



**The Valuation Damage from Financial Systems Weaknesses:  
A Study of SOX Disclosures**

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Effective control systems assure the integrity of financial reporting, and are essential for good corporate governance. Management and auditor reports on internal controls are required by Section 404 of the Sarbanes-Oxley Act of 2002 and must contain disclosures of any material weaknesses and plans for remediation. Firms' Sarbanes-Oxley (SOX) disclosures often identify IT shortcomings as a source of their internal control deficiencies. This paper analyzes 47 companies that disclosed their internal controls over financial reporting were ineffective due to inadequate computer systems. We find abnormal returns of  $-1.5\%$  on average over a 2-day (0,+1) window around the 10K filing date. Twenty-three of these companies fail to address the problems and do not remediate their control problems by their 2006 10K filing date. These firms suffer an average  $-2.2\%$  abnormal return over the (0,+1) window around their 10K filing date. The effects of IT material weaknesses are also evident in longer term returns on portfolios of companies that are non-compliant with SOX requirements. Failing to have adequate, controlled financial system is costly, and the evidence shows IT is essential element good corporate governance.

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**Introduction**

In companies today, computerized systems are relied on to provide financial reports and support the information needs of managers and boards of directors. A number of corporate governance breakdowns have occurred when managers, directors, and shareholders lacked access to critical information, or when information was unreliable. To address the integrity of public companies' controls and financial reporting, the Sarbanes-Oxley Act (SOX) was signed into law on July 30, 2002.

Requirements of SOX include audited Section 404 disclosures in which management attests to the effectiveness of their company's internal controls.<sup>1</sup> Beginning with firms' fiscal year 2005 10Ks, disclosures were mandatory for companies with market capitalizations of \$75 million or more. This initially included 3,900 companies, of which just less than 16 percent reported their internal control over financial reporting was not effective. Companies and their auditor identify the material weaknesses and outline remediation plans. Among the most cited reasons for weaknesses is information technology and financial systems.

Adverse opinions on SOX Section 404 disclosures, similar to major earnings surprises, profit warnings, or income restatements probably reflect poorly informed and ineffective boards. However, can these reporting and control weaknesses due to inadequate information management be linked to adverse consequences for shareholders? Based on the event study method and returns comparisons, the answer is yes. The three figures below highlight the conclusions for the analyses.

### **Internal control and IT**

Internal control is the process carried out in a company and overseen by a board of directors to provide reasonable assurance of (a) the reliability of financial reporting, (b) the effectiveness and efficiency of financial operations, and (c) compliance with applicable laws and regulations. There are a number of sources of guidance for how internal controls should be designed and managed. The Committee of Sponsoring Organizations of the Treadway Commission (COSO), for instance, was originally formed in 1985 to help prevent fraudulent financial reporting and make recommendations for public companies and their independent auditors, for the SEC and other regulators, and for educational institutions.

The Public Company Accounting Oversight Board (PCAOB) in its Auditing Standard No. 2 defines material internal control weaknesses as “... *more than a remote likelihood that a material misstatement of the annual or interim financial statements will*

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<sup>1</sup> Unaudited section 302 disclosures were required in firms' 10Q filings from November 15, 2004.

*not be prevented or detected on a timely basis by employees in the normal course of their assigned functions.”*

COSO distinguishes between general controls and application controls. General controls cover areas as the data center and network operations, systems software acquisition and maintenance, access security, and application system acquisition, development and maintenance. IT application controls apply to individual accounting systems, such as payroll or accounts payable, and insure that transactions occurred, are authorized, and are completely and accurately recorded, processed, and reported.

Effective internal controls mean that misstatements will be detected by the client and the firm’s financial data can be relied upon by the auditor. Weaknesses in a firm’s internal control procedures on the other hand mean that material misstatements in directors’ and shareholders’ financial reports may not be detected by the firm’s auditor.

Below are two examples of SOX disclosures of material weaknesses.

