

**Corporate Governance Consequences of Accounting Scandals:
Evidence from Top Management, CFO and Auditor Turnover**

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Abstract

This paper examines the consequences of accounting scandals to top management, top financial officers, and outside auditors. We examine a sample of 518 U.S. public companies that announced earnings-decreasing restatements during the 1997-2002 period and an industry-size matched sample of control firms. Using logistic regressions that control for other determinants of management turnover, we find strong evidence of greater turnover of CEOs, top management and CFOs of restating firms compared to the control sample. The magnitudes of these effects are even larger for restatements that are more serious, have worse effects on stock prices, or result in negative restated earnings. We find no consistent evidence that auditor turnover is higher in restating firms, except for restatements initiated by the company. Our paper provides evidence of effective functioning of internal governance mechanisms following accounting scandals, adds to the literature on consequences of accounting manipulation, corporate fraud and crime, and complements the literature on motives and causes of such corporate activities.

JEL classification: G34, M43, K22

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1. Introduction

The revelations of serious accounting problems over the last decade at several prominent companies such as Enron, Worldcom, Tyco and Healthsouth have been watershed events. Following these scandals, a number of other companies admitted to having accounting problems of their own. Most experienced large stock price declines upon announcing that misstated financial reports would be restated (see, e.g., Palmrose, Richardson and Scholz (2004) and Agrawal and Chadha (2005)). A number of companies acknowledging misstatements, including Enron and Worldcom, were forced into bankruptcy. Many were defendants in lawsuits filed by investors, customers, suppliers, and employees (see, e.g., Palmrose and Scholz (2004)).

Lawmakers have responded to these scandals by adopting the Sarbanes-Oxley Act of 2002, whose tough corporate governance rules apply to all companies with stock listed in the U.S. In addition, the New York Stock Exchange (NYSE), Nasdaq, and American Stock Exchange (AMEX) have adopted new corporate governance rules as part of their listing requirements. These scandals have also resulted in a significant restructuring of the audit industry. The Arthur Andersen partnership dissolved following its criminal indictment on charges of obstructing a federal investigation by destroying Enron-related documents. Several large audit firms have divested their consulting businesses to eliminate potential conflicts of interest that could undermine their credibility as auditors.

In addition to the consequences to restating companies, these scandals can have significant consequences to top management (i.e., the Chief Executive Officer (CEO), Chairman, and President) and outside directors (see, e.g., Desai, Hogan and Wilkins (2006) and Srinivasan (2005)). However, as yet there is no systematic evidence on the consequences to the two parties who are closest to the financial reporting process, namely top financial managers and external auditors. This paper attempts to fill this gap in the literature. In addition, we extend Desai, et al.'s evidence on top management turnover by

examining a larger sample of restatements. Finally, we analyze a number of sub-samples where restatements are likely to have greater consequences. Our study focuses on two important outcomes of the functioning of internal governance mechanisms, namely management and auditor turnover, during a time of intense corporate turmoil. Our paper also contributes to the literature on the consequences of accounting manipulation, corporate fraud, and other crimes discussed in section 2.2. In a broader context, our study adds to the literature on managerial disciplining surrounding other times of major corporate turmoil such as bankruptcy and corporate control events.¹

Anecdotal evidence is mixed on whether an accounting scandal leads to greater management and auditor turnover. In certain high-profile cases, top management, the CFO, and outside auditors all lost their positions following the scandals. For example, Enron's CEO, Jeffrey Skilling, unexpectedly resigned in August 2001, less than three months before the company's accounting problems were publicly revealed. Enron's CFO, Andrew Fastow, was ousted in October 2001. Kenneth Lay, who resumed the CEO position when Skilling left, resigned in February 2002. Enron's long-time auditor, the Big 5 accounting firm Arthur Andersen, dissolved after criminal indictment. Worldcom CEO, Bernard Ebbers, resigned shortly after his firm's \$3.8 billion accounting fraud became public. In addition, Worldcom fired its CFO, Scott Sullivan, and its auditor, Arthur Andersen. Similarly, Healthsouth's board voted unanimously to fire its Chairman and CEO, Richard Scrushy, less than two weeks after the revelation of a massive accounting fraud at the company. Healthsouth also fired its CFO and its auditor, Ernst & Young. These departures received enormous media coverage. Less known are numerous other scandals which did not prompt any changes in management or auditors. For example, First USA Inc., 3Com, Boston Scientific, and Bausch & Lomb did not replace their CEO, CFO and auditors following the revelations of their accounting problems.

As these examples illustrate, the consequences to top management, top financial officers and external auditors of firms involved in accounting scandals can be quite

¹See, e.g., Gilson (1989) for bankruptcies, Martin and McConnell (1991) and Agrawal and Walkling (1994) for takeovers, DeAngelo and DeAngelo (1989) for proxy contests, and Klein and Rosenfeld (1988) for greenmail. Related work analyzes the interaction between internal and external governance mechanisms (see, e.g., Agrawal and Knoeber (1996), Hadlock and Lumer (1997), Mikkelsen and Partch (1997), and Huson, Parrino and Starks (2001)).

different. In this paper, we provide systematic evidence on this issue. In doing so, we seek to shed some light on competing theoretical arguments about these consequences.

Managerial changes entail significant costs and benefits for a firm. One would expect a firm to replace management if the benefits exceed the costs. Agrawal, Jaffe and Karpoff (1999) discuss several reasons for greater management turnover in firms that experience a fraud. These reasons also apply to accounting scandals. First, restating firms may be more inclined to replace top management and top financial officers in order to regain or re-establish reputational capital that is often lost when accounting scandals occur. Second, restating firms face greater risk of securities class action lawsuits from shareholders; replacing managers can help firms limit their liability exposure following restatement. Third, top management turnover increases following poor stock price performance (see, e.g., Warner, Watts, and Wruck (1988)). A substantial decline in market value upon restatement announcement can also trigger management turnover. Fourth, along similar lines, firms experiencing financial distress tend to have high management turnover (see, e.g. Gilson (1989)). The higher incidence of delisting or bankruptcy in restating firms (see Palmrose and Scholz (2004)) can also lead to greater management turnover.

On the other hand, there are also reasons why an earnings restatement may not lead to greater management turnover. First, the cost of replacing a fired manager's accumulated firm-specific human capital may be prohibitive. Second, the level of internal controls needed to *eliminate* any possibility of accounting problems may be sub-optimal for a firm. The direct and indirect costs (such as lost business) of such controls may be prohibitive. So the revelation of accounting problems may not prompt the board to change managers, unless the problems are directly linked to those individuals. Third, while restatements generally are bad news for firms, some restating firms may not lose significant reputational capital. In such cases, the net benefits from replacing managers can be small. Finally, even though a restatement of earnings implies that management caused, ignored or failed to detect material misstatements, Jensen (1993) argues that a firm's internal governance mechanisms may not be strong enough to prompt management turnover. So an earnings restatement may not lead to greater managerial turnover.

We also examine the effect of an earnings restatement on subsequent changes in the outside auditor. As in the case of top management, there are significant costs and benefits associated with replacing the auditor. Replacing the auditor may be beneficial, if the change will help the firm regain its reputational capital or limit its liability exposure. But the cost of replacing auditors can be large. First, new auditors often face steep learning curves. Second, the audit firm also may be providing other services to the company such as tax, computer systems and management consulting, which may have synergies with auditing. Third, the company may face a limited choice of audit firms that specialize in its industry, have the necessary scale and have offices near its headquarters. Significant replacement costs may explain why auditor turnover is rare.

We examine a sample of 518 U.S. public companies that announced earnings-decreasing restatements during the 1997-2002 period and an industry-size matched sample of control firms. Using logistic regressions that control for other determinants of management turnover, we find strong evidence that restating firms have greater turnover of CEOs, top management and CFOs than control firms. The magnitudes of these effects are quite large. After controlling for other factors, restating CEOs, CFOs and top management face, respectively, a 14%, 10% and 8% greater probability of being replaced during years (-1, +1) than control firms, where 0 is the year of restatement announcement. Compared to the usual turnover probabilities in non-restating firms over this window, these represent increases of about 46%, 25% and 19%, respectively. These effects are even larger for restatements that are more serious, have worse valuation effects, or result in negative restated earnings. We find some evidence of greater auditor turnover at restating firms relative to control firms in univariate tests. Except in the subsample of restatements initiated by the company, the difference disappears once we control for other factors with logistic regressions.

The remainder of this paper is organized as follows. Section 2 briefly reviews the relevant literature. Section 3 describes our sample and data. Section 4 presents our empirical results for the full sample, and section 5 reports the results for a number of subsamples where the restatement may have greater effects. Section 6 concludes.

2. Prior studies on the causes and consequences of accounting manipulation and corporate fraud

Previous studies have examined the causes and consequences of three types of accounting manipulations. In decreasing degrees of seriousness, these are: earnings manipulation where the SEC brought enforcement action, restatements to correct financial misstatements, and earnings management.² Other studies have investigated a variety of corporate frauds and crimes. We briefly review the literature on the causes and consequences of these four types of infractions.

2.1 Causes

2.1.1 SEC accounting enforcement actions

A seminal paper by Dechow, Sloan and Sweeney (1996) examines the motives and causes of earnings manipulation that resulted in SEC enforcement actions. The SEC announces these actions via Accounting and Auditing Enforcement Releases (AAER). Dechow, et al. find that firms with weak corporate governance are more likely to manipulate earnings to lower the cost of external financing. Beasley (1996) also finds evidence of governance weaknesses in firms subject to SEC enforcement. Beneish (1999) finds evidence of another motive for earnings manipulation in these firms, namely managers' desire to sell overpriced stock and option holdings. While Erickson, Hanlon and Maydew (2006) find no consistent evidence that the likelihood of fraud in these firms is related to managers' equity incentives, Johnson, Ryan and Tian (2006) find that this likelihood is positively related to the size of managers' stockholdings.

2.1.2 Financial misstatements

Agrawal and Chadha (2005) find that the probability of restating earnings is lower when boards and audit committees have financial expertise. Burns and Kedia (2006) find that firms whose CEOs have large option holdings are more likely to misreport. Top executives also engage in abnormally large amounts of stock sales and option exercises during misstated periods (see Agrawal and Cooper (2007) and Burns and Kedia (2007)).

²See Agrawal and Chadha (2005, pp. 373-374) for a discussion of their relative seriousness.

Kedia and Philippon (2007) show theoretically and empirically that firms hire and invest excessively during misreported periods to exaggerate their growth prospects.

