

EFFICIENCY OF SARBANES-OXLEY ACT: WILLINGNESS-TO-COMPLY AND AGENCY PROBLEMS

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Abstract

Using the events that occurred in a series of corporate transactions in the US (Nwogugu (2004)), this article analyzes the efficiency of the Sarbanes-Oxley Act (“SOX”; 2002, USA) and introduces new quantitative models of *Willingness-To-Comply* which is a statistical measure of the employee/company’s propensity to comply with SOX and similar regulations.

Keywords: Sarbanes Oxley Act; deterrence effect and fraud; Willingness-To-Comply, complexity; disclosure; due diligence.

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Introduction

See: Nwogugu (2003); Leung & Cooper (2003). Encompass Services Corp. (“ESR”) was formed in 2000 by the two-phase restructuring and merger of Building One Services Corp. (“BOSS”), and Group Maintenance America (“GMAC”) which was announced on November 3, 1999 and approved by shareholders of both companies on February 22, 2000. ESR provided maintenance and electrical/mechanical services and installation of building equipment at various types of facilities in many industries and residential buildings. ESR, formerly a Fortune-500 was subsequently de-listed from the New York Stock Exchange and now trades on the NASDAQ Pink sheets (“ESVN”). Shortly after the merger, a confluence of events resulted in ESR’s financial distress. On October 18, 2002, some of ESR’s creditors proposed a restructuring and a pre-packed bankruptcy filing, but there was no agreement among the creditors and ESR. On or around November 19, 2002, ESR filed for Chapter Eleven bankruptcy protection in the Federal Bankruptcy Court in Texas, USA. While under bankruptcy protection, ESR’s 25,000 employees in 200+ offices, provide mechanical services, electrical services, cleaning systems/services and network technologies to commercial and residential buildings in the US.

As of September 2002, ESR had about \$1.2 billion of indebtedness (\$589 million Secured Credit Facility; \$339 million of unsecured bonds and note obligations; \$309 million of outstanding mandatorily redeemable convertible preferred stock; and trade obligations).

Sarbanes-Oxley Act and The Role of Internal Auditors In Technology Companies and In Banks

Its worth noting that in its present form, the Sarbanes-Oxley Act (2002) (henceforth, “SOX”) would not have prevented:

- The internal control problems and string of fraudulent conveyances at BOSS, and GMAC.
- The internal control problems and fraud implicit in the ESR transactions.
- The inaction of banks – ie. inadequate due diligence and improper monitoring of existing loans;
- Inaction of bond trustees. Sarbanes-Oxley Act applies only to companies that meet the definition of ‘issuer’.
- Inaction of external auditors – moral hazard.

See: Tackett (2004); Duke (2003); Greene & Pierre-Marie (2005); Jahangar, Kamