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An Investigation Of Firms' Earnings Management Practices Around Product Recalls

Zeeshan Ahmed

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AN INVESTIGATION OF FIRMS' EARNINGS MANAGEMENT PRACTICES
AROUND PRODUCT RECALLS

By

Zeeshan Ahmed

A Dissertation
Submitted to the Faculty of
Mississippi State University
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy
in Business Administration
in the Department of Finance and Economics

Mississippi State, Mississippi

December 2005

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2005

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AROUND PRODUCT RECALLS

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This study investigates the earnings management practices of firms around product recalls. In recent years, the management of earnings around firm-specific events has received considerable attention in the finance and accounting literature. New equity issues, mergers and acquisitions, share repurchases, and management buyouts are some events around which at least some firms have been shown to manage their earnings to achieve managements' objectives. Product recalls offer yet another interesting occasion when managers have incentives to cover up the true financial performance of their firms and mislead investors.

In order to determine whether firms announcing product recalls manage earnings more aggressively than non-announcing firms, this study employs the cross-sectional version of the modified Jones (1991) model, as adapted by Teoh, Welch, and Wong

(1998 a and b). In order to address the misspecification concern of the model, especially in the context of a performance-related event like product recall, we suggest a modification in the model. We show that the proposed change in the model not only better controls for event-specific working capital changes around recalls, it also increases the explanatory power of the model. Overall, our results suggest that managers tend to manage earnings upwards in quarters immediately preceding and following the recall announcement quarter. We also find weak evidence of downward earnings management in the quarter of recall. These results are in line with the predictions of theoretical models and the findings of past empirical studies in earnings management. The results of our research have important implications for investors and regulators.

DEDICATION

I would like to dedicate this research to my parents Muhammad and Rizwana Saleem, my devoted wife Somaya and my children Aamina and Ammar.

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The author expresses his sincere gratitude to the many people, without whose selfless assistance, this dissertation could not have materialized. First of all, sincere thanks are due to Dr. Theodor Kohers, my dissertation committee chairman, for his magnanimity in expending time and effort to guide and assist me throughout the intricacies of the doctoral program and the dissertation process. Expressed appreciation is also due to the other members of my dissertation committee, namely, Dr. Larry White, Dr. Wayne Kelly, Dr. Randall Campbell, and Dr. Alireza Tahai, for the invaluable aid and direction provided by them.

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CHAPTER I

INTRODUCTION

The topic of corporate earnings management has not only generated a great deal of media attention but it also has become a source of serious concern to regulators and policy makers. In the wake of the events that shook investors' confidence in the American financial reporting system in late 2001 and early 2002, the earnings management practices of firms have come under fire by shareholders groups, institutional investors and the financial press alike. To some extent, regulators have responded by proposing and enacting new rules and regulations.¹ Likewise, accounting and financial researchers are increasingly probing into this topic.

Although researchers started documenting evidence of earnings management much before the recent corporate scandals, these events have aroused a renewed and invigorated campaign among academic researchers to develop and improve models to detect earnings management and apply those models to determine the variables associated with such practice.² One stream of research within the earnings management

¹ For example, the Sarbanes-Oxley Act of 2002, which President George W. Bush dubbed as “the most far-reaching reforms of American business practices since the time of Franklin D. Roosevelt”.

² Leading scholarly journals like *Accounting Horizons* and *The Accounting Review* published special issues devoted exclusively to ‘Earnings Management’ and ‘Earnings Quality’.

literature focuses on examining earnings management practices around certain firm-specific events (e.g., management buyouts (see Perry and William (1994)), IPOs and SEOs (see Teoh, Welch, and Wong (1998 a and b)), mergers and acquisitions (see Erickson and Wang (1999))). The general purpose of this line of research is to investigate whether firms announcing these events manage earnings around them. Furthermore, these studies relate the abnormal returns observed in the announcement window to the degree of earnings management extant at the time of announcement. Most of these studies argue that firms have strong incentives to engage in earnings management around the specified corporate events and subsequently document the evidence that the firms not only engage in more earnings management, but the market reaction to these events is also significantly related to the managed component in earnings. Following the aforementioned strand of research, this study examines earnings management around another significant but relatively neglected event – product recalls.

Product recalls are actions taken by a manufacturer or distributor to remove a product from the market. A recall is initiated when there is reason to believe that the product may pose a safety hazard to product users or may simply be unreliable or unfit for use. Most recalls are voluntary in nature, but at times they may be requested or even enforced by the regulatory authority overseeing the product class in question. Although product recall announcements are pervasive across most industries and types of manufacturing firms, some industries have a far greater frequency of recalls than others. Also, their nature and seriousness vary across different industrial sectors. In this paper,

we are concerned with more severe types of recalls which receive significant publicity. Such recalls are important economic events that have been shown by previous research to result in the loss of demand for firms' products as well as the decline in firms' stock prices. It has also been shown that such recalls have considerable reputational effects which result in shareholders' wealth losses beyond what is warranted by the direct costs of these events.

Prior studies demonstrate that managers of the firms experiencing deteriorating profits or share prices have relatively greater incentives to engage in earnings management. Also, managers attempt to smooth periodic earnings by creating 'cookie-jar reserves' in good times and drawing on these reserves in harsh times. Product recall is one such event where managers need to level-off the downward spike in earnings and share prices.

In order to investigate whether firms making product recall announcements are more prone to manage earnings around the event dates, this study uses the aggregate accruals approach for detecting earnings management. Specifically, it uses the cross-section version of the modified Jones (1991) model, as adapted by Teoh *et al.* (1998 a and b), to extract the discretionary component in the reported earnings

This paper contributes to the earnings management literature by identifying an economically important corporate event as a situation in which the managerial incentives to distort true earnings numbers are heightened. Also, it documents the extent of earnings management prevalent before and after the product recall announcements. The findings have implications for firms' shareholders, regulators and

other stakeholders. Should investors and others view the earnings figures announced by the firms recalling their products with doubt? Or are these genuine profits?

Furthermore, the study contributes to product recall research by examining a dimension of the event which has not been investigated in the research.

The remainder of this dissertation is organized as follows: Chapter II presents the background on earnings management including a review of the previous literature in this area. Chapter III provides the necessary background on product recalls and reviews the empirical evidence on recalls. The research hypothesis is developed in Chapter IV. This chapter also describes the research methodology in detail. Chapter V discusses the sample screening procedures and the empirical results. Finally, Chapter VI summarizes the dissertation.

CHAPTER II

BACKGROUND ON EARNINGS MANAGEMENT

Earnings management research is concerned with identifying incentives for managing earnings, investigating situations where these incentives are high, exploring the ways in which earnings are actually managed and finally, examining the effects of earnings management on stock prices and firms' future financial performance. This chapter presents an overview of the earnings management literature with added emphasis on the issues relevant to this study. Section A in this chapter reviews some definitions of earnings management and discusses some of its important aspects. Section B discusses various managerial incentives for earnings management and findings of some of the major studies. Section C describes various constraints on earnings management as documented by prior studies. The final section of this chapter discusses different approaches to detecting earnings management along with the merits and shortcomings of each approach.

II. A. DEFINITION OF EARNINGS MANAGEMENT

Below are some of the widely quoted definitions of earnings management found in the literature:

“... a purposeful intervention in the external reporting process, with the intent of obtaining some private gain (as opposed to, say, merely facilitating the neutral operation of the process).”... “A minor extension of this definition would encompass “real” earnings management, accomplished by timing investment or financing decisions to alter reported earnings or some subset of it.”

Schipper (1989)

“Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers.”

Healy and Whalen (1999)

Although earnings management is generally considered to occur within the framework of financial reporting, the first definition also accommodates earnings management through “real activities” such as timing asset sales, delaying maintenance, altering R&D expenditure. While earnings can be managed through real activities, it is usually relatively more costly and less convenient for managers to do that. Also, it is methodologically difficult for the researchers to spot such manipulation. Researchers do not have a reliable mechanism to distinguish the real decisions undertaken to modify reported earnings from the ones undertaken solely for rational value maximization. For instance, if a firm sells assets near the end of an accounting year, it is difficult for the

researcher to ascertain or demonstrate whether the primary motivation behind such a sale is to achieve an earnings target or operational efficiency. Therefore, this research, following the approach taken by most other in this area, focuses on earnings management through pure accrual manipulation. In order to understand the true nature of earnings management, one needs to first appreciate the fine line between ‘earnings management’ and the legitimate application of accrual accounting.

II. A. 1. Earnings Management and Accrual Accounting

The primary objective of accrual accounting is to provide a better and more meaningful measure of a firm’s current economic income and to be a better predictor of the firm’s future performance than is available by examining cash flows. The idea is that the earnings number should be reflective of the economic substance underlying financial transactions rather than merely representing the cash receipts and payments for the period. But the analysis shows that the accrual process inherently produces a consistently smoother income number than cash flows. Expressed differently, earnings smoothing is an inherent property of Generally Accepted Accounting Principles (GAAP) based accrual accounting. Therefore, in practice, it is quite difficult to separate income smoothing arising from the implementation of GAAP based accrual accounting and that resulting from management of earnings. The definitions given above rely on managerial intent (as manifested in the words “with the intent of obtaining private gain...” or “...mislead...or to influence contractual outcomes...”) to distinguish earnings management from faithful implementation of accrual accounting.

Both the definitions quoted above correspond to the opportunistic perspective of earnings management. The accounting literature takes two perspectives on earnings management: (1) an information perspective and (2) an opportunistic perspective. Under the opportunistic perspective, which has its roots in agency theory (see Jensen and Meckling, 1976), managers are assumed to manipulate earnings to mislead stakeholders or to maximize their (managers') personal benefit at the cost of other stakeholders' interests. "Information perspective", on the other hand, regards earnings management as a mechanism through which managers attempt to reveal their private information about future prospects of the company to the investors (see Holthausen and Leftwich, 1983). Most prior research in this area is based on the opportunistic perspective.

II. A. 2. Earnings Management versus Fraudulent Reporting

While not all attempts to manage earnings are outright fraud, many accounting irregularities that are later classified as fraudulent reporting by the SEC emanate from seemingly naïve efforts of the firm to smooth income by engaging in earnings management. The National Association of Certified Fraud Examiners defines financial fraud as: "the intentional, deliberate, misstatement or omission of material facts, or accounting data, which is misleading and, when considered with all the information made available, would cause the reader to change or alter his or her judgment or decision." Academics and regulators seem to agree on the notion that while earnings

management can be exercised within the limits of GAAP accounting, fraudulent reporting necessarily entails overt violation of GAAP.³

II. B. INCENTIVES TO MANAGE EARNINGS

Prior to testing for earnings management, a researcher must identify conditions or situations where the incentives to manage earnings exist. Prior studies identify several such incentives, which can be broadly classified as: capital market incentives, contracting incentives, and regulation-related incentives. This section covers a brief explanation of the sources and nature of these incentives along with summary of related research findings.

II. B. 1. Capital Market Incentives

Although earlier earnings management research focused heavily on contracting and regulatory incentives ignoring the capital market motivations for managing earnings, recent studies have found capital market incentives to be a strong driving force behind managers' attempts to manage earnings. Dechow and Skinner (2000) argue that "academic research should focus more on capital market incentives for earnings management". The growing importance of capital market incentives in earnings management is directly related to the increasing sensitivity of managers to stock price movements.

³ Examples of fraudulent earnings management include recording fictitious sales, and related receivables, deferring expenses that should be recognized in current period. A specific example would be WorldCom's misclassification of a staggering \$3.8 billion of operating expenses as capital expenditures.

Reported earnings are an important input for valuation decisions by investors, analysts, and other market participants. The fixation of market participants on earnings figures creates incentives for the managers to manipulate them in the direction which best serves their own interests. Several studies investigate whether or not firms manage earnings around various capital market transactions. These studies begin with analyzing managerial incentives to manage earnings in the context of such transactions. The analysis yields hypotheses about the direction of earnings management (income-increasing versus income-decreasing). Finally, parametric and/or non-parametric techniques are used to test the hypothesis about the presence, direction and extent of earnings management. The following paragraphs review selected studies falling in the aforementioned category.

DeAngelo (1988) and Perry and Williams (1994) analyze management buyouts and argue that in the presence of information asymmetries, managers acting in their own interest rather than in the interest of the shareholders would attempt to get a bargain price for the buyout. Accruals manipulation affords a convenient method for managers to understate earnings and thus the stock price. Although DeAngelo (1988) fails to find evidence in favor of her hypothesis, Perry and Williams (1994) document significantly negative discretionary accruals prior to a buyout.

Likewise, Teoh, Welch and Wong (1998 a and b) make a case for income-increasing earnings management prior to initial public offers (IPO's) and seasoned equity issues (SEOs). By engaging in income-increasing earnings management prior to these equity issues, managers can paint a favorable picture of a firm's prospects,

thereby obtaining an attractive price for the newly issued stocks. They find that equity issuing firms typically have higher earnings prior to stock issues most of which is attributable to high discretionary current accruals. They also show that the post-issue underperformance is strongly predicted by the extent of upward earnings management at the time of issue. Further, the evidence indicated reversal of abnormal accruals in years subsequent to the equity issue. Rangan (1998) and Shivakumar (2000) provide similar evidence using quarterly data. Shivakumar (2000) uses a rational expectations explanation to account for earnings management and subsequent investor reaction. He contends that investors recognize and undo earnings management at the time of the announcement.

Similar incentives exist in cases of stock-for-stock mergers. The acquiring firm in such transactions has inducements to inflate the stock price around the agreement date, so that the purchase can be made by issuing fewer stocks. Therefore, it is in the interest of an acquiring firm to resort to income-increasing earnings management in periods before the merger agreement. Erickson and Wang (1999) show that not only are the discretionary accruals significantly positive prior to mergers, but their size has a significant relationship with the size of the merger. Louis (2004) shows evidence of acquiring firms using income-increasing current accruals in the quarter preceding a stock swap announcement. He relates post-merger underperformance of acquiring firms to the reversal of pre-merger earnings overstatement.

Beneish (1999), studying a sample of firms subject to SEC accounting enforcement actions, documents that managers are likely to sell their shareholdings and

exercise stock appreciation rights when the earnings are overstated and share prices are inflated. Park and Park (2004) find that managers engage in income-increasing earnings management prior to the sale of shares by insiders. The degree of discretionary accruals prior to the sale was also found to have predictive power for stock underperformance after the insider sales.

Vafeas, Vlittis, Katranis, and Ockree (2003) find some evidence of relatively low discretionary accruals prior to self-tender offers. However, Chou and Lin (2003) observe that managers resort to inflating the stock price through the upward management of discretionary accruals around the share repurchase announcements. The authors argue that managers, through income increasing earnings management, attempt to enhance the credibility of the undervaluation signal sent to the market by the repurchase announcement.

Bartov and Mohanram (2004) document that managers overstate earnings before abnormally large stock option exercises in order to increase their payout. The post-exercise underperformance of the stock of such firms is reflective of the subsequent reversal of overstated earnings. Anthony, Bettinghaus, and Farber (2004) show that firms appear to increase discretionary current accruals around convertible debt offerings, but fail to relate the discretionary accruals to the subsequent long-term underperformance of such issues.

Apart from the incentives spawned by the specific capital market transactions discussed above, strong incentives to manage earnings also arise in response to capital market pressures for meeting simple earnings benchmarks. Burgstahler and Dichev

(1997) scrutinize the cross-sectional frequency distribution of earnings and changes in earnings and notice that the probability associated with observing small losses and small declines in earnings is lower than expected. Conversely, the incidences of small profits and small increases in earnings from the previous year are unusually high. In the absence of any purposeful managerial intervention in the financial reporting process, such statistical anomalies are highly unlikely. Therefore, the authors explain these distributional inconsistencies as arising from managerial motivation to avoid losses and earnings declines.

DeGeorge, Patel, and Zeckhauser (1999) present a hierarchy of benchmarks for quarterly earnings that managers attempt to achieve. Once firms have avoided losses and earnings declines, meeting analysts' forecasts becomes the next critical target. He provides evidence similar to Burgstahler and Dichev (1997) regarding distributional discontinuities around analysts' earnings expectations. Brown (1999) finds that over time the disruption in frequency distribution around these benchmarks has become even more pronounced. Kasznik (1999) shows that managers use discretionary accruals to increase income in cases where earnings are likely to fall short of management's forecast, and revise the forecast upward when earnings exceed their earlier forecast.

Myers and Skinner (1999), using a time-series approach, provide evidence that the firms manage earnings to show consistent earnings growth. In their sample, the number of firms reporting a continuous increase in earnings is unusually high. Further, they show that firms use special items and income tax provision for income smoothing.

II. B. 2. Contracting Incentives

Early research in earnings management focused on managerial motivations to manage earnings arising from firms' contracts with other stakeholders. Typically, terms of such contracts incorporated earnings figures as a key to certain payoffs to the parties involved (e.g., management bonuses) or as a mechanism for monitoring the compliance with contract terms (e.g., lending contracts). Managers enjoy a unique position in these contracts as they are, on one hand, a party to the contract (being affected by the outcome of earnings), and, on the other hand, perched at a vantage point to influence contractual outcomes by managing reported earnings. Under agency theory arguments, managers are expected to influence the earnings in a manner that would best serve their self-interest. Watts and Zimmerman (1978) identified managerial incentives to affect accounting choices in the context of bonus schemes, lending agreements, and taxes, as well as political costs. Below, we discuss major research works on earnings management related to two important contracts: earnings-based management compensation contracts and lending contracts.

II. B. 2. a. Compensation Contracts:

Most companies tie managerial bonus awards to the reported earnings. Watts and Zimmerman (1983), using agency theory arguments, postulate that managers, acting to maximize the present value of their wealth, would attempt to choose those accounting procedures that would shift the reported earnings to the present period. Zmijewski and Hagerman (1981), in one of the earliest papers in this area, reported a significant association between management incentive contracts and income strategy

(firm's accounting choices to arrive at income). Healy (1985), in a seminal work in 'bonus plan' research, documented a strong association between accruals and earnings-related incentives under bonus plans.⁴ Specifically, the study found that managers tend to manage accruals downward when upper or lower bounds of their bonus plans are binding and upward when these limits are not binding. They also found evidence that adjustments in accounting methods are associated with modifications in the bonus schemes.

Gaver, Gaver and Austin (1995) extended Healy's work by using the Jones (1991) model and detailed proprietary dataset to gauge the behavior of discretionary accruals with respect to bonus schemes. Unlike Healy, they found that firms engage in income-increasing earnings manipulation when un-managed earnings fall short of the lower bound. Likewise, Holthausen, Larcker and Sloan (1995) confirmed Healy's findings of downward earnings management when the executive bonuses peak, but failed to find evidence for downward earnings management when earnings are below the lower bound. Guidry, Leone and Rock (1999) improved the methodology in this line of research by using business unit data rather than corporate level data. Consistent with Healy (1985), they find that business unit level managers for large conglomerate multinational firms are likely to resort to income decreasing accruals when the earnings target in their bonus plans will not be met and when they are entitled to the maximum bonuses allowed under the plans. Richardson and Waagelein (2002) showed that the

⁴ Healy (1985) treated the mean total accruals in the estimation period as a measure of non-discretionary accruals. Thus, discretionary accruals were defined as deviation from this mean.

firms having long-term performance plans engage in earnings management to a lesser extent than firms that have only short-term bonus plans.

Aside from bonus schemes, earnings management has also been linked to top executives' job security and other implicit incentives. DeAngelo (1988) shows evidence of income-increasing earnings management during proxy fights (a potential threat to managers' job security). Dempsey (1993) documents an inverse relationship between earnings management and managerial ownership. He attributed non-owner managers' job insecurity as a possible reason for this result. Gao and Shrieves (2002) relate the degree of earnings management to the design of compensation contracts. They show that earnings management is likely to be relatively more intense for firms having higher degrees of stock options or bonuses and lower proportions of salaries in the pay structure. Some evidence related to stock options is covered in the section on capital market incentives.

II. B. 2. b. Lending Contracts

Debt contracts generally include accounting-based covenants for the protection of the lenders. Typically, these covenants require firms to maintain certain financial ratios (like leverage, working capital, fixed charge coverage, and related ratios), and impose restrictions on dividends as well as on borrowings. For those firms that are approaching the violation of accounting-based covenants, a tempting alternative to contravening the contract terms is to engage in income-increasing earnings management. Arguing along these lines, several accounting researchers investigated the earnings management behavior of firms facing covenant violation. For example, Press

and Weintrop (1990) investigated the effects of accounting constraints of debt agreements on a firm's accounting choices. They show that accounting choices are significantly affected by both leverage and a leverage constraint indicator (a measure of the closeness to violating a leverage ratio covenant). More specifically, they find that firms resort to income increasing strategies in the presence of leverage constraints. Bartov (1993) documents a significantly positive relationship between the gains from asset sales and a firm's debt-to-equity ratio (which is a researcher's proxy for closeness to a covenant violation). DeFond and Jiambalvo (1994) provided evidence that the firms that eventually end-up violating covenants resort to income-increasing earnings management in the year preceding the violation. DeAngelo, DeAngelo and Skinner (1994) scrutinized the accounting choices of troubled firms (i.e., those firms with persistent losses and dividend reductions). They reported that such firms had significant income-decreasing accruals in the dividend-reduction-year and in the following three years, a time period during which these firms engaged in contract renegotiations with lenders, unions, and the government. Similarly, Sweeney (1994) finds evidence for income increasing accounting changes for firms approaching default. Furthermore, the covenant violators also managed earnings after the technical default, possibly to avoid future violations.

Thus the overall evidence on earnings management in the context of 'compensation' and 'lending contracts' suggests that these contracts induce managers to manipulate earnings to increase bonus remuneration and job-security and decrease the likelihood of technical default.

II. B. 3. Regulatory Motivations

Another potential source of earnings management incentives arises from government regulations. These incentives are more pronounced in cases where industries face heavier regulatory burden. Typically, regulators monitor certain accounting figures to ensure firms' compliance with industry-specific and anti-trust regulations, which in turn, motivates managers to manipulate accruals in the desired direction. These incentives are strong, especially when the firms are on the verge of violating the regulation. For instance, banks must comply with capital adequacy requirements. If they fail to do so, they risk regulatory intervention in the form of restrictions on dividends, mandatory asset reduction, and ultimately, management dismissal. Therefore, banks that are near the minimum required capital are found to manage earnings upward to ward-off regulatory crackdown. Scholes, Wilson and Wolfson (1990) find evidence of earnings management from income from investment security transactions. Moyer (1990) shows that banks manage loan loss reserves and securities gains to manipulate earnings. Clinch and Magliolo (1993) show that bank managers use income from discretionary transactions (like miscellaneous gains and losses) to manage earnings. Collins, Shackelford and Wahlen (1995) find that loan write-offs, security issuances, and dividend payments are used to manage capital and loan loss reserves to manage earnings. Beatty, Chamberlain and Magliolo (1995) find that loan loss reserves, loan-write offs, and security issue decisions are jointly determined to manage primary capital ratios.

Apart from industry-specific regulations, incentives to manage earnings also stem from a host of other regulations. Specifically, firms facing adverse political consequences like anti-trust or anti-dumping investigations, have incentives to appear less profitable (Watts and Zimmerman, 1978). Similarly, firms seeking government subsidies or protection from foreign competition may attempt to win government sympathy by appearing to be financially weak. Jones (1991) documents that the firms undergoing import relief investigation by the U.S. International Trade Commission engage in income-decreasing earnings management so that they can obtain a favorable verdicts. Likewise, Cahan (1992) documents that firms that are under investigation for antitrust violations by the Department of Justice and the Federal Trade Commission manage earnings downward during the investigation period. Cahan, Chavis, and Elemendorf (1997) show that at the time when Congress was debating a proposal to impose environmental clean-up costs on the chemical industry, the firms in that industry exhibited income decreasing accruals. Key (1997) shows similar behavior on the part of cable television companies during Congressional investigations regarding industry deregulation. Han and Wang (1998) show that petroleum refining firms managed earnings downward around Iraq's invasion of Kuwait to hide excessive profits resulting from a steep surge in oil prices in order to avoid possible regulatory actions against them.

II. C. BIG BATH ACCOUNTING

One earnings management approach that deserves special mention when investigating firms' reporting behavior around adverse announcements (like product

recall) is 'big bath' accounting. Under this approach, firms going through a particularly 'bad' year or quarter overstate their losses in an attempt to clean up their balance sheets and create a buffer which can be used to artificially inflate the earnings in future periods. Big bath accounting is manifested in sizeable asset write-offs as well as in income decreasing discretionary accruals.

Big bath behavior is encouraged by Wall Street's tendency to overlook large write-offs as one-time events and focus on future earnings. Firms can afford to overstate their losses (i.e., take a big bath) because of the fact that investor reaction to adverse earnings news does not exacerbate proportionally to its intensity. Stated differently, the market reaction to an earnings announcement for a 15% shortfall in earnings may be only slightly more negative than the reaction to a 10% shortfall. Therefore, when the firms find that their earnings are far too short of market expectations so that even the plausible manipulation of discretionary items would not help them achieve the target, they might resort to taking a big bath instead. Remaining paragraphs in this section present a brief summary of prior findings on big bath accounting.

A typical context in which the big bath hypothesis has been most frequently explored is management changes. Moore (1973) investigated the prevalence of discretionary accounting decisions subsequent to management changes. He found the incidences of income decreasing accounting choices to be significantly higher in firms with management changes relative to firms with no management change. In a similar vein, Pourciau (1993) investigated firms' earnings management practices around non-

routine executive changes. He found that incoming executives manage earnings downward and take large write-offs in the year of change and manage earnings upward in the subsequent year. Collins and DeAngelo (1990) provide similar evidence of income decreasing earnings management subsequent to management changes as a result of proxy contests.

Healy's (1985) work regarding bonus payments mentioned in section II. B. 2. also lends support to the big bath hypothesis. Langer and Lev (1993) found that firms are likely to take large asset write-offs when earnings fall below the lower bound for bonus calculations. Abarbanell and Lehavy (2002) demonstrate that firms that receive unfavorable ratings (i.e., "Sell" recommendations) from analysts have weak incentives to meet earnings expectations. Consequently, these firms resort to taking a 'big bath' during such periods and they create hidden reserves that enable them to manage earnings upward in the future. This is evidenced by the presence of frequent and extreme negative discretionary accruals for such firms in those periods. On the other hand, firms that receive favorable analyst ratings (i.e., "Buy" recommendations), tend to engage in income-increasing earnings management to meet the analysts' expectations on a more frequent basis. Elliot and Shaw (1988) and Strong and Meyer (1987) provide evidence for association between large write-offs and firms' underperformance.

Overall, the empirical evidence is consistent with the theoretical framework developed by Kirschenheiter and Melumad (2002) where they show that both smoothing and big bath can coexist. They show that "for sufficiently "bad" news, the manager under-reports earnings by the maximum, preferring to take a "*big bath*" in the

current period in order to report higher future earnings. If the news is “good,” the manager smoothes earnings, with the amount of smoothing depending on the level of cash flows observed. He either over-reports or partially under-reports for slightly good news, and gradually increases his under-reporting as the news gets better, until he is under-reporting the maximum amount for sufficiently good news. This result holds both when investors are “naïve” and ignore management’s ability to manipulate earnings, and when they are “sophisticated” and correctly infer management's disclosure strategy”.

Preceding sections focused on the motivations and incentives for earnings management. The next section presents various factors that act as constraints on managers’ ability to maneuver earnings to suit their interests.

II. D. CONSTRAINTS ON MANAGING EARNINGS

As mentioned earlier, the prevalent GAAP allows managers to exercise considerable discretion in estimating earnings. On one hand, this flexibility gives managers an opportunity to communicate an earnings figure that incorporates their unbiased future expectations. On the other hand, the same flexibility can be exploited to manipulate earnings opportunistically. However, managers do not have complete liberty to manage earnings at will. They face several constraints or limitations. Prior research identifies several limiting factors on the ability or incentives of managers to manipulate earnings. Jiambalvo (1996), for instance, lists several factors that may inhibit managers’ ability to manipulate earnings: auditing, internal controls, governance structures, the probability that earnings management would be detected, the cost

imposed in case of detection (e.g., litigation costs, and rising financing costs) and prior earnings management decisions.

One of the factors identified by prior research that restrains earnings management is an audit - especially by a reputable audit firm. Perhaps, auditors' concerns about reputational damage and litigation risk induces them to question dubious accounting estimates more frequently and rigorously.

Becker, DeFond, Jiambalvo and Subramanyam (1998) document the negative relationship between auditors' quality and the level of discretionary accruals. Specifically, they found that the mean and the median absolute abnormal accruals are higher for non-big-six accounting firms. Francis and Krishnan (1999) show that auditors' reporting conservatism is high for firms having higher accruals, that is, auditors (specifically the big six firms) are more likely to issue modified reports for firms having high components of (especially income-increasing) accruals in their reported figures. Francis, Maydew and Sparks (1999) provide similar evidence on the relationship between earnings management and audit quality. They show that although the total accruals are higher for companies audited by the big six audit firms, the amounts of discretionary accruals are significantly lower. Basu *et al.* (2000) find the reported earnings to be more conservative in the audited (fourth) quarter than those in interim ones. Mendenhall and Nichols (1988) provide empirical evidence for the hypothesis that managers have more discretion in the interim quarters (which are usually unaudited) relative to the audited fourth quarter. DeFond and Subramanyam (1998) found that in cases where companies switched auditors, discretionary accruals

were significant and negative (income-decreasing) during the last years with the predecessor auditor, and were insignificant in the first year of a newly appointed auditor. Krishnan (1994) shows that auditor conservatism might induce a firm to change its auditors. However, according to evidence shown by Krishnan and Stephens (1995), switchers are treated relatively conservatively by both predecessor and successor auditors. Krishnan (2003) shows that specialist auditors (those having industry expertise) do a better job in controlling earnings management than non-specialist ones. Overall, the empirical evidence is consistent with the notion that the audits, especially those by reputable firms, act as a deterrent to manage earnings.

Another constraint on earnings management is the ownership of firms by managers. Dempsey, Hunt III, and Schroeder (1993) examined the relationship between corporate ownership structures and earnings management through extraordinary items. They observed that non-owner managers engaged in income-increasing earnings management more frequently as compared to owner managers. They offered the explanation that non-owner managers have relatively less job security, and they have to work harder to keep shareholders satisfied with the performance of the firm.

Warfield, Wild, and Wild (1995) hypothesize and find that firms having relatively higher levels of managerial ownership have lower discretionary accruals. In cases where managers have higher ownership stakes in the firm, their incentives to manage earnings opportunistically may be limited.

Rajgopal, Venkatachalam, and Jiambalvo (2002) report the tendency to manage earnings is curtailed by a higher degree of institutional ownership. They argue that higher informativeness of institutional investors may lower “perceived benefits of managing accruals”. Bushee (1998) shows evidence of better monitoring by institutional investors as compared to individual ones. Specifically, the study shows that firms with a high proportion of institutional ownership are less prone to use R&D for earnings management purposes.

Dechow *et al.* (1996) demonstrate that stronger corporate governance structures also discourage earnings management. They study the profile of firms singled out by the SEC for enforcement actions against them. Typically, these are firms that have overtly and opportunistically manipulated earnings. They found that such firms are more likely to have (1) boards dominated by managers, (2) CEOs serving as board chairmen, (3) CEOs who are also the founders of the firms, and (4) no audit committees. Pope, Peasnell and Young (1998) hypothesize that the presence of outside directors on companies’ boards serves to curb earnings management. Consistent with their hypothesis, they document a statistically significant negative association between income-increasing accruals and the proportion of outside board directors. Beasley (1996) documents that the higher the proportion of outside directors on the board, the lower the probability of financial statements fraud, implying that outside directors serve as a constraint on financial statement manipulation. Klein (2002) shows that lower levels of discretionary accruals are associated with relatively more independent audit committees and boards of directors. Chtourou, Bédard, and Courteau (2001) relate the

effectiveness of governance structures to earnings management. They find that income-increasing discretionary accruals are likely to be low for firms with (1) audit committees comprised of a larger proportion of outside members not serving as managers in other firms, (2) audit committees vested with “clear mandate for overseeing both financial statements and external audit”, (3) audit committees having at least one member with financial expertise and the necessary authority for monitoring financial statements and external audits, and (4) boards of directors having experienced outside members. Xie, Davidson and DaDalt (2003) found relatively low levels of discretionary current accruals for firms with (1) more frequent board and audit committee meetings and (2) more financially sophisticated board and committee members.

Finally, Barton and Simko (2002) hypothesize that a balance sheet acts as a constraint on earnings management. Since previous (income-increasing) earnings management is reflected in the overstated values of net assets on the balance sheet, they act as constraints on managers’ ability to opportunistically overstate reported earnings. The authors provide empirical evidence that “the likelihood of meeting or beating analysts’ earnings forecasts by optimistically biasing earnings decreases with the extent to which net assets are already overstated on the balance sheet.”

II. E. APPROACHES TO DETECTING EARNINGS MANAGEMENT

Methodologies used by earnings management studies can be broadly classified into three broad approaches:

1. the aggregate or total accruals approach,

2. the specific accrual approach, and
3. the earnings distribution approach.

The methodologies based on ‘aggregate accruals’ attempt to model expectations of normal or non-discretionary accruals based on explanatory factors relating to firms’ economic environment. The portion of accruals unexplained by these factors is called abnormal or discretionary accruals and is regarded as a proxy of earnings management. The pioneers of this approach were Healy (1985) who considered total accruals as a measure of earnings management and DeAngelo (1986) who took change in total accruals as a measure thereof. Jones (1991) enhanced the sophistication of these techniques by suggesting a regression based model to isolate discretionary accruals. Models later developed in this area were extensions or modifications of the Jones (1991) model.

Unlike the ‘aggregate accruals’ approach, the ‘specific accrual’ approach focuses on modeling the behavior of a particular accrual in order to sort out the discretionary and non-discretionary components. Rather than suspecting entire accruals as the source of earnings management, this approach identifies a single source where managers are most likely to exercise their discretion. Ideal candidates for such a source are those accrual accounts which, on one hand, are large enough to be an effective source of earnings management and, on the other hand, require managerial judgment in their estimation. Naturally, researchers’ prior expectations about such accounts would vary from one industry setting to another. Below are some major contributions (along with the accrual types examined by them in parenthesis): McNichols and Wilson, 1988

(bad debt provisions); Petroni, 1992 (claim loss reserve of proper and casualty insurers); and Beaver and Engel 1996 (loan loss reserves in banking firms). An advantage of this approach over the aggregate accruals approach is that it enables the researcher to focus on one major account. Using the knowledge of GAAP and fundamentals affecting the specific account, researchers can better model its behavior. However, according to McNichols (2000), the specific accruals approach has several problems. First, it requires greater industry knowledge and a richer dataset. Second, there is a potential risk that while focusing on specific accounts, researchers might fail to detect earnings management taking place in other accounts. Lastly, the results may not be generalizable to other firms and industries.

The third approach to detecting earnings management examines the distribution of reported earnings to spot any statistical inconsistencies from the expected distribution of earnings. Specifically, these studies search for discontinuities in the frequency distribution of earnings around some threshold or benchmark earnings figure. These benchmarks include last year's earnings, zero earnings, and earnings expected by analysts. The pioneers of this approach, Burgstahler and Dichev (1997) and Degeorge *et al.* (1999), hypothesize and find evidence of earnings management around these thresholds. The distributions based approach avoids some of the critical objections raised against alternative approaches. For instance, under this approach, errors related to the measurement of discretionary accruals are avoided. This is because the focus of the distribution approach is on the comparison between the earnings distribution in the absence of any manipulation and earnings distribution observed in reality rather than on

decomposing accruals into discretionary and non-discretionary parts. Furthermore, in addition to capturing earnings management through accruals, this approach also detects earnings management through real activities. However, a limitation of the distribution approach is that it fails to identify the magnitude of earnings management and the manner in which it is practiced.

In short, each of the three approaches to detect earnings management has its benefits and shortcomings. A researcher's job is to choose the most appropriate approach given the research objectives, data availability, and the nature of the research problem. To the best of our knowledge, almost all earnings management studies that attempt to detect the degree of earnings management around a certain corporate event employ the aggregate accruals approach. Accordingly, this study also relies on aggregate or total accrual models to examine firms' earnings management practices around product recalls.

This chapter provided a brief overview of the empirical research on earnings management, an area which is growing at a very rapid pace. The next chapter presents the necessary background on product recalls along with a review of prior research on this topic. Taken together both chapters provide the necessary theoretical framework on which we will build our research hypothesis.

CHAPTER III

BACKGROUND ON PRODUCT RECALLS

This chapter presents the essential background on product recalls. First, a brief introduction and general background is provided on product recalls as an important firm-specific event including some basic information on the nature and process of recalls. Second, direct and indirect costs associated with recalls are analyzed in order to better understand the economic impact of product recalls. Lastly, an overview of prior studies on product recall is presented.

III. A. NATURE AND TYPES OF PRODUCT RECALLS

Hundreds of products are recalled each year. An overwhelming majority of these products is recalled because of safety concerns.⁵ The recall itself consists of corrective actions by a firm needed to protect consumers from harmful effects of a potentially hazardous product.

The corrective actions may involve anything from minor repairs to completely replacing the product or disbursing full refunds to the customers. Nearly all recalls are

⁵According to the U.S. Consumer Product Safety Commission, there are 300 recalls each year and it costs the nation more than \$700 billion in deaths, injuries and property damage from consumer products. Source: "How Do You Know if You Have a Recalled Product?" Wyoming Tribune-Eagle, December 6, 2004.

voluntarily undertaken by the manufacturer or distributor of the product. However, if the firm involved fails to cooperate, the regulatory authority has the legal right to enforce the recall.

Recalls vary widely in terms of the gravity of the product defect that triggers the recall. The product defects prompting recalls can range from being life threatening defects to minor mislabeling problems. The number of units involved in a recall can vary widely too. It can range from a few units to several million items.⁶ Recalls also differ vastly in the scope of efforts and resources required to implement them. Certain recall efforts simply require sending some additional instructions regarding product safety and handling.⁷ Other recall campaigns can be very extensive requiring complete destruction and permanent removal of all units of the product involved.

This study focuses on newsworthy recalls that have significant economic consequences. The trade press typically covers recalls by large reputed firms involving products with safety related defects.

III. B. THE PROCESS OF PRODUCT RECALLS

A recall may be initiated by the manufacturer or the federal agencies monitoring compliance with national safety standards. Consumer safety legislations (like the

⁶ In order to appreciate the massive scale of some recalls, consider these examples: In 2002, Wampler Foods (a subsidiary of Pilgrim's Pride Corporation) recalled 27.4 million pounds of cooked deli products. Similarly, in 1996 Ford Motor Co. recalled 8.7 million vehicles in the largest auto recall ever. Recently, the recall of Merck's arthritis drug Vioxx with annual sales of 2.5 billion dollars became all-time largest prescription drug withdrawal.

⁷ Such recalls are referred to as placards recalls because they merely involve mailing instructions on placards to investors apprising them of the possible safety hazard and precautions to be taken in product usage.

Consumer Product Safety Act) require manufacturers or other firms in distribution channels to report any safety related defects to federal agencies as soon as they surface. Federal regulatory agencies (like the FDA, CPSC, EPA, NHTSA) also gather information about safety related defects from their inspectors, news stories, emergency-room records, and death certificates. However, most of the initial reports come from consumers themselves. As soon as the agency learns of a potentially unsafe product, it opens up a preliminary investigation to determine if the product violates mandatory safety standards. Once it is ascertained that the product is in fact hazardous or of significantly substandard quality, the authority requests the firm to recall the product. Subsequently, the firm and agency make a joint announcement regarding the recall. A number of channels (including first-class mail, press releases, websites, and distribution networks) may be used to communicate the announcement to the consumers.

III. C. THE COST OF PRODUCT RECALLS

This section analyzes the components and nature of costs associated with a typical recall. Evidently, most recalls involve considerable costs. Even though the direct costs of recalls are substantial in their own right, the indirect costs related to recalls can exceed direct costs by several times. Costs that are directly attributable to product recalls may include, among others, the following ⁸:

⁸ Based on “AIG offers coverage for product recalls” Anonymous. Rough Notes. Indianapolis: Jul 1999. Vol. 142, Issue. 7; p. 42 and “Company's insurance may ease the blow”. By: Higgins, Greg; Landa, Shellie. Business Journal (Central New York), 04/16/99, Vol. 13 Issue 15, p. 18.

- *Investigation costs* paid by the firm to test the product defects as well as fees paid to outside consultants for analysis. It includes costs of employee interviews, engineering and equipment tests.
- *Communication costs* incurred in the process of contacting customers like letters to consumers, announcements on TV, newspapers, magazines or websites.
- *Transportation costs* to bring the product to the centers where they would be repaired, restored, modified or disposed.
- *Warehousing costs* for holding the products during the recall process.
- *Overtime* and other employee-related expenses.
- *Product disposal costs* including the costs of destroying or disposing faulty parts
- *Inventory Losses* including any unsold inventory that has to be destroyed, in addition to any products removed from market circulation.
- *Fines* paid to government agencies.
- *Restoration costs* to replace or restore the recalled product.
- *Redistribution costs* incurred to deliver the restored products back to customers.
- *Costs to replace* a recalled product that has been destroyed or is unfit for its original use.
- *Capital expenditure* to renovate or replace the equipment responsible for faulty products.

Although direct costs of a recall are somewhat mitigated by a low consumer response rate to recall announcements⁹, the indirect costs associated with a recall remain formidable in most circumstances. Also, indirect costs persist for longer periods of time. These costs are reflected in losses in the equity value of the firm above and beyond the associated direct costs. Various expressions have been used in the literature to represent these indirect costs. Jarrell and Peltzman (1985) refer to these costs as “goodwill losses”; Dranove and Olsen (1994) call them “a general loss of faith”; Alessi and Staaf (1994) term them as “loss of trade mark capital”. Indirect costs include, but are not limited to, the following:

- **Reduction in Future Sales:** Recalls convey negative information about the quality and reliability of recalling firms’ products resulting in loss of consumer confidence. Several studies show that the demand for these firms’ products is adversely affected after recall announcements.¹⁰
- **Cost of Litigation:** Recalls immediately expose the announcing firm to product-liability litigation.¹¹ Defense against lawsuits filed by customers, consumer groups, or government agencies entails substantial outlays.

⁹ According to a Consumer Reports (August 2004) article, almost one-third of all vehicles subject to recall; more than half of toys, clothes, appliances, tools, and electronics gear; and three-fourths of child car seats remain on the road or in the home. *Source:* Consumer Reports, August, 2004, Vol. 69, No. 8; Pg. 12, CR Investigates. The Trouble With Recalls. 2004.

¹⁰ The next section gives a detailed account of these studies.

¹¹ Within the first 15 days after announcing Vioxx’s recall, Merck & Company was named in 300 lawsuits on behalf of 900 plaintiff groups. Estimates of Vioxx’s legal costs have ranged between \$4 billion and \$18 billion.

- **Public Relations Costs:** Soon after announcing a product recall, firms have no choice but to come out and actively defend themselves against mounting public criticism. Firms attempt to convince the public that all efforts were done to prevent the hazard and the product was recalled immediately upon learning about the defects. Again, significant outlays are associated with the efforts to rehabilitate the image of the company or its product following the recall.¹²

III. D. PRIOR STUDIES ON PRODUCT RECALLS

III. D. 1. The Effects of Product Recall Announcements on Demand and Sales

Wynne and Hoffer (1976) published one of the first papers in the series of empirical studies examining the economic consequences of a product recall. The paper, like most others in the area of product recall research, focused on the auto industry (specifically, it studied the ‘subcompact’ market segment to hold the effects of style constant). The authors tested the hypothesis that safety-related auto recalls, which generally entail negative publicity to the manufacturer, adversely affect the market share of the same make of automobile. Covering recalls from the beginning of 1971 to first quarter 1973, they found only limited evidence of a significant decline in market share of the recalled products. They also found that for those recall campaigns that are concentrated in time, there is a significant drop in the market share of the announcing firm.

¹² After the recall of Explorer/Firestone Tires (one of the most notorious recalls in corporate history), Ford Motor Co. spent at least \$5 million on series of TV ads which featured the CEO Jacques Nasser trying to reassure the public. This was just a part of a far more extensive public relations effort.

One of the most detailed examinations of recalls' impact on demand came from Crafton, Hoffer and Reilly (1981). They used a randomized block design or paired difference tests to examine the relationship between recalls and future automobile demand. At first, the recall events in the sample period (1970-1978) were classified according to their severity, with Type III recalls being the most severe category. Severe (or Type III) recalls included, for example, problems resulting in loss of brakes or steering control, problems that could cause vehicle fires or acute and recurring engine stalling. Type I and Type II recalls covered problems of minor and intermediate severity, respectively.¹³ The authors did not find any evidence of a significant effect of recalled models on sales as a result of the Type I recalls, Type II recalls, or all three types of recalls taken together. However, they found that the severe, or Type III, recalls significantly decreased the unit sales of recalled model. Not only that, the adverse impact of Type III recalls of a particular model was also reflected in the sales of similar models produced by competitors. The results of this study corroborated the contention that severe recalls convey negative information about the product quality to consumers who, in turn, curtail their future purchases of the recalled model.

Reilly and Hoffer (1983) conducted a similar analysis over the 1978-1981 period. They argued that because of the unavailability of other objective measures of quality, government-mandated auto recalls serve as a proxy of the vehicles' quality. Accordingly, they studied whether recalls affect subsequent consumer purchases of the

¹³ Minor (Type I) recalls included tire, carjack and seatbelt related problems, as well as placard recalls. Intermediate (Type II) recalls included missing bolts or other key parts, emission control problems and wind-shield wiper problems.

cars from the same line. They hypothesized that the sales performance of a particular car line would be negatively associated with both the recall frequency and the extent of negative publicity each recall event receives in the media. Naturally, a single recall event which draws considerable media attention and spawns sizeable adverse publicity is likely to have a greater impact on sales than multiple recall announcements which go relatively unnoticed in the media. However, due to the unavailability of other acceptable and objective measures of the degree of publicity, the authors used the severity ranking and the number of vehicles involved in the recall campaign as proxies for media coverage and negative publicity. Consequently, the recalls were ranked as severe, intermediate, or minor depending on the scale of potential safety hazard associated with it. The study found evidence of a significant negative effect on sales immediately after the announcement for the recalls classified severe. For minor or intermediate recalls, however, there was no significant dent in sales. Although, on the whole, this study confirmed the results of Crafton, Hoffer and Reilly (1981), it found conflicting evidence on the sales behavior of competitive models. The evidence showed that the recall announcement had a salutary effect on the sales of similar models offered by competitors. The authors inferred that this effect could be explained by the increasing consumer loyalty to the segment of their choice. Rather than switching to a different model, consumers tend to switch to other manufacturers. Overall, the evidence indicated that auto recalls have significant economic consequences for both the firms making the announcement and their competitors.

Marsh, Schroeder and Mintert (2004) studied the effects of recalls of meat products on consumer demand. In line with Crafton *et al.* (1981), they treated recalls as indicators of low product quality and attempted to gauge the consumer reactions to recall announcements. They tested whether recall indices or media coverage of the recall event affected demand. Recall indices were obtained by linearly aggregating the number of Food Safety Inspection Service (FSIS) reported recall events for beef, pork, and poultry each quarter during the 1982 to 1998 period. To measure media coverage, the authors used the number of articles that appeared in the top fifty English language newspapers reporting the recall event. They found significantly negative contemporaneous and lagged effects of recalls on the demand for beef and pork. The lagged effect lasted for three quarters. For poultry however, the negative and significant effect was found only in the period of announcement. There was a significant and negative relationship between the incidence of recall (as measured by FSIS recall indices) and the demand for meat. However, the association between media indices and demand was found to be statistically insignificant. The study also documented that recall of one type of meat negatively affects the demand for other meat categories, suggesting that consumers substitute other consumer goods in place of meat. Based on the evidence, the authors concluded that the meat recalls lower the perceived quality of meat, resulting in a reduced demand for it.

III. D. 2. Stock Price Reaction to Product Recall Announcements

Another set of articles within the product recall research focuses on the effect of recall announcements on shareholders' wealth. Pioneering work in this area was done by Jarrell and Peltzman (1985).

The authors approached the issue of recalls as one of capital market efficiency. They argued that efficient capital markets should internalize the cost of recalls so that the size of the penalty to shareholders should be sufficient to deter production of defective products in the future. This argument implied that the losses to shareholders as a result of product recalls should be significantly higher than the direct cost of recalls. In order to test for the size and significance of share price reaction to recall announcement, they focused on drug and automotive recalls. They estimated the direct costs and shareholder wealth losses related to 116 automobile recalls overseen by the National Highway Traffic Safety Administration and with 26 drug recalls overseen by the Federal Drug Administration over the period from 1974 to 1982. Results of their study support the hypothesis that losses in the capital market do, in fact, provide considerable deterrence to selling defective products which have a potential to be recalled. Specifically, they found that the shareholder losses as a consequence of product recalls far exceeded the direct costs of recalls. In fact, these losses were several times larger than direct costs which were quite generously estimated. The authors also found that recalls involving complete product withdrawals as well as the ones receiving greater publicity proved to be more costly for the shareholders. Furthermore, weak evidence of intra-industry contagion effects was also documented by this study.

Hoffer, Pruitt, and Reilly (1988) replicated Jarrell and Peltzman's (1985) study after revising their methodology and amending their dataset for the automobile recall sample. They found that the significance of Jarrell and Peltzman's findings are lost, at least for the automobile recalls. However, a number of subsequent studies reconfirmed significant and negative stock price reactions to product recalls in a variety of industry settings. Barber and Darrough (1996) studied an expanded sample of automobile recalls covering a longer period of time (from 1973 to 1992) and a broader classification of auto manufacturers (including the recalls by three Japanese automakers in addition to the three domestic ones). They confirmed the results of Jarrell and Peltzman (1985) by documenting significant and negative stock market reactions to recalls. However, in contrast to Jarrell and Peltzman (1985), they failed to find any spillover effects for competitors.

Pruitt and Peterson (1986) investigated the information content of 156 non-automotive recalls reported by the *Wall Street Journal* from 1968 to 1983. The automotive sector was excluded because of the exceptionally high frequency of auto recalls over the sample period, possibly resulting in sample bias. In addition to measuring the market reaction to recall announcements, the study also attempted to ascertain the length of time for which the stock prices keep on adjusting after the initial release of the information. They found a statistically significant negative price reaction in the 2-day window around the announcement date. Furthermore, the product recall announcement in the *Wall Street Journal* was unanticipated by the market as none of the 20 day returns leading to the announcement date turned out to be statistically

significant. Another interesting finding reported by the article was the initial under-reaction to the recall announcement, which manifested itself in significant downward adjustments in the stock price that went on for almost two months after the announcement. Rubin, Murphy and Jarrell (1988) examined a sample of CPSC recalls during the period 1977 to 1981 and confirmed the results of previous studies showing significant negative equity responses to the event.

Pruitt, Reilly and Hoffer (1986) studied the intra-industry effects of recall announcements. In addition to confirming significantly negative own-share price reactions to Type III automobile recalls, the study documented intra-industry competitive effects. In other words, the equity of the recalling firm's competitors exhibited significantly positive reactions at the time of the recall. This finding substantiates the results of Reilly and Hoffer (1983), but it conflicts with the intra-industry contagion effects documented by Jarrell and Peltzman (1985) and Crafton, Hoffer and Reilly (1981).

In sum, product recalls have significant economic repercussions for the announcing firms. The direct and indirect costs associated with the recalls are substantial. Recalls adversely affect firms' revenues, profitability and, consequently, stock prices. Under such circumstances, the management of firms with recalls is under considerable pressure to mitigate the damage caused by the recall and to deal with the grim prospects faced by the firm. The following chapter discusses the *a priori* expectations regarding the earnings management practices of the firm in the context of product recalls

CHAPTER IV

RESEARCH HYPOTHESES AND METHODOLOGY

This chapter develops the main hypotheses and lays out the research design of the study. Section A in this chapter develops the hypotheses regarding the earnings management practices of firms around recalls in the light of the findings of previous earnings management and product recall studies. Section B describes and justifies the measure of discretionary accruals (or earnings management) employed in this study along with the tests to gauge the statistical significance thereof.

IV. A. RESEARCH HYPOTHESES

After an extensive review of the background on earnings management and product recalls, we turn our attention to the development of hypotheses for this research. Our central task in this section is to develop the hypotheses that would capture the reporting behavior of managers when their firms face a product recall. While reviewing the prior literature, we found support for two alternate scenarios of reporting behavior for an adverse economic event like product recalls. This section presents our *a priori* expectations of firms' reporting behaviors in the form of two hypotheses, both of which are well documented in previous studies. The first one is known as the 'smoothing' hypothesis and the second is called the 'big bath' hypothesis.

In the remainder of this section we discuss the anecdotal and empirical evidence in support of our hypotheses.

IV. A. 1. Smoothing Hypothesis

As discussed earlier, the reported earnings per share figure is a crucial input for valuation decisions by investors, analysts, and other market participants. Consequently, earnings announcements not only attract a lot of attention from market participants, but they also affect stock prices significantly. Share prices have been found to soar on positive earnings surprises and plunge on negative ones.

A number of news articles and empirical studies shows that investors and other market participants have a strong aversion for negative earnings surprises. Early in the first quarter of 2000, Lucent Technologies, Inc., lost \$ 64 billion (or 30% of its market value) as a result of disclosing that it would miss analysts' expectations. Likewise, SEC chairman Arthur Levitt mentioned "I recently read of one major U.S. company that failed to meet its so-called "numbers" by one penny, and lost more than six percent of its stock value in one day." There are numerous examples of firms suffering from substantial losses in stock value as a result of failing to meet the expectations.

The significance of the impact of earnings surprises on stock prices is also documented in a number of empirical studies. Ball and Brown (1968) and Beaver (1968) published one of the earliest studies that documented the direct relationship between earnings surprises and the consequent stock price reactions. Brown, Hagerman, and Zmijewski (1987) also report negative stock price revisions as a result of a negative earnings surprise. Skinner and Sloan (2001) document evidence that a

negative earnings surprise results in disproportionately larger negative stock price reactions, especially for growth firms. Myers and Skinner (1999) show that firms that exhibit steady growth with few surprises often get rewarded with premiums from investors in the form of higher stock prices.

Since managers' job security, bonus pay and stock option values are all tied to stock price movements, they are under enormous pressure to show steadily growing earning numbers with little or no negative surprises. Bergstresser and Philippon (2004) document a positive association between the degree of earnings management and the extent to which managers' financial benefits are directly tied to share prices. Lambert (1984) and Dye (1988) suggest a similar relationship between managers' income smoothing tendency and stock prices based compensation contracts. Moses (1987) also found that income smoothing behavior is associated with the existence of bonus plans.

Recent studies confirm a managerial tendency to avoid negative earnings surprises. Managers attempt to avoid losses and declines in earnings (Burgstahler and Dichev, 1997). Further, once the benchmark of positive earnings and increase in earnings are met, the managers then attempt to meet analysts' expectations (Degeorge, Patel, and Zeckhauser, 1999). This finding is further substantiated by the results of Burgstahler and Eames (2001).

Overall, there seems to be a widespread consensus among accountings regulators, the financial press, investors, and researchers that firms manage earnings to report a smooth and steady stream of consistently growing income with few earnings surprises. On one hand, this reporting behavior involves understating the profits (by

managing accruals downward) when pre-managed earnings are on the higher side, thereby creating a buffer of reserves that can be used when times are not so good. On the other hand, it involves overstating the profits (by managing accruals upward) when pre-managed earnings fall short of expectations, thus utilizing the reserves created in good times. Both anecdotal and empirical evidence support the hypothesis that firms engage in earnings smoothing.

Product recall forces the firm into a situation where they are faced with a reduction in pre-managed earnings.²⁷ The managers in this case have incentives to persuade the market that the recall announcement was not a big setback for the firm. They have incentives to relay the impression to the investors and the analysts that the dent in the bottom line due to the recall was neither significant nor long-lasting. In order to soften the blow of the recall announcement and to hide the current adverse operating performance, managers have strong incentives to engage in income-increasing earnings management around the time of the product recalls.

Based on this line of argument we hypothesize that firms announcing product recalls have incentives to manage earnings upward in the quarter of and around the product recall announcement. Stated differently, we expect the discretionary accruals of recalling firms to be income-increasing and significantly positive at the time of and around product recall announcements.

IV. A. 2. Big Bath Hypothesis

²⁷ See chapter III for a review of the empirical evidence on the economic impact of product recalls.

Alternatively, one can argue that most product recalls affect a recalling firm's bottom-line so intensely that the firm loses sight of their initial earnings target. Even with the conceivable manipulation of discretionary accruals, the firm cannot meet original expectations of the market. If this is the case, then managers might be tempted to make the most of this situation and turn the financial adversity into an advantage by taking a 'big bath'. As explained in Chapter II, section C, the idea is to clean up their balance sheets and create a buffer which can be used to artificially inflate the earnings in future periods. On one hand, severe recalls bring misfortune to the firm, but on the other hand, they provide an opportunity to 'clean the decks' and create a cushion of reserves that can be exploited to reduce future expenses and enhance future income.

When one looks at the typical quarterly earnings announcement after a significant product recall, one observes that the recalling firm's management often attributes the shortfall in earnings per share to the recall event. Thus, anecdotal evidence suggests that at least some firms might use a recall as a scapegoat and take a 'big bath' behind the curtain of recall.

Section II C summarizes empirical and theoretical evidence favoring the big bath hypothesis. Under normal circumstances, firms attempt to smooth earnings. But when the news is 'sufficiently bad', managers understate the earnings even more and take additional losses in order to report higher future earnings.

Thus, following this line of argument, we hypothesize that when firms face a severe product recall, they prefer to take a 'big bath' and manage their earnings downward. In other words, severe product recalls are generally "sufficiently bad news"

for most recalling firms, so that they resort to income-decreasing earnings management in the quarter of recall.

IV. B. STATISTICAL METHODOLOGY

In order to test the hypotheses of earnings management developed in the previous section, this study uses the cross-sectional version of the modified Jones (1991) model, as adapted by Teoh *et al.* (1998 a and b). This model belongs to the class of approaches which is broadly classified as total or aggregate accrual models. The model attempts to decompose total accruals reported by a firm into normal (non-discretionary or expected) and abnormal (discretionary or unexpected) components. The normal or non-discretionary portion of accruals is considered to be driven by firm-specific economic variables like sales and level of investments in fixed assets. The remaining portion of accruals which is unexplained by these economic variables is considered to be arising from managerial discretion rather than a firm's economic fundamentals and is, therefore, treated as a proxy for the level of earnings management.

This section is organized as follows: The first part of this section provides the necessary background and the underlying rationale for the Jones (1991) model. The second part discusses the modification in the Jones (1991) model proposed by Dechow, Sloan and Sweeney (1995) and the intuition behind it. The third part compares the time-series and cross-sectional version of the model and justifies the selection of the cross-sectional one for an event-specific earnings management study like this. The fourth part presents arguments for decomposing accruals into current and long-term

accruals, as proposed by Teoh *et al.* (1998 a and b). Finally, the last part presents detailed step-by-step procedures for computing the accrual measures.

IV. B. 1. The Jones (1991) Model

Under the aggregate accruals approach, researchers attempt to isolate the discretionary component of reported earnings and use it as a proxy for earnings management. The earnings or net income figure is composed of two elements, that is, cash flow from operations and total accruals.²⁸ The cash flow component of earnings reflects real or economic activities of a firm involving actual cash receipts or payments and is generally less susceptible to manipulation by managers.²⁹ Total accruals, on the other hand, signify transactions that affect future operating cash flows rather than current ones. Since the precise amount of future cash flows resulting from current period activities is not known, managers must use their judgment in estimating the amount of accruals to be included in the present year's earnings. This flexibility afforded to the managers under Generally Accepted Accounting Principles (GAAP) may result in opportunistic behavior on their part. Managers can both increase or decrease current earnings by maneuvering accruals. For instance, in order to increase current period earnings, managers may underestimate the provisions for bad and doubtful debt. On the other hand, if decreasing current period earnings serves them

²⁸ Total accruals for an accounting period consist of changes in non-cash working capital minus depreciation charge for the period.

²⁹ As mentioned earlier, although earnings can be managed through real activities (such as timing asset sales, delaying maintenance, altering R&D expenditure), it is usually relatively more costly and less convenient for managers to do that. Also, it is methodologically difficult for the researchers to spot such manipulation (see Beneish, (2001) for a further discussion).

better, managers may overestimate provision for warranty expenses associated with current sales.

However, it does not mean that total accruals are entirely driven by managerial discretion. According to Kaplan (1985), total accruals (or change in working capital and depreciation) are determined by the economic environment of the firm as well as management discretion. A portion of total accruals driven by economic conditions of the firm is designated as non-discretionary or expected accruals. The remaining portion of total accruals not explained by firm-specific fundamentals is regarded as discretionary accrual subject to managerial manipulation. Discretionary accruals serve as the proxy for earnings management.

Following this line of argument, Jones (1991) proposed an expectations model that attempts to control for the economic conditions of the firm and thereby develop an estimate of the expected or non-discretionary accrual. Under this expectations model, total accruals are regressed on two firm specific variables: change in sales revenue and the levels of depreciable assets. The two variables included in the model as regressors are assumed to account for non-discretionary components of total accruals, that is, non-discretionary working capital changes and non-discretionary depreciation. Change in revenues³⁰ are supposed to account for non-discretionary changes in working capital accounts (like receivables or inventories), while the level of gross plant, property and equipment is supposed to account for non-discretionary depreciation expense.

³⁰ Jones (1991) implicitly assumed that revenues are exogenous or free from managers' discretion. However, in many instances revenues themselves are prominent source of earnings management. Jones also admitted this limitation of her model in her article.

Specifically, the model parameters (α , β_1 , β_2) are estimated by running the following regression during the estimation period:

$$TACC_{j,t} = \alpha + \beta_1 \Delta REV_{j,t} + \beta_2 PPE_{j,t} + \varepsilon_{j,t} \quad (1)$$

where:

$TACC_{j,t}$ = period t total accruals which are assumed to be non-discretionary during the estimation period,

$\Delta REV_{j,t}$ = net revenues in period t minus revenues in period t-1, and

$PPE_{j,t}$ = gross property, plant, and equipment in period t.

All variables, including the intercept, are scaled by total assets at the beginning of the year. Total accruals are measured as changes in non-cash current assets minus changes in current-liabilities (excluding current maturity of long-term debt) less the depreciation expense for the period. Once the parameters estimates are obtained, predicted values of accruals for the event period are estimated. These predicted values are treated as expected or non-discretionary accruals. Event period discretionary accruals are then the deviation of actual accruals from these benchmark non-discretionary accruals.

IV. B. 2. The Modified Jones (1991) Model

As pointed out in footnote 17, the Jones (1991) model implicitly assumes that revenues are non-discretionary or exogenous. This assumption lowers the power of the model in that it fails to capture managed earnings arising from managed revenues.

Dechow, Sloan and Sweeney (1995) argue that revenues (especially credit sales) can be

an expedient source of earnings management. Consequently, they proposed a modification in the original Jones model to capture earnings management through discretionary revenues as well. They adjusted the change in revenues for change in receivables in the event period, implicitly assuming that all changes in uncollected credit sales at the end of an event period results from earnings management.

Specifically, in the Dechow, Sloan and Sweeney (1995) modified Jones model, the non-discretionary accruals in the event period are estimated as:

$$NDCACC_{j,t} = a + b_1 (\Delta REV_{j,t} - \Delta REC_{j,t}) + b_2 PPE_{j,t} \quad (2)$$

where:

$$\Delta REC_{j,t} = \text{net receivables in year } t \text{ minus net receivables in year } t-1.$$

Note that the estimates (a , b_1 and b_2) of the model parameters (α , β_1 , β_2) are still obtained using the original Jones (1991) model (see Equation 1). Dechow *et al.* (1995) further showed in their paper that the modified version of the Jones (1991) model tends to outperform other models for detecting earnings management.

IV. B. 3. Time-series versus Cross-sectional Estimation

The modified Jones (1991) model has been used extensively in the earnings management literature and is estimated in both a firm-specific, time-series manner and in cross-sectional fashion. In the case of time-series models, parameters are estimated for each firm in the sample separately using time-series of observations prior to the event period. During this estimation period no systematic earnings management is expected. Then discretionary accruals for the event period are obtained by deducting

predicted values of non-discretionary accruals from the actual event period accruals. Finally, a test for statistical significance of discretionary accruals is conducted to prove the earnings management hypothesis. In the cross-section modified Jones (1991) model, however, the parameters are estimated by running a cross-sectional regression using all firms in the same industry as the event firm, but excluding the event firm itself. This cross-sectional regression is performed for each period around the event (including the event period) during which earnings management is suspected. The rest of the procedure is the same as in the time-series modified Jones (1991) model.

Clearly, the parameters and the measures of discretionary accruals obtained from time-series and cross-sectional models are conceptually different from each other. The time-series model measures discretionary accruals during the event period relative to the level of normal accruals during the estimation period. It inherently assumes that the estimation period is free from earnings management. The cross-sectional model measures a firm's discretionary accruals during the event period relative to the industry norm. The level of accruals across firms in the same industry as the event firm serves as the benchmark against which accruals of the event firm are compared. Only if the discretionary accruals of the event firm are more extreme than those of other firms in the industry, are they likely to be identified. This tendency of the cross-sectional approach introduces a bias against finding evidence of earnings management, especially in cases where the earnings management is expected to occur simultaneously across many firms in the industry. Nevertheless, for studies attempting to measure the degree of earnings management around a specific event (e.g., share repurchases, stock option

grants, equity offerings, product recalls), the cross-sectional model has several advantages over its time-series counterpart. First, the cross-sectional approach enables the researcher to control for earnings management attributable to factors other than the event of interest, thus providing a clear focus on earnings management related to the event of interest (in this case, product recall announcements). Second, it is easier to obtain a reasonable number of observations using the cross-sectional approach. With the time-series model, one needs to go back several years to assure that the sample size is reasonable. Doing so introduces survivorship and selection bias in the time-series model. Third, the cross-sectional version has been shown to be better specified than the firm-specific time-series version (see e.g., Subramanyam, 1996). Finally, the researcher does not have to impose the restrictive assumption of stationarity on the time-series data.³¹

IV. B. 4. Annual versus Quarterly Estimates

This study employs quarterly observations for estimating discretionary accruals. Both annual and quarterly accounting data have been extensively used in detecting earnings management. However, studies focusing on earnings management around a certain event are increasingly using quarterly rather than annual estimates of discretionary accruals. There are a number of reasons for this trend. First, quarterly data allows the researcher a sharper focus on earnings management around the event

³¹ See Defond and Jiambalvo (1994), Subramanyam (1996), Jeter and Shivakumar (1999) for a more detailed comparison of the two approaches and the appropriateness of the cross-sectional approach for detecting earnings management around a firm-specific event.

examined. Stated differently, researchers can observe the behavior of discretionary accruals around the event more closely with the quarterly observations than with the annual ones. Second, with the quarterly data, researchers have greater choices and flexibility in choosing the “window” around the event during which they want to investigate the presence of earnings management. Third, since researchers attempt to detect earnings management in only a few quarters around the event, the chances that the discretionary accruals are contaminated with effects of earnings management from other events (like equity issues) are much less in the case of quarterly data. However, with annual data, even if the researcher takes just a couple of years around the event, he would end up with a relatively longer period of time during which it would be quite difficult to control for the confounding effects. Lastly, although the annual figures are always audited, three out of every four quarterly financial results are not audited. The absence of an audit in these quarters allows the managers greater latitude to manage earnings in them. Rangan (1998), for instance, finds that earnings management around equity offerings is more obvious in quarterly statements than in annual ones.³² With heightened opportunity to manage earnings in interim quarters, earnings management around a specific event is less likely to escape the scrutiny of researchers.³³

³² As one would suspect, an audit acts as a constraint on the manipulation of accruals. Several studies document that audits (especially by reputable firms) work as a deterrent to earnings management. See Chapter II, section C for a more detailed discussion on earnings management constraints.

³³ See Mendenhalls and Nichols (1988) and Jeter and Shivakumar (1999) for a more detailed discussion on the relative merits and demerits of choosing quarterly estimations over annual ones.

IV. B. 5. Current versus Long-term Accruals

In addition to segregating total accruals on the basis of management control (i.e., discretionary versus non-discretionary), Teoh *et al.* (1998 a and b) further partition the accruals on the basis of time period (i.e., current versus long-term portions). Current portion of accruals represents changes in current assets and liabilities related to the day-to-day activities, whereas long-term portion reflects changes in net fixed assets. Healy (1985) and Sloan (1996) argue that long term accruals account for only modest variation in total accruals. Guenther (1994), Jones (1999) and several other researchers contend that current accruals capture the discretionary behavior better than aggregate accruals. The justification for this contention is that current accruals are more susceptible to managerial manipulation than long term accruals.

Furthermore, long-term discretionary accruals are less likely to reflect period-specific earnings management, which is of critical importance in an event-specific earnings management investigation. However, the most compelling reason for focusing on current accruals rather than long-term or total accruals comes from the data availability constraints. Two main items necessary for computing total as well as long-term accruals (i.e., Gross plant, property and equipment and the corresponding depreciation expense) are missing from the Compustat quarterly files for a significant portion of our sample. Even when these items are available for recalling firms, their unavailability for a considerable number of other firms used in cross-sectional regressions in the expectations model causes the parameters estimates to be less reliable. Despite these problems, we still report our results from the long-term accruals

model; but in order to detect earnings management around product recalls the behavior of current discretionary accruals of the recalling firms remains our focal point.

IV. B. 6. Detailed Procedures for Computation of Discretionary Accruals:

Below is the step-by-step procedure used to compute our measures of earnings management. Note that we define the quarter in which a recall announcement was made in the *Wall Street Journal* as quarter (0). In other words, Q(0), is the quarter of first earnings announcement after the recall. Consequently, quarter -1 is the quarter of latest earnings announcement prior to the recall.

Step 1: Compute Current Accruals ($CACC_{j,t}$) as:

$$CACC_{j,t} = (\Delta CA_{j,t} - \Delta CL_{j,t} - \Delta CASH_{j,t} + \Delta STDEBT_{j,t}) \quad (3)$$

where:

$\Delta CA_{j,t}$ = firm j's change in current assets (Compustat item #40) from quarter t-1 to quarter t,

$\Delta CL_{j,t}$ = firm j's change in current liabilities (Compustat item #49) from quarter t-1 to quarter t,

$\Delta CASH_{j,t}$ = firm j's change in cash and cash equivalents (Compustat item #36) from quarter t-1 to quarter t, and

$\Delta STDEBT_{j,t}$ = firm j's change in short-term debt (Compustat item #45) included in current liabilities from quarter t-1 to quarter t.

Step 2: Estimate the coefficients of the cross-sectional regression model for current accruals:

$$\frac{CACC_{j,t}}{TA_{j,t-1}} = \alpha \left(\frac{1}{TA_{j,t-1}} \right) + \beta_1 \left(\frac{\Delta REV_{j,t}}{TA_{j,t-1}} \right) + \varepsilon_{j,t} \quad (4)$$

where:

j firms belong in the same 2-digit SIC code as the recalling firm,

$TA_{j,t-1}$ = firm j 's book value of total assets (Compustat item #44) at the beginning of quarter t , and

$\Delta REV_{j,t}$ = firm j 's change in revenues (Compustat #2) from quarter $t-1$ to quarter t .

Note that all the variables as well as the intercept are scaled by total assets at the beginning of the quarter. This OLS regression is estimated for the entire test period, that is, each quarter from $Q(-4)$ to $Q(+4)$ including the quarter of event, i.e., $Q(0)$. Each of these cross-sectional regressions uses all firms in the same 2-digit SIC code as the recalling firm (except, of course, the recalling firm itself).³⁴ In order to ensure reliability, the above estimation is made only if for a particular recall there are at least ten observations in the corresponding 2-digit SIC code.

Step 3: Calculate the non-discretionary current accruals for each quarter in the test period [$Q(-4)$ to $Q(+4)$], using the parameter estimates obtained from the intra-industry cross-sectional regression in Equation (4):

$$NDCACC_{j,t} = \hat{\alpha} \left(\frac{1}{TA_{j,t-1}} \right) + \hat{\beta}_1 \left(\frac{\Delta REV_{j,t} - \Delta REC_{j,t}}{TA_{j,t-1}} \right) \quad (5)$$

where:

$NDCACC_{j,t}$ = Non-discretionary current accruals, scaled by lagged assets for firm j in quarter t ,

³⁴ Matching with the 2-digit SIC code is consistent with the methodology adopted in previous research. Earlier attempts by researchers to go down to finer levels of SIC classifications resulted in significantly limiting the sample.

$\Delta REC_{j,t}$ = Net receivables (Compustat item #37) in quarter t minus net receivables in quarter t-1, and

$\hat{\alpha}, \hat{\beta}_1$ = Estimates of α, β_1 obtained from Equation (4) in step 2.

Step 4: Calculate discretionary current accruals as:

$$DCACC_{j,t} = \frac{CACC_{j,t}}{TA_{j,t-1}} - NDCACC_{j,t} \quad (6)$$

where:

$DCACC_{j,t}$ = Discretionary current accruals, scaled by lagged assets for firm j in quarter t.

Step 5: Next, to decompose the long-term accruals into their discretionary and non-discretionary components, first estimate the total accruals

($TACC_{j,t}$) as:

$$TACC_{j,t} = CACC_{j,t} - DEPN_{j,t} \quad (7)$$

where:

$DEPN_{j,t}$ = firm j's depreciation and amortization expense (Compustat item #5) in quarter t.

Step 6: Then, estimate the parameters of the following cross-sectional regression:

$$\frac{TACC_{j,t}}{TA_{j,t-1}} = a \left(\frac{1}{TA_{j,t-1}} \right) + b_1 \left(\frac{\Delta REV_{j,t}}{TA_{j,t-1}} \right) + b_2 \left(\frac{PPE_{j,t}}{TA_{j,t-1}} \right) + \varepsilon_{j,t} \quad (8)$$

where:

$PPE_{j,t}$ = firm j's gross value of property, plant and equipment (Compustat item #118) in quarter t.

Similar to step 2, this OLS regression is estimated for each test quarter. All the firms in the same two digit SIC code as the recalling firm (except the recalling firm) are included in this estimation model.

Step 7: Calculate the non-discretionary total accruals for each quarter in the test period, using the parameter estimates obtained from the regression in equation (7):

$$NDTACC_{j,t} = \hat{a} \left(\frac{1}{TA_{j,t-1}} \right) + \hat{b}_1 \left(\frac{\Delta REV_{j,t} - \Delta REC_{j,t}}{TA_{j,t-1}} \right) + \hat{b}_2 \left(\frac{PPE_{j,t}}{TA_{j,t-1}} \right) \quad (9)$$

where:

$NDTACC_{j,t}$ = Non-discretionary total accruals, scaled by lagged assets for firm j in quarter t, and

$\hat{a}, \hat{b}_1, \hat{b}_2$ = Estimates of a, b₁, b₂ obtained from equation (7) in step 6.

Step 8: Calculate discretionary total accruals as:

$$DTACC_{j,t} = \frac{TACC_{j,t}}{TA_{j,t-1}} - NDTACC_{j,t} \quad (10)$$

where:

$DTACC_{j,t}$ = Discretionary total accruals, scaled by lagged assets for firm j in quarter t.

Step 9: Calculate non-discretionary long-term accruals as:

$$NDLACC_{j,t} = NDTACC_{j,t} - NDCACC_{j,t} \quad (11)$$

where:

$NDLACC_{j,t}$ = Non-discretionary long-term accruals, scaled by lagged assets for firm j in quarter t.

Step 10: Calculate discretionary long-term accruals as:

$$DLACC_{j,t} = \frac{TACC_{j,t} - CACC_{j,t}}{TA_{j,t-1}} - NDLACC_{j,t} \quad (12)$$

where:

$DLACC_{j,t}$ = Discretionary long-term accruals, scaled by lagged assets for firm j in quarter t.

After computing the discretionary current and long-term accruals (our proxies for earnings management), we turn our attention to conducting the tests for their statistical significance. We conduct a two-tailed Wilcoxon signed rank test to examine whether the discretionary accruals for the announcing firms are significantly different from zero. Also, we conduct a parametric two-tailed t-test and non-parametric sign test for the statistical significance of announcing firms' discretionary accruals.

CHAPTER V

EMPIRICAL RESULTS

Chapter V begins with the description of the sample of recall firms investigated in this study. Next, section B explores the profile of net income around recalls. Section C presents empirical findings on the behavior of discretionary accruals based on the modified Jones (1991) model around product recalls. Section D discusses an important shortcoming of the modified Jones (1991) model in the investigation of earnings management around events like product recalls. Section E attempts to resolve the shortcoming by suggesting a modification in the model to capture the discretionary accruals more precisely. Finally, section F discusses the results of the proposed models.

V. A. SAMPLE DESCRIPTION

In this section we present the sampling strategy and data sources employed in this study. More specifically, we describe the nature and characteristics of recall events that qualify for inclusion in our sample as well as the rationale behind the sample screening procedures. Toward the end of this section we present a statistical profile of the firms that make it to the final sample

V. A. 1. Sample Strategy and Screening Procedures:

This study covers product recall announcements that receive sufficient publicity in the trade press. As mentioned earlier in section III, recalls can range from being very minor (having no significant economic impact on the firm) to extremely consequential (resulting in severe economic damage to the firm). Previous recall studies show that severe type recalls which get coverage in the financial press are associated with significantly negative economic effects. Our hypotheses of earnings management apply to these types of recalls, which constitute major economic events for the firm.

Since our sample consists of recalls reported by the media (specifically the *Wall Street Journal*), it is pertinent to evaluate the attributes of such recall announcements. Rupp (2001) analyzes the characteristics of newsworthy recalls using the *Wall Street Journal* coverage as a proxy for such recalls. He analyzed safety-related recalls by automobile manufacturers over the 1973- 1998 period. Using a standard probit model, the author finds that recalls involving a larger number of vehicles and recalls categorized as high hazard by the NHTSA have a significantly high probability of being reported by the media. As expected, *placard recalls* (defined in footnote 7) are much less likely to receive media attention. Remember that our hypothesis relates earnings management to economically important safety-related recalls. Since the *Wall Street Journal's* coverage is capturing these constructs well, our focus on the *Wall Street Journal* reported recalls is justified.

This study covers recall announcements reported by the *Wall Street Journal* from January 1990 through December 2003. We exclude vehicle recalls monitored by

the NHTSA from our sample for the following reasons. First, the automotive industry has the highest frequency of recalls during the sample period. The inclusion of automobile recalls would cause our sample to heavily tilt toward the auto industry which, in turn, would cause the results to be less generalizable across the recalls in different industries. Second, the vast majority of these recalls are announced by the three major domestic automakers. It can be argued that if recall announcements for a particular industry or firm are quite regular and frequent, investors incorporate the expectations of a recall in their valuation models, causing the recall to lose its economic significance. Since our earnings management hypotheses apply to recalls that are both economically significant and relatively unexpected, automotive recalls can potentially confound the effects on discretionary accruals. Third, automotive recalls are highly concentrated in time. It is typical for General Motors or Ford to have more than two to three major recalls in a single year. Since our research examines the behavior of discretionary accruals in four quarters before and after the announcement date, recalls which are concentrated in time must be removed to avoid time interval overlap problems.

Table 1 reports the year-wise details of the remaining sample screening procedures. Our initial sample consists of 282 non-automotive recalls reported by the *Wall Street Journal* during the 14 year period starting from January 1, 1990 and ending on December 31, 2003. Out of these 282 recalls, 36 recalls are eliminated because of involvement of more than one firm in the recall process. These joint recalls include those by retailing firms which generally share the losses related to product recalls with

Table 1: Sample Selection Procedures

Sample Selection:	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Total	%:
Non-Auto Recalls Reported by WSJ	17	18	11	13	24	11	16	21	27	37	37	23	12	15	282	100
-Recalls by Retailers																
Other Joint Recalls	(2)	(2)	-	(2)	(4)	-	(1)	(2)	(5)	(6)	(10)	(2)	-	-	(36)	(13)
	15	16	11	11	20	11	15	19	22	31	27	21	12	15	246	87
-Recalls by Foreign or Private Firms	(4)	(4)	-	(3)	(6)	(4)	(6)	(5)	(9)	(12)	(7)	(4)	(4)	(7)	(75)	(27)
	11	12	11	8	14	7	9	14	13	19	20	17	8	8	171	61
-2 or More Recalls Within a Year	(6)	(2)	-	(2)	(6)	(1)	(3)	(5)	(8)	(7)	(11)	(7)	(1)	(3)	(62)	(22)
	5	10	11	6	8	6	6	9	5	12	9	10	7	5	109	39
-Recalls of Software, Videos, Books, and Promotional Stuff	(1)	(1)	(4)	(1)	(1)	(1)	-	(2)	(1)	(2)	-	(2)	-	(3)	(19)	(7)
	4	9	7	5	7	5	6	7	4	10	9	8	7	2	90	32
-Missing CA Data	(2)	(1)	(3)	(1)	(1)	-	-	(2)	-	-	-	-	-	-	(10)	(4)
Final Sample for CA Model	2	8	4	4	6	5	6	5	4	10	9	8	7	2	80	28
-Missing LTA Data:	-	(1)	-	-	(2)	-	(2)	(3)	(1)	-	(4)	(3)	(1)	-	(17)	(6)
Final Sample for LTA Model	2	7	4	4	4	5	4	2	3	10	5	5	6	2	63	22

Notes: The initial sample consists of non-auto recalls reported by the *WSJ*. Joint recalls, those by retailers, private and foreign firms are excluded from the initial set. Further, more than one recall within a span of a year are also dropped. Next, recalls of unusual items like software, videos logos, and promotion stuff are excluded. Finally, those firms for which the necessary data for the current accruals model or long-term accruals model were not available on the quarterly Compustat files were dropped.

manufacturers of the recalled products. Second, joint recalls also include recalls that affect two or more firms within the same industry. Such recalls generally apply to an entire product category rather than a particular brand manufactured by one firm. Since the effects of such recalls may be spread over several firms, the reporting behavior of firms involved is likely to be different from that of a firm shouldering the burden of a full blown recall all by itself.