2005 10K filed: September 13, 2005 - “Based on this assessment, management determined that a material weakness existed in the Company’s internal controls over certain Information Technology General Controls as of June 30, 2005. Specifically, the Company did not have (i) monitoring of information technology managers who have access to the application and underlying data, (ii) mechanisms to track changes made to the application itself, and (iii) adequate security administration of users’ access to the application. These control deficiencies did not result in any known financial statement misstatements. However, the aggregation of these control deficiencies represents a material weakness ...” - Quixote Corp. (2005 sales \$146 million)

2006 10K filed: March 15, 2007 - “*Information Technology* - The Company did not adequately implement certain controls over information technology, including certain spreadsheets, used in its core business and financial reporting. These areas included logical access security controls to financial applications, segregation of duties and backup and recovery procedures. The Company’s controls over the completeness, accuracy, validity, restricted access, and the review of certain spreadsheets used in the period-end

financial statement preparation and reporting process was not designed appropriately. This material weakness affects the Company’s ability to prevent improper access and changes to its accounting records.” - CanArgo Energy Corp. (YE2006 Market Cap \$384 million)

Section 404 of SOX, “Effectiveness of the design and operation of disclosure controls and procedures”, is seen as a reason some non-US companies have chosen to delist from U.S. exchanges. The number of foreign companies traded on the NYSE has dropped 9.5% since SOX became law. For instance, the BG Group (U.K.) blamed its decision to leave NYSE on “U.S.-specific obligations [that] carry a cost and administrative complexity.” Moody’s however comments supportively (Jonas, 2004):

*“We believe that reporting on internal control has helped restore confidence in U.S. financial reporting which was badly shaken after massive instances of fraudulent reporting. Our discussions with companies suggest that control reporting has promoted investment in the people, policies, processes, and systems necessary to support quality reporting. Further, Moody’s has benefited from new information about control problems which has helped us assess the risk of misleading financial reporting, which is one of many elements we consider when assessing credit risk. These benefits have been significant.”*

Figure 1: Cited reasons for material weakness in financial control and reporting, as tracked in Compliance Week

| <b>Weakness</b>                 | <b>Companies Reporting</b> | <b>Percentage of Companies</b> |
|---------------------------------|----------------------------|--------------------------------|
| 1. Personnel                    | 166                        | 41.5%                          |
| 2. Taxes                        | 132                        | 33.0%                          |
| 3. Financial Procedures         | 106                        | 26.5%                          |
| 4. Documentation                | 67                         | 16.8%                          |
| 5. Revenue Recognition          | 58                         | 14.5%                          |
| <b>6. IT, Financial Systems</b> | <b>52</b>                  | <b>13.0%</b>                   |
| 7. Hedge Accounting             | 28                         | 7.0%                           |
| 8. Cash Flows                   | 27                         | 6.8%                           |
| 9. Tone at Top                  | 20                         | 5.0%                           |
| 10. Lease Accounting            | 18                         | 4.5%                           |
| 11. Vendor Contracts            | 14                         | 3.5%                           |
| Total weaknesses                | 688                        |                                |

Companies may disclose more than one type of weakness contributing to its deficiencies in internal control over financial reporting. Figure 1 is based on data from 399 firms that disclosed 688 deficiencies in their 2005 10Ks. (CW, 2006)

Figure 2: Data were available for 47 of the 52 companies reporting “IT, Financial Systems” weaknesses. These 47 companies reported an average of 2.6 other deficiencies with Personnel and Accounting being most prevalent other weakness with IT and financial systems

| Other weaknesses                         | Companies reporting | Percentage companies |
|--|---------------------|----------------------|
| Personnel: Inadequate Training, Staffing | 30                  | 63.8%                |
| Other Accounting (M&A, etc.)             | 30                  | 63.8%                |
| Financial Procedures                     | 21                  | 44.7%                |
| Revenue Recognition                      | 13                  | 27.7%                |
| Documentation                            | 11                  | 23.4%                |
| Taxes (Income, Payroll)                  | 7                   | 14.9%                |
| Control Environment Or "Tone At The Top" | 4                   | 8.5%                 |
| Hedges, Derivatives (FAS133)             | 3                   | 6.4%                 |
| Lease Accounting                         | 2                   | 4.3%                 |
| Vendor Contracts, SAS 70 Issues          | 2                   | 4.3%                 |
| Cash Flows                               | 1                   | 2.1%                 |
| Total weaknesses                         | 124                 |                      |

