and D3) are added to account for seasonality, and year dummies are included to control for fixed year effects.

$$\Delta REV_{j,p} = \alpha_p + \beta_{1,p} INDCHREV_{j,p} + \beta_{2,p} \Delta EMPLOYEE_{j,p} + \beta_{3,p} \Delta CFO_{j,p}$$
$$+ \beta_{4,p} D1 + \beta_{5,p} D2 + \beta_{6,p} D3 + \Sigma \beta_{y,p} Dyear_y + \varepsilon_{j,p}, \quad (2.9)$$

where all variables are deflated by total assets (Compustat item 44) at the beginning of the quarter, and:

ΔREV	=	Change in revenue (Compustat data item 2);
INDCHREV	=	Three-digit SIC industry median of change in revenue (2);
ΔEMPLOYEE	=	Change in number of employees (Compustat data item 29 times 1000);
ΔCFO	=	Change in operating cash flows (108);
D1, D2, D3	=	Dummy variable set equal to one if observation relates to first, second, third fiscal quarter, respectively;
Dyear	=	Dummy variable for fiscal years 1987 through 2000;
j	=	Firm index for firms within same two-digit SIC industry;
p	=	Index for estimation portfolio, which includes all non-litigation firm-quarters within the same two-digit SIC industry.

To estimate the revenue model, I form 63 estimation portfolios, each consists of all non-litigation firms within two-digit SIC industry. All firm-quarters in Compustat quarterly full coverage, industry, and research files from 1987 to 2001 are used in estimation, with the following exception: (1) firm-quarters with any missing variables for the revenue model are excluded, and (2) all firms sued during 1980-2000, as covered by Woodruff-Sawyer class action securities litigation database, are excluded. To reduce influence from outliers, all variables are winsorized at top and bottom 0.5 percent. I also eliminate from each regression all influential observations identified as absolute values of DFFITS or RSTUDENT greater than two, following procedures suggested by Besley et al. (1980).

Table 2.1 Panel A provides the descriptive statistics for the 63 (two-digit SIC industries) pooled cross-sectional OLS estimations of the revenue model, for years 1987-

2001. The estimated coefficient on INDCHREV is around one, with a mean (median) of 1.08 (0.93). In other words, as expected, each dollar of increase in industry median change in revenue is associated with approximately one dollar of increase in each firm's change in revenue. The estimated coefficients on ΔEMPLOYEE and ΔCFO are also generally positive and highly significant as predicted. More specifically, the estimated coefficient on ΔEMPLOYEE has a mean (median) of 2.14 (2.18), and the estimated coefficient on ΔCFO has a mean (median) of 0.06 (0.02).

The estimated coefficients from equation (2.9) are used to estimate normal (predicted) component of change in revenue, PCHREV, for each sample firm-quarter:

$$\begin{aligned} PCHREV_{i,t} = {} & a_p + b_{1,p}INDCHREV_{i,t} + b_{2,p}\Delta EMPLOYEE_{i,t} + b_{3,p}\Delta CFO_{i,t} \\ & + b_{4,p}D1 + b_{5,p}D2 + b_{6,p}D3 + \Sigma b_{y,p}Dyear_y, \end{aligned} \tag{2.10}$$

where a, b_1, b_2 through b_6 and b_y's are estimation of the coefficients α, β_1 through β_6 and β_y's. Abnormal change in revenue is then estimated as the difference between total change in revenue and estimated normal change in revenue:

$$ABCHREV_{i,t} = \Delta REV_{i,t} - PCHREV_{i,t}. \tag{2.11}$$

2.4.3.2 Estimation of the IV Current Accruals Model

I estimate expected current accruals using the following cross-sectional regression, which is just the quarterly version of equation (2.8):

$$\begin{aligned} CAC_{j,p} = {} & \phi_p + \delta_{1,p}PCHREV_{j,p} + \delta_{2,p}\Delta Employee_{j,p} + \delta_{3,p}\Delta CFO_{j,p} \\ & + \delta_{4,p}D1 + \delta_{5,p}D2 + \delta_{6,p}D3 + \Sigma\delta_{y,p}Dyear_y + \upsilon_{j,p}, \end{aligned} \tag{2.12}$$

where:

CAC = Current accruals =
- change in accounts receivable (103)
- change in inventory (104)
- change in accounts payable and accruals liabilities (105)
- change in accrued income taxes (106)
- change in other assets and liabilities (107);

or alternatively, if CAC cannot be calculated using the above definition due to missing data, current accruals =
income before extraordinary items (76)
+ depreciation and amortization (77)
+ extraordinary items and discontinued operations (78)
+ deferred taxes (79)
+ equity in net loss (earnings) (80)
+ loss (gain) from sale of property, plant and equipment (102)
+ other funds from operations (81)
- net cash from operating activities (108)[8];

PCHREV = Normal change in revenue estimated from the revenue model, i.e., predicted values from equation (2.10).

Other variables are the same as defined in equation (2.9), and all variables are deflated by total assets at beginning of the quarter. Following the suggestion by Collins and Hribar (2002), I use statement of cash flows numbers (rather than balance sheet numbers) in defining accruals. This approach avoids measurement errors caused by non-articulation events such as mergers and acquisitions.

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[8] This definition of CAC demonstrates that because of the identity: Income = Accruals + Cash Flows, a simultaneous-equation bias is present in equation (2.12). More specifically, due to the constraint of GAAP and double-entry system, the regressor ΔCFO is not truly exogenous, and ΔCFO is correlated with the disturbances υ in equation (2.12). This simultaneity problem means that ordinary least squares estimates of the parameters are inconsistent (Greene, 1997, pp. 710). One way to deal with this problem is to regress ΔCFO on a set of instrumental variables, and use predicted value from the regression as a regressor in the second-stage regression (equation 2.12). However, recognizing the difficulty in finding appropriate instruments for ΔCFO, I directly include ΔCFO as a regressor in equation 2.12, following a similar design used by Kasznik (1999, pp. 66-67).

The estimation portfolios for the current accruals model are defined the same as for the revenue model discussed earlier. Table 2.1 Panel B provides descriptive statistics for model estimation. As expected, the estimated coefficients on normal change in revenue (PCHREV) are generally positive and significant, with a mean (median) of 0.15 (0.12). The estimated coefficients on the change in number of employees (ΔEMPLOYEE) are also in general positive and highly significant, with a mean (median) of 5.20 (1.56). The mean (median) t-statistics for the coefficients on PCHREV and ΔEMPLOYEE are 5.16 (5.06) and 1.93 (1.76), respectively, suggesting that ΔEMPLOYEE appears to be a more important determinant of working capital accruals than PCHREV. Finally, the estimated coefficients on the change in cash flows (ΔCFO) are generally negative as expected, with mean (median) of -0.18 (-0.16).

Using the estimated coefficients, I estimate the abnormal (discretionary) portion of current accruals, ABCAC, for each sample firm-quarter observation i assigned to estimation portfolio p:

$$ABCAC_{i,t} = CAC_{i,t} - (c_p + d_{1,p}PCHREV_{i,t} + d_{2,p}\Delta EMPLOYEE_{i,t} + d_{3,p}\Delta CFO_{i,t} + d_{4,p}D1 + d_{5,p}D2 + d_{6,p}D3 + \Sigma d_{y,p}Dyear_y), \quad (2.12a)$$

where c, d_1 through d_6 and d_y's denote estimated coefficients ϕ, δ_1 through δ_6 and δ_y's, respectively, in equation (2.12).

2.5 Testing Model Specification and Power

2.5.1 Experimental Design

In this section, I compare specification and power of six competing accrual expectation models in tests of earnings management. The six accruals expectation models examined are:

(1) Jones (1991) model (equation 2.1, as discussed in section 2.3.1).

(2) DSS' (1995) modified Jones (1991) model (equation 2.2, as discussed in section 2.3.2).

(3) Term-Adjusted modified Jones (1991) model (equation 2.5, as discussed in section 2.3.3).

(4) KS (1995) model (equation 2.6, as discussed in section 2.3.4).

(5) Term-adjusted KS model (equation 2.6a, as discussed in section 2.3.4).

(6) My proposed IV model (equation 2.8, as discussed in section 2.4.2).

All six models are estimated using pooled time-series and cross-sectional quarterly data within two-digit SIC industry. Section 2.4.3.2 discusses in detail the estimation procedure for the IV model of discretionary accruals. The other five competing models are estimated in the same manner. For ease of discussion, section 2.3 and section 2.4.2 demonstrate the six competing models in cross-sectional form. However, in the rest of this thesis, all six models are estimated using time-series cross-sectional regressions pooled within two-digit SIC industries. Each of the models is therefore modified to include quarter and year dummies, as in equation (2.12).

I run regression for each of the six models on the estimation sample. To construct the estimation sample, I start with 2000 COMPUSTAT quarterly (industrial and research) data. I exclude all firm-quarters subject to shareholder allegation of accounting manipulation[9] as well as those firm-quarters subject to SEC accounting and auditing enforcement actions, because earnings management are likely to be present in these firm-quarters and including them in the regression would bias the estimated coefficient. Each test-sample-firm is then matched with its estimation sample, which consists of all firm-quarters within its two-digit SIC industry, excluding the SEC enforcement actions or litigation-related firm-quarters as just discussed. After running the six models on estimation samples, discretionary accruals (DA) are then estimated by subtracting the predicted level of nondiscretionary accruals (NDA) from total accruals (standardized by lagged total assets)[10]. To test for earnings management, the estimated discretionary accruals (of test sample firms' all quarters with necessary COMPUSTAT data) are regressed on PART, the partitioning variable. In other words, the following regression is performed:

$$DA_{it} = a + bPART_{it} + e_{it}, \tag{2.13}$$

where PART is set equal to one if the observation is an event quarter and zero if the observation is not an event quarter. The coefficient on PART provides an estimate of the magnitude of the earnings management by sample firms in event period T. The null hypothesis of no earnings management in period T is tested by applying a t-test to the null hypothesis that b = 0.

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[9] Firm-quarters subject to shareholder allegation of accounting manipulation are according to the Woodruff-Sawyer shareholder class action litigation database used in this study.

[10] To be more specific, for models of expected current accruals rather than expected total accruals, discretionary current accruals (DCA) are estimated by subtracting the predicted level of nondiscretionary current accruals (NDCA) from current accruals (standardized by lagged total accruals).

2.5.2 Sample Construction and Description of Simulation

To compare the specification and power of alternative discretionary accruals models in earnings management tests, the following five samples were constructed:

(1) 200 samples of 100 randomly selected firm-quarters.

(2) 200 samples of 100 firm-quarters that are randomly selected from pools of firm-quarters that experienced a decrease in return on assets compared with the quarter before.

(3) 200 samples of 100 firm-quarters that are randomly selected from pools of firm-quarters that experience an increase in return on assets compared with the quarter before.

(4) 200 samples of 100 firm-quarters in which a specified amount of accrual manipulation has been artificially injected into relevant income statement and balance sheet accounts.

(5) A sample of 140 firms that are sued by shareholders for accounting fraud, and also subject to SEC accounting and auditing enforcement actions or earnings restatement.

These five samples are selected from an initial pool of firm-quarters as described in the following. I begin with the 1987 to 2000 COMPUSTAT quarterly data. Firms from the financial and banking industry (SIC code 6021-6799) are excluded because they have special financial reporting environments. To be included in the sample, a firm-quarter should have non-missing data for variables needed to estimate each accrual prediction model. I require at least 20 observations in the pooled (time-series and cross-section) two-digit SIC industry to ensure reliable parameter estimation. I also require sample firms to have five or more time-series observations. To control for outliers, I set top and bottom 0.5 percent of each variable (of the discretionary accruals model) to missing.

Sample (1) is intended to examine the specification of the six competing models when the measurement error in discretionary accruals is uncorrelated with the partitioning earnings management variable. From the above pool of firm-quarters, sample (1) is constructed by repeating the following procedure 200 times. First, 100 firms are randomly and sequentially selected without replacement. Second, for each of the 100 sample firms, one quarter is randomly selected as the event quarter. Since the earnings management partitioning variable (PART) is selected at random in this sample, it is expected to be uncorrelated with any omitted variables. Thus Type I errors should correspond to the specified test level if the normality assumption is satisfied.

The earnings management partitioning variable investigated in many prior studies are correlated with firm performance. Therefore, I use samples (2) and (3) to test the specification of the six models when PART is correlated with firm performance. Samples (2) and (3) are constructed using the same procedure as the one used for sample (1), with the following exceptions. For sample (2), I require that pretax operating income (deflated by beginning total assets) has increased in the chosen quarter, compared with the immediate previous quarter. For sample (3), the requirement is that the pretax operating income (deflated by beginning total assets) has decreased in the chosen quarter. Because I determine PART by randomly selecting firm-quarters with increase (or decrease) in return on assets, PART itself does not cause earnings management, although it might be correlated with unknown factors that cause earnings management. Thus, any rejection of the null hypothesis of no earnings management represents Type I errors, and the rejection rates for the null hypothesis should correspond to the specified test level if the models are well-specified.

In sample (4), income-increasing earnings management is artificially injected in event quarters, and this sample is designed to compare the type II errors of the competing models in detecting earnings management. I obtain sample (4) by repeating the following procedures 200 times. First, randomly select 100 firms. Second, randomly select an event quarter for each firm. Third, add a specified amount of accruals to the income and balance sheet accounts of event quarter. Specifically, the simulation (i) increases the receivables, inventory, and other current assets, respectively by an average of three percent of their respective balances, (ii) decreases current liabilities by an average of three percent, and (iii) decreases depreciation expense by an average of one percent. I also make corresponding changes to the income and expense accounts so that all accounts balance out. Note that I randomize the amount to be added to each account. For example, the percentage of increase in the receivable balance is uniformly distributed from zero to six percent for each selected firm. As a result, not only the total amount but also the amount of individual components varies across firms. I also assume that all injected accruals reverse in the following quarter, and all related accounts are adjusted accordingly. Sample (4) is constructed in the same way as the one used in Kang and Sivaramakrishnan (1995, p. 360)[11].

The validity of tests of power using sample (4) is subject to the limitation of the above assumptions about how earnings are managed. To corroborate the findings from simulation, I use sample (5), which consists of 140 firms facing accounting-related allegations in class action securities lawsuits, and at the same time also subject to either SEC enforcement actions or earnings restatement[12]. To construct this sample, I start with

[11] I thank Sok-Hyon Kang for generously answering my questions about the details of this simulation procedure, as well as questions about estimating the KS (1995) model. All errors are my own.

[12] To examine the type II errors of alternative accruals models, DSS (1995) use a sample of firm-periods subject to accounting-based enforcement actions by the SEC. Their sample included only 32 firms with a total of 56 firm-years.

781 firms sued by shareholders in class action securities litigation during the period 1988-2000[13]. I then exclude 415 defendant firms that do not face any accounting allegations, leaving 366 firms facing accounting allegations. Because not all securities lawsuits have merits, the mere existence of earnings management allegations doesn't necessarily mean that earnings management really occurred. I therefore further impose the following criterion: for a firm to be included in sample (5), I also require that it should have been subject to accounting-related enforcement actions by the SEC, or restated its earnings between 1986 and 2000. This criterion reduces the final sample size from 366 to 140 firms. In a typical lawsuit of this kind, shareholders allege that a firm inflated its stock price when it manipulated earnings over a period of time, and stock price dropped when such earnings management was revealed subsequently. Therefore, I assume (i) income-increasing earnings management occurred during periods subject to earnings management allegations, (ii) immediately following these firm-periods, income-decreasing earnings management occurred due to the reversal of accruals.

2.5.3 Empirical Finding: Test of Specification

2.5.3.1 Random Sample of Firm-Quarters

Table 2.2 summarizes the descriptive statistics for tests of earnings management using six competing discretionary accruals on 200 random samples of 100 randomly-selected firm-quarters. For each model, the row labeled "earnings management" is for the estimated coefficient on PART, the row labeled "standard error" is for the standard error of this coefficient estimate, and the row labeled "t-statistic" is for the t-statistic for testing the null hypothesis that this coefficient is equal to zero. Five descriptive statistics of the parameter estimate and test statistics are listed: mean, standard deviation, lower quartile,

[13] See section 3.3.1 for description of the litigation data and sample.

median and upper quartile. As expected, the mean and median values of earnings management are close to zero for all models. Because the event quarters are randomly selected, well-specified discretionary accruals models should not find systematic evidence of earnings management in these firm-quarters relative to non-event firm-quarters. The IV model has the lowest standard errors (mean 0.010) and absolute value of t-statistic (mean 0.022). The term-adjusted modified Jones model performs similarly well. Jones model and the modified Jones model generate larger standard errors and t-statistics. KS model and term-adjusted modified KS model tend to have the largest standard errors (mean 0.015 for both) and absolute values of t-statistics (0.262 and 0.356, respectively).

Table 2.5 summarizes the rejection frequencies of the six discretionary accruals evaluated at the .05 level (one-tailed). The results on the random firm-quarters are listed in column (1), denoted "All Firms." Since the event quarter is selected at random, the earnings management partitioning variable PART is expected to be uncorrelated with any omitted variables. Therefore, as long as the Gaussian assumptions are satisfied, the frequency of rejecting the null (i.e., type I error) should correspond to the test level, .05. For each model, the row "earnings management ≤ 0" represents the null hypothesis that discretionary accruals are less than or equal to zero, and the row "earnings management ≥ 0" represents the null hypothesis that discretionary accruals are greater than or equal to zero. A binomial test (with normal approximation) is performed to assess whether the rejection frequencies are significantly different from .05.

Table 2.5 column (1) shows that the empirical rejection frequencies for the IV model are very close to the .05 test level, with statistically insignificant differences: 4.0% for the null hypothesis EM ≥ 0, and 2.5% for EM ≤ 0. For the three versions of the Jones model, although the rejection frequencies (3.5% for all three models) for the null hypothesis EM ≥ 0 are close to the test level, type I errors are statistically lower than the test level for the null hypothesis that EM $\leq$ 0 (1.5% for the Jones model and the term-adjusted modified Jones model, 1.0% for the modified Jones model). Finally, the two versions of the KS model over-reject the null hypothesis of EM $\geq$ 0, with portions of type I errors by the KS model and the term-adjusted KS model at 8.5% and 10.0%, respectively, which are significantly higher than the .05 test level. This means that the quarterly KS model is prone to erroneously finding income-reducing earnings management when there is none.

In summary, the results in table 2.2 and table 2.5 indicate that when applied to random samples of firm periods, the IV model is the best-specified among the six competing models of discretionary accruals. The KS model and the term-adjusted KS model generate higher rate of type I error than specified test level for tests of the null hypothesis earnings management $\geq$ 0. This means that the two variations of the KS model tend to bias estimated discretionary accruals downward. In contrast, the three Jones (1995) type models do not over-reject the null hypotheses; however, the distributions of the discretionary accruals estimated from these models tend to have thinner right tails than the normal distribution.

2.5.3.2 Samples of Firm-Quarters with a Decrease or an Increase in ROA

Table 2.3 presents the descriptive statistics on parameter estimates and test statistics generated by the six discretionary accruals when applied to sample (2), the 200 samples of 100 firm-quarters with a decrease in return on assets. The mean and median values of earnings management (the parameter estimate on PART) are negative for all six models, and in general do not have a statistically significant difference from zero. The IV model generates the smallest standard error for the coefficient estimate on PART (mean 0.009). The Jones model generates the lowest absolute value of t-statistic (mean 0.105) for testing the null hypothesis that the coefficient on PART is zero. The KS model and term-adjusted KS model generally produce larger standard errors, and larger absolute value of coefficient estimate and t-statistics.

Parallel to table 2.3, table 2.4 reports the descriptive statistics for earnings management tests applied to sample (3), firm-quarters with an increase in return on assets. The coefficient estimates tend to be positive for all six models, although they are in generally not significantly different from zero at conventional test levels. Similar to the results presented in table 2.2, the IV model generates the lowest standard error, and the Jones model generates the lowest t-statistic.

Remember that event periods in sample (2) and sample (3) are randomly selected from the pool of firm-quarters with a decrease (sample 2) or an increase (sample 3) in return on assets. Therefore, although PART may be imperfectly correlated with some variables that can cause earnings management, PART itself is not a causal determinant of earnings management. Thus, rejections of the null hypothesis of no earnings management can be called type I errors.

Table 2.5 reports the type I errors for tests of earnings management using six discretionary accruals models. Rejection frequencies on sample (2) (firm-quarters with a decrease in ROA) are listed in column (2), labeled "firms with ROA decrease." The proportion of type I errors for the tests of the null hypothesis that earnings management $\geq$ 0 are significantly higher than the test level of .05 for the KS model and the term-adjusted KS model. Therefore, test statistics from the KS model and the term-adjusted KS model are biased in favor of the alternative that earnings are managed downwards. This is because firm-quarters with low earnings also tend to have low total accruals, and these two models falsely attribute part of the lower nondiscretionary accruals to negative discretionary accruals. In contrast, the other four models do not over-reject the null hypotheses. However, these four models tend to generate type I errors for the null hypothesis of earnings management $\geq$ 0 at a lower rate than the .05 test level, which means that the distributions of discretionary accruals estimated from these four models have thinner right tails than the normal distribution.

Rejection frequencies on sample (3) (firm-quarters with an increase in ROA) are listed in column (3) of Table 2.5. On this sample, none of the six models have higher type I error rate than the .05 test level, although all of the models tend to under-reject the null hypothesis of earnings management ≥ 0.

The evidence in tables 2.3, 2.4 and 2.5 indicates that when applied to firm-periods with a decrease in ROA or an increase in ROA, the IV model, as well as the three Jones (1995) type models, do not generate higher rate of type I errors than specified test levels. However, the two variations of the KS model over-reject the null hypothesis of earnings management ≥ 0 when applied to the sample of firm-periods with a decrease in ROA.

2.5.4 Empirical Finding: Test of Power

2.5.4.1 Sample of Firm-Quarters with Artificially Induced Earnings Management

The results of the simulation using artificially induced earnings management are summarized in tables 2.6 and 2.7. Following the simulation procedures used by Kang and Sivaramakrishnan (1995), I add income-increasing earnings management of about 2% of total beginning assets. The lowest panel of table 2.7 provides statistics on the amount of simulated earnings management. The mean and median of the earnings management is 2.65% and 2.00% of beginning total assets, respectively. However, the induced accruals manipulation represents a large percentage (median 62.6%) of net income.

Table 2.6 shows that the IV model, as well as the three Jones (1995) type models, generates positive coefficient estimates that are statistically different from zero. The mean and median of the coefficient estimates are similar for these four models, with mean ranging from 0.025 to 0.027. The IV model generates the smallest standard deviation (mean 0.010) and the highest t-statistic (mean 2.610). In contrast, the two variations of the KS model generate negative coefficient estimates which are not statistically different from zero, and the standard errors from these two models tend to be the highest among all six competing models.

Table 2.7 reports the rejection frequencies for tests of earnings management on sample (4), a random sample of firm quarters with artificially injected positive earnings management. Because of the way this sample is constructed, the earnings management partitioning variable PART is a causal determinant of earnings management. Therefore, failure to detect earnings management represents type II errors. Table 2.7 shows that the IV model rejects the null hypothesis of earnings management ≤ 0 at a rate of 74.5%. The three Jones (1991) type models reject this null at a rate ranging from 60.0% for the Jones model to 69.5% for the term-adjusted modified Jones model. The KS model and the term-adjusted KS model only detect positive earnings management 7.5% and 12.0% of the time, respectively.

The simulation results in table 2.6 and 2.7 suggest that among the six competing models of discretionary accruals, the IV model has the lowest type II errors in earnings management tests. The term-adjusted modified Jones model ranks the next in terms of power. The two variations of the KS model have very low power in detecting earnings management in the simulation. The last result is somewhat surprising given the findings from prior studies (KS, 1995; Kang, 1999; Thomas and Zhang, 2000) that the KS (1995) model has higher power compared with Jones (1991) model. The discrepancy may be due to the fact that these prior studies test the discretionary accruals models using annual data, while I use quarterly data. The KS (1995) model may be particularly unsuitable to be applied to quarterly data due to high measurement errors in the individual balance sheet accounts on interim reporting dates. Also, the inconsistency of using balance sheet dependant variables (accrual balances) and "flow" explanatory variables (revenue and expense) may be more pronounced in quarterly data.

2.5.4.2 Sample of Firm-Quarters in which Shareholders Allege Accounting Manipulation

To reinforce the findings from simulations using sample (4), I also conduct earnings management tests on sample (5), firm-quarters subject to allegations of earnings management in class action securities lawsuits. More specifically, to be included in this sample, a firm not only should be sued by shareholders for accounting manipulation, it also has to either restate its earnings or be subject to accounting-related enforcement actions by the SEC. Sample (5) is constructed in such a way that income-increasing earnings management has very likely occurred during the event quarters, measured by the partitioning variable PART. In other words, PART is a causal determinant of earnings management in this sample.

Table 2.8 summarizes the descriptive statistics for tests of earnings management on sample (5), with the event quarters defined as firm-quarters with quarter-end falling between two dates: (i) one year prior to the start of class period, and (ii) the end of the class period. The descriptive statistics show that the IV model and the two Jones type models generate positive coefficient estimates which are significantly different from zero. The IV model has the lowest standard error (mean 0.042), highest t-statistic (mean 1.511) and Z-statistic (13.87). The KS model also generates a positive coefficient estimate, but because the standard deviation is so large (mean 0.289), the coefficient is not significantly different from zero (mean t-statistic is 0.159, Z-statistic is 0.98).

Earnings manipulation using accruals has to be reversed at some point. For firms facing securities litigation, such accruals reversal usually happens after the end of class period[14]. As such, I conduct supplemental analysis by applying the discretionary accruals on the firm-quarters immediately after class periods. Table 2.9 summarizes the results. As expected, the coefficient estimates generated from all the models are negative, indicating income-reducing discretionary accruals. The IV model still generates the lowest standard errors, but the modified Jones model has higher mean t-statistic.

Table 2.10 summarizes the rejection frequencies for earnings management tests on sample (5). The column "manipulation period" represents firm-quarters during class periods and the year before. The column "one year after class period" represents firm-quarters within the year after the end of class periods. Of all the competing models, IV model has the highest detection rate of positive earnings management (28.0%) in the "positive manipulation" periods, and the highest detection rate of negative discretionary accruals reversal (21.3%) in the "accrual reversal" periods. The next best model in terms of rate of rejection is the term-adjusted Jones model. The KS model is not able to detect any earnings management in the sample.

2.6 Conclusion

Motivated by the lack of suitable discretionary accruals model to measure earnings management in the securities litigation setting, I develop an alternative model of discretionary accruals. This model uses an instrumental-variable approach to overcome the errors-in-variables problem present in commonly-used discretionary accruals models.

I then conduct tests of earnings management on five samples designed for comparing specification and power of my proposed model and five existing discretionary accruals models. The empirical results suggests that in tests of earnings management on

[14] Class period is the period over which a defendant firm allegedly misleads its investors and overstates its stock price. Please refer to section 3.3.2 for further discussion.

the five samples, my proposed IV model of discretionary current accruals consistently generates the lowest standard errors, the lowest type I errors and the lowest type II errors. Therefore, the IV model represents an improvement over existing discretionary accruals models in terms of both specification and power.

