Corporate Governance and Firm Value–the Impact of the 2002 Governance Rules[*]

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Abstract

The 2001-2002 corporate scandals led to rules that affect the governance structure of public U.S. firms. We find a significant effect of the rules on firm value. Firms that need to make more changes to their governance structure and their insiders' behavior to comply with the rules outperform firms that need to make fewer changes. We also find some evidence that the result is concentrated in large firms. Small firms that need to make more changes underperform small firms that need to make fewer changes, suggesting that the costs of the rules outweigh their benefits in small firms.

The high-profile corporate failures in the United States in 2001-2002 led to new governance rules. These rules consist of the Sarbanes-Oxley law (SOX) and the amendments to the stock-exchange regulations. The new rules include provisions such as independence of audit committee members, majority of independent directors on the board, chief executive officer (CEO) certification of the financial statements, and increased penalties for corporate fraud.

The aim of the rules is clear. They are intended to ensure that mechanisms that align the incentives of CEOs, auditors, and directors function properly. Arguably, such rules are necessary because existing governance mechanisms do not offer enough protection to shareholders, and shareholders do not have enough power to require corporate insiders to change them.

Yet, it is not clear whether all firms should benefit from these rules. Optimal governance structure depends on firms' monitoring needs and on the costs and benefits of different governance mechanisms. To the extent that these costs and benefits vary across firms and over time, optimal governance structure should also vary (Hermalin and Weisbach (1988), Hermalin and Weisbach (1998), Cremers and Nair (2005), Gillan, Hartzel, and Starks (2003), Lehn, Patro, and Zhao (2004)). Thus, imposing one structure on all firms might be suboptimal to some firms. [1]

In particular, several researchers have warned that small firms might bear higher costs than large firms in implementing the rules. For example, Holmstrom and Kaplan (2003) warn that relative to their size, small firms bear higher costs of complying with the internal control requirements of the SOX. In addition, smaller firms might find it harder to attract qualified independent directors because good directors are attracted to larger, more visible firms. Consistent with these arguments, smaller firms tend to choose more insiders on boards (Chhaochharia and Grinstein (2004), Lehn et al. (2004)).

In this article we study the announcement effect of the rules on firm value. We ask whether there is a significant effect of the rules on firm value, and whether there is a difference in the announcement effect across small and large firms.

To test the effect of the rules on firm value, we construct portfolios of firms based on how much they are affected by the rules. We then study the returns of these portfolios during the rule announcement period. If the rules have a positive effect on firm value then, holding else constant, a portfolio of firms that are more affected by the rules should outperform a portfolio of firms that are less affected by the rules. If, on the other hand, the rules have a negative effect on firm value then, holding else constant, a portfolio of firms that are more affected by the rules should underperform a portfolio of firms that are less affected by the rules.

The rules have many provisions, each of which has a different effect on firms. We construct five different portfolios to capture four main provisions of the rules: anti-fraud provisions, related party transactions provisions, internal control provisions, and board and committee independence provisions. For each of these provisions we construct a portfolio of firms that are more affected by the rules and we test whether that portfolio outperforms or underperforms a benchmark portfolio of firms that are less affected by the rules. For the anti-fraud provisions we choose a portfolio of firms whose insiders sold shares just before a negative abnormal stock performance, and a portfolio of firms that restated their financial statements in the past. For the related party transaction provisions we choose a portfolio of firms that disclosed related party transactions in the past. For the internal control provisions we choose a portfolio of firms that replaced their auditors in the past, and for the director independent provisions, we choose a portfolio of firms who do not have independent directors on the board or in their committees.

It is argued that the rules are more likely to benefit large firms than small firms. For example, Holmstrom and Kaplan (2003) argue that the rules might hurt small firms because of the large fixed costs that are required to enhance internal control mechanisms. Lehn et al. (2004) and Chhaochharia and Grinstein (2004) show that smaller firms choose to have a larger portion of non-independent board members than larger firms. According to these arguments, imposing internal controls and board structure requirements are likely to have a different effect across firm size. We therefore test separately the response to these two aspects of the rules across large and small firms.

In general, we find that during the announcement period, portfolios of firms that are more affected by the rules earn positive abnormal returns. Firms that restated their earnings, firms that experienced stock sales by insiders just before an abnormal drop in the stock price, firms that have related party transactions, and firms whose board and committees are not independent outperform their peers by about 10%-25% during the announcement year. We perform several robustness tests to ensure that our results are not driven by some other events not related to the rules or by some unobserved firm characteristics. Our results are robust to all these tests.

When we analyze separately large and small firms, we find the positive abnormal return only in large firms. Small firms that are more affected by the rules do not outperform small firms that are less affected by the rules. In fact, we find some evidence for negative abnormal returns. For example, a portfolio of small firms with less board independence underperform a matching portfolio of small firms with more board independence by about 12% during the announcement year. These results suggest that the rules have imposed excessive costs on small firms.

This article contributes to the line of research that examines the relation between corporate governance and firm value (e.g., Yermack (1996), Gompers, Ishii, and Metrick (2003), Cremers and Nair (2005), Bebchuk, Cohen, and Ferrel (2004)). Many of these studies find that certain governance

structures are associated with better performance and higher firm value. However, it is sometimes hard to interpret the results in these studies since governance structure is a variable chosen by firms, in part because of their monitoring needs. Controlling for this endogenous relation often requires additional assumptions on the potential effect of firm characteristics on governance structure and firm value, and might lead to estimation bias and a reduced statistical power. The new governance rules offer a unique laboratory to test the effect of governance structure on firm value, since the rules are exogenously imposed on all firms.

This research also contributes to the line of literature that studies the desirability of governance rules on corporations. Dahya, McConnell, and Travlos (2002) study the effect of the Cadbury committee recommendations on the relation between corporate performance and managerial turnover in the United Kingdom. They find that firms adopting the recommendations have larger sensitivity of CEO turnover to performance. Greenstone, Oyer, and Vissing-Jørgensen (2005) study the effect of the 1964 OTC disclosure rules on firm value, and find an overall positive effect. Gomes, Gorton, and Madureira (2004) study the effect of the regulation of Fair Disclosure on firms' cost of capital, and find that the rules resulted in reduced cost of capital in large firms but in increased cost of capital in small firms.

More closely related to our work are the studies of Li, Pincus, and Rego (2004), Razaee and Jain (2005), and Zhang (2005), who all look at the effect of the announcement of the SOX on firm value. Unlike our study, their approach is based on identifying key dates associated with changes in the likelihood that the law will be passed and examining abnormal market reaction as well as abnormal firm-level reaction around those dates. Li et al. (2004) and Rezaee and Jain (2005) find a total positive effect of the law on firm value, while Zhang (2005) finds a total negative effect of the law on firm value. The results differ across the studies partly because each identifies different key

dates associated with the rules, and each has a different interpretation as to whether the information release on these key dates increased or decreased the likelihood that the law will be passed. Our study overcomes this identification problem by considering a large event window that captures any information spillover and belief updates by the market during the legislation process. We are also better able to control for market-wide shocks not associated with the rules by focusing on differences in returns between portfolios of firms that are more affected by the rules and matching portfolios of firms that are less affected by the rules. Finally, we also explore variations in the announcement effect across firm size.

The rest of the article continues as follows: Section I summarizes the background to the rules and the provisions of the new rules. Section II describes the methodology, and section III presents the data and variables. Section IV provides the results, section V has the robustness checks, and section VI is the conclusion.

I. Background

The legislation of the new governance rules in 2002 came after a series of corporate scandals that involved accounting irregularities and share-price manipulation. The largest scandal that sparked the legislation process was the collapse of the energy company Enron. On December 2, 2001, it filed for bankruptcy.[2]

The collapse came after several weeks of investigation by the Securities and Exchange Commission (SEC), which revealed accounting irregularities and corporate misconduct. Several months later, the SEC found several other accounting irregularities and corporate misconduct in other firms such as Tyco and WorldCom. These events eventually led to the SOX and to the changes in the stock-exchange regulations.

Figure 1 shows the timeline of events. On November 8, 2001, after several weeks of SEC investigation, Enron filed restated financial results with the SEC. The investigation revealed several accounting irregularities and showed that the company was heavily indebted and in a worse situation than what was provided in its statements. On December 2, 2001, Enron filed for bankruptcy protection.

[FIGURE 1 APPROXIMATELY HERE]

Between December 2001 and April 2002, the Senate Committee on Banking, Housing, and Urban Affairs and the House Committee on Financial Services held numerous hearings about Enron's collapse and related accounting and investor-protection issues. These hearings and the corporate scandals that followed Enron led to the passage of the SOX. The Senate and the House reached consensus on the act on July 24 and voted almost unanimously for the act on July 25, 2002. President George W. Bush signed the bill into law on July 30, 2002.

The act has eleven sections. These sections include new requirements from several corporate entities, such as accounting firms, financial analysts, corporate officers, and corporate directors. The main provisions of the SOX are as follows:

1. Section I: The establishment of the Public Corporation Oversight Board. Among its tasks are to register public accounting firms, to establish standards related to preparation of audit reports to issuers, and to oversee public accounting firms.

2. Section II: Restrictions on public accounting firms. The main provisions require public accounting firms not to provide any non auditing services contemporaneously with the auditing services, and to rotate the coordinating auditing partner and the reviewing auditing partner every 5 years.

3. Section III: Corporate responsibility.

a. Requirement for independent audit committee (subsection 301)

b. Executive certification of financial reports (subsection 302)

c. Forfeiture of certain bonuses and profits upon financial restatements (subsection 304)

4. Section IV: Enhanced financial disclosure and internal controls.

   a. Enhanced disclosure of firms' relationship with unconsolidated entities. (subsection 401)

   b. Prohibition of personal loans to executives (subsection 402)

   c. Disclosure of managerial assessment of internal controls (subsection 404)[3]

   d. Code of ethics for senior financial officers (subsection 406)

   e. Disclosure of audit committee financial expert (subsection 407)

5. Sections VIII, IX, and XI: Increased penalties for corporate fraud.

In conjunction with the legislation of the SOX, the stock exchanges came up with their own governance rules. On February 13, 2002, the SEC called the major stock exchanges to review their governance requirements. In response, on June 6, 2002, the New York Stock Exchange (NYSE) announced the governance proposal recommended by its board committee. NYSE's board approved the proposal on August 1, 2002, and submitted it to the SEC for approval on August 16 of that year. The main provisions of the final NYSE proposal are:

1. All firms must have a majority of independent directors.

2. Independent directors must comply with an elaborate definition of independent directors.

3. The compensation committee, nominating committee, and audit committee shall consist of independent directors.

4. All audit committee members should be financially literate. In addition, at least one member of the audit committee would be required to have accounting or related financial management expertise.