Adverse opinions on SOX Section 404 disclosures, similar to major earnings surprises, profit warnings, or income restatements probably reflect poorly informed and ineffective boards. *However, can these reporting and control weaknesses due to inadequate information management be linked to adverse consequences for shareholders?*

Based on the event study method and returns comparisons, the answer is yes. Shareholder returns of 47 companies reporting material weaknesses in their controls over financial reporting due to IT and financial systems reveals the (0,+1) abnormal returns around the FY 2005 10K filing date relative to the CRSP equally weighted index for these was -1.46%. The average firm in the sample saw its market value drop by \$6.2 million, For the 23 companies that fail to remediate their material weaknesses in their controls within the next year, the (0,+1) abnormal returns around the FY 2006 10K filing date relative to the CRSP equally weighted index for these was -2.16%. This is a \$9.1 million fall in market cap for the average firm in the sample.

## **Event Study Methods**

The efficient markets hypothesis (EMH; Fama, 1970; Fama, 1991) provides the foundation for the event study method. When the EMH holds, share prices reflect all current information that has a bearing on the value of a stock. Trading on the basis of existing information would not generate any excess returns relative to investing broadly in the entire market. If all information is fully reflected in a firm's share price, then only new and unanticipated information will cause the returns on a company's shares to diverge from the market's returns. Therefore, the stock price of a company will move up relative to the market when the news is perceived to be favorable, i.e. if the reported events are likely to benefit the company and raise its earnings generating potential. Returns will be less than the market when the new information is unfavorable. An event study therefore determines whether a set of news releases generates systematic positive or negative abnormal returns in the company stock. When abnormal returns are observed, the event is interpreted as having an impact on shareholders and on the company's prospects.

## **Sample Data**

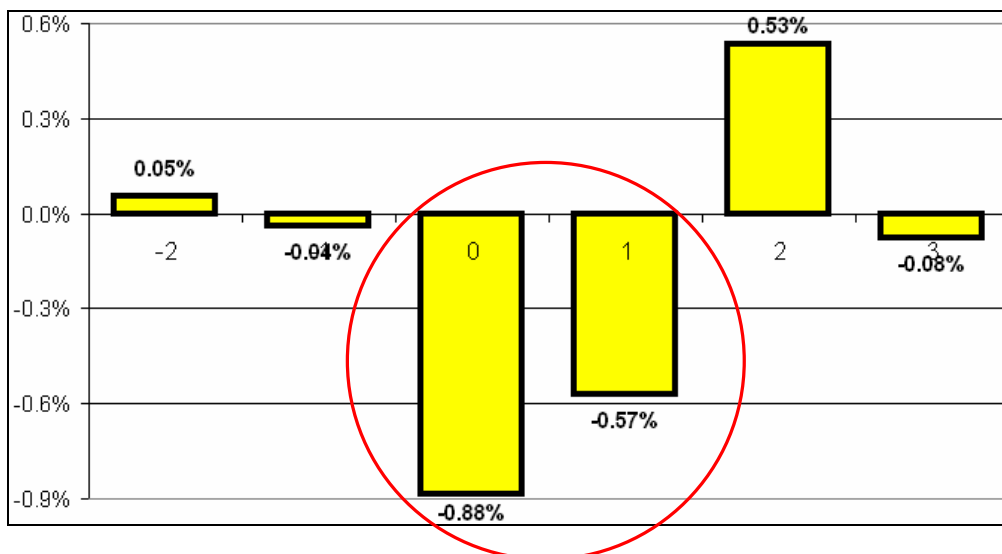
The companies in the data sample come from a listing of 52 firms with material weaknesses in their 2005 10Ks. The average sample firm generated \$374 million in revenue in 2005 and had a market capitalization of \$427 million.