3 Does Private Securities Litigation Properly Target Earnings Manipulators?

3.1 Introduction

The recent explosion of accounting scandals like Enron and WorldCom has seriously eroded investor confidence. There is a widespread suspicion that with public accounting firms' independence compromised, and the SEC's resource limited, earnings management is unchecked and running amok in corporate America. In this environment, class action securities litigation is increasingly relied upon as an important disciplinary mechanism to deter corporate misconduct, and compensate shareholders for their loss caused by securities frauds. However, is class action securities litigation effective in punishing and deterring earnings management? To answer this question, we must first ask the question, do class action securities lawsuits properly target firms that have manipulated earnings? Several prior studies[15] have examined the effect of earnings management measures on securities litigation risk, with mixed results. The chapter reexamines this question using a larger sample, more refined measures of earnings management, and additional statistical tests to document evidence of earnings management by defendant firms.

In the legal literature, numerous studies have argued that private securities litigation may not be based on merits. This mainly results from the fact that in the current legal regime, there are numerous incentives for defendant firms to settle securities lawsuits rather than proceeding to trial. One such incentive is directors and officers'

[15] See section 3.2.2 for review of relevant prior research.

insurance, which covers lawsuit settlement but not court-ordered judgment. Another is firm executives' aversion toward potential reputation damage due to lengthy publicized trials. When trial is essentially eliminated as an option, private securities attorneys may select lawsuit targets based on settlement value rather than chance of prevailing in trials. For these reasons, critics of the private securities litigation argue that the legal system is abused by private securities attorneys to file meritless lawsuits and extract settlements from corporations. Proponents of the private securities litigation argue that class action lawsuits are a necessary supplement to the SEC's effort in enforcing securities laws. However, is private securities litigation effective in this regard? In particular, do private securities lawsuits target firms that have manipulated earnings outside of GAAP and thus violated securities laws?

There are two sides to the above research question. First, have firms sued by shareholders for accounting frauds actually manipulated earnings? Second, controlling for other factors, do earnings management increase firms' probability of getting sued for securities fraud? To address the first side of the question, I examine defendant firms' earnings management measures before, during, and after the alleged manipulation periods, and assess whether evidence is consistent with plaintiffs' claims that defendants overstated earnings during alleged manipulation periods. I find that compared with a control group matched with financial performance, the litigation group of firms have abnormally large positive discretionary current accruals prior to and during alleged manipulation periods, and abnormally large negative discretionary accruals in periods immediately afterwards. As for the second side of the question, I use multivariate logistic regressions on a matched sample of sued and non-sued firms, and have the following finding. Controlling for other variables known to affect litigation risk, my measures of earnings management have significant and positive effect on a firm's likelihood of getting sued in class action securities litigation.

Among firms sued for securities fraud, some face allegations of GAAP violations, and some do not. Within the group of firms facing accounting allegations, some are also subject to SEC accounting and auditing enforcement actions or have restated financial statements. I divide all defendant firms into three mutually exclusive subgroups: group one consists of defendant firms subject to SEC enforcement actions or financial restatements; group two consists of defendant facing allegations of GAAP violation, but not subject to SEC enforcement actions or financial restatement; and group three consists of firms sued for securities fraud but with no allegations about accounting frauds. For reasons discussed in the following, I expect that group one exhibits the largest magnitude of earnings management, while group three has the least amount, with group two in between.

DSS (1996) examines the earnings management behavior of 92 firms subject to SEC enforcement. These firms' total accruals as well as discretionary accruals estimated from the modified Jones (1991) model are plotted against event time. The study finds that the firms' accrual measures gradually increase as the alleged year of earnings manipulation approaches, and then experience a sharp decline. It concludes that the evidence is consistent with the notion that the SEC has identified a sample of firms attempting to overstate earnings. DSS (1996, p. 7) argues that due to the high cost of investigation, the SEC only targets firms with high probability of success. Therefore, firms prosecuted by the SEC tend to be the most egregious earnings manipulators.

By restating previously reported earnings, companies publicly admit that they have misstated earnings. In addition, because earnings restatements tend to bring about severe capital market consequences (see, e.g., Wu, 2002; Palmrose et al, 2004), companies would not have restated earnings for immaterial amounts.

For these reasons, I expect that defendant firms with SEC enforcement or accounting restatement overstate their earnings, and their magnitude of such earnings overstatement are greater than that of other defendant firms. As for defendant firms without accounting allegations, the primary issues are those of disclosures rather than GAAP violations. Therefore, this group includes those cases where there may be some earnings manipulation but earnings management is not central to the case. Accordingly, I expect firms with no accounting allegations to exhibit the least amount of earnings management.

My empirical results are consistent with these predictions. In other words, I find that earnings management is most pronounced in group one, defendant firms who face SEC accounting and auditing enforcement actions and/or have restated their financial statements. Earnings management is also found in group two, firms facing accounting allegations but no SEC enforcement or financial restatement, albeit to a lesser extent. Finally, group 3, which consists of defendant firms not facing allegations of accounting fraud, exhibits the least amount of earnings management. By documenting different levels of earnings management in the three subgroups of defendant firms, the study provides evidence that earnings management, which is an aspect of the merits of securities fraud cases, does matter both in terms of defendant firms targeted by securities attorneys and the allegations they choose to include in class action complaints. This finding also indirectly corroborates the validity of the earnings management proxies used in the tests: abnormal current accruals and abnormal change in revenue, which are both developed in chapter 2.

This study contributes to the literature regarding the role of private securities litigation in identifying securities frauds. My empirical findings show that despite the wide-spread suspicion that private class action securities litigation may not be based on merits, such lawsuits appear to have targeted firms that exhibit patterns of earnings management. In other words, earnings management, which is one aspect of merits, does matter in class action securities lawsuits. Furthermore, I find that even after excluding firms subject to SEC enforcement actions or financial restatement, defendant firms facing accounting allegations have apparently managed earnings. Moreover, controlling for other factors (including SEC enforcement), earnings management still has a positive and significant effect on firms' litigation risk. These results suggest that private securities attorneys to some degree have performed the role of identifying earnings manipulators independent of, or in addition to, those identified by the SEC or admitted by the companies themselves. In short, by finding that the incidence of class action litigation is responsive to earnings management, the study shows that private securities litigation is on average effective in targeting earnings manipulators.

The study also contributes to the empirical literature in earnings management. Specifically, I document that defendant firms of class action securities litigation exhibit abnormal levels of discretionary accruals and abnormal change in revenue, two measures of earnings management, prior to, during and after alleged manipulation period. Furthermore, I examine earnings management by three subgroups of defendant firms, and find that as expected, defendant firms facing SEC enforcement actions or financial restatements have the highest amount of earnings management, defendant firms not facing any allegations of accounting violations exhibit the least amount of earnings management, and the group of firms with accounting allegations but without SEC enforcement and financial restatement goes in between. Besides showing that earnings management matters in private securities litigation, this finding also corroborates the validity of the earnings management proxies used in the tests: abnormal current accruals and abnormal change in revenue, which are both developed in the previous chapter.

This chapter is organized as follows. Section 3.2 reviews the legal background about private securities litigation and earnings management, and summarizes the relevant empirical literature. Section 3.3 describes research design issues, including the data. Section 3.4 presents empirical analysis and results. Section 3.5 provides a summary and conclusion.

3.2 Background and Motivation

3.2.1 Private Securities Litigation and Earnings Management

Firms that make misleading financial reporting may be sued by their shareholders. Rule 10b-5 of the Securities Exchange Act of 1934 makes it unlawful to disseminate false information of a material fact, or fail to disclose material relevant information to investors. Therefore, violation of GAAP in financial reporting is also a violation of the Securities Act. 10b-5 cases are typically class action lawsuits filed by law firms on behalf of shareholders. The law firm usually alleges that the defendant firm's misleading disclosure caused a temporary inflation in its stock price, and the plaintiff shareholders suffered damages because of the price inflation. In order to establish a successful case, the plaintiff must show that the misleading disclosure is material and is the cause of a temporary inflation in stock price, and that the plaintiff's reliance on the disclosure caused his or her damage. Reliance typically means that the plaintiffs are aware of and relied on the misleading disclosure for their decisions. However, based on the fraud on the market theory, endorsed by the Supreme Court in its decision in *Basic Inc. v. Levinson*, 108 Supreme Court 978 (1988), plaintiffs only need to show that the shares are traded in an efficient market and therefore they relied on the integrity of the market price. Another point worth mentioning is that most 10b-5 cases are filed after major single-day stock price declines[16]. This is related to the point of materiality and causality. More specifically, the majority of class actions appear to be precipitated by disclosures that lead to sharp stock price declines; and ceteris paribus, with sharp stock price declines, it is easier to establish that shareholders have suffered significant damage.

[16] However, a major price reaction is neither necessary nor sufficient in establishing a successful case under Rule 10b-5. See, for example, footnote 5 of Francis, Philbrick and Schipper (1994). Nonetheless, the majority of securities class actions appear to be brought after disclosures that lead to stock price declines.

Class action securities lawsuits can also be filed under Section 11 or Section 12(2) of the Securities Act of 1933, which specifically governs disclosures related to public stock issuance (both initial and seasoned offerings). The key difference between claims brought under Section 11 or Section 12(2) and claims filed under Rule 10b-5 is the following. While claims brought under Section 10b-5 must adequately allege scienter (i.e., intention to defraud), Section 11 or Section 12(2) claims alleging fraud in IPOs or SEOs are not subject to this requirement. Since most cases are filed under Rule 10b-5[17], for ease of exposition, hereafter I refer to all cases as 10b-5 cases.

Lawsuits filed under Rule 10b-5 used to be frequently based on profit projections that didn't materialize. This has changed since the Congress enacted Private Securities Litigation Reform Act of 1995 (PSLRA) in December 1995. PSLRA was designed in part to deter frivolous and abusive class action lawsuits against companies making voluntary disclosure of forward-looking information. A significant feature of PSLRA is that it provides a safe harbor for voluntary disclosure of financial projection and other forward-looking information[18]. However, one of the consequences of PSLRA appears to be a marked increase in the cases alleging misrepresentations or omission in financial statements (Grundfest and Perino, 1997), since such misstatements are not subject to safe harbor protection. In fact, according to my data (see discussion in Section 3.3.1), accounting-related cases represented 35.9% and 27.7% in class action securities lawsuits filed in 1994 and 1995, respectively; the proportion of accounting-related cases increased to an average of 51.9% between 1996 and 2000.

Within GAAP, firms have considerable discretion in reporting earnings. Numerous studies have shown that firms manage earnings to increase executive

[17] According to Grundfest and Perino (1997), approximately 21 to 24 percent of class action securities litigations filed between 1988 and 1996 alleged violation of Section 11 or Section 12(2).

[18] Johnson et al. (2000) shows that the Act has indeed increased firms' voluntary disclosure of forward looking-information.

compensations, to reduce taxes, to avoid violations of debt covenants, and to temporarily affect stock prices, in addition to several other incentives (see review by Healy and Wahlen, 1999 and McNichols, 2000). Earnings management does not necessarily violate Rule 10b-5. When using discretion to increase income, firms presumably try not to violate GAAP if possible. However, some firms may violate GAAP in order to meet certain earnings targets, when they perceive the benefit of managing earnings exceeds the cost imposed by litigation risk[19].

When firms engage in earnings management outside of GAAP, such behavior constitutes accounting fraud. As evidenced by the number of financial restatements, GAAP-violating earnings management appears to be widespread in publicly traded U.S. companies and can cause severe damage to shareholder wealth. A report prepared by the U.S. General Accounting Office (2002) identified 919 financial restatements at 845 companies from January 1997 to June 2002. According to the GAO report, restating companies represented about 10 percent of listed companies from 1997 to 2002. Improper revenue recognition and expensing was the most frequently cited reason for restatement, representing 38 percent of the cases. These restatements cost investors 10 percent of their stock value in the short term, from the day before to the day after the restatement, and 18 percent in the intermediate term, from 60 days before to 60 days after the restatement.

Earnings management outside of GAAP also constitutes violation of federal securities laws, and is subject to enforcement by the SEC. However, given the limitation of resource, the SEC could only pursue very few of the companies who conducted accounting frauds. The private securities litigation system is a supplement to the SEC effort in deterring future accounting frauds, and it is also a means to provide some

[19] For example, Skinner and Sloan (1999) have documented a so-called "torpedo effect," that is, small earnings disappointment by "growth" firms leads to large decline in stock prices. To avoid this effect, a company may decide to manage earnings outside of GAAP when it has exhausted options to manage earnings within GAAP.

compensation to investors for their losses. However, critics of the private securities litigation argue that the current legal system creates incentive for plaintiffs' attorneys to file "strike suits" and extort settlements from defendant firms. They argue that many factors in the current regime provide incentives to settle instead of going to trial. One of such factors is directors' and officers' (D&O) insurance, which is generally only available to fund settlements, not trial judgments. Other reasons why firms prefer to settle rather than proceed to trial include: high legal cost and diversion of management effort from daily operation during prolonged discovery, and potential reputation loss from a well-publicized trial. Since the option of trial to verdict is critical for merit-based resolutions of legal disputes, the elimination of trial as a viable option causes the lawsuits to produce outcomes not based on substantive merits of the case[20].

Private securities attorneys are usually compensated through contingency fees, ranging from twenty to thirty percent of the recovery. These fees are intended to compensate attorneys for their own litigation risk and for the cost associated with searching out and prosecuting fraud cases[21]. Compared with the expected payoffs from filing securities fraud cases, the costs incurred by private securities attorneys are relatively low. Private securities attorneys are said to scour for class action targets using easily implemented methodology (e.g., looking for sudden drop in stock prices, insider trading activities, financial restatements, etc.); and as soon as a target is found, it can cost an attorney virtually nothing to craft complaints about securities laws violations using ready-made templates, with almost no prefiling investigation. Although under Federal Rule of Civil Procedure 11, attorneys can face sanction for filing patently frivolous cases, courts are reluctant to impose Rule 11. To date, relatively small sanctions have been imposed in only a handful of securities cases. "Consequently, other than the opportunity and other costs associated with pursuing the case through a pretrial dismissal, it appears

[20] See Alexander (1991) and Palmrose (1997) for comprehensive discussion about whether merits do matter in these lawsuits.

[21] Perino (2002, pp. 918).

that attorneys do not face significant downside risks in filing marginal or nonmeritorious securities class actions"[22].

Given the above perceived abuses in private securities litigation, in 1995 Congress enacted the Private Securities Litigation Reform Act (PSLRA, the Act) over President Clinton's veto. The Act creates various procedural hurdles to make it more difficult for private securities attorneys to file and maintain frivolous securities lawsuits. In addition to the safe harbor for forward-looking statements as previously discussed, some of the hurdles raised by PSLRA are: the lead plaintiff provisions, which were intended to reduce the race to the courthouse and increase institutional investor participation in class actions; the heightened pleading standard, which was intended to reduce the incidence of nonmeritorious filings; and the discovery stay, which was intended to decrease plaintiffs' attorneys' ability to impose costs on defendants before a court reviewed the legal sufficiency of the complaint. Because courts have interpreted provisions of PSLRA with wide variation, plaintiff attorneys may choose jurisdictions advantageous for them to bring and establish cases. To curtail this kind of jurisdiction shopping, Congress passed the Securities Litigation Uniform Standards Act of 1998 (the 1998 Act), which requires that class actions involving allegations of securities fraud be brought exclusively in federal, not state, courts.

While discouraging baseless suits, the litigation reforms (PSLRA and the 1998 Act) may inadvertently weaken the role of private securities in deterring securities fraud, and in particular, earnings manipulations. The controversy surrounding PSLRA is heightened in the wake of the explosion of accounting scandals like Enron, WorldCom, MicroStrategy, and Waste Management. Critics of the Act charge that the PSLRA set too high an obstacle for shareholders to pursue legitimate cases, and thus making it easy for perpetrators to escape liabilities for accounting frauds. Because private securities litigation plays an important disciplinary role in the U.S. capital markets, it is imperative

[22] Perino (2002, pp. 938).

to assess the effectiveness of class action litigation in enforcing securities laws and deterring securities frauds. This chapter addresses the question by focusing on the relation between private securities litigation and earnings management. The next section provides an overview of relevant empirical research in this area.

3.2.2 Relevant Prior Research

Several previous studies have considered the role of earnings management in class action securities litigation. C. Jones (1998) studies the determinants of securities litigation risk using a sample of 69 firms sued during 1989-1992 and a control sample of non-sued firms with 10% drop in stock price. He finds a negative but insignificant association between litigation risk and discretionary current accruals estimated from a term-adjusted version of the Jones (1991) model[23]. C. Jones also examines other potential determinants of litigation risk and finds that insider trading and seasoned equity offerings have no effect on litigation risk, but accounting restatements and SEC enforcement actions increase likelihood of lawsuits.

DuCharme et al. (2002) examines the association between earnings management by firms issuing stocks and incidence of litigation, allegation of earnings management, and lawsuit settlement amounts. The study uses a litigation sample consisting of 150 IPOs and 72 SEOs from 1988 to 1997, and a control sample consisting of all IPOs and SEOs that are not subject to litigation during the same periods. After controlling for characteristics of the stock offerings, the study finds (1) a significant and positive association between abnormal current accruals[24] and the incidence of lawsuit filings for the SEO firms, but not for the IPO firms, (2) no significant relation between abnormal

[23] C. Jones (1998)'s abnormal current accruals are the residuals from regressing current accruals on the changes in revenues.

[24] DuCharme (2002)'s abnormal current accruals are the residuals from regressing current accruals on the change in cash sales.

current accruals and allegation of earnings management, (3) significant and positive association between abnormal current accruals and lawsuit settlement amounts for both IPO firms and SEO firms. DuCharme et al. concludes that their results support the view that some firms opportunistically overstate earnings before stock issues, and such earnings manipulation make these firms vulnerable to litigation.

Johnson et al. (2002) investigates the determinants of lawsuit filings, accounting allegations and settlement amounts greater than nuisance value ($2 million). The sample consists of 119 firms sued from 1991 to 2000 in the computer industry, with a control sample matched on stock performance. The study finds a significant association between abnormal accruals[25] and lawsuit incidence post-PSLRA, but not for the pre-PSLRA sample. The study does not find a significant association between abnormal accruals and accounting allegation or lawsuits settled for more than $2 million. In addition to abnormal accruals, Johnson et al. (2002) also uses accounting restatement as a measure of aggressive accounting, and finds it to be positively associated with litigation risk, accounting allegation and settlement of more than nuisance amount in the post-PSLRA period, but not in the pre-PSLRA period. The paper concludes that its findings suggest that PSLRA has effectively discouraged frivolous lawsuits and made lawsuits in the post-PSLRA period more based on merits.

Also relevant to my study is a paper on auditor litigation: Heninger (2001) investigates the relation between abnormal accruals (estimated from the modified Jones model) and incidence of lawsuits against firms' auditors. On a sample of 67 firms whose auditors are sued during 1969 to 1998, along with a randomly selected control sample matched on year and industry, Heninger (2001) finds that probability of auditor litigation increases as clients have higher abnormal accruals.

[25] Johnson et al. (2002) use the Jones (1991) to estimate abnormal accruals. In other words, abnormal accruals are the residuals from regressing total accruals on the changes in revenue and gross property, plant and equipment.

Under an "ideal" legal system as far as policing earnings manipulation is concerned, earnings manipulators should be punished by getting sued, and firms who get sued should be earnings manipulators. The above studies examine the effect of abnormal accruals on lawsuit incidence and thus assess the former criterion. To my knowledge, no prior research has systematically evaluated the effectiveness of private securities litigation based on the latter criterion: whether firms who get sued are earnings manipulators. This latter criterion is to be studied in the first set of hypotheses developed in the next section.

3.3 Research Design

3.3.1 Sample and Data Source

The shareholder lawsuits data are obtained from the class action securities litigation database of Woodruff-Sawyer & Co (hereafter, WS). This database is compiled and maintained by WS in-house researchers and covers almost the entire population of federal shareholder class action lawsuits filed from 1988. The sources for this database include Securities Class Action Alert newsletters, Securities Class Action Clearinghouse by Stanford Law School, Press releases and wire service articles, IPO Reporter newsletter, Moody's Corporation Data System, and various law firms and claims administration services.

From the WS database I obtain the following information about the lawsuits: name of the company sued; starting and ending date of class period; date of class action filing; the nature of the allegation made, including whether there is specific allegations about improper accounting or violation GAAP; indication whether the company has restated its financial numbers; type of disposition of the case; total dollar sum of cash and non-cash settlement and court awarded damages. The accounting data I use to estimate discretionary accruals and abnormal change in revenue are obtained from the Compustat full coverage, industrial and research quarterly files. The stock returns data are obtained from CRSP daily stocks and indices files.

Information about whether a defendant company is subject to SEC enforcement is obtained from the Accounting and Auditing Enforcement Releases (AAERs) No. 1 through No. 1385, published by the SEC from April 1982 to April 2001[26]. The AAERs record enforcement actions brought by the SEC against companies (and/or auditing firms, officers and directors) for violating the financial reporting requirements of the Securities Exchange Act of 1934. For each release of AAERs, I collect the name of the corporation whose financial reporting is questioned. The names of the enforced companies along with periods of violation are then matched with those of the defendant companies in the WS class action litigation database. There are 618 unique firms cited in AAERs no 1 – 1385, and 163 of these firms are sued in 189 class action securities lawsuits during 1980-2000 according to the WS database.

The litigation sample consists of shareholder class action securities lawsuits in the WS database whose class period begin within 1988-2000. Table 3.1 Panel A describes the process of my sample selection. From the population of 2,033 class action lawsuits, I sequentially remove the following: (1) 279 cases with defendant firms in the financial and banking industry (SIC 6021-6799); (2) 122 cases with no beginning or ending date for class period; (3) 197 cases which is not the first class action securities lawsuit for the firm during 1988-2000; (4) 267 cases with defendant firms not covered in Compustat; (5) 70 cases with no fiscal quarter falling within alleged manipulation period[27]; and (6) 317 cases with missing Compustat data for calculating abnormal accruals and abnormal change in revenue during alleged manipulation periods. After imposing these restrictions,

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[26] The cutoff at Release No. 1385 merely reflects the timing of my data collection.

[27] See Section 4.2 for discussion of alleged manipulation period. In short, for a fiscal quarter to be part of alleged manipulation period, the quarterly earnings announcement date should fall within class period.

my sample includes 781 firms. The availability of Compustat and CRSP data for certain variables will affect the sample sizes for each test.

Table 3.1 Panel B reports the lawsuit sample by industry (as defined in Barth et al. 1998), whether defendant firms are subject to SEC enforcement or have restated their financial statements, and whether there are accounting allegations. Among the fourteen industries, the computer industry has the biggest number of lawsuits, and represents about one-third of all the cases filed, as well as cases with SEC enforcement, restatement and/or accounting allegations. This is consistent with several prior studies' (e.g., Jones and Weingram, 1998) finding that technology firms are more susceptible to securities class action lawsuits.

Panel C of Table 3.1 lists case filings by year of class period beginning. There is generally an upward trend in case filings over years, reflecting the growth in the overall economy. The drop in the percentage of cases with defendant firms subject to SEC enforcement is due to the time-lag from beginning of manipulation periods to the issuing of AAERs, and my cut-off point of reviewing AAERs. As such, the number of firms subject to SEC enforcement may be understated in my sample in later periods. Note also that the WS litigation database does not systematically code the restatement variable prior to 1996. Therefore, the number of defendant firms with accounting restatement is likely understated from 1988 to 1995. In the whole sample of 781 firms across all years, there are 66 (8.5%) defendant firms subject to SEC accounting and auditing enforcement actions, 108 (13.8%) firms with accounting restatements, and 366 (46.9%) facing allegations of GAAP violation. Note that lawsuit filings in the three columns of Table 3.1 (SEC Enforcement, Accounting Restatement, and Accounting Allegations) can be overlapping and not mutually exclusive. More specifically, defendant firms subject to SEC enforcement might also have restated its financial statements; defendant firms with SEC enforcement and/or earnings restatement usually also face accounting allegations.

Table 3.1 Panel D reports case outcome of the lawsuits. For cases with disposition data available, 79.1% are settled. 18.5% are dismissed, 1.0% are tried and 1.4% withdrawn. Compared with all cases pooled together, cases with accounting allegations appear to be more often settled (87.7% vs. 79.1%) and less often dismissed (11.5% vs. 18.5%). The same is true for cases with restatement and especially SEC enforcement, with the latter group settled in 95.1% cases and dismissed only in 4.9% cases.

As previously discussed, the class action securities litigation sample used in this study constitutes the largest of its kind used in academic accounting research. We know that *ceteris paribus*, large sample size increases the power of statistical tests. Moreover, because my sample covers a large portion of all private securities lawsuits filed in federal courts in various industries from 1988 to 2000[28], empirical results generated from my sample are more generalizable than results found from samples of firms limited to a single industry. However, if a larger sample is more heterogeneous, then larger variance will lower the power of statistical tests. Furthermore, compared with my approach of including a large sample of firms from various industries, a study focused on a single industry and with smaller sample size may better control for other important variables which are largely hand-collected[29].

3.3.2 Manipulation Period

To test my hypothesis of earnings management by defendant firms, it is critical to understand the timing of earnings management and its revelation. Ideally, I should

[28] The WS class action securities litigation database covers virtually the entire population of private securities lawsuits brought to federal courts. Out of the 2,033 cases covered in the WS database from 1988 to 2000, 781 (or 42.8%) are included in my sample.

[29] For example, Johnson et al. (2002) studies class action securities litigation within computer hardware and software industries. When examining determinants of lawsuit filings, the study includes hand-collected corporate governance variables, such as director average tenure, percentage of outside directors on the board, as control variables.

identify the specific periods with allegedly misstated financial statements. However, the WS database does not provide information about manipulation period, and I have to infer this information from an available variable: class period.

Diagram 1 illustrates the chronology of events for a typical firm sued by shareholders for alleged GAAP violation. A class period is the period during which a company is alleged to have engaged in improper conduct. To determine when the class period begins and ends, plaintiffs' attorneys review the facts of the case, including company disclosures and reaction of share prices. Usually, the class period starts with the first occurrence of material misrepresentation and ends with the revelation of prior misstatement. Because of the nature of financial reporting (more specifically, the financial results are always announced after the period ends), the manipulation period usually starts before the beginning of the class period and ends before the ending of the class period. But the two periods usually have some overlapping. To illustrate this point, I use the case of Informix Corp[30] as an example. On 2/8/1995, Informix issued a press release announcing its financial results for fiscal year 1994 ended 12/31/1994, containing allegedly overstated earnings. During the subsequent periods, the company made a series of announcements containing misstated quarterly and annual earnings for year 1995 and 1996. On November 18, 1997, the Company announced that it had completed its extended audit and that it had restated results for 1994, 1995, 1996 and the first and second quarters of 1997. According to the WS litigation database, the class period for this case is 2/8/95 – 11/18/97. In contrast, the manipulation period is 10/1/94 – 6/30/97, with financial results manipulated for fiscal year 1994, 1995 and 1996, and for all quarters of 1995 and 1996.