2.1.3 Earnings management

Prior research finds more earnings management at firms with less independent boards and audit committees (see Klein (2002)) and in firms where CEO compensation is more closely tied to the value of stock and option holdings (see Bergstresser and Philippon (2006)). The latter paper also finds that during periods of high accruals, CEOs exercise unusually large amounts of stock options, and CEOs and other insiders sell large amounts of stock.

2.1.4 Corporate fraud and other crimes

Alexander and Cohen (1999) examine a sample of 78 public companies involved in corporate crimes such as contract breaches, bribes, kickbacks, and regulatory violations. They find lower incidence of crime among firms where management owns more equity. Niehaus and Roth (1999) find no evidence of abnormal stock sales by officers and directors in a sample of firms that settle securities class action lawsuits. Povel, Singh and Winton (2007) explain theoretically why corporate frauds increase in good times, peak toward the end of a boom, and are revealed in the ensuing bust.

2.2 Consequences

2.2.1 SEC accounting enforcement actions

Dechow, Sloan and Sweeney (1996) find that firms subject to SEC enforcement actions for manipulating earnings experience significant increases in their costs of capital. Beneish (1999) finds no evidence of abnormal management turnover in these firms. Chen, et al. (2005) present univariate evidence of greater CEO and auditor turnover surrounding enforcement actions for securities fraud in China.

2.2.2 Financial misstatements

Desai, Hogan and Wilkins (2006) examine a sample of 146 firms that announce earnings restatements during 1997-98. They find that the top management (CEO, Chairman, and President) of these firms experiences abnormally large turnover and diminished job prospects following restatements. Our paper is most closely related to this paper. As discussed in the introduction, we provide empirical evidence on the consequences to the two parties closest to the financial reporting process: top financial officers and outside auditors. To our knowledge, this issue has not been examined by any prior study. In addition, we add to Desai, et al.'s evidence on top management turnover by examining a larger sample of restatements that covers a longer time period; we also examine a number of sub-samples where the restatements are likely to have greater effects. Srinivasan (2005) finds that outside directors of restating firms experience abnormally large turnover and loss of other board seats. This effect is greater for audit committee members and for more severe restatements.

2.2.3 Earnings management

Bradshaw, Richardson and Sloan (2001) find no evidence of greater turnover of auditors following higher levels of accruals. We are not aware of any study that examines managerial turnover resulting from high levels of earnings management.

2.2.4 Corporate fraud and other crimes

Agrawal, Jaffe, and Karpoff (1999) examine a sample of firms facing a variety of fraud accusations from investors, customers, suppliers, employees or governments, regulatory violations, and 12 cases of financial reporting fraud. They find greater turnover of inside directors, but little systematic evidence of greater turnover of top managers and outside directors, following fraud revelations. Niehaus and Roth (1999) find abnormally high CEO turnover in a sample of firms that settle securities class action lawsuits, especially in suits with more merit. Fich and Shivdasani (2006) find no evidence of abnormal turnover of outside directors in firms facing securities class action lawsuits, but find a significant decline in their other board seats.

3. Sample and data

Section 3.1 details our sample selection procedure and describes the sample of restating firms. Section 3.2 deals with the selection of our control sample and compares the restating and control samples. Section 3.3 describes the stock price reaction to the restatement announcements, and section 3.4 examines the operating performance of the two samples.

3.1 Sample of restating firms

Our sample of restating firms is obtained from the United States General Accounting Office (GAO, 2002), which lists 919 restatements of financial statements announced by 832 publicly traded firms during the period January 1, 1997 to June 30, 2002. These restatements correct prior misstatements, i.e., GAAP violations. Most of the restatements correct quarterly or annual financial statements filed with the U.S. Securities and Exchange Commission (SEC).³ The GAO database excludes routine or technical restatements prompted by mergers and acquisitions, discontinued operations, stock splits, accounting rule changes, and changes in accounting method. We consider the seriousness of restatements in our sample in section 5.1 below.

Table 1 summarizes our sample selection procedure. Starting with the 919 restatements in the GAO database, we omit 87 cases of repeat restatements by sample firms.⁴ In order to obtain a control sample and to construct several control variables (see sections 3.2 and 4.2 below), we require that a restating firm be listed on the Center for Research in Security Prices (CRSP) database of the University of Chicago starting at least nine months before the restatement announcement. We also require sample firms to have at least two-thirds of the daily stock returns available over the one-year period prior to the announcement date. A total of 88 (= 47 + 13 + 5 + 23) firms do not satisfy these requirements. We omit an additional 62 cases where the restating firm is a real estate investment trust, exchange-traded fund, or is incorporated outside of the U.S. We also

³Fifteen cases in our sample are restatements of earnings releases and do not result in restatement of quarterly or annual financial statements. Omitting these cases does not change any of our results.

⁴Our final sample of 518 restating firms includes 50 firms that announced multiple restatements during the sample period. Second and subsequent restatements by these 50 firms are not included in our sample. Furthermore, our results are qualitatively similar when we omit these 50 repeat violators from the sample.

omit two cases where our review of news reports and SEC filings indicates that a misstatement did not occur. Finally, we omit 162 cases where the restatement did not decrease net income because auditors and investors appear to view such restatements as less serious (see, e.g., Agrawal and Chadha (2005)).⁵ Our final sample consists of 518 firms that announce earnings-decreasing restatements.^{6,7} For each restatement in our sample, we collect data on the original earnings, restated earnings, and the quarters restated by reading news reports and the original and amending 10-Qs and 10-Ks filed with the SEC.^{8,9} We obtain news reports from the ProQuest Newspapers database, Lexis-Nexis News Wires database, and press releases attached to 8-Ks filed with the SEC. Finally, we obtain stock prices and returns from CRSP, and financial data from Compustat.

Table 2 describes our sample of 518 restating firms. Panel A summarizes the distribution of our sample by the identity of the initiator and by the nature of accounts restated. About 79% of the restatements in our sample are initiated by the company itself,¹⁰ and about 7% by the outside auditor. Most of the remaining restatements are

⁵Consistent with this idea, the stock price reaction to such announcements, although statistically significant, is much smaller than to earnings-decreasing restatements. Over the window of days (-1, +1) around the announcement, the average cumulative abnormal return for the two samples is -3.3% and -10.3%, respectively; the corresponding values over the (-20, +1) window are -6.6% and -17.7%. Nevertheless, for completeness, we separately analyze the sample of non-earnings-decreasing restatements. We find marginally significant evidence of greater CEO turnover in these firms, but no evidence of greater turnover among top management, CFOs, top financial managers, or outside auditors. To save space, we do not present these results in a table.

⁶Our sample includes 16 firms that were dissolved or terminated their registration with the SEC after the announcement but before any restatement.

⁷In a few instances, a firm listed in the GAO database restated its financial statements because the financial statements of a newly acquired subsidiary were misstated for fiscal years or quarters ending prior to the acquisition date. In such cases, we replace the acquiring firm with the subsidiary.

⁸In several instances, news reports and SEC filings indicate that the restatement was announced before the announcement date listed in the GAO database. Because we use the earlier announcement date in such cases, eight firms in our sample have announcement dates prior to January 1, 1997, the beginning date of the GAO database.

⁹In determining the beginning date of the misstated period, we take into account any adjustments made to retained earnings for prior periods. In addition, if a firm restates its financials for, say, the fiscal year ending December 2000, but the amended 10-K indicates that the restatement relates only to the last two quarters of the year, we define the beginning date of the misstatement as July 1, 2000.

¹⁰Following Palmrose, et al. (2004), this category includes cases where the identity of the initiator is not identified in the GAO database.

initiated by the SEC. About 63% of the cases involve only core accounts, about 21% involve only non-core accounts, and the remaining cases involve both.¹¹

Panel B provides descriptive statistics of firm age and the magnitude of the change in earnings due to restatement. The median firm has been listed on CRSP (i.e., on NYSE, AMEX or Nasdaq) for about 6.5 years. The median change in earnings¹² is about -33%. The mean change is much larger, about -234%. The median firm restated 4 quarters of earnings, and the median length of the misstated period is 586 days.

Panel C of Table 2 shows the distribution of the number of quarters restated. About 20% of the sample firms restate a single quarter's financial statements. About 55% of the firms restate four or fewer quarters, 19% restate five to eight quarters, and the remaining 26% restate nine or more quarters. Approximately 3% of the sample firms restate more than 20 quarters.

Panel D shows the industry distribution of the sample based on the first two digits of a firm's primary SIC code, using Song and Walkling's (1993) industry classification. For comparison, we also show the corresponding distribution for the active CRSP population as of December 31, 2002. Of our sample of 518 restating firms (CRSP population), 26% (20%) are in services; 15% (13%) in machinery; 12% (20%) in finance, insurance and real estate; 8% (7%) in transport, communications and utilities; and 7% (7%) in chemical industry; and 7% (6%) in retail trade. The remaining 25% (27%) of the firms are distributed over 12 (14) different industries.

Panel E of Table 2 shows the distribution of the sample by the year of restatement announcement. There is a sharp increase in the number of restatements announced starting in 1999. The data for 2002 is for the first half of the year. About 41% of the restatements in the sample were announced during 1996-99, and the remaining 59% were announced during 2000-02.

¹¹We classify as core restatements cases involving routine accounts such as sales revenue, cost of sales, selling, general and administrative expenses, accounts receivable, inventory, accounts payable, and certain accrued liabilities (e.g., accrued workers' compensation expense). We classify cases involving non-routine accounts and one-time or special items as non-core restatements. For restatements that affect income statement accounts, our definition of core restatements is very similar to that of Palmrose, et al. (2004).

¹²Change in earnings is defined as $(\text{Restated earnings} - \text{Original earnings}) / |\text{Original earnings}|$.

3.2 Control sample

We compare management and auditor turnover in restating firms to that in a control group. The restating and control firms are matched by size and industry one year before the announcement date.¹³ We match each restating firm with a control firm that has the same two-digit primary SIC industry code, is the closest in size, and did not announce a restatement during the period January 1, 1995 to June 30, 2002. Size is defined as the market capitalization of common stockholders' equity and equals the number of common shares outstanding times the closing share price reported by CRSP on the matching date.¹⁴ The pool of potential matching control firms excludes firms incorporated outside of the U.S. Each control firm is matched to a single restating firm.