5. Separate executive sessions: The board should hold regular sessions without management.

The National Association of Securities Dealers Automated Quotation System (NASDAQ) followed a similar process. On April 12, 2002, NASDAQ announced that its executive committee approved a first round of governance change proposals. NASDAQ board of directors approved these measures on May 22, 2002. On July 24, 2002, NASDAQ board approved a second round of proposals that closely followed those of the NYSE.[4] NASDAQ submitted its second-round proposals to the SEC in October 2002. After few minor changes, the SEC approved the NYSE and NASDAQ proposals in November 2003.

This timeline of events suggests that the legislation process of the governance rules took months, and market expectations about the rules could have gone in different directions before the rules were signed. It is also clear from the timeline of events that the triggering event for the whole legislative process is the Enron scandal. Therefore, we choose an event window between November 2001 and October 2002 to capture the total effect of the events that are related to the legislation on corporate value.

II. Methodology

Our goal is to assess whether the rules have a positive effect on firm value. To that end, we compare, during the announcement period, returns of firms that are more affected by the rules to those that are less affected by the rules, controlling for other firm attributes that are likely to affect value. If the rules have a positive effect on firm value, then firms that are more affected by the rules should exhibit positive abnormal returns compared to firms that are less affected by the rules.

In analyzing aggregate abnormal returns associated with rule announcement, we face a clustering problem. Since all firms under consideration are affected by the same event, the

covariance among their abnormal returns differs from zero, and a simple event study test where the abnormal returns of individual stocks are aggregated (or regressed against explanatory variables) will be biased and will lead to wrong inferences. To mitigate the clustering problem, Schwert (1981) and Campbell, Lo, and MacKinlay (1997) recommend a portfolio approach, where firms under consideration are formed into portfolios and the return of these portfolios is compared against a benchmark. We adopt their approach in this paper.

We use two different methodologies of forming benchmarks. These methodologies are reminiscent of the ones used by Greenstone, Oyer, and Vissing-Jørgensen (2005), who test the announcement effect of disclosure rules in U.S. companies across different portfolios of firms. Our first benchmark is the four-factor model. Define A, a portfolio of firms that are affected by the rules. We can then run the following regression over the daily portfolio returns between November 2001 and October 2002:

$$R_{At} - R_{ft} = \alpha_A + \beta_{1A}(R_{mt} - R_{ft}) + \beta_{2\backslash A}SMB_t + \beta_{3A}HML_t + \beta_{4A}MOM_t + \varepsilon_t \quad (1)$$

where R_{ft} is the risk-free rate. The first factor controls for the excess return that is correlated with the market-excess return. The second and the third factors are based on Fama and French (1993), and the momentum factor follows Carhart (1997). The Fama and French factors are the differences in returns between portfolios of small and large firms (SMB) and the differences in returns between portfolios of high and low book-to-market ratios.[5]

The parameter α_H in equation 1 measures the excess return of portfolio A relative to the four factors. Since we consider daily returns, α_H represents the average excess daily return. Thus, if the rules have a positive impact on firm value, then the abnormal return of portfolio A should be positive and significant. (To give an idea of the economic significance of these coefficients, we also report the average annualized excess return, which is obtained by multiplying the alpha parameter by 252

trading days.) In the regression analysis we consider both equal-weighted portfolios and value-weighted portfolios.[6] We also run the four-factor regression where the return is of a portfolio that goes long firms that are more affected by the rules and goes short firms that are less affected by the rules. This approach increases accuracy because it cancels out the effect of common shocks to the two portfolios that are unrelated to the passage of the law (Greenstone et al. 2005).

The second way we form a benchmark is based on matched sample methodology (e.g., Barber and Lyon 1997, and Lyon, Barber, and Tsai 1999). In this methodology, we match firms that are more likely to be affected by the rules with firms that are less likely to be affected by the rules based on industry, market cap, and market-to-book ratio (in some of our tests we also match based on past performance and leverage). We define the market-to-book ratio as the market value of the firms' equity plus the book value of the firms' assets minus the book value of the firm's equity, all divided by the book value of the firms' assets. The industry matching is based on the Fama and French 17-industry classification. We require that the market capitalization of the matched firm is within +/-30% of the market capitalization of the firm that is more affected by the rules, and within this range we pick the firm with the closest market-to-book ratio.[7]

Define R^{M}_{iA}, the buy-and-hold return over the event period of firm i that is likely to be affected by the rule, and R^{M}_{iNA} the buy-and-hold of its matched firm that is less likely to be affected by the rule. Define also $R^{M}_{g} = \frac{1}{N}\sum_{i=1}^{N} R^{M}_{ig}$, the buy-and-hold return of the portfolio of firms that have a score $g=\{A,NA\}$, and $\hat{\Delta} = R^{M}_{A} - R^{M}_{NA}$ the difference in returns between portfolios A and NA. Since, by assumption, the matching portfolios should have similar risk, we should expect $E(\Delta) = 0$. We can therefore form the t-statistic $\hat{\Delta}/\hat{\sigma}_{\Delta}$ where $\hat{\sigma}^{2}_{\Delta}$ is the volatility of the returns of a portfolio that goes long A and short NA, measured over the three months before the event period.

One of the drawbacks of the above hypothesis test is that it is based on asymptotic theory, and can be misleading when the sample size is small. The simulation-based bootstrap approach often helps improve the accuracy of these tests (e.g., Mackinnon, 2002). We therefore employ the bootstrap methodology in this paper. In this methodology, we generate the empirical distribution of the t-statistic in the following way: For each firm that is more affected by the rule, we randomly select (with replacement) a firm that is in the same industry and in the same quintile in terms of the matched characteristics (our matching quintiles are based on the Compustat population). After matching all firms in our sample, we calculate $\hat{\Delta}, \hat{\sigma}^2$ and the t-statistic $\hat{\Delta}/\hat{\sigma}_\Delta$ of the matched portfolio. We repeat the entire process 1000 times until we have 1000 observations of the t-statistic. We then compare the t-statistic from our original test to the distribution of t-statistics from the empirical distribution, and reject the hypothesis that the t-statistic is not positive at the α significance level if the fraction of t-stat observations above the t-stat under consideration is lower than α.

III. Data description and Variables

We measure the extent to which the rules affect firm value, by comparing portfolios of firms along four different dimensions: compliance with anti-fraud provisions, insiders' engagement in related party transactions, existence of well-functioning internal control mechanisms, and the compliance of the board of directors with the new independence requirements. In this section we describe the variables used to measure compliance with each of the provisions and our source of data for these variables. The financial data for all the tests are from the Center for Research in Security Prices (CRSP) database and the Compustat database.[8]

A. Compliance with the anti-fraud provisions

One of the main aims of the SOX is to limit corporate fraud, especially fraud associated with manipulation of financial statements and insider trading. To that end, SOX imposes increased penalties on corporate executives charged with manipulation of financial statements and fraudulent insider trading. It also requires forfeiture of certain bonuses and profits upon financial restatements, and gives the SEC the authority to seek a court freeze of extraordinary payments to directors and other corporate insiders.

If the rules are effective, then firms that are perceived by the market as more fraudulent should increase in value compared to firms that are perceived as less fraudulent.

We use two measures for whether firms are perceived as fraudulent.

The first measure is associated with insider trading. We conjecture that the market perceives corporate insiders who, in the past, sold shares just before a large drop in their stock price, as those who are more likely to benefit from such rules, because these insiders are more likely to have used their inside information at the expense of the shareholders. We consider all firms whose insiders sold shares between January 2001 and March 2001. Out of this group we pick firms which, between April 2001 and October 2001, experienced a large drop in price relative to the market (bottom third of all firms in the sample who experienced a drop in the price). We generate two groups of firms. The first group consists of firms whose CEOs sold shares, and the second group consists of firms whose corporate insiders sold shares. There are 73 firms in the CEO sample and 124 firms in the insider sample. We obtain information about insider selling activity from Thomson Financial's Insider Filings database.

The second measure is associated with accounting fraud. We conjecture that the market perceives firms who had to restate their financial statements in the past as those that are likely to

benefit from the rules. Accounting literature finds that firms which restate their financial statements are perceived by the market as having lower earnings quality and management credibility. For example, Dechow, Hutton and Sloan (1996), and Palmrose, Richardson, and Scholz (2004) find that the market reaction to announcements of restatements reflects not only the market updated expectations about future cash flows, but also their revisions of expectations with respect to earnings quality and management credibility. Consistent with these findings, Hribar and Jenkins (2004) find that firms' cost of capital increases after financial restatements, and Anderson and Yohn (2002) find that the bid-ask spread of firms increases after financial restatements.[9]

We obtain the data on firms which restated their financial statements from the Government Accountability Office (GAO). In October 2002, at the request of Senator Sarbanes, GAO has published its investigation with respect to financial restatements. Using online search of periodicals and news reports, it has identified 919 cases of financial restatements by 842 firms between January 1997 and June 2002. From this list, we kept firms that had accounting restatements prior to November 2001, and which had information on Compustat and on CRSP. A total of 312 firms are in our final sample.

B. Related party transactions

Related party transactions are transactions between the company and its insiders or its affiliates. Transactions, such as buying certain goods or services from insiders, selling goods to insiders, or extending loans to executives, all fall under the category of related party transactions.[10]

One criticism of these transactions is that they can be a way for corporate insiders to transfer value from shareholders. In fact, several of the highlighted corporate scandals, such as Tyco and Adelphia, involved related party transactions.