Because of the above relation between class period and manipulation period, I use the following criterion (which is illustrated in Diagram 2) to estimate the manipulation

[30] This case is settled for $136.5 million, making it one of the top-ten "mega-settlements" in the US, according to Securities Class Action Clearinghouse by Stanford Law School.

period. For a quarter to be part of the manipulation period, I require its earnings announcement date (Compustat item RDQE) to occur within the class period. Let me illustrate using the Informix example. Because earnings announcement for the fourth quarter of 1994 was made on 2/8/1995, which coincides with the start of the class period, Q4 1994 is the first quarter of the manipulation period. Since the last earnings announcement made before the class period ends is for the second quarter of 1997, Q2 1997 is the last quarter in the manipulation period.

3.3.3 Proxies for Earnings Management

To examine evidence of earnings management by defendant firms of private securities litigation, the measure of earnings management is a key research design choice. Recent earnings management studies have often used discretionary accruals estimated from regression-based expected accruals models as proxies for earnings management[31]. However, in addition to managing accruals, companies could also manage components of earnings that are not necessarily reflected in accruals. For example, to artificially inflate earnings, a company could prematurely recognize revenue from a multi-period contract. When cash is received up front for such a contract, accrual models will not capture this kind of earnings management. Therefore, in addition to abnormal accruals, I have introduced in Chapter 2 abnormal change in revenue as a measure of earnings management by firms sued for securities fraud. Abnormal change in revenue is estimated from the revenue model, and abnormal accruals are estimated from the instrumental variable (IV) model of current accruals. Both models are described in Chapter 2. While it is an invention of this dissertation to use abnormal change in revenue as a measure of revenue manipulation, numerous prior studies have used discretionary accruals from Jones (1991) model and its variation as proxies for earnings management. I choose to use

[31] See Healy and Wahlen (1999) and McNichols (2000) for reviews of earnings management studies.

abnormal change in current accruals estimated from my IV model as the proxy for earnings management, because in Chapter 2 I find that compared with other widely-used discretionary accruals measures, this measure generates tests of earnings management with the best specification and power.

3.3.4 Performance Matching

Just like any empirical proxies for earnings management used in the literature, my estimates of abnormal change in revenue and abnormal current accruals measure earnings management with error. If such measurement error is correlated with the incidence of lawsuit filings, then my tests of earnings management will be biased. DSS (1995) finds that although modified Jones model is the best among all the models tested, it still produces earnings management tests that are not well specified for sample of firm-periods experiencing extreme performance, in that firms with extremely low (high) earnings tend to have negative (positive) accrual prediction errors. Furthermore, Kasznik (1999), McNichols (2000) and Kothari et al. (2005) show that discretionary accruals from commonly used accrual expectation models (Jones model and modified Jones model) are correlated with growth.

For the above reason, I adopt a performance-matching approach to calculate abnormal accruals, as suggested by Kothari et al. (2005). More specifically, I construct a nonlitigation control sample matching on industry and earnings performance. Each defendant firm is matched with a nonlitigation firm from the same industry with comparable earnings performance as the defendant firm at the beginning of alleged manipulation period. Abnormal change in revenue (ABCHREV) and abnormal current accruals (ABCAC) are calculated for both the litigation sample and the control sample. The performance-matched ABCHREV and ABCAC for defendant firms are calculated as the ABCHREV and ABCAC of the defendant firm minus ABCHREV and ABCAC of the control firm, respectively.

The matching procedure is as follows. For each defendant firm, I find its first fiscal quarter of alleged manipulation, and identify all firms within the same 3-digit SIC code with Compustat data available for calculating return on asset (earnings scaled by beginning assets) and IV model abnormal current accruals for that quarter, excluding any firm ever sued for securities fraud during the period 1980-2001, as mentioned in the WS litigation database. Within this group of firms, I find the firm with the closest ROA to the defendant firm's ROA during the first quarter of alleged manipulation. I impose a restriction that the matched-firm's ROA should be no bigger (smaller) than 120% (80%) of the ROA by the defendant firm. If no matching firm can be found within 3-digit *SIC* industry, I look for a matching firm satisfying the criteria with the same 2-digit *SIC* code, and finally 1-digit *SIC* code. This procedure is successful in obtaining close matches for the majority of the defendant firms. Of all defendant firms, 78.1% are matched on three-digit SIC codes, and 92.1% are matched on at least two-digit SIC codes. The mean (median) ROA is -1.76% (1.38%) for the litigation sample and -1.62% (1.37%) for the control sample. The difference in mean and median of the two distributions are not statistically significant.

Table 3.4 includes a comparison of the litigation sample and the control sample in terms of variables such as leverage, ROA, and sales growth. The table shows that there is no significant difference in ROA between the two groups. The litigation group's leverage (mean 0.382, median 0.074) is higher than that of the control group (mean 0.183, median 0.061). The litigation group's sales growth has a lower mean (1.136 vs. 1.300) but higher median (1.079 vs. 1.049) than that of the control group. Section 3.4.2.1 will define a number of other variables and compare between the two groups.

The performance-matching procedure is used to eliminate measurement errors in my revenue and accruals expectation models that are correlated with firm performance. However, control firms with similar earnings performance may have similar incentives to manage earnings. For this reason, the matching procedure may be too conservative and fail to detect earnings management by defendant firms. In other words, if return on assets is related to actual earnings management, then the performance-matching procedure could remove abnormal change in revenue and abnormal current accruals resulting from defendant firms' earnings management activities.

3.4 Empirical Results

3.4.1 Have Defendant Firms of Private Securities Litigation Managed Earnings?

3.4.1.1 Time series profiles of earnings management proxies

Figure 1, 2 and 3 plot median quarterly changes in revenue and current accruals by 781 firms sued in class action securities litigation from 1988 to 2000, along with a control sample matched on ROA, against event time. Each data point in these figures represents the median of abnormal change in revenue or abnormal current accruals for sample firm-quarters pooled within that event year. The definition of the event periods in the figures is as follows: Lit1 and Lit2 are the first and second four-quarter period during the manipulation period, respectively. Year -3, -2, and -1 is the third, second and first four-quarter period prior to the first quarter of alleged manipulation. Year 1, 2 and 3 is the first, second and third four-quarter period after the last quarter of alleged manipulation. Figure 1B plots median quarterly predicted and abnormal current accruals of defendant companies, along with control sample, against event time.

Figure 1 illustrates the litigation sample and the control sample's behavior of predicted and abnormal change in revenue estimated from the revenue model described in Section 2.4.1. Plot A separately displays the predicted and abnormal change in revenue by the litigation sample and the control sample. Plot B presents the matched-pair predicted and abnormal change in revenue. Both plots indicate that even after controlling for earnings performance, the litigation sample's abnormal change in revenue is positive in the periods leading to the alleged manipulation period, and then subsequently experience a sharp decline and become negative. Untabulated results show that the matched-pair difference in abnormal change in revenue between the litigation and control firms is significant (both in mean and median) in the year prior to the first quarter of alleged manipulation, the first year of alleged manipulation, and the year after the last quarter of alleged manipulation.

Figure 2 presents the time series profile of IV-model predict and abnormal current accruals of litigation and control samples. Plot A makes comparison between the litigation sample (solid lines) and the control sample (dotted lines). Plot B plots the matched-pair predicted and abnormal current accruals estimated from the IV model of current accruals discussed previously. The two plots indicate that while predicted current accruals stay relatively flat over time, the litigation sample's abnormal current accruals gradually increase as the alleged manipulation period approaches, and then experience a sharp decline, even after controlling for earnings performance. Untabulated results indicate that the matched-pair difference in abnormal current accruals between the litigation and control firms is statistically significant (both in mean and median) in the year prior to the first quarter of alleged manipulation, the first year of alleged manipulation, and the year after the last quarter of alleged manipulation.

Taken together, Figure 1 and Figure 2 indicate that even after controlling for earnings performance, defendant firms' abnormal current accruals and abnormal change in revenue gradually increase as the manipulation period approaches and experience a sharp decline after the manipulation period. The evidence is consistent with the notion that the defendant firms have used discretionary accruals and reported abnormal growth in revenue to overstate earnings during manipulation periods and such earnings overstatement reverses subsequently.

Comparing Figure 1 and Figure 2, however, we find some differences between the revenue plots and the accruals plots. For example, Figure 1 Plot B shows that litigation firms had positive and unusually high abnormal change in revenue in the three years prior to the alleged manipulation period, as well as the first year of the alleged manipulation period. However, abnormal change in revenue of the litigation sample gradually declines. Going into the second year of alleged manipulation period, there is no significant difference in abnormal change in revenue between the litigation sample and the control sample. Defendant firms' abnormal change in revenue reaches the lowest and negative point in the first year after the alleged manipulation period, after which it gradually recovers to the point of showing no difference from the control firms. In contrast, Figure 2 Plot B shows that three years prior to the start of alleged manipulation period, the litigation sample starts out with no difference in abnormal current accruals from the control group. Defendant firms' abnormal current accruals then gradually increases till it reaches the highest point in the first year of alleged manipulation period. Then it gradually decreases until it reaches the lowest and negative point in the second year of alleged manipulation. After that point, it recovers till three years after alleged manipulation period, when there is no significant difference between the litigation group and the control group. The difference between Figure 1 and Figure 2 shows that revenue overstatement and its subsequent reversal happens about one or two years before the overstatement and reversal of abnormal accruals. In other words, defendant firms' revenue management predates accruals management by one or two years. I conjecture that this is because defendant firms start out by managing reported revenue growth in order to overstate earnings; later when their true revenue growth cannot be sustained, these firms resort to accrual management in order to report better earnings.

Within all firms sued for securities fraud, I further examine the earnings management behavior of four subsamples: (1) firms subject to SEC accounting and auditing enforcement actions ("enforce"), (2) firms with restated financial statements ("restate"), (3) firms with accounting allegations but without SEC enforcement or accounting restatement (GAAP only); and (4) firms without accounting allegations, enforcement or restatement ("no GAAP"). Note that the "enforce" group and the "restate" group are not mutually exclusive. However, the combined group of "enforce or restate", the "GAAP only" group and the "no GAAP" group are mutually exclusive.

Figure 3 generally confirms the prediction about magnitudes of earnings management by subgroups of defendant firms. Plot A presents matched-pair IV-model abnormal current accruals by four groups of defendant firms over time. As expected, the "enforce" and the "restate" firms display the most evident pattern of accruals management: the magnitude of both the positive abnormal current accruals in the period leading to alleged manipulation period, and the subsequent reversal are higher for these two groups compared to the "GAAP only" and the "no GAAP" group. Furthermore, the "no GAAP" group exhibits the lowest degree of accruals management among all four groups. Plot B shows the matched-pair abnormal change in revenue by the four subgroups of defendant firms. Also as expected, the "enforce" and the "restate" firms exhibit the most evident pattern of revenue management, while the "no GAAP" firms appear to have engaged in the least amount of revenue management.

3.4.1.2 Regression Analysis

Next, I use the following regression to examine earnings management by defendant firms in periods during and surrounding alleged periods of manipulation:

$$EM_{itq} = \alpha + \gamma_1 BEF3 + \gamma_2 BEF2 + \gamma_3 BEF1 + \gamma_4 LIT1 + \gamma_5 LIT2 + \gamma_6 LIT3plus + \gamma_7 AFT1 + \gamma_8 AFT2 + \gamma_9 AFT3 + \varepsilon_{it}, \quad (3.1)$$

where:

i	=	Firm index for defendant firms;
t	=	Period index for year-quarter;
q	=	Index for earnings management proxies: $q = 1$ for abnormal current accruals estimated from the IV model; $q = 2$ for abnormal change in revenue estimated from the revenue model;
EM_{it1}	=	Performance-matched abnormal current accruals, i.e., abnormal current accruals of defendant firm minus abnormal current accruals of control firm, both estimated from the IV model described in Chapter 2;
EM_{it2}	=	Performance-matched abnormal change in revenue, i.e., abnormal change in revenue of defendant firm minus abnormal change in revenue of control variable, both estimated from the revenue expectation model described in Chapter 2;
BEF3 – BEF1	=	1 if the observation is from the third, second and first four-quarter period, respectively, prior to the first quarter of alleged manipulation period; 0 otherwise;
Lit1 and Lit2	=	1 if the observation is from the first and second four-quarter period, respectively, during alleged manipulation period; 0 otherwise;
Lit3plus	=	1 if the observation is from a quarter after the ninth quarter during manipulation period; 0 otherwise;
AFT1-AFT3	=	1 if the observation is from first, second or third four-quarter period, respectively, after the last quarter of alleged manipulation period; 0 otherwise.

The regression is run on the litigation sample, which consists of all firm-quarters of the 781 defendant firms with necessary Compustat data to calculate quarterly earnings management measures EM_{itq} from 1988 to 2000.

The null hypothesis of no earnings management in each period is tested by applying a t-test to the null hypothesis that the coefficient on the indicator variable is zero. The alternative hypotheses of earnings management are: γ_3 and $\gamma_4 > 0$, $\gamma_7 < 0$. In other words, positive coefficients on indicator variables for periods during and immediately prior to alleged manipulation, and negative coefficients on indicator variables for periods immediately after the alleged manipulation period would be consistent with the earnings management hypothesis.

Columns (1) and (2) of Table 3.2 and 3.3 summarize the regression results of equation (3.1). The dependent variable in Table 3.2 is the performance-matched abnormal change in revenue estimated from the revenue model. Panel A partitions all cases on existence on accounting allegations. As expected, estimated coefficients on BEF1, LIT1 and AFT1 are all significant and with the expected signs. Panel B partitions all cases with accounting allegations based on existence of SEC enforcement actions or accounting restatement. Estimated coefficients on BEF1 and AFT1 are significant and with the expected signs for both groups. Estimated coefficient on LIT1, however, is positive but only significant for the group of firms without enforcement or restatement.

In Table 3.2, the dependent variable is the performance-matched abnormal current accruals estimated from the IV model. Panel A partitions the litigation sample into two groups: those with accounting allegations and those without. For both groups, estimated coefficients on BEF1, LIT1 are significantly positive as expected. For firms with accounting allegations, the estimated coefficient on AFT1 is significantly negative as expected. Panel B focuses on the sample of firms with accounting allegations, and further partitions these firms into two subsamples: those with SEC enforcement actions or accounting restatement, and those without. The estimated coefficients on BEF1, LIT1, and AFT1 are all significant and with expected signs for both subsamples.

Overall, regression results for equation (3.1) supports the notion that defendant firms overstate earnings through accruals and revenue management, and such earnings overstatement reverses subsequently.

I then use the following regression to test the difference in magnitudes of earnings management by subsamples of defendant firms:

$$EM_{itq} = \alpha + \beta Part_s + \gamma_1 BEF3 + \gamma_2 BEF2 + \gamma_3 BEF1 + \gamma_4 LIT1$$
$$+ \gamma_5 LIT2 + \gamma_6 LIT3plus + \gamma_7 AFT1 + \gamma_8 AFT2 + \gamma_9 AFT3$$
$$+ \gamma_{10} Part*BEF3 + \gamma_{11} Part*BEF2 + \gamma_{12} Part_s*BEF1$$
$$+ \gamma_{13} Part_s*LIT1 + \gamma_{14} Part_s*LIT2 + \gamma_{15} Part_s*LIT3plus$$
$$+ \gamma_{16} Part_s*AFT1 + \gamma_{17} Part_s*AFT2 + \gamma_{18} Part_s*AFT3 + \varepsilon_{it}, \qquad (3.2)$$

where:

s	=	Index for type of partition on litigation sample: s = 1 for partition on whether there are accounting allegations; s = 2 for partition on whether the defendant firm has accounting restatement or SEC enforcement;
$Part_1$	=	GAAP, which is a dummy variable that equals one if defendant firm is subject to accounting allegations;
$Part_2$	=	AARE, which is a dummy variable that equals one if the defendant firm is subject to SEC enforcement action or has accounting restatement;

and all other variables are the same as defined in equation (3.1).

As previously discussed, I expect defendant firms subject to SEC enforcement or financial restatement to exhibit larger magnitude of earnings management than defendant firms otherwise only facing accounting allegations. Therefore, I predict γ_{12} and $\gamma_{13} > 0$, $\gamma_{16} < 0$. In other words, in the year before and the first year of alleged manipulation period, firms with accounting allegations (firms with enforcement or restatement) overstate earnings more than firms without accounting allegations (firms with accounting allegation but without enforcement or restatement). In the year after alleged manipulation period, firms with accounting allegations and firms with enforcement/restatement experience more earnings reversal.

I then examine the difference in the magnitude of earnings management by defendant firms facing accounting allegations and those not facing such allegations. As previously discussed, I expect firms with accounting allegations overstate earnings more than firms without such allegations do. To test this, I partition defendant firms according to existence of accounting allegations. The results are presented in Panel A Column (3) of Table 3.2 and 3.3. Table 2.2 Panel A Column (3) shows that when dependent variable is abnormal change in revenue estimated from the revenue model, estimated coefficient on GAAP*BEF1 and GAAP*AFT1 are significant and with expected sign. Table 3.3 Panel A Column (3) indicates that when the dependent variable is abnormal current accruals, estimated coefficients on GAAP*BEF1, GAAP*LIT1 and GAAP*AFT1 are all significant and with the expected signs. Therefore, regression results suggest that consistent with prediction, firms with accounting allegations tend to overstate both accruals and revenue growth to a larger extent than firms without such allegations.

Next, I examine the prediction that defendant firms subject to SEC enforcement actions or financial restatements manage earnings more than defendant firms otherwise only face accounting allegations. To do this analysis, I further partition firms with accounting allegations into two subsamples: firms with SEC enforcement actions or accounting restatements, and those without. The results are presented in Panel B Column (3) of Table 3.2 and 3.3. Table 3.2 Panel B Column (3) shows that when the dependent variable is abnormal change in revenue, none of the estimated coefficient on AARE *BEF1, AARE&LIT1 and AARE *AFT1 are significant. However, when the dependent variable is abnormal current accruals, Table 3.3 Panel B Column (3) indicates that estimated coefficients on AARE*BEF1, AARE *LIT1 and AARE *AFT1 are all significant and with expected signs. In short, regression results suggest that consistent with my prediction, firms with enforcement/restatement tend to overstate earnings by managing accruals more than firms with accounting allegations but no enforcement/ restatement. However, the two subsamples do not seem to differ in the magnitude of revenue management.

To summarize, the evidence from Figure 1 - 3 and Table 3.2 & 3.3 indicates that defendant companies display patterns of earnings and revenue manipulation consistent with plaintiffs' complaint. More specifically, the companies overstate earnings using discretionary accruals and abnormal change in revenue in the periods leading to alleged manipulation period, and these discretionary components or earnings take a reversal after the manipulation period. Furthermore, defendant firms facing accounting allegations appear to overstate accruals and revenue to a greater extent than firms without such allegations; defendant firms with SEC enforcement or accounting restatement appear to overstate accruals (but not revenue) more than firms with accounting allegations but no enforcement or restatement.

3.4.2 Does Earnings Management Increase Litigation Risk?

3.4.2.1 Variable Definitions and Univariate Tests

Turning to the second research question, does earnings management increase litigation risk, I construct three sets of variables to capture determinants of probability of class action securities lawsuits: (1) market variables, (2) indications of aggressive accounting, and (3) incentives for aggressive accounting. Definitions of the variables are listed in the Appendix.

The first set of variables includes stock market variables used in prior research to predict securities class action lawsuits. Studies[32] have found that market capitalization (Log market cap), equity beta (Beta), share turnover (Turnover), and return kurtosis (Kurtosis) are positively associated with incidence of lawsuits, while recent period cumulative returns (Cum. Return), precipitous drop in stock price (Min. Return[33]), and

[32] For example, Francis et al. (1994), Jones and Weingram (1996a, b), Jones (1998), Johnson et al. (2000), and Johnson et al. (2002).

[33] As defined in the Appendix, Min. Return is the minimum daily return of defendant firm during class period.

return skewness (Skewness) are negatively associated with incidence of lawsuits. Table 3.5 Panel A shows that as expected, compared to control firms, defendant firms are larger (Log market cap), and have experienced worse stock performance (Cum. Return) and more severe sudden drop in stock prices (Min. Return). Also as expected, defendant firms' stocks are more actively traded (Turnover), with heavier tails (Kurtosis) and more skewed to the left (Skewness) in return distribution. The paired t-test and Wilcoxon signed-rank test are both significant at the 0.001 level (one-tailed) for all of these market variables.

The second set of variables represents indications of aggressive accounting. The first variable, Enforcement, is a dummy variable which equals one for firms subject to SEC accounting and auditing enforcement actions (as cited in AAERs) related to reporting periods falling within alleged manipulation periods. DSS (1996) find evidence consistent with SEC enforced firms having manipulated earnings. Further, Jones and Weingram (1996b) find that litigation risk is higher for firms subject to SEC enforcement actions[34]. The second variable, abnormal current accruals (ABCAC), is a proxy for earnings management through accruals. The third variable, abnormal change in revenue (ABCHREV), attempts to measure earnings management through manipulation in recording revenues. Table 3.5 Panel A shows that as expected, compared to control firms, defendant firms are more likely subject to SEC enforcement actions, and have significantly higher abnormal current accruals (ABCAC) and abnormal change in revenue (ABCHREV).

The third set of variables attempts to capture incentives for aggressive accounting. Prior studies show that firms are more likely to engage in aggressive accounting if they

[34] Jones and Weingram (1996b) and Johnson et al. (2002) also find that accounting restatements increase a firm's probability of getting sued. However, I have excluded the restatement variable from determinants of lawsuit incidence because of data restriction. More specifically, I only know whether a defendant firm has made accounting restatement during class period, but I haven't collected data on accounting restatement by firms not facing class action securities lawsuits.

have high leverage (Leverage) or high sales growth (Sales Growth), attempt to issue stocks (Equity Issue) or make stock-based acquisitions (Acquisitions). More specifically, studies find that firms report positive abnormal accruals prior to SEOs (Teoh et al. 1998b), IPOs (Teoh et al. 1998a; Teoh et al. 1998), and stock-financed acquisitions (Erickson and Wang 1998). Dechow et al. (1996) find that firms with high leverage or depend on external financial are more likely to be subject to SEC enforcement actions. Beneish (1997) finds that leverage and sales growth are positively associated with probability of GAAP violation. It is also suggested in the literature that firms have incentive to manage earnings in order to maintain increasing pattern of earnings (captured by the variable return on assets, ROA)[35].

Table 3.4 Panel A shows as expected, defendant firms are more likely than control firms to have made acquisitions or issued stocks, and generally have higher leverage. However, because I select control firms based on closeness in return on assets[36], defendant firms do not appear to have consistently higher Sales Growth and ROA than control firms.

Table 3.4 Panel B reports correlations among all the above variables and the indicator variable, Lawsuit, which equals one for firms sued for securities fraud. The Spearman correlations between Lawsuit and all of these variables are significant and have expected signs, with the exception of ABCHREV (marginally significant) and ROA

[35] Barth et al. (1999) demonstrate that firms with patterns of increasing earnings have higher price-earnings multiples than other firms; however, PE ratio declines significantly when earnings decrease after a previous pattern of increasing earnings. Myers and Skinner (1999) find evidence consistent with the idea that firms manage earnings to accomplish and maintain a pattern of increasing earnings.

[36] Each defendant firm is matched with a control firm with the closest return on assets in the first quarter of alleged manipulation is selected within the same industry. Note that the ROA reported in Table 3 is a quarterly average of return on assets within alleged manipulation periods. Considering the possibility that my matching procedure may not completely control for earnings performance, I include ROA as a control variable in multivariate regressions involving abnormal current accruals.

(unexpected sign). The correlations between abnormal change in revenue (ABCHREV) and abnormal current accruals (ABCAC) are positive but not very high (0.06), suggesting that these two measures of earnings management are distinct from each other.

In addition to the above three sets of explanatory variables for incidence of lawsuit filings, Table 3.4 Panel A also reports descriptive statistics of several other variables used in later hypothesis testing. The statistics indicate that of all the firms sued for securities fraud, 54.4 percent have class periods ending in or after 1996 (Post PSLRA), 46.9 percent face allegations of GAAP violation (Accounting Allegation), 13.8 percent have accounting restatement within class period[37]; 7.3% have external auditors also sued (Auditor Sued); 36.2% face allegations about insider trading (Insider Allegation). Defendant firms also experience sizable negative market-adjusted returns surrounding end of class periods (ABRET3), with a mean (median) of -25.0% (-23.5%).

3.4.3 Regression Analysis

Having defined the variables, I then analyze the effect of earnings management on probability of class action securities lawsuits using the following logit model:

$$\begin{aligned} \text{Lawsuit} = \alpha &+ \beta_1\text{ABCHREV} + \beta_2\text{ABCAC} + \beta_3\text{Enforcement} \\ &+ \beta_4\text{Log Market Cap} + \beta_5\text{Turnover} + \beta_6\text{Beta} + \beta_7\text{Kurtosis} \\ &+ \beta_8\text{Skewness} + \beta_9\text{Min. Return} + \beta_{10}\text{Cum. Return} \\ &+ \beta_{11}\text{Leverage} + \beta_{12}\text{Acquisition} + \beta_{13}\text{Equity Issue} \\ &+ \beta_{14}\text{Sales Growth} + \beta_{15}\text{ROA} + \beta_{16}\text{Post PSLRA} + \varepsilon. \qquad (3.3) \end{aligned}$$

All variables are discussed in Section 3.4.2.1. Table 3.6 presents regression results.

[37] The WS database does not systematically code the restatement variable prior to 1996, therefore, 13.8 percent most likely understates the proportion of defendant firms with financial restatements.

The estimated coefficients on abnormal change in revenue (ABCHREV) and abnormal current accruals (ABCAC) are 3.02 and 3.87, with probability value of 0.03 and less than 0.01, respectively. Therefore, as expected, both earnings management measures are statistically and economically significant positive explanatory variables for litigation risk. Note that ABCHREV and ABCAC both have significant explanatory power for litigation risk, even though they are "competing" with each other as well as in the presence of several other "competing" variables such as Enforcement.

Enforcement, which is the other variable to capture indication of aggressive accounting, is also significantly positively associated with the incidence of lawsuit filing (with coefficient 3.93 and p-value less than 0.001). The market variables that have significant estimated coefficients are: firm size (Log Market Cap), share turnover (Turnover), daily return skewness (Skewness) and minimum daily abnormal return during class period (Min. Return), cumulative abnormal return over class period (Cum. Return). All of these estimated coefficients have predicted signs.

As for variables intended to capture the incentives of aggressive accounting, only two of them have significant estimated coefficients: both Sales Growth and ROA are negatively associated with incidence of lawsuit filing. This is inconsistent with the role of these two variables as incentives for earnings management. In fact, since I also include ABCHREV and ABCAC as regressors, Sales Growth and ROA may be capturing the normal portion of sales and earnings performance. Therefore, the positive coefficients are consistent with the notion that controlling for earnings management, firms with higher sales growth and return on assets are less likely to be sued.

Also noteworthy is the significant and negative coefficient on Post PSLRA (coefficient estimate -0.521, p-value less than 0.001). This is consistent with the notion that the Reform Act discouraged frivolous lawsuits and reduced securities litigation risks for firms. Finally, the logit model explains a significant portion of litigation risk, with pseudo R^2 equaling 0.35.