Panel A of Table 3 shows characteristics of our samples of restating and control firms. All dollar values reported in the paper are in inflation-adjusted 2005 dollars. All variables are observed for (or as of) the last fiscal year ending before the restatement announcement date. The typical restating firm in our sample is relatively small compared to the typical firm traded on the major U.S. stock markets. The median sales of restating (control) firms are about \$153 million (\$173 million). Their median market capitalization is about \$207 million (\$232 million), and they employ about 900 (1,000) people. None of these differences between restating and control firms is statistically significant at the 5% level.

The two groups of firms appear to have similar growth opportunities, as measured by the ratio of firm value to total assets and the five year sales growth rate.¹⁵ The two groups also have similar financial leverage ratios. For example, the median ratio of long-term debt to firm value for each group is about 7%.

Panel B of Table 3 shows certain board characteristics observed one year before the year of announcement using the *S&P Register of Corporations, Directors and Executives*. The median board consists of 7 members, about 71% of whom are outsiders

¹³Some restating firms were not listed in CRSP one year prior to the announcement date. For these firms, the matching date is the restating firm's first trading day in CRSP. We exclude restating firms whose beginning date in CRSP is less than nine months before the announcement date.

¹⁴All publicly traded common share classes are included when calculating market capitalization.

¹⁵Firm value is defined as the book value of total assets minus the book value of equity plus the market value of equity.

in each group of firms. About 65% (62%) of the CEOs of restating (control) firms chair the board.

3.3 Stock price reaction

We next examine the stock price reaction to restatement announcements. We compute the abnormal return for stock i on day t as:

$$e_{it} = r_{it} - r_{mt}, \quad (1)$$

where r_i and r_m are the stock returns for firm i and the market, respectively. The market return is defined as the return on the CRSP (i.e., NYSE, AMEX and Nasdaq) equal-weighted stock index. The cumulative abnormal return for firm i over days (t_1, t_2) is measured as

$$CAR^i_{t_1, t_2} = \sum_{t=t_1}^{t_2} e_{it}. \quad (2)$$

Table 4 shows the mean and median values of CARs for our full sample of restating firms and for a number of sub-samples over five windows covering trading days $(-1, +1)$, $(-5, +1)$, $(-5, +5)$, $(-20, +1)$ and $(-20, +20)$ around the announcement date (day 0). Restatement announcements have large effects on stock prices. The mean CAR for restating firms ranges from -10.3% over days $(-1, +1)$ to as much as -17.7% over days $(-20, +1)$. Mean and median CARs for all five windows are significantly different from zero at the 1% level. The announcement effects are even more negative for the sub-samples of more serious restatements (discussed in section 6.1 below), cases where the restated earnings are negative, cases where the restatement leads to a large drop in reported earnings (large restatements), and cases with more restated quarters. For comparison, the abnormal returns for non-restating firms (not shown in the table) are small and statistically insignificant over all five windows.

3.4 Operating performance

We next examine the operating performance of our samples of restating and control firms over the years $(-3, +3)$, where 0 is the fiscal year that ends closest to the restatement announcement date. We use two measures: operating performance to assets (OPA) and operating performance to sales (OPS). OPA (OPS) equals operating income

before depreciation as a percentage of the firm's total assets (net sales). We compute average OPA or OPS values over multiple years by summing a firm's ratios over the relevant years and averaging these sums across firms. Table 5 shows that the average (both mean and median) OPA and OPS for the two groups of firms are statistically indistinguishable in year -3. Starting in year -2 (0), the OPA (OPS) for the median restating firm is lower than that for its control firm.¹⁶ This pattern persists until year +3. For example, the median OPA in year 0 for restating (control) firms is 4.1% (10.8%). These differences are both statistically and economically significant.

4. Management and auditor turnover: Full sample results

We discuss univariate results on management and auditor turnover in section 4.1, correlations between the variables in the regressions in section 4.2, and results of the logistic regressions in section 4.3.

4.1 Univariate results

Table 6 presents mean turnover rates and the percentage of firms with turnover of management and outside auditor. The first two columns show mean turnover rates for CEOs in matched samples of restating (R) and control (C) firms. The next two columns report two-tailed p-values from matched pairs t-tests for differences in means and Wilcoxon signed rank tests for differences in medians. Column 5 shows sample size. The next four sets of five columns each show corresponding values for top management (CEO, Chairman, and President), CFO, top financial officers (CFO, Controller, and Treasurer), and outside auditor. For a given year, turnover for a firm equals 1 if the group of officers or auditor listed in the *S&P Register* differs from the previous year's listing; it equals 0 otherwise.¹⁷ The table shows turnover for years -1 to +2, where 0 is the year of announcement. Turnover values for individual years are summed to compute

¹⁶Young technology firms with sizeable losses and minimal revenues cause mean OPS values to be very negative in some years.

¹⁷In cases where a firm listed in the *S&P Register* in the prior year is not listed in the current year, we attempt to identify the reason for the non-listing (e.g., name change, merger, privatization, or bankruptcy) using the listings under 'Additional Companies Formerly Included' in the *S&P Register* and by consulting the *Directory of Obsolete Securities*.

turnover for multiple-year periods. P-values are computed from two-tailed matched pairs t-tests for differences in means and Wilcoxon signed rank tests for differences in medians.

Table 6 shows significantly greater turnover of CEOs, top management, and CFOs of restating firms relative to control firms in each of years 0 through +2 and for all five multi-year periods. The magnitudes of these differences are substantial. For example, in year 0, the CEO (CFO) turnover in restating firms is 20% (27%); the corresponding rate for control firms is only 9% (11%). Over the window of years (-1, +1), the CEO (CFO) turnover rate in restating firms is 53% (65%), while the rate for control firms is only 34% (43%). There is also evidence of abnormally large turnover for the group of top financial officers in restating firms in years +1, (0, +1), and (+1, +2). The table also shows abnormally large turnover rates for the outside auditors of restating firms in year +1 and in several multi-year periods.

4.2 Correlations

Table 7 shows Pearson correlation coefficients for management and auditor turnover and explanatory variables. RESTATE is a dummy variable equal to 1 if the firm is a restating firm; it equals 0 otherwise. LSALES is the natural logarithm of net sales. V/A equals firm value divided by total assets. D/A equals total debt divided by total assets. OUTSIDER equals the number of outside directors divided by board size. BOSS equals 1 if the CEO chairs the board; it equals 0 otherwise. Data availability reduces the sample size to 600 firms (i.e., 300 matched pairs).

Table 7 shows several noteworthy relations. First, consistent with the univariate results in Table 6, the turnover of CEOs, top management, and CFOs over several time windows is positively related to the RESTATE variable. Second, CEO and top management turnover are lower when the CEO chairs the board. This is not surprising, given that a CEO-Chairman wields more power. Third, the turnover of CFOs is positively related to the turnover of both CEOs and auditors. The positive correlation between CFO and CEO turnover is consistent with Mian (2001). The positive correlation between the turnover of CFOs and auditors suggests that their fortunes are linked in the aftermath of a restatement. Fourth, larger firms (LSALES) have higher debt ratios (D/A), consistent

with higher debt capacity and greater access to public debt markets. Finally, larger firms have larger boards, with a higher proportion of outside directors. The positive relation between firm size and board size is consistent with the notion that larger firms are more complex and so need more expertise on the board, requiring more board members (see, e.g., Agrawal and Knoeber (1996)). The positive relation between firm size and the proportion of outsiders on the board is consistent with the greater pressure during our sample period on large public firms to have more independent boards (see, e.g., NYSE and Nasdaq (1999)). All of these relations are statistically significant at the 5% level in two-tailed tests.

4.3 Cross-sectional regressions

We next examine whether management and auditor turnover following the revelation of accounting problems is higher than control firms, after controlling for other determinants of the level of turnover. We discuss the regression specification, management turnover results, and auditor turnover results in sections 4.3.1, 4.3.2 and 4.3.3, respectively.

4.3.1 Regression specification

We estimate separate logistic regression models for the turnover of the CEO, top management, CFO, top financial officers, and auditors. We estimate these models for each of five time windows around the year of the restatement announcement (i.e., year 0): years (-1, 0), (+1, +2), (0, +1), (-1, +1), and (-1, +2). The dependent variable is TURNOVER, which equals 1 if there was a change of the officer or auditor during the time window according to the *S&P Register*; it equals 0 otherwise. The main explanatory variable is RESTATE, which equals 1 for restating firms; it equals 0 otherwise. Prior research and several arguments suggest that management and auditor turnover can also be affected by a number of other variables, such as the proportion of outsiders on the board, board size, whether the CEO chairs the board, the valuation effects of the restatement, firm size, firm valuation, prior operating performance, and financial leverage. We control

for these variables in the logistic regressions.¹⁸ We briefly discuss each variable and its measurement below. Board data are for the year before the announcement year using the *S&P Register*. Financial variables are for the last fiscal year ended before the announcement year.

Proportion of outsiders on the board (OUTSIDER): Jensen (1993) argues that outside directors facilitate the removal of top executives. This argument implies that OUTSIDER should be positively related to management turnover. Outside directors can also prevent auditors from being fired for questioning management, implying that OUTSIDER should be negatively related to auditor turnover.

Board size (BDSIZE): Jensen (1993) and Yermack (1996) argue that larger boards are less effective monitors. This argument implies that management (auditor) turnover should be negatively (positively) related to the number of directors on the board (BDSIZE).

Does the CEO chair the board? (BOSS): Jensen (1993) argues that the board's monitoring ability is curtailed when the CEO chairs the board. We define a variable BOSS, which equals 1 if the CEO chairs the board, and 0 otherwise. Jensen's argument implies that top management (auditor) turnover should be negatively (positively) related to BOSS.

Valuation effects of the restatement (CAR(-5,+5)): Accounting scandals that are more costly to a firm are likely to have greater consequences to managers and auditors. We measure the valuation effect of a scandal by the stock price reaction upon its announcement. CAR(-5,+5) is the cumulative abnormal return over days (-5, +5) around the restatement announcement (day 0), measured as described in section 3.3. We expect CAR(-5,+5) to be negatively related to both management and auditor turnover, i.e., the worse the announcement effect, the greater the turnover.

¹⁸Our choice of the control variables largely follows Agrawal, Jaffe and Karpoff (1999).

Firm size (LSALES)): An accounting scandal may have greater consequences to managers and auditors of larger firms because such firms are subject to more scrutiny from analysts and the media. We measure firm size as the natural logarithm of net sales, denoted LSALES, and expect it to be positively related to both management and auditor turnover.

Firm valuation (V/A): One would expect firms with higher valuations to have lower turnover of executives and auditors. We measure firm valuation as firm value divided by the book value of total assets, V/A. We estimate firm value as the book value of total assets minus the book value of equity plus the market value of equity.