In these cases loans to executives were often given at much lower rates than market rates, becoming a way of transferring value from shareholders to executives. Moreover, the lucrative terms of loans were not disclosed to the shareholders; and in some cases, these loans would also be collateralized by the firm's shares, and firms would often not require a repayment of the loan if the stock price fell below a certain level (Bebchuk and Fried (2003)).

We expect the new rules to affect related party transactions in firms. First, the general provisions that deal with corporate fraud should cause insiders to think twice before they attempt to strike a deal with the company that might conflict with their duty to the shareholders. The SOX also explicitly bans firms from extending loans to executives (section 402), and requires enhanced disclosure of other related party transactions that have a material effect on the firm (section 401).

If the rules have a positive effect on firms, then, holding else constant, firms that were engaging in related party transactions should benefit more from the rules than firms that were not engaging in related party transactions. We construct our related party transaction sample by picking randomly a sample of 263 firms from the S&P 1500 index and checking whether these firms were involved in related party transactions in the years 2000 and 2001. For each firm, we read the proxy

statements and the 10-K statements in the years 2000 and 2001 for disclosure of related party transactions. We find 138 disclosed related party transactions in 95 firms.

C. Board and Committee Independence

The rules have several requirements related to board and committee independence. For example, the NYSE requires boards to have a majority of independent directors, an independent audit committee, an independent nominating committee, and an independent compensation committee, and other exchanges followed with similar requirements. The SOX requires all public firms to have an independent audit committee. If the rules have a positive effect on firm value, then firms that have not complied with these provisions before the rules were enacted should outperform firms that have complied with these provisions.

We define firms that are least likely to be affected by these rules as those that have at least three of the four above independence requirements, and those that are most likely to be affected by the rules as complying only with one or none of the requirements.

We obtain board structure information from the Investor Responsibility Research Center (IRRC), which provides governance information on firms that belong to the S&P 500, MidCap 400, and SmallCap 600 indexes. We exclude foreign issuers and firms in which there is one controlling shareholder, because the rule requirements from them differ from those of other U.S. issuers. We obtain financial information of the firms from the Compustat and CRSP databases. After merging these databases with the IRRC data, we have data for 1101 firms.

D. Internal Controls

The rules require firms to enhance their internal controls. Among other provisions, firms need to establish procedures to evaluate their internal auditing (SOX 404) and the chief financial officer (CFO) has to certify the accuracy of the financial statements (SOX 302). If the rules have a positive effect on firms, then holding else constant, firms whose internal control mechanisms are perceived as less effective and whose financial reporting is less accurate should outperform firms whose internal control mechanisms are perceived as more effective. Our measure of whether the firm is perceived as one with less effective internal controls is whether the firm replaced its external auditors in the past. Firms' choice to change auditors is often perceived as a way to shop for more favorable auditors' opinion. In fact, in the past, the SEC has raised its concern that auditor change might involve "the search for an auditor willing to support a proposed accounting treatment designed to help a company achieve its reporting objectives even though that treatment might frustrate reliable reporting" (Securities and Exchange Commission (1988)). Consistent with this concern, previous research suggests that, on average, auditor switches are considered bad news (e.g., Fried and Schiff (1981), Shu (2000)), and that auditing firms switch firms when there is a higher litigation risk to the client (e.g., Defond and Subramanyan (1997), Shu (2000)).

We obtain data on auditor changes from the Auditor Track database of Strafford Publications Inc., which gathers this information from SEC filings of U.S. public corporations. Our sample consists of all firms in the Strafford database that replaced their auditors between January 2001 and September 2001, and have information in the Compustat database. A total of 87 firms are in our final sample.

IV. Results

A. Effect of the anti-fraud provisions

Table I shows the result of the analysis of the group of firms whose insiders' sold shares prior to a price drop. Panel A shows that the average dollar value of shares sold by CEOs in our sample between January 2001 and March 2001 is $20.1 million, and the median is $11.4 million. Insiders as a whole sold on average $30.5 million worth of shares and a median of $10.3 million worth of shares. The mean drop in the price (net of market) between April 2001 and October 2001 in the CEO and insider samples is 27.7% and 27.8% respectively, and the median drop is 18.6% and 18.8% respectively.

[TABLE I APPROXIMATELY HERE]

Table I panel A also shows the financial characteristics of the firms in the insider trading group at the end of fiscal year 2001. The average market capitalization of the firms is $10.4 billion in the CEO sample and $11.9 billion in the insider sample. The medians are $2.9 and $2.6 billion respectively. As a comparison, the average market capitalization of all firms that belong to the S&P 1500 composite index is around $9 billion, and the median market capitalization is around $2 billion. Thus, compared to the S&P1500, these two samples consist of relatively large firms. Average market-to-book ratio is 2.26 in the CEO sample and 2.24 in the insider sample. As a comparison, the average market-to-book ratio in the S&P 1500 index is around 1.95. Therefore, the firms in our sample have, on average, higher growth opportunities, or are valued higher on average.

Panel B shows the abnormal returns over the period November 2001 – October 2002 of the sample portfolios. The alpha coefficient of the sample of firms whose CEO sold shares is 0.0009 in the equal-weighted portfolio and 0.0010 in the value-weighted portfolio. These coefficients are

significant at the 5% level. We can convert these coefficients into average annualized abnormal returns, by multiplying them by 252 trading days. The average annualized abnormal returns become 23% and 25% respectively. We get similar results in the sample of firms whose insiders' sold shares.

Panel C shows the abnormal returns of the matched sample methodology. We match firms based on market-to-book, size, and past performance, and use a bootstrap analysis to generate the empirical distribution of the returns. We match also based on past performance, because by construction firms in the sample have had negative abnormal returns, and so their returns during the announcement period could be driven by momentum. The results suggest that the portfolio of firms in which the CEO sold shares earned 13.9% above the matched portfolio return during the announcement year. The portfolio of firms in which the insiders sold shares earned 11.2% above the matched portfolio return. The bootstrap analysis shows that these abnormal returns are significant at the 5% level or better. Thus, the bootstrap results corroborate the results of the four-factor model, and show that firms whose insiders are likely to be engaged in fraudulent trading activity have benefited from the rules.

Table II shows the abnormal returns of the group of firms which have filed financial restatements between January 1997 and November 2001. Table II Panel A shows financial characteristics of firms in the sample. The average market capitalization is $2.65 billion, but the median is only $0.12 billion. These differences suggest that the sample is skewed by several large firms. The average market to book ratio is 1.85, which is slightly lower than the average of 1.95 in the S&P 1500 index.

[TABLE II APPROXIMATELY HERE]

Table II panel B shows the abnormal returns of the sample portfolio over the announcement period. The alpha coefficient is 0.0005 in both the equal-weighted and the value-weighted portfolios.

These coefficients are significant at the 5% level. We can convert these coefficients into average annual abnormal returns, by multiplying them by 252 trading days. The average annual abnormal returns become 13% and 12% respectively.

Panel B also shows the abnormal returns of the matched sample methodology. We match firms based on market-to-book, leverage, and industry and use a bootstrap analysis to generate the empirical distribution of the returns. We choose to match based on market to book and leverage because prior literature suggests that among firm's financial variables, these variables tend to strongly distinguish restating firms from others. (e.g., Richardson, Tuna, and Wu (2002)).

The results suggest that the portfolio of firms in which the CEO sold shares earned 8.5% above the matched portfolio return during the announcement year. The bootstrap analysis shows that these abnormal returns are significant at the 5% level. Thus, the bootstrap results corroborate the results of the four-factor model.

B. Related Party Transactions

Table III panel A shows the types of related party transactions in our sample. We follow the classification of Gordon et al. (2004) and divide the related party transactions into four categories: sales, purchase, direct, and loan. "Sales" is a sale of a company asset or good to a related party (such as the management or the board). "Purchase" is a buy of goods by the company from a related party, such as a corporate executive, a board member or a related party of the board members. "Direct" means that a director provides services to the company. "Loans" are loans to management or to directors.

Table III panel A shows that related party transactions appear across large-, medium-, and small-size firms, and that Purchase and Loans are the most frequent types of related party

transactions in these firms. Table III panel B shows that the average market capitalization of these firms at the end of fiscal year 2001 is $6.6 billion, and the average market-to-book ratio is 1.98. As a comparison, the average market capitalization of the S&P 1500 firms is $8.3 billion, and the average market to book is 1.95. Thus, firms engaging in related party transactions are on average smaller and have similar growth opportunities and performance as the average S&P 1500 firms.

[TABLE III APPROXIMATELY HERE]

Table III panel C shows the abnormal returns of the firms engaged in related party transactions. The alpha coefficient of the equal-weighted portfolio between November 2001 and October 2002 is 0.0004. This coefficient converts into 9% abnormal return over the period. The alpha coefficient of the value-weighted portfolio over the same period is 0.0006, which converts into 15% abnormal return over the period. The alpha coefficient of the equal-weighted portfolio is significant at the 10% level, and the coefficient of the value-weighted portfolio is significant at the 5% level. These results suggest that firms that have engaged in related party transactions before the announcement of the rules benefited from the rules. We also report the results of the bootstrap analysis. We randomly select 95 firms out of the 263 firms and calculate their portfolio return and t-statistics. We repeat this procedure 1000 times to obtain the empirical distribution of the t-statistics. We then compare the t-statistic obtained from the buy-and-hold return of our original sample of related party transactions to the empirical distribution. The bootstrap analysis suggests a significantly positive abnormal return at the 5% level to the firms engaged in related party transactions.

C. Director Independence

We define group L as the group of firms that need to make the most changes to their board structure. These firms either do not have any of the board and committee independence requirements at the end of fiscal year 2000, or they only comply with one of them. Group H is the group of firms that have the most of the required characteristics. They either have all the independence requirements in place or they have all but one of these requirements. Group M is the group of firms that do not belong to H or L. Table IV panel A shows that 237 firms in our sample belong to group L, 254 firms belong to group M, and 610 firms belong to group H. Thus, the majority of firms in our sample comply with all or most of the board independence requirements.

[TABLE IV APPROXIMATELY HERE]

Panel B shows differences in financial characteristics across the three groups. We could not detect any strong trend across market capitalization, sales, or market-to-book ratio across the different groups, although group L tends to have slightly larger average market-to-book ratio and slightly lower average sales than the other groups. The average sales are $4.6 billion in group L, compared with $7.6 billion in group M and $5.4 billion in group H. The average market-to-book ratio is 2.07 in group L compared with 1.88 in group M and 1.93 in group H.

