Accounting Irregularities, Management Compensation Structure, and Information Asymmetry

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Abstract

The results of this study emphasise the validity of public, government and shareholder concerns in regard to the impact of accounting irregularities on shareholders' wealth. Market reaction to announcements of accounting irregularities has a highly negative effect on shareholders' wealth. Information asymmetry between management and investors is found to affect market reaction more negatively for firms with high Tobin's q values, relatively smaller firm size, lower levels of leverage and those companies engaged in high-tech industries. This study also provides evidence suggesting that market participants react as if they believe that accounting irregularities are the result of management actions that maximise their own total compensation. Finally, market reaction shows a significant and consistent ability to predict which accounting irregularity announcements subsequently result in shareholder class-action lawsuits.

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I. Introduction

Properly-functioning capital markets require accurate accounting and financial information as a basis for allocating capital and other scarce resources. Accurate information is also important so market participants may be confident that capital markets are fair and financial accounts transparent. However, reports of accounting irregularities, in the wake of notorious business failures like Enron and WorldCom and the involvement of other large firms (cf. Tyco, Kmart, and Xerox) have caused a great deal of concern over the issue of accounting statement reliability and the impact on shareholders, the corporate sector, and the general economy. Indeed the magnitude of this problem may be appreciated through the remarks made by U.S. President Bush upon signing the Sarbanes-Oxley Corporate Reform Act of 2002, observing: "and now corporate corruption has struck at investor confidence … and we must not allow fraud to undermine it (the economy) either". [1]

This issue has captured the attention of the media, investors, government regulators and legislators and has also prompted the President to form the Corporate Fraud Task Force and the Securities and Exchange Commission (SEC) to form the Public Oversight Board's Panel on Audit Effectiveness. In fact, former SEC Chairman Levitt testified, "In recent years, countless investors have suffered significant losses as market capitalisations have dropped by billions of dollars due to restatements of audited financial statements" (Levitt, 2000).

Accounting irregularities need to be distinguished from two related concepts, namely accounting errors and accounting restatements. In comparison to accounting errors, an accounting irregularity is an intentional (rather than unintentional) misstatement, or omission of amounts or disclosure in financial statements. As might be anticipated, the consequences of discovering material accounting irregularities are far more serious than those arising from accounting errors. An accounting restatement occurs as a result of the discovery of either accounting errors or irregularities, and as such represents a formal "correcting" of the firm's accounting statements.

Accounting irregularities may convey that previous financial statements, which presumably are used to assess the value of the firm, are not reliable and contain false

information. The announcement possibly causes investors to revise their assessment regarding the future prospects of the firm or the potential for legal action against the company, its management, and other parties involved. The firm's management may also be perceived as lacking integrity, being dishonest or incompetent. Shareholders may decide management should be replaced or even initiate class-action lawsuits against them. It is therefore logical to propose that the market reaction to an announcement of such irregularities will be negative. However, examination of the extent and the valuation effect of such events may contribute further interesting results.

The main objectives of this research are to first examine market reaction to announcements that a company is implicated in a situation where accounting irregularities are involved. A second goal is to establish the environment under which accounting irregularities occur. Finally, the possibility of a link between the level and structure of management compensation and the accounting irregularities is examined. In essence, the issue is whether improper accounting is perceived by investors as reflecting a desire by management to increase their incentive-based compensation?

A limited number of studies examine the information content effect of restatement announcements on the market value of the firm (i.e., Defond and Jiambalvo (1991), Anderson and Yohn (2001), Palmrose, Richardson, and Scholz (2001), and Erickson, Hanlon, and Maydew (2002)). To the best of the authors' knowledge, no previous work examines stock market reaction to accounting irregularities.

Earnings management studies provide evidence that management compensation is explicitly or implicitly linked with accounting data (Dye (1988) and Duru and Iyengar (2001)). Previous research (eg. Healy (1985), Holthausen, Larcker and Sloan (1995), Healy and Wahlen (1999), and Klinger, Hartman, Anderson and Cavanaugh (2002)) also suggests that earnings management and financial statement manipulation are motivated by management's desire to maximise their own compensation. The financial press has also recently focused on this issue. *Money Magazine*[2], for example, concluded: "Options, which were spread among executives like party favours over the past few years, fuelled the emphasis on short-term results that, in turn, tempted many executives to inflate earnings".

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[1]White House press release, July 30, 2002.
[2]*Money Magazine*, September 2002, Volume 31, Number 9 pages 63-64.

Accounting irregularities may represent an aggressive and intentional form of earnings management in some cases. If the capital market believes that such activities are motivated by management's pursuit of maximising their own compensation, then a negative relationship between management compensation and the market's reaction to accounting irregularities would be expected. This study attempts to fill a gap in the accounting literature by providing evidence regarding a direct link between the level and structure of management compensation and accounting irregularities.

Previous studies suggest that information asymmetry is a necessary and sufficient condition for earnings management to occur (Dye (1988) and Trueman and Titman (1988)). Richardson (2000) finds a positive relationship between the level of earnings management and the degree of information asymmetry. The implication of previous findings is that firms with higher levels of information asymmetry may be more likely to engage aggressively in accounting irregularities. This suggests that a negative relationship between the level of information asymmetry and the market reaction to announcements of accounting irregularities is expected.

A large and significantly negative response to the announcement of an accounting irregularity is found, as expected. The negative event-period return found is much larger than those of previous researchers who examine restatements (i.e., Palmrose, Richardson and Scholz (2001) and Richardson (2000)) and suggests that the impact of accounting irregularity discoveries on shareholder wealth has been underestimated. Companies with greater information asymmetry (as proxied by Tobin's q, size, leverage and high-tech industry) are found to experience significantly more adverse, negative market reaction and this lends support to the Information Asymmetry hypothesis proposed. Market reaction to management compensation variables shows that firms with higher levels of both total compensation and greater proportions of incentive-based compensation experience greater negative reaction to accounting irregularity announcements. These results are consistent with the Management Compensation hypothesis suggesting that the accounting irregularities are linked to managements' desire to increase their compensation by manipulating reported earnings. Taken altogether these results suggest that shareholders need to be aware of the type of firm they are making an investment in. At the same time, they need to consider the incentive-based compensation for senior executives and the basis upon these incentives are assessed. Finally, the findings here support the desirability of increased legislative efforts to identify, eradicate and punish corporate corruption as

manifested by managers, accountants and auditors who tolerate or engage in improper accounting practices.

This research is organised as follows: Section 2 explicitly defines accounting irregularities and the different types, describes the disclosure process and the consequences of irregularities. Section 3 contains a review of the literature. Testable hypotheses are developed in Section 4. The data collection approach employed and the methods of analysis are described in Section 5. The empirical results are discussed in Section 6. Section 7 then summarises the results and draws conclusions from the research.

II. Definition, Disclosure Process, Types, and Consequences of Accounting Irregularities

A. Definition of Accounting Irregularities

The Statement on Auditing Standards (SAS) No. 53 (The Auditor's Responsibility to Detect and Report Errors and Irregularities) states the formal definition of accounting irregularities.

> *"The term irregularities refers to intentional misstatements or omissions of amounts or disclosure in financial statements. Irregularities may include fraudulent financial reporting undertaken to render financial statements misleading and misappropriation of assets. Irregularities may involve: Manipulation, falsification, or alteration of accounting records or supporting documents from which financial statements are prepared; Misrepresentation or intentional omission of events, transactions, or other significant information; Intentional misapplication of accounting principles relating to amounts, classification, manner of presentation, or disclosure"*.

Conversely, accounting errors are formally defined by SAS No. 53 as follows:

> *"The term error refers to unintentional misstatements or omissions of amounts or disclosures in financial statements. Errors may involve: Mistakes in gathering or processing accounting data from which financial statements are prepared; Incorrect accounting estimates arising from oversight or misinterpretation of facts; Mistakes in the application of accounting principles relating to amount, classification, manner of presentation, or disclosure."*

It is clear from these definitions that the principal difference between accounting errors and accounting irregularities hinges upon the intention of the misstatements. The difference in their implications is accordingly a serious matter. In the case of accounting errors, the company can typically restate previous financial reports without any legal implications. However, upon the revelation or discovery of accounting irregularities the company may face shareholder class-action litigation, investigation by the Securities and Exchange Commission (SEC), a criminal investigation, and/or management dismissal.

B. The Disclosure Process

Several parties, including the company, the SEC, independent auditors and outside financial analysts can detect and initiate a preliminary investigation of potential accounting irregularities. Once potential accounting irregularities have been uncovered, a preliminary investigation is often conducted to verify the existence and the extent of the irregularities. The investigation can be carried out by an outside auditor, a corporate director, the company's financial management or a combination of these parties. If the preliminary investigation confirms the existence of accounting irregularities, then a restatement of previous financial reports cannot be avoided. The decision to restate and the extent of restatement are disclosed after a thorough investigation that also reveals the extent of management involvement.

C. Types of Accounting Irregularities

Accounting irregularities occur, to a large extent, in financial statements that involve flexibility and judgment in the application of generally accepted accounting principles (GAAP). A lack of clarity and straightforward rules in some areas makes irregularities difficult to detect. For example, cash is unlikely to be manipulated, because the GAAP rules are clear and the balances are easy to verify. Similarly, physical assets, such as plant, property, and equipment cannot be easily overstated. Still, there are areas that are potential targets of manipulation. The main types of accounting irregularities are described below.

Income Overstatement is the most common area of potential manipulation which may involve artificially inflating sales, or improper accounting entries that cause earnings to be overstated (Vesta Insurance Group Inc., for example), or overstating

inventory (Gibson Greetings Inc.), or overstating assets and retained earnings (Seaboard Corp.).