3.5 Summary and Conclusion

Private securities litigation is an important disciplinary mechanism in the U.S. capital markets. It is designed as a supplement to the government enforcement of securities laws. However, there is an on-going controversy regarding the effectiveness of class action securities litigation in terms of identifying and deterring securities frauds, and in particular, earnings manipulations. This chapter addresses this issue by asking the following question: does class action securities litigation properly target earnings manipulators? In particular, I study two aspects of this research question. First, I directly examine whether defendant firms of class action securities litigation have managed earnings. Second, I study whether controlling for other factors, class action securities litigation is responsive to earnings management. The empirical results suggest that in general, the answers to both of these two questions are affirmative.

To answer the first question, on a large sample of firms sued in securities class action litigation, I document strong evidence that defendant firms have overstated earnings using accruals and revenue management during alleged periods of manipulation. More specifically, even after controlling for earnings performance, both the revenue growth and current accruals are abnormally high prior to and during alleged manipulation periods, and they tend to reverse subsequently. Moreover, this phenomenon is most pronounced for a subset of defendant firms that are subject to SEC accounting and auditing enforcement actions, or have restated their financial statements. As for the second question, after controlling for other determinants of litigation risk, abnormal current accruals and abnormal change in revenue during alleged manipulation periods are positively related to incidence of lawsuit filings. Taken together, the empirical evidence is consistent with the notion that defendant firms of shareholder class action lawsuits have manipulated earnings, and earnings management does matter in private securities fraud litigation.

4 The Effect of Earnings Management on Shareholder Losses, Accounting Allegations, and Settlement Amounts in Private Securities Litigation

4.1 Introduction

The previous chapter shows that despite the controversy surrounding private securities litigation, empirical evidence suggests that firms sued for accounting fraud appear to have overstated earnings on average during alleged manipulation periods. Furthermore, controlling for other factors, earnings management appears to increase the probability that firms will be sued in class action securities litigations. These findings are consistent with the notion that private securities litigation targets firms who have manipulated earnings. However, to understand whether earnings management, as an aspect of merits, matters in private securities litigation, numerous questions remain to be answered.

In this chapter, I further examine the role of earnings management in private securities litigation by addressing the following questions regarding class action securities fraud cases. First, does earnings management during alleged manipulation period affect damages suffered by shareholders? Second, does the existence of allegations of accounting frauds in class action complaints relate to measures of earnings management? Finally, does earnings management during alleged manipulation period affect the cases' settlement amounts?

The first question to be examined in this chapter relates to the notion of causality, that is, whether investors have been misled by the alleged earnings manipulation. Even if defendant firms have managed earnings, shareholders are not necessarily misled by it. If defendant firms' earnings management has in effect misled investors, then stock prices should drop upon revelation of the earnings management, and the stock return should have a negative relation with the degree of earnings management during alleged manipulation periods. Accordingly, I hypothesize that defendant firms' measures of earnings management during alleged manipulation periods are negatively related to stock returns at the time of public announcements that trigger lawsuits. At first glance, given that I use regressions on publicly available data to detect earnings management[38] by defendant firms, there should be no stock price reaction to the information contained in the earnings management measures. However, at the time of public announcements that triggers class action litigation, the following information needed to calculate earnings management measures is usually not available to the market yet: alleged period of manipulation, financial statement data by defendant firm and its industry peers during alleged period of manipulation. Therefore, it is a valid empirical question whether higher measures of earnings management during alleged period of manipulation relates to larger stock price declines at the time of public announcement that triggers class action securities lawsuits.

The second research question of this chapter examines whether defendant firms' earnings management plays a role in private securities attorneys' decision to include allegations of accounting fraud in class action complaints. If my proxies for earnings management properly gauge deceptive earnings manipulation and accounting allegations are not entirely baseless, then defendant firms with higher measures of earnings management during class periods should be subject to accounting allegations more often.

[38] This chapter utilizes the same measures of earnings management as used in Chapter 3, that is, abnormal change in revenue estimated from the revenue model, abnormal current accruals estimated from the IV accrual expectation model.

However, critics of the private securities litigation argue that many class actions are hastily filed within days of precipitous stock price declines, and hence the allegations may not be based on sufficient investigation. Further, since allegations of GAAP violations help withstand courts' motion to dismiss, and there is virtually no additional cost to plaintiffs' attorneys for making such allegations, the existence of accounting allegations may not properly reflect defendant firms' earnings management. To find out which of these two views are supported by empirical evidence, I test the following hypothesis, stated in alternative form: Defendant companies' measures of earnings management during alleged manipulation period are positively related to the existence of accounting allegations in class action complaints.

Finally, I examine the relation between earnings management by defendant firms and settlement amounts of class action securities lawsuits. Critics of private securities litigation argue that private securities attorneys often bring marginal or meritless cases for their settlement values, not because they believe that securities fraud had actually occurred. This argument is often used to show that class action securities lawsuits are nonmeritorious. However, if settlement value in part depends on merits of cases, then as a result, the filing of class action securities litigation would be at least partly driven by merits as well. Now consider earnings management, an aspect of merits of securities fraud cases. Is defendant firms' earnings management during alleged period of manipulation among one of the determining factors for settlement amounts? This is an empirical question not yet addressed by prior studies. Accordingly, I test the following hypothesis, stated in alternative form: Defendant firms' measures of earnings management during alleged manipulation periods are positively related to lawsuit settlement amounts.

I conduct empirical analysis on the same class action securities lawsuits data used in Chapter 3. The findings for the three research questions are summarized as follows. First, on the relation between earnings management and loss of shareholder wealth, I find that controlling for other factors, abnormal current accruals of defendant firms during alleged period of manipulation is negatively associated with three-day abnormal stock returns surrounding the date of public announcement that triggers class action securities lawsuits. Second, on the relation between earnings management and existence of accounting allegations in class action complaints, I find that controlling for other factors, abnormal current accruals by defendant firms during alleged period of manipulation is positively associated with the probability that these firms would face allegations of accounting fraud. Finally, on the relation between earnings management and lawsuit settlement value, I find that *ceteris paribus*, higher abnormal current accruals and higher abnormal change in revenue during alleged period of manipulation is associated with higher settlement amounts.

4.2 Sample and Variables

In this chapter, I utilize the same dataset as used in the previous chapter: 781 firms sued in class action securities litigation between 1988 and 2000. The data availability constraint further reduces the sample size to the following: 681 for analyzing loss of shareholder wealth, 725 firms for studying existence of accounting allegations, 448 firms for examining determinants of lawsuit settlement amounts.

Table 3.5 reports descriptive statistics of the litigation sample along with the control sample. In addition to the variables already used and discussed in Chapter 3, the following variables of interest in this chapter are reported: ABRET3, Accounting Allegation and Settlement. Table 3.4 Panel A indicates that defendant firms experience sizable negative market-adjusted returns in the three days surrounding end of class periods (ABRET3), with a mean (median) of -25.0% (-23.5%). The statistics indicate that of all the firms sued for securities fraud, 46.9 percent face allegations of GAAP violation (Accounting Allegation). Finally, settlement amount (deflated by market capitalization at the end of the month prior to the beginning of class period) has a mean (median) of 0.023 and 0.002.

The measures of earnings management in this chapter are the same as those used in Chapter 3, that is, average quarterly abnormal change in revenue (ABCHREV) and average quarterly abnormal current accruals (ABCAC) during alleged manipulation period. Quarterly abnormal change in revenue is estimated using the revenue model as described in Section 2.4.3.1. Quarterly abnormal current accruals is estimated using the IV model as described in Section 2.4.3.2. Table 3.5 indicates that the mean (median) of ABCHREV and ABCAC are 0.012 (0.005), and 0.029 (0.017), respectively.

4.3 Analysis and Empirical Results

4.3.1 Loss of Shareholder Wealth

I first study the relation between measures of earnings manipulation and loss of shareholder wealth upon corrective disclosure of alleged misrepresentation. A corrective disclosure can take one or more of the following forms: (1) negative earnings news, (2) negative earnings forecasts by management, (3) announcement of earnings restatement, (4) news about resignation of high management or auditing firm, (5) news about an SEC investigation, and potentially other information events. It is usually accompanied by a precipitous drop in stock prices.

Under Rule 10b-5, a plaintiff's damage is the difference between the purchase price and either (a) the price at which the security was sold or (b) the price of the security when the market has adjusted to public discovery of the alleged misrepresentation (Kellogg, 1984). Therefore, plaintiff's attorneys usually select the end of class period so that it coincides with a corrective disclosure accompanied by negative stock returns.

Because I don't have data on date of corrective disclosure, I use end of class period as its proxy.

Although I use regressions on publicly available data to detect earnings management by defendant firms, such data are not yet available to investors at the end of class periods. Therefore, even under the assumption of weak form market efficiency, there still may be negative stock price reaction to my measures of earnings management on the day of corrective public disclosure. Further, my measures of earnings management (ABCHREV and ABCAC) are meant to gauge the discretionary components of earnings, but they are not by themselves measures of accounting fraud. However, ABCHREV and ABCAC may well be correlated with the occurrences of accounting fraud that are not known to the market until the day of corrective disclosure. Therefore, ABCHREV and ABCAC may in effect capture defendant firms' earnings manipulation that has misled the market. Accordingly, I hypothesize that defendant firms' stock returns surrounding corrective disclosures are negatively correlated with ABCHREV and ABCAC during alleged period of manipulation. To test this hypothesis, I estimate the following regression:

$$\begin{aligned} \text{ABRET3} = \alpha &+ \beta_1\text{Cum. Return} + \beta_2\text{ABCHREV} + \beta_3\text{ABCAC} \\ &+ \beta_4\text{Enforcement} + \beta_5\text{Restatement} + \beta_6\text{Accounting Allegation} \\ &+ \beta_7\text{Auditor Sued} + \beta_8\text{Insider Allegation} + \beta_9\text{Sales Growth} \\ &+ \beta_{10}\text{ROA} + \beta_{11}\text{Post PSRLA} + \varepsilon. \qquad (4.1) \end{aligned}$$

All variables are discussed in Section 3.4.2.1 and defined in the Appendix. The dependent variable, ABRET3, is the cumulative return of defendant company's stock from the trading day before to the trading day after the end of class period, less the cumulative return of the CRSP equal-weighted market index for the same period. Regression results are summarized in Table 4.1.

The coefficients on abnormal change in revenue (ABCHREV) and abnormal current accruals (ABCAC) should be negative if these two variables properly measure earnings management through accrual and revenue manipulation, and if such earnings management has misled investors. The results in Table 4.1 indicate that as expected, ABRET3 is significantly negatively related to ABCAC (coefficient -0.24 with p-value less than 0.01). Note that this significant correlation is documented in spite of the fact that ABCAC is competing with a number of other explanatory variables of ABRET3 that also capture defendant firms' earnings management: ABCHREV, Enforcement, Restatement, Accounting Allegation, Auditor Sued. However, the coefficient on ABCHREV is insignificant and positive (coefficient 0.02 with p-value 0.43). There are several potential explanations for the lack of significant association between ABRET3 and ABCHREV. First, ABCHREV is competing with ABCAC as well as a number of other explanatory variables that capture defendant firms' earnings management: Enforcement, Restatement, Accounting Allegation, and Auditor Sued. In particular, compared with accrual management in general, overstatement of revenue is more likely to be subject to SEC enforcement actions or accounting restatement. Second, recall from Chapter 3 that defendant firms' revenue management predates accruals management by one or two years. As show in Figure 1, ABCHREV was abnormally high up to three years prior to the start of the alleged manipulation periods, and gradually declines to an average of around zero in the second year of alleged period of manipulation. Therefore, ABCHREV in equation (4.1), which is averaged over alleged period of manipulation, does not adequately capture the magnitude of revenue manipulation by defendant firms. Finally, revenue manipulation may face tighter scrutiny (by investors or regulators) than does accruals management in general, and hence revelation of revenue manipulation may happen prior to the end of class period. If this is the case, then the three-day window surrounding the end of class period does not capture the negative market reaction to the news about revenue manipulation.

The variable Cum. Return is cumulative daily abnormal returns over the period beginning from the first day of class period, and ending three trading days prior to end of class period, thus it do does not overlap with ABRET3 in measurement period. I predict a negative coefficient on Cum. Return because this variable captures the fact that there is usually some bad news released to the market prior to the end of class period. The regression results is consistent with my prediction, the estimated coefficient on Cum. Return is -0.084 (p-value less than 0.01).

Prior studies of restatement (e.g., Kinney and McDaniel, 1989; Wu, 2002) show that firms that make accounting restatements are often sued subsequently. Since accounting restatements are usually announced prior to the end of class periods, restatement firms should experience less severe negative stock returns compared to other defendant firms at the end of class periods. Therefore, I predict a positive coefficient on the variable Restatement. In contrast, SEC enforcement actions are usually not known to the public at the end of the class period[39]. Accordingly, I predict a negative coefficient on the variable Enforcement because this variable captures the seriousness of accounting violations. The results in Table 4.1 indicate that as expected, estimated coefficients are positive for Restatement (coefficient 0.04, significant at 0.05 level for one-tailed test), and negative for Enforcement (-0.04, significant at 0.10 level for one-tailed test).

Table 4.1 also shows that estimated coefficients is significantly positive on Auditor Sued, significantly negative on Insider Allegation, and significantly negative on Post PSLRA. The negative association between ABRET3 and Insider Allegation is consistent with the view that insiders have profited from temporary inflation of stock price caused by firms' misstatement. The negative association between Post PSLRA and ABRET3 suggests that firms sued in the Post-PSLRA period experience larger drop in stock price surrounding corrective disclosure than firms sued before 1996, consistent with

[39] There are typically long delays between initiation of an SEC investigation and the public revelation of such investigation, while class action lawsuits are usually filed within days of the end of class period (Griffin and Grundfest, 2000).

the notion that the Reform Act raised bar for class action securities litigation. The positive coefficient on Auditor Sued is possibly attributable to the investors' expectation that the firm will pay lower settlements, as the auditor will share the burden.

4.3.2 Accounting Allegations

Turning to the second research question, I use the following logit model to study the relation between accounting allegations and earnings management measures.

$$\begin{aligned}\text{Accounting Allegation} = \alpha &+ \beta_1\text{ABCHREV} + \beta_2\text{ABCAC} + \beta_3\text{Enforcement} \\ &+ \beta_4\text{Restatement} + \beta_5\text{Auditor Sued} + \beta_6\text{Insider Allegation} \\ &+ \beta_7\text{Sales Growth} + \beta_8\text{ROA} + \beta_9\text{Equity Issue} \\ &+ \beta_{10}\text{Acquisition} + \beta_{11}\text{Leverage} + \beta_{12}\text{Post PSLRA} + \varepsilon. \qquad (4.2)\end{aligned}$$

All variables are discussed in Section 3.4.2.1. In particular, ABCHREV and ABCAC are average quarterly abnormal change in revenue and abnormal current accruals, respectively, during alleged period manipulation. I predict positive coefficients on the two measures of earnings management: ABCHREV and ABCAC. The results in Table 4.2 indicate that although the estimated coefficients are positive for both variables, only ABCAC obtains statistical significance (for ABCAC: coefficient 2.11, p-value 0.07; for ABCHREV: coefficient 2.61, p-value 0.11). The lack of significant correlation between existence of accounting allegation and ABCHREV may be due to the fact that ABCHREV does not adequately capture defendant firms' revenue manipulation. More specifically, as shown in Figure 1, ABCHREV by defendant firms are abnormally high up to three years prior to the start of alleged period of manipulation but gradually declines. By the second year of alleged period of manipulation, ABCHREV becomes close to zero on average. In contrast, Figure 2 shows that ABCAC gradually increases and on average reaches the highest point during the first year of alleged period of manipulation. Note that in equation (4.2) ABCHREV and ABCAC are both measured over alleged period of manipulation. Therefore, while ABCAC captures the magnitude of accruals management by defendant firms at its peak, ABCHREV measures revenue manipulation after most of it is already reversed.

On the control variables, I predict positive coefficients on Enforcement, Restatement, and Auditor Sued, because these variables indicate the existence of aggressive accounting, and results in Table 4.2 generally support this prediction. I also predict positive coefficients on Sales Growth, ROA, Equity Issue, and Acquisition and Leverage because these variables capture incentives for aggressive accounting. Results in Table 4.1 are generally consistent with these predictions, with the exception that estimated coefficient on Sales Growth is negative (coefficient –0.85, significant at 0.10 level). Table 4.2 also shows a negative coefficient on Insider Allegation. This is consistent with the notion that insider trading allegations and accounting allegations are frequently convenient alternatives for each other in complaints (see Johnson et al. 2002). Finally, Post PSLRA is significantly positively related to existence of accounting allegation (coefficient 0.41, significant at 0.05 level). This is consistent with the argument that after the passage of PSLRA, plaintiffs' attorneys more often make allegations about misrepresentations or omission in financial statements, since such misstatements are not subject to safe harbor protection (Grundfest and Perino 1997).

4.3.3 Lawsuit Settlement Amount

Finally, turning to the third research question, I use the following OLS regression to examine the relation between lawsuit settlement amounts and earnings management measures.

$$\begin{aligned}\text{Settlement} &= \alpha + \beta_1\text{ABCHREV} + \beta_2\text{ABCAC} + \beta_3\text{Enforcement} + \beta_4\text{Restatement} \\ &+ \beta_5\text{Accounting Allegation} + \beta_6\text{Auditor Sued} + \beta_7\text{Insider Allegation} \\ &+ \beta_8\text{ABRET3} + \beta_9\text{Turnover} + \beta_{10}\text{Sales Growth} + \beta_{11}\text{ROA}\end{aligned}$$

$$+ \beta_{12}\text{Acquisition} + \beta_{13}\text{Equity Issue} + \beta_{14}\text{Leverage}$$
$$+ \beta_{15}\text{Post PSLRA} + \varepsilon. \qquad (4.3)$$

The dependent variable, Settlement, is the settlement amount deflated by market capitalization at the end of the month prior to the beginning of class period. All other variables are discussed in Section 3.4.2.1 and defined in the Appendix. The regression results are reported in Table 4.3. Consistent with my predication, my two measures of earnings management, ABCHREV and ABCAC, are both positively associated with settlement amounts. The estimated coefficient on ABCAC is 0.04 (significant at 0.05 level one-tailed). The estimated coefficient on ABCHREV is 0.05, which is marginally significant (at 0.10 level one-tailed). Note from equation (4.3) that ABCAC and ABCHREV are competing with each other as well as a number of other explanatory variables that are may be positively correlated with earnings management: Enforcement, Restatement, Accounting Allegation and Auditor Sued.

As for the control variables, I predict positive association between settlement amounts and the following variables: Enforcement, Restatement, Accounting Allegation, Auditor Sued and Insider Allegation, because these variables capture legal merits. With the exception on Insider Allegation, the results are consistent with my prediction. The results in Table 4.3 are also consistent with my predictions on the variables that capture damage: settlement amounts are higher for lower return around the end of class periods (ABRET3), and higher for firms with more actively traded stock (Turnover). Settlement amounts are also positively related to Equity Issue and Leverage, two variables that capture incentives for aggressive accounting.

Finally, settlement amount is negatively correlated with Post PSLRA (coefficient -0.007, marginally significant at 0.10 level two tailed). I do not predict the sign of coefficient on Post PSLRA for the following reasons. Several studies[40] find that post-Reform Act cases are settled at higher value than cases filed prior to the passage of the Reform Act. In comparison with my analysis, however, these studies do not control for other determinants of settlement amounts. Another difference is that while these studies look at dollar settlement amounts, the dependent variable Settlement in equation (4.3) is settlement amount deflated by market capitalization at the end of the month prior to the beginning of class period. If the Reform Act has reduced the incidence of meritless cases, then settlement value should be increased.

4.4 Summary and Conclusion

This chapter examines the effects of earnings management on the following aspects of class action securities fraud litigation. First, I find that *ceteris paribus*, defendant firms' abnormal current accruals during alleged period of manipulation is negatively correlated with their three-day abnormal stock returns surrounding the dates of corrective disclosure that precipitate class action securities lawsuits. This suggests that defendant firms' earnings management has misled the market and increased shareholder damage. Second, controlling for other factors, defendant firms' abnormal current accruals during alleged period of manipulation increase their likelihood of facing accounting allegations. This indicates that the allegations in private securities litigation are at least partly based on merits. Finally, I find that controlling for other factors, defendant firms' abnormal current accruals and abnormal change in revenue during alleged period of manipulation increase case settlement amounts (scaled by market capitalization of firm). Therefore, it appears that earnings management, an aspect of merits of cases, does play a role in lawsuit settlement amounts.

[40] For example, Cornerstone Research (1999), Bajaj, Mazumdar and Sarin (2000), and Perino (2003) find that cases filed after the passage of the Reform Act are on average settled at higher amounts than do cases filed pre-Reform Act.

5 Does Litigation Risk Deter or Encourage Earnings Management

5.1 Background and Motivation

Shareholder class action lawsuits impose high cost to firms. Besides involving hefty legal fees and potential settlement money, they also divert management time and resource away from productive use, and worst of all, damage the reputation of firms and their managers. Because securities lawsuits are so costly, litigation risk is an important concern for firms in determining their financial disclosure policy. As an important aspect of external financial reporting, earnings management is conceivably affected by management's concern about litigation risk. Kasznik (1999) shows that firms use discretionary accruals to manage earnings toward management earnings forecasts, fearing shareholder litigation and loss of reputation. However, if firms manage their earnings to the extent of violating GAAP, then they would violate securities laws and face the risk of being sued by shareholders. Indeed, Chapter 3 of this thesis shows that firms' higher discretionary accruals are associated with higher probability of subsequent securities lawsuits. If managers know that earnings management may increase litigation risk, then fear of securities lawsuits may have a deterrence effect on earnings management. It is therefore not evident whether litigation risk would increase or decrease the amount of earnings management by firms. In this chapter, I try to answer this empirical question by studying the intricate relation between litigation risk and earnings management.

Except for the study by Kasznik (1999), I am not aware of any paper that examines the effect of litigation risk on firms' earnings management behavior. Kasznik (1999) shows that firms use positive discretionary accruals to report earnings toward management voluntary earnings forecast, and the extent of such earnings management is positively associated with proxies for litigation risk and cost. Note that rather than employing a direct measure of litigation risk, Kasznik (1999) uses several factors to proxy for ex ante litigation cost. Such factors include stock returns, analyst coverage, and proximity of management earnings forecast to yearend. The empirical results in Kasznik (1999) indicate that litigation risk increases firms' use of income-increasing discretionary accruals.

Compared with only a single paper on the effect of litigation risk on earnings management, there are several papers that examine the effect of earnings management on litigation risk. C. Jones (1998) shows that discretionary accruals have a negative but insignificant effect on firms' litigation risk. In contrast, DuCharme et al. (2002), Heninger (2001) and Chapter 3 of my dissertation all find that higher discretionary accruals increase the probability of lawsuits.

For the following three reasons, the effect of litigation risk on earnings management is worthy of a reexamination. First, Kasznik (1999) takes litigation risk as given, and finds that higher litigation risk leads to larger positive discretionary accruals. Since such earnings management is apparently prompted by management's wish to stave off litigation, then management must have believed that they can reduce litigation risk by managing earnings up toward their earnings forecast. Therefore, litigation risk should not be treated as an exogenous variable. Second, Kasznik (1999) uses data from 1987 to 1991. As discussed in section 3.2.1, after the passage of Private Securities Litigation Reform Act (PSLRA) of 1995, management voluntary earnings forecast is protected under a safe harbor. Therefore, the change in legal environment may change the way in which litigation risk affect firms' earnings management behavior. Third, as discussed above, there are two groups of papers that examine the relation between earnings management and litigation risk: one (Kasznik 1999) considers the effect of litigation risk on earnings management, taking litigation risk as exogenous. The other (C. Jones 1998, DuCharme et al. 2002, Heninger 2001) investigates the effect of earnings management on litigation risk, taking earnings management as exogenous. However, since earnings management and litigation risk are obviously both endogenous, simple OLS, logistic or probit regressions (as used by prior studies) would lead to biased and inconsistent estimates. Therefore, a new study is called for to examine the relation between the two variables in a system of equations.

In chapter 3 of this dissertation, I document that larger amount of income-increasing earnings management is associated with higher probability of securities lawsuits. This is not surprising, because earnings management that violates GAAP also violates securities laws, and hence could increase litigation risk. If managers expect this, then concern for litigation risk may deter firms from managing their earnings upward. However, as Kasznik (1999) has shown, rather than deterring earnings management, fear of litigation could actually induce earnings management. For Kasznik's argument to be true, managers must believe that earnings management could reduce litigation risk. One might argue this is no plausible because a firm should not be sued for accounting fraud if it does not violate GAAP in the first place. However, we notice that not all securities litigation involve allegations of GAAP violations, while most of these cases are triggered by a sudden drop in stock prices. Further, not all GAAP-violating earnings management is caught. So, if a firm has already violated GAAP, and is trying to avoid being sued, the manager may be inclined to further manipulate earnings to stave off an impending stock price drop. If the firm's future earnings will be better than expected, then the manager can afford to "borrow from the future." All-in-all, it is an empirical question whether litigation risk has a positive or negative effect on earnings management.

Incidentally, it is worthwhile to revisit the question how earnings management affects litigation risk. As discussed previously, GAAP-violating earnings management could increase a firm's litigation risk for several reasons. First, earnings management that violates GAAP helps class action attorneys in establishing the merit of a 10b-5 case. Second, if a firm uses such aggressive earnings management to temporarily inflate its stock price, then the subsequent reversal of the accruals could cause a decline in earnings, which could in turn prompt an abrupt decline in its share price. Since 10b-5 cases are usually filed when there's a large and sudden drop in share prices, earnings management could thus increase a firm's litigation risk. Therefore, it is profitable for law firms to target those firms that have managed earnings outside of GAAP. However, earnings management may also decrease litigation risk. For example, a "growth" firm could manage earnings upward to meet analyst forecast, in an attempt to avoid the so-called "torpedo effect" (Skinner and Sloan, 1999), that is, small earnings disappointment leading to large decline in stock prices. If the firm does so successfully, then earnings management could in effect reduce its chance of being sued by its shareholders. The above discussion demonstrates that earnings management and litigation risk may be jointly determined. Most of the prior studies (with the exception of C. Jones, 1998) find that income-increasing earnings management increases litigation risk. However, the findings are based on simple OLS analysis, and therefore are subject to simultaneity bias. In this chapter, I study the relation between earnings management and litigation risk using a simultaneous-equations approach.

5.2 Data and Methodology

5.2.1 Data

In this chapter, I use the same data as used in Chapter 3. Sample selection and data source are discussed in section 3.3.1. In short, my litigation sample consists of shareholder class action securities lawsuits in the Woodruff-Sawyer database, with class period beginning within the interval 1988-2000. I also construct a nonlitigation control sample matching on industry, time period and earnings performance. See table 3.5 for selected descriptive statistics for the litigation sample and the control sample.

5.2.2 Background on Statistical Issues

As previously discussed, the simultaneity of earnings management and litigation risk makes ordinary least squares (OLS) method inappropriate to estimate the relationship between the two variables. Specifically, OLS in the presence of simultaneity will result in biased and inconsistent parameter estimates. This type of bias is usually treated using two-stage least squares (2SLS) in a simultaneous equation framework. In the accounting literature, the simultaneity problem usually occurs in situations where the endogenous variables are continuous in both equations. However, to study my research question, earnings management is represented by a continuous variable ABCAC, and litigation risk is observed as a dichotomous variable Lawsuit.