Prior operating performance (OPA): Prior studies (e.g., Weisbach (1988) and Murphy and Zimmerman (1993); see Murphy (1999) for a review) find that executive turnover increases following poor operating performance. Similarly, auditor turnover may also be higher following poor performance. We measure operating performance as OPA, defined as operating income before depreciation divided by total assets, and expect it to be negatively related to management and auditor turnover.

Financial leverage (D/A): Jensen (1986) argues that corporate debt has a disciplinary effect on managers. So we control for a potential effect of financial leverage on management turnover. We measure leverage as D/A, the ratio of total debt to total assets. Total debt (D) equals long-term debt plus short-term debt in current liabilities.

We estimate the following logistic model:

$$(1) \quad \text{TURNOVER} = F(\text{RESTATE}, \text{OUTSIDER}, \text{BDSIZE}, \text{BOSS}, \text{CAR}(-5, +5), \text{LSALES}, \text{V/A}, \text{OPA}, \text{D/A})$$

4.3.2 Management turnover

Table 8 reports the results of logistic regressions of management and auditor turnover for the full sample. The table shows marginal effects (dy/dx) of each explanatory variable and their z-statistics. The five columns in Panel A show the results

for turnover during years (-1, 0) for the CEO, top management, CFO, top financial officers, and outside auditor. We estimate separate regressions for each group, with each column reporting the results of one regression. Panels B through E present the results for turnover during four other windows: years (+1, +2), (0, +1), (-1, +1), and (-1, +2), respectively.

Table 8 shows strong evidence of greater turnover of CEOs, top management and CFOs in restating firms for all five windows examined, as can be seen from the significantly positive coefficient of the RESTATE variable. The magnitude of this effect is quite substantial. After controlling for other determinants of management turnover, the probability of turnover in Panel D for CEOs (CFOs) of restating firms is about 14% (10%) higher than for control firms during years (-1, +1). As shown in the last row in the panel, this represents an increase of about 46% (25%) over the usual probability of turnover for CEOs (CFOs) of non-restating firms over this window.¹⁹ For top financial officers in Panel B, the probability of turnover in restating firms is about 25% higher than for control firms during years (+1, +2), which represents an increase of 81% relative to the usual turnover probability for non-restating firms over this window. The results for several of the control variables are also noteworthy. Consistent with our expectation, the turnover rate for the CEOs and top management is significantly lower for most time windows in firms where the CEO chairs the board. In a few windows, firms with a greater proportion of outside directors experience greater turnover of CEOs and top financial officers. Firms where announcements of accounting problems have worse valuation effects experience greater turnover of CEOs, top management and CFOs. Top executives and top financial officers experience greater turnover in several windows in larger firms and firms with worse operating performance. All of these effects are statistically significant at the 10% level or better in two-tailed tests. These results do not appear to be caused by industry or year effects: our main results are essentially unchanged when we add industry or year dummies to the regressions.

¹⁹The percentage increase in the probability of turnover upon restatement is computed as $100 \times [p(\text{TURNOVER}=1 | \text{RESTATE}=1) / p(\text{TURNOVER}=1 | \text{RESTATE}=0) - 1]$, where the probabilities are predicted values from the logistic model evaluated at the means of other independent variables.

4.3.3 Auditor turnover

The last column of each panel in Table 8 presents the results for auditor turnover. The evidence of greater turnover of the outside auditors of restating firms that we find in univariate tests disappears after we control for other determinants of auditor turnover via logistic regressions. The results for several of the control variables are noteworthy. Consistent with our expectation, auditor turnover tends to be higher in firms with larger boards, boards with a lower proportion of outside directors, boards chaired by the CEO, firms where restatements have worse valuation effects, and larger firms.

5. Sub-sample results

We next examine a number of sub-samples where the consequences of the restatement may be greater. These sub-samples include restatements that are more serious, have worse announcement effects, result in negative restated earnings, involve more restated quarters, result in large percentage changes in earnings, or are announced by large firms.

5.1 More serious misstatements

As discussed in section 3.1, our sample consists of firms that announced restatements to correct financial misstatements resulting from GAAP violations. Because the financial reporting boundaries set by GAAP are wide, and a violation is deemed a misstatement only when material, the restatements in our sample represent serious infractions (see, e.g., Palmrose and Scholz (2004)). Nevertheless, our sample includes some cases where firms restated due to technical, and arguably less serious, reasons. One such group of less serious restatements was triggered by the SEC's adoption of revenue recognition rules under Staff Accounting Bulletin (SAB) 101.²⁰ Our sample of 518 restating firms contains 61 firms that attribute their restatements to SAB 101. The sample contains one additional restatement prompted by guidance issued by the Emerging Issues Task Force (EITF) of the Financial Accounting Standards Board (FASB). The EITF

²⁰Although SAB 101 restatements are viewed as less serious, Rountree (2003) finds that on average, stock price reactions to such announcements are negative.

periodically identifies emerging accounting issues and releases guidelines to establish a uniform set of accounting practices before divergent methods arise and become widespread.²¹ As noted in section 3.1 above, our sample includes 15 firms that restate earnings releases and not financial statements issued in 10-K or 10-Q filings. Finally, restatements involving non-core accounts, used to record non-routine transactions and one-time or special items, tend to be less serious than restatements involving core accounts. Our sample includes an additional 103 cases of restatements that involve only non-core accounts. We next examine whether omitting these 180 (=61+1+15+103) cases from the sample alters our main results in Table 8.

Row 2 of Table 9 shows the estimates of logistic model (1) for this sub-sample. To save space, we only report the marginal effects and z-statistics of the main explanatory variable of interest, RESTATE, for the (-1, +1) window, corresponding to Panel D in Table 8. Accordingly, for each group (e.g., CEOs), the first two columns in this table are the same as in Table 8; we add a third column that shows the relative increase in the probability of turnover upon restatement compared to the usual turnover probability for non-restating firms. The CEOs, top management and CFOs of restating firms experience significantly greater turnover in this sub-sample compared to the control firms, after controlling for other determinants of executive turnover. Furthermore, consistent with the idea that the restatements in this sub-sample represent more serious accounting problems, all three groups of managers of restating firms experience greater turnover in this sub-sample compared to the full sample, shown in row 1 of the table. This effect is particularly pronounced for the CEOs of restating firms, who experience a 19% greater probability of turnover in this sub-sample than non-restating firms, after controlling for other factors. Compared to the usual turnover probability for CEOs of non-restating firms over this window, this represents a whopping 64% increase!

5.2 Restatements with worse valuation effects

The revelation of accounting problems should have greater consequences for managers and auditors if the announcement leads to a greater drop in the stock price. To

²¹See <http://www.investopedia.com>. Both SAB 101 and EITFs represent clarifications of, rather than changes to, GAAP.

examine this issue, we estimate equation (1) for the sub-sample of firms in the bottom 40% based on the cumulative abnormal return over days -5 to +5 around the announcement date.²² Row 2 in Table 9 shows that the CEOs, top management and CFOs of such restating firms all face significantly higher probabilities of turnover relative to control firms, after controlling for other determinants of turnover. The increases in turnover probabilities for these groups of restating managers are also substantially greater than those shown in row 1 of the table for the full sample. For example, a restatement leads to an increase in the turnover probability for the CEOs (CFOs) of firms with worse announcement returns by about 24% (15%) over years (-1, +1), after controlling for other factors. Compared to the usual turnover probability for CEOs (CFOs) of non-restating firms over this window, this represents an increase of about 82% (38%).

5.3 Negative restated earnings

While the announcement of any restatement is bad news because it damages the credibility of management, the news tends to be more detrimental if the restated earnings are negative (see Agrawal and Cooper (2007)). The average abnormal return around the announcement in our sample is nearly twice as negative when the restated earnings are negative than when they are positive. To examine whether managers and auditors suffer worse consequences in the former case, we estimate equation (1) for the sub-sample of firms with negative restated earnings. Row 3 of Table 9 shows that the probability of turnover is significantly higher for CEOs, CFOs and top management of this sub-sample of restating firms compared to control firms, after controlling for other factors. The magnitude of this effect is substantially greater in this sub-sample compared to the full sample, shown in row 1 of the table. For example, CEOs (CFOs) of this sub-sample of restating firms face a 19% (16%) greater probability of losing their jobs relative to the control sample. This represents an increase of about 56% (39%) relative to the usual turnover probability for CEOs (CFOs) of non-restating firms

²²Forty percent is an arbitrary cutoff. Results are similar when medians are used to partition the sample in section 5.

5.4 Restatements with more quarters restated

We next examine the sub-sample of firms restating more than four quarters of earnings because misstatements over a longer period are arguably more serious. We use four quarters as the breakpoint because that is the median number of quarters restated in our sample (see Table 2, Panels B and C). Row 4 of Table 9 shows the coefficient estimate of RESTATE for this sub-sample. Consistent with the idea that restatements in this sub-sample are more serious, CFOs of restating firms experience a greater probability of turnover relative to control firms in this sub-sample than in the full sample (shown in row 1), after controlling for other factors. The incremental probabilities for CFOs in the sub-sample and full sample are 18% and 10%, respectively. However, CEOs of restating firms in the two groups display the opposite pattern, with the corresponding probabilities of 11% and 14%, respectively.

5.5 Large restatements

We next examine the possibility that larger restatements have greater consequences for managers and auditors. In our sample, announcements of larger restatements lead to greater stock price declines. Accordingly, we sort the sample by the absolute percentage change in reported earnings, and estimate equation (1) for the sub-sample of firms in the top 40% by the size of the restatement. Row 5 in Table 9 shows the results for this sub-sample. Consistent with the idea that larger restatements lead to greater consequences, restatements lead to an increase in the probability of turnover for top managers by 13% in this sub-sample compared to 8% in the full sample (see row 1). But the turnover rate for CEOs is similar in the two groups.

5.6 Restatements by large firms

We next examine the possibility that the consequences of a restatement to managers and auditors depend on firm size. The relationship between turnover and firm size is not clear *a priori*. Large firms receive more scrutiny from analysts and the media, implying greater consequences to their managers upon the revelation of accounting problems. But equity ownership is likely to be more diffuse in large firms, so investors

face greater free-rider problems in disciplining managers. To address this issue, we sort the sample by market capitalization of the restating firm at the end of the last fiscal year prior to the restatement announcement, and estimate equation (1) for the sub-sample of firms in the top 40%. Row 6 in Table 9 shows the coefficient estimate of RESTATE for this sub-sample. The consequences of a restatement are lower for CEOs and CFOs in this sub-sample than in the full sample, shown in row 1. The probability of turnover for CEOs (CFOs) of large restating firms is 11% (0.1%) greater than that for control firms, after controlling for other factors; the corresponding value for the full sample is 14% (10%).