Table IV panel C shows that the alpha coefficient of portfolio L is statistically significant at the 1% level both for the equal-weighted and the value-weighted portfolios. The coefficient is also economically significant. The equal-weighted portfolio has an alpha of 0.0006, and the value weighted portfolio has a coefficient of 0.0008. We can again convert these coefficients into average annual abnormal returns by multiplying them by 252 trading days. The average annual abnormal returns become 15% and 20% respectively.

The results are also similar when we consider the abnormal return of a portfolio that long portfolio L and short portfolio H. Such a portfolio has an alpha of 0.0002 in the equal-weighted portfolio and 0.0006 in the value-weighted portfolio. The coefficient is significant at the 5% level in the value-weighted portfolio but it is not significant in the equal weighted portfolio. These coefficients convert into annual abnormal returns of 4% and 14% respectively.

We do not find a significant alpha coefficient for portfolio M in either the value weighted or the equal weighted portfolios and for portfolio H in the value weighted portfolio. This evidence is consistent with the hypothesis that only the firms that are most affected by the rules should have abnormal returns. However, we do find that the alpha coefficient of the equal-weighted portfolio H is positive and significant at the 5% level. This evidence is not consistent with the hypothesis that only firms that are most affected by the rules should have abnormal returns; and it might suggest that we are capturing some heterogeneity in response across different firm sizes. We explore this possibility in subsection *E*.

Table IV panel D shows the results of the matched sample methodology. For every firm that belongs to portfolio L, we match a firm that belongs to portfolio H by market cap, market-to-book, and industry, and calculate the buy-and-hold returns for each of the matching portfolios during the event period. The difference between the returns is 6%. The bootstrap test shows that the difference is significant at the 5% level.[11]

Our measure of board structure sums all the board characteristics together. However, there might be some board characteristics that are perceived by the market as more important than others. To explore whether all characteristic are important, we repeat the regression analysis above; but this time, we analyze each board characteristic separately. Thus, for example, we form portfolios based on whether they have a majority of independent directors, and test whether a strategy that long

portfolio of firms that do not have a majority of independent directors, and short portfolio of firms that have a majority of independent directors outperforms the market. We find that such a strategy has a statistically significant abnormal return for each and every one of the board and committee independence requirements.

D. Internal Control

Table V shows the results of the analysis of the group of firms that replaced their auditors between January 2001 and September 2001. Table V panel A shows that the average market capitalization of these firms is $1334 million and the median market capitalization of these firms is $191 million, suggesting that firms that switch auditors tend to be small. The large discrepancy between the average market capitalization and the median market capitalization suggests that most firms in the sample are very small, and that there are several large firms who are responsible for the skewed distribution. Similar results are obtained when we compare average and median sales. The mean market-to-book ratio in these firms is 1.94 and the median is 1.09.

[TABLE V APPROXIMATELY HERE]

Table V panel B shows the abnormal returns of firms that switched their auditors. The alpha coefficient of the equal-weighted portfolio is 0.0004, and the alpha coefficient of the value-weighted portfolio is 0.0011. By multiplying these coefficients by 252, these coefficients convert into annual abnormal returns of 10% and 28% respectively. However, only the alpha coefficient of the value weighted portfolio is statistically significant. The fact that the value-weighted portfolio has larger alpha than the equal-weighted portfolio might suggest that larger firms tend to have larger abnormal return than smaller firms. We explore this possibility in the next section.

Table V panel B also shows the results of the matched sample methodology. We match firms based on size, market to book, and industry. The difference in return between firms in our sample and the matched firms is only -0.16%, suggesting that our sample does not outperform the matched sample. The bootstrap analysis shows also no significant abnormal returns.

Overall the results in this section suggest that firms which replaced their auditors did not outperform their peers. However, since the sample is highly skewed, and the majority of firms in the sample are very small, we might capture heterogeneity of the effect of the rules on small firms.

E. Heterogeneity in response across firm sizes

Several studies suggest that the rules are more likely to benefit large firms than small firms. For example, Holmstrom and Kaplan (2003) argue that because of the high fixed costs of complying with the rules, small firms are less likely to benefit from the rules. Lehn et al. (2004) show that smaller firms find it optimal to have a lower fraction of independent board members than larger firms, suggesting that having a majority of independent directors on the board of smaller firms might not be optimal.

According to these arguments, imposing certain internal controls and board independence requirements is likely to have a different effect across firm size. We therefore test separately the response to these two aspects of the rules across large and small firms.

Table VI shows the analysis of firms that have replaced their auditors. We separate our original sample of 87 firms into two groups, based on their market capitalization. Panel A shows that the group of the large firms has 44 firms, with an average market capitalization of $2584 million and a median of $746 million. The group of the small firms has 43 firms, with an average market capitalization of $55 million and a median market capitalization of $43 million. The group of the

large firms has an average market-to-book ratio of 2.42 and a median market-to-book ratio of 1.52. In contrast, the group of the small firms has a market-to-book ratio of 1.439 and a median of 1.048. Thus, the group of the large firms seems to have more growth opportunities.

[TABLE VI APPROXIMATELY HERE]

Table VI panel B shows the tests of abnormal returns in the large and small firms. The alpha coefficient of the equal-weighted portfolio of large firms is 0.0001 and the coefficient of the value-weighted portfolio is 0.0011. We can convert these returns into average annual abnormal returns by multiplying them by 252 trading days. The average annual coefficients become 3% and 28% respectively. The alpha coefficient of the value weighted portfolio is statistically significant. The matched sample methodology shows that large firms which have replaced their auditors have higher buy and hold returns than their matched sample, but the difference is not statistically significant.

In small firms, the alpha coefficients of both the equal-weighted and the value-weighted portfolios are not statistically significant from zero. The matched sample methodology shows that small firms which have replaced their auditors have slightly lower buy and hold returns than their matched sample, but again, the difference is not statistically significant.

Overall, the results suggest that small firms which replaced their auditors did not exhibit abnormal returns upon the announcement of the rules. In large firms, however, there is a positive abnormal return in the value-weighted portfolio and positive but not statistically significant abnormal return in the equal weighted portfolio. This result is consistent with the hypothesis that only the large firms in this sample benefited from the rules.

We repeat the analysis across firm size also in the samples that differ in board and committee independence. Table VII shows the abnormal returns to firms complying with board characteristics across large-, medium-, and small-size firms. Table VII panel A shows the distribution of firms in

portfolios L and H in each of the size groups. As before, group L is the group of firms that comply with either one or with none of the board and committee independence requirements, and group H is the group of firms that comply with at least three out of the four independence requirements. The table shows that a higher percentage of large firms belong to group H than small firms. As much as 59% of the large firms belong to group H, compared to 48% of the small firms. The difference, however, is not statistically significant. Table VII panel A also shows the rate of compliance with each of the board characteristics in each of the size groups. We observe a similar pattern across all sizes.

[TABLE VII APPROXIMATELY HERE]

Table VII panel B shows the financial characteristics of the firms in the three groups. In each of the groups, firms that belong to group L tend to have slightly larger market capitalization than firms that belong to group H. They also have slightly larger market-to-book ratio.

Table VII panel C shows the abnormal returns of the portfolios across the different size groups. In large- and medium-size firms, portfolio L has a significant and positive alpha coefficient of 0.0009 both in the equal-weighted portfolio and in the value-weighted portfolio. By multiplying this coefficient by 252, we get an average annualized abnormal return of 21%-23%. In contrast, in small-size firms, portfolio L does not exhibit any significant return. In fact, portfolio H exhibits significantly positive returns.

We observe a similar pattern when we measure the returns of an investment strategy that long portfolio L and short portfolio H. The abnormal return associated with this strategy over the period November 2001-October 2002 is positive and significant in the medium-size and the large-size firms, but it is negative and significant (at the 1% level) in the small-size firms.

Table VII panel D shows the results of the matched-sample methodology. Again, for each firm that belongs to portfolio L, we match a firm that belongs to portfolio H and that belongs to the same size quintile, the same market-to-book quintile, and the same industry. We find that the difference between the buy-and-hold returns of portfolios L and H is 18.2% among the large-size firms and 14.1% among the medium-size firms. The bootstrap analysis suggests that these returns are statistically significant at the 1% level. In contrast, we find that in small-size firms, the difference between portfolio L and portfolio H is -12.2%, and it is statistically significant in the bootstrap analysis at the 1% level.

We use different matching techniques to verify the robustness of our results. We use a finer partition of industries (the Fama and French 48 industries), we match firms based on past performance, size, and market to book, and we match only the firms that have all the independence requirements with firms that do not have any of the independence requirements. The results we get in these different matching strategies are similar to those above.

Overall, the results in Table VII suggest that in large- and medium-size firms the announcement of the rule is associated with higher return to portfolios of firms with lower governance score. At the same time, in small firms, the announcement of the rule is associated with lower returns to such portfolios.

V. Robustness tests

A. Abnormal returns outside the event window

One potential reason for the correlation between abnormal returns and rule-related characteristics is that these characteristics are a proxy for some fundamental risk characteristics not related to the ruling event. To check that possibility we repeat the analysis in section IV in the

periods before and after the event window. If there is a fundamental difference in risk characteristics across portfolios, then the portfolios in section IV should exhibit a similar pattern in abnormal returns during those periods.

We study the returns of the portfolios during the period between January 2001 and October 2001 and between November 2002 and July 2003. (For the insider-trading portfolio and the restatement portfolio we could only study the later period, because, by construction, they would have abnormal returns in the period before the event window).

We find no abnormal returns in any of the portfolios we considered in section IV. The insider-trading portfolio, the restatement portfolio, the internal control portfolio, the related transaction portfolio, and the board independence portfolios exhibit no abnormal return during those periods. This result suggests that the abnormal returns found in the previous section are not because of fundamental differences in risk characteristics but are specific to the events that occurred between November 2001 and October 2002.