Such models, where endogenous variables include both continuous and dichotomous variables, are discussed by Heckman (1978), Amemiya (1978), and Maddala (1983). Heckman (1978) and Maddala (1983) use two stage procedures. Specifically, in the first stage, endogenous variables are regressed on instruments to get fitted values; then in the second stage, endogenous variables are substituted by the fitted values in the structural equations. Amemiya (1978) uses indirect generalized least squares to analyze this kind of models, that is, by recovering the structural parameters from reduced form estimates. Amemiya (1978) shows that this indirect GLS approach is more efficient than two-stage methods. Therefore, in this chapter, I adopt the method described in Amemiya (1978) to study the relation between earnings management and litigation risk.

Despite the existence of statistical literature discussing this kind of models (simultaneity between a dichotomous variable and a continuous variable), the estimation of such models poses a practical problem. To my knowledge, there isn't any statistical package that includes procedures to fit such models. This is the reason why most of the studies in accounting literature use the regular 2SLS method to deal with this kind of model, as if the two endogenous variables are continuous variables. For example, part of the analysis in Kasznik (1999) look at the simultaneous determination of management's decision to make voluntary earnings forecast (a dichotomous variable) and earnings management (a continuous variable). A two-stage least squares method is used by Kasznik (1999) to estimate the system of two equations, which are both expressed as OLS regressions. Note that earnings forecast is a dichotomous variable, which actually calls for a nonlinear model like Probit or Ligit.

Copley et al. (1994) is one of the very few accounting papers[41] that adopt a proper method to estimate endogenous limited dependent variables models. Copley et al. (1994) uses the method suggested by Amemiya (1978) to study the relationship between audit fee (a continuous variable) and audit quality (a limited dependent variable). My following discussion of statistical methods borrows heavily from Copley et al. (1994).

5.2.3 Simultaneous Equations Framework

Conceptually, the ideas discussed in Section 5.1 can be embodied in the following equations:

$$\text{Lawsuit} = \alpha_0 + \alpha_1 \text{ABCAC} + \boldsymbol{\alpha}'\textbf{CONTROLS} + \zeta, \qquad (5.1)$$

$$\text{ABCAC} = \beta_0 + \beta_1 \text{Lawsuit} + \boldsymbol{\beta}'\textbf{CONTROLS} + \xi \qquad (5.2)$$

[41] The only other such paper that I am aware of is Copley et al. (1995). I thank Kenneth Gaver, coauthor of both papers, for generously providing me with his SAS program written for the analysis in Copley et al. (1995).

where ABCAC is defined in Section 2.4.3.2, Lawsuit is defined in Section 3.4.2.1, and **CONTROLS** is a vector of variables which I describe shortly. More specifically, Lawsuit is a measure of litigation risk; it is set to equal one if the firm is named a defendant in securities class action lawsuits during the sample period, and zero otherwise. ABCAC is the proxy for earnings management; it is abnormal current accruals estimated from my IV model. The vector **CONTROLS** includes two sets of variables, one set common to all equations, and the other intended to help identify the system of simultaneous equations.

5.2.3.1 Variables Common to All Equations

I include the following two variables as common control for both equations: Log Market Cap and Cum. Ret. The variables are defined in Appendix. The relation between these variables and litigation risk is previously discussed in section 3.4.2.1. Here, I discuss their relation with ABCAC (the measure of earnings management.)

The first variable, Log Market Cap, captures the effect of firm size. I expect a negative association between firm size and ABCAC, because of two reasons: (i) larger firms and their managers have a higher stake in their reputation, (ii) analyst coverage and investor vigilance is higher on larger firms. For these two reasons, concerns about having earnings management detected will have a larger deterrence effect on larger firms. The second common control variable is cumulative daily returns (Cum. Return) from beginning of class period to three days prior to end of class period. Prior studies (Beneish 1997) find that one common reason for managing earnings is to conceal ineffective management and delay bad news. Cum. Return reflects information known to the market about firms' operation, and therefore it is expected to be negatively associated with ABCAC.

5.2.3.2 Variables to Identify the Simultaneous-Equations Model

While I provide economic intuition for selecting the identifying variables discussed below to be excluded from a particular equation, I recognize that an argument against exclusion can be made for each variable. Therefore, I overidentify the system to reduce reliance on a single identifying variable.

To identify equation (5.1), the litigation risk (Lawsuit) equation, I use the following variables: Turnover, Beta, Kurtosis, Skewness, Min. Return, and Post PSLRA. Prior studies on litigation risk (e.g., Francis et al., 1994; Jones and Weingram, 1996a,b; Jones, 1998; Johnson et al., 2000; Johnson et al., 2002) have found that equity beta (Beta), share turnover (Turnover), and return kurtosis (Kurtosis) are positively associated with incidence of lawsuits, while recent period cumulative returns (Cum. Return), precipitous drop in stock price (Min. Return), and return skewness (Skewness) are negatively associated with incidence of lawsuits. Finally, Post PSLRA is an indicator variable for periods after the passage of the Private Securities Litigation Reform Act (PSLRA) of 1995. As discussed in section 3.2.1, PSLRA is intended to curb the filings of "strike suits" triggered by a mere drop of stock prices, and therefore has the effect of lower firms' overall securities litigation risk. Therefore, negative association is expected between Post PSLRA and Lawsuit.

To identify equation (5.2), the earnings management (ABCAC) equation, I use the following variables: Leverage, Acquisition, Equity Issue, Sales Growth, ROA, and Accrual Flex. Prior studies show that firms are more likely to engage in income-increasing earnings management if they have high leverage (Leverage) or high sales growth (Sales Growth), attempt to issue stocks (Equity Issue) or make stock-based acquisitions (Acquisitions). It is also suggested in the literature that firms have incentive to manage earnings in order to maintain increasing pattern of earnings (captured by the variable return on assets, ROA). I also use a variable Accrual Flex to capture the flexibility of accounting in a firm's industry. Accrual Flex is defined as the root mean squared error of the cross-sectional accrual expectations regression used to estimate the firm-quarter's ABCAC, and is expected to be positively associated with earnings management.

5.2.3.3 Structural Model

To summarize the above discussion, I specify the structural form of the model as:

$$\begin{aligned} \text{Lawsuit} = \; & \alpha_0 + \alpha_1\text{Cum. Return} + \alpha_2\text{Log Market Cap} \\ & + \alpha_3\text{Post PSLRA} + \alpha_4\text{Turnover} + \alpha_5\text{Beta} + \alpha_6\text{Skewness} \\ & + \alpha_7\text{Kurtosis} + \alpha_8\text{Min. Return} + \alpha_9\text{ABCAC} + \upsilon_1 \end{aligned} \quad (5.3)$$

$$\begin{aligned} \text{ABCAC} = \; & \beta_0 + \beta_1\text{Cum. Return} + \beta_2\text{Log Market Cap} \\ & + \beta_3\text{Leverage} + \beta_4\text{Acquisition} + \beta_5\text{Equity Issue} + \beta_6\text{Sales Growth} \\ & + \beta_7\text{ROA} + \beta_8\text{Accrual Flex} + b_9\text{Lawsuit} + \upsilon_2 \end{aligned} \quad (5.4)$$

5.3 Estimation Procedure

Because ABCAC and Lawsuit are jointly determined endogenous variables, ordinary least squares (OLS) is inappropriate for estimating equations (5.3) and (5.4). More specifically, since Lawsuit and ABCAC are correlated with υ_2 and υ_2, the standard assumptions of the linear model are violated, making OLS parameter estimates biased and inconsistent. This bias can be corrected by choosing one of the two methods: the two-stage method suggested by Heckman (1978) and Maddala (1983, 242-245) or the indirect (generalized) least squares suggested by Amemiya (1978). Amemiya (1978) shows that this approach is more efficient than two-stage methods. Therefore, I adopt the Amemiya (1978) method to obtain consistent parameter estimates for the structural equations.

To implement this procedure, I specify the reduced form equations:

$$\text{Lawsuit} = a_0 + a_1\text{Cum. Return} + a_2\text{Log Market Cap}$$

$$+ a_3\text{Post PSLRA} + a_4\text{Turnover} + a_5\text{Beta} + a_6\text{Skewness} + a_7\text{Kurtosis} + a_8\text{Min. Return} + a_9\text{Leverage} + a_{10}\text{Acquisition} + a_{11}\text{Equity Issue} + a_{12}\text{Sales Growth} + a_{13}\text{ROA} + a_{14}\text{Accrual Flex} + v_1 \quad (5.5)$$

$$\text{ABCAC} = b_0 + b_1\text{Cum. Return} + b_2\text{Log Market Cap} + b_3\text{Post PSLRA} + b_4\text{Turnover} + b_5\text{Beta} + b_6\text{Skewness} + b_7\text{Kurtosis} + b_8\text{Min. Return} + b_9\text{Leverage} + b_{10}\text{Acquisition} + b_{11}\text{Equity Issue} + b_{12}\text{Sales Growth} + b_{13}\text{ROA} + b_{14}\text{Accrual Flex} + v_2 \quad (5.6)$$

where the disturbance terms v_1 and v_2 are independently and identically distributed normal random variables with zero means, covariance σ_{12}, and variances 1.0 and σ^2_2, respectively. To estimate $\mathbf{a} = (a_0, \ldots, a_{14})'$, probit analysis is used in equation (5.5). The parameters $\mathbf{b} = (b_0, \ldots, b_{14})'$ in equation (5.6) are estimated using ordinary least squares.

Amemiya's (1978) method is used to obtain estimates of the structural parameters. Let the structural parameters for the litigation risk (*Lawsuit*) equation be written $\boldsymbol{\alpha} = (\alpha_0, \ldots, \alpha_9)'$, and $\boldsymbol{\beta} = (\beta_0, \ldots, \beta_9)'$ for earnings management equation. Further, let the exogenous predictors in the system be written:

$\mathbf{X}$ = [1, Cum. Return, Log Market Cap, Post PSLRA, Turnover, Beta, Skewness, Kurtosis, Min. Return, Leverage, Acquisition, Equity Issue, Sales Growth, ROA, Accrual Flex].

Amemiya (1978) shows that the systems' parameters satisfy:

$$\mathbf{a} = (S_1, b)\,\boldsymbol{\alpha} \quad (5.7)$$

and

$$\mathbf{b} = (S_2, a)\boldsymbol{\beta} \quad (5.8)$$

where S_1 and S_2 are matrices of zeroes and ones such that:

XS_1 = [1, Cum. Return, Log Market Cap,
Post PSLRA, Turnover, Beta, Skewness, Kurtosis, Min. Return],

and

XS_2 = [1, Cum. Return, Log Market Cap,
Leverage, Acquisition, Equity Issue, Sales Growth, ROA, Accrual Flex],

When **a** and **b** are replaced by their reduced form estimates, the structural parameters α and β can be estimated by applying generalized least squares to equations (5.7) and (5.8).

5.4 Empirical Results

5.4.1 Litigation Risk Model

Table 5.1 presents the results of the indirect generalized least squares procedure for the litigation risk (Lawsuit) model in equation (5.3). For comparison purpose, I also present (in panel B) a single equation probit analysis of the same model, which ignores the endogeneity of the earnings management variable (ABCAC) on the right-hand side of the equation. In both panels, the estimated coefficients on all the control variables have the same signs as predicted.

Panel B of table 5.1 indicates that single-stage probit analysis generates a positive and significant coefficient (coefficient 1.593, p-value 0.004 two-tailed) on ABCAC, suggesting that income-increasing earnings management can increase litigation risk. This is consistent with the findings in Section 3.4.2 of my dissertation. However, if earnings management increases litigation risk, then it is hard to interpret the finding in Kasznik

(1999) that fear of litigation induces firms to manage earnings up toward management earnings forecast.

As previously discussed, the probit coefficient may be biased because earnings management, as measured by ABCAC, may be an endogenous variable. The proper way to examine the effect of ABCAC on Lawsuit is to use a two-stage simultaneous estimation procedure, the result of which is reported in panel A of table 5.1. In contrast to the single-stage probit result, the coefficient on predicted ABCAC (estimated from the first stage) is negative (coefficient -3.395, p-value 0.273 two-tailed), suggesting that managing earnings upward potentially reduces the probability of securities litigation. However, the coefficient is not statistically significant. This calls into question my previous results in Chapter 3 that earnings management increases litigation risk. In other words, the analysis in Chapter 3 does not consider the endogeneity of firms' earnings management (measured by ABCAC), which makes interpretation of the empirical results difficult. When the relation between litigation risk and earnings management is properly estimated in a simultaneous equations framework, it is found that income-increasing earnings management does not increase the probability of securities litigation. This may be the result of two forces working against each other: on the one hand, overstating earnings to the extent of violating GAAP also violates securities laws, and thus increases litigation risk; on the other hand, managing earnings upward may stave off earnings disappointments that could cause precipitous drop in stock price, which triggers securities litigation.

5.4.2 Earnings Management Model

Now I address the main question of this chapter: does litigation risk increase or decrease earnings management? Table 5.2 reports the comparison of the results of the earnings management (ABCAC) model (structural equation 5.4), using a two-stage simultaneous equations estimation procedure (panel A) and single-stage ordinary least squares (OLS).

Using both procedures, the signs of the estimated coefficients on the control variables are as expected.

Focusing on the effect of Lawsuit on ABCAC, I find that in panel B of table 5.2, single-stage OLS regression generates a significant and positive coefficient on Lawsuit (coefficient 0.022, p-value less than 0.001 two-tailed), suggesting that litigation risk has the effect of encouraging income-increasing earnings management rather than discouraging it. Because litigation risk (measured by Lawsuit) is an endogenous variable, regular OLS may lead to inconsistent estimates. Therefore, I focus on the results from the two-stage simultaneous equation procedure, which are summarized in panel A. After controlling for endogeneity of Lawsuit, the estimated coefficient on Lawsuit is still significant and positive (coefficient 0.032, p-value less than 0.001 two-tailed).

The results presented in table 5.2 suggest that firms with high litigation risk tend to manage their earnings upward using positive discretionary current accruals. Therefore, consistent with Kasznik (1999), fear of litigation actually provides an incentive for firms to engage in earnings management. This is in contradiction with the notion that litigation risk has a deterrence effect on firms' earnings management behavior.

5.5 Conclusion

This chapter investigates whether litigation risk deters or induces earnings management, and whether income-increasing earnings management decreases or increases a firm's litigation risk. Several studies have addressed either one of these two questions, but none of them have examined both questions together. In this paper, I argue that both earnings management and securities litigation risk are endogenous variables, and therefore a two-stage simultaneous equations approach is called for to examine the complex relation between the two.

After controlling for the endogeneity problem using a simultaneous equations framework, I find the following results. First, firms with higher securities litigation risk are likely to engage in larger amount of income-increasing earnings management. Second, by managing earnings upwards, firms at least do not increase their securities litigation risk; in fact, earnings management may even lower the litigation risk, although the negative effect is not statistically significant. I conjecture, but do not formally test, the following explanation for the seemingly counter-intuitive empirical finding. Although earnings management to the extent of violating GAAP also violates securities laws and therefore should increase probability of securities fraud litigation if revealed, such earnings management is not always detected. In fact, if a firm "successfully" avoids an earnings disappointment using earnings management, it may stave off an impending sudden drop in stock prices and thus effectively avoid shareholder lawsuits. For this reason, managers of firms with high litigation risk may have incentive to manage earnings upward in an attempt to reduce litigation risk.

6 Summary and Concluding Remarks

This dissertation studies the relation between firms' earnings management behavior and class action securities litigation. I use a sample of 781 firms sued by shareholders for securities fraud, with beginning of class period falling between 1988 and 2000. I find that on average, firms sued by shareholders for accounting fraud appear to have engaged in income-increasing earnings management during alleged period of manipulation. Further, controlling for other factors, earnings management using positive accruals during alleged manipulation period appears to have the following effects. First, it increases the magnitude of drop in stock prices surrounding corrective disclosures that lead to securities lawsuits. Second, it increases the probability that a defendant firm of class action securities lawsuit will face allegations of accounting impropriety. Third, it increases defendant firms' lawsuit settlement amounts. These results suggest that earnings management plays an important role in class action securities lawsuits. As an aspect of merits of the cases, earnings management appears to affect shareholder damage, lawsuit allegations, and lawsuit settlement amounts. Private securities litigations also appear to have properly targeted firms that have manipulated earnings.

The thesis further studies the relationship between firm's earnings management behavior and securities litigation risk, taken into consideration that both variables can be endogenously determined. The results from empirical analysis using a simultaneous-equations framework are summarized as follows. First, controlling for other factors, higher litigation risk increases the amount of income-increasing earnings management. This suggests that concerns about litigation risk do not deter earnings management. On the contrary, firms with higher litigation risk engage in larger amounts of income-increasing earnings management. This may be due to firms' use of earnings management to avoid earnings disappointments that could potentially lead to lawsuit-inducing precipitous drop in stock prices. Second, controlling for other factors, larger amount of income-increasing earnings management does not increase firms' securities litigation risk; if anything, it appears to decrease litigation risk, although the effect is not statistically significant. This may be the result of two counteracting forces. On the one hand, earnings management to the extent of violating GAAP violates securities laws and thus can increase litigation risk. On the other hand, not all GAAP-violating earnings management is caught, and earnings management that successfully avoids earnings disappointment could in effect reduce litigation risk. However, these conjectures about the mechanism of the influence of earnings management on litigation risk are not formally examined, leaving an opportunity for future research.

The relationship between earnings management and securities litigation is an important topic that warrants further study. Following are some of my planned future extensions of this study. First, I will refine the measurement of earnings management. In particular, I will utilize the specific allegations in class action complaints and develop models to measure discretion in specific accounts. Second, in the litigation risk analysis, I will conduct more robust analyses, such as constructing control groups of nonlitigation firms matched on stock return performance, and including more control variables of litigation risk such as insider trading data. Third, I will include more recent data to incorporate the period with an explosion of accounting frauds. Fourth, I will study firms' earnings management in a broader sense. Specifically, in the current thesis, I measure earnings management as the unexpected component of accruals using an accrual expectation model. Such measure does not discern between within GAAP or outside-of-GAAP earnings management. As a future extension, I will study the effects of litigation risk on firms' (1) within-GAAP earnings management, (2) GAAP-violating earnings management, (3) real earnings management that have economic consequences. Finally, I will examine whether past class action securities lawsuits have any effect on firms' corporate governance, and whether change in corporate governance affect firms' future earnings management and litigation risk.

APPENDIX

Variable Definitions

Variable	Definition
ABCHREV	Average quarterly abnormal change in revenue estimated from the revenue model (described in Section 2.4.3.1) during alleged manipulation period
ABCAC	Average quarterly abnormal current accruals estimated from the IV model (described in Section 2.4.3.2) during alleged manipulation period
Enforcement	Dummy which equals one if firm is subject to SEC accounting and auditing enforcement actions related to any reporting periods falling within alleged period of manipulation
Turnover	$1-(1-Turn)^n$, where Turn is mean of daily trading volume divided by the number of shares outstanding during class period, and n is number of days in class period
Log Market Cap	Mean of natural log of market capitalization at the end of first, second and third month prior to start of class period
Beta	Slope coefficient from a regression of daily returns during class period on the equal-weighted market index
Skewness	Skewness of raw daily returns during class period
Kurtosis	Kurtosis of raw daily returns during class period
Min. Return	Minimum daily return during class period
Cum. Return	Cumulative daily return from beginning of class period to three trading days prior to end of class period
Leverage	Quarterly average of ratio of long-term debt to equity during alleged manipulation period

Variable	Definition
Acquisition	Dummy which equals one if firm made business acquisition during alleged manipulation period (if Compustat data item 94 is greater than zero or shows a combined code for any quarter during the alleged manipulation period)
Equity Issue	Dummy which equals one if number of shares outstanding, adjusted for splits and dividends, increases by more than 10 percent over class period
Sales Growth	Quarterly average of sales growth (i.e., current quarter sales divided by prior quarter sales) during alleged manipulation period
ROA	Quarterly average of return on assets during alleged manipulation period, where return on assets is calculated as income before extraordinary items (Compustat data item 8) divided by prior quarter total assets (Compustat data item 44)
Lawsuit	Dummy which equals one if firm is sued in class action securities fraud litigation during 1988-2000
Post PSLRA	Dummy which equals one if class period ends during or after 1996
Accounting Alleg	Dummy which equals one if firm faces accounting allegations in lawsuit
Restatement	Dummy which equals one if firms restated financial statements during class period
Auditor Sued	Dummy which equals one if auditor of the firm is also named a defendant in the class action securities fraud lawsuit
Insider Alleg	Dummy which equals one if firm faces allegation of insider trading in lawsuit
ABRET3	Cumulative market-adjusted return over a three-day period surrounding end of class period, calculated as cumulative daily return minus equally-weighted market index from the trading day before the end of class period to one trading day after
Settlement	Settlement amount deflated by market capitalization at the end of the month prior to the beginning of class period.

Diagrams

Diagram 1 Chronology of events for a typical firm sued by shareholders for alleged GAAP violation

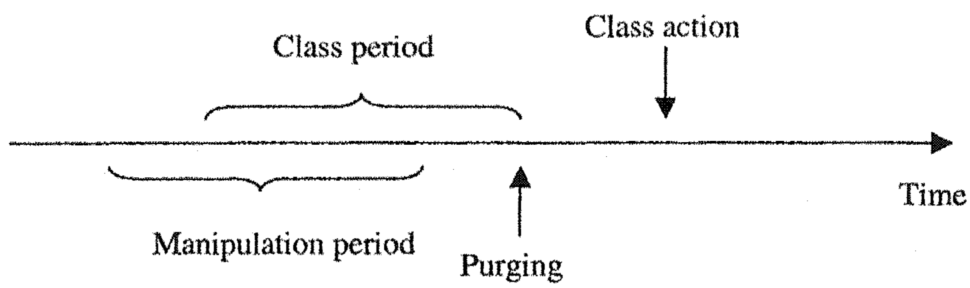
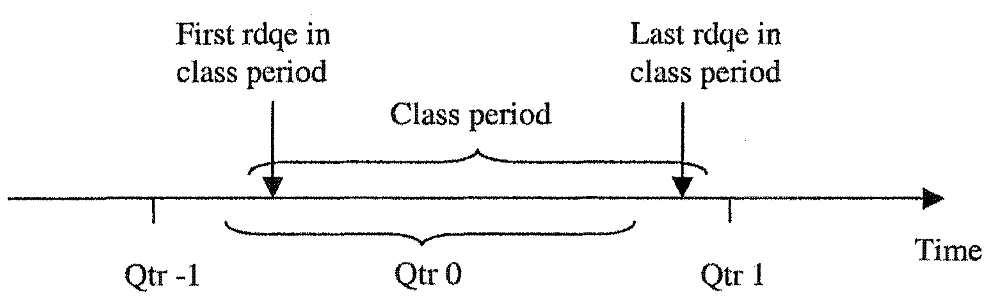


Diagram 2 Time line for a typical firm sued by shareholders for GAAP violations – Earnings management analysis using quarterly data



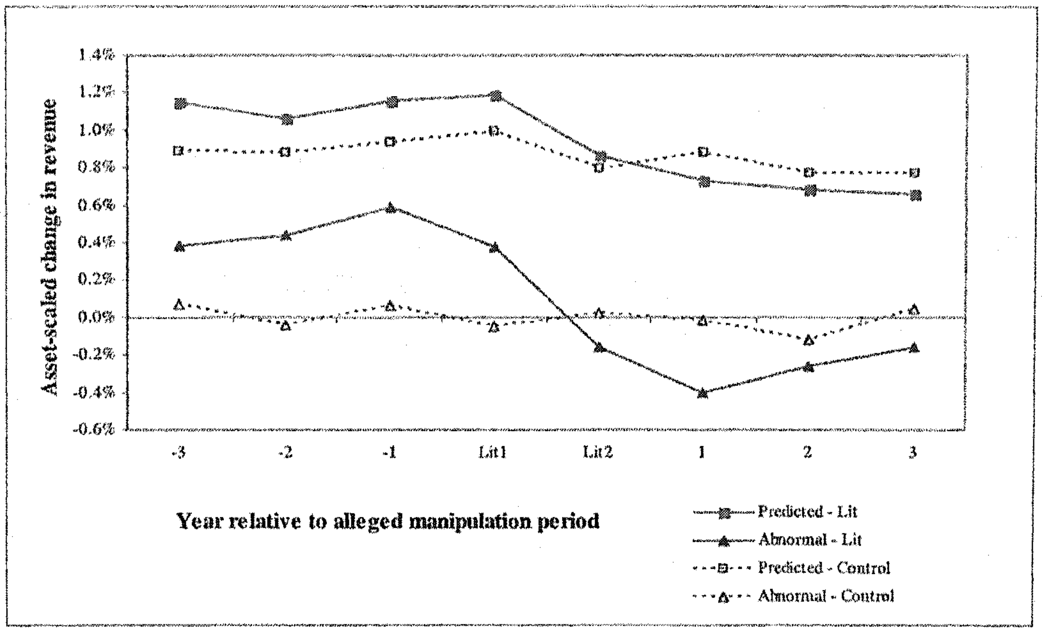
First rdqe – the first quarterly earnings announcement date falling within the class period (the corresponding quarter is the first quarter in the manipulation period)

Last rdqe – the last quarterly earnings announcement date falling within the class period (the corresponding quarter is the last quarter in the manipulation period)

Figures

Figure 1: Time Series Profile of Predicted and Abnormal Change in Revenue

Plot A: Predicted and abnormal change in revenue for defendant firms and control firms



Plot B: Matched-pair predicted and abnormal change in revenue for defendant firms