Understatement of expenses or payables is a method employed to inflate earnings. Accounting irregularity examples in this category include artificially-reduced expenses (Rent Way Inc.), inappropriate recording of expenses (Chicago & North Western Holdings), understating accounts payable (Guilford Mills Inc.), and undervaluing contract costs (Gunther International Ltd).

Improper Revenue Recognition is one of several ways used to manipulate revenue. Among the examples in this research are: premature recognition of sales (Systems Network Corp. recognised revenue in 1996, which should have properly been reported in 1997), shipment manipulations (Structural Dynamics Research Corp. found that certain shipments intended for sale to, or through, third party distribution channels, apparently did not represent valid sales), inappropriate recognition of gains on derivatives transactions (Safety Kleen Corp.), improper recording of receivables and recording previously unrecognised expenses (Park Electrochemical Corp.), and inappropriately recorded revenues (Allscripts Inc.), sales (McKesson HBOC Inc.), and transactions (JDN Realty Corp.).

Time Differentiation is another form of manipulation. There are eight companies in the sample that overstated their earnings using this method. For example, Exide Corp. improperly deferred a pre-fiscal 1998 charge until fiscal 1998 and 1999. Transactions were booked in the wrong periods by Informix Corporation. Legato Systems Inc. recorded contracts as revenue in the third quarter that should have been recorded as revenue in the first and second quarters of 2000.

D. Consequences of Accounting Irregularities

The consequences of involvement in accounting irregularities vary depending on the different characteristics and the extent of irregularities. Some common consequences are discussed below.

Shareholder class action lawsuits are quite commonly filed within 2 or 3 days after an announcement of accounting irregularities. The most likely candidates to be named in the class action complaints are the company, individual officials, the audit committee and outside auditors. The parent or holding company may be named as a defendant, for example, in the case of Safety-Kleen, the holding company Laidlaw was subject to the class action lawsuit by shareholders. The announcement of

accounting irregularities, in some cases, identify particular officers as being responsible for the irregularities, and these individuals are inevitably named as defendants in the complaint. This includes the top executives such as the chief executive officer (CEO) and the chief financial officer (CFO), since they have signed misstated SEC filings, such as 10-K or 10-Q forms. The audit committee and outside auditors are two parties that have responsibility for prevention and early detection of potential inaccurate financial reporting. The incidence of accounting irregularities provides evidence that they have not done their job well and therefore they are likely to be included as defendants in a class action lawsuit.

If the case is proven, the parties involved have to determine the resulting damages and to negotiate an appropriate settlement amount. In some cases, the settlement is huge. For example, in December 1999 Cedant Corp. agreed to pay $2.83 billion to settle a shareholder class action suit alleging that the company had recorded about $500 million in false revenue during a period of three years. Ernst & Young who served as Cedant's auditor during that period made a $335 million payout for their accounting negligence.

***Investigation by the Regulatory Agencies*:** If the SEC believes that violations of securities laws or exchange rules are occurring as a result of accounting irregularities, the SEC has the power to conduct its own investigation, even if the exchange is conducting an investigation at the same time. The federal securities laws also entitle the SEC to regulate not only the listed company but also its controlling shareholders, directors, officers, underwriters, accountants, and lawyers.

After the investigation, the SEC will assess different penalties for the parties involved depending upon their status and complicity. Senior executives who were knowingly involved in deliberate wrongdoing can expect punishment. Penalties may include insistence by the SEC on removal from the company, a bar against further service as an officer or director of a public company, an injunction against further violations of the securities laws, and a fine. The SEC may also refer the matter to other parties for criminal prosecution. In the case of Sensormatic, which was caught manipulating their product shipments in 1995, the CEO was penalised by an injunction and a $50,000 fine. These penalties were also applied to the CFO plus a five-year bar from appearing before the SEC.

***Delisting from National Exchanges*:** Another possible consequence of accounting irregularities is the delisting from the associated national exchange. Subject to

approval from the SEC, the exchanges have the authority to determine for themselves, which securities qualify for listing. If the company, as a result of its accounting irregularities, has violated the exchange listing requirements, delisting is highly probable. There are seven companies in the sample that were delisted after the discovery of accounting irregularities.

Criminal Investigation which leads to criminal prosecution is the most severe consequence of accounting irregularities. For several firms in the sample, the Federal Bureau of Investigation was involved in investigating potential financial fraud. For example, Paul F. Polishan, former chief financial officer of Leslie Fay, was charged with directing and authorising a $131 million financial fraud related to the firm's reported earnings and sentenced to nine years in jail. Other cases involving criminal investigations into the activities of CFOs include Donnkenny, Livent, and Cedent.

III. Review of Literature

A. Management Compensation and Earnings Manipulation

Jensen and Meckling (1976) propose that a solution to deal with agency problems arising from the separation between owners and management is to provide management compensation packages designed to align managerial incentives with shareholders' interests. Typical compensation schemes consist of fixed and incentive components. Salary, bonus, other annual compensation are included in the fixed part. Whereas restricted stock awards, options or stock appreciation rights (SARs), and long-term incentive plan payouts (LTIP) comprise the incentive-based portion.

While there are no studies directly linking the level and structure of management compensation to accounting irregularities, a large number of studies provide evidence about the linkage between management compensation and earnings management or manipulation. Dye (1988) states that as long as accounting data are used in compensation contracts, incentives will arise to manage these data. Elitzur and Yaari (1995) examine how insider trading and executive incentive compensation affect earnings management. Their results indicate that there is a systematic relationship between executive incentive compensation and earnings manipulation. This implies that executive incentive compensation can motivate management to increase the degree of earnings manipulation. Elitzur and Yaari also indicate that the design of compensation schemes can affect management's earnings manipulation practices.

Healy (1985) examines the effect of executive earning-based bonus plans on accrual policies and accounting procedure choice decisions. He indicates the bonus schemes and performance plans are explicitly dependent on accounting earnings. His results suggest that bonus plans motivate management to select accrual and accounting procedures that maximise the present value of their own bonus. Further, the adoption or modification of a bonus plan has a high probability of causing changes in accounting procedures. Holthausen, Larcker, and Sloan (1995) extend the work of Healy (1985) and examine the degree to which earnings manipulation is driven by maximisation of short-term bonus value. Their results support Healy's bonus-maximisation hypothesis. Guidry et al. (1999) find that business unit managers from multinational conglomerates manipulate earnings to maximise their short-term bonus plans. Duru and Iyengar (2001) explore the relationship between compensation variables and accounting- and market-based performance measures. Their evidence shows that CEOs' bonuses are more closely tied to accounting performance measures like earnings before interest and taxes (EBIT) and earnings per share. However, CEO incentive compensation is associated with the firms' market-based returns, which explicitly or implicitly incorporate accounting data.

B. Earnings Management and Information Asymmetry

Dye (1988) argues that the principal factor leading to earnings management practices is management's information advantage compared to current shareholders. This asymmetric information environment is thereby a prerequisite for earnings management. Trueman and Titman (1988) examine the conditions under which firms smooth reported income to create the impression of lower earnings variability. In their model, potential lenders do not recognise that the smoothed earnings result from asymmetric information between management and investors. Theoretically, if investors and creditors have access to the same information as management, like earnings forecasts and current research and development efforts, then the investors can use this information to undo the effects of earnings management. The incentives for earnings management would thereby disappear.

The Dye (1988) and Trueman and Titman (1988) studies suggest that two distinct groups of investors exist. One group benefits from earnings management and the other group pays the cost. The paying group cannot detect and undo the manipulated accounting numbers due to information asymmetry and simply accepts the investment

based on the managed earnings. Therefore the asymmetric information environment is an essential setting for earnings management.

Richardson (2000) contends that the disciplining mechanism of GAAP and the information asymmetry between management and shareholders determine the extent of earnings management. He hypothesises a positive relationship between information asymmetry and earnings management and uses the bid-ask spread and the dispersion of analyst forecasts as proxies for information asymmetry to explain managed accounting accruals. Richardson finds a positive relationship between the level of earnings management and the degree of information asymmetry. He also finds that under circumstances of high levels of information asymmetry, investors may not undo manipulated earnings due to insufficient information and their limited ability to monitor management actions due to a lack of sufficient resources, incentives, or access to relevant information.

C. Accounting Restatements

Defond and Jiambalvo (1991) employ a sample of 41 annual overstatement errors from 1977 to 1988 to compare characteristics of restatement and non-restatement companies. They propose that management overstates earnings to maximise their compensation and to avoid violation of debt covenants. They find that companies with restatements have diffuse ownership, lower earnings growth, relatively fewer income-increasing GAAP alternatives, and were less likely to have audit committees compared to companies without restatements. In addition, the overstatements were negatively correlated with growth in earnings.

Anderson and Yohn (2001) examine how the announcements of a forthcoming accounting restatement due to accounting errors and the filing of restated financial statements affect stock returns and information asymmetry. They find a significant market reaction (-3.79% for a seven-day window) surrounding the restatement announcements. They also report an increase in spreads around the announcements of revenue recognition, and suggest that revenue recognition issues increased the information asymmetry in the stock market.

Palmrose, Richardson, and Scholz (2001) examine market reaction to restatement announcements made between 1995 and 1999. They report a significantly negative market reaction of -9.2% associated with restatement announcements. A greater negative reaction is associated with statements that include negative implications for

management integrity and competence (management fraud, more material dollar effects and restatements attributed to auditors). Palmrose et al. suggest that the negative signal associated with fraud and auditor-initiated restatements is associated with an increase in investors' expected monitoring costs, while higher materiality is associated with greater revisions of future performance expectations. Erickson, Hanlon, and Maydew (2002) examine the extent to which firms pay additional income taxes on allegedly fraudulent earnings and provide evidence that firms are willing to sacrifice substantial cash to inflate their accounting earnings. Their sample consists of firms that restated their financial statements in conjunction with SEC allegations of accounting fraud during the years 1996 to 2002. Their analysis indicates that the mean firm sacrificed eleven cents in additional income taxes per dollar of inflated pre-tax earnings.