5.7 Restatements not initiated by the company

Finally, we examine the possibility that restatements initiated by the company have lesser consequences than restatements initiated by other parties (such as the auditors or the SEC). The last two rows in Table 4 show that the stock price reaction to the restatement announcement is generally similar for the two sub-samples. Nevertheless, for completeness, we examine whether management and auditor turnover differ across the two groups. The results are shown in the last two rows of Table 9. After controlling for other factors, firms in both sub-samples experience significantly greater CEO turnover than control firms. The magnitudes of these effects are similar across the two samples. But there are two interesting differences between the sub-samples. First, there is significantly higher top management turnover in the sub-sample of restatements initiated by other parties, but not in company-initiated restatements. Second, there is significantly greater CFO and auditor turnover in company-initiated restatements, but not in restatements initiated by other parties.

6. Summary and conclusions

U.S. stock markets have been roiled by the revelation of accounting problems at numerous companies over the last decade. Many of the resulting scandals, such as those involving Wall Street icons like Enron, Worldcom and HealthSouth, had enormous consequences. Revelations of accounting problems usually result in large drops in stock prices, and often are followed by bankruptcy filings and lawsuits. These scandals were the impetus behind passage of the Sarbanes-Oxley Act of 2002, adoption of new

corporate governance requirements by major U.S. stock markets, and significant restructuring of the audit industry.

This paper examines the consequences of accounting scandals to top management (CEO, Chairman, and President), top financial officers (CFO, Controller, and Treasurer), and outside auditors of restating firms. Top management bears ultimate responsibility for a firm's activities, including financial reporting. Top financial managers and external auditors are directly involved in the financial reporting process. Whether these groups suffer consequences when financial reports are misstated is therefore a natural question. Having credible financial reports is important to investors, analysts and regulators, who rely on financial statements to monitor firm performance and operations.

We examine a sample of 518 U.S. public companies that announced earnings-decreasing restatements during the 1997-2002 period and an industry-size matched sample of control firms. Using logistic regressions that control for other determinants of management turnover, we find strong evidence of greater turnover of CEOs, top management and CFOs of restating firms compared to the control sample. The magnitudes of these effects are quite large. After controlling for other factors, restating CEOs, CFOs and top management face, respectively, a 14%, 10% and 8.5% greater probability of being replaced during years (-1, +1) than control firms, where 0 is the year of restatement announcement. Compared to the usual turnover probabilities in non-restating firms over this window, these represent increases of about 46%, 25% and 19%, respectively. The magnitudes of these effects are even larger for restatements that are more serious, have worse valuation effects, or result in negative restated earnings. Univariate tests provide some evidence of greater turnover of outside auditors in restating firms relative to control firms, but except in the sub-sample of restatements initiated by the company, the difference disappears in logistic regressions that control for other factors.

In sum, our paper provides evidence of effective functioning of internal governance mechanisms following accounting scandals. The study adds to the literature on consequences of accounting manipulation, corporate fraud and crime, and complements the literature on motives and causes of such corporate activities.

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Table 1

Sample Selection

The table shows sample selection out of the 919 restatements listed in the GAO database, announced during January 1, 1997 and June 30, 2002.

		Number of firms
Total number of restatements in GAO database		919
- Repeat restatements	87	
- Firms not listed on CRSP	47	
- Firms delisted from CRSP more than one year before the restatement announcement	13	
- Firms with incomplete CRSP coverage	5	
- Firms whose listing on CRSP began less than nine months before the restatement announcement	23	
- Real estate investment trusts, exchange traded funds, and firms incorporated outside of the U.S.	62	
- Cases where a misstatement did not occur	2	
- Firms whose restatements do not decrease net income	162	
Number of restating firms in the final sample		518

Table 2**Frequency Distribution and Descriptive Statistics of Restating Firms**

Panels A through E show, respectively, the frequency distribution, descriptive statistics, distribution of the number of quarters restated, industry distribution, and time distribution of the sample. The sample consists of publicly traded U.S. companies that announced earnings-decreasing financial statement restatements during the period January 1, 1997 to June 30, 2002. The list of restating firms was obtained from *Financial Statement Restatements: Trends, Market Impacts, Regulatory Responses, and Remaining Challenges* (Washington, D.C.: GAO-03-138).

Panel A: Frequency Distribution

<u>Initiated by</u>	<u>Number</u>
Auditor	38
Company ¹	409
Regulators	
SEC	56
Others	3
Multiple parties	12
	<u>518</u>

<u>Accounts restated</u>	<u>Number</u>
Core	325
Non-core	108
Mixed	85
	<u>518</u>

Panel B: Descriptive Statistics

	Mean	p-value	Median	Wilcoxon p-value	Sample size
Firm age since CRSP listing (years)	10.7	0.000	6.5	0.000	518
Original earnings ² (\$million)	103.3	0.003	2.0	0.000	518
Restated earnings ² (\$million)	-57.1	0.556	-1.0	0.159	502
Change in earnings ³ (%)	-234.1	0.000	-32.7	0.000	502
Number of quarters restated	6.3	0.000	4	0.000	518
Length of misstated period (days)	734	0.000	586	0.000	518

Table 2 (cont.)

Panel C: Distribution by the Number of Quarters Restated	
Number of quarters restated	Number of firms
1	106
2	38
3	105
4	37
5-8	96
9-12	58
13-16	41
17-20	22
21-24	13
25-28	0
29-32	2
Total	518

Panel D: Industry Distribution				
Industry (SIC2 codes)	Sample		CRSP Population⁴	
	Number of firms	% of total	Number of firms	% of total
Agriculture (01-09)	0	0	15	0
Mining (10-14)	10	2	154	3
Construction (15-19)	3	1	54	1
Food and tobacco (20-21)	9	2	100	2
Textiles and apparel (22-23)	7	1	45	1
Lumber, furniture, paper, and print (24-27)	12	2	140	3
Chemicals (28)	35	7	365	7
Petroleum, rubber, and plastics (29-30)	6	1	70	1
Leather, stone, glass (31-32)	6	1	42	1
Primary and fabricated metals (33-34)	9	2	116	2
Machinery (35-36)	78	15	677	13
Transport equipment (37)	9	2	83	2
Instruments and miscellaneous manufacturing (38-39)	31	6	359	7
Transport, communications, utilities (40-49)	40	8	379	7
Wholesale trade (50-51)	24	4	203	4
Retail trade (52-59)	37	7	330	6
Finance, insurance, real estate (60-69)	61	12	1,033	20
Hotels and personal services (70-71)	3	1	26	0
Services (72-89)	138	26	1,043	20
Public administration and others (90-99)	0	0	1	0
Total	518	100	5,235	100

Table 2 (cont.)

Panel E		
Time Distribution		
Year of restatement announcement	Sample	
	Number of firms	% of total
1996 ⁵	7	1
1997	51	10
1998	61	12
1999	92	18
2000	127	25
2001	117	22
2002	63	12
Total	518	100

¹ Includes 245 cases where the initiator was not identified in the GAO database

² The sum of net income for all quarters affected by the restatement

³ Defined as $(\text{Restated earnings} - \text{Original earnings}) / |\text{Original earnings}|$

⁴ Industry distribution of active CRSP firms as of December 31, 2002

⁵ These firms announced restatements in 1996 (reported as 1997 in the GAO database).

Table 3**Descriptive Statistics of Restating and Control Firms**

The table shows the mean and median values for matched samples of restating and control firms and tests for differences between the two groups. The restatement sample consists of 518 publicly traded U.S. firms that announced earnings-decreasing restatements during the period January 1, 1997 to June 30, 2002, as identified by the GAO Report. Each restating firm is matched with a control firm that has the closest size (market capitalization one year before the restatement is announced) from among all firms in its industry that did not restate their financial statements during the period January 1, 1995 to June 30, 2002. All dollar values have been adjusted for inflation and converted to 2005 dollars.

	Mean			Median			Sample size
	Restate	Control	p-value ¹	Restate	Control	p-value ²	
Panel A: Firm Characteristics³							
Firm size							
Total assets (\$million)	2,796	2,213	0.111	236	243	0.001	413
Net sales (\$million)	2,123	1,539	0.048	153	173	0.132	413
Market value of equity (\$million)	2,885	3,187	0.599	207	232	0.500	413
Firm value ⁴ (\$million)	4,798	4,740	0.932	391	409	0.022	413
Number of employees ('000)	7.7	6.4	0.137	0.9	1.0	0.072	390
Growth							
Firm value/total assets	2.26	2.43	0.322	1.41	1.48	0.068	413
Sales growth ⁵	20.42	17.63	0.231	13.30	11.65	0.139	231
Financial leverage							
Long-term debt/total assets	0.18	0.18	0.599	0.12	0.13	0.933	413
Total debt/total assets ⁶	0.25	0.24	0.392	0.22	0.21	0.176	413
Long-term debt/firm value	0.14	0.13	0.432	0.07	0.07	0.375	413
Total debt/firm value	0.20	0.17	0.033	0.14	0.12	0.057	413
Panel B: Board Characteristics⁷							
Board size	7.1	7.3	0.174	7	7	0.123	518
% of outsiders on board	67.4	67.6	0.840	71.4	71.4	0.946	518
Boss ⁸	0.65	0.62	0.250	1	1	0.250	518

¹For the matched pairs t-test (2-tailed)

²For the Wilcoxon signed rank test (2-tailed)

³For (or as of the end of) the last fiscal year ended before the announcement date

⁴Firm value=Book value of total assets-Book value of equity+Market value of equity

⁵Sales growth rate=[Sales(-1) / Sales (-6)]^{1/5}-1

⁶Total debt equals long-term debt plus short-term debt in current liabilities

⁷As of one year before the year of announcement using the *S&P Register*

⁸Equals 1 if a firm's CEO chairs the board; it equals 0 otherwise

Table 4

This table shows the mean and median cumulative abnormal returns (CARs) of restating firms from 20 trading days before to 20 days after the announcement date. For each firm, the abnormal return for trading day t is computed by subtracting the return on the equal-weighted CRSP (i.e., NYSE, Nasdaq and AMEX) index from the return on a stock on day t . Both returns include dividends. Mean and median values are reported as percentages. The sub-sample of more serious cases excludes restatements that are triggered by SAB 101 or certain EITF consensuses, correct earnings releases, or involve only non-core accounts. *Large (small)* and *high (low)* refer to the top (bottom) 40% of the full sample when ranked according to the sub-sample characteristic of interest. Restatement size is the absolute percentage change in reported earnings. We use the CAR (-5, +5) relative to the announcement date when assigning firms to the high and low announcement return sub-samples. Firm size is the market value of equity at the end of the last fiscal year ended before the announcement date. Initiators of restatements are identified using the GAO database.