Another 75 recalls by private and foreign firms are also excluded from the sample. Included in this category of elimination are recalls by firms whose stocks trade as Pink sheet stocks and ADRs. The financial reporting process of such firms is not subject to compliance with U.S. GAAP or SEC regulations. Since the reporting requirements for these firms are different, their earnings management behavior may be quite distinct from domestic, listed firms.

Also excluded from the sample are instances where one firm is engaged in two or more recalls within a year. In such cases, it is difficult to attribute earnings management to a single recall announcement due to time interval overlap problems. This step screens out another 62 recall announcements from the sample.

Another category of exclusion consists of recalls of unusual items like audios, videos, software, recipe books, logos, and promotional material. Recall of such items differs from the recall of more traditional products in a number of ways. Not only is the nature of costs associated with such recalls quite unique, but the rate of consumer response to recall announcement of such products is also fairly low. Inclusion of such

recalls in the final sample is likely to blur the profile of a typical safety-related recall which is the object of investigation in this study.

Finally, we exclude the recalls for which the necessary data to compute our measures of earnings management is not available from the Compustat quarterly files. Each of the two measures of earnings management used in this study (*i.e.*, current discretionary accruals and long-term discretionary accruals) has unique data requirements. Therefore, the final sample size differs for the two measures. For the discretionary current accruals computations, another 10 recalls are omitted from the final sample for lack of essential quarterly data. For the discretionary long-term accruals, 17 more recalls are dropped because of data requirements (chiefly the missing quarterly depreciation expense). However, two exceptions were made here in order to prevent the loss of valuable observations from the analysis. First, there were several firms for which the gross plant, property and equipment figures were reported only at annual or semi-annual frequency. For such instances, the quarterly figures were estimated by way of simple linear interpolation. Similarly, for the recalling firms for which the quarterly receivable balances were not available (primarily because they are combined with other figures), we assumed that there was no change in receivables. Altogether, there were no more than 18 observations for which these items had to be inferred. This strategy facilitated salvaging vital data points without risking contamination of data with unwarranted conjectures. Thus, our final sample size for the discretionary current accruals model is 80 and that for the long-term accruals model is 63.

V. A. 2. Sample Distribution and Characteristics:

Tables 2 and 3 summarize the key features and characteristics of the final sample. Panel A in Table 2 presents the industry-wise distribution of the recalling firms in our sample. The distribution here closely follows the incidence of recalls across various industries (except for the noticeable omissions of the automotive and retail industries which are not covered by this study). As one would expect, industries where product-related safety issues are most pronounced are the ones that are highly vulnerable to product recalls and therefore constitute the majority of the sample. Specifically, four major industry groups, that is, Food (SIC 20), Chemical and Allied (SIC 28), Industrial Equipment (SIC 35), and Scientific Instruments (SIC 38) collectively account for 58 out of 80 recalls covered in this study (almost three-fourths of the entire sample). Pharmaceutical Preparations (SIC 2834) is the single most represented industry in the sample (contributing over 16% of the observations of the sample). Overall there are 38 different (four-digit) SIC industries covered by the sample.

Table 2, Panel B summarizes the year-wise distribution of the final sample. Although the study spans fourteen years (from 1990 to 2003), the four year period from 1999 to 2003 accounts for over 42% of the recalls. Higher frequencies of recalls reported by the media during this period could be attributable to a greater public interest in recalls or tougher enforcement of safety standards ensuing some of the biggest and most infamous recalls in corporate history (e.g., Coca-Cola's recall in 1999 across Europe and Ford/Firestone recall in 2000). The remaining recalls are distributed

Table 2. Sample Distribution and Characteristics

Panel A: Sample Distribution by Industry

SIC Code	Industry:	Frequency:	%:
20	Food Products	16	20.0
22	Textile Mills Products	1	1.3
23	Apparel and Other fabric based Products	1	1.3
26	Paper and Allied Products	2	2.5
28	Chemicals and Allied Products	15	18.8
30	Rubber and Miscellaneous Plastic Products	3	3.8
34	Fabricated Metal Products	2	2.5
35	Industry Machinery and Equipment	14	17.5
36	Electronic and Other Electric Equipment	5	6.3
37	Transportation Equipment	1	1.3
38	Instruments and related Products	13	16.3
39	Miscellaneous Manufacturing Industries	3	3.8
73	Business Services	2	2.5
80	Health Services	2	2.5

Panel B: Sample Distribution by Year

Year:	Frequency:	%:	Cumulative Freq.:	Cumulative %
1990	2	2.5	2	2.5
1991	8	10.0	10	12.5
1992	4	5.0	14	17.5
1993	4	5.0	18	22.5
1994	6	7.5	24	30.0
1995	5	6.3	29	36.3
1996	6	7.5	35	43.8
1997	5	6.3	40	50.0
1998	4	5.0	44	55.0
1999	10	12.5	54	67.5
2000	9	11.3	63	78.8
2001	8	10.0	71	88.8
2002	7	8.8	78	97.5
2003	2	2.5	80	100.0

relatively evenly over remaining years in the sample.

Table 3 presents the descriptive statistics for key size and performance variables of the sample firms. Mean and median book values of total assets for the sample firms are \$8,477 million and \$5,198 million, respectively. Mean and median market values of equities are \$14,677 million and \$4,688 million, respectively. These figures show that firms in our recall sample are relatively large. Past studies on product recalls have found similar size statistics indicating one of the following possibilities: (1) larger firms tend to have a higher frequency of recalls and (2) the *WSJ*, or more generally, the financial press, tends to have greater coverage of recalls by large public firms that are likely to generate greater public interest. These figures along with the statistics of variability reveal that sample firms vary considerably in asset size and market value of equity³⁵.

Performance statistics reported in Table 3 are for the quarter preceding the quarter of recall. Mean and median quarterly earnings are \$137 and \$56 million, respectively. Sales growth, which is defined as change in sales in Q (-1) scaled by total assets at the end of Q (-2), is positive and averages 1.2%. These numbers show that the firms in the sample are, on average, profitable.

³⁵ One observation viz. Cisco Systems strongly influences the mean and variability statistics. Around the time of recall (start of quarter I, 2000), Cisco had market capitalization of a whopping \$ 366 billion, at least 8 standard deviations above the sample mean. At that time the Cisco stock (which is hovering around \$ 20 at present) was trading at an amazing \$ 130.

Table 3: Size and Performance Characteristics for Recall Sample

Variables:	Mean:	Std. Dev.:	Minimum:	1st Quartile:	Median:	3rd Quartile:	Maximum:
Total Assets	8,477.0	13,959.7	14.3	938.5	5,198.0	11,075.2	85,713.0
Market Value of Equity	14,676.8	42,268.2	7.7	777.6	4,687.6	14,962.2	366,498.3
Book Value of Equity	3,172.6	4,809.4	-153.8	207.3	1,461.9	4,148.1	27,219.0
Sales	2,226.9	3,052.9	0.8	216.0	1,320.9	3,147.4	19,896.0
Sales Growth	1.2%	6.8%	-20.0%	-1.3%	0.7%	3.1%	28.7%
Earnings	137.2	267.7	-740.0	1.3	56.2	263.2	1,231.0
Return on Assets	1.1%	4.4%	-26.8%	0.4%	1.7%	3.1%	6.7%
Return on Equity	1.2%	42.2%	-338.0%	0.9%	4.3%	7.1%	106.0%

Size and performance statistics are measured in millions of dollars. Sales, earnings and returns are quarterly variables measured for Q (-1), that is, last reporting quarter before the recall announcement. Likewise, book value of assets and equity as well as market value of equity are as of the end of Q (-1). Sales growth is the change in revenue in Q (-1) scaled by book value of total assets at the end of Q (-2).

V. B. OPERATING PERFORMANCE OF RECALLING FIRMS

Once we have analyzed the distribution of our sample, we take a closer look at the behavior of earnings around product recalls in order to develop an appreciation of how recalls affect the net income performance of firms. Specifically, we look at the time-series profile of quarterly net income scaled by prior total assets in quarter -4 through quarter +4 around the recall. Results of this initial analysis are reported in Table 4.

Three different measures of net income performance are analyzed. The first measure is simply the quarterly net income deflated by the book value of total assets at the beginning of the quarter. The second measure shows the change in asset-scaled net income from the previous quarter. The third one measures abnormal income using a seasonal random walk model. Abnormal income is defined as the deviation of a quarter's scaled income from that of the corresponding quarter in the previous year. Table 4 reports the mean and median for the three measures mentioned above. The statistical significance is based on the two-tailed Wilcoxon signed rank test for the median and a parametric two-tailed t-test for the mean.

Overall, recalling firms have positive net income in and around the quarter of recall. However, the statistical significance of mean scaled income of recalling firms starts dropping in the quarter of recall and continues to drop in the subsequent quarters. On the other hand, median scaled net income remains positive and significant throughout the period of analysis. This trend in the scaled net income indicates that recalls have a sharp negative effect on the income of at least some firms in the sample. Next, we analyze the change in scaled net income from the previous quarter. As shown

Table 4. Net Income Performance of Firms around Product Recalls

Quarter	-4	-3	-2	-1	0	1	2	3	4
<i>Net Income Around Recalls:</i>									
Median	1.93**	1.58**	1.76**	1.78**	1.82**	1.80**	1.89**	1.69**	1.42**
Mean	1.16*	1.61**	0.89**	1.24**	1.04*	0.89	0.95	0.78	0.41
Sample Size	80	80	79	79	80	80	80	80	80
<i>Recalling Firms' Change in Net Income from Previous Quarter:</i>									
Median	-	-0.35	-0.31	0.59	0.21	-0.26	-0.51	0.16	0.10
Mean	-	-0.71	-0.85	0.51	0.77	3.11	-4.12	0.97	-0.20
Sample Size	-	80	79	79	79	80	80	80	80
<i>Recalling Firms' Abnormal Net Income:</i>									
Median	0.02	-0.07	-0.12*	-0.13	-0.18*	-0.01	-0.01	0.02	-0.03
Mean	-1.17*	0.08	-0.35	-0.75*	-0.12	-0.72	0.06	-0.46	-0.63
Sample Size	72	78	78	79	80	80	79	79	80

Net income is quarterly net income after extraordinary items and discontinued operations.

Abnormal net income is computed using seasonal random-walk model. It is the difference between current quarter's net income and net income of last year's corresponding quarter.

** and * denote significance at the 5% and 10% levels, respectively. Statistical significance is based on the Wilcoxon signed rank test for the median, and a parametric t-test for the mean. All measures of net income are scaled by the beginning of the quarter book value of total assets, and are reported as percentage.

in Table 4, none of the quarters shows significant change in net income from the previous quarter. This pattern is apparently consistent with the smoothing hypothesis.

Finally, we look at the abnormal income of recalling firms based on the seasonal random walk model. When earnings of the previous year's corresponding quarter is taken as a benchmark, recalling firms seem to under-perform in the quarters around a recall. Abnormal income is significantly negative in the quarter of the event and several of the quarters around the event. After adjusting for seasonality, the negative effect of recalls on earnings becomes more discernable. This pattern is in apparent contradiction to the smoothing hypothesis.

V. C. TEST FOR THE EARNINGS MANAGEMENT HYPOTHESIS

After initial inspection of net income profiles, we turn our attention to estimating current abnormal accruals, the main proxy for earnings management used in this study. Table 5 reports summary statistics for cross-sectional OLS regressions based on the current accruals version of the Jones (1991) model. Means and standard deviations (in parenthesis) of parameter estimates, their t-statistics, the number of firms in each regression, and the regular and adjusted R^2 are reported for each quarter covered by the analysis.

The average coefficient for the change in revenue is positive for all quarters except quarter (-2). The t-statistics for the slope coefficients are significant (at the 5% level) and positive for at least 50% of the cases in each quarter. This shows that generally the effect of changes in current assets (such as receivables) dominates that of

Table 5. Summary Statistics for the Expected Current Accruals Model

Descriptive statistics are presented for the Expected Current Accruals Model. It is based on the Jones (1991) model, as adapted by Teoh *et al.* (1998 a and b):

$$\frac{CACC_{j,t}}{TA_{j,t-1}} = \alpha \left(\frac{1}{TA_{j,t-1}} \right) + \beta_1 \left(\frac{\Delta REV_{j,t}}{TA_{j,t-1}} \right) + \varepsilon_{j,t}$$

- $CACC_{j,t}$ = firm j's change in working capital excluding cash and short term debt from quarter t-1 to quarter t,
 $TA_{j,t-1}$ = firm j's total assets at the beginning of quarter t,
 $\Delta REV_{j,t}$ = firm j's change in revenues between quarter t-1 and quarter t,
 $\varepsilon_{j,t}$ = Error term for firm j in quarter t.

Quarter	-4	-3	-2	-1	0	1	2	3	4
α	-0.031 (0.366)	0.040 (0.298)	-0.041 (0.169)	0.016 (0.159)	-0.007 (0.101)	0.005 (0.155)	-0.013 (0.139)	0.017 (0.157)	0.040 (0.221)
t-statistic	-1.823 (14.538)	2.651 (42.967)	-6.484 (30.049)	-2.043 (13.731)	1.689 (22.580)	0.426 (18.789)	-2.323 (13.591)	-0.432 (28.411)	-2.106 (29.578)
β_1	0.178 (0.400)	0.288 (0.787)	-0.178 (1.792)	0.193 (0.477)	0.231 (0.837)	0.257 (0.476)	0.221 (0.842)	0.105 (0.588)	0.217 (1.094)
t-statistic	2.122 (4.596)	4.076 (17.737)	1.225 (13.860)	4.348 (17.376)	3.608 (14.943)	4.890 (17.265)	3.440 (10.746)	1.791 (9.904)	3.613 (14.513)
N	324.78 (178.33)	328.59 (180.03)	331.10 (181.68)	332.21 (182.26)	335.34 (184.13)	334.18 (185.42)	335.71 (186.60)	337.20 (187.53)	336.79 (188.50)
R^2	0.214 (0.240)	0.279 (0.298)	0.285 (0.314)	0.228 (0.274)	0.255 (0.276)	0.300 (0.299)	0.297 (0.294)	0.312 (0.313)	0.347 (0.306)
Adj. R^2	0.206 (0.242)	0.271 (0.302)	0.278 (0.318)	0.220 (0.277)	0.248 (0.279)	0.294 (0.301)	0.290 (0.296)	0.305 (0.316)	0.340 (0.309)

Means and standard deviations (in parenthesis) are reported for model coefficients and goodness of fit statistics for each quarter covered by the analysis.

changes in current liabilities (such as payables) which is in line with expectations. The average number of firms in each cross-sectional regression is well above 300. The minimum number of observations in any regression is 25. The average adjusted R^2 ranges between 0.21 and 0.34.

Now we turn to the estimation of the discretionary current accruals of the model - the proxy for earnings management in this study. Discretionary current accruals for recalling firms are calculated as the difference between the actual current accruals and expected or predicted accruals from the current accruals expectation model. Under the modified Jones (1991) model used in this study, change in revenues is taken net of change in receivables when estimating the predicted accruals.

Under the null hypothesis of no earnings management, the mean and median discretionary current accruals are expected to be statistically insignificant. Further, the signs of discretionary current accruals are expected to be evenly distributed between positives and negatives. Positive and significant mean or median discretionary current accruals would be indicative of upward or income-increasing earnings management. Negative and significant discretionary current accruals are suggestive of downward or income-decreasing earnings management.

Table 6 reports descriptive statistics for the discretionary current accruals and the results from the test of the hypothesis on earnings management for eighty recalling firms in the sample. Both parametric and non-parametric tests are employed to test the statistical significance of discretionary current accruals. Table 6 reports the p-values for

Table 6: Discretionary Current Accruals around Recalls Based on the Current Accruals Version of the Modified Jones (1991) Model

Quarter:	-4	-3	-2	-1	0	1	2	3	4
Statistics:									
Mean:	-0.99	1.39	0.27	1.08	-1.93	1.28	0.76	0.50	-1.27
Parametric t-test (p-value):	(0.177)	(0.024)	(0.651)	(0.103)	(0.017)	(0.038)	(0.132)	(0.378)	(0.076)
Median:	-0.22	0.33	0.44	0.70	-1.32	0.67	0.56	0.80	-0.73
Sign Rank Test (p-value):	(0.571)	(0.096)	(0.608)	(0.100)	(0.006)	(0.142)	(0.207)	(0.082)	(0.046)
Positive/Negative:	37/43	43/37	42/38	43/37	30/50	46/34	46/34	47/33	34/46
Binomial Sign Test (p-value):	(0.576)	(0.576)	(0.738)	(0.576)	(0.033)	(0.219)	(0.219)	(0.146)	(0.219)

Discretionary current accruals for firms announcing product recalls are calculated as prediction errors from current accruals. The expectation model is based on the cross-sectional modified Jones (1991) model, as adapted by Teoh *et al.* (1998 a and b).

$$\frac{CACC_{j,t}}{TA_{j,t-1}} = \alpha \left(\frac{1}{TA_{j,t-1}} \right) + \beta_1 \left(\frac{\Delta REV_{j,t}}{TA_{j,t-1}} \right) + \varepsilon_{j,t}$$

- $CACC_{j,t}$ = firm j's change in working capital excluding cash and short term debt from quarter t-1 to quarter t,
 $TA_{j,t-1}$ = firm j's total assets at the beginning of quarter t,
 $\Delta REV_{j,t}$ = firm j's change in revenues between quarter t-1 and quarter t,
 $\varepsilon_{j,t}$ = error term.

Discretionary current accruals are reported as percentage of the book value of total assets at the beginning of the quarter. All p-values reported here are for a two tailed test. Values significant at the 10% level are reported in bold face.

the parametric t-test, Wilcoxon signed rank test and the binomial sign test along with mean, median and frequencies for positive and negative discretionary current accruals.

Overall, the results reported in Table 6 exhibit evidence of income-decreasing earnings management in the quarter of recalls. Only for the quarter of recall, that is, quarter 0, discretionary current accruals are significantly different from zero (at the 5% level) as indicated by the p-values for all three statistical tests. In the quarter of recall, 50 out of 80 firms have negative discretionary current accruals, which results in a p-value of 0.033 for the sign test. The mean for discretionary current accruals in the quarter of recall is -1.93, which has a p-value of 0.017 for the parametric t-test. The median discretionary accrual for quarter 0 is -1.32, which is significant at the 1% level under the Wilcoxon signed rank test. Evidence presented in Table 6 shows that managers resort to income-decreasing earnings management in the quarter of bad news. This finding is in line with the big bath hypothesis and in conflict with the smoothing hypothesis. Firms, rather than attempting to smooth income by managing accruals upward, tend to manage them downward under the cover of bad news. According to Kirschenheiter and Melumad (2002), firms tend to take a 'big bath' and under-report earnings when faced with sufficiently bad news. Under this argument, severe recalls seem to constitute sufficiently bad news for most firms.

Other than the quarter of recall, the mean discretionary current accruals are significant in quarters -3 and +1. In these quarters, the sign of discretionary current accruals is positive, which is indicative of upward earnings management. However, non-parametric test statistics turn out to be insignificant for these quarters. This

tendency could be a result of aggressive upward earnings management around recalls on the part of a few firms in order to improve the overall performance for the fiscal year in which the recall took place. For quarter +1, a significant and positive mean can also be interpreted as reversal of income-decreasing discretionary current accrual found in the recall quarter.