IV. Development of Testable Hypotheses

A. The Information Content Hypothesis

Announcements in this study are defined as the first public announcement that a company is involved with accounting irregularities. The sample is restricted to announcements of accounting irregularities and it excludes accounting errors, since accounting errors do not have the same implications with regard to the legal consequences, management involvement, and market reaction as compared to accounting irregularities. Accounting irregularity announcements may be hypothesised to reveal the following information to capital markets. 1) Previous financial statements, which investors and other capital market participants used to assess the value of the firm and its future financial prospects, are no longer reliable, contained false information, and it had to be restated. 2) Announcements of accounting irregularities signal potential legal action against the company, its management, its accounting firm and auditors, and any other parties involved. Dechow, Sloan and Sweeney (1996) and Griffin, Grundfest and Perino (2000) report a significant negative market reaction to announcements of SEC accounting and enforcement actions. 3) The announcement may convey negative information regarding management's integrity and competence. Incapable, dishonest, and incompetent management may need to be replaced. The process of management replacement or shifting will impose an additional cost on the firm and lower its value. Even if the management remains in place, future agency costs are more likely to be

higher. 4) If accounting irregularities involve earnings overstatement, then the announcement reveal negative information related to additional income taxes paid on overstated earnings (eg. Erickson, Hanlon, and Maydew (2002)).

Given that the announcement of accounting irregularities conveys the above negative information, it seems obvious that capital markets will react negatively to such information. However, it is of interest to estimate the extent of such reaction. Thus, the first testable hypothesis may be stated as follows. **Hypothesis 1**: *Stock market reaction to the announcements of accounting irregularities is expected to be negative and statistically and economically significant.*

B. Management Compensation Hypothesis

Management compensation plans are designed to motivate management to improve the firm's performance and to align the interests of management with those of shareholders. Jensen and Meckling (1976) argue that as long as the management team owns less than 100 percent of the company, they have incentives to maximise their own wealth at the expense of shareholders. Previous studies provide evidence that management compensation is explicitly or implicitly linked with accounting data, (Duru and Iyengar (2001)). As long as accounting data are used in compensation contracts, incentives can arise to manage the data in order to maximise management welfare, (Dye (1988)).

The earnings management literature provides evidence that management manipulates accruals and inventory in order to maximise their own compensation, (Healy (1985), Holthausen, Larcker, and Sloan (1995) and Gaver, Gaver, and Austin (1995)). Klinger, Hartman, Anderson, and Cavanagh (2002) find that CEOs in 23 companies involved in accounting irregularities earned 70 percent more than the typical CEO at a large company.

Two proxies for management compensation are employed. The ratio of total compensation to total assets (TCTA) is used to represent the level of compensation. Compensation structure is measured as the percentage of incentive compensation to total compensation (PINC).

Total compensation is the sum of annual compensation and long-term incentive compensation. Annual compensation includes salary, bonuses, and other annual compensation (perquisites and tax payment reimbursements). Long-term incentive

compensation includes restricted stock awards, options, stock appreciation rights (SARs), long-term incentive plan payouts (LTIP), and all others.

Abowd and Kaplan (1999) state that while total compensation measures the level of compensation and determines where the manager works, long-term incentive compensation determines how management works. PINC is measured as the long-term incentive compensation divided by total compensation. Several studies emphasise the importance of the long-term incentives, Jensen and Murphy (1990), as a determinant of firm performance. Mehran (1995), Main, Bruce, and Buck (1996), and McKnight and Tomkins (1999), find that firm performance is positively related to the percentage of executive compensation that is equity based.

If investors and the capital markets perceive that accounting irregularities are motivated by management's desire to increase either their total compensation or long-term incentive compensation, then one would anticipate finding a negative relationship between the announcement period cumulative average abnormal return (CAAR) and TCTA or PINC. Companies with high total compensation or a high percentage of incentive compensation (above median TCTA/PINC) will be associated with a more negative CAAR relative to companies with below median TCTA/PINC, and the difference in the CAARs is expected to be negative and statistically significant. Thus, the general hypothesis with regard to management compensation is stated below. **Hypothesis 2**: *The relationship between both total compensation and the percentage of incentive-based management compensation and the announcement period CAAR is expected to be negative and statistically significant.*

C. Information Asymmetry Hypothesis

Previous research points to the existence of information asymmetry between management and investors. Dye (1988) and Trueman and Titman (1988) suggest that information asymmetry is a necessary and sufficient environmental condition for earnings management to occur. Richardson (2000) finds that there is a systematic, positive relationship between the level of earnings management and the level of information asymmetry. Under the assumption that accounting irregularities represent an aggressive form of earnings management (although this is an understatement since in most of the cases, involvement in accounting irregularities is illegal) the implication of the above research is that firms with higher levels of information

asymmetry are more likely to engage aggressively in earning manipulation. The announcements of accounting irregularities reveal the extent of irregularities (the differences between actual earnings and the misstated earnings) and the capital markets will react by discounting share prices to reflect the new information. This suggests that there is a negative relationship between the level of information asymmetry and the announcement window CAAR. Announcements of companies with higher degrees of information asymmetry will be associated with more negative CAARs as compared to announcements by companies with lower levels of information asymmetry. This leads to the information asymmetry hypothesis. **Hypothesis 3**: *The relationship between the level of information asymmetry and the extent of accounting irregularities as reflected in the announcement period CAAR, is expected to be negative and statistically significant.*

Tobin's q ratio (TQ), firm size (SIZE), a high-tech (HITECH) dummy variable and financial leverage (LEV) are used as proxies for information asymmetry. Expectations regarding each proxy using both univariate tests and a multivariate cross-sectional model are discussed below. The actual specification of the regression models is deferred until the following section.

Tobin's q ratio is defined as the market value of equity divided by the book value of equity. The market value of equity reflects the value of intangible assets such as research and development (R&D) cost, intellectual property, patents, and trademarks. Aboody and Lev (2000) find that the degree of information asymmetry is positively associated with the R&D investment of the firm. They suggest that management tends to take advantage of the information asymmetry and benefits at the expense of shareholders. Thus, the higher the degree of information asymmetry (higher TQ ratio), the greater the probability that the management will aggressively be involved in accounting manipulation and irregularities. This implies that there is expected to be a negative relationship between the TQ ratio and the announcement period CAAR. Companies with higher (above median) TQ ratios will be associated with larger negative CAARs relative to companies with lower TQ ratios. Further, the difference between the above-median and below-median CAARs is expected to be negative and statistically significant. In the cross-sectional model, the parameter estimate for TQ ratio is expected to be negative and statistically significant.

Firm Size is measured by the (natural log) of sales. Lang and Lundholm (1993) state that larger firms tend to disclose more information in comparison to small firms.

Atiase (1985) finds that disclosure quality is an increasing function of firm size. Furthermore, larger firms are followed by more analysts and their shares are more widely held by investors. Thus, the larger the firm size, the lower the degree of information asymmetry and the less negative the market reaction to accounting irregularities is expected to be compared to smaller firms. Larger companies (above median SIZE) will be associated with less negative CAARs relative to smaller companies (below median SIZE) and the difference in the CAAR between the groups is expected to be positive and statistically significant. Furthermore, in the cross-sectional model, the relationship between CAAR and SIZE is expected to be positive and statistically significant.

High Technology firms are those with SIC code 3570 (computer equipment), 3577 (computer peripheral equipment), 7370 (computer programming, data processing), or 7372 (pre-packaged software) in this study. This variable is set equal to one if the announcements is by one of these firms and is zero otherwise. HITECH firms tend to derive their value from growth options as opposed to assets in place, and they tend to have a high degree of information asymmetry in comparison to other firms. High-tech firms are thereby expected to be associated with more negative CAARs in comparison to non-high tech firms. The difference in CAARs between high-tech and non-high tech firms is expected to be negative and statistically significant. In the cross-sectional model, the relationship between the CAAR and HITECH is expected to be negative and statistically significant.

Financial Leverage is proxied by the ratio of total liabilities to the sum of total liabilites plus market value of equity. Defond and Jiambalvo (1994) find evidence of earnings management when firms are close to their lending covenant limits. They argue that firms which violate debt covenants can be subjected to a costly re-contracting, and management may have incentives to manage earnings to avoid such violations. However, Sweeney (1994) finds no evidence of earnings management to avoid lending contractual violations. Companies with high degrees of financial leverage are possibly more closely monitored by the capital markets. Such monitoring may reduce the level of information asymmetry between management and investors. This implies that companies with higher (above median) degrees of financial leverage (and lower levels of information asymmetry) are expected to be associated with less negative CAARs in comparison to firms with lower financial leverage. In the cross-

sectional model, the relationship between the CAAR and LEV is expected to be positive and statistically significant.

D. Historical Performance, Management Competence and Shareholder Lawsuits

A firm's historical financial performance, management competence and subsequent lawsuits may also influence the market reaction to accounting irregularities. Historical performance is measured by return on assets (ROA). Management integrity and competence (POSITION) is proxied by a dummy variable that reflects whether management is subsequently fired or resigns. A dummy variable (LAWSUIT) is also employed to show whether the company subsequently becomes subject to a class action lawsuit.