	Days around announcement					Days around announcement					Sample size
	Means					Medians					
	(-1,+1)	(-5,+1)	(-5,+5)	(-20,+1)	(-20,+20)	(-1,+1)	(-5,+1)	(-5,+5)	(-20,+1)	(-20,+20)	
Full sample	-10.3 ^a	-12.7 ^a	-12.7 ^a	-17.7 ^a	-20.9 ^a	-4.9 ^a	-6.1 ^a	-6.2 ^a	-10.5 ^a	-12.9 ^a	419
More serious cases	-13.7 ^a	-16.9 ^a	-17.7 ^a	-23.5 ^a	-28.4 ^a	-8.8 ^a	-9.6 ^a	-10.2 ^a	-17.6 ^a	-22.3 ^a	263
Positive restated earnings	-7.1 ^a	-8.5 ^a	-9.2 ^a	-12.2 ^a	-15.3 ^a	-3.4 ^a	-4.5 ^a	-4.0 ^a	-8.3 ^a	-10.0 ^a	197
Negative restated earnings	-13.1 ^a	-16.4 ^a	-15.9 ^a	-22.6 ^a	-26.0 ^a	-6.1 ^a	-8.2 ^a	-9.7 ^a	-14.2 ^a	-18.5 ^a	222
Large restatements	-14.5 ^a	-18.5 ^a	-17.7 ^a	-23.2 ^a	-26.8 ^a	-7.4 ^a	-9.9 ^a	-11.5 ^a	-18.5 ^a	-19.6 ^a	166
Small restatements	-9.0 ^a	-10.2 ^a	-8.7 ^a	-14.1 ^a	-14.3 ^a	-4.6 ^a	-4.9 ^a	-4.4 ^a	-9.8 ^a	-11.5 ^a	169
≤ 4 restated quarters	-8.3 ^a	-9.7 ^a	-8.8 ^a	-12.4 ^a	-15.0 ^a	-3.9 ^a	-5.5 ^a	-4.8 ^a	-7.5 ^a	-9.1 ^a	235
>4 restated quarters	-12.8 ^a	-16.4 ^a	-17.7 ^a	-24.6 ^a	-28.4 ^a	-6.2 ^a	-7.7 ^a	-9.5 ^a	-16.0 ^a	-20.8 ^a	184
High announcement returns	0.2	3.3 ^a	8.7 ^a	-2.6	-0.6	0.4	3.5 ^a	5.6 ^a	0.0	1.8	168
Low announcement returns	-23.8 ^a	-31.4 ^a	-37.1 ^a	-37.7 ^a	-45.8 ^a	-19.4 ^a	-26.9 ^a	-28.2 ^a	-33.4 ^a	-37.2 ^a	168
Large firms	-10.4 ^a	-12.3 ^a	-12.9 ^a	-17.7 ^a	-21.0 ^a	-5.0 ^a	-5.7 ^a	-8.1 ^a	-10.5 ^a	-12.4 ^a	184
Small firms	-9.8 ^a	-12.9 ^a	-12.1 ^a	-17.2 ^a	-20.8 ^a	-5.1 ^a	-6.9 ^a	-6.6 ^a	-11.2 ^a	-12.3 ^a	151
Initiated by the company	-11.0 ^a	-13.6 ^a	-13.1 ^a	-18.0 ^a	-20.6 ^a	-4.4 ^a	-6.1 ^a	-5.7 ^a	-10.6 ^a	-12.0 ^a	332
Initiated by others	-7.7 ^a	-9.1 ^a	-11.3 ^a	-16.9 ^a	-21.9 ^a	-5.7 ^a	-5.7 ^a	-6.8 ^a	-10.4 ^a	-17.6 ^a	87

^{a,b,c} Denote significant difference from zero at the 1%, 5%, and 10% levels, respectively, in two-tailed tests.

Table 5**Operating Performance of Restating and Control Firms**

The table shows the mean and median operating performance for matched samples of restating and control firms and tests for differences between the two groups. The restatement sample consists of 518 publicly traded U.S. firms that announced earnings-decreasing restatements during the period January 1, 1997 to June 30, 2002, as identified by the GAO Report. Each restating firm is matched with a control firm with the same 2-digit SIC code and the closest market value of equity one year before the restating firm's announcement date. The control firms did not announce restatements during the period January 1, 1995 to June 30, 2002. A sample firm's OPA (OPS) equals operating income before depreciation as a percentage of the firm's total assets (net sales). OPA and OPS are calculated for fiscal years -3 to +3, where 0 is the fiscal year that ends closest to the restatement announcement date. Each firm's OPA or OPS percentages are summed over the applicable years to calculate mean and median values for multiple-year periods. P-values are for matched pairs t-tests (2-tailed) for differences in means or Wilcoxon signed rank tests (2-tailed) for differences in medians.

Year(s)	Mean			Median			Sample size
	Restate	Control	p-value	Restate	Control	p-value	
Panel A: OPA							
-3	5.0	4.3	0.771	11.0	11.7	0.264	360
-2	0.7	3.0	0.497	9.5	11.8	0.010	412
-1	2.6	4.8	0.286	8.7	11.3	0.015	422
0	-4.1	3.7	0.000	4.1	10.8	0.000	427
+1	-3.0	2.5	0.025	4.7	9.1	0.000	302
+2	1.7	-4.9	0.318	5.8	9.6	0.012	247
+3	3.0	4.3	0.627	6.7	9.8	0.010	204
(-3,-1)	17.9	13.9	0.454	30.6	34.1	0.132	356
(0,+1)	-4.2	7.0	0.008	7.2	21.0	0.000	302
(+2,+3)	5.0	-1.3	0.503	11.0	20.0	0.005	204
Panel B: OPS							
-3	-2.7	-401.9	0.232	11.5	11.3	0.978	346
-2	-39.3	-62.3	0.611	10.6	12.6	0.202	399
-1	-30.3	-32.8	0.903	10.3	12.2	0.177	415
0	-45.6	-20.4	0.374	6.3	12.5	0.000	420
+1	-156.7	-38.1	0.411	5.5	11.0	0.000	298
+2	-124.4	-76.1	0.645	8.0	10.4	0.002	244
+3	-87.1	-51.0	0.599	8.7	10.5	0.025	198
(-3,-1)	-1.7	-469.7	0.174	33.0	35.3	0.841	341
(0,+1)	-175.3	-55.3	0.418	11.1	24.0	0.000	295
(+2,+3)	-228.9	-122.7	0.574	17.5	20.3	0.004	197

Table 6

Management and Auditor Turnover in Restating and Control Firms

The table shows mean turnover rates for matched samples of restating (R) and control (C) firms and tests for differences between the means and medians of the two groups. The sample of restating firms consists of 518 publicly traded U.S. firms that announced earnings-decreasing restatements during the period January 1, 1997 to June 30, 2002. Each restating firm is matched with a control firm with the same 2-digit SIC code and the closest market value of equity one year before the restating firm's announcement date. The control firms did not announce restatements during the period January 1, 1995 to June 30, 2002. For each firm, we observe turnover for five groups: CEO, top management (CEO, Chairman, and President), CFO, top financial officers (CFO, Controller, Treasurer), and outside auditor. For a given year, turnover for a firm equals 1 if the group of officers or auditor listed in the *S&P Register of Corporations, Directors and Executives* differs from the previous year's listing; it equals 0 otherwise. Turnover is shown for years -1 to +2, where 0 is the year of announcement. Turnover values for individual years are summed to compute turnover for multiple-year periods. P-values are from two-tailed matched pairs t-tests for differences in means and Wilcoxon signed rank tests for differences in medians.

Years around ann (0)	CEO					Top Management					CFO				
	R	C	p-value of t-test	Wilcoxon p-value	Sample size	R	C	p-value of t-test	Wilcoxon p-value	Sample size	R	C	p-value of t-test	Wilcoxon p-value	Sample size
-1	0.12	0.11	0.482	0.485	514	0.20	0.19	0.618	0.615	509	0.15	0.12	0.282	0.283	491
0	0.20	0.09	0.000	0.000	479	0.30	0.17	0.000	0.000	476	0.27	0.11	0.000	0.000	465
+1	0.21	0.14	0.007	0.006	411	0.37	0.25	0.004	0.004	408	0.27	0.19	0.006	0.005	391
+2	0.21	0.10	0.000	0.000	345	0.33	0.21	0.004	0.003	342	0.21	0.12	0.005	0.005	322
(-1,0)	0.33	0.20	0.000	0.000	475	0.50	0.35	0.001	0.001	471	0.42	0.22	0.000	0.000	454
(+1,+2)	0.44	0.23	0.000	0.000	345	0.72	0.45	0.000	0.000	341	0.50	0.31	0.000	0.000	320
(0,+1)	0.41	0.23	0.000	0.000	411	0.66	0.42	0.000	0.000	408	0.53	0.31	0.000	0.000	390
(-1,+1)	0.53	0.34	0.000	0.000	407	0.85	0.59	0.000	0.000	404	0.65	0.43	0.000	0.000	380
(-1,+2)	0.75	0.43	0.000	0.000	342	1.20	0.80	0.000	0.000	338	0.87	0.54	0.000	0.000	311

Table 6 (cont.)