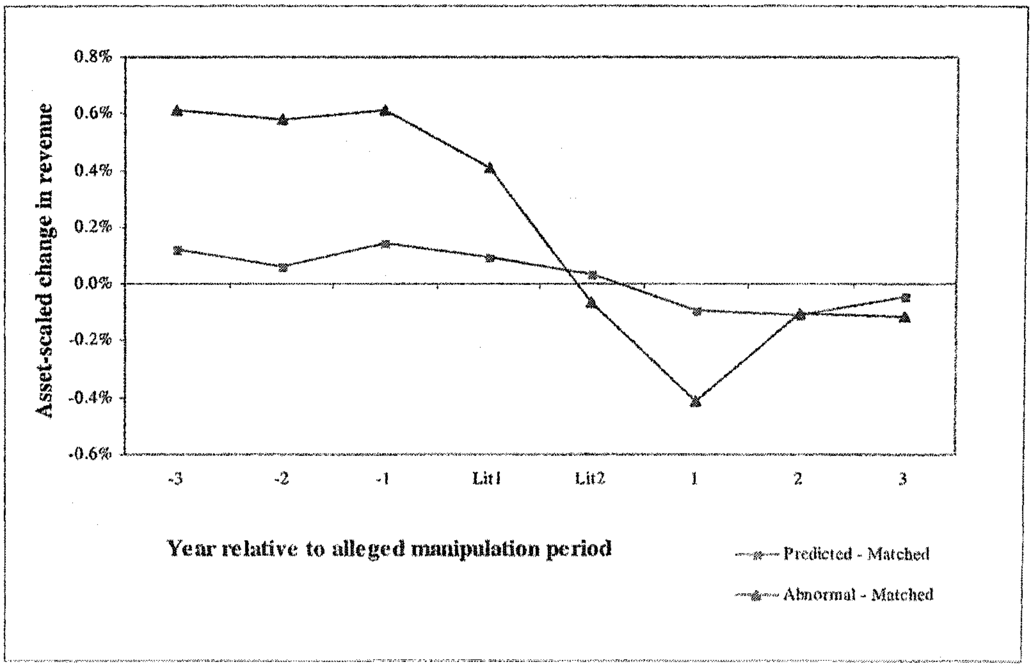
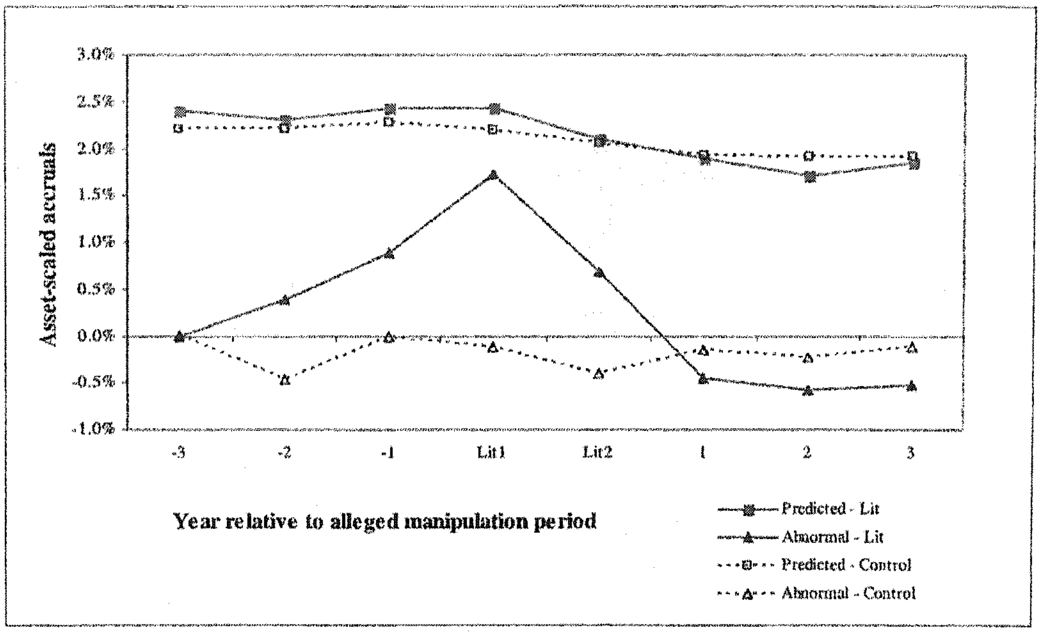


Figure 2: Time Series Profile of Predicted and Abnormal Current Accruals

Plot A: *Predicted and abnormal current accruals for defendant firms and control firms*



Plot B: *Matched-pair predicted and abnormal current accruals for defendant firms*

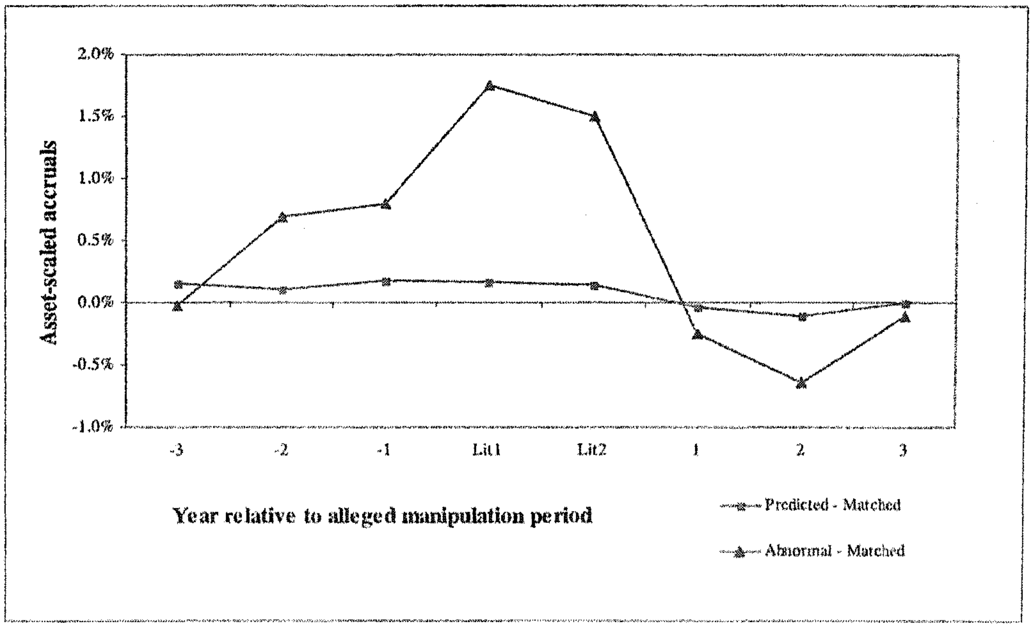
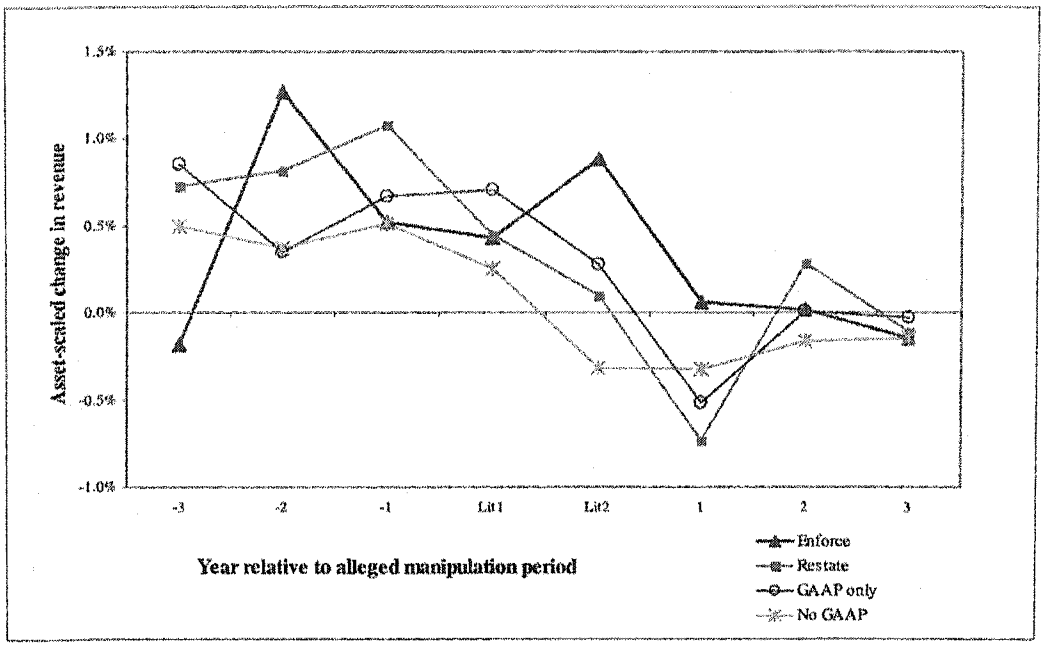
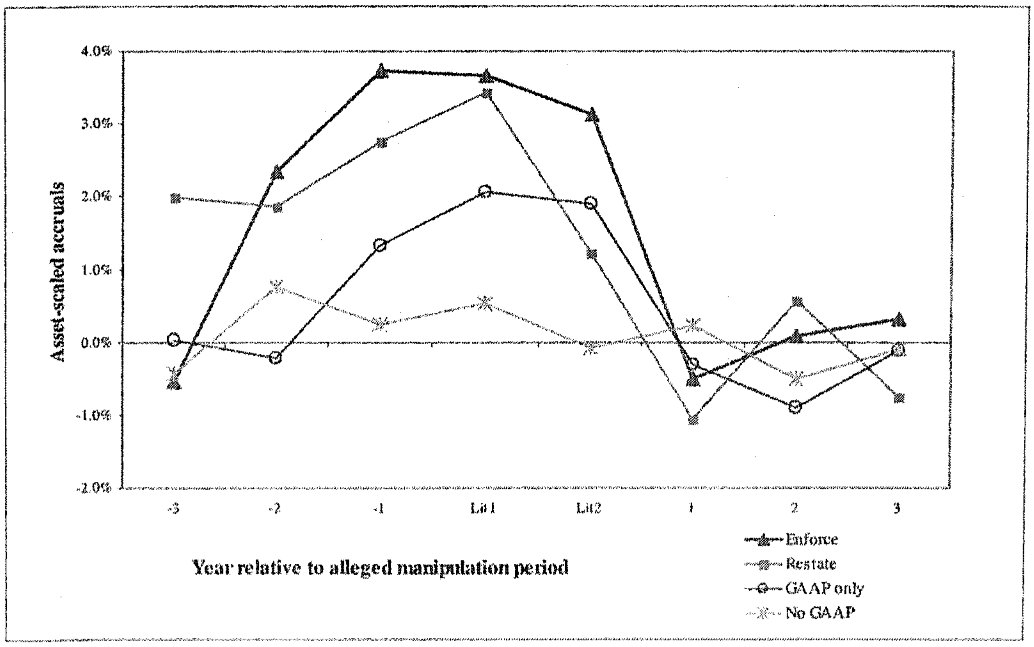


Figure 3: Time Series Profile of Abnormal Current Accruals and Abnormal Change in Revenue for Sub-Samples of Defendant Firms

Plot A: Matched-Pair Abnormal change in revenue



Plot B: Matched-Pair IV-Model Abnormal current accruals



Tables

Table 2.1 Descriptive Statistics for Estimation of the Revenue Model and the Current Accruals Model

Panel A: Revenue Model

$$\Delta REV_{j,p} = \alpha_p + \beta_{1,p}INDCHRE_{j,p} + \beta_{2,p}\,\Delta\,EMPLOYEE_{j,p} + \beta_{3,p}\,\Delta\,CFO_{j,p} + \beta_{4,p}D1 + \beta_{5,p}D2 + \beta_{6,p}D3 + \Sigma\beta_{y,p}Dyear_y + \varepsilon_{j,p} \quad (2.9)$$

		Mean	Std dev	Q3	Median	Q1
a	63	0.00	0.03	0.00	0.00	-0.01
t-Statistic	63	0.34	1.86	1.48	-0.11	-0.97
b_1	63	1.08	1.13	1.07	0.93	0.81
t-Statistic	63	14.92	8.83	22.14	12.26	8.05
b_2	63	2.14	1.63	2.79	2.18	1.15
t-Statistic	63	8.70	7.47	11.68	6.50	4.15
b_3	63	0.06	0.13	0.08	0.02	0.00
t-Statistic	63	3.34	5.92	5.50	1.49	-0.04
# of Obs.	63	3082	4448	3607	1575	609
Adj. R^2	63	0.25	0.16	0.33	0.21	0.14

Panel B: Current Accruals Model

$$CAC_{j,p} = \phi_p + \delta_{1,p}PCHREV_{j,p} + \delta_{2,p}\,\Delta\,EMPLOYEE_{j,p} + \delta_{3,p}\,\Delta\,CFO_{j,p} + \delta_{4,p}D1 + \delta_{5,p}D2 + \delta_{6,p}D3 + \Sigma\delta_{y,p}Dyear_y + \upsilon_{j,p} \quad (2.12)1a$$

	N	Mean	Std. dev.	Q3	Median	Q1
c	63	0.01	0.02	0.02	0.01	0.00
t-Statistic	63	1.46	2.71	2.92	1.42	0.08
d_1	63	0.15	0.34	0.22	0.12	0.02
t-Statistic	63	1.93	2.65	3.35	1.76	0.35
d_2	63	5.20	27.12	3.18	1.56	0.38
t-Statistic	63	5.16	4.65	8.30	5.09	1.49
d_3	63	-0.18	0.13	-0.08	-0.16	-0.26
t-Statistic	63	-11.55	7.91	-4.94	-11.47	-16.81
# of Obs.	63	2945	4246	3448	1516	589
Adj. R^2	63	0.19	0.14	0.25	0.16	0.10

Variable definitions: ΔREV is change in revenue; INDCHREV is median change in revenue by firms in 3-digit SIC industry; ΔEMPLOYEE is change in number of employees, ΔCFO is change in cash flow from operations; CAC is current accruals, PCHREV is predicted change in revenue, defined as the predicted values from equation (2.9); D1-D3 is dummy variable which equals one if observation relates to first, second, and third quarter, respectively; Dyear is dummy which equals one if observation relates to year 1987 through 2000, respectively; *y* denotes index for year 1987 through year 2000; *j* denotes index for firms within estimation portfolio *p*; all variables (except year and quarter dummies) are deflated by total assets at the beginning of the quarter. *a*, b_1, b_2 and b_3 denote estimated coefficients α, β_1, β_2, and β_3, respectively; *c*, d_1, d_2 and d_3 denote estimated coefficients ϕ, δ_1, δ_2, and δ_3, respectively.

Each estimation portfolio consists of all non-litigation firms within two-digit SIC industry. There are 63 industry estimation portfolios. All firm-quarters in COMPUSTAT quarterly full coverage, industry, and research files from 1987 to 2001 are used in estimation, with the following exception: (1) firm-quarters with any variables used in model missing are excluded, and (2) all firms sued during 1980-2000, as covered by Woodruff-Sawyer class action securities litigation database, are excluded. All variables are winsorized at top and bottom 0.5 percent.

Table 2.2 Descriptive Statistics for Tests of Earnings Management Using Alternative Models to Measure Discretionary Accruals. The Results are based on 200 Random Samples of 100 Randomly Selected Firm-Quarters.

Model	Mean	Standard Deviation	Lower Quartile	Median	Upper Quartile
IV model					
earnings management	0.000	0.010	-0.006	0.000	0.006
standard error	0.010	0.001	0.009	0.010	0.011
t-statistic	-0.022	0.967	-0.602	0.030	0.550
Jones Model					
earnings management	-0.002	0.011	-0.008	-0.002	0.005
standard error	0.011	0.001	0.010	0.011	0.012
t-statistic	-0.185	0.969	-0.771	-0.170	0.426
Modified Jones Model					
earnings management	-0.002	0.011	-0.008	-0.002	0.005
standard error	0.011	0.001	0.010	0.011	0.012
t-statistic	-0.185	0.958	-0.772	-0.189	0.393
Term-Adjusted Modified Jones Model					
earnings management	0.000	0.010	-0.006	0.000	0.006
standard error	0.010	0.001	0.009	0.010	0.011
t-statistic	-0.030	0.971	-0.643	0.017	0.542
Kang-Sivaramakrishnan Model					
earnings management	-0.005	0.018	-0.013	-0.003	0.006
standard error	0.015	0.003	0.013	0.014	0.017
t-statistic	-0.262	1.156	-0.868	-0.169	0.421
Term-Adjusted Kang-Sivaramakrishnan Model					
earnings management	-0.006	0.018	-0.014	-0.003	0.005
standard error	0.015	0.003	0.013	0.015	0.017
t-statistic	-0.356	1.155	-1.028	-0.255	0.319

The descriptive statistics reported are for 200 iterations of pooled time-series cross-sectional regressions: $DA_{it} = a + bPART_{it} + e_{it}$; where DA is the measure of discretionary accruals estimated from each of the six models, PART is an indicator variable set equal to 1 in a firm-quarter in which earnings management is hypothesized (i.e., if an observation is one of the 100 randomly selected firm-quarters) and 0 otherwise.

Earnings management is the estimated coefficient on PART, b.

Standard error is the standard error of b, the coefficient on PART, for each of the regressions.

t-statistic is the t-statistic testing the null hypothesis that b, the coefficient on PART, is equal to 0.

Table 2.3 Descriptive Statistics for Tests of Earnings Management Using Alternative Models to Measure Discretionary Accruals. The Results are based on 200 Random Samples of 100 Firm-Quarters with Decreasing Return on Assets

Model	Mean	Standard Deviation	Lower Quartile	Median	Upper Quartile
IV model					
earnings management	-0.004	0.009	-0.010	-0.004	0.003
standard error	0.009	0.001	0.009	0.009	0.010
t-statistic	-0.429	0.922	-1.142	-0.394	0.318
Jones Model					
earnings management	-0.001	0.009	-0.008	-0.001	0.006
standard error	0.010	0.001	0.010	0.010	0.011
t-statistic	-0.105	0.915	-0.816	-0.128	0.574
Modified Jones Model					
earnings management	-0.005	0.010	-0.012	-0.006	0.001
standard error	0.010	0.001	0.010	0.010	0.011
t-statistic	-0.528	0.937	-1.144	-0.568	0.130
Term-Adjusted Modified Jones Model					
earnings management	-0.004	0.009	-0.011	-0.004	0.003
standard error	0.010	0.001	0.009	0.010	0.011
t-statistic	-0.452	0.947	-1.119	-0.380	0.258
Kang-Sivaramakrishnan Model					
earnings management	-0.013	0.015	-0.022	-0.012	-0.003
standard error	0.014	0.002	0.013	0.014	0.015
t-statistic	-0.947	1.028	-1.683	-0.893	-0.216
Term-Adjusted Kang-Sivaramakrishnan Model					
earnings management	-0.013	0.015	-0.022	-0.012	-0.004
standard error	0.014	0.002	0.013	0.014	0.015
t-statistic	-0.931	1.002	-1.588	-0.898	-0.253

The descriptive statistics reported are for 200 iterations of pooled time-series cross-sectional regressions: $DA_{it} = a + bPART_{it} + e_{it}$; where DA is the measure of discretionary accruals estimated from each of the six models, PART is an indicator variable set equal to 1 in a firm-quarter in which earnings management is hypothesized (i.e., if an observation is one of the 100 firm-quarters randomly selected from a pool of all Compustat firm-quarters with decreasing return on assets and necessary data to calculate discretionary accruals from each of the six models) and 0 otherwise.

Earnings management is the estimated coefficient on PART, b.

Standard error is the standard error of b, the coefficient on PART, for each of the regressions.

t-statistic is the t-statistic testing the null hypothesis that b, the coefficient on PART, is equal to 0.

Table 2.4 Descriptive Statistics for Tests of Earnings Management Using Alternative Models to Measure Discretionary Accruals. The Results are based on 200 Random Samples of 100 Firm-Quarters with Increasing Return on Assets.

Model	Mean	Standard Deviation	Lower Quartile	Median	Upper Quartile
IV model					
earnings management	0.005	0.009	-0.002	0.005	0.012
standard error	0.009	0.001	0.009	0.009	0.010
t-statistic	0.511	0.992	-0.172	0.510	1.223
Jones Model					
earnings management	0.001	0.010	-0.005	0.001	0.008
standard error	0.011	0.001	0.010	0.010	0.011
t-statistic	0.074	0.948	-0.523	0.054	0.780
Modified Jones Model					
earnings management	0.004	0.010	-0.002	0.004	0.011
standard error	0.011	0.001	0.010	0.010	0.011
t-statistic	0.392	0.940	-0.194	0.332	1.053
Term-Adjusted Modified Jones Model					
earnings management	0.005	0.010	-0.002	0.005	0.011
standard error	0.010	0.001	0.009	0.010	0.010
t-statistic	0.491	0.990	-0.213	0.500	1.172
Kang-Sivaramakrishnan Model					
earnings management	0.008	0.013	0.000	0.008	0.016
standard error	0.014	0.003	0.012	0.014	0.016
t-statistic	0.559	0.917	-0.035	0.675	1.175
Term-Adjusted Kang-Sivaramakrishnan Model					
earnings management	0.006	0.013	-0.002	0.008	0.015
standard error	0.014	0.002	0.013	0.014	0.016
t-statistic	0.431	0.905	-0.147	0.534	1.075

The descriptive statistics reported are for 200 iterations of pooled time-series cross-sectional regressions of: $DA_{it} = a + bPART_{it} + e_{it}$; where DA is the measure of discretionary accruals estimated from each of the six models, PART is an indicator variable set equal to 1 in a firm-quarter in which earnings management is hypothesized (i.e., if an observation is one of the 100 firm-quarters randomly selected from a pool of all Compustat firm-quarters with increasing return on assets and necessary data to calculate discretionary accruals from each of the six models) and 0 otherwise.

Earnings management is the estimated coefficient on PART, b.

Standard error is the standard error of b, the coefficient on PART, for each of the regressions.

t-statistic is the t-statistic testing the null hypothesis that b, the coefficient on PART, is equal to 0.

Table 2.5 Comparison of Type I Errors of Tests of Earnings Management Using Alternative Models to Measure Discretionary Accruals. Rejection Frequencies Based on One-Tailed Test at 5 Percent Level for the Null Hypothesis of No Earnings Management.

Models and Null Hypotheses	(1) All Firms	(2) Firms with ROA Decrease	(3) Firms with ROA Increase
IV Model			
Earnings Management ≥ 0	4.0%	4.5%	1.0% **
Earnings Management ≤ 0	2.5%	0.0% **	6.0%
Jones Model			
Earnings Management ≥ 0	3.5%	2.0%	1.5% *
Earnings Management ≤ 0	1.5% *	0.5% **	2.5%
Modified Jones Model			
Earnings Management ≥ 0	3.5%	6.5%	1.0% **
Earnings Management ≤ 0	1.0% **	0.5% **	5.0%
Term-Adjusted Modified Jones Model			
Earnings Management ≥ 0	3.5%	5.5%	1.5% *
Earnings Management ≤ 0	1.5% *	0.0% **	6.5%
Kang-Sivaramakrishnan Model			
Earnings Management ≥ 0	8.5% *	17.5% **	1.0% **
Earnings Management ≤ 0	3.0%	0.0% **	4.5%
Term-Adjusted Kang-Sivaramakrishnan Model			
Earnings Management ≥ 0	10.0% **	15.0% **	1.5% *
Earnings Management ≤ 0	2.5%	0.0% **	2.5%

The simulation samples are drawn from 1987-2000 Compustat quarterly data. Two hundred simulations are performed. For each simulation, 100 firms are selected and an event quarter is selected for each firm. Case 1 selects at random 100 firms and an event quarter for each firm, case 2 randomly selects 100 firm-quarters with a decrease in return on assets, case 3 randomly selects 100 firm-quarters with an increase in return on assets. Each simulation runs the following pooled time-series cross-sectional regressions: $DA_{it} = a + bPART_{it} + e_{it}$; where DA is the measure of discretionary accruals estimated from each of the six models, PART is an indicator variable set equal to 1 for an event quarter (i.e., a firm-quarter in which earnings management is hypothesized) and 0 otherwise.

* Significantly different from 5%, at the 5 percent level using a two-tailed binomial test.

** Significantly different from 5% at the 1 percent level using a two-tailed binomial test.

Table 2.6 Descriptive Statistics for Tests of Earnings Management Using Alternative Models to Measure Discretionary Accruals. The Results are based on 200 Random Samples of 100 Randomly Selected Firm-Quarters with Random Positive Accruals Added to Event Quarter.

Model	Mean	Standard Deviation	Lower Quartile	Median	Upper Quartile
IV model					
earnings management	0.026	0.012	0.020	0.026	0.035
standard error	0.010	0.002	0.009	0.010	0.011
t-statistic	2.610	1.179	1.949	2.644	3.336
Jones Model					
earnings management	0.025	0.015	0.017	0.025	0.033
standard error	0.012	0.002	0.011	0.012	0.013
t-statistic	2.120	1.143	1.499	2.190	2.777
Modified Jones Model					
earnings management	0.026	0.015	0.018	0.026	0.033
standard error	0.012	0.002	0.011	0.012	0.013
t-statistic	2.160	1.154	1.478	2.267	2.840
Term-Adjusted Modified Jones Model					
earnings management	0.027	0.013	0.019	0.026	0.036
standard error	0.011	0.002	0.010	0.011	0.012
t-statistic	2.451	1.159	1.815	2.440	3.151
Kang-Sivaramakrishnan Model					
earnings management	-0.101	1.558	-0.072	0.009	0.131
standard error	0.216	0.151	0.138	0.178	0.232
t-statistic	0.088	1.747	-0.451	0.040	0.756
Modified Kang-Sivaramakrishnan Model					
earnings management	-0.164	2.257	-0.001	0.026	0.054
standard error	0.064	0.156	0.032	0.040	0.049
t-statistic	0.396	2.495	-0.041	0.584	1.353

The descriptive statistics reported are for 200 iterations of pooled time-series cross-sectional regressions: $DA_{it} = a + bPART_{it} + e_{it}$; where DA is the measure of discretionary accruals estimated from each of the six models, PART is an indicator variable set equal to 1 in a firm-quarter in which earnings management is hypothesized (i.e., if an observation is one of the 100 firm-quarters randomly selected to be injected with random positive accruals) and 0 otherwise.

Earnings management is the estimated coefficient on PART, b.

Standard error is the standard error of b, the coefficient on PART, for each of the regressions.

t-statistic is the t-statistic testing the null hypothesis that b, the coefficient on PART, is equal to 0.

Table 2.7 Comparison of Type II Errors of Tests of Earnings Management Using Alternative Models to Measure Discretionary Accruals. The Results are based on 200 Random Samples of 200 Randomly Selected Firm-Quarters with Random Positive Accruals Added to Event Quarter. Rejection Frequencies Based on One-Tailed Test at 5 Percent Level for the Null Hypothesis of No Earnings Management.

Model and Null Hypotheses	Rejection Rate
IV Model	
Earnings Management ≥ 0	0.5% **
Earnings Management ≤ 0	74.5% **
Jones Model	
Earnings Management ≥ 0	0.5% **
Earnings Management ≤ 0	60.0% **
Modified Jones Model	
Earnings Management ≥ 0	0.0% **
Earnings Management ≤ 0	61.5% **
Term-Adjusted Modified Jones Model	
Earnings Management ≥ 0	0.0% **
Earnings Management ≤ 0	69.5% **
Kang-Sivaramakrishnan Model	
Earnings Management ≥ 0	4.5%
Earnings Management ≤ 0	7.5%
Term-Adjusted Kang-Sivaramakrishnan Model	
Earnings Management ≥ 0	8.5% *
Earnings Management ≤ 0	12.0% **

Amount of Manipulation

	Scaled by Beginning Net Total Assets	Scaled by Net Income
Mean	0.0265	3.282
Standard Deviation	0.0441	32.937
Lower Quartile	0.0111	0.251
Median	0.0200	0.626
Upper Quartile	0.0324	1.553

The simulation samples are drawn from 1987-2000 Compustat quarterly data. Two hundred simulations are performed. For each simulation, 200 firms are selected and an event quarter is selected for each firm. Positive random accruals are added to each event quarter. Each simulation runs the following firm-specific regressions: $DA_{it} = a + bPART_{it} + e_{it}$; where DA is the measure of discretionary accruals estimated from each of the six models, PART is an indicator variable set equal to 1 for an event quarter (i.e., a firm-quarter in which earnings management is hypothesized) and 0 otherwise.

* Significantly different from 5%, at the 5 percent level using a two-tailed binomial test.

** Significantly different from 5% at the 1 percent level using a two-tailed binomial test.

Table 2.8 Descriptive Statistics for Tests of Earnings Management Using Alternative Models to Measure Discretionary Accruals. Sample of 140 Firms Sued by Shareholders for Accounting Fraud, and also Subject to the SEC Accounting and Auditing Enforcement Actions or Earnings Restatement between 1986 and 2000: Class Period Plus One Year Before.