Return on Assets (net income divided by total assets) measures a firm's historical profitability and financial performance. Mehran (1995) uses ROA as a proxy for firm performance. Defond and Jiambalvo (1991) indicate that managements with smaller earning growth rates have the incentive to overstate earnings. ROA is hypothesised to reflect a firm's historical profitability and management with poor historical performance has greater incentive to be involved in accounting irregularities. This implies that management of companies with poor financial performance (below median ROA) are more likely to be involved in accounting irregularities and will be associated with more negative CAARs relative to companies with good financial performance. The difference in CAARs between the two groups is expected to be negative and statistically significant. In the cross-sectional model, the relationship between the CAAR and ROA is expected to be positive and statistically significant.

Management's Integrity and Competence may be called into question as a result of announcements of accounting irregularities. Incapable, dishonest, and/or incompetent management may need to be replaced and instances where this happens would suggest more serious incidents. This process will presumably impose an additional cost on the firm and lower its value. As a proxy for this proposition a dummy variable is utilised which takes a value of one if the management is subsequently fired or resigned and zero otherwise. Companies where the management team is fired or replaced are expected to be associated with a more negative market reaction relative to firms where the management remains in position. The difference

in CAARs between the two groups is expected to be negative and statistically significant.

Class Action Lawsuits filed against the company, its management, its accounting firm and auditors, and any other parties involved, in the wake of the announcement of accounting irregularities may have an impact on the market's reaction. These actions may have severe consequences and impose heavy costs on the firm. Griffin, Grundfest, and Perino (2000) and Dechow, Sloan, and Sweeney (1996) report a significant negative market reaction to announcements of SEC accounting and enforcement actions. As a proxy for class action lawsuits a dummy variable is utilised which equals one if the firm becomes subject to a class action lawsuit and is zero otherwise. Companies that become subject to class action lawsuits are expected to be associated with a more negative CAAR relative to those companies which are not.

Table 1 summarises the hypotheses and variables involved in this analysis. This table also describes the expected signs of the proxy variables in relation to the CAARs in the regression analysis.

Insert Table 1 about here.

V. Data Description and Method of Analysis

A. Data Description

The initial sample of accounting irregularity announcements was obtained using the *Dow Jones Interactive Library* and a keyword search of "accounting irregularities" for the period between January 1, 1980 and December 31, 2000. Four excerpted examples of these announcements are shown in Appendix 1. The initial sample of 193 announcements of accounting irregularities has been subjected to the following criteria to produce the final sample of 117 announcements.

1. No major confounding events (bankruptcy filing announcements, merger or acquisition announcements, dividend announcements, capital structure changes, etc.), occurred within a three-day window from one day before, to one day after, the accounting irregularities announcement.
2. The firm had returns available on the CRSP Daily Return File 250 days before to 90 days after the announcement day.

3. The announcement is specifically related to accounting irregularities and it does not represent an accounting error.

The financial variables, (total sales, net income, EBIT, book value of equity, long-term debt, total assets, and total liabilities) were obtained from Datastream or from the EDGAR database which is publicly available on the SEC website. These financial variables are from the year prior to the announcement year. Financial variable data for 18 firms cannot be found on DataStream or EDGAR. These announcement dates were too early and EDGAR does not maintain SEC files for the period before 1993.

The compensation data of the firms were collected from the DEF-14A proxy statements. Compensation data are classified into the seven categories in this report's summary compensation tables. These tables show information related to the top five officers in the firm according to their rank. The categories include salary, bonus, other annual compensation (including perquisites and tax payment reimbursements), restricted stock awards, options or stocks appreciation rights (SARs), long-term incentive plan payouts and all other compensation. The average dollar value of each category (except for options and SARs) for the top five executives, were calculated using data from the year before the announcement year.

For options and SARs the five variables necessary to estimate the value of call options using Black and Scholes (1976) model were obtained as described below. The exercise price and expiration date were collected from the proxy statement. Five-year treasury bill rates are used as an estimate of the risk-free rate. The standard deviation of the underlying asset was estimated over the 160-day period (from -90 to -250 relative to the announcement day) using of share price returns data. The underlying asset's share price market value is the 10-day average price (from day -12 to day -2 relative to the announcement day). The value of unexercised in-the-money options held by the top five executives is also collected. The stock ownership percentage of all current directors and executive officers is also retrieved from the proxy statement for the year before the announcement year. There are 44 firms with proxy files that are not available in EDGAR database.

Figure 1 provides a frequency distribution by type of accounting irregularity in the final sample. The classification criteria are based on the main features of the accounting irregularities and are somewhat subjective. This figure shows that more than half of the accounting irregularities either relate to revenue recognition or

income overstatement. Figure 2 provides a frequency distribution of the final sample by industry group. These classifications are based on the first digit of the SIC code. The two industries with the largest number of accounting irregularities are durable manufacturing and consumer services. Figure 3 provides a frequency distribution of the announcements by year. Of the 117 announcements, nine come from 1980s and the remaining 108 observations are from the 1990-2000 period. The largest number of announcements (29) occurs in the year 2000.

Insert Figures 1, 2 and 3 about here.

Table 2 provides descriptive statistics of selected financial variables (sales, net income, EBIT, book value of equity, long-term debt, book value of total assets, total liabilities, market value of equity, ROA, and return on equity (ROE)). The average firm is quite large with approximately $3.4 billion in market value, $2.8 billion in total assets, and $2.5 billion in sales. The profitability of the average firm is quite poor with ROA of -3.63% and ROE of -2.36%. This suggests that firms involved in accounting irregularities may already have some profitability problems.

Insert Table 2 about here.

Table 3 shows descriptive statistics on the management compensation data. The average total compensation for executives whose firms are involved in accounting irregularities is $7.08 million. The average level of fixed compensation and incentive compensation are $0.48 million and $6.6 million respectively. The average percentage of incentive compensation is 56.38% of total compensation. These figures show that, on average, more than half of management income comes from the incentive compensation.

Insert Table 3 about here.

B. Method of Analysis

This study uses two different methods of analysis: First, a market model is used to estimate the abnormal security returns associated with accounting irregularity

announcements. The slope and intercept terms used in the market model are estimated over a 160-day period (from day t = -250 to day t = -90, relative to the announcement day t=0). Following Patell (1976), the standardised abnormal return approach is used to generate test statistics. Several studies use the same procedure, for example, Linn and McConnell (1983), and Schipper and Smith (1983). The generalised sign Z (GSZ) test is used to test for the fraction of positive and negative average abnormal returns. The null hypothesis for the GSZ is that the fraction of positive returns is the same as in the estimation period. Cowan (1992) provides examples of the GSZ. Univariate tests for significant differences in CAARs between groups split on the basis of the variables previously described are employed to provide evidence on the hypotheses of interest.

Two multivariate regressions models are used to develop further evidence on the information asymmetry and management compensation hypotheses. In these regressions the dependant variable is the CAAR from day t = -1 to day t = +1 (CAAR3). The regression Model 1 used to test the information asymmetry hypothesis is given in equation (1) below.

$$CAAR3 = \alpha_0 + \alpha_1 TQ + \alpha_2 SIZE + \alpha_3 LEV + \alpha_4 HITECH + \varepsilon_1, \qquad (1)$$

where: TQ = market value of equity divided by book value of equity,
SIZE = (natural log of) total sales,
LEV = total liabilities (TL)/(TL plus market value of equity), and
HITECH = a dummy variable that takes the value of one if the firm is in a high-tech industry and zero otherwise.

To provide evidence regarding the effects of historical performance, management competence and shareholder lawsuits on market reaction to accounting irregularity announcements the ROA, POSITION and LAWSUIT variables are added onto regression model above to yield Model 2.

Regression Model 3 shown in equation (2) below is used to develop multivariate evidence for the management compensation hypothesis.

$$CAAR3 = \alpha_0 + \alpha_1 TCTA + \alpha_2 PINC + \varepsilon_3, \qquad (2)$$

where: TCTA = total management compensation divided by total assets, and
PINC = long-term incentive compensation divided by total compensation.

As was the case with Model 1 above, Model 3 here is similarly expanded with the addition of the ROA, POSITION and LAWSUIT variables, and this is designated Model 4. Also, as previously noted, the expected signs of the parameter estimates under each of the hypotheses are summarised in Table 1.

6. Empirical Results

A. Univariate Tests

Table 4 shows that the three-day announcement period CAAR is a negative –24.88% (Z-statistic of –11.469) which is significant at the 0.1% level. The ratio of positive to negative returns is 10:107, and the generalised sign-Z test is –8.326 which is also significant at the 0.1% level. These results are consistent with hypothesis 1 that the announcement of accounting irregularities conveys negative information to the capital market. As expected this signals that the future prospects of the company are unfavourable. The results also indicate that the level of market reaction to the announcement of accounting irregularities is much larger in magnitude compared to market reaction to overstatement announcements as found by Palmrose, Richardson, and Scholz (2001) who report a CAAR of -9.20%, and Richardson (2000) who reports a CAAR of -3.51% over a seven-day window around restatement announcements. This suggests that previous studies do not adequately predict the impact of accounting irregularities on shareholders' wealth.

Insert Table 4 about here.

Prior to the three-day announcement period the AARs on both days –4 and –2 are negative and significant at the 1%, and 0.1% levels, respectively. This suggests some leakage of information prior to the public announcement of the accounting irregularity. In fact, all of the various period CAARs shown at the bottom of Table 4 are significant based on both the Z-statistics and the generalised sign Z statistics, except one. That exception is the post-event CAAR (t = +2, t = +90), which suggests that the market reaction at the announcement efficiently incorporates the negative information. This point is reinforced visually by Figure 4 which shows a massive

downward spike in the AAR at day 0, and then a rebound to approximately a 0% return by day two. Equally impressive, but necessarily distressing for shareholders in these firms is the line showing the CAAR, which is still at around –60% ninety days after the announcement.