There is another noticeable pattern that emerges in table 6. Mean and median discretionary current accruals have positive signs in the three quarters preceding the quarter of recall and the three quarters following the quarter of recall. This pattern is suggestive of upward earnings management in the quarters around quarter of recall announcement. But since the discretionary current accruals generally turn out to be statistically insignificant in these quarters (with the exceptions mentioned above), they cannot be taken as a firm evidence of upward earnings management.

Next, we estimate long-term discretionary accruals. In order to do that, we run cross-sectional regressions based on the full version of the modified Jones (1991) model, as outlined in section IV. C. 6. Table 7 reports summary statistics for these regressions.

The average slope coefficients for the change in revenue have the expected sign and are significant in most cases. The expected sign for gross plant, property and equipment is negative, which is consistent with increases in the level of fixed assets being associated with higher depreciation expense – an income-decreasing accrual. The average number of firms in each full model regression is considerably less than that in the current accruals model. This outcome is mainly because of the higher frequency of

Table 7. Summary Statistics for the Expected Total Accruals Model

The total Accruals Model from which long term expected accruals are obtained is based on the Jones (1991) model:

$$\frac{TACC_{j,t}}{TA_{j,t-1}} = a \left(\frac{1}{TA_{j,t-1}} \right) + b_1 \left(\frac{\Delta REV_{j,t}}{TA_{j,t-1}} \right) + b_2 \left(\frac{PPE_{j,t}}{TA_{j,t-1}} \right) + \varepsilon_{j,t}$$

- $TACC_{j,t}$ = firm j's change in working capital excluding cash and short term debt from quarter t-1 to quarter t minus depreciation for quarter t,
 $TA_{j,t-1}$ = firm j's total assets at the beginning of quarter t,
 $\Delta REV_{j,t}$ = firm j's change in revenues between quarter t-1 and quarter t,
 $PPE_{j,t}$ = firm j's gross value of property, plant and equipment in quarter t,
 $\varepsilon_{j,t}$ = Error term for firm j in quarter t.

Quarter	-4	-3	-2	-1	0	1	2	3	4
a	-0.004 (0.531)	0.082 (0.547)	-0.046 (0.157)	0.030 (0.205)	-0.002 (0.130)	-0.026 (0.286)	-0.005 (0.155)	0.015 (0.224)	0.040 (0.240)
t-statistic	-1.584 (13.713)	-0.470 (28.077)	-6.839 (16.183)	3.861 (43.297)	9.423 (58.224)	10.648 (59.722)	-2.168 (17.575)	-2.249 (30.923)	0.935 (47.898)
b_1	0.212 (0.434)	0.307 (0.886)	0.092 (0.788)	0.277 (0.842)	0.031 (1.109)	0.131 (1.099)	0.141 (0.723)	0.219 (0.722)	0.074 (1.537)
t-statistic	2.318 (5.411)	3.852 (17.079)	2.428 (7.929)	3.761 (16.964)	1.570 (5.583)	4.445 (16.706)	2.844 (6.634)	1.976 (7.036)	2.266 (16.591)
b_2	-0.030 (0.123)	-0.024 (0.125)	-0.049 (0.168)	-0.103 (0.623)	0.007 (0.138)	-0.047 (0.169)	-0.031 (0.141)	-0.077 (0.451)	-0.015 (0.161)
t-statistic	-0.944 (4.003)	-1.682 (2.633)	-2.049 (12.710)	-2.067 (7.443)	-1.757 (8.256)	-1.899 (3.635)	-0.919 (5.461)	-1.446 (5.213)	-4.417 (18.097)
N	210.35 (124.39)	213.59 (127.59)	211.45 (129.31)	203.89 (122.68)	208.45 (125.64)	214.23 (130.48)	212.81 (135.07)	207.44 (129.17)	206.53 (130.01)
R^2	0.285 (0.275)	0.325 (0.287)	0.331 (0.328)	0.277 (0.298)	0.301 (0.289)	0.343 (0.313)	0.353 (0.288)	0.369 (0.319)	0.414 (0.347)
Adj. R^2	0.268 (0.280)	0.309 (0.294)	0.316 (0.335)	0.259 (0.307)	0.285 (0.295)	0.328 (0.318)	0.335 (0.295)	0.352 (0.326)	0.399 (0.354)

Means and standard deviations (in parenthesis) are reported for model coefficients and goodness of fit statistics for each quarter covered by the analysis.

missing depreciation and gross plant, property and equipment figures at the quarterly level in the Compustat database.

Table 8 reports the results from the test of significance of the long-term discretionary accruals. None of the reported p-values are significant at the 5% level. Only the mean discretionary long-term accruals are significant at the 10% level for quarter 0, and the variable has a negative sign. This result is only a weak indication that some firms might be managing long-term discretionary accruals downward in the recall quarter. Overall, there seems to be little or no evidence of earnings management from the results reported in Table 8. This finding is consistent with the arguments made by Guenther (1994), Jones (1999), and several other researchers who contend that current accruals capture the discretionary behavior better than long-term accruals.

In general, evidence presented in this section favors the big bath hypothesis over the smoothing hypothesis. However, before drawing firm conclusions from our findings in this section, we look at some potential shortcomings of the Jones (1991) model, especially in the context of events like product recalls, that can cast doubt on our findings.

V. D. A LIMITATION OF EXPECTED ACCRUALS MODEL IN DETECTING EARNINGS MANAGEMENT AROUND PRODUCT RECALLS

Unlike most other events investigated in the context of earnings management (like management buyouts, equity issue, and mergers), product recalls have a direct

Table 8: Discretionary Long-term Accruals around Recalls Based on the Modified Jones (1991) Model

Quarter:	-4	-3	-2	-1	0	1	2	3	4
Statistics:									
Mean:	0.32	0.44	2.05	8.04	-3.37	1.80	0.72	3.71	0.96
Parametric t-test (p-value):	(0.795)	(0.767)	(0.142)	(0.246)	(0.099)	(0.205)	(0.566)	(0.244)	(0.664)
Median:	0.27	-0.73	0.90	-0.68	-1.17	-0.56	0.47	0.88	0.27
Sign Rank Test (p-value):	(0.538)	(0.887)	(0.308)	(0.823)	(0.231)	(0.725)	(0.607)	(0.631)	(0.515)
Positive/Negative:	32/31	28/35	33/30	30/33	27/36	30/33	34/29	35/28	33/30
Binomial Sign Test (p-value):	(1.000)	(0.450)	(0.801)	(0.801)	(0.314)	(0.801)	(0.615)	(0.450)	(0.801)

Discretionary long term accruals are obtained by subtracting discretionary current accruals from discretionary total accruals. Discretionary total accruals are computed as prediction errors from modified Jones (1991) model:

$$\frac{TACC_{j,t}}{TA_{j,t-1}} = a \left(\frac{1}{TA_{j,t-1}} \right) + b_1 \left(\frac{\Delta REV_{j,t}}{TA_{j,t-1}} \right) + b_2 \left(\frac{PPE_{j,t}}{TA_{j,t-1}} \right) + \varepsilon_{j,t}$$

- $TACC_{j,t}$ = firm j's change in working capital excluding cash and short term debt from quarter t-1 to quarter t minus depreciation for quarter t,
 $TA_{j,t-1}$ = firm j's total assets at the beginning of quarter t,
 $\Delta REV_{j,t}$ = firm j's change in revenues between quarter t-1 and quarter t.
 $PPE_{j,t}$ = firm j's gross value of property, plant and equipment in quarter t,
 $\varepsilon_{j,t}$ = Error term for firm j in quarter t.

Discretionary long-term accruals are reported as percentages of book value of total assets at the beginning of the quarter. All p-values reported are for a two tailed test. Values significant at the 10% level are reported in bold face.

impact on the accruals of event firms. Recalls almost always involve a change in certain accruals. More specifically, recalls have a direct effect on certain working capital accounts, even when there is neither any change in other economic conditions (as captured by a change in sales) nor any attempt by managers to manipulate earnings.

For instance, it is typical for recalling firms to write-off defective inventory, to write-off receivables against the recalled product or to record a current liability for the expected refunds. All of these accruals (or changes in non-cash working capital accounts) associated with recalls are, by their very nature, income-decreasing. Insofar as the expectations model used to detect earnings management fails to control for the effect on accruals arising exclusively because of the recall itself, it would systematically overestimate expected accruals. Hence, such a model would be biased toward rejecting the null hypothesis in favor of income-decreasing earnings management.

Another way of looking at this problem is to appreciate the difference between ‘abnormal’ accruals and ‘discretionary’ accruals. There are changes in non-cash working capital accounts (i.e., current accruals) that are inextricably tied to recalls that would be considered ‘abnormal’ for any non-recalling firm. But since they arise in the natural course of a recall event, without any ‘purposeful intervention’ from the management, they cannot be regarded as ‘discretionary accruals’ or taken as evidence of earnings management. If the model used to detect earnings management does not adequately account for ‘abnormal’ (but non-discretionary) accruals intrinsically associated with recalls, it would misinterpret all ‘abnormal’ accruals as ‘discretionary’ and would tend to detect downward earnings management even when none exists.

The Jones (1991) model suffers from this weakness, at least in the context of an event like product recalls. Regressors in the model fail to control for ‘abnormal’ accruals associated with recall that may not necessarily be ‘discretionary’. These abnormal accruals that are unexplained by variation in right-hand side variables in the modified Jones (1991) model are invariably negative or income-decreasing in case of product recalls. The predicted or non-discretionary accruals from the modified Jones (1991) model are overstated for the recalling firms to the extent that the model fails to adjust the predicted accruals downward for anomaly in accruals attributable to product recall. These overstated non-discretionary or predicted accruals, when subtracted from the actual accruals of recalling firms, result in understated discretionary accruals or prediction errors. This weakness in the expectations model would bias the test of earnings management in favor of detecting income-decreasing earnings management, at least in the quarter of recall. Therefore, there is a possibility that the significantly negative accruals that we detected in the quarter of recall are attributable to the model misspecification error discussed above.

Dechow, Sloan and Sweeney (1995) also indicate this potential weakness of the Jones (1991) model. They show that most aggregate accruals models (including the Jones model) are likely to suffer from misspecification when applied to firms with extreme financial performance. Kothari, Leone and Wasley (2005) assert that existing aggregate accrual models reject the null hypothesis of no earnings management at rates exceeding acceptable levels in cases where the event related to the incentive is correlated with performance. Since our partitioning variable (i.e., product recall

announcements) is likely to be related to performance, the misspecification problem may be a source of concern in our case too. With these revelations, the results shown in preceding section come under a shade of doubt.

V. E. PROPOSED MODIFICATION TO THE EXPECTATIONS MODEL AND ITS RATIONALE

In order to mitigate misspecification concerns and to check the robustness of our results, we propose a modification in the model which would make the model well-specified by controlling for the accruals inherently linked to recalls. We propose adding the cost of goods sold as an additional regressor in the current accruals model. The reason behind this proposition is rooted in the typical accounting treatment awarded to costs associated with recall. Recalling firms charge the expenses or losses associated with the recall to the cost of manufacturing the product. Therefore, the write-offs and liabilities booked as a result of recall are all reflected in the cost of goods sold rather than sales³⁶. Thus, the abnormal but non-discretionary accruals (on the left hand side of the expectations model) associated with recalls would be accounted for by a change in cost of goods sold (on the right hand side of the model). The remaining unexplained accruals or prediction errors are thus likely to capture the discretionary accruals more accurately.

³⁶ Under U.S. GAAP, firms are required to recognize both an expense and a liability for a contingent liability that is probable and estimable. For most firms and industries this condition applies in case of product recalls. Therefore, many firms make an explicit provision for the recalls. To the extent the recalls follow the estimates set against them, they would not have any material impact on either expenses or liabilities. However, the type of recalls that we analyze in our study may not be covered by these provisions as indicated in the financial statements of recall quarters that typically allude to a charge taken to account for the recall.

Generally, variation in the cost of goods sold mimics the change in sales and is, therefore, justifiably considered superfluous as an additional explanatory variable in earnings management models. But in the cases of recalling firms, movements in the cost of goods sold account offer additional information about recalls-specific accruals that is not captured by change in sales. Therefore, adding the cost of goods sold not only provides better control for abnormal accruals associated with recalls, it also improves the explanatory power of the model considerably.

V. F. NEW MODEL RESULTS

Table 9 reports the summary statistics for our proposed model. The fact that the absolute value of average t-statistic for the newly added variable (i.e., cost of sales) is quite high in the quarter of recall as well as in immediately adjacent quarters vouches for the contribution of the cost of sales as an additional explanatory variable. The average coefficients for change in revenues and change in cost of sales have the expected signs.

Descriptive statistics for discretionary current accruals under the new model are reported in Table 10 along with the p-values of the tests for significance. As somewhat expected, the significance of negative discretionary current accruals in the recall quarter fell down.

Under the original modified Jones (1991) model, the recall quarter discretionary accruals were significant at the 5% level under all three tests conducted. However, under the new model, none of the test statistics are significant at the 5% level. On the basis of the parametric t-test and non-parametric Wilcoxon signed rank test, the

Table 9. Summary Statistics for the Expected Current Accruals Model with Asset-scaled Cost of Goods Sold as an Additional Regressor

The change in cost of goods sold is added as an additional regressor to the expected current accruals model based on the modified Jones (1991) model:

$$\frac{CACC_{j,t}}{TA_{j,t-1}} = a \left(\frac{1}{TA_{j,t-1}} \right) + b_1 \left(\frac{\Delta REV_{j,t}}{TA_{j,t-1}} \right) + b_2 \left(\frac{\Delta CGS_{j,t}}{TA_{j,t-1}} \right) + \varepsilon_{j,t}$$

- $CACC_{j,t}$ = firm j's change in working capital excluding cash and short term debt from quarter t-1 to quarter t minus depreciation for quarter t,
 $TA_{j,t-1}$ = firm j's total assets at the beginning of quarter t,
 $\Delta REV_{j,t}$ = firm j's change in revenues between quarter t-1 and quarter t,
 $\Delta CGS_{j,t}$ = firm j's change in cost of sales between quarter t-1 and quarter t,
 $\varepsilon_{j,t}$ = Error term for firm j in quarter t.

Quarter:	-4	-3	-2	-1	0	1	2	3	4
a	-0.013 (0.209)	0.044 (0.310)	-0.034 (0.131)	0.024 (0.158)	-0.005 (0.109)	-0.004 (0.195)	-0.014 (0.122)	0.018 (0.155)	0.007 (0.144)
t-statistic	-2.234 14.927	1.026 39.127	-8.005 21.239	-0.758 12.957	1.853 22.859	-0.311 19.029	-0.972 16.770	-1.207 27.808	-5.363 37.318
b_1	0.434 (0.812)	0.407 (1.169)	0.049 (1.493)	0.307 (0.832)	0.337 (1.039)	0.324 (0.592)	0.469 (0.950)	0.152 (0.776)	0.188 (1.364)
t-statistic	3.135 (4.430)	4.816 (20.508)	2.102 (5.770)	5.185 (20.777)	2.825 (12.002)	4.747 (20.295)	3.773 (9.619)	1.039 (7.221)	1.132 (21.595)
b_2	-0.264 (0.934)	-0.271 (1.305)	-0.001 (1.023)	-0.230 (0.918)	-0.331 (1.005)	-0.224 (0.750)	-0.281 (0.994)	-0.102 (0.822)	-0.041 (1.255)
t-statistic	-1.956 (5.183)	-2.184 (5.972)	-0.999 (5.334)	-2.493 (9.367)	-1.989 (5.842)	-2.006 (6.904)	-1.166 (6.570)	-0.141 (10.954)	4.508 (27.064)
N	318.51 (175.35)	322.29 (176.70)	324.19 (177.42)	325.37 (178.14)	326.85 (180.44)	327.86 (182.35)	329.49 (183.40)	331.33 (184.48)	331.02 (185.16)
R^2	0.279 (0.253)	0.337 (0.295)	0.312 (0.305)	0.292 (0.289)	0.288 (0.259)	0.346 (0.306)	0.362 (0.308)	0.347 (0.315)	0.381 (0.317)
Adj. R^2	0.268 (0.256)	0.327 (0.298)	0.302 (0.310)	0.280 (0.293)	0.276 (0.263)	0.337 (0.309)	0.352 (0.312)	0.337 (0.319)	0.371 (0.322)

Means and standard deviations (in parenthesis) are reported for model coefficients and goodness of fit statistics for each quarter covered by the analysis

Table 10: Discretionary Current Accruals around Recalls Based on the Current Accruals Version of the Modified Jones (1991) Model with Cost of Goods Sold as an Additional Regressor

Quarter:	-4	-3	-2	-1	0	1	2	3	4
Statistics:									
Mean:	-0.97	1.02	-0.35	1.86	-1.36	1.27	0.37	0.74	-1.00
Parametric t-test (<i>p</i> -value):	(0.305)	(0.101)	(0.598)	(0.022)	(0.097)	(0.046)	(0.535)	(0.255)	(0.244)
Median:	-0.13	0.00	0.68	1.31	-0.72	1.01	0.11	0.47	-0.75
Sign Rank Test (<i>p</i> -value):	(0.922)	(0.162)	(0.874)	(0.011)	(0.055)	(0.049)	(0.627)	(0.072)	(0.133)
Positive/Negative:	37/39	38/38	42/34	47/30	33/44	48/30	41/36	48/30	33/44
Binomial Sign Test (<i>p</i> -value):	(0.909)	(1.000)	(0.422)	(0.068)	(0.254)	(0.054)	(0.649)	(0.054)	(0.254)

Change in the cost of goods sold is added as an additional regressor to the expected current accruals model based on the modified Jones (1991) model. Discretionary current accruals for firms announcing product recalls are calculated as prediction errors from the model:

$$\frac{CACC_{j,t}}{TA_{j,t-1}} = a \left(\frac{1}{TA_{j,t-1}} \right) + b_1 \left(\frac{\Delta REV_{j,t}}{TA_{j,t-1}} \right) + b_2 \left(\frac{\Delta CGS_{j,t}}{TA_{j,t-1}} \right) + \varepsilon_{j,t}$$

$CACC_{j,t}$ = firm *j*'s change in working capital excluding cash and short term debt from quarter *t*-1 to quarter *t* minus depreciation for quarter *t*,

$TA_{j,t-1}$ = firm *j*'s total assets at the beginning of quarter *t*,

$\Delta REV_{j,t}$ = firm *j*'s change in revenues between quarter *t*-1 and quarter *t*,

$\Delta CGS_{j,t}$ = firm *j*'s change in cost of sales between quarter *t*-1 and quarter *t*,

$\varepsilon_{j,t}$ = Error term.

Discretionary current accruals are reported as percentage of the book value of total assets at the beginning of the quarter. All *p*-values reported here are for a two tailed test. Values significant at the 10% level are reported in bold face.

discretionary current accruals in the quarter of recall are significantly negative at the 10% level. These results weaken our earlier findings that firms engage in income-decreasing earnings management in the quarter of recall without completely wiping it off. There are still traces of downward earnings management in the recall quarter, at least on the part of some firms. The fact that both the mean and median are negative and significant at the 10% level along with the finding that the binomial sign test statistic is not significant suggests that although the sign of discretionary accruals is relatively evenly distributed (33 positive versus 44 negative), the magnitude or rank sum of the negative discretionary accruals far outweighs that of the positive ones. Stated differently, many firms may not be resorting to income-decreasing earnings management in the quarter of recall, but the ones that are doing so are engaging in more intense downward management of accrual – a trend that is consistent with the big bath hypothesis.

There can be an alternate explanation for the erosion in the significance of negative discretionary accruals in the recall quarter under the new model. While movements in the cost of sales are expected to do a good job in explaining the changes in working capital accounts initially arising from the recall accounting, it cannot account for reversals of the changes that take place within the recall quarter. For instance, a liability is recorded for the expected refunds or repairs on account product recall in the quarter in which the recall is announced. This change in current liability (or current accrual) would be accounted for by a change in the cost of goods sold on the right hand side of the model. But when this liability reverses (*i.e.*, refunds and repairs

actually take place soon after the recall is announced), it would result in income-increasing accruals that would not be controlled for by any of the regressors even in the new model. To the extent that the product recall liability reverses in the recall quarter, it would tend to offset the negative discretionary accruals arising due to downward earnings management thereby diluting the significance of income-decreasing earnings management found in the recall quarter. The expected refund or repair liability recognized in the quarter of recall is likely to reverse mostly in the recall quarter and in quarters immediately after the recall quarter³⁷.