Figure 3: Summary descriptive data from 47 companies reporting IT, Financial Systems weaknesses.

|  | <u>Average</u> | <u>Median</u>     |
|--|----------------|-------------------|
| <b>Revenue (millions)-FY2005</b>             |                |                   |
| All  | \$373.8        | \$152.3           |
| Unremediated                                 | \$278.9        | \$158.2           |
| Remediated                                   | \$477.8        | \$133.4           |
| <b>Market Value (millions)-Year End 2005</b> |                |                   |
| All  | \$427.0        | \$191.8           |
| Unremediated                                 | \$419.5        | \$187.7           |
| Remediated                                   | \$433.9        | \$195.5           |
|  | <u>Filed</u>   | <u>Remediated</u> |
| 2006 10K                                     | 44             | 21                |
|  |                | 47.7%             |

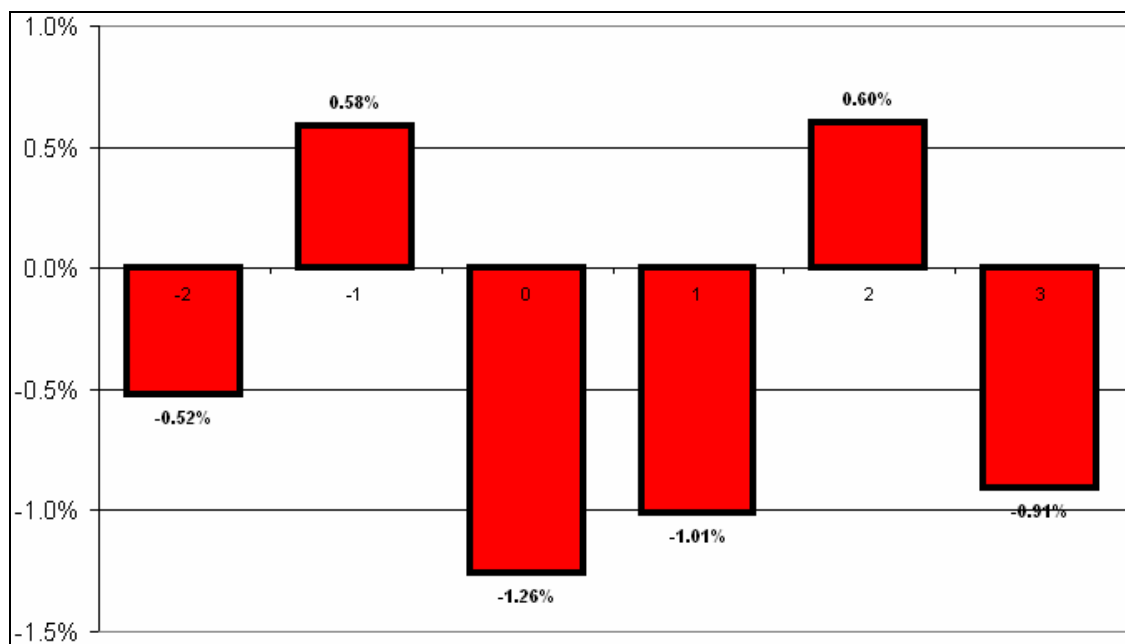
Of the 47 sample firms with IT material weaknesses in their 2005 10Ks, 44 filed a 2006 10K. Of the other three, one was acquired, one was restructured, and one was taken private. A total of 21 companies remediated their material weakness and reported effective control over financial reporting. The other 23 companies continued to disclose material weaknesses and reported ineffective control over financial reporting.

Figure 4: Abnormal returns around the FY 2005 10K filing date for 47 firms reporting ineffective control over financial reporting due to IT and financial systems problems.



Only the Day 0 return (p-value = 0.3%) is significantly different from zero with significance level 0.05. The 2-day (0,+1) return of -1.46% has a p-value of 0.7%, indicating it is negative and would be unlikely to have occurred by chance.

Figure 5: Abnormal returns around the FY 2006 10K filing date for 23 firms that have not remediated their problems and again report ineffective control over financial reporting due to IT and financial systems problems.