Insert Figure 4 about here.

Table 5 portrays the univariate results depicting evidence for tests of the information asymmetry hypothesis, using differences in CAARs split on the basis of above- and below-median TQ, SIZE, LEV and whether firms are in HITECH industries or not. Companies with high TQ ratios are associated with more negative CAARs relative to companies with lower a TQ, which is as expected. The difference in the CAARs between high and low TQ firms equals -8.84%, however the Z-test statistic is only significant at the 10% level. Large SIZE firms are associated with less negative market reaction (-19.18) relative to smaller size firms (-30.03). Further, the difference in the CAARs (10.85) is, as expected, positive and statistically significant at the 0.1% level. Companies with a higher degree of leverage are associated with a lower CAAR of (-16.55) relative to companies with higher degrees of financial leverage (CAAR = -32.71). The difference in the CAARs between the two groups is, as expected, negative (-26.70) and is statistically significant at the 0.1% level. HITECH firms are associated with more negative CAARs (-34.13) relative to non-high-tech firms. The difference in the CAARs is negative (-12.44) and statistically significant at 5% level. This result is consistent with expectations under the information asymmetry hypothesis, as are the TQ, SIZE and LEV results. These results provide consistent support for the information asymmetry hypothesis and suggest that information asymmetry provides the environmental conditions for management to become involved in accounting irregularities.

Insert Table 5 about here.

Table 6 reports the results of market reaction based on management compensation variables. It indicates that companies with a high ratio of TCTA are associated with a more negative market reaction (-33.98) relative to companies with a lower level of

total compensation (–19.83). The difference in CAARs between the high and low TCTA firms equals -14.15, which is statistically significant at the 5% level. These results are exactly as expected under the management compensation hypothesis. Companies with a higher percentage of incentive compensation relative to total compensation (PINC) are associated with a more negative CAAR (-29.81) relative to companies with lower PINC (CAAR is –24.11). However, the difference in CAARs, while negative (-5.70) as expected, is not statistically significant. These results are consistent with the management compensation hypothesis. This suggests that the market perceives management involvement in accounting irregularities is primarily to maximise their total compensation, and to a lesser extent, their incentive-based compensation.

Insert Table 6 about here.

Table 7 reports market reaction based on historical performance as represented by ROA, changes in management, and shareholder class action lawsuits. Companies with higher ROAs are associated with less negative CAARs (-16.33) relative to companies with lower ROAs (CAAR is –32.94). The difference in CAARs is positive (16.61) and statistically significant at 0.1%. This suggests that companies involved in accounting irregularities are already exhibiting poor performance. Companies where the management is subsequently fired or resign are associated with more negative CAAR (-30.43) relative to companies where the management maintains their positions (CAAR equals –21.53). The difference in CAARs (-8.90) is negative, but is only marginally significant at the 10% level. This result suggests that the announcement conveys negative information about management integrity, and is consistent with the market anticipating that management will be replaced. Firms that subsequently become subject to a class action lawsuit, are associated with a more negative CAAR (-32.79) relative to companies which do not (CAAR is -15.96). The difference in the CAARs between the two groups is negative (-16.83) and is statistically significant, as expected. This suggests that, at the time of the announcement, the market anticipates the possibility that the company will be subject to legal action.

Insert Table 7 about here.

B. Multivariate Regression Results

Table 8 reports the results of running the two cross-sectional models to test the information asymmetry hypothesis. This table shows the normal t-test for parameter estimate significance as well as the White test statistic which is corrected for heteroscedasticity. Model 1 shows that TQ, SIZE, and LEV are all significant and have the predicted signs. HITECH has the expected sign, although it is not statistically significant. The F-test statistic for the overall model is significant at the 0.1% level and the model's adjusted R-square value is 0.164.

Insert Table 8 about here.

Model 2 includes the same variables as in Model 1 with the addition of three control variables (ROA, LAWSUIT, and POSITION). In Model 2, the TQ, SIZE and LEV variables maintain the same sign, although SIZE loses its significance and the significance of the other two variables is reduced. The sign of the insignificant HITECH variable changes from negative to positive. The three added variables have the predicted signs, but only the LAWSUIT variable is statistically significant (based on both the t-test and White test statistics). The F-test for this model is significant at the 0.1% level and in comparison to Model 1, its adjusted R-square is markedly higher at 0.253.

These results lend support to the information asymmetry hypothesis, and to a large extent confirm the results of the univariate analysis. This suggests that the higher the degree of information asymmetry, as measured by TQ, SIZE, LEV, and HITECH, the more likely that the management will be involved in accounting irregularities, and the larger the negative effect on shareholders' wealth. Further, the significant negative findings for LAWSUIT reinforce earlier results consistent with the market being able to anticipate the filing of class action lawsuits subsequent to accounting irregularity announcements.

Table 9 reports the results of the cross-sectional regression models used to test the management compensation hypothesis. Model 3 shows that TCTA and PINC have the predicted negative signs. TCTA is statistically significant at the 1% level, but

PINC is not found to be signficant. The F-test is significant at the 0.1% level and the adjusted R-square of 0.144 indicates a reasonable level of goodness-of-fit for the model.

Insert Table 9 about here.

Model 4 includes the same variables as in Model 3 with the addition of the three control variables (ROA, LAWSUIT, and POSITION). As in Model 3, TCTA is negative and statistically significant, and the PINC variable retains its negative sign. Both the LAWSUIT and POSITION variables have a negative sign as predicted, and LAWSUIT's parameter estimate is significantly different from zero at the 5% level. Again the overall model is significant based on the F-test and the adjusted R-square rises moderately (0.188) in comparison to Model 3.

These results are consistent with the argument that market participants believe management uses irregular accounting methods to maximise their total compensation (including both fixed and the long-term incentive components) and reacts accordingly. Also, as was the case with the Model 2 results, the significant, negative finding for LAWSUIT is consistent with the market's ability to predict which accounting irregularity events will result in shareholder lawsuits.

VII. Summary and Conclusions

The results of this study show that public, government, and shareholder concerns with regard to the impact of accounting irregularities on shareholders' wealth are extremely valid. Market reaction to announcements of accounting irregularities has a highly negative effect on shareholders' wealth. This negative impact is found to be statistically significant using both univariate and multivariate tests. More practically, the calculated three-day, market-adjusted, average cumulative loss of nearly 25% would certainly be considered economically significant by most investors.

In addition, the empirical results offer evidence on aspects of the corporate environment which are more likely to give rise to the occurrence of accounting irregularities. As is anticipated, the larger the degree of information asymmetry, the more negative the impact on shareholders' wealth. Information asymmetry between management and investors is found to affect market reaction more negatively for

firms with high Tobin's q values, relatively smaller firm size, lower levels of leverage and those companies engaged in high tech industries.

This study also provides evidence suggesting that market participants react as if they believe that accounting irregularities are the result of management actions motivated by their desire to maximise their own total compensation. While the main objective of long-term incentive compensation is to align the interest of the management with those of shareholders, this study provides evidence that the motivational aspects of incentive-based compensation are not viewed favourably by investors, in the wake of accounting irregularity announcements.

Firms with relatively poorer performance as proxied by return on assets experience significantly more negative market reaction to accounting irregularity announcements. The market is found to react less severely to these announcements when it correctly anticipates the subsequent replacement of the management of these firms, through either resignation or termination. Finally, the market appears to exhibit a remarkable degree of prescience in that it shows a consistently significant ability to predict which accounting irregularity announcements will subsequently result in shareholder class action lawsuits.

In conclusion, the recent attempts by the U.S. federal government to better control incidents of corporate dishonesty as manifested in improper and illegal accounting practices through passage of the Sarbanes-Oxley Corporate Reform Act of 2002 seem to be well-founded and necessary. Among its aims are to expose and punish dishonest corporate leaders while recognising those who are honest by lifting the shadow of suspicion from them.[3] It specifically notes that the high standards of the accounting profession will be enforced and that both auditors and accountants will be held accountable. Both shareholders and workers are expected to benefit. The former because the financial information provided will be true and reliable and the latter because reckless corporate practices which artificially inflate stock prices and lead to corporate failure will not be tolerated. On the basis of the findings of this research, all interested parties should hope this act's goals are realised.

[3] Paraphrased from White House Press Release, 30 July, 2002.

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Table 1
Summary of the Hypotheses Tested, Variables used as a Proxy for Each Hypothesis, Variable Description, and the Variable's Expected Sign Under the Given Hypothesis.

Hypothesis/ Variable	Variable Definition	Expected Sign
Information Content		
CAAR3	Cumulative Average Abnormal Returns from Day –1 to Day +1	Negative
Management Compensation		
TCTA	(Total Compensation)/(Total Assets)	Negative
PINC	(Incentive Compensation)/(Total Compensation)	Negative
Information Asymmetry		
TQ	(Market Value of Equity)/(Book Value of Equity)	Negative
SIZE	Log of (Total Sales)	Positive
HITCH	Hi-Tech Firms=1, Others=0	Negative
LEV	(Total Liabilities)/(Total Liabilities + Market value of Equity)	positive
Historical Performance, Management Competence and Shareholder Lawsuits		
ROA	(Net Income)/(Total Assets)	Positive
POSITION	Management Resigned or Fired=1, No Change=0	Negative
LAWSUIT	Class Action Lawsuit=1, No Class Action lawsuit=0	Negative

Table 2
Summary Statistics of Selected Company Account Data for the Final Sample

Sales are total annual sales. NI is net income. EBIT is earnings before interest and taxes. BVE is the book value of equity. LTD is long term debt. TA is total assets. TL is total liabilities. MVE is the market value of equity. ROA is return on assets. ROE is the return on equity. All amounts are in millions of dollars, except ROA and ROE which are in percentage terms. Std is the standard deviation, N is the number of observations.