Now we turn our attention to another noticeable change in results under the new model as exhibited in Table 10. Interestingly, the discretionary current accruals in the quarters around recall which previously were not significant for most part became significant under the new model. In the quarters immediately preceding and following the quarter of recall (i.e., quarters -1 and +1), mean and median discretionary current accruals are positive and statistically significant. In the quarter preceding the recall, the mean (p-value for parametric t-statistic) of discretionary current accruals changes from +1.08 (0.103) under the previous model to +1.86 (0.022) under the new model. The median (signed rank test p-value) of the discretionary current accruals changes from

³⁷ Response to the recall announcement is usually high initially as the announcement appears all over in the media. But as time passes, the response rate falls rapidly. In fact, as we browsed over the financial statements of some of the recalling firms we noticed that some of them wrote-off the product recall liability after sometime citing high attrition in recall response rate. This is consistent with the Consumer Reports (August 2004) article quoted in footnote 9 that almost one-third of all vehicles subject to recall; more than half of toys, clothes, appliances, tools, and electronics gear; and three-fourths of child car seats remain on the road or in the home.

+0.70 (0.100) to 1.31 (0.011). Thus both the mean and median discretionary accruals become significant at the 5% level in quarter -1.

Similarly, in quarter +1, the median, which was previously insignificant, becomes significantly positive at the 5% level. Thus, for the quarter preceding the recall announcement as well as the quarter following it, discretionary current accruals are positive and significant. This evidence is consistent with the smoothing hypothesis discussed earlier. Managers driven by various contracting and capital market incentives tend to smooth earnings and try to meet analyst expectations. Here it appears that product recall charges taken in the announcement quarter are large enough to make it difficult for managers to smooth the earnings in that particular quarter. Therefore, in these quarters managers prefer to take a 'big bath'. This behavior is in line with the theoretical framework developed by Kirschenheiter and Melumad (2002) and empirical studies summarized in section II C. In a fiscal period where a particular bad news item makes the prospect of reaching the expectational target rather grim, managers resort to under-reporting earnings even further in order to create hidden reserves that can be used to enhance future earnings.

But in other quarters around recall, managers quickly revert to their job of downplaying the effect of bad news and attempt to mitigate the slump in their financial performance by means of income-increasing earnings management. It seems from the data that managers tend to manage earnings downward in the quarter of recall as they can attribute bad performance to the charges arising from recall and attempt to undo this

effect by managing earnings upward in quarters before and after the recall quarter so that the fiscal year earnings expectation can still be met.

However, caution must be exercised in interpreting the significant and positive discretionary accruals in quarter +1 as upward earnings management. There is another possibility that may explain significantly positive discretionary current accruals in the quarter subsequent to the recall quarter. As mentioned earlier, product recall liability set aside for refunds and repairs reverses in the quarter of recall and in the following quarters. A part of this liability is expected to reverse in quarter +1. Therefore, there is a possibility that the significantly positive discretionary accruals in quarter +1 are in part due to reversal of product recall liability.

Nevertheless, it is unlikely that the entire positive significance of discretionary accruals in quarter +1 can be explained by a reversal of accrual liability for two reasons. First, if this were the case, then one would have observed a pattern of significant positive accruals in the remaining quarters after the recall as well. But there is no such indication in quarter +2 discretionary accruals, and by quarter + 4, the discretionary accruals become negative, although they remain insignificant. Second, discretionary accruals in the quarter preceding the recall quarter are also positive and significant, which cannot be attributed to product recall liability reversal. A pattern of positive and significant current discretionary accruals in quarters before and after the recall is suggestive of earnings management by recalling firms.

Overall, the results from our new model provide support for the smoothing hypothesis or income-increasing earnings management around recalls. Specifically, we

find that in the quarters preceding and following the product recall announcement, firms have significant and positive discretionary current accruals (the type of accruals most susceptible to manipulation from management). These significantly positive discretionary current accruals are indicative of managers' attempts to 'window dress' or paint a prettier picture of firms' performances which is affected by recalls.

There is also weak evidence that recalling firms engage in income-decreasing earnings management in the quarter in which the recall is announced. This tendency is consistent with the big bath behavior. Under the big bath hypothesis, firms make the most of the bad news by overstating their losses in an attempt to clean-up their balance sheets and create hidden reserves which can be used to artificially inflate the earnings in future periods.

On the whole our findings are indicative of a managerial tendency to smooth earnings and meet earnings targets when those targets are within reachable limits and to under-report earnings and take a 'big bath' when a 'sufficiently' bad news item makes the target look unattainable or otherwise provide a scapegoat for bad performance.

CHAPTER VI

SUMMARY AND CONCLUSION

Mounting anecdotal as well as empirical evidence suggests that firms manage earnings in response to pressures from capital market participants, among other things. These pressures are even higher on the firms that face performance-related problems. Product recalls are firm-specific events of significant economic consequence. Firms recalling products are likely to miss earnings targets and suffer from negative stock price reactions. Under these circumstances, firms (under pressure from capital market participants and contracting parties) are likely to mitigate slumps in their financial performances by resorting to earnings management. Do these firms use discretionary accruals to paint better pictures of themselves around recalls? Our study attempts to answer this question. We use non-automotive recall announcements from 1990 to 2003 and models based on the cross-sectional modified Jones (1991) model to answer this question.

We find that firms have a tendency to manage earnings upward in the quarters immediately preceding and following the quarter of recall, possibly to undo the adverse effects of product recall on the earnings and stock prices. This tendency is signified in the presence of significant and positive abnormal current accruals in these quarters. We

also find evidence consistent with big bath behavior in the quarter of the recall announcement. More specifically, we found the discretionary accruals to be significant and negative in the quarter of recall. This finding is in line with the big bath theory in the accounting literature and popular in the financial press that for sufficiently bad news, firms prefer to overstate losses and understate earnings in order to enhance future earnings.

This paper contributes to the earnings management literature by identifying an economically important corporate event as a context in which managerial incentives to manipulate earnings are relatively high. Further, this paper is one of the few attempts to gauge earnings management tendencies of firms around an event of truly operating nature. Most of the past earnings management studies explore earnings management around financial events like seasoned equity offerings, mergers, and share repurchases. However, events related to a firm's operation are as likely to offer incentives to manage earnings as other events. This paper attempts to fill a gap in the earnings management literature.

Another unique contribution of this paper comes from its adaptation of an expectations model to control for event-related changes in accruals which may not be discretionary. The proposed model does a better job in isolating discretionary accruals from abnormal changes in working capital accounts inextricably tied to recall events and addresses the misspecification concern commonly raised against the Jones (1991) model.

Finally, this paper documents the extent of earnings management prevalent before, after, and in the quarter of product recall announcements. The findings have implications for firms' shareholders, regulators and other stakeholders.

REFERENCES

- Abarbanell, J., and R. Lehavy. "Can Stock Recommendations Predict Earnings Management and Analysts' Earnings Forecast Errors?" *Journal of Accounting Research* 41 (2003), 1-31.
- Abdullah, S. N., and N. M. Nasir. "Accrual Management and the Independence of the Boards of Directors and Audit Committees." *IJUM Journal of Economics and Management* 12 (2004), 49-80.
- Alessi, L. d., and R. J. Staaf. "What does reputation assure? The relationship of trademarks to expectations and legal remedies." *Economic Inquiry* 32 (1994), 477-485.
- Anthony, J. H., B. Bettinghaus, and D. B. Farber. "Earnings Management and the Market Response to Convertible Debt Issuance." Working Paper, Michigan State University (2004).
- Anthony, J. H., and K. R. Petroni. "Accounting Estimation Disclosures and Firm Valuation in the Property-Casualty Insurance Industry." *Journal of Accounting, Auditing & Finance* 12 (1997), 257-281.
- Arya, A., J. Glover, and S. Sunder. "Earnings Management and the Revelation Principle." *Review of Accounting Studies* 3 (1998), 7-34.
- Ashbaugh, H., R. LaFond, and B. W. Mayhew. "Do Nonaudit Services Compromise Auditor Independence? Further Evidence." *Accounting Review* 78 (2003), 611-639.
- Baker, T., D. Collins, and A. Reitenga. "Stock Option Compensation and Earnings Management Incentives." *Journal of Accounting* 18 (2003), 557-582.
- Ball, R., and P. Brown. "An Empirical Evaluation of Accounting Income Numbers." *Journal of Accounting Research* 6 (1968), 159-177.
- Balsam, S., E. Bartov, and C. Marquardt. "Accruals Management, Investor Sophistication, and Equity Valuation: Evidence from 10-Q Filings." *Journal of Accounting Research* 40 (2002), 987-1012.

- Bannister, J. W., and H. A. Newman. "Accrual Usage to Manage Earnings toward Financial Analysts' Forecasts." *Review of Quantitative Finance and Accounting* 7 (1996), 259-278.
- Barber, B. M., and M. N. Darrrough. "Product Reliability and Firm Value: The Experience of American and Japanese Automakers, 1973-1992." *Journal of Political Economy* 104 (1996), 1084-1099.
- Barton, J., and P. J. Simko. "The Balance Sheet as an Earnings Management Constraint." *Accounting Review* 77 (2002), 1-27.
- Bartov, E. "The Timing of Asset Sales and Earnings Manipulation." *Accounting Review* 68 (1993), 840-855.
- Bartov, E. "The Timing of Asset Sales and Earnings Manipulation." *Accounting Review* 79 (2004), 889-920.
- Bartov, E., and P. Mohanram. "Private Information, Earnings Manipulations, and Executive Stock-Option Exercises." *Accounting Review* 79 (2004), 889-920.
- Beasley, M. S. "An Empirical Analysis of the Relation Between the Board of Director Composition and Financial Statement Fraud." *Accounting Review* (1996), 443-465.
- Beatty, A., S. L. Chamberlain, and J. Magliolo. "Managing Financial Reports of Commercial Banks: The Influence of Taxes, Regulatory Capital, and Earnings." *Journal of Accounting Research* 33 (1995), 231-261.
- Beatty, A. L., and D. G. Harris. "The Effects of Taxes, Agency Costs and Information Asymmetry on Earnings Management: A Comparison of Public and Private Firms." *Review of Accounting Studies* 4 (1999), 299-326.
- Beatty, A. L., B. Ke, and K. R. Petroni. "Earnings Management to Avoid Earnings Declines across Publicly and Privately Held Banks." *Accounting Review* 77 (2002), 547-570.
- Beaver, W. H. "The Information Content of Annual Earnings Announcements." *Journal of Accounting Research* 6 (1968), 67-92.
- Beaver, W. H., and E. E. Engel. "Discretionary behavior with respect to allowances for loan losses and the behavior of security prices." *Journal of Accounting & Economics* 22 (1996), 177-206.

- Bedard, J., S. M. Chtourou, and L. Courteau. "The Effect of Audit Committee Expertise, Independence, and Activity on Aggressive Earnings Management." *Auditing* 23 (2004), 15-37.
- Bedard, J. C., and K. M. Johnstone. "Earnings Manipulation Risk, Corporate Governance Risk, and Auditors' Planning and Pricing Decisions." *Accounting Review* 79 (2004), 277-304.
- Beneish, M. D. "Incentives and Penalties Related to Earnings Overstatements that Violate GAAP." *Accounting Review* 74 (1999), 425-457.
- Beneish, M. D., and M. E. Vargus. "Insider Trading, Earnings Quality, and Accrual Mispricing." *Accounting Review* 77 (2002), 755-91.
- Bens, D. A. "Employee Stock Options, EPS Dilution, and Stock Repurchases." *Journal of Accounting and Economics* 36 (2003), 51-90.
- Bergstresser, D., M. A. Desai, and J. Rauh. "Earnings Manipulation and Managerial Investment Decisions: Evidence from Sponsored Pension Plans." Working Papers, National Bureau of Economic Research Inc. (2004).
- Bergstresser, D., and T. Philippon. "CEO incentives and earnings management." Working Paper, Harvard University (2004).
- Bernard, V. L., and D. J. Skinner. "What Motivates Managers' Choice of Discretionary Accruals?" *Journal of Accounting and Economics* 22 (1996), 313-325.
- Brown, L. D., R. L. Hagerman, P. A. Griffin, and M. E. Zmijewski. "Security Analyst Superiority Relative To Univariate Time-Series Models In Forecasting." *Journal of Accounting & Economics* 9 (1987), 61-87.
- Brown, P. R. "Earnings Management: A Subtle (and Troublesome) Twist to Earnings Quality." *Journal of Financial Statement Analysis* 4 (1999), 61-63.
- Burgstahler, D., and I. Dichev. "Earnings Management to Avoid Earnings Decreases and Losses." *Journal of Accounting and Economics* 24 (1997), 99-126.
- Burgstahler, D. C., and M. J. Eames. "Earnings Management to Avoid Losses and Earnings Decreases: Are Analysts Fooled?" *Contemporary Accounting Research/Recherche Comptable Contemporaine* 20 (2003), 253-294.
- Bushee, B. J. "The Influence of Institutional Investors on Myopic R&D Investment Behavior." *Accounting Review* 73 (1998), 305-333.

- Butters, G. R. "The Impact of Product Recalls on the Wealth of Sellers: Comments." *Empirical approaches to consumer protection economics: Proceedings of a conference sponsored by the Bureau of Economics, Federal Trade Commission, April (1984)*, 411-413.
- Cahan, S. F. "The Effect of Antitrust Investigations on Discretionary Accruals: A Refined Test of the Political-Cost Hypothesis." *Accounting Review* 67 (1992), 77-95.
- Cahan, S. F., B. M. Chavis, and R. G. Elmendorf. "Earnings Management of Chemical Firms in Response to Political Costs from Environmental Legislation." *Journal of Accounting* 12 (1997), 37-65.
- Chan, K., N. Jegadeesh, and T. Sougiannis. "The Accrual Effect on Future Earnings." *Review of Quantitative Finance and Accounting* 22 (2004), 97-121.
- Chaney, P. K., and C. M. Lewis. "Earnings Management and Firm Valuation under Asymmetric Information." *Journal of Corporate Finance* 1 (1995), 319-345.
- Chaney, P. K., and C. M. Lewis. "Income Smoothing and Underperformance in Initial Public Offerings." *Journal of Corporate Finance* 4 (1998), 1-29.
- Chung, K.-H., R. A. Jacob, and Y. B. Tang. "Earnings Management by Firms Announcing Earnings after SEC Filing." *International Advances in Economic Research* 9 (2003), 152-162.
- Chung, R., M. Firth, and J.-B. Kim. "Institutional Monitoring and Opportunistic Earnings Management." *Journal of Corporate Finance* 8 (2002), 29-48.
- Clinch, G., and J. Magliolo. "CEO compensation and components of earnings in bank holding companies." *Journal of Accounting & Economics* 16 (1993), 241-272.
- Collins, D. W., and L. DeAngelo. "Accounting Information and Corporate Governance: Market and Analyst Reactions to Earnings of Firms Engaged in Proxy Contests." *Journal of Accounting and Economics* 13 (1990), 213-247.
- Collins, J. H., D. A. Shackelford, and J. M. Wahlen. "Bank Differences in the Coordination of Regulatory Capital, Earnings, and Taxes." *Journal of Accounting Research* 33 (1995), 263-291.
- Crafton, S. M., G. E. Hoffer, and R. J. Reilly. "Testing the Impact of Recalls on the Demand for Automobiles." *Economic Inquiry* 19 (1981), 694-703.

- Das, S., and H. Zhang. "Rounding-Up in Reported EPS, Behavioral Thresholds, and Earnings Management." *Journal of Accounting and Economics* 35 (2003), 31-50.
- Davidson III, W. N., and D. L. Worrell. "Research Notes and Communications: The Effect of Product Recall Announcements on Shareholder Wealth." *Strategic Management Journal* 13 (1992), 467-473.
- de Albornoz Noguera, B. G., and M. Illueca Munoz. "Comparing Abnormal Accruals Models: A Non-parametric Approach." *Applied Economics* 36 (2004), 1455-1460.
- DeAngelo, H., L. DeAngelo, and D. J. Skinner. "Accounting choice in troubled companies." *Journal of Accounting & Economics* 17 (1994), 113-143.
- DeAngelo, L. "Evidence of Earnings Management from the Provision for Bad Debts: Discussion." *Journal of Accounting Research* 26 (1988), 32-40.
- Dechow, P. M., S. A. Richardson, and I. Tuna. "Why Are Earnings Kinky? An Examination of the Earnings Management Explanation." *Review of Accounting Studies* 8 (2003), 355-384.
- Dechow, P. M., and D. J. Skinner. "Earnings Management: Reconciling the Views of Accounting Academics, Practitioners, and Regulators." *Accounting Horizons* 14 (2000), 235-250.
- Dechow, P. M., R. G. Sloan, and A. P. Sweeney. "Detecting Earnings Management." *Accounting Review* 70 (1995), 193-225.
- Dechow, P. M., R. G. Sloan, and A. P. Sweeney. "Causes and Consequences of Earnings Manipulation: An Analysis of Firms Subject to Enforcement Actions by the SEC." *Contemporary Accounting Research* 13 (1996), 1-35.
- DeFond, M. L. "The Balance Sheet as an Earnings Management Constraint: Discussion." *Accounting Review* 77 (2002), 29-33.
- DeFond, M. L., and K. R. Subramanyam. "Auditor Changes and Discretionary Accruals." *Journal of Accounting and Economics* 25 (1998), 35-67.
- DeGeorge, F., J. Patel, and R. Zeckhauser. "Earnings Management to Exceed Thresholds." *Journal of Business* 72 (1999), 1-33.

- Dempsey, S. J., H. G. Hunt Iii, and N. W. Schroeder. "Earnings Management And Corporate Ownership Structure: An Examination Of Extraordinary Item Reporting." *Journal of Business Finance & Accounting* 20 (1993), 479-500.
- Detzler, M. L., and S. M. Machuga. "Earnings Management Surrounding Top Executive Turnover in Japanese Firms." *Review of Pacific Basin Financial Markets and Policies* 5 (2002), 343-371.
- Dhaliwal, D. S., C. A. Gleason, and L. F. Mills. "Last-Chance Earnings Management: Using the Tax Expense to Meet Analysts' Forecasts." *Contemporary Accounting Research/Recherche Comptable Contemporaine* 21 (2004), 431-459.
- Dranove, D., and C. Olsen. "The Economic Side Effects of Dangerous Drug Announcements." *Journal of Law and Economics* 37 (1994), 323-348.
- DuCharme, L. L., P. H. Malatesta, and S. E. Sefcik. "Earnings Management: IPO Valuation and Subsequent Performance." *Journal of Accounting* 16 (2001), 369-396.
- DuCharme, L. L., P. H. Malatesta, and S. E. Sefcik. "Earnings Management, Stock Issues, and Shareholder Lawsuits." *Journal of Financial Economics* 71 (2004), 27-49.
- Dutta, S., and F. Gigler. "The Effect of Earnings Forecasts on Earnings Management." *Journal of Accounting Research* 40 (2002), 631-655.
- Dye, R. A. "Earnings Management in an Overlapping Generations Model." *Journal of Accounting Research* 26 (1988), 195-235.
- Easterwood, C. M. "Takeovers and Incentives for Earnings Management: An Empirical Analysis." *Journal of Applied Business Research* 14 (1997), 29-47.
- Elgers, P. T., R. J. Pfeiffer, and S. L. Porter. "Anticipatory Income Smoothing: A Re-examination." *Journal of Accounting and Economics* 35 (2003), 405-422.
- Elitzur, R. R., and V. Yaari. "Executive Incentive Compensation and Earnings Manipulation in a Multi-period Setting." *Journal of Economic Behavior and Organization* 26 (1995), 201-219.
- Erickson, M., and M. Shiing-wu Wang. "Earnings management by acquiring firms in stock for stock mergers." *Journal of Accounting & Economics* 27 (1999), 149-176.