Model	*Mean*	*Standard Deviation*	*Lower Quartile*	*Median*	*Upper Quartile*
IV model					
earnings management	0.048	0.107	-0.003	0.028	0.080
standard error	0.042	0.034	0.018	0.030	0.054
t-statistic	1.511	4.598	-0.063	0.992	2.256
Z-statistic = 13.87**					
Modified Jones Model					
earnings management	0.063	0.142	-0.002	0.032	0.100
standard error	0.068	0.071	0.023	0.045	0.086
t-statistic	1.492	6.788	-0.049	0.880	2.095
Z-statistic = 11.40**					
Term-Adjusted Modified Jones Model					
earnings management	0.050	0.120	-0.006	0.028	0.092
standard error	0.053	0.049	0.021	0.037	0.067
t-statistic	1.151	2.034	-0.085	0.901	2.282
Z-statistic = 13.72**					
Kang-Sivaramakrishnan Model					
earnings management	0.046	0.286	-0.068	0.024	0.110
standard error	0.289	0.197	0.164	0.246	0.365
t-statistic	0.159	0.961	-0.392	0.129	0.539
Z-statistic = 0.98					

The descriptive statistics reported are for firm-specific regressions: $DA_{it} = a + bPART_{it} + e_{it}$; where DA is the measure of discretionary accruals estimated from each of the six models, PART is an indicator variable set equal to 1 in a firm-quarter in which earnings management is hypothesized (i.e., if an observation is a firm-quarter with restated earnings or subject to SEC enforcement) and 0 otherwise.

Earnings management is the estimated coefficient on PART, b.

Standard error is the standard error of b, the coefficient on PART, for each of the regressions.

t-statistic is the t-statistic testing the null hypothesis that b, the coefficient on PART, is equal to 0.

Z-statistic, defined below, tests the null hypothesis that the average t-statistic is zero for the firms in the sample: $Z = \frac{1}{\sqrt{N}}\sum_{j=1}^{N}\frac{t_j}{\sqrt{k_j/(k_j-2)}}$, where t_j is t-statistic for firm j; and k_j is degrees of freedom for t-statistic of firm j.

** Significantly different from zero at the 1 percent level using a two-tailed test.

Table 2.9 Descriptive Statistics for Tests of Earnings Management Using Alternative Models to Measure Discretionary Accruals. Sample of 140 Firms Sued by Shareholders for Accounting Fraud, and also Subject to SEC Accounting and Auditing Enforcement Actions or Earnings Restatement between 1986 and 2000: One Year after Class Period.

Model	*Mean*	*Standard Deviation*	*Lower Quartile*	*Median*	*Upper Quartile*
IV model					
earnings management	-0.044	0.130	-0.076	-0.026	0.017
standard error	0.051	0.044	0.024	0.037	0.064
t-statistic	-1.128	4.571	-1.984	-0.638	0.511
Z-statistic = -8.25**					
Modified Jones Model					
earnings management	-0.065	0.142	-0.112	-0.044	0.010
standard error	0.080	0.071	0.031	0.053	0.099
t-statistic	-1.436	7.369	-1.783	-0.744	0.211
Z-statistic = -9.19**					
Term-Adjusted Modified Jones Model					
earnings management	-0.055	0.128	-0.093	-0.032	0.010
standard error	0.063	0.058	0.026	0.044	0.078
t-statistic	-0.923	1.816	-1.742	-0.768	0.372
Z-statistic = -9.83**					
Kang-Sivaramakrishnan Model					
earnings management	-0.063	0.296	-0.163	-0.039	0.050
standard error	0.322	0.178	0.218	0.279	0.395
t-statistic	-0.249	0.999	-0.689	-0.152	0.152
Z-statistic = -1.59					

The descriptive statistics reported are for firm-specific regressions of: $DA_{it} = a + bPART_{it} + e_{it}$; where DA is the measure of discretionary accruals estimated from each of the six models, PART is an indicator variable set equal to 1 in a firm-quarter in which earnings management is hypothesized (i.e., if an observation is a firm-quarter falling within one year after class period for defendant firms facing earnings restatement or SEC enforcement actions) and 0 otherwise.

Earnings management is the estimated coefficient on PART, b.

Standard error is the standard error of b, the coefficient on PART, for each of the regressions.

t-statistic is the t-statistic testing the null hypothesis that b, the coefficient on PART, is equal to 0. Z-statistic, defined below, tests the null hypothesis that the average t-statistic is zero for the firms in the sample: $Z = \frac{1}{\sqrt{N}} \sum_{j=1}^{N} \frac{t_j}{\sqrt{k_j/(k_j-2)}}$, where t_j is t-statistic for firm j; and k_j is degrees of freedom for t-statistic of firm j.

** Significantly different from zero at the 1 percent level using a two-tailed test.

Table 2.10 Comparison of Type II Errors of Tests of Earnings Management Using Alternative Models to Measure Discretionary Accruals. Sample of 140 Firms Sued by Shareholders for Accounting Fraud, and also Subject to SEC Accounting and Auditing Enforcement Actions or Earnings Restatement. Rejection Frequencies Based on One-Tailed Test at 5 Percent Level for the Null Hypothesis of No Earnings Management.

Model and Null Hypotheses	Defendant Firms Subject to SEC Enforcement or Earnings Restatement: Manipulation Period	One Year after Class Period
IV Model		
Earnings Management ≤ 0	3.0	21.3**
Earnings Management ≥ 0	28.0**	2.2
Modified Jones Model		
Earnings Management ≤ 0	3.9	17.4**
Earnings Management ≥ 0	22.8**	1.3*
Term-Adjusted Modified Jones Model		
Earnings Management ≤ 0	2.7	19.7**
Earnings Management ≥ 0	26.8**	1.3*
Kang-Sivaramakrishnan Model		
Earnings Management ≤ 0	0.0**	0.0**
Earnings Management ≥ 0	0.8*	1.0

Rejection frequencies reported are for the following firm-specific regressions: $DA_{it} = a + bPART_{it} + e_{it}$; where DA is the measure of discretionary accruals estimated from each of the six models, PART is an indicator variable set equal to 1 for an event quarter (i.e., a firm-quarter in which earnings management is hypothesized) and 0 otherwise.

* Significantly different from 5%, at the 5 percent level using a two-tailed binomial test.

** Significantly different from 5% at the 1 percent level using a two-tailed binomial test.

Table 3.1 Descriptive Statistics on Litigation Sample

Panel A: Sample of securities class action lawsuits with beginning of class period during 1988 – 2000.

Class action securities lawsuits with beginning of class period during 1988 - 2000		2,033
Less: cases with defendant firms in the financial and banking industry (SIC 6021-6799)	279	
Less: cases with no defined class period	122	
Less: multiple lawsuits involving the same firms	197	
Less: firms not covered by COMPUSTAT	267	
Less: cases with no fiscal quarter falling within alleged manipulation period	70	
Less: cases with missing data for calculating abnormal accruals and abnormal change in revenue during alleged manipulation period	317	
Final sample		781

Table 3.1 (continued) Descriptive Statistics on Litigation Sample

Panel B: *Number of filings by industry*

Industry	Primary SIC Code	Number of Suits	SEC Enforcement		Financial Restatement*		Accounting Allegation	
1 Agriculture	100-999	1	0	(0.0%)	0	(0.0%)	0	(0.0%)
2 Mining and construction	1000-1999, except 1300-1399	12	1	(8.3%)	1	(8.3%)	5	(41.7%)
3 Food	2000-2111	11	1	(9.1%)	2	(18.2%)	6	(54.5%)
4 Textile, printing and publishing	2200-2799	29	2	(6.9%)	6	(20.7%)	13	(44.8%)
5 Chemicals	2800-2824, and 2840-2899	14	0	(0.0%)	1	(7.1%)	7	(50.0%)
6 Pharmaceuticals	2830-2836	54	1	(1.9%)	4	(7.4%)	13	(24.1%)
7 Extractive industries	2900-2999, and 1300-1399	9	0	(0.0%)	0	(0.0%)	2	(22.2%)
8 Durable manufacturers	3000-3999, except 3570-3579 and 3670-3679	161	19	(11.8%)	25	(15.5%)	77	(47.8%)
9 Computers	7370-7379, 3570-3579, and 3670-3679	250	21	(8.4%)	36	(14.4%)	120	(48.0%)
10 Transportation	4000-4899	35	0	(0.0%)	8	(22.9%)	14	(40.0%)
11 Utilities	4900-4999	15	1	(6.7%)	2	(13.3%)	7	(46.7%)
12 Retail	5000-5999	105	11	(10.5%)	14	(13.3%)	53	(50.5%)
13 Services	7000-8999, except 7370-7379	82	8	(9.8%)	9	(11.0%)	48	(58.5%)
14 Other	>9000	3	1	(33.3%)	0	(0.0%)	1	(33.3%)
Total		781	66	(8.5%)	108	(13.8%)	366	(46.9%)

* The WS database does not systematically code the restatement variable prior to 1996.

Table 3.1 (Continued) Descriptive Statistics on Litigation Sample

Panel C: *Number of filings by year of class period beginning*

Class Period Begin Year	Number of Suits	SEC Enforcement	Accounting Restatement*	Accounting Allegation
1988	16	1 (6.3%)	0 (0.0%)	5 (31.3%)
1989	53	8 (15.1%)	0 (0.0%)	22 (41.5%)
1990	39	7 (17.9%)	0 (0.0%)	12 (30.8%)
1991	59	7 (11.9%)	0 (0.0%)	24 (40.7%)
1992	52	7 (13.5%)	0 (0.0%)	23 (44.2%)
1993	64	7 (10.9%)	4 (6.3%)	30 (46.9%)
1994	54	9 (16.7%)	6 (11.1%)	25 (46.3%)
1995	79	5 (6.3%)	9 (11.4%)	37 (46.8%)
1996	69	4 (5.8%)	17 (24.6%)	36 (52.2%)
1997	90	6 (6.7%)	21 (23.3%)	50 (55.6%)
1998	85	5 (5.9%)	27 (31.8%)	49 (57.6%)
1999	79	0 (0.0%)	14 (17.7%)	32 (40.5%)
2000	42	0 (0.0%)	10 (23.8%)	21 (50.0%)
Total	781	66 (8.5%)	108 (13.8%)	366 (46.9%)

Panel D *Number of filings by lawsuit outcome*

Type of Disposition#	All Suits Filed		SEC Enforcement		Accounting Restatement*		Accounting Allegation	
Dismissed before trial	93	(18.5%)	3	(4.9%)	11	(16.4%)	28	(11.5%)
Settled before trial	398	(79.1%)	58	(95.1%)	55	(82.1%)	214	(87.7%)
Tried	5	(1.0%)	0	(0.0%)	0	(0.0%)	0	(0.0%)
Withdrawn	7	(1.4%)	0	(0.0%)	1	(1.5%)	2	(0.8%)
	503	(100.0%)	61	(100.0%)	67	(100.0%)	244	(100.0%)

* The WS database does not systematically code the restatement variable prior to 1996.

\# The difference between total sample size (781) and number of cases for which outcome is coded in WS database (503) represents cases with outcome pending or unknown.

Table 3.2 OLS Regression of Quarterly Performance-Matched Asset-Scaled Abnormal Change in Revenue[a] on Event-Year Dummies

Panel A: Compare regression coefficients between two groups of defendant firms – those with allegations of GAAP violations vs. those without.

Independent Variable[b]	Pred Sign	(1) With GAAP Allegations # of Obs =1	(1) Coeff. Est.	(1) t-stat	(2) Without GAAP Allegations # of Obs =1	(2) Coeff. Est.	(2) t-stat	(3) All Cases # of Obs =1	(3) Coeff. Est.	(3) t-stat
Intercept	?		0.001	1.04		-0.001	-1.39		-0.001	-1.46
GAAP	?							12098	0.002 *	1.75
BEF 3	?	715	0.007 ***	3.40	750	0.007 ***	4.04	1470	0.008 ***	4.22
BEF 2	?	908	0.008 ***	4.08	956	0.007 ***	4.66	1862	0.008 ***	4.86
BEF 1	+	1156	0.013 ***	7.25	1274	0.009 ***	6.59	2433	0.009 ***	5.94
LIT1	+	1194	0.008 ***	4.39	1096	0.007 ***	4.40	2291	0.007 ***	4.48
LIT2	?	417	-0.001	-0.29	249	0.000	0.10	666	0.000	0.14
LIT3PLUS	?	107	-0.003	-0.62	55	0.003	0.45	161	0.003	0.44
AFT1	-	1346	-0.008 ***	-4.71	1670	-0.004 ***	-3.01	3007	-0.003 ***	-2.52
AFT 2	?	1151	-0.004 **	-2.52	1403	-0.001	-0.91	2555	-0.001	-1.03
AFT 3	?	901	-0.002	-1.29	1157	-0.001	-0.74	2054	-0.001	-0.35
GAAP*BEF3	?							713	0.000	-0.06
GAAP*BEF2	?							898	0.001	0.32
GAAP*BEF1	+							1147	0.004 **	1.76
GAAP*LIT1	+							1190	0.000	0.06
GAAP*LIT2	?							415	-0.001	-0.30
GAAP*LIT3PLUS	?							106	-0.004	-0.55
GAAP*AFT1	-							1332	-0.004 **	-2.11
GAAP*AFT2	?							1147	-0.003	-1.33
GAAP*AFT3	?							892	-0.003	-1.21
F-test of vector parm[c]									1.449	
Number of obs		12183			14590			26769		
F-value of model			17.271 ***			12.901 ***			15.867 ***	
Adj. R^2			0.012			0.007			0.010	

Table 3.2 (continued) OLS Regression of Quarterly Performance-Matched Asset-Scaled Abnormal Change in Revenue[a] on Event-Year Dummies

Panel A (continued): compare regression coefficients between two groups of defendant firms – those with allegations of GAAP violations vs. those without.

***, **, and * Significance at the 1%, 5% and 10% levels, one-tailed for variables with predicted signs, two-tailed for those without predicted signs.

a Dependent variable is the difference between quarterly abnormal change in revenue by defendant firm and control firm.

b Definitions of independent variables: GAAP is a dummy variable which equals one if the defendant firm is subject to SEC accounting and auditing enforcement actions, or the firm has restated its financial reports during the alleged period of manipulation; BEF3 – BEF1 are dummy variables which equal one if the observation is from the third, second and first four-quarter period, respectively, prior to the first quarter of alleged manipulation period; Lit1 and Lit2 are dummies which equal one if the observation is from the first and second four-quarter period, respectively, during alleged manipulation period; Lit3plus is a dummy variable which equals one if the observation is from a quarter after the ninth quarter during manipulation period; AFT1-AFT3 are dummies which equal one if the observation is from first, second or third four-quarter period, respectively, after the last quarter of alleged manipulation period; GAAP *BEF3 through GAAP *AFT3 are interaction terms between GAAP and year dummies defined above.

c F test for the joint hypotheses that the coefficients on GAAP*BEF3 through GAAP*AFT3 are zero.

Table 3.2 (continued): OLS Regression of Quarterly Performance-Matched Asset-Scaled Abnormal Change in Revenue[a] on Event-Year Dummies

Panel B: *Compare regression coefficients between two groups of defendant firms with accounting allegations – those with SEC enforcement or financial restatement, vs. those without*

Independent Variable[b]	Pred Sign	(1) With Enforce/Restate # of Obs =1	(1) Coeff. Est.	(1) t-stat	(2) Without Enforce/Restate # of Obs =1	(2) Coeff. Est.	(2) t-stat	(3) All Cases with GAAP Alleg. # of Obs =1	(3) Coeff. Est.	(3) t-stat
Intercept	?		0.002	1.25		0.001	1.56		0.002 *	1.66
AARE	?							4860	0.000	0.06
BEF 3	?	326	0.003	1.05	480	0.007 ***	2.90	804	0.007 ***	2.80
BEF 2	?	388	0.006 **	2.03	604	0.009 ***	3.86	994	0.007 ***	3.26
BEF 1	+	488	0.008 ***	3.13	761	0.012 ***	6.13	1250	0.013 ***	6.11
LIT1	+	503	0.003	1.08	763	0.007 ***	3.66	1264	0.008 ***	3.66
LIT2	?	224	-0.003	-0.86	219	0.000	-0.03	443	0.001	0.17
LIT3PLUS	?	67	-0.005	-0.79	56	-0.004	-0.58	123	-0.004	-0.58
AFT1	-	516	-0.008 ***	-3.08	878	-0.009 ***	-4.73	1397	-0.008 ***	-4.31
AFT 2	?	426	-0.006 **	-2.00	756	-0.004 **	-2.14	1182	-0.004 **	-2.16
AFT 3	?	330	-0.003	-1.03	594	-0.003	-1.38	924	-0.003	-1.27
AARE *BEF3	?							324	-0.004	-0.94
AARE *BEF2	?							386	-0.001	-0.14
AARE *BEF1	+							486	-0.004	-1.26
AARE *LIT1	+							500	-0.004	-1.30
AARE *LIT2	?							223	-0.003	-0.58
AARE *LIT3PLUS	?							67	-0.001	-0.12
AARE *AFT1	-							513	0.001	0.42
AARE *AFT2	?							426	-0.001	-0.34
AARE *AFT3	?							329	-0.001	-0.23
F-test of vector parm[c]									0.471	
Number of observation		4877			8191			13079		
F-value of model			4.555 ***			13.658 ***			8.101 ***	
Adj. R^2			0.007			0.014			0.010	

Table 3.2 (continued): OLS Regression of Quarterly Performance-Matched Asset-Scaled Abnormal Change in Revenue[a] on Event-Year Dummies

Panel B (continued): *Compare regression coefficients between two groups of defendant firms with accounting allegations – those with SEC enforcement or financial restatement, vs. those without*

***, **, and * Significance at the 1%, 5% and 10% levels, one-tailed for variables with predicted signs, two-tailed for those without predicted signs.

a Dependent variable is the difference between quarterly abnormal change in revenue by defendant firm and control firm.

b Definitions of independent variables: AARE is a dummy variable which equals one if the defendant firm is subject to SEC accounting and auditing enforcement actions, or the firm has restated its financial reports during the alleged period of manipulation; BEF3 – BEF1 are dummy variables which equal one if the observation is from the third, second and first four-quarter period, respectively, prior to the first quarter of alleged manipulation period; Lit1 and Lit2 are dummies which equal one if the observation is from the first and second four-quarter period, respectively, during alleged manipulation period; Lit3plus is a dummy variable which equals one if the observation is from a quarter after the ninth quarter during manipulation period; AFT1-AFT3 are dummies which equal one if the observation is from first, second or third four-quarter period, respectively, after the last quarter of alleged manipulation period; AARE*BEF3 through AARE*AFT3 are interaction terms between AARE and year dummies defined above.

c F test for the joint hypotheses that the coefficients on AARE*BEF3 through AARE*AFT3 are zero.

Table 3.3 OLS Regression of Quarterly Performance-Matched Asset-Scaled Abnormal Current Accruals[a] on Event-Year Dummies

Panel A: compare regression coefficients between two groups of defendant – those with accounting allegations vs. those without

Independent Variable[b]	Pred Sign	(1) With GAAP Allegations # of Obs =1	(1) Coeff. Est.	(1) t-stat	(2) Without GAAP Allegations # of Obs =1	(2) Coeff. Est.	(2) t-stat	(3) All Cases # of Obs =1	(3) Coeff. Est.	(3) t-stat
Intercept	?		0.001	1.24		0.000	-0.16		0.000	-0.25
GAAP	?							9958	0.002	1.11
BEF 3	?	604	0.001	0.23	595	0.005 **	1.97	1202	0.005 *	1.77
BEF 2	?	788	0.010 ***	3.97	753	0.009 ***	4.09	1540	0.009 ***	3.66
BEF 1	+	985	0.021 ***	8.61	1019	0.010 ***	4.75	1999	0.010 ***	4.58
LIT1	+	999	0.034 ***	14.29	874	0.013 ***	6.22	1869	0.014 ***	5.97
LIT2	?	360	0.019 ***	5.16	197	0.010 ***	2.36	555	0.009 **	2.03
LIT3PLUS	?	83	0.004	0.55	42	0.003	0.36	125	0.003	0.34
AFT1	-	1127	-0.013 ***	-5.74	1344	0.001	0.47	2472	0.001	0.49
AFT 2	?	927	-0.012 ***	-4.89	1132	-0.009 ***	-4.61	2062	-0.009 ***	-4.29
AFT 3	?	710	-0.001	-0.46	910	-0.005 **	-2.51	1621	-0.006 ***	-2.59
GAAP*BEF3	?							600	-0.005	-1.23
GAAP*BEF2	?							783	0.001	0.22
GAAP*BEF1	+							975	0.011 ***	3.47
GAAP*LIT1	+							990	0.020 ***	6.20
GAAP*LIT2	?							355	0.009 **	1.65
GAAP*LIT3plus	?							83	0.001	0.06
GAAP*AFT1	-							1122	-0.013 ***	-4.66
GAAP*AFT2	?							924	-0.002	-0.80
GAAP*AFT3	?							706	0.005	1.53
F-test of vector parm[c]									10.766 ***	
Number of obs		10017			11363			21388		
F-value of model			48.861 ***			14.229 ***			32.276 ***	
Adj. R^2			0.041			0.010			0.027	

Table 3.3 (continued) OLS Regression of Quarterly Performance-Matched Asset-Scaled Abnormal Current Accruals[a] on Event-Year Dummies

Panel A (continued): Compare regression coefficients between two groups of defendant – those with accounting allegations vs. those without

***, **, and * Significance at the 1%, 5% and 10% levels, one-tailed for variables with predicted signs, two-tailed for those without predicted signs.

a Dependent variable is the difference between quarterly IV-model abnormal current accruals by defendant firm and control firm.

b Definitions of independent variables: GAAP is a dummy variable which equals one if the defendant firm faces accounting allegations; BEF3 – BEF1 are dummy variables which equal one if the observation is from the third, second and first four-quarter period, respectively, prior to the first quarter of alleged manipulation period; Lit1 and Lit2 are dummies which equal one if the observation is from the first and second four-quarter period, respectively, during alleged manipulation period; Lit3plus is a dummy variable which equals one if the observation is from a quarter after the ninth quarter during manipulation period; AFT1-AFT3 are dummies which equal one if the observation is from first, second or third four-quarter period, respectively, after the last quarter of alleged manipulation period; GAAP*BEF3 through GAAP*AFT3 are interaction terms between GAAP and year dummies defined above.

c F test for the joint hypotheses that the coefficients on GAAP*BEF3 through GAAP*AFT3 are zero.

Table 3.3 (Continued): OLS Regression of Quarterly Performance-Matched Asset-Scaled Abnormal Current Accruals[a] on Event-Year Dummies

Panel B: *Compare regression coefficients between two groups of defendant firms with accounting allegations – those with SEC enforcement or financial restatement, vs. those without*

Independent Variable[b]	Pred Sign	(1) With Enforce/Restate # of Obs =1	(1) Coeff. Est.	(1) t-stat	(2) Without Enforce/Restate # of Obs =1	(2) Coeff. Est.	(2) t-stat	(3) All Cases with GAAP Alleg. # of Obs =1	(3) Coeff. Est.	(3) t-stat
Intercept	?		0.000	0.17		0.001	0.53		0.001	0.50
AARE	?							4057	-0.001	-0.27
BEF 3	?	300	0.012 ***	2.75	377	-0.002	-0.47	674	-0.001	-0.16
BEF 2	?	350	0.005	1.22	503	0.014 ***	4.46	854	0.014 ***	4.37
BEF 1	+	422	0.028 ***	7.06	634	0.019 ***	6.84	1058	0.018 ***	6.24
LIT1	+	428	0.043 ***	11.00	624	0.027 ***	9.58	1047	0.027 ***	9.25
LIT2	?	194	0.017 ***	3.21	177	0.017 ***	3.43	371	0.019 ***	3.72
LIT3PLUS	?	55	0.024 ***	2.42	40	0.001	0.12	96	-0.008	-0.81
AFT1	-	437	-0.019 ***	-4.95	731	-0.008 ***	-2.97	1173	-0.008 ***	-2.75
AFT 2	?	348	-0.014 ***	-3.33	600	-0.012 ***	-4.20	952	-0.011 ***	-3.59
AFT 3	?	259	0.002	0.37	471	-0.002	-0.78	730	-0.003	-0.89
AARE *BEF3	?							293	0.012 **	2.21
AARE *BEF2	?							346	-0.009 *	-1.68
AARE *BEF1	+							417	0.009 **	2.00
AARE *LIT1	+							418	0.015 ***	3.24
AARE *LIT2	?							192	0.001	0.14
AARE *LIT3PLUS	?							54	0.028 **	2.05
AARE *AFT1	-							437	-0.011 ***	-2.52
AARE *AFT2	?							346	-0.002	-0.41
AARE *AFT3	?							256	0.004	0.76
F-test of vector parm[c]									4.448 ***	
Number of obs.		4098			6657			10763		
F-value of model			29.479 ***			24.667 ***			25.904 ***	
Adj. R^2			0.059			0.031			0.042	

Table 3.3 (Continued): OLS Regression of Quarterly Performance-Matched Asset-Scaled Abnormal Current Accruals[a] on Event-Year Dummies

Panel B (Continued): Compare regression coefficients between two groups of defendant firms with accounting allegations – those with SEC enforcement or financial restatement, vs. those without

***, **, and * Significance at the 1%, 5% and 10% levels, one-tailed for variables with predicted signs, two-tailed for those without predicted signs.

[a] Dependent variable is the difference between quarterly IV-model abnormal current accruals by defendant firm and control firm.

[b] Definitions of independent variables: AARE is a dummy variable which equals one if the defendant firm is subject to SEC accounting and auditing enforcement actions, or the firm has restated its financial reports during the alleged period of manipulation; BEF3 – BEF1 are dummy variables which equal one if the observation is from the third, second and first four-quarter period, respectively, prior to the first quarter of alleged manipulation period; Lit1 and Lit2 are dummies which equal one if the observation is from the first and second four-quarter period, respectively, during alleged manipulation period; Lit3plus is a dummy variable which equals one if the observation is from a quarter after the ninth quarter during manipulation period; AFT1-AFT3 are dummies which equal one if the observation is from first, second or third four-quarter period, respectively, after the last quarter of alleged manipulation period; AARE*BEF3 through AARE*AFT3 are interaction terms between GAAP and year dummies defined above.

[c] F test for the joint hypotheses that the coefficients on AARE*BEF3 through AARE*AFT3 are zero.

Table 3.4 OLS Regression of Quarterly Performance-Matched Asset-Scaled Abnormal Change in Revenue[a] on Event-Year Dummies

Panel A: compare regression coefficients between two groups of defendant firms – those with allegations of GAAP violations vs. those without.