Variable/ Statistics	Sales	NI	EBIT	BVE	LTD	TA	TL	MVE	ROA	ROE
Mean	2,557.5	88.3	223.7	1,064.5	739.9	2,840.3	1,775.8	3421.4	-3.6	-2.4
Median	278.0	2.1	8.4	133.4	54.8	383.2	223.7	235.0	1.1	3.0
Std	6,675.7	392.7	698.6	3,341.5	1,899.3	7,601.1	4,498.2	11,013.1	27.3	72.2
Minimum	2.0	-1118.7	-132.1	2.4	0.0	9.4	3.7	3.2	-165.1	-218.8
Maximum	35,211	2,489	4,314	26,172	10,994	48,792	22,895	74,263	152	498
Kurtosis	13.4	18.9	18.2	36.4	14.6	18.7	13.0	24.9	22.5	25.8
N	99	99	99	99	95	99	99	117	99	99

Table 3
Summary Statistics of Management Compensation Structure Variables

Salary is annual salary. Bonus is the annual bonus. OAC is other annual compensation including perquisites and tax payment reimbursement. AOC is all other compensation (including restricted stock awards, stock appreciation rights, long-term incentive plan payouts). Options is the value of stock options. Fixed Comp. is the fixed compensation which is the sum of salary, bonuses, and other annual compensation. Incentive Comp. is the sum of option values and all other long-term incentive compensation. VUE is the value of unexercised in-the-money options which are exercisable. VUU is the value of unexercised in-the-money options which are unexercisable. Percentage of incentive compensation (PINC) equals incentive compensation divided by total compensation. All values are in millions of dollars, except PINC which is in percentage terms. Std is the standard deviation, N is the number of observations.

Variable/ Statistics	Salary	Bonus	OAC	AOC	Options	Fixed Comp	Incentive Comp	Total Comp	VUE	VUU	PINC
Mean	0.29	0.17	0.02	0.31	6.30	0.48	6.60	7.08	4.96	3.24	56.38
Median	0.22	0.06	0.00	0.01	0.57	0.33	0.62	1.06	0.43	0.21	61.88
Std	0.17	0.38	0.09	1.04	24.75	0.54	25.59	25.79	22.57	12.46	31.51
Kurtosis	1.67	29.43	41.54	25.41	34.56	19.53	34.03	33.30	65.03	61.39	-1.19
Minimum	0.10	0.00	0.00	0.00	0.00	0.12	0.00	0.13	0.00	0.00	0.00
Maximum	0.80	2.64	0.66	6.46	174.58	3.48	180.11	180.92	189.26	103.61	99.56
N	73	73	73	73	73	73	73	73	72	72	73

Table 4

Average, Cumulative Average, and Median Average Abnormal Returns

Average Abnormal Return (AAR), Cumulative Average Abnormal Return (CAAR), and Median Abnormal Return (MAR) are from the Market Model using the Standardised Cross-Sectional method. Z Stat is the Z-test statistic testing if AAR is significantly different from zero. N is number of announcements, Pos:Neg is the number of positive and negative abnormal returns, GSZ is the Generalised Sign Z statistic.

Day	AAR (%)	CAAR (%)	MAR (%)	N	Pos:Neg	Z Stat.	GSZ
-90	-0.32	-0.32	-0.05	117	56:61	-0.475	0.195
-70	-0.25	-4.66	-0.17	117	52:65	-0.429	-0.546
-50	-0.35	-7.96	-0.02	117	57:60	-1.167	0.38
-30	-1.07	-15.74	-0.88	117	37:80	-2.609**	-3.324***
-20	-0.50	-18.58	-0.28	117	49:68	-0.621	-1.102
-10	-0.44	-19.82	-0.14	117	53:64	-0.663	-0.361
-5	-0.27	-22.89	-0.24	117	52:65	-0.506	-0.546
-4	-1.10	-23.99	-0.38	117	41:76	-2.585**	-2.583**
-3	-0.52	-24.51	-0.66	117	45:72	-1.114	-1.843$
-2	-2.81	-27.32	-1.39	117	34:83	-4.626***	-3.880***
-1	-1.59	-28.91	-0.54	117	47:69	-2.262*	-1.391
0	-18.77	-47.68	-8.22	117	22:92	-9.068***	-5.918***
1	-5.53	-53.21	-2.32	117	39:67	-2.726**	-2.098*
2	0.12	-53.09	0.04	107	56:51	0.033	1.114
3	0.16	-52.93	-0.74	106	45:61	-0.069	-0.93
4	-1.62	-54.55	-0.23	107	47:60	-1.723$	-0.63
5	-2.58	-57.13	-1.08	108	41:67	-1.974*	-1.874$
10	0.64	-53.60	-0.15	106	48:58	0.745	-0.347
20	-1.13	-55.56	-0.42	105	43:62	-1.064	-1.234
30	-0.16	-58.46	-0.12	103	48:55	0.305	-0.073
50	-0.02	-56.57	0.03	93	47:46	0.112	0.691
70	-0.32	-62.37	-0.18	85	40:45	-0.523	0.018
90	-1.24	-64.38	-0.24	84	38:46	-1.852$	-0.317

Period	N	CAAR	MCAAR	Pos:Neg	Z Stat	GSZ
(0,+1)	117	-24.30	-10.54	30:87	-10.770***	-7.662***
(-1,0)	117	-19.87	-9.95	20:97	-9.338***	-6.474***
(-1,+1)	117	-24.88	-21.18	10:107	-11.469***	-8.326***
(-2,+2)	117	-27.58	-24.74	11:106	-12.142***	-8.141***
(-5,+5)	117	-33.18	-28.63	11:106	-11.142***	-8.141***
(-10,+10)	117	-33.19	-30.42	14:103	-9.408***	-7.585***
(-90,-2)	117	-27.32	-21.00	32:85	-6.259***	-4.251***
(+2,+90)	110	-9.74	-4.01	48:62	-1.388	-0.699
(-90,+90)	117	-61.35	-47.64	29:88	-7.547***	-4.806***

$, *, **, *** denotes significant at 10%, 5%, 1% and 0.01% level, respectively.

Table 5
Equity Market Reaction to Accounting Irregularities Based on Information Asymmetry Variables

No. is a reference label. N is number of announcements. CAAR is the Cumulative Average Abnormal Return. MCAR is the median cumulative abnormal return. Z-Stat is the statistic testing for the significance of the CAAR. Pos:Neg is the number of positive to negative returns. GSZ is the generalised sign z statistic testing for significance of the positive to negative returns. SIZE is the natural log of sales. LEV is the ratio of total liabilities to the sum of total liabilities plus market value of equity. HITECH Industry refers to firms with SIC code 3570 (computer equipment), 3577 (computer peripheral equipment), 7370 (computer programming, data processing), or 7372 (pre-packaged software). N/A means not applicable.

No	Classification Criteria	N	CAAR	MCAR	Pos:Neg	Z-Stat	GSZ
1.2	Above Median Tobin's q	50	-28.92	-21.89	2:48	-8.660***	-6.072***
1.2	Below Median Tobin's q	49	-20.08	-21.30	8:41	-5.892***	-4.345***
1.3	Unknown	18	-26.70	-27.69	0:18	-6.281***	-3.939***
	Difference (1.1-1.2)		-8.84	-0.59	N/A	-1.79	N/A
2.1	Above Median SIZE	50	-19.18	-12.71	4:46	-6.480***	-5.554***
2.2	Below Median SIZE	49	-30.03	-32.02	6:43	-8.079***	-4.868***
2.3	Unknown	18	-26.70	-27.69	0:18	-6.281***	-3.939***
	Difference (2.1-2.2)		10.85	19.31	N/A	2.20*	N/A
3.1	Above Median LEV	50	-16.55	-8.34	9:41	-5.091***	-4.116***
3.2	Below Median LEV	49	-32.71	-32.02	1:48	-10.196***	-6.321***
3.3	Unknown	18	-26.70	-27.69	0:18	-6.281***	-3.939***
	Difference (3.1-3.2)		16.16	23.68	N/A	3.37***	N/A
4.1	HITECH Industry	30	-34.13	-32.91	1:29	-7.054***	-4.801***
4.2	Non HITECH Industry	87	-21.69	-17.48	9:78	-9.286***	-6.836***
	Difference (4.1-4.2)		-12.44	-15.43	N/A	2.49*	N/A

*, and *** denote significance at the 5% and 0.1% levels, respectively, using a 2-tailed test.

Table 6
Equity Market Reaction to the Announcements of Accounting Irregularities based on Management Compensation Variables

No. is a reference label. N is number of firm returns for a given category. CAAR is the Cumulative Average Abnormal Return. MCAR is the median CAAR. Z-Stat is the statistic testing for the significance of the CAAR. Pos:Neg is the number of positive to negative returns. GSZ is the generalised sign z statistic testing for significance of the positive to negative returns. N/A means not applicable.