B. Controlling for other financial and governance characteristics

One concern with our analysis is that the results can be driven by some firm characteristics not captured by industry, size, and market to book matching. We therefore include several tests to ensure that our results are indeed not driven by other characteristics. We first test whether there are differences between the sample portfolios and matching portfolios in the following financial characteristics: institutional holdings, outside financing, leverage, book assets, and sales. We run both a t-test and a Wilcoxon test, and we could not detect any significant difference in these characteristics between sample portfolios and matched portfolios. Second, we test whether there are

differences in board and CEO holdings across firms. Since we have data on board and CEO holdings only for firms in the IRRC database, we could perform the test only on our board sample.

We do find a significant difference in board and CEO holdings between firms that belong to portfolio L (low compliance with the independence requirements) and firms that belong to portfolio H (high compliance with the independence requirements). CEOs and boards of firms that belong to portfolio L have significantly larger holdings than CEOs and boards of firms that belong to portfolio H. It is therefore possible that our results are driven by these differences in governance characteristics.

To explore this issue further, we test whether director independence is associated with abnormal return after we control for board holdings. Table VIII panel A shows the abnormal returns after controlling for the total equity stake of directors. We divide each size group into two equal groups based on the equity stake of the directors in the firm. We then compare the return to firms in group H (high compliance with director independence requirements) to group L (low compliance with director independence requirements) within each equity-stake group. The results in panel A show that when equity stake is high, then there is no difference between firms with high director independence and low director independence. However, when insiders' equity stake is low, then firms with low director independence earn higher returns than firms with high director independence. As before, the results are significant only in large- and medium-size firms. This result indicates that board and committee independence add value after controlling for other governance characteristics. It also indicates that board and committee independence matter only when board holdings are low, and only in large firms.

[TABLE VIII APPROXIMATELY HERE]

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Since the above analysis indicates that controlling for other governance characteristics seems to be important, we do another robustness check. We repeat the above analysis, but this time we replace insiders' equity stake with the governance score of Gompers et al. (2003) (GIM score). The GIM score measures the compliance of the firm with 24 different governance characteristics, that captures firms' vulnerability to takeover attempts and the ability of shareholders (vs. corporate insiders) to affect corporate decisions. Gompers et al. define firms with high shareholders' rights and more takeover vulnerability as Democracy firms (score of 5 or below), and firms with low shareholder rights and less takeover vulnerability as Dictatorship firms (score of 13 or above).

Panel B shows that firms with less director independence earn higher returns than firms with more director independence in large-size firms, and medium-size firms, regardless of whether they are Dictatorship firms or Democracy firms. The difference is between 10% and 17.2% across the different portfolios. The result, however, is generally not significance. (The difference is statistically significant at the 10% significance level only in medium-size Democracy firms). One potential reason for the lack of significance is the relatively small number of firms in each portfolio. The fact that the effect is similar across Democracy firms and Dictatorship firms might suggest that the governance measure captured by the GIM score does not substitute for board and committee independence in large firms.

Interestingly, firms with less director independence earn significantly lower returns than firms with higher director independence in small-size Democracy firms. Those with less compliance earn return that is 25% lower than the return of their matched firms. This result is consistent with our previous findings, that the rules do not improve value in small firms. It also suggests that the requirement for board and committee independence in small firms has the worse impact when the firm is already disciplined by the takeover market.

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As a whole, the results in table VIII suggest that the requirement for board and committee independence has a positive impact on firms after controlling for other governance characteristics, but only in large- and medium-size firms. The requirement has a negative impact in smaller firms.

C. Differences between small firms and large firms

Anecdotal evidence suggests that the direct costs of complying with the internal control requirements are substantial for small firms.[12] However, the cost of attracting independent directors in small firms might not be high enough to explain the -12% abnormal returns that we find between small firms that comply with the board independence requirements and small non-complying firms. Therefore, there could be other potential reasons for the large negative abnormal returns.

One possibility is that director independence in small firms has other costs besides the direct search costs. For example, Adams and Ferreira (2006), argue that board independence might have adverse effect on CEO's willingness to share information with the board. Almazan and Suarez (2003) show that weak boards are a form of commitment not to replace managers ex-post in order to elicit managerial effort ex-ante. It is possible that these potential costs of having independent boards are larger in small firms than in large firms.

Another possibility is that the market viewed the corporate scandals as a large-firm problem, and therefore applauded the oversight regulations in large firms more so than in small firms.

A full analysis of the misalignment of insiders' incentives across firm size and the importance of board independence in small and large firms is beyond the scope of this study. But we can shed some light on this issue by providing evidence on the relation between firm size, board independence, and incidences of financial restatements and insider trading. Table IX shows that 27% of the firms in the accounting restatements sample belong to the largest-size quintile. In contrast,

only 12% of the restatements occur in the small-size quintile, and only 20% of the restatements occur in the medium-size quintile (quintile 3). The difference in frequencies is statistically significant at the 5% level.[13] Table IX also shows that 70% of the cases of managerial selling of shares in 2001 are in the large-size quintile. The rest are distributed between the second largest size quintile and the medium-size quintile.[14] The difference in frequencies between the largest-size quintile and the medium-size quintile is significant at the 1% level.

[TABLE IX APPROXIMATELY HERE]

We also measure the correlation between board and committee independence and insider trading activity in large firms and in small firms. In large firms the correlation between the board score and insider trading is -0.31.[15] This correlation is statistically different from zero. In contrast, the correlation in small firms is -0.03 and is not statistically different from zero.

These findings suggest that there are significant differences in incidences in restatements and insider trading across firm size, and that lack of board independence is related to incidences of insider trading only in large firms. Overall, these results suggest that the benefits from board oversight and stringent controls in small firms might not be as large as they are in large firms.

D. Association of abnormal return with rule announcements

So far, in the analysis we use a large event window to ensure that the announcement of the rules comes as a full surprise to the market and that investors have not already formed their own expectations about the rules before they are announced. The drawback of any analysis of this kind is that it might miss other events during that period that cause a similar effect on prices. While we cannot rule out this possibility, we wish to establish a direct relation between the rules and stock returns.

In this section we run a test to establish the relation between the legislation and corporate value. We run an event study similar to the one we already did, but this time with an event window of one day to see whether announcements related to the rules are associated with any price effect. We do not make inferences about the effect of the rules on corporate value from the sign of the announcement effect because it is likely that the market forms expectations about the rule before the event day. However, a significant effect of any kind would establish a direct relation between the announcement of the rule and corporate value.

A standard event study methodology is not appropriate for rule-announcements, since the announcement events are not independent across firms, and therefore the errors from the estimation of the expected returns are correlated with one another (Schwert 1981). Moreover, there is often more than one regulation announcement to consider.

Schipper and Thompson (1983, 1985) propose a methodology that takes into account the correlation in errors across firms and the possibility for several announcements. They use this methodology to test the effect of merger-related regulations on acquiring firms. Our test is based on their methodology.

In each of the three size groups, we pick all firms from the portfolio with score zero, so that we have N=28 firms from the large-size firms, N=35 from the medium-size firms, and N=36 from the small-size firms. For each of the groups we estimate the following regression, using a panel of N firms x T=237 days (November 2001-October 2002):

$$r_j - r_o = \alpha_j + \beta_j(r_m - r_0) + \delta_k \mu_{jk} + \varepsilon_j$$

where:

$r_j - r_o$ = the $T \times 1$ time-series vector of excess returns to firm j.

$(r_m - r_0)$ = the $T \times 1$ time series vector of excess returns of the market portfolio.

r_m = the $T \times 1$ time series vector of realized returns of the market portfolio proxy, here we use the value weighted CRSP index.

r_0 = the $T \times 1$ time series vector of realized returns on a one-month treasury bill.

α_j = an intercept coefficient.

β_j = beta of the stock.

δ_k = the $K \times 1$ vector of event parameters multiplying the regulatory announcement variables. These variables represent the shift in the mean excess return associated with the K regulatory-related announcements.

μ_{jk} = a $T \times K$ matrix of regulatory change variables, with one column for each regulatory change considered. Each column contains ones and zeroes to identify time periods with no regulatory-related announcements (zeros) and time periods with regulatory-related announcements (ones).

ε_j = a $T \times 1$ vector of error terms assumed to be serially independent, independent of the excess return on the market and the regulatory change variables, and identically distributed normally.

A full description of the estimation method appears in the appendix. We identify from figure 1 six important announcement dates that are related to the rulings. The dates are 2/13/2002, 4/12/2002, 5/22/2002, 6/6/2002, 7/24/2002, and 8/1/2002.

Table X shows that there is a significant announcement effect across all size groups on July 24—the day Congress announces a consensus regarding the SOX and the approval date of the NASDAQ governance proposal by the NASDAQ board. There is also a significant effect in large and small firms on August 1st, the day NYSE board approves the NYSE proposals. Middle-size firms have a significant announcement effect on May 22nd, the date the NASDAQ approved the first

round of governance recommendations. These results establish a direct relation between the rules and firm value.

[TABLE X APPROXIMATELY HERE]

E. The effect of the worsening corporate scandals on firm value

Another way to establish the connection between corporate value and the governance structure imposed by the rules is to analyze the effect of the worsening of the corporate scandals, before the market realizes their legislation effect on firm value.[16] If the rules enhance firm value, then the worsening of the corporate scandals should have a larger negative effect on firms that do not comply with the rules.

We choose the periods 10/10/2001 – 12/1/2001 and 10/10/2001 – 10/20/2001 as the periods in which the corporate scandals have worsened.[17] Table XI shows the difference between the returns of our portfolios and matched portfolios for each of the rule provisions. The results show that, in general, the portfolios of firms that were affected the most by the rules, had lower returns than their matched portfolios. The effect is negative across the different provisions: firms with less director independence, firms with more related party transactions, and firms with worse internal controls performed worse on these event dates. This result suggests that the market changed its expectations about firms after the scandals, and perceived such firms as in a worse condition. The result suggests that the provisions we measure indeed capture governance characteristics that needed to be improved.