Independent Variable[b]	Pred Sign	(1) With GAAP Allegations # of Obs =1	(1) Coeff. Est.	(1) t-stat	(2) Without GAAP Allegations # of Obs =1	(2) Coeff. Est.	(2) t-stat	(3) All Cases # of Obs =1	(3) Coeff. Est.	(3) t-stat
Intercept	?		0.001	1.04		-0.001	-1.39		-0.001	-1.46
GAAP	?							12098	0.002 *	1.75
BEF 3	?	715	0.007 ***	3.40	750	0.007 ***	4.04	1470	0.008 ***	4.22
BEF 2	?	908	0.008 ***	4.08	956	0.007 ***	4.66	1862	0.008 ***	4.86
BEF 1	+	1156	0.013 ***	7.25	1274	0.009 ***	6.59	2433	0.009 ***	5.94
LIT1	+	1194	0.008 ***	4.39	1096	0.007 ***	4.40	2291	0.007 ***	4.48
LIT2	?	417	-0.001	-0.29	249	0.000	0.10	666	0.000	0.14
LIT3PLUS	?	107	-0.003	-0.62	55	0.003	0.45	161	0.003	0.44
AFT1	-	1346	-0.008 ***	-4.71	1670	-0.004 ***	-3.01	3007	-0.003 ***	-2.52
AFT 2	?	1151	-0.004 **	-2.52	1403	-0.001	-0.91	2555	-0.001	-1.03
AFT 3	?	901	-0.002	-1.29	1157	-0.001	-0.74	2054	-0.001	-0.35
GAAP*BEF3	?							713	0.000	-0.06
GAAP*BEF2	?							898	0.001	0.32
GAAP*BEF1	+							1147	0.004 **	1.76
GAAP*LIT1	+							1190	0.000	0.06
GAAP*LIT2	?							415	-0.001	-0.30
GAAP*LIT3PLUS	?							106	-0.004	-0.55
GAAP*AFT1	-							1332	-0.004 **	-2.11
GAAP*AFT2	?							1147	-0.003	-1.33
GAAP*AFT3	?							892	-0.003	-1.21
F-test of vector parm[c]									1.449	
Number of obs		12183			14590			26769		
F-value of model			17.271 ***			12.901 ***			15.867 ***	
Adj. R^2			0.012			0.007			0.010	

Table 3.4 (continued) OLS Regression of Quarterly Performance-Matched Asset-Scaled Abnormal Change in Revenue[a] on Event-Year Dummies

Panel A (continued): compare regression coefficients between two groups of defendant firms – those with allegations of GAAP violations vs. those without.

***, **, and * Significance at the 1%, 5% and 10% levels, one-tailed for variables with predicted signs, two-tailed for those without predicted signs.

a Dependent variable is the difference between quarterly abnormal change in revenue by defendant firm and control firm.

b Definitions of independent variables: GAAP is a dummy variable which equals one if the defendant firm is subject to SEC accounting and auditing enforcement actions, or the firm has restated its financial reports during the alleged period of manipulation; BEF3 – BEF1 are dummy variables which equal one if the observation is from the third, second and first four-quarter period, respectively, prior to the first quarter of alleged manipulation period; Lit1 and Lit2 are dummies which equal one if the observation is from the first and second four-quarter period, respectively, during alleged manipulation period; Lit3plus is a dummy variable which equals one if the observation is from a quarter after the ninth quarter during manipulation period; AFT1-AFT3 are dummies which equal one if the observation is from first, second or third four-quarter period, respectively, after the last quarter of alleged manipulation period; GAAP *BEF3 through GAAP *AFT3 are interaction terms between GAAP and year dummies defined above.

c F test for the joint hypotheses that the coefficients on GAAP*BEF3 through GAAP*AFT3 are zero.

Table 3.4 (continued): OLS Regression of Quarterly Performance-Matched Asset-Scaled Abnormal Change in Revenue[a] on Event-Year Dummies

Panel B: *Compare regression coefficients between two groups of defendant firms with accounting allegations – those with SEC enforcement or financial restatement, vs. those without*

Independent Variable[b]	Pred Sign	(1) With Enforce/Restate # of Obs =1	(1) Coeff. Est.	(1) t-stat	(2) Without Enforce/Restate # of Obs =1	(2) Coeff. Est.	(2) t-stat	(3) All Cases with GAAP Alleg. # of Obs =1	(3) Coeff. Est.	(3) t-stat
Intercept	?		0.002	1.25		0.001	1.56		0.002 *	1.66
AARE	?							4860	0.000	0.06
BEF 3	?	326	0.003	1.05	480	0.007 ***	2.90	804	0.007 ***	2.80
BEF 2	?	388	0.006 **	2.03	604	0.009 ***	3.86	994	0.007 ***	3.26
BEF 1	+	488	0.008 ***	3.13	761	0.012 ***	6.13	1250	0.013 ***	6.11
LIT1	+	503	0.003	1.08	763	0.007 ***	3.66	1264	0.008 ***	3.66
LIT2	?	224	-0.003	-0.86	219	0.000	-0.03	443	0.001	0.17
LIT3PLUS	?	67	-0.005	-0.79	56	-0.004	-0.58	123	-0.004	-0.58
AFT1	-	516	-0.008 ***	-3.08	878	-0.009 ***	-4.73	1397	-0.008 ***	-4.31
AFT 2	?	426	-0.006 **	-2.00	756	-0.004 **	-2.14	1182	-0.004 **	-2.16
AFT 3	?	330	-0.003	-1.03	594	-0.003	-1.38	924	-0.003	-1.27
AARE *BEF3	?							324	-0.004	-0.94
AARE *BEF2	?							386	-0.001	-0.14
AARE *BEF1	+							486	-0.004	-1.26
AARE *LIT1	+							500	-0.004	-1.30
AARE *LIT2	?							223	-0.003	-0.58
AARE *LIT3PLUS	?							67	-0.001	-0.12
AARE *AFT1	-							513	0.001	0.42
AARE *AFT2	?							426	-0.001	-0.34
AARE *AFT3	?							329	-0.001	-0.23
F-test of vector parm[c]									0.471	
Number of observation		4877			8191			13079		
F-value of model			4.555 ***			13.658 ***			8.101 ***	
Adj. R^2			0.007			0.014			0.010	

Table 3.4 (continued): OLS Regression of Quarterly Performance-Matched Asset-Scaled Abnormal Change in Revenue[a] on Event-Year Dummies

Panel B (continued): Compare regression coefficients between two groups of defendant firms with accounting allegations – those with SEC enforcement or financial restatement, vs. those without

***, **, and * Significance at the 1%, 5% and 10% levels, one-tailed for variables with predicted signs, two-tailed for those without predicted signs.

[a] Dependent variable is the difference between quarterly abnormal change in revenue by defendant firm and control firm.

[b] Definitions of independent variables: AARE is a dummy variable which equals one if the defendant firm is subject to SEC accounting and auditing enforcement actions, or the firm has restated its financial reports during the alleged period of manipulation; BEF3 – BEF1 are dummy variables which equal one if the observation is from the third, second and first four-quarter period, respectively, prior to the first quarter of alleged manipulation period; Lit1 and Lit2 are dummies which equal one if the observation is from the first and second four-quarter period, respectively, during alleged manipulation period; Lit3plus is a dummy variable which equals one if the observation is from a quarter after the ninth quarter during manipulation period; AFT1-AFT3 are dummies which equal one if the observation is from first, second or third four-quarter period, respectively, after the last quarter of alleged manipulation period; AARE*BEF3 through AARE*AFT3 are interaction terms between AARE and year dummies defined above.

[c] F test for the joint hypotheses that the coefficients on AARE*BEF3 through AARE*AFT3 are zero.

Table 3.5 Selected Descriptive Statistics for Litigation Sample and Control Sample

Panel A: Selected descriptive statistics and test of difference between litigation sample and control sample

	Defendant Firms				Control Firms				Test of Difference		
Variable	N	Mean	Median	Std. Dev.	N	Mean	Median	Std. Dev.	Pred. Sign	Mean	Median
Log Market Cap.	738	5.826	5.686	1.576	583	4.539	4.502	1.886	+	**<0.001**	**<0.001**
Turnover	741	0.807	0.894	0.221	590	0.561	0.556	0.300	+	**<0.001**	**<0.001**
Beta	740	1.930	1.831	1.402	590	1.363	1.150	1.160	+	**<0.001**	**<0.001**
Skewness	739	-0.596	-0.222	1.705	590	0.582	0.448	1.372	-	**<0.001**	**<0.001**
Kurtosis	739	10.692	5.693	13.622	590	6.744	2.656	17.632	+	**<0.001**	**<0.001**
Min. Return	739	-0.202	-0.167	0.122	590	-0.154	-0.123	0.102	-	**<0.001**	**<0.001**
Cum. Return	739	-0.102	-0.107	0.720	590	0.301	0.184	0.717	-	**<0.001**	**<0.001**
Enforcement	781	0.085	0.000	0.278	781	0.003	0.000	0.051	+		
ABCAC	781	0.029	0.017	0.083	781	0.005	0.000	0.104	+	**<0.001**	**<0.001**
ABCHREV	777	0.012	0.005	0.063	777	0.008	0.002	0.076	+	**0.076**	**0.025**
Leverage	773	0.382	0.074	1.705	778	0.183	0.061	4.614	+	0.067	**0.024**
Acquisition	781	0.496	0.000	0.500	781	0.316	0.000	0.465	+		
Equity Issue	741	0.336	0.000	0.473	598	0.184	0.000	0.388	+		
Sales Growth	777	1.136	1.079	0.360	769	1.300	1.049	2.036	?	0.026	**0.008**
ROA	781	-0.014	0.009	0.101	781	-0.021	0.011	0.172	?	0.175	0.039
Lawsuit	781	1.000	1.000	0.000	781	0.000	0.000	0.000			
Post PSLRA	781	0.544	1.000	0.498	781	0.544	1.000	0.498			
Accounting Alleg.	781	0.469	0.000	0.499							
Restatement	781	0.138	0.000	0.345							
Auditor Sued	781	0.073	0.000	0.260							
Insider Allegation	781	0.362	0.000	0.481							
ABRET3	719	-0.250	-0.235	0.214							
Settlement	738	0.023	0.002	0.076							

Test of difference is for matched pairs; probability values are based on T distribution for means, and Wilcoxon for median; one-tailed for variables with predicted sign, two-tailed for variables without predicted sign.

Bold case indicates significance at 0.10 level.

See variable definitions in the Appendix.

Table 3.5 (Continued): Selected Descriptive Statistics for Litigation Sample and Control Sample

Panel B: *Pearson (upper right) and Spearman (lower left) correlations for variables in lawsuit incidence regression*

Variable	Lawsuit	ABCHREV	ABCAC	Enforce -ment	Turn -over	Beta	Skew -ness	Kurt -osis	Min. Return	Cum. Return	Lever -age	Acqui -sition	Equity Issue	Sales Growth	Log Mktcap	ROA	Post -PSLRA
Lawsuit		0.02	**0.17**	**0.21**	**0.43**	**0.17**	**-0.25**	0.02	**-0.22**	**-0.30**	0.00	**0.17**	**0.17**	**-0.06**	**0.35**	**-0.06**	0.00
ABCHREV	0.04		**0.06**	-0.03	0.03	**0.07**	0.05	0.00	0.02	**0.07**	-0.02	-0.02	**0.08**	**0.20**	-0.04	0.02	-0.03
ABCAC	**0.20**	**0.06**		**0.09**	**0.13**	0.03	**-0.09**	0.01	**-0.06**	**-0.07**	-0.04	0.03	**0.09**	0.00	0.03	**0.12**	0.03
Enforcement	**0.21**	-0.04	**0.09**		**0.15**	0.01	**-0.11**	**0.09**	**-0.15**	-0.03	0.01	0.01	**0.09**	-0.02	-0.02	**-0.06**	**-0.10**
Turnover	**0.41**	**0.09**	**0.13**	**0.17**		**0.29**	**-0.08**	**0.10**	**-0.36**	-0.01	-0.04	**0.21**	**0.38**	-0.02	**0.20**	**-0.10**	**0.13**
Beta	**0.27**	**0.09**	**0.06**	0.02	**0.48**		-0.02	0.02	**-0.13**	**-0.07**	**-0.05**	0.02	**0.13**	0.01	**0.17**	-0.05	0.00
Skewness	**-0.29**	0.03	**-0.08**	**-0.13**	**-0.10**	-0.04		**0.21**	**0.28**	**0.33**	-0.03	**-0.07**	**0.07**	0.02	**-0.20**	**-0.11**	**0.07**
Kurtosis	**0.15**	-0.01	**0.08**	**0.10**	**0.23**	0.03	0.04		**-0.42**	0.03	0.00	**0.08**	**0.07**	-0.02	**-0.06**	**-0.08**	0.05
Min. Return	**-0.23**	0.03	**-0.07**	**-0.12**	**-0.45**	**-0.26**	**0.25**	**-0.57**		**0.14**	0.01	**-0.11**	**-0.19**	0.01	**0.15**	**0.28**	**-0.18**
Cum. Return	**-0.34**	**0.10**	**-0.11**	**-0.06**	-0.01	-0.04	**0.36**	**-0.14**	**0.20**		-0.02	**-0.08**	0.04	0.04	**-0.22**	**0.11**	-0.02
Leverage	0.05	**-0.08**	-0.04	0.02	**-0.12**	**-0.24**	-0.02	0.02	**0.12**	-0.04		**0.05**	-0.02	-0.03	0.01	0.01	-0.01
Acquisition	**0.17**	0.04	**0.07**	0.01	**0.21**	0.02	**-0.07**	**0.15**	**-0.10**	**-0.07**	**0.20**		**0.27**	-0.03	**0.22**	-0.05	**0.16**
Equity Issue	**0.17**	**0.10**	**0.06**	**0.09**	**0.42**	**0.20**	**0.06**	**0.13**	**-0.20**	0.01	0.02	**0.27**		0.04	0.01	**-0.17**	**0.13**
Sales Growth	**0.11**	**0.64**	**0.05**	0.01	**0.22**	**0.22**	0.04	0.00	**-0.06**	**0.06**	**-0.07**	**0.11**	**0.25**		**-0.06**	**-0.09**	0.00
Log Mktcap	**0.37**	0.02	0.03	-0.02	**0.21**	**0.24**	**-0.26**	-0.03	**0.17**	**-0.17**	**0.07**	**0.22**	0.01	**0.06**		**0.13**	**0.12**
ROA	**-0.06**	**0.17**	**0.09**	**-0.08**	**-0.06**	-0.01	**-0.12**	**-0.16**	**0.31**	**0.15**	**-0.17**	**-0.10**	**-0.18**	0.03	**0.22**		**-0.16**
Post PSLRA	0.00	-0.01	**0.07**	**-0.10**	**0.15**	0.00	**0.11**	**0.11**	-0.20	-0.01	-0.04	**0.16**	**0.13**	**0.07**	**0.12**	**-0.14**	

Number of observations for all variables is 1,080.

Bold case indicates significance at 0.10 level or better.

Variable definitions are in the Appendix.

Table 3.6 Logistic Regression Analysis of Lawsuit Incidence

$$\begin{aligned}\text{Lawsuit} = {} & \alpha + \beta_1\text{ABCHREV} + \beta_2\text{ABCAC} + \beta_3\text{Enforcement} \\ & + \beta_4\text{Log Market Cap} + \beta_5\text{Turnover} + \beta_6\text{Beta} + \beta_7\text{Kurtosis} + \beta_8\text{Skewness} \\ & + \beta_9\text{Min. Return} + \beta_{10}\text{Cum. Return} + \beta_{11}\text{Leverage} + \beta_{12}\text{Acquisition} \\ & + \beta_{13}\text{Equity Issue} + \beta_{14}\text{Sales Growth} + \beta_{15}\text{ROA} + \beta_{16}\text{Post PSLRA} + \varepsilon.\end{aligned}$$

Independent Variable	Predicted Sign	Coefficient Estimate	Wald Chi-sq	p-value
Intercept	?	-4.331 ***	68.828	<0.001
ABCHREV	+	3.016 **	5.020	0.025
ABCAC	+	3.873 ***	13.035	<0.001
Enforce	+	3.931 ***	20.831	<0.001
Log Market Cap	+	0.472 ***	72.608	<0.001
Turnover	+	3.324 ***	78.420	<0.001
Beta	+	-0.011	0.051	0.822
Kurtosis	+	-0.011	1.488	0.222
Skewness	-	-0.131 *	2.750	0.097
Min. Return	-	-2.244 *	3.630	0.057
Cum. Return	-	-1.118 ***	54.589	<0.001
Leverage	+	0.008	0.030	0.863
Acquisition	+	0.149	0.781	0.377
Equity Issue	+	0.190	0.864	0.353
Sales Growth	-	-0.553 *	3.122	0.077
ROA	-	-3.431 **	5.856	0.016
Post PSLRA	-	-0.521 ***	9.064	0.003
Likehood Ratio Statistic			517.701	<0.001
Pseudo R^2		0.346		
Number of Observations		1080		

***, **, and * represent significance levels at the 1%, 5% and 10% levels.

Dependent variable, Lawsuit, is an indicator variable set equal to one if the firm is sued in a class action securities lawsuit, zero otherwise.

Definitions of independent variables are in the Appendix.

Table 4.1 OLS Regression Analysis of Three-Day Market-Adjusted Returns of Defendant Firms Surrounding End of Class Period

$$\begin{aligned} ABRET3 = \alpha &+ \beta_1 \text{Cum. Return} + \beta_2 \text{ABCHREV} + \beta_3 \text{ABCAC} \\ &+ \beta_4 \text{Enforcement} + \beta_5 \text{Restatement} + \beta_6 \text{Accounting Allegation} \\ &+ \beta_7 \text{Auditor Sued} + \beta_8 \text{Insider Allegation} + \beta_9 \text{Sales Growth} \\ &+ \beta_{10} \text{ROA} + \beta_{11} \text{Post PSRLA} + \varepsilon. \end{aligned}$$

Independent Variables	Predicted Sign	Coefficient Estimate	t-stat	p-value
Intercept	?	-0.183 ***	-5.208	<0.001
ABCHREV	-	0.022	0.179	0.429
ABCAC	-	-0.244 ***	-2.869	0.002
Cum. Return	-	-0.084 ***	-8.255	<0.001
Enforcement	-	-0.039 *	-1.451	0.074
Restatement	+	0.043 **	1.888	0.030
Accounting Allegation	?	0.012	0.792	0.429
Auditor Sued	?	0.073 **	2.482	0.013
Insider Allegation	-	-0.048 ***	-3.163	0.001
Sales Growth	?	-0.024	-0.785	0.433
ROA	?	0.024	0.327	0.744
Post PSLRA	-	-0.058 ***	-3.664	<0.001
F-statistic			11.358	<0.001
Adjusted R^2		0.143		
Number of Observations		681		

***, **, and * represent significance levels at the 1%, 5% and 10% levels, one-tailed for coefficients with predicted sign, and two-tailed for those without prediction.

Dependent variable, ABRET3, is cumulative market-adjusted return over a three-day period surrounding the end of class period, calculated as cumulative daily return minus equally-weighted market index from the trading day before the end of class period to one trading day after.

Definitions of independent variables are in the Appendix.

Table 4.2 Logistic Regression Analysis of Accounting Allegations

$$\begin{aligned}\text{Accounting Allegation} &= \alpha + \beta_1\text{ABCHREV} + \beta_2\text{ABCAC} + \beta_3\text{Enforcement} \\ &+ \beta_4\text{Restatement} + \beta_5\text{Auditor Sued} + \beta_6\text{Insider Allegation} \\ &+ \beta_7\text{Sales Growth} + \beta_8\text{ROA} + \beta_9\text{Equity Issue} \\ &+ \beta_{10}\text{Acquisition} + \beta_{11}\text{Leverage} + \beta_{12}\text{Post PSLRA} + \varepsilon.\end{aligned}$$

Independent Variable	Predicted Sign	Coefficient Estimate	Wald Chi-sq	p-value
Intercept	?	-0.296	0.308	0.579
ABCHREV	+	2.610	2.513	0.113
ABCAC	+	2.108 *	3.229	0.072
Enforcement	+	2.058 ***	20.511	<0.001
Restatement	+	16.249	0.003	0.958
Auditor Sued	+	2.382 ***	14.179	<0.001
Insider Allegation	-	-0.162	0.620	0.431
Sales Growth	+	-0.854 *	3.127	0.077
ROA	+	3.488 **	6.550	0.010
Equity Issue	+	0.170	0.707	0.400
Acquisition	+	0.556 ***	8.531	0.003
Leverage	+	0.004	0.005	0.942
Post PSLRA	+	0.410 **	3.969	0.046
Likehood Ratio Statistic			273.078	<0.001
Pseudo R^2		0.272		
Number of Observation		725		

***, **, and * represent significance levels at the 1%, 5% and 10% levels.

Dependent variable, Accounting Allegation, is an indicator variable set equal to one for cases with accounting allegations, zero otherwise.

Definitions of independent variables are in the Appendix.

Table 4.3 OLS Regression Analysis of Settlement Amount Scaled by Market Capitalization

$$\begin{aligned}\text{Settlement} = {} & \alpha + \beta_1\text{ABCHREV} + \beta_2\text{ABCAC} + \beta_3\text{Enforcement} + \beta_4\text{Restatement} \\ & + \beta_5\text{Accounting Allegation} + \beta_6\text{Auditor Sued} + \beta_7\text{Insider Allegation} \\ & + \beta_8\text{ABRET3} + \beta_9\text{Turnover} + \beta_{10}\text{Sales Growth} + \beta_{11}\text{ROA} \\ & + \beta_{12}\text{Acquisition} + \beta_{13}\text{Equity Issue} + \beta_{14}\text{Leverage} + \beta_{15}\text{Post PSLRA} + \varepsilon.\end{aligned}$$

Variable	Predicted Sign	Coefficient Estimate	t-statistic	p-value
Intercept	?	-0.002	-0.166	0.869
ABCHREV	+	0.048 *	1.587	0.057
ABCAC	+	0.035 **	1.714	0.044
Enforcement	+	0.019 ***	3.354	<0.001
Restatement	+	0.011 **	1.945	0.026
Accounting Allegation	+	0.001	0.133	0.447
Auditor Sued	+	0.040 ***	5.863	<0.001
Insider Allegation	+	-0.005	-1.232	0.110
ABRET3	-	-0.014 **	-1.647	0.050
Turnover	+	0.025 ***	2.977	0.002
Sales Growth	?	-0.005	-0.640	0.523
ROA	?	-0.009	-0.492	0.623
Acquisition	+	-0.003	-0.761	0.224
Equity Issue	+	0.018 ***	4.682	<0.001
Leverage	+	0.002 *	1.282	0.100
Post PSLRA	?	-0.007 *	-1.701	0.090
F-statistic			10.951	<0.001
Adjusted R^2		0.250		
Number of Observations		448		

***, **, and * represent significance levels at the 1%, 5% and 10% levels, one-tailed for coefficients with predicted sign, and two-tailed for those without prediction.

Dependent variable, Settlement, is settlement amount in millions of dollar, deflated by market capitalization at the end of the month prior to the beginning of class period.

Definitions of independent variables are in the Appendix.

Table 5.1 Comparison of Simultaneous Equations vs. Single Equation Probit Regression Analysis of Determinants of Litigation Risk[a]

Panel A: Two-Stage Simultaneous Estimation Procedure

Predictor Variables[b]	Predicted Sign	Coefficient	Asymptotic Std. Error	Z-statistic	P-Value (two-tail)
Intercept	?	-2.792	0.208	-13.457	0.000
Cum. Return	-	-0.606	0.080	-7.592	0.000
Log Market Cap	+	0.240	0.030	8.114	0.000
Post PSLRA	-	-0.375	0.094	-3.967	0.000
Turnover	+	1.969	0.223	8.812	0.000
Beta	+	0.031	0.035	0.878	0.380
Skewness	-	-0.179	0.042	-4.290	0.000
Kurtosis	-	-0.004	0.006	-0.634	0.526
Min. Return	+	-3.035	0.607	-5.000	0.000
ABCAC (predicted)[c]	?	-3.395	3.098	-1.096	0.273

The chi-square statistic for model: 674.1 (p=0.000); pseudo-R^2: 0.368.

Panel B: Single-Stage Probit (for comparison purpose only)

Predictor Variables[b]	Predicted Sign	Coefficient	Std. Error	Z-statistic	P-Value (two-tail)
Intercept	?	-2.908	0.201	208.868	<.0001
Cum. Return	-	-0.496	0.070	50.627	<.0001
Log Market Cap	+	0.263	0.028	88.218	<.0001
Post PSLRA	-	-0.390	0.091	18.432	<.0001
Turnover	+	1.752	0.182	92.761	<.0001
Beta	+	0.034	0.033	1.064	0.302
Skewness	-	-0.161	0.038	18.436	<.0001
Kurtosis	-	-0.004	0.005	0.708	0.400
Min. Return	+	-3.296	0.567	33.842	<.0001
ABCAC (actual)	+	1.593	0.547	8.499	0.004

The chi-square statistic for model: 666.4 (p=0.000); pseudo-R^2: 0.368.

[a] Dependent variable, Lawsuit, is an indicator variable set equal to one if the firm is sued in a class action securities lawsuit, zero otherwise.

[b] Definitions of independent variables are in the Appendix.

[c] The value of ABCAC predicted by the first-stage, reduced form regression.

Table 5.2 Comparison of Simultaneous Equations vs. Single Equation OLS Analysis of Determinants of Earnings Management[a]

Panel A: Two-Stage Simultaneous Estimation Procedure

Predictor Variables[b]	Pred. Sign	Coefficient	Asymptotic Std. Error	Z-statistic	P-Value (two-tail)
Intercept	?	-0.013	0.016	-0.829	0.407
Cum. Return	-	-0.008	0.002	-4.592	0.000
Log Market Cap	-	-0.004	0.005	-0.801	0.423
Leverage	+	-0.001	0.001	-0.845	0.398
Acquisition	+	0.001	0.005	0.245	0.806
Equity Issue	+	0.011	0.006	1.767	0.077
Sales Growth	+	0.001	0.003	0.223	0.823
ROA	+	0.179	0.032	5.568	0.000
Accrual Flex	+	0.514	0.190	2.709	0.007
Litrisk[d]	?	0.032	0.003	9.316	0.000

The F-statistic for model: 6.815 ($p=0.000$) ; Adjusted R^2: 0.063

Panel B: Single-Stage Ordinary Least Squares (for comparison purpose only)

Predictor Variables	Pred. Sign	Coefficient	Asymptotic Std. Error	Z-statistic	P-Value (two-tail)
Intercept	?	-0.015	0.013	-1.160	0.246
Cum. Return	-	-0.008	0.003	-2.550	0.011
Log Market Cap	-	-0.003	0.001	-1.970	0.049
Leverage	+	-0.001	0.001	-0.920	0.360
Acquistion	+	0.002	0.005	0.380	0.706
Equity Issue	+	0.012	0.005	2.280	0.023
Sales Growth	+	0.000	0.002	0.280	0.782
ROA	+	0.170	0.026	6.580	<.0001
Accrual Flex	+	0.531	0.162	3.290	0.001
Lawsuit[c]	?	0.022	0.005	4.430	<.0001

The F-statistic for model: 9.750 ($p=0.000$); Adjusted R^2: 0.057.

The simultaneous equation generalized probit model, the two-stage generalized least squares estimation procedure, and the asymptotic standard errors of the coefficient estimates are described in Amemiya (1978).

[a] Earnings management is measured by the average quarterly abnormal current accruals estimated from the IV model (described in Section 2.4.3.2) during alleged manipulation period.

[b] Definitions of independent variables are in the Appendix.

[c] Lawsuit is an indicator variable set equal to one if the firm is sued in a class action securities lawsuit, zero otherwise.

[d] Litirisk represents the probability of class action lawsuits, which is the predicted value from the first-stage reduced form probit analysis of Lawsuit.

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