			Announcement Day t-1 Through Day t+1				
No	**Classification Criteria**	**N**	**CAAR**	**MCAR**	**Pos: Neg**	**Z-Stat**	**GSZ**
	All announcements	117	-24.88	-21.18	10:107	-11.469***	-8.326***
1.0	**Total compensation to total assets (TCTA)**						
1.1	Above Median (0.2147%)	37	-33.98	-31.29	4:33	-6.614***	-4.410***
1.2	Below median (0.2147%)	36	-19.83	-15.61	3:33	-6.089***	-4.665***
1.3	Unknown	44	-21.36	-20.62	3:41	-7.261***	-5.313***
	Difference (1.1-1.2)		-14.15	-15.68	N/A	-2.39*	N/A
2.0	**Incentive compensation to total compensation (PINC)**						
2.1	Above median (61.88%)	37	-29.81	-18.32	2:35	-6.362***	-5.091***
2.2	Below median (61.88%)	36	-24.11	-24.37	5:31	-6.358***	-3.974***
2.3	Unknown	44	-21.36	-20.62	3:41	-7.261***	-5.313***
	Difference (2.1-2.2)		-5.70	6.05	N/A	-0.94	N/A

*** denotes significance at the 0.1% level, using a 2-tailed test.

Table 7
The Market Reaction to Accounting Irregularity Announcements based on Return on Assets, Change in Management and Shareholder's Class Action Lawsuits

No. is a reference label. N is number of firm returns for a given category, CAAR is the Cumulative Average Abnormal Return, MCAR is the median CAAR, Z-Stat is the statistic testing for the significance of the CAAR. Pos:Neg is the number of positive to negative returns. GSZ is the generalised sign z statistic testing for significance of the positive to negative returns. N/A means not applicable.

			Announcement Day t-1 Through Day t+1				
No	**Classification Criteria**	**N**	**CAAR**	**MCAR**	**Pos:Neg**	**Z-Stat**	**GSZ**
1.0	**Return on Assets (ROA)**						
1.1	Above Median ROA	50	-16.33	-13.62	6:44	-6.485***	-4.993***
1.2	Below Median ROA	49	-32.94	-33.79	4:45	-7.785***	-5.435***
1.3	Unknown	18	-26.70	-27.69	0:18	-6.281***	-3.939***
1.4	Difference (1.1-1.2)		16.61	20.17	N/A	3.48***	N/A
2.0	**Top Position Changes (POSITION)**						
2.1	Top Officials Fired/Resigned	44	-30.43	-32.46	4:40	-7.151***	-4.983***
2.2	No Changes	73	-21.53	-14.69	6:67	-9.254***	-6.672***
2.3	Difference (2.1-2.2)		-8.90	-17.77	N/A	-1.95	N/A
3.0	**Shareholder Class Action (LAWSUIT)**						
3.1	With Class Action	62	-32.79	-35.71	2:60	-10.408***	-6.908***
3.2	Without Class Action	55	-15.96	-10.51	8:47	-6.288***	-4.809***
3.3	Difference (3.1-3.2)		-16.83	-25.20	N/A	-4.01***	N/A

*** denotes significance at the 0.1% level.

Table 8
Cross-Sectional Regression Models Testing the Information Asymmetry Hypothesis

The dependent variable CAAR3 is the cumulative average abnormal return from day -1 to day +1.ROA equals net income divided by total assets. TQ is the ratio of market value of equity to book value of equity; LEV is the ratio of total liabilities to the sum of total liabilities and market value of equity. SIZE is the log of total sales. HITECH is the one/zero dummy variable for high technology firms; LAWSUIT (POSITION) is the one/zero dummy variable for shareholder's class action lawsuits (top management resignation and firing) subsequent to the announcement. t-Test is the statistic testing whether the parameter estimate is significantly different from zero. White Test is the t-Test corrected for heteroskedastic error terms. VIF is the variance inflation factor. F-test is the test for the overall explanatory power of the regression. R-square (Adjusted R-square) is the regression coefficient of determination (corrected for degrees of freedom). N/A means not applicable.

	Expected	Model 1				Model 2			
Variable	**Sign**	**Estimate**	**t -Test**	**White Test**	**VIF**	**Estimate**	**t-Test**	**White Test**	**VIF**
Intercept	N/A	-47.69	-4.91***	-6.63***	0	-31.53	-3.05**	-3.88***	0
TQ	(–)	-0.62	-1.7$	-1.79$	1.15	-0.59	-1.71$	-1.67$	1.16
SIZE	(+)	6.00	2.2*	2.75**	1.14	4.30	1.60	2.01*	1.24
LEV	(+)	0.27	2.4*	2.81**	1.45	0.20	1.82$	2.30*	1.53
HITECH	(–)	-1.54	-0.25	-0.28	1.45	0.10	0.02	0.02	1.55
ROA	(+)	-	-	-	-	0.16	1.87$	1.32	1.18
LAWSUIT	(–)	-	-	-	-	-12.66	-2.6*	-2.81***	1.20
POSITION	(–)	-	-	-	-	-3.74	-0.77	-0.78	1.17
		F-test		5.82***		**F-test**		5.73***	
		R-square		0.1985		**R-square**		0.3059	
		Adjusted R-square		0.1644		**Adjusted R-square**		0.2525	

$, *, **, and *** denote statistical significance at the 10%, 5%, 1% and 0.1% levels, respectively, using a 2-tailed test.

Table 9
Cross-Sectional Regression Models Testing the Management Compensation Hypothesis

The dependent variable CAAR3 is the cumulative average abnormal return from day -1 to day +1.ROA equals net income divided by total assets. TCTA is the ratio of total compensation to total assets. PINC is the ratio of incentive compensation to total compensation. HITECH is the one/zero dummy variable for high technology firms; LAWSUIT (POSITION) is the one/zero dummy variable for shareholder's class action lawsuits (top management resignation and firing) subsequent to the announcement. t-Test is the statistic testing whether the parameter estimate is significantly different from zero. White Test is the t-Test corrected for heteroskedastic error terms. VIF is the variance inflation factor. F-test is the test for the overall explanatory power of the regression. R-square (Adjusted R-square) is the regression coefficient of determination (corrected for degrees of freedom). N/A means not applicable.

	Expected	Model 3				Model 4			
Variable	**Sign**	**Estimate**	**t -Test**	**White Test**	**VIF**	**Estimate**	**t-Test**	**White Test**	**VIF**
Intercept	N/A	-16.94	-2.91**	-3.56***	0	-7.74	-1.16	-1.40	0
TCTA	(–)	-5.27	-3.08**	-2.82**	1.13	-5.30	-2.9**	-2.64*	1.36
PINC	(–)	-0.09	-0.97	-1.01	1.13	-0.07	-0.76	-0.76	1.14
ROA	(+)	-	-	-	-	-0.02	-0.18	-0.18	1.22
LAWSUIT	(–)	-	-	-	-	-13.51	-2.23*	-2.59*	1.07
POSITION	(–)	-	-	-	-	-4.58	-0.76	-0.70	1.07
		F-test		7.04***		**F-test**		4.32***	
		R-square		0.1675		**R-square**		0.2440	
		Adjusted R-square		0.1437		**Adjusted R-square**		0.1876	

*, **, and *** denote statistical significance at the 5%, 1% and 0.1% levels, respectively, using a 2-tailed test.