- Erickson, M., and S.-w. Wang. "Earnings Management by Acquiring Firms in Stock for Stock Mergers." *Journal of Accounting and Economics* 27 (1999), 149-176.
- Felcher, E. M. "Product Recalls: Gaping Holes in the Nation's Product Safety Net." *Journal of Consumer Affairs* 37 (2003), 170-179.
- Feltham, G. A., and J. Pae. "Analysis of the Impact of Accounting Accruals on Earnings Uncertainty and Response Coefficients." *Journal of Accounting* 15 (2000), 199-220.
- Fischer, P. E., and P. C. Stocken. "Effect of Investor Speculation on Earnings Management." *Journal of Accounting Research* 42 (2004), 843-870.
- Frankel, R. M., M. F. Johnson, and K. K. Nelson. "The Relation between Auditors' Fees for Nonaudit Services and Earnings Management." *Accounting Review* 77 (2002), 71-105.
- Gao, P., and R. E. Shrieves. "Earnings Management and Executive Compensation: A Case of Overdose of Option and Underdose of Salary?" Working Paper, University of Tennessee (2002).
- Gaver, J. J. "Discussion--Stock Option Compensation and Earnings Management Incentives." *Journal of Accounting* 18 (2003), 583-592.
- Gaver, J. J., K. M. Gaver, and J. R. Austin. "Additional Evidence on Bonus Plans and Income Management." *Journal of Accounting and Economics* 19 (1995), 3-28.
- Gaver, J. J., and J. S. Paterson. "The Association between External Monitoring and Earnings Management in the Property-Casualty Insurance Industry." *Journal of Accounting Research* 39 (2001), 269-282.
- Govindaraj, S., B. Jaggi, and B. Lin. "Market Overreaction to Product Recall Revisited--The Case of Firestone Tires and the Ford Explorer." *Review of Quantitative Finance and Accounting* 23 (2004), 31-54.
- Guenther, D. A. "Earnings Management in Response to Corporate Tax Rate Changes: Evidence from the 1986 Tax Reform Act." *Accounting Review* 69 (1994), 230-243.
- Guidry, F., A. J. Leone, and S. Rock. "Earnings-Based Bonus Plans and Earnings Management by Business-Unit Managers." *Journal of Accounting and Economics* 26 (1999), 113-142.

- Gul, F. A., C. J. P. Chen, and J. S. L. Tsui. "Discretionary Accounting Accruals, Managers' Incentives, and Audit Fees." *Contemporary Accounting Research/Recherche Comptable Contemporaine* 20 (2003), 441-464.
- Gul, F. A., S. G. Lynn, and J. S. L. Tsui. "Audit Quality, Management Ownership, and the Informativeness of Accounting Earnings." *Journal of Accounting* 17 (2002), 25-49.
- Hall, S. C., and W. W. Stammerjohan. "Damage Awards and Earnings Management in the Oil Industry." *Accounting Review* 72 (1997), 47-65.
- Han, J. C. Y., and S.-w. Wang. "Political Costs and Earnings Management of Oil Companies during the 1990 Persian Gulf Crisis." *Accounting Review* 73 (1998), 103-117.
- Hand, J. R. M., and T. R. Skantz. "The Economic Determinants of Accounting Choices: The Unique Case of Equity Carve-Outs under SAB 51." *Journal of Accounting and Economics* 24 (1997), 175-203.
- Harikumar, T., and K. C. J. Wei. "Managerial Compensation and the Corroboration Effect of Earnings and Dividend Announcements." *International Review of Economics and Finance* 1 (1992), 133-145.
- Hartman, R. S. "Product Quality and Market Efficiency: The Effect of Product Recalls on Resale Prices and Firm Valuation." *Review of Economics and Statistics* 69 (1987), 367-372.
- Healy, P. M. "The Effect Of Bonus Schemes On Accounting Decisions." *Journal of Accounting & Economics* 7 (1985), 85-107.
- Healy, P. M. "Discussion of Earnings-Based Bonus Plans and Earnings Management by Business Unit Managers." *Journal of Accounting and Economics* 26 (1999), 143-147.
- Healy, P. M., S. C. Myers, and C. D. Howe. "R&D Accounting and the Tradeoff Between Relevance and Objectivity." *Journal of Accounting Research* 40 (2002), 677-710.
- Healy, P. M., and J. M. Wahlen. "A Review of the Earnings Management Literature and Its Implications for Standard Setting." *Accounting Horizons* 13 (1999), 365-383.
- Healy, P. M., and J. M. Wahlen. "A Review of the Earnings Management Literature and Its Implications for Standard Setting." *Accounting Horizons* 13 (1999), 365-383.

- Healy, P. M. "Discussion of earnings-based bonus plans and earnings management by business unit managers." *Journal of Accounting & Economics* 26 (1999), 143-146.
- Hoffer, G. E., S. W. Pruitt, and R. J. Reilly. "The Impact of Product Recalls on the Wealth of Sellers: A Reexamination." *Journal of Political Economy* 96 (1988), 663-670.
- Hoffer, G. E., and R. J. Reilly. "Auto Recalls and Consumer Recall: Effects on Sales." *Challenge* 26 (1983), 56-57.
- Holthausen, R. W., D. F. Larcker, and R. G. Sloan. "Annual bonus schemes and the manipulation of earnings." *Journal of Accounting & Economics* 19 (1995), 29-74.
- Holthausen, R. W., and R. W. Lefwich. "The Economic Consequences Of Accounting Choice." *Journal of Accounting & Economics* 5 (1983), 77-117.
- Jaggi, B., and P. Lee. "Earnings Management Response to Debt Covenant Violations and Debt Restructuring." *Journal of Accounting* 17 (2002), 295-324.
- Jarrell, G., and S. Peltzman. "The Impact of Product Recalls on the Wealth of Sellers." *Journal of Political Economy* 93 (1985), 512-536.
- Jarrell, G. A., and S. Peltzman. "The Impact of Product Recalls on the Wealth of Sellers." *Chicago studies in political economy* (1988), 612-633.
- Jensen, M. C., and W. H. Meckling. "Theory Of The Firm: Managerial Behavior, Agency Costs And Ownership Structure." *Journal of Financial Economics* 3 (1976), 305-360.
- Jeter, D. C., and L. Shivakumar. "Cross-sectional estimation of abnormal accruals using quarterly and annual data: effectiveness in detecting event-specific earnings management." *Accounting & Business Research* 29 (1999), 299-319.
- Jiambalvo, J. "Discussion of "Causes and Consequences of Earnings Manipulation: An Analysis of Firms Subject to Enforcement Actions by the SEC"." *Contemporary Accounting Research* 13 (1996), 37-47.
- Jiambalvo, J., S. Rajgopal, and M. Venkatachalam. "Institutional Ownership and the Extent to which Stock Prices Reflect Future Earnings." *Contemporary Accounting Research* 19 (2002), 117-145.

- Jones, J. J. "Earnings Management during Import Relief Investigations." *Journal of Accounting Research* 29 (1991), 193-228.
- Jordan, C. E., and S. J. Clark. "Big Bath Earnings Management: The Case of Goodwill Impairment under SFAS No 142." *Journal of Applied Business Research* 20 (2004), 63-69.
- Jordan, C. E., S. J. Clark, and W. R. Smith. "Earnings Management under SFAS No 115: Evidence from the Insurance Industry." *Journal of Applied Business Research* 14 (1997), 49-56.
- Kang, S.-H., and K. Sivaramakrishnan. "Issues in Testing Earnings Management and an Instrumental Variable Approach." *Journal of Accounting Research* 33 (1995), 353-367.
- Kaplan, R. S. "Comments On Paul Healy." *Journal of Accounting & Economics* 7 (1985), 109-113.
- Kaszniak, R. "On the Association between Voluntary Disclosure and Earnings Management." *Journal of Accounting Research* 37 (1999), 57-81.
- Key, K. G. "Political Cost Incentives for Earnings Management in the Cable Television Industry." *Journal of Accounting and Economics* 23 (1997), 309-337.
- Kim, J.-B., R. Chung, and M. Firth. "Auditor Conservatism, Asymmetric Monitoring, and Earnings Management." *Contemporary Accounting Research/Recherche Comptable Contemporaine* 20 (2003), 323-359.
- Kim, K., and D. A. Schroeder. "Analysts' Use of Managerial Bonus Incentives in Forecasting Earnings." *Journal of Accounting and Economics* 13 (1990), 3-23.
- Kinney, W. R., Jr., and R. Libby. "The Relation between Auditors' Fees for Nonaudit Services and Earnings Management: Discussion." *Accounting Review* 77 (2002), 107-114.
- Klein, A. "Audit committee, board of director characteristics, and earnings management." *Journal of Accounting & Economics* 33 (2002), 375-400.
- Kothari, S. P., A. J. Leone, and C. E. Wasley. "Performance Matched Discretionary Accrual Measures." *Journal of Accounting and Economics* 39 (2005), 163-197.
- Krishnan, G. V. "Does Big 6 Auditor Industry Expertise Constrain Earnings Management?" *Accounting Horizons* 17 (2003), 1-15.

- Krishnan, J. "Auditor Switching and Conservatism." *Accounting Review* 69 (1994), 200-215.
- Krishnan, J., and R. G. Stephens. "Evidence on Opinion Shopping from Audit Opinion Conservatism." *Journal of Accounting & Public Policy* 14 (1995), 179-201
- Lambert, R. A. "Income Smoothing as Rational Equilibrium Behavior." *Accounting Review* 59 (1984), 604-618.
- Larcker, D. F. "Discussion of "Employee Stock Options, EPS Dilution, and Stock Repurchases"." *Journal of Accounting and Economics* 36 (2003), 45-49.
- Leuz, C., D. Nanda, and P. D. Wysocki. "Earnings Management and Investor Protection: An International Comparison." *Journal of Financial Economics* 69 (2003), 505-527.
- Liang, P. J. "Equilibrium Earnings Management, Incentive Contracts, and Accounting Standards." *Contemporary Accounting Research/Recherche Comptable Contemporaine* 21 (2004), 685-717.
- Louis, H. "Earnings Management and the Market Performance of Acquiring Firms." *Journal of Financial Economics* 74 (2004), 121-148.
- Louis, H. "Earnings management and the market performance of acquiring firms." *Journal of Financial Economics* 74 (2004), 121-149.
- Lusk, J. L., and T. C. Schroeder. "Effects of Meat Recalls on Futures Market Prices." *Agricultural and Resource Economics Review* 31 (2002), 47-58.
- Magnan, M., C. Nadeau, and D. Cormier. "Earnings Management during Antidumping Investigations: Analysis and Implications." *Revue Canadienne des Sciences de l'Administration/Canadian Journal of Administrative Sciences* 16 (1999), 149-162.
- Marino, A. M. "A Model of Product Recalls with Asymmetric Information." *Journal of Regulatory Economics* 12 (1997), 245-265.
- Marquardt, C. A., and C. I. Wiedman. "How Are Earnings Managed? An Examination of Specific Accruals." *Contemporary Accounting Research/Recherche Comptable Contemporaine* 21 (2004), 461-491.
- Marsh, T. L., T. C. Schroeder, and J. Mintert. "Impacts of Meat Product Recalls on Consumer Demand in the USA." *Applied Economics* 36 (2004), 897-909.

- Maydew, E. L. "Tax-Induced Earnings Management by Firms with Net Operating Losses." *Journal of Accounting Research* 35 (1997), 83-96.
- McNichols, M., and G. P. Wilson. "Evidence of Earnings Management from the Provision for Bad Debts." *Journal of Accounting Research* 26 (1988), 1-31.
- McNichols, M. F. "Research design issues in earnings management studies." *Journal of Accounting & Public Policy* 19 (2000), 313-345.
- McNichols, M. F. "The Quality of Accruals and Earnings: The Role of Accrual Estimation Errors: Discussion." *Accounting Review* 77 (2002), 61-69.
- Mendenhall, R. R., W. D. Nichols, and K. G. Palepu. "Bad News and Differential Market Reactions to Announcements of Earlier-Quarters Versus Fourth-Quarter Earnings." *Journal of Accounting Research* 26 (1988), 63-90.
- Moses, O. D. "Income Smoothing and Incentives: Empirical Tests Using Accounting Changes." *Accounting Review* 62 (1987), 358-77.
- Moyer, S. E. "Capital Adequacy Ratio Regulations and Accounting Choices in Commercial Banks." *Journal of Accounting and Economics* 13 (1990), 123-154.
- Myung Seok, P., and P. Taewoo. "Insider sales and earnings management." *Journal of Accounting & Public Policy* 23 (2004), 381-411
- Nelson, M. W., J. A. Elliott, and R. L. Tarpley. "Evidence from Auditors about Managers' and Auditors' Earnings Management Decisions." *Accounting Review* 77 (2002), 175-202.
- Payne, J. L., and S. W. G. Robb. "Earnings Management: The Effect of Ex Ante Earnings Expectations." *Journal of Accounting* 15 (2000), 371-392.
- Peasnell, K., P. Pope, and S. Young. "A New Model Board." *Accountancy: International Edition* 122 (1998), 91-91.
- Peltier-Rivest, D. "The Determinants of Accounting Choices in Troubled Companies." *Quarterly Journal of Business and Economics* 38 (1999), 28-44.
- Peltier-Rivest, D., and S. Swirsky. "Earnings Management in Healthy Firms." *Quarterly Journal of Business and Economics* 39 (2000), 21-37.
- Perry, S. E., and T. H. Williams. "Earnings Management Preceding Management Buyout Offers." *Journal of Accounting and Economics* 18 (1994), 157-179.

- Pourciau, S. "Earnings Management and Nonroutine Executive Changes." *Journal of Accounting and Economics* 16 (1993), 317-336.
- Press, E. G., and J. B. Weintrop. "Accounting-Based Constraints in Public and Private Debt Agreements: Their Association with Leverage and Impact on Accounting Choice." *Journal of Accounting and Economics* 12 (1990), 65-95.
- Pruitt, S. W., and D. R. Peterson. "Security Price Reactions around Product Recall Announcements." *Journal of Financial Research* 9 (1986), 113-122.
- Pruitt, S. W., R. J. Reilly, and G. E. Hoffer. "Security Market Anticipation of Consumer Preference Shifts: The Case of Automotive Recalls." *Quarterly Journal of Business and Economics* 25 (1986), 14-28.
- Rangan, S. "Earnings Management and the Performance of Seasoned Equity Offerings." *Journal of Financial Economics* 50 (1998), 101-122.
- Rangan, S. s. u. e. "Earnings management and the performance of seasoned equity offerings." *Journal of Financial Economics* 50 (1998), 101-122.
- Reilly, R. J., and G. E. Hoffer. "Will Retarding the Information Flow on Automobile Recalls Affect Consumer Demand?" *Economic Inquiry* 21 (1983), 444-447.
- Reitenga, A. L., and M. G. Tearney. "Mandatory CEO Retirements, Discretionary Accruals, and Corporate Governance Mechanisms." *Journal of Accounting* 18 (2003), 255-280.
- Richardson, V. J. "Information Asymmetry and Earnings Management: Some Evidence." *Review of Quantitative Finance and Accounting* 15 (2000), 325-347.
- Richardson, V. J., and J. F. Waagelein. "The Influence of Long-Term Performance Plans on Earnings Management and Firm Performance." *Review of Quantitative Finance and Accounting* 18 (2002), 161-183.
- Robb, S. W. G. "The Effect of Analysts' Forecasts on Earnings Management in Financial Institutions." *Journal of Financial Research* 21 (1998), 315-331.
- Ronen, J., T. Ronen, and V. Yaari. "The Effect of Voluntary Disclosure and Preemptive Preannouncements on Earnings Response Coefficients (ERC) When Firms Manage Earnings." *Journal of Accounting* 18 (2003), 379-409.
- Ronen, T., and V. Yaari. "On the Tension between Full Revelation and Earnings Management: A Reconsideration of the Revelation Principle." *Journal of Accounting* 17 (2002), 273-294.

- Rosner, R. L. "Earnings Manipulation in Failing Firms." *Contemporary Accounting Research/Recherche Comptable Contemporaine* 20 (2003), 361-408.
- Rubin, P. H., Murphy, Dennis and R., Jarrell, Gregg. "Risky Products, Risky Stocks." *Regulation* 1 (1988), 35-39.
- Rupp, N. G. "Are Government Initiated Recalls More Damaging for Shareholders? Evidence from Automotive Recalls, 1973-1998." *Economics Letters* 71 (2001), 265-270.
- Rupp, N. G. "The Attributes of a Costly Recall: Evidence from the Automotive Industry." *Review of Industrial Organization* 25 (2004), 21-44.
- Rupp, N. G., and C. R. Taylor. "Who Initiates Recalls and Who Cares? Evidence from the Automobile Industry." *Journal of Industrial Economics* 50 (2002), 123-149.
- Salin, V., and N. H. Hooker. "Stock Market Reaction to Food Recalls." *Review of Agricultural Economics* 23 (2001), 33-46.
- Schipper, K. "COMMENTARY on Earnings Management." *Accounting Horizons* 3 (1989), 91-103.
- Scholes, M. S., G. P. Wilson, and M. A. Wolfson. "Firms' Responses to Anticipated Reductions in Tax Rates: The Tax Reform Act of 1986." *Journal of Accounting Research* 30 (1992), 161-185.
- Shivakumar, L. "Do Firms Mislead Investors by Overstating Earnings before Seasoned Equity Offerings?" *Journal of Accounting and Economics* 29 (2000), 339-371.
- Skinner, D. J., and L. Myers. "Earnings momentum and earnings management." Working Paper, University of Michigan and University of Illinois (1999).
- Skinner, D. J., and R. G. Sloan. "Earnings Surprises, Growth Expectations, and Stock Returns or Don't Let an Earnings Torpedo Sink Your Portfolio." *Review of Accounting Studies* 7 (2002), 289-312.
- Smith, J. A., and Z. Rezaee. "Earnings Management by the Early Adopters of SFAS No 106." *International Advances in Economic Research* 1 (1995), 426-430.
- Subramanyam, K. R. "The Pricing of Discretionary Accruals." *Journal of Accounting and Economics* 22 (1996), 249-281.
- Sweeney, A. P. "Debt-covenant violations and managers' accounting responses." *Journal of Accounting & Economics* 17 (1994), 281-308.

- Teoh, S. H., I. Welch, and T. J. Wong. "Earnings Management and the Underperformance of Seasoned Equity Offerings." *Journal of Financial Economics* 50 (1998a), 63-99.
- Teoh, S. H., I. Welch, and T. J. Wong. "Earnings Management and the Long-Run Market Performance of Initial Public Offerings." *Journal of Finance* 53 (1998b), 1935-1974.
- Teoh, S. H., and T. J. Wong. "Why New Issues and High-Accrual Firms Underperform: The Role of Analysts' Credulity." *Review of Financial Studies* 15 (2002), 869-900.
- Teoh, S. H., T. J. Wong, and G. R. Rao. "Are Accruals during Initial Public Offerings Opportunistic?" *Review of Accounting Studies* 3 (1998), 175-208.
- Thomsen, M. R., and A. M. McKenzie. "Market Incentives for Safe Foods: An Examination of Shareholder Losses from Meat and Poultry Recalls." *American Journal of Agricultural Economics* 83 (2001), 526-538.
- Uri, N. D. "A Reconsideration of the Impact of Recalls on the Market Valuation of a Product." *Economic Modelling* 6 (1989), 457-466.
- Vafeas, N., A. Vlittis, P. Katranis, and K. Ockree. "Earnings Management Around Share Repurchases: A Note." *Abacus* 39 (2003), 262-272.
- Vander Bauwhede, H., and M. Willekens. "Earnings Management and Institutional Differences: Literature Review and Discussion." *Tijdschrift voor Economie en Management* 45 (2000), 189-212.
- Wang, Z. "Stock Market Reaction to Food Recalls: A GARCH Application." *Applied Economics Letters* 9 (2002), 979-987.
- Warfield, T. D., J. J. Wild, and K. L. Wild. "Managerial ownership, accounting choices, and informativeness of earnings." *Journal of Accounting & Economics* 20 (1995), 61-91.
- Watts, R. L., and J. L. Zimmerman. "Towards a Positive Theory of the Determination of Accounting Standards." *Accounting Review* 53 (1978), 112-134.
- Watts, R. L., and J. L. Zimmerman. "Agency Problems, Auditing, and the Theory of the Firm: Some Evidence." *Journal of Law & Economics* 26 (1983), 613-633.
- Welling, L. "A Theory of Voluntary Recalls and Product Liability." *Southern Economic Journal* 57 (1991), 1092-1111.

- Wu, Y. W. "Management Buyouts and Earnings Management." *Journal of Accounting* 12 (1997), 373-389.
- Wynne, A. J., and G. E. Hoffer. "Auto Recalls: Do They Affect Market Share?" *Applied Economics* 8 (1976), 157-163.
- Xie, B., W. N. Davidson, III, and P. J. DaDalt. "Earnings Management and Corporate Governance: The Role of the Board and the Audit Committee." *Journal of Corporate Finance* 9 (2003), 295-316.
- Yermack, D. "Do Corporations Award CEO Stock Options Effectively?" *Journal of Financial Economics* 39 (1995), 237-69.
- Zmijewski, M. E., and R. L. Hagerman. "An Income Strategy Approach To The Positive Theory Of Accounting Standard Setting/Choice." *Journal of Accounting & Economics* 3 (1981), 129-149.