[TABLE XI APPROXIMATELY HERE]

VI. Conclusion

We find a positive abnormal return of 10%-25% to firms that are more affected by the rules. These results imply that the corporate governance rules had a major impact on firm value, and that firms that were more affected by the rules enhanced in value compared to firms that are less affected

by the rules. We find some evidence that the rules associated with board independence and with internal controls do not enhance the value of small firms, since small firms that need to make large changes to their governance structure and small firms with worse internal controls exhibit lower returns compared to other firms. These results are consistent with the assessment of Holmstrom and Kaplan (2003) that compared to their size, small firms bear higher costs of implementing the rules than large firms.

Since our results capture only relative costs and benefits between firms that are more affected and firms that are less affected by the rules, we cannot identify rule-related costs that are equally born by all firms, such as extra filing costs and auditing costs. These costs can potentially decrease the benefits that we identify in our study. Our study also does not capture potential benefits of the rules on other constituencies besides shareholders, such as employees and creditors. To the extent that these benefits are substantial, they will increase the positive overall effect of the rules on the society.

We see two avenues for future research. First, our analysis captures investors' perception about the rules, but does not look at actual improvements in shareholder wealth in the long run. It is important to see whether the rules actually enhance firm performance. Second, our analysis suggests that, compared to their size, small firms suffer larger costs from implementing the rules than large firms. Analyzing these costs and studying their effect on a firm's financial and non-financial strategies is an important topic for future research.

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Appendix

Schipper and Thompson (1983) estimation methodology

For each of the firms in our sample we use 237 *(T)* daily observations. The system of equations for the firms is formed as:

$$R = X\Gamma + E$$

Where,

$$R = \begin{bmatrix} r_1 - r_o \\ \\ \\ r_J - r_0 \end{bmatrix} \qquad X = \begin{bmatrix} \tilde{X} & & & \tilde{X} \\ & \ddots & & \\ & & \tilde{X} & \\ & & & \ddots \\ \tilde{X} & & & \tilde{X} \end{bmatrix} \qquad \tilde{X} = \begin{bmatrix} 1 & r_m - r_0 & \delta_k \end{bmatrix}$$

$$E = \begin{bmatrix} \varepsilon_1 \\ \\ \\ \varepsilon_J \end{bmatrix} \qquad \Gamma = \begin{bmatrix} \alpha_1 \\ \beta_1 \\ \mu_{1K} \\ \\ \alpha_J \\ \beta_J \\ \mu_{JK} \end{bmatrix}$$

In this system, the contemporaneous residual covariance matrix is $\Sigma_{J \times J}$, and therefore the covariance matrix of E is $\Sigma \otimes I$. The estimation procedure used is seemingly unrelated regressions (Zellner 1962). When $\Sigma_{J \times J}$ is known, the GLS estimate of Γ is maximum likelihood and best unbiased. When $\Sigma_{J \times J}$ is replaced by the OLS residual covariance matrix, the joint GLS estimate of Γ is consistent and asymptotically efficient.

Here since we have identical explanatory variables, the OLS estimates provide identical parameter estimates to GLS. We test that for a particular regulatory announcement, all of the individual μ_{jk} parameters across the sample of firms are equal to zero.

$$H_0 : \mu_{jk} = 0 \, \forall j$$

The quadratic form used to test the null hypothesis is formulated as:-

$$(a - A\hat{\Gamma})'[A(X'(\Sigma^{-1} \otimes I)X)^{-1}A']^{-1}(a - A\hat{\Gamma})$$

where A is a matrix of J rows, each of the rows contains a single one multiplying an individual $\hat{\mu}_{jk}$ and zeroes multiplying the rest of $\hat{\Gamma}$.

Under the null hypothesis, the test statistic is distributed as a $\chi^2(q)$ where q is the number of constraints being tested. There are J degrees of freedom, one for each coefficient tested. Note that the covariance matrix must be inverted to calculate the test statistic and the inversion is possible as long as the number of time series observations exceeds the number of firms, (or else the inverted covariance matrix follows a Wishart distribution that has undesirable properties).

Table I: Effect of the Anti-Fraud Rules – Insider Trading

The table shows abnormal returns of firms which are more likely to be affected by the anti-fraud rules. The sample consists of firms whose insiders sold shares between January 2001 and March 2001, and whose stock had the worst negative return compared to the market between April 2001 and September 2001, (bottom third of firms with negative returns in the sample). Market to Book is the market value of equity plus the book value of assets minus the book value of equity, all divided by the book value of assets. Abnormal returns are calculated over the period November 2001 and October 2002. In Panel C, the matching is based on market capitalization, market-to-book ratio, past performance and industry. Industry match is based on Fama and French classification (17 industries). For a description of the Bootstrap methodology see the text. *, **, *** indicates significance at the 10%, 5%, and 1% level respectively.

Panel A: Summary Statistics

	N	Shares sold ($ millions)		Return (relative to market)		Market Cap ($ billions)		Market to Book	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median
CEO Redemption of shares followed by a large price decline	72	20.1	11.4	-27.7%	-18.6%	10.4	2.9	2.26	1.79
Insiders Redemption of shares followed by a large price decline	124	30.5	10.3	-27.8%	-18.8%	11.9	2.6	2.24	1.70

Panel B: Abnormal Returns – Four Factor Model

Sample	N	Four Factor equal-weighted		Alpha annualized	Four Factor value-weighted		Alpha annualized
		Alpha			Alpha		
CEO redemption of shares followed by a large decrease in stock price	72	0.0009 (0.0004)	**	23%	0.0010 (0.0005)	*	25%
Insiders' redemption of shares followed by a large decrease in stock price	124	0.0008 (0.0004)	**	20%	0.0008 (0.0004)	**	20%

Panel C: Abnormal Returns – Matched Sample Methodology (equal weighted portfolios)

Sample	B&H return	Matched sample return	Difference	t-stat	p-value Bootstrap
CEO redemption of shares followed by a large decrease in stock price	-11.0%	-24.9%	13.9%	1.38	0.049 **
Insiders' redemption of shares followed by a large decrease in stock price	-15.5%	-26.7%	11.2%	1.41	0.001 ***

Table II: Effect of the Anti-Fraud Rules – Financial Restatements

The table shows abnormal returns in a sample of firms which have restated their financial statements between the years 1997-2001. Abnormal returns are calculated over the period November 2001 and October 2002. In Panel B, the matching is based on market-to-book ratio, leverage, and industry. Industry match is based on Fama and French classification (17 industries). For a description of the Bootstrap methodology see the text. *, **, *** indicates significance at the 10%, 5%, and 1% level respectively.

Panel A: Summary Statistics

N	Market Cap ($ billions)		Sales ($ billions)		Market to Book	
	Mean	Median	Mean	Median	Mean	Median
312	2.65	0.12	3.02	0.37	1.85	1.32

Panel B: Abnormal Returns

N	Four Factor equal-weighted		Four Factor value-weighted		B&H return	Matched sample return	Matched sample equal-weighted			p-value Bootstrap
	Alpha	Alpha annualized	Alpha	Alpha annualized			Difference	t-statistic		
312	0.0005 ** (0.0002)	13%	0.0005 ** (0.0002)	12%	-0.7%	-9.5%	8.5%	1.159	0.019 **	

Table III: Related Party Transactions

The table shows abnormal returns of firms whose insiders engaged in related party transactions. The sample consists of 263 firms, randomly picked from the S&P 1500 index. Information on related party transactions is taken from the 2000 and 2001 proxy statements and 10-K statements. These transactions are classified into four categories: Sale, Purchase, Direct, and Loan. "Sales" is a sale of company assets or goods to a related party of the management or the board. "Purchase" is a buy of good by the company from a board member or a related party of the board members. "Direct" means that a director provides services to the company. "Loans" are loans to management. In Panel B, Market to Book is the market value of equity plus the book value of assets minus the book value of equity, all divided by the book value of assets. Panel C shows the abnormal returns of portfolios of those firms between November 2001 and October 2002. For a description of the Bootstrap methodology see the text. *, **, *** indicates significance at the 10%, 5%, and 1% level respectively.

Panel A: Frequency of Related Party Transactions (RPT)

Type	Sample size	Number of firms reporting RPT	Number of RPT	Sale	Purchase	Direct	Loans
All	263	95	138	22	58	21	37
S&P 500	84	33	53	7	27	8	11
MidCap	94	31	44	11	13	6	14
SmallCap	85	31	41	4	18	7	12

Panel B: Financial Characteristics of RPT Firms

	Market Cap ($billion)		Sales ($billion)		Market to Book	
N	Mean	Median	Mean	Median	Mean	Median
95	6.6	1.6	4.7	1.3	1.98	1.59

Panel C: Abnormal Returns

	Four Factor equal-weighted		Four Factor value-weighted		B&H return (equal weighted)	p-value Bootstrap (equal weighted)
N	Alpha	Alpha annualized	Alpha	Alpha annualized		
95	0.0004 * (0.0002)	9%	0.0006 ** (0.0002)	15%	3.9%	0.019 **

Table IV: Director Independence

The table shows announcement effect of governance rules to different groups of firms, based on their board characteristics. Board information is for firms that belong to the S&P 500, MidCap 400 and Small Cap 600 indexes and is taken from IRRC. The board score is based on the sum of four indicator variables: existence of a majority of independent directors, existence of an independent audit committee, existence of an independent nominating committee, and existence of an independent compensation committee. Score L corresponds to a sum of one or zero, Score M corresponds to a sum of two, and score H corresponds to a sum of three or four. In panel B Market to Book is the market value of equity plus the book value of assets minus the book value of equity, all divided by the book value of assets. In panel C the matching is based on market capitalization, market-to-book ratio, and industry in fiscal year 2001. Industry match is based on Fama and French classification (17 industries). For a description of the Bootstrap methodology see the text. *, **, *** indicates significance at the 10%, 5%, and 1% level respectively.