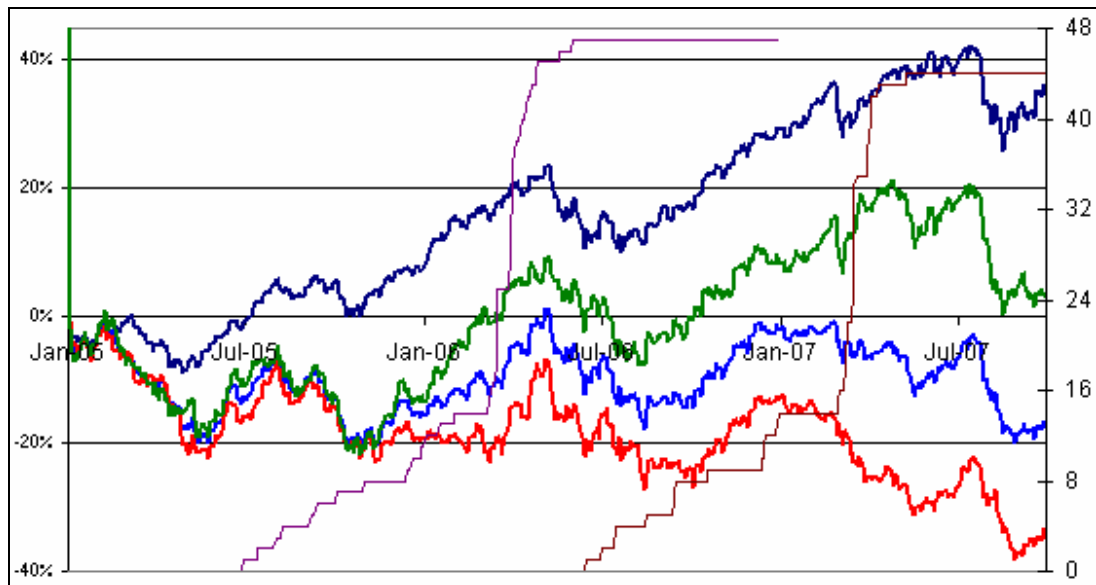
Only the Day 0 return (p-value = 6.1%) is significantly different from zero with significance level 0.10. The 2-day (0,+1) return of -2.16% has a p-value of 9.6%, indicating it is unlikely to have occurred by chance.

### Portfolio returns

Also striking is that the portfolio of these 47 firms held for two years from January 3, 2005 to September 28, 2006 underperformed the market by 52%. From the recent FY 2006 10K filings of the sample firms, 21 of 44 firms remediated their material weaknesses, and reported effective control over financial reporting as of the end of FY2006. Splitting the sample into the firms that mediated (fixed) and did not fix the problems generated the result that remediating firms do not fall as far behind the market

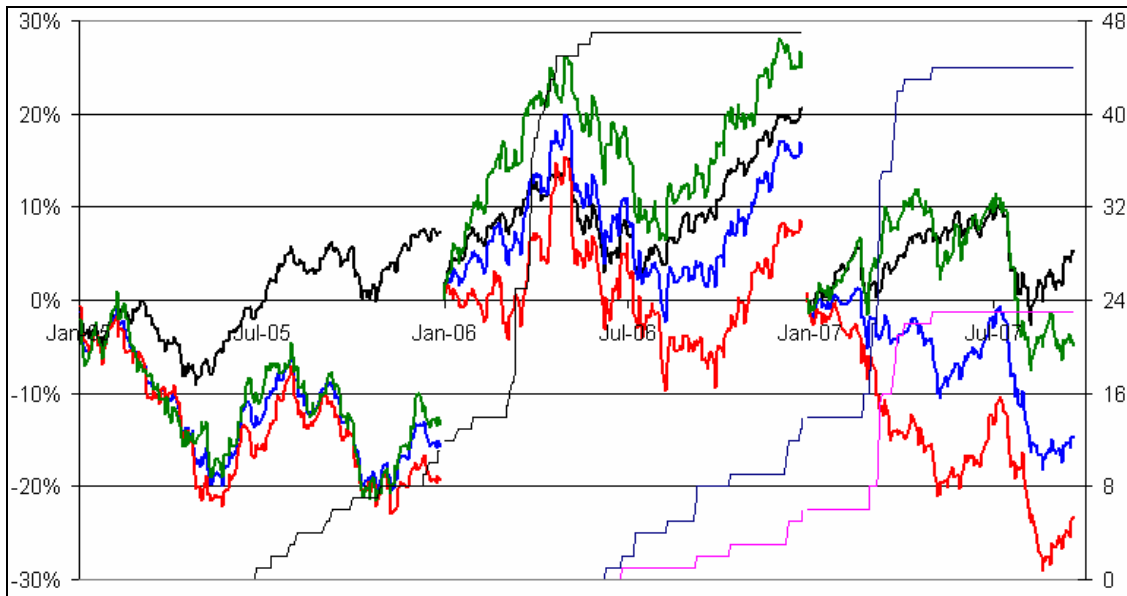
index. An equally weighted portfolio of the 23 nonremediating firms underperformed the market by -69%, while remediating firms underperform by -33%.