Years	Top Financial Officers					Auditor				
	R	C	p-value of t-test	Wilcoxon p-value	Sample size	R	C	p-value of t-test	Wilcoxon p-value	Sample size
-1	0.20	0.22	0.770	0.733	114	0.06	0.04	0.190	0.192	507
0	0.31	0.20	0.144	0.170	118	0.10	0.07	0.128	0.129	479
+1	0.37	0.19	0.007	0.007	134	0.13	0.08	0.032	0.032	403
+2	0.22	0.20	0.887	0.894	93	0.10	0.07	0.180	0.183	333
(-1,0)	0.56	0.48	0.538	0.598	84	0.16	0.11	0.048	0.048	468
(+1,+2)	0.77	0.49	0.080	0.034	65	0.21	0.16	0.094	0.094	332
(0,+1)	0.81	0.49	0.009	0.012	75	0.22	0.16	0.034	0.033	403
(-1,+1)	1.09	0.77	0.058	0.058	64	0.28	0.20	0.020	0.021	392
(-1,+2)	1.40	1.02	0.143	0.086	47	0.36	0.27	0.038	0.039	325

Table 7
Correlation Matrix

The table shows Pearson correlation coefficients for turnover and several variables. The sample consists of (1) 518 publicly traded U.S. firms that announce earnings-decreasing restatements during the period January 1, 1997 to June 30, 2002, and (2) 518 industry-size matched control firms that do not announce restatements during the period January 1, 1995 to June 30, 2002. Correlation coefficients are calculated using turnover observations for the CEO, top 3 managers (CEO, Chairman, and President, denoted TOP3), CFO, and the outside auditor (AUD) for the years (-1,0), (0,+1), and (-1,+1), where 0 is the year of the restatement announcement. For a given year, turnover equals 1 if there were any officer or auditor changes according to the *S&P Register of Corporations, Directors and Executives*; it equals 0 otherwise. Turnover values for individual years are summed to compute turnover for multiple-year periods. RESTATE is a dummy variable equal to 1 if the firm is a restating firm; it equals 0 otherwise. Ln(sales) is the natural logarithm of net sales. V/A equals firm value divided by total assets. D/A equals total debt divided by total assets. OPA is operating income before depreciation divided by total assets. Ln(sales), V/A, D/A, and OPA are computed using values for (or as of the end of) the last fiscal year ended before the announcement date. All dollar values have been adjusted for inflation and converted to 2005 dollars. Board size is the number of directors on the board. Outsider equals the number of outside directors divided by board size. Boss equals 1 if the CEO chairs the board; it equals 0 otherwise. Board data is observed one year before the announcement year using the *S&P Register*. CAR(-5,+5) is the cumulative abnormal return over trading days (-5, +5), where day 0 is the announcement day. The sample size is 600 firms (i.e., 300 matched pairs) with all the data available. Cutoff values of the correlation coefficient at significance levels of 1%, 5% and 10% in two-tailed tests are respectively, 0.1048, 0.0799 and 0.067.

Variables	CEO (-1,0)	CEO (0,+1)	CEO (-1,+1)	TOP3 (-1,0)	TOP3 (0,+1)	TOP3 (-1,+1)	CFO (-1,0)	CFO (0,+1)	CFO (-1,+1)	AUD (-1,0)	AUD (0,+1)	AUD (-1,+1)	RE-STATE	LSALES	V/A	D/A	OPA	OUT-SIDER	BDSIZE	BOSS	CAR (-5,+5)	
CEO (-1,0)	1.000																					
CEO (0,+1)	0.422	1.000																				
CEO (-1,+1)	0.723	0.813	1.000																			
TOP3(-1,0)	0.827	0.365	0.614	1.000																		
TOP3 (0,+1)	0.382	0.807	0.693	0.456	1.000																	
TOP3 (-1,+1)	0.592	0.666	0.819	0.716	0.825	1.000																
CFO (-1,0)	0.234	0.118	0.174	0.255	0.124	0.181	1.000															
CFO (0,+1)	0.072	0.262	0.234	0.101	0.257	0.244	0.424	1.000														
CFO (-1,+1)	0.109	0.229	0.233	0.134	0.233	0.243	0.685	0.839	1.000													
AUD (-1,0)	0.081	0.072	0.057	0.076	0.034	0.021	0.090	0.035	0.051	1.000												
AUD (0,+1)	0.060	0.109	0.080	0.065	0.076	0.059	0.143	0.132	0.165	0.511	1.000											
AUD (-1,+1)	0.053	0.109	0.081	0.053	0.069	0.053	0.144	0.126	0.159	0.702	0.899	1.000										
RESTATE	0.100	0.189	0.164	0.074	0.130	0.103	0.104	0.135	0.114	0.055	0.060	0.068	1.000									
LSALES	0.005	0.014	0.011	0.037	0.077	0.045	0.055	0.057	0.058	-0.037	-0.010	-0.016	0.035	1.000								
V/A	-0.048	0.018	-0.011	-0.039	0.044	-0.004	0.005	0.028	0.034	-0.006	-0.053	-0.036	-0.023	-0.158	1.000							
D/A	0.053	-0.018	0.024	0.031	-0.003	0.027	0.020	-0.008	0.002	0.063	0.033	0.074	0.067	0.237	-0.407	1.000						
OPA	-0.050	-0.108	-0.109	-0.049	-0.067	-0.083	-0.031	-0.055	-0.041	-0.019	-0.041	-0.034	-0.024	0.466	-0.147	0.113	1.000					
OUTSIDER	0.053	0.082	0.087	0.040	0.034	0.061	0.087	0.017	0.037	-0.052	-0.009	-0.041	0.018	0.239	-0.052	0.055	0.044	1.000				
BDSIZE	0.035	0.022	0.019	0.048	0.025	0.006	0.071	0.002	0.015	-0.017	0.023	0.005	-0.034	0.459	-0.104	0.062	0.116	0.511	1.000			
BOSS	-0.218	-0.046	-0.179	-0.205	-0.110	-0.189	0.019	0.030	0.015	0.040	0.021	0.035	0.038	0.095	0.038	-0.036	0.030	0.118	-0.001	1.000		
CAR(-5,+5)	-0.012	-0.152	-0.114	-0.040	-0.127	-0.125	-0.021	-0.138	-0.102	-0.102	-0.083	-0.095	-0.268	0.030	-0.177	-0.022	0.012	-0.038	0.088	-0.109	1.000	

Table 8

Logistic Regressions

The table shows marginal effects (dy/dx) and their z-statistics from logistic regressions of turnover on several explanatory variables. The sample consists of publicly traded U.S. firms that announce earnings-decreasing restatements during 1997-2002, and industry-size matched control firms that do not announce restatements during this period. Panels A through E show regression results for sample periods (-1,0), (+1,+2), (0,+1), (-1,+1), and (-1,+2), where 0 is the year of the restatement announcement. TURNOVER equals 1 if there were any officer or auditor changes during the sample period according to the *S&P Register of Corporations, Directors and Executives*; it equals 0 otherwise. RESTATE is a dummy variable equal to 1 for a restating firm; it equals 0 otherwise. OUTSIDER equals the number of outside directors divided by board size. BDSIZE is the number of directors on the board. BOSS equals 1 if the CEO chairs the board; it equals 0 otherwise. Board data are obtained from the *S&P Register* for the year before the announcement year. CAR(-5,+5) is the cumulative abnormal return over days (-5,+5), where day 0 is the announcement day. LSALES is the natural logarithm of net sales. A equals the book value of total assets. Firm value, V, equals A minus the book value of equity plus the market value of equity. OPA is operating income before depreciation divided by A. Total debt, D, equals long-term debt plus short-term debt in current liabilities. All dollar values have been adjusted for inflation and converted to 2005 dollars. Financial data are for the last fiscal year ending before the announcement year. Reported marginal effects have been multiplied by 10 for all explanatory variables except RESTATE. Test statistics are computed using a robust variance estimator.

Independent variable	Dependent Variable: Turnover of									
	CEO		Top Management		CFO		Top Financial Officers		Auditor	
	dy/dx	z	dy/dx	z	dy/dx	z	dy/dx	z	dy/dx	Z
Panel A: (-1,0)										
RESTATE	0.0960	2.86 ^a	0.0795	2.13 ^b	0.1114	3.14 ^a	-0.0862	-0.93	0.0246	0.99
OUTSIDER	0.017	1.72 ^c	0.005	0.45	0.003	0.28	0.035	1.23	-0.015	-2.29 ^b
BDSIZE	-0.023	-0.35	-0.009	-0.13	0.034	0.46	0.044	0.26	0.087	2.08 ^b
BOSS	-1.989	-5.52 ^a	-2.151	-5.62 ^a	0.168	0.46	-0.465	-0.45	0.446	1.86 ^c
CAR(-5,+5)	0.002	0.21	-0.008	-0.90	0.002	0.28	0.014	0.78	-0.008	-1.72 ^c
LSALES	0.086	0.87	0.203	1.83 ^c	0.129	1.22	0.374	1.22	-0.132	-1.67 ^c
V/A	-0.063	-0.78	-0.099	-1.10	-0.010	-0.10	0.308	1.52	0.033	0.56
OPA	-0.013	-2.01 ^b	-0.016	-1.98 ^b	-0.012	-1.57	-0.043	-1.18	0.003	0.55
D/A	0.470	0.49	-0.596	-0.55	0.030	0.03	4.166	1.33	1.577	2.37 ^b
Constant	-1.521	-3.57 ^a	-0.782	-2.00 ^b	-1.800	-4.33 ^a	-3.042	-3.23 ^a	-1.763	-3.48 ^a
Number of observations	724		720		692		132		712	
p-value ¹	0.0000		0.0000		0.0609		0.2476		0.0342	
Pseudo R-squared	0.0582		0.0474		0.0195		0.0636		0.0336	
% ↑ in turnover probability ²	50.4		27.9		48.9		-22.7		23.0	

Table 8 (cont.)