Figure 1: Frequency Distribution by Types of Accounting Irregularities

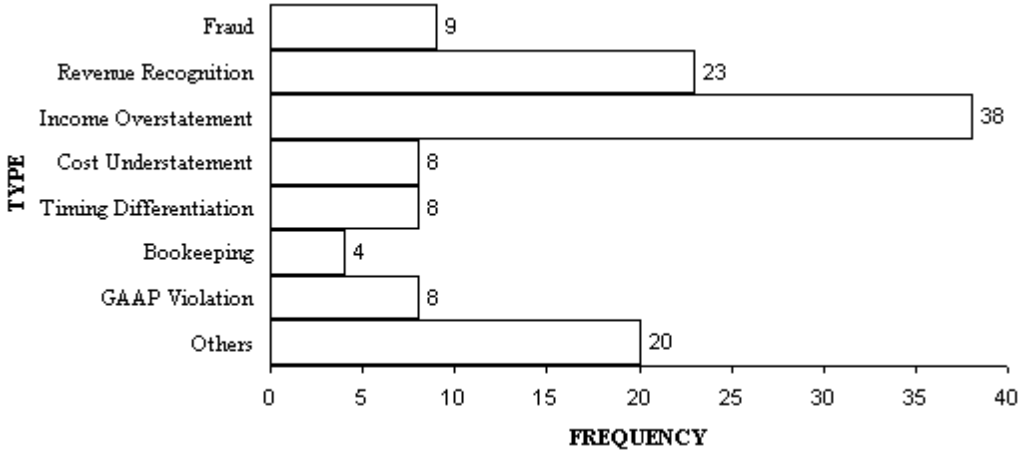


Figure 2: Frequency Distribution by Industry Group

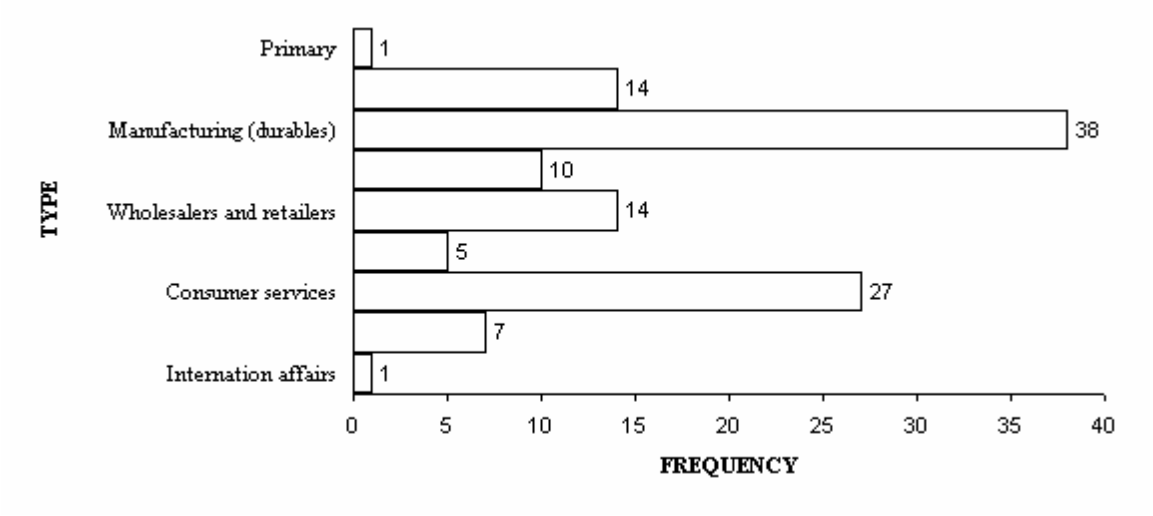


Figure 3: Frequency Distribution of the Final Sample by Year of Announcement

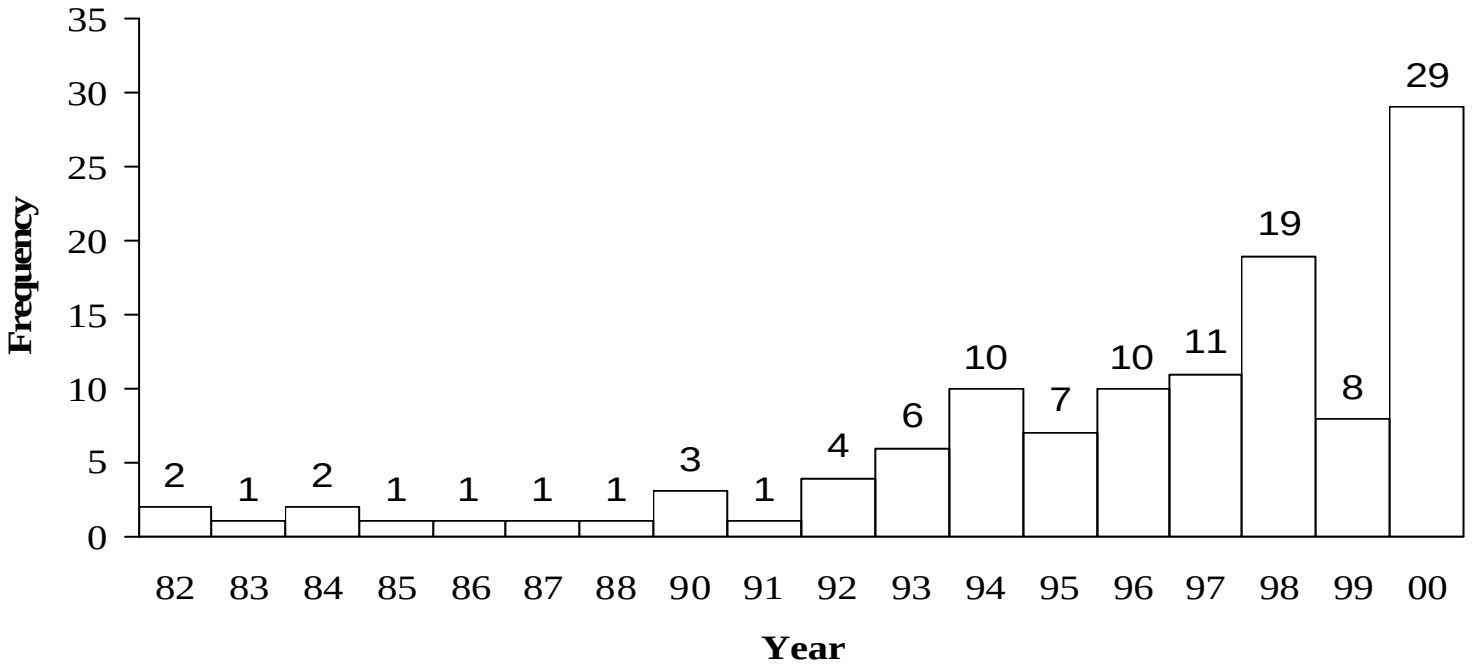
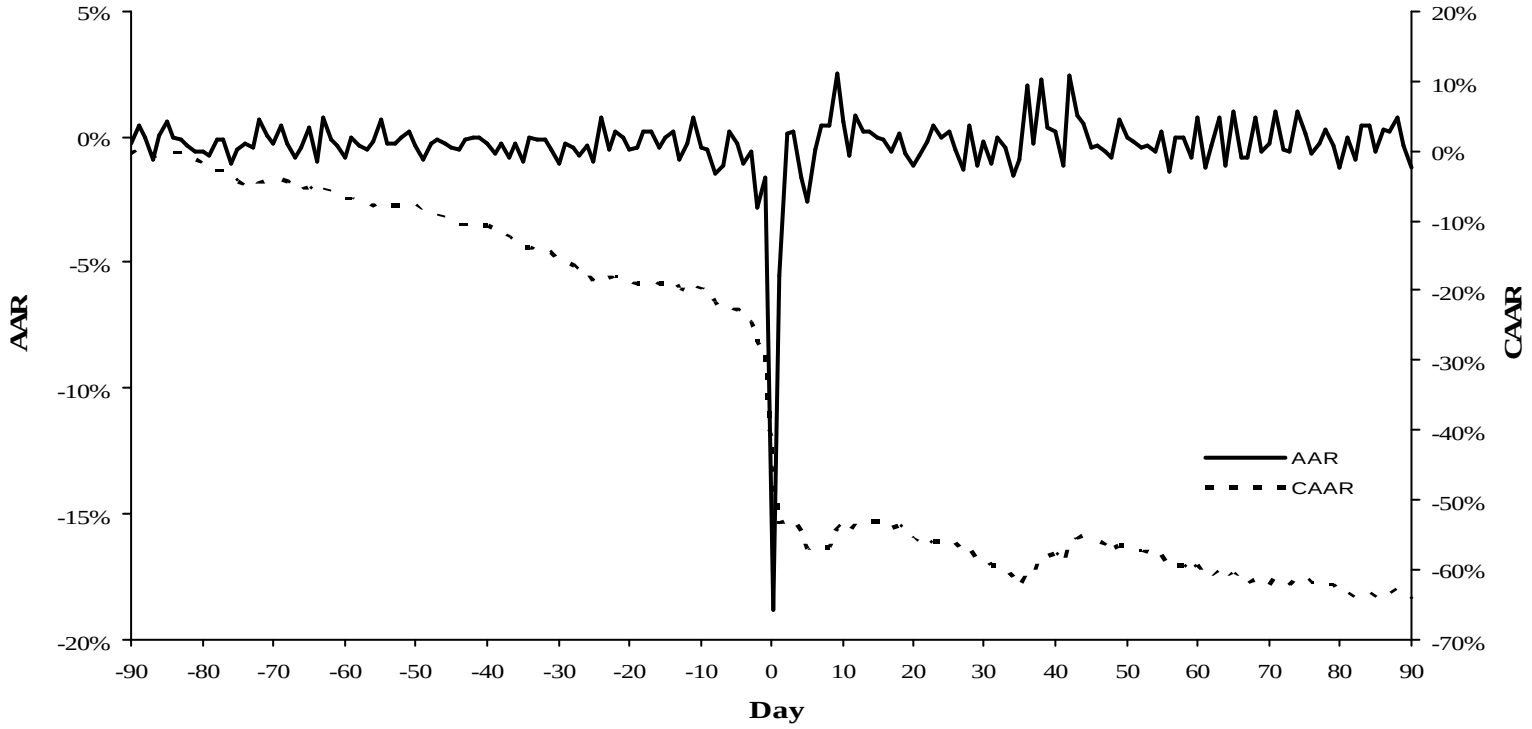


Figure 4: Average (AAR) and Cumulative Average Abnormal Returns (CAAR) 90 Days before, to 90 Days after, the Announcement of Accounting Irregularities



Appendix: Examples of Accounting Irregularities Announcements

1. "**Cedant Corp** said it discovered "potential **accounting irregularities**" in its core membership-club operations that will require it to reduce reported 1997 operating income by $100 million or more and that will hurt this year's earnings". *The Wall Street Journal, April 16, 1998.*

2. "**Anicom Inc** a provider of wire, cable and other products for communications systems, late Monday announced that it is investigating possible **accounting irregularities** that could force the firm to restate previously-issued financial statements. The Rosemont, Ill.-based Company announced its chief executive, Carl Putnam, and chief financial officer, Don Welchko, have taken administrative leaves, with pay, pending completion of the investigation. The company appointed Chairman Thomas J. Reiman interim president and CEO and vice president Daniel Distel interim CF". *Dow Jones Business News, July 18, 2000.*

3. "**Mercury Finance Company** announced the discovery of **accounting irregularities** which caused an overstatement of the previously released earnings. According to John N. Brincat, President and Chief Executive Officer, the accounting irregularities appear to be the result of unauthorized entries being made to the accounting records of the Company by the Principal Accounting Officer. Based on the findings and analysis to date, it appears that the previously reported net income for fiscal years 1993-1996 will be restated as…" *PR Newswire, January 29, 1997.*

4. "**Safety-Kleen Corp** began an internal investigation of its accounting practices, which may result in the correction of past financial statements. In a press release Monday, the industrial waste company said it placed Chief Executive Officer Kenneth W. Winger, Executive Vice President and Chief Operating Officer Michael J. Bragagnolo and Chief Financial Officer Paul R. Humphreys on administrative leave. Safety-Kleen said its directors recently received information alleging possible **accounting irregularities** that may have affected financial results since fiscal 1998" *Dow Jones News Service, 3/06/2000.*