Panel A: Board Score

Score	N	% of firms in group	% with majority of independent directors on board	% with independent Nominating Committee	% with independent Audit Committee	% with independent Compensation Committee
L	237	18%	32%	0%	14%	11%
M	254	19%	88%	7%	64%	41%
H	610	46%	100%	48%	98%	92%

Panel B: Financial Characteristics

Score	N	Markt Cap ($billions)		Sales ($billions)		Market to book	
		Mean	Median	Mean	Median	Mean	Median
L	255	9.4	1.9	4.6	1.3	2.07	1.63
M	280	9.9	1.6	7.6	1.5	1.88	1.45
H	663	8.0	1.9	5.4	1.7	1.93	1.39

Panel C: Abnormal Returns—Four-Factor Model

	Four Factor equal-weighted			Four Factor value-weighted	
	Alpha	Alpha (annualized)		Alpha	Alpha (annualized)
L-H	0.0002 (0.0001)	4%		0.0006 ** (0.0002)	14%
Portfolio L	0.0006 *** (0.0001)	15%		0.0008 *** (0.0002)	20%
Portfolio M	0.0002 (0.0001)	4%		0.0001 (0.0001)	2%
Portfolio H	0.0004 ** (0.0001)	9%		0.0002 (0.0002)	6%

Panel D: Abnormal Returns—Matched Sample methodology (equal weighted portfolios)

	N	B&H Return	t-stat	p-value Bootstrap	
Portfolio L	237	5.6%			
Portfolio H	237	-0.4%			
Difference		6.0%	1.15	0.043	**

Table V: Internal Controls

The table shows abnormal returns for firms with worse internal controls. The sample consists of a group of firms whose auditors were replaced between January 2001 and September 2001. The data are from the Auditor Track database of Strafford Publications Inc. Panel B shows the abnormal returns of portfolios of those firms between November 2001 and October 2002. In panel B the matching is based on market capitalization, market-to-book ratio, past performance and industry in fiscal year 2001. Past performance is the buy-and-hold return between June 2001 and November 2001. Industry match is based on Fama and French classification (17 industries). For a description of the Bootstrap methodology see the text. *, **, *** indicates significance at the 10%, 5%, and 1% level respectively.

Panel A: Summary Statistics

N	Market Cap ($millions)		Sales ($millions)		Market to Book	
	Mean	Median	Mean	Median	Mean	Median
87	1334	191	777	176	1.94	1.09

Panel B: Tests of Abnormal Return

	Four Factor equal-weighted		Four Factor value-weighted			Matched sample	Matched sample equal-weighted		
N	Alpha	Alpha (annualized)	Alpha	Alpha (annualized)	B&H return	Matched sample return	Difference	t-statistic	p-value Bootstrap
87	0.0004 (0.0003)	10%	0.0011 ** (0.0005)	28%	-0.01%	0.14%	-0.16%	-0.01	0.51

Table VI: Internal Controls—by Firm Size

The table shows abnormal returns for large and small firms with worse internal controls. The sample consists of a group of firms whose auditors were replaced between January 2001 and September 2001. The data are from the Auditor Track database of Strafford Publications Inc. Panel B shows the abnormal returns of portfolios of those firms between November 2001 and October 2002. In panel B the matching is based on market capitalization, market-to-book ratio, past performance and industry in fiscal year 2001. Past performance is the buy-and-hold return between June 2001 and November 2001. Industry match is based on Fama and French classification (17 industries). For a description of the Bootstrap methodology see the text. *, **, *** indicates significance at the 10%, 5%, and 1% level respectively.

Panel A: Summary Statistics

N	Size	Market Cap ($millions)		Sales ($millions)		Market to Book	
		Mean	Median	Mean	Median	Mean	Median
44	Large	2584	746	1443	577	2.420	1.520
43	Small	55	43	96	49	1.439	1.048

Panel B: Tests of Abnormal Return

N	Size	Four Factor equal-weighted		Four Factor value-weighted		B&H return	Matched sample return	Matched sample equal-weighted	t-statistic	p-value (Bootstrap)
		Alpha	Alpha (annualized)	Alpha	Alpha (annualized)			Difference		
44	Large	0.0001 (0.0003)	3%	0.0011 ** (0.0004)	28%	1.7%	-0.1%	1.8%	0.17	0.35
43	Small	0.0006 (0.0005)	15%	0.0005 (0.0005)	12%	0.3%	4.5%	-4.2%	-0.28	0.76

Table VII: Director Independence—by Firm Size

The table shows announcement effect of governance rules to different groups of firms, based on their board characteristics and their size. Board information is for firms that belong to the S&P 500, MidCap 400 and Small Cap 600 indexes and is taken from IRRC. The board score is based on the sum of four indicator variables: existence of a majority of independent directors, existence of an independent audit committee, existence of an independent nominating committee, and existence of an independent compensation committee. Score L corresponds to a sum of one or zero, Score M corresponds to a sum of two, and score H corresponds to a sum of three or four. In panel B Market to Book is the market value of equity plus the book value of assets minus the book value of equity, all divided by the book value of assets. In panel C the matching is based on market capitalization, market-to-book ratio, and industry in fiscal year 2001. Industry match is based on Fama and French classification (17 industries). For a description of the Bootstrap methodology see the text. *, **, *** indicates significance at the 10%, 5%, and 1% level respectively.

Panel A: Board Characteristics

Size	Score	N	% of firms in group	% with majority of independent directors on board	% with independent Nominating Committee	% with independent Audit Committee	% with independent Compensation Committee
Large	L	72	17%	40%	0%	14%	7%
	H	246	59%	100%	64%	98%	90%
Medium	L	68	23%	23%	0%	14%	12%
	H	178	59%	100%	42%	97%	93%
Small	L	97	25%	33%	0%	15%	12%
	H	186	48%	99%	32%	99%	95%

Panel B: Financial Characteristics

Size	Score	N	Mktcap		Sales		Market to book	
			Mean	Median	Mean	Median	Mean	Median
Large	L	72	25833	8515	11641	4536	2.28	1.83
	H	246	17326	7673	10793	6464	2.16	1.54
Medium	L	68	2804	2451	1979	1462	2.24	1.67
	H	178	2025	1669	2236	1439	2.04	1.39
Small	L	97	671	534	742	539	1.79	1.39
	H	186	594	430	891	550	1.52	1.29

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Panel C: Abnormal returns—Four-Factor Model

Size	Portfolio	Four Factor equal-weighted		Four Factor value-weighted	
		Alpha	Alpha (annualized)	Alpha	Alpha (annualized)
Large	Portfolio L	0.0009 ***	22%	0.0009 ***	21%
		(0.0002)		(0.0003)	
	Portfolio H	0.0002	5%	0.0000	0%
		(0.0002)		(0.0002)	
Medium	Portfolio L	0.0009 ***	23%	0.0009 ***	23%
		(0.0003)		(0.0003)	
	Portfolio H	0.0003	7%	0.0004	9%
		(0.0002)		(0.0003)	
Small	Portfolio L	0.0001	3%	-0.0001	-3%
		(0.0002)		(0.0002)	
	Portfolio H	0.0008 ***	20%	0.0005 **	12%
		(0.0002)		(0.0002)	
Large	Port. L-Port. H	0.0007 ***	16%	0.0006 ***	16%
		(0.0002)		(0.0002)	
Medium	Port. L-Port. H	0.0006 ***	16%	0.0005 *	13%
		(0.0002)		(0.0003)	
Small	Port. L-Port. H	-0.0007 ***	-17%	-0.0006 **	-15%
		(0.0002)		(0.0003)	

Panel D: Abnormal Returns—Matched Sample Methodology (equal weighted portfolios)

Size		N	Return	t-stat	Bootstrap p-value	
Large	Portfolio L	72	5.3%			
	Portfolio H	72	-12.8%			
	Difference		18.2%	3.01	0.001	***
Medium	Portfolio L	68	11.1%			
	Portfolio H	68	-2.9%			
	Difference		14.1%	2.11	0.001	***
Small	Portfolio L	97	2.1%			
	Portfolio H	97	14.3%			
	Difference		-12.2%	-1.54	0.001	***

Table VIII: Abnormal Returns—Controlling for Other Governance Characteristics

The table shows buy-and-hold returns over the event window November 2001-October 2002, of firms that have high board score and low board score after controlling for equity stake by board members and the Governance Index of Gompers et al. (2003). Board information is from IRRC. The board score is the sum of four indicator variables: existence of a majority of independent directors, existence of an independent audit committee, existence of an independent nominating committee, and existence of an independent compensation committee. A portfolio of high score has firms that have a score of at three or four. A portfolio of low score has firms that have a score of one or zero. The numbers in square brackets are the number of firms in each portfolio. In panel B, for each of the size groups, firms are first divided into Democracy firms (Governance Index of 5 or below) and Dictatorship firms (Governance index of 15 or above). Within each group, the returns of firms with high score are compared to the returns of firms with low board score. *, **, *** indicates significance at the 10%, 5%, and 1% level respectively.

Panel A: Controlling for Board Holdings

Large	Mean ownership	High Score	Low Score	Wilcoxon test
High Equity Stake	8.6%	-3.1% [93]	-1.6% [50]	(0.06)
Low Equity Stake	0.4%	-11.3% [141]	6.3% [20]	(2.56)**

Medium		High Score	Low Score	Wilcoxon test
High Equity Stake	14.5%	0.1% [72]	5.8% [50]	(0.29)
Low Equity Stake	1.0%	-9.6% [96]	19.1% [16]	(2.68)**

Small		High Score	Low Score	Wilcoxon test
High Equity Stake	20%	6.9% [63]	-0.2% [67]	(0.69)
Low Equity Stake	2%	19.5% [116]	-2.5% [26]	(-1.36)

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Panel B: Controlling for the Gompers, Ishii, and Metrick (2001) Score

Large	Director Independence		Difference (Low-High)	Wilcoxon Test
	Low Score	High Score		
GIM Score Democracy	-1.1% [32]	-10.8% [61]	10%	1.07
GIM Score Dictatorship	6.4% [17]	-3.3% [69]	10%	1.21

Medium	Director Independence		Difference (Low-High)	Wilcoxon Test
	Low Score	High Score		
GIM Score Democracy	11.0% [29]	-6.2% [64]	17.2%	1.69*
GIM Score Dictatorship	14.7% [13]	4.3% [45]	10.5%	0.72

Small	Director Independence		Difference (Low-High)	Wilcoxon Test
	Low Score	High Score		
GIM Score Democracy	-0.2% [54]	25.0% [62]	-25.2%	-1.93**
GIM Score Dictatorship	12.9% [9]	3.3% [30]	9.6%	1.11

Table IX: Distribution of Restatements and Insider Trading Across Firm Size

The table reports the percentage of restatements and of insider trading across size quintiles. The size quintile cut-offs are based on the Compustat population in the year 2000. The restatement sample consists of firms that have restated their financial statements within the five years before November 2001. The insider trading sample consists of firms whose insiders sold shares between January 2001 and March 2001, and whose stock had the largest negative return (bottom third) compared to the market between April 2001 and September 2001. The tests are for differences in success probabilities. *, **, *** indicates significance at the 10%, 5%, and 1% level respectively.

| | Size Quintile | | | | | Test for difference | |
| | | | | | | Largest vs. Smallest | Largest vs. Middle |
	Smallest	2	Middle	4	Largest	(p-value)	(p-value)
Restatements	12.2%	18.8%	20.3%	22.0%	26.7%	0.000***	0.02**
Insider trading	0%	0%	4.2%	25.4%	70.4%	0.000***	0.000***
Median Market Cap ($millions):	8	38	122	456	3295		

Table X: Abnormal Returns on Specific Ruling Dates

The table shows the chi-square coefficients of the tests of abnormal returns around different rule-related event dates between December 2001 and November 2002. The methodology for forming the tests closely follows Schipper and Thompson (1983), and is described in the appendix. The tables report the results for a random sample of Large-, Medium-, and Small-size firms with governance score of 0. The event dates are taken from Figure 1. *, **, *** indicates significance at the 10%, 5%, and 1% level respectively.

Size	Event Date	N	Chi-square value	
Large	02/13/02	28	21.12	
	04/12/02	28	31.53	
	05/22/02	28	22.35	
	06/06/02	28	20.49	
	07/24/02	28	115.76	***
	08/01/02	28	153.77	***
Medium	02/13/02	35	22.07	
	04/12/02	35	21.56	
	05/22/02	35	20.60	
	06/06/02	35	40.09	
	07/24/02	35	109.28	***
	08/01/02	35	40.26	
Small	02/13/02	36	37.82	
	04/12/02	36	42.92	
	05/22/02	36	40.30	
	06/06/02	36	20.94	
	07/24/02	36	103.76	***
	08/01/02	36	101.12	***

Table XI: Abnormal Returns at the Worsening of the Corporate Scandals

The table reports buy-and-hold as well as matched-sample returns of the related party transactions, board independence, and auditor changes samples around dates of worsening of the corporate scandals. The returns of firms in panel A and C is matched against similar firms, based on size, market-to-book, and industry. The returns of firms in panel B is based on size and industry. *, **, *** indicates significance at the 10%, 5%, and 1% level respectively.

Panel A: Financial Restatements

Event Window	B&H Return	Return (matched)	Difference	t-stat
10/10/2001-12/1/2001	19.5%	18.2%	1.3%	0.502
10/10/2001-10/20/2001	4.1%	4.4%	-0.3%	-0.237

Panel B: Related Party Transactions

Event window	B&H Return	Return (matched)	Difference	t-stat
10/10/2001-12/1/2001	15.9%	16.4%	-0.5%	-0.164
10/10/2001-10/20/2001	4.6%	4.2%	0.5%	0.325

Panel C: Internal Controls

Event Window	Sample	Return	Return (matched)	Difference	t-stat
10/10/2001-12/1/2001	Whole	16.9%	18.0%	-1.1%	-0.258
	Small	19.0%	19.7%	-0.8%	-0.130
	Large	14.8%	16.2%	-1.3%	-0.331
10/10/2001-10/20/2001					
	Whole	0.0%	0.1%	0.0%	-0.005
	Small	5.9%	7.3%	-1.5%	-0.539
	Large	3.9%	4.2%	-0.3%	-0.142

Panel D: Director Independence

Event window:	Size	Return (H)	Return (L)	Difference	t-stat	
10/10/2001-12/1/2001	Small	16.7%	12.7%	-4.0%	-1.663	*
	Medium	14.8%	11.0%	-3.8%	-0.822	
	Large	19.7%	11.4%	-8.3%	-2.243	**
10/10/2001-10/20/2001	Small	-2.9%	-4.9%	-2.0%	-2.082	**
	Medium	0.1%	-1.3%	-1.4%	-0.770	
	Large	2.3%	-1.1%	-3.4%	-2.287	**

November 2001	December 2001	January - March 2002	April 2002	May 2002	June 2002
11/8/2001 Enron files earnings restatement with the SEC.	12/2/2001 Enron files for bankruptcy.	Senate Banking committee hearings. House Financial Service committee hearings.	4/12/2002 Nasdaq's Executive Committee approves first round of new corporate governance requirements.	5/22/2002 Nasdaq's board approves the executive committee proposals.	6/6/2002 NYSE committee unveils its new governance requirements.
		2/13/2002 SEC asks NYSE and Nasdaq to review their corporate governance requirements.	4/24/2002 The House passes the bill of rep. Oxley to enhance corporate and auditing accountability, responsibility, and transparency.		6/25/2002 WorldCom announces that its profits had been inflated by $3.8 B. 6/28/2002 Nasdaq's committee discusses 2nd round of proposals that would follow NYSE proposals.

July 2002	August 2002	September 2002	October 2002	………………….	November 2003
7/15/2002 The Senate passes the bill of senator Sarbanes to enhance auditing related procedures, corporate responsibility, and financial disclosure.	8/1/2002 NYSE board approves proposals.		10/9/2002 Nasdaq submits its proposed rules (2nd round) to the SEC.		11/4/2003 SEC approves exchanges' proposals.
7/24/2002 Nasdaq's board approves 2nd round of proposals. House and Senate reach a concensus on a joint SOX bill.	8/16/2002 NYSE submits its proposed rules to the SEC.				
7/25/2002 House and Senate approve the SOX bill.					
7/30/2002 President Bush signs the SOX into law.					

Figure 1: Timeline of events that led to the SOX law and the exchange regulations.

Footnotes

[1] See also Romano (2005), who argues that the corporate governance provisions of the SOX should be stripped of their mandatory force and rendered optional, so that firms can decide whether they want to adopt them.

[2] For an analysis of the Enron collapse, see, for example, Healy and Palepu (2003).

[3] In order to assess their internal controls, CEOs need to establish mechanisms that assess the quality of the internal controls across all levels in the organization, detect potential risks in the internal control procedures and implementations, and establish ways to eliminate these risks.

[4] NASDAQ relaxes some of the NYSE provisions to fit smaller firms. The main difference is that it also allows the compensation and nomination decisions to be held by a majority of independent directors without a formal committee, and it permits in special circumstances one non-independent board member to participate in these decisions.

[5] Our source for these daily factors is Kenneth French's web site (http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/). To mitigate any potential non-synchronous trading biases, we also tried weekly returns. All of our results stay the same when we consider weekly returns.

[6] To reduce the effect of outliers, we winsorize the value-weighted returns at 1%.

[7] To ensure that our selection methodology does not lead to biased samples, we test for differences in market cap and market-to-book ratios between the two samples in each of our tests. We conduct both a rank test and a t-test. We do not detect any significant differences across samples.

[8] We exclude from our samples penny stocks (stocks that are traded at a price of less than $1). These stocks have often very low liquidity and limited attention from investors, and their price is less likely

to fully reflect market information. Our main results do not change if we include these stocks in our tests.

[9] Another approach is to group firms into portfolios according to their likelihood of accounting problems or earning manipulation and to look at their returns during the announcement period. A number of studies in the accounting literature compare the characteristics of firms that had accounting problems to those of other firms and find differences in accounting variables, market variables, and governance variables (e.g., Dechow, Sloan and Sweeny 1996, Beasley 1996, Summers and Sweeney 1998, Beneish 1999, Richardson, Tuna, and Wu, 2002). These variables can then be used to forecast the likelihood of accounting problems or earning manipulation in firms. In our study, we choose to look at firms that have accounting problems rather than at firms for which we estimate accounting problems, to mitigate potential biases and reduced statistical power associated with such estimates.

[10] The Financial Accounting Standard Board (FASB) defines related party transactions as transactions between companies and their management, board members, affiliates, owners, or family members of these groups (FASB Statement No. 57). FASB requires the disclosure of material-related party transactions in the financial statements. The SEC requires the disclosure of the following relationships: (a) transactions over $60,000 between the company and affiliated persons such as board members, executives, principal owners, or the families of any of these groups; (b) ownership or management relationships between directors and any entity with which the company has a business relationship such as sales to, purchases from, loans to, or borrowings from; (c) transactions with promoters; and (d) corporate loans to the management of the company. For a detailed discussion of related party transactions, see Gordon, Henry, and Palia (2004).

[11] In the bootstrap methodology in this section, we randomly assign portfolios L and H across firms in the sample (based on size, market-to-book, and industry) and calculate the difference in returns and the t-stat between these portfolios. We repeat these random assignments 1000 times to obtain the empirical distribution of t-statistics between randomly assigned portfolios. We then compare the t-statistic to the one we originally obtained to the distribution.

[12] *The Wall Street Journal* (February 10, 2004) reports a study by Financial Executives International, estimating that first-year direct costs of implementing stricter control systems to comply with the new amount to about 1% of revenues in small firms. These costs decrease to about 0.1% of revenues in large firms.

[13] We note that the distribution of restating firms across size might be biased upwards, since data on restatements was collected from public sources which are more likely to publicize restatements in larger firms. However, even if such selection bias exist, the bias is likely to affect the lower tail of the distribution. The selection bias is less likely to be of a concern in the upper quintiles, where there is still a positive relation between restatements and firm size.

[14] The results are virtually the same when we consider as our population the subsample of firms that also had a market-adjusted negative return between April 2001 and September 2001.

[15] The board score is the sum of the four indicator variables: existence of a majority of independent directors, existence of an independent audit committee, existence of an independent nominating committee, and existence of an independent compensation committee. Therefore, higher board score means more compliance with the independence requirements.

[16] We thank the referee for pointing out this test.

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[17] On October 16, 2001, Enron filed its third-quarter earnings, reporting more than a billion dollars in losses, of which more than half were related to the structured finance arrangements. The SEC began its inquiry the following day. The inquiry became a formal investigation on October 30.