Independent variable	Dependent Variable: Turnover of									
	CEO		Top Management		CFO		Top Financial Officers		Auditor	
	dy/dx	z	dy/dx	z	dy/dx	z	dy/dx	z	dy/dx	z
Panel B: (+1,+2)										
RESTATE	0.1382	3.47 ^a	0.0966	2.25 ^b	0.1421	3.29 ^a	0.2541	2.56 ^b	0.0298	0.89
OUTSIDER	0.014	1.12	-0.004	-0.32	-0.012	-0.92	0.060	1.85 ^c	-0.008	-0.88
BOARD SIZE	-0.039	-0.47	0.020	0.23	-0.190	-2.00 ^b	-0.153	-0.73	0.001	0.02
BOSS	0.063	0.15	-0.633	-1.40	-0.423	-0.94	-2.122	-1.77 ^c	0.181	0.52
CAR(-5,+5)	-0.033	-3.58 ^a	-0.024	-2.34 ^b	-0.025	-2.40 ^b	-0.022	-0.90	-0.008	-1.06
LSALES	0.146	1.17	0.214	1.64	0.167	1.20	0.351	1.11	-0.119	-1.12
V/A	-0.143	-1.39	0.018	0.15	-0.068	-0.58	-1.009	-2.01 ^b	-0.038	-0.39
OPA	-0.025	-3.11 ^a	-0.018	-2.14 ^b	-0.013	-1.43	-0.080	-1.28	-0.009	-1.43
D/A	-2.364	-1.84 ^c	-0.863	-0.65	-1.722	-1.36	-5.757	-1.72 ^c	0.676	0.68
Constant	-1.636	-3.44 ^a	-0.829	-2.01 ^b	-0.006	-0.01	-0.752	-0.68	-0.962	-1.90 ^c
Number of observations	582		574		550		112		568	
p-value ¹	0.0000		0.0128		0.0003		0.0190		0.2050	
Pseudo R-squared	0.0649		0.0265		0.0484		0.1389		0.0206	
% ↑ in turnover probability ²	60.6		27.1		47.6		81.1		18.1	
Panel C: (0,+1)										
RESTATE	0.1494	4.07 ^a	0.1068	2.65 ^a	0.1265	3.15 ^a	0.1371	1.35	0.0439	1.40
OUTSIDER	0.014	1.25	0.003	0.22	-0.005	-0.41	0.013	0.36	-0.012	-1.43
BOARD SIZE	-0.026	-0.36	-0.066	-0.85	-0.029	-0.34	0.061	0.33	0.075	1.28
BOSS	-0.644	-1.65 ^c	-1.410	-3.41 ^a	0.321	0.79	-1.258	-1.14	0.230	0.72
CAR(-5,+5)	-0.016	-1.92 ^c	-0.018	-1.86 ^c	-0.020	-2.09 ^b	-0.023	-1.09	-0.015	-2.25 ^b
LSALES	0.112	0.97	0.393	3.06 ^a	0.259	2.00 ^b	0.610	2.04 ^b	-0.047	-0.49
V/A	-0.030	-0.38	0.070	0.81	-0.038	-0.44	-0.597	-1.58	-0.172	-1.89 ^c
OPA	-0.021	-2.42 ^b	-0.023	-2.49 ^b	-0.017	-1.72 ^c	-0.073	-2.29 ^b	-0.007	-1.23
D/A	-0.970	-0.84	-0.663	-0.55	-0.908	-0.78	-2.450	-0.71	-0.120	-0.12
Constant	-1.595	-3.69 ^a	-1.076	-2.73 ^a	-1.204	-2.94 ^a	-1.287	-1.22	-1.167	-2.38 ^b
Number of observations	662		656		634		122		656	
p-value ¹	0.0001		0.0001		0.0022		0.0603		0.0721	
Pseudo R-squared	0.0462		0.0417		0.0335		0.0993		0.0240	
% ↑ in turnover probability ²	65.8		31.1		41.6		36.7		27.5	

Table 8 (cont.)

Independent variable	Dependent Variable: Turnover of									
	CEO		Top Management		CFO		Top Financial Officers		Auditor	
	dy/dx	z	dy/dx	z	dy/dx	z	dy/dx	z	dy/dx	z
Panel D: (-1,+1)										
RESTATE	0.1444	3.58 ^a	0.0845	2.01 ^b	0.0994	2.37 ^b	0.0764	0.68	0.0476	1.39
OUTSIDER	0.024	1.91 ^c	0.018	1.47	-0.001	-0.11	0.026	0.76	-0.018	-1.90 ^c
BDSIZE	-0.071	-0.88	-0.130	-1.58	-0.016	-0.19	0.070	0.36	0.087	1.37
BOSS	-2.012	-4.85 ^a	-2.219	-5.44 ^a	0.105	0.25	0.153	0.13	0.470	1.36
CAR(-5,+5)	-0.016	-1.71 ^c	-0.025	-2.46 ^b	-0.016	-1.57	0.022	0.93	-0.014	-1.95 ^c
LSALES	0.205	1.58	0.400	2.90 ^a	0.249	1.85 ^c	0.364	1.11	-0.100	-0.93
V/A	-0.060	-0.65	-0.044	-0.50	-0.002	-0.02	0.113	0.56	-0.039	-0.37
OPA	-0.028	-2.49 ^b	-0.030	-2.42 ^b	-0.015	-1.39	-0.078	-1.65 ^c	-0.005	-0.87
D/A	-0.289	-0.24	-0.548	-0.45	-0.618	-0.51	1.857	0.50	1.545	1.52
Constant	-1.076	-2.67 ^a	-0.559	-1.47	-0.847	-2.16 ^b	-1.714	-1.65 ^c	-1.088	-2.41 ^b
Number of observations	656		650		620		104		638	
p-value ¹	0.0000		0.0000		0.0639		0.3863		0.0491	
Pseudo R-squared	0.0609		0.0568		0.0200		0.0720		0.0244	
% ↑ in turnover probability ²	45.5		18.9		24.6		14.5		24.1	
Panel E: (-1,+2)										
RESTATE	0.1648	3.74 ^a	0.0801	1.83 ^c	0.1378	3.08 ^a	0.1334	1.14	0.0433	1.08
OUTSIDER	0.017	1.25	0.006	0.43	0.003	0.24	0.091	3.01 ^a	-0.025	-2.18 ^b
BDSIZE	0.039	0.42	0.064	0.71	-0.133	-1.41	-0.233	-1.20	0.052	0.64
BOSS	-1.466	-3.19 ^a	-2.003	-4.73 ^a	-0.192	-0.42	-1.876	-1.75 ^c	0.773	1.90 ^c
CAR(-5,+5)	-0.030	-2.63 ^a	-0.030	-2.80 ^a	-0.022	-1.97 ^b	0.014	0.44	-0.019	-1.97 ^b
LSALES	0.319	2.23 ^b	0.368	2.58 ^a	0.219	1.54	0.531	1.57	-0.200	-1.57
V/A	-0.149	-1.23	-0.059	-0.53	-0.011	-0.09	-0.304	-0.62	-0.126	-1.00
OPA	-0.047	-3.78 ^a	-0.038	-3.28 ^a	-0.014	-1.21	-0.065	-1.15	-0.010	-1.22
D/A	-1.476	-1.08	-0.457	-0.35	-0.852	-0.64	1.467	0.31	2.552	2.14 ^b
Constant	-1.025	-2.42 ^b	-0.290	-0.68	-0.136	-0.31	-2.189	-1.54	-0.251	-0.55
Number of observations	578		570		536		82		558	
p-value ¹	0.0000		0.0000		0.0088		0.0111		0.0021	
Pseudo R-squared	0.0707		0.0623		0.0315		0.1611		0.0408	
% ↑ in turnover probability ²	40.8		14.1		28.3		25.0		16.8	

¹Of the chi-squared test.

²The percentage increase in the probability of turnover upon restatement equals $100 \times \left[\frac{p(\text{TURNOVER}=1 | \text{RESTATE}=1)}{p(\text{TURNOVER}=1 | \text{RESTATE}=0)} - 1 \right]$, where the probabilities are predicted values from the logistic model computed at the means of other independent variables.

^{a,b,c} denote statistical significance at the 1%, 5%, and 10% levels, respectively, in two-tailed tests.

Table 9
Sub-Sample Regressions of Turnover over Years (-1, +1)

The table shows the marginal effects (dy/dx) of RESTATE and their z-statistics and the percent increase in turnover probability due to restatement from the full sample and several sub-sample regressions similar to those described in Table 8. Turnover observations are for the period (-1, +1) relative to the year of restatement announcement (year 0). Each cell in the table reports the result of one regression. Test statistics are computed using a robust variance estimator.

Independent variable	Dependent Variable: Turnover of														
	CEO			Top Management			CFO			Top Financial Officers			Auditor		
	$\frac{dy}{dx}$	z	% ↑ in prob. ¹	$\frac{dy}{dx}$	z	% ↑ in prob. ¹	$\frac{dy}{dx}$	z	% ↑ in prob. ¹	$\frac{dy}{dx}$	z	% ↑ in prob. ¹	$\frac{dy}{dx}$	z	% ↑ in prob. ¹
Full sample	0.144	3.58 ^a	45.5	0.084	2.01 ^b	18.9	0.099	2.37 ^b	24.6	0.076	0.68	14.5	0.048	1.39	24.1
More serious restatements ²	0.192	3.70 ^a	63.9	0.112	2.06 ^b	25.3	0.111	2.00 ^b	26.4	0.051	0.32	9.0	0.055	1.25	29.3
Low announcement returns ³	0.237	3.07 ^a	82.5	0.192	2.39 ^b	46.1	0.149	1.87 ^c	38.2	0.357	1.42	94.0	0.035	0.51	16.4
Negative restated earnings	0.193	3.26 ^a	55.5	0.225	3.79 ^a	55.0	0.158	2.58 ^a	38.7	0.045	0.19	7.6	0.072	1.55	41.6
> 4 quarters restated	0.107	1.66 ^c	28.2	0.072	1.10	15.0	0.177	2.64 ^a	49.8	-0.072	-0.40	-11.2	0.090	1.55	42.5
Large restatements ⁴	0.137	2.08 ^b	44.2	0.131	1.94 ^c	32.8	0.083	1.20	18.7	-0.076	-0.34	-13.2	0.013	0.24	7.0
Large firms ⁵	0.110	1.84 ^c	37.3	0.049	0.77	10.6	0.001	0.02	0.3	-0.036	-0.26	-5.4	0.007	0.15	4.0
Initiated by company	0.134	2.95 ^a	42.5	0.043	0.91	9.5	0.097	2.01 ^b	23.0	0.101	0.80	19.5	0.071	1.86 ^c	38.9
Initiated by others	0.168	1.80 ^c	51.4	0.228	2.47 ^b	54.5	0.095	1.01	27.4	-0.115	-0.29	-13.1	-0.081	-1.15	-32.8

Table 9 (cont.)

¹The percentage increase in the probability of turnover upon restatement equals $100 \times [\{p(\text{TURNOVER}=1 | \text{RESTATE}=1) / p(\text{TURNOVER}=1 | \text{RESTATE}=0)\} - 1]$, where the probabilities are predicted values from the logistic model computed at the means of other independent variables.

²Excludes firms whose restatements were triggered by SAB 101 or certain EITFs, corrected earnings releases, or involved only non-core accounts.

³Restating firms in bottom 40% of the sample based on the cumulative abnormal return over days (-5, +5) around the restatement announcement

⁴Restatements in the top 40% of the sample ranked by the absolute percentage change in reported earnings

⁵Restating firms in the top 40% of the sample based on market capitalization one year before the announcement date

^{a,b,c}Denote statistical significance at the 1%, 5%, and 10% levels, respectively, in two-tailed tests.