Figure 6: Cumulative returns of CRSP equal weighted index (above), the portfolio of the 47 in-sample firms, and the two sub-samples of firms. The cumulative number of 2005 10K and 2006 10K filings are shown on the right axis.



For the full sample of 47 firms, the underperformance relative to the market was -22.9% in 2005, -4.5% in 2006, and -19.9% in the first 9 months of 2007.

Figure 7: Returns 2004-2007 for firms reporting ineffective control over financial reporting due to IT and financial systems problems in their 2005 10K. In subsequent FY 2006 10K filings, 23 firms continued to report ineffective control (Red), 21 reported they had remediated their control problems (Green). The full sample is blue



On average the firms reporting they had corrected the material weakness by the end of FY 2006 outperformed the market in 2006 by 4.6%. However, the difference from zero is not statistically significant.

Figure 8: Performance of companies disclosing ineffective control over financial reporting due to IT and financial systems weaknesses. Two sub-samples are compared to the CRSP equal weighted index

|   | <b>2004</b> | <b>2005</b>     | <b>2006</b> | <b>3Q2007</b>   |
|---|-------------|-----------------|-------------|-----------------|
| CRSP equal weighted index                     | 24.1%       | 7.3%            | 20.4%       | 5.2%            |
| All (47)                                      | 20.7%       | -15.6%          | 15.9%       | -14.8%          |
| Not fixed (23 firms)                          | 20.9%       | -19.4%          | 8.0%        | -23.3%          |
| Remediated according to FY2006 10K (21 firms) | 22.5%       | -13.4%          | 25.0%       | -4.9%           |
| Performance relative to index                 |             |                 |             |                 |
| All   | -3.4%       | <b>-22.9%**</b> | -4.5%       | <b>-19.9%**</b> |
| Not fixed (23 firms)                          | -3.2%       | <b>-26.7%**</b> | -12.3%      | <b>-28.5%**</b> |
| Remediated according to FY2006 10K (21 firms) | -1.6%       | <b>-20.6%*</b>  | 4.6%        | -10.1%          |

\*\* Difference from zero statistically significant (with p-values less than 1.0%)

\* Difference from zero statistically significant (with p-values less than 10.0%)

## Conclusions

The contribution of IT to business performance and shareholder returns remains uncertain (Melville et al., 2004). Companies dedicate substantial resources to IT, but measuring and understanding the effects on performance remains a research challenge (Kohli and Devaraj, 2003). Without investment in IT infrastructure and financial systems, companies risk having inadequate controls over financial reporting. The lack of a robust control environment is seen as a negative signal by investors. The 2-day abnormal drop in market value was 1.5% for the 47 firms disclosing IT-related material weaknesses in 2005. It was 2.2% for the 23 firms that had a second adverse SOX disclosure in their 2006 10Ks. IT failings can destroy value. Board of directors need to ensure there are adequate IT systems to generate reliable financial reports. Good

corporate governance depends on accurate information and sufficient IT resources to produce reliable information.

Future research will compare the adverse SOX disclosures for IT problems with all other causes of material weaknesses. Are the negative abnormal returns the result of a real cost of IT investment and remediation, or a downgrading due to the perception of management sloppiness that could lead to ineffective control systems. To address this, will examine whether IT remediation costs were detectable in the financial statement of the 47 sample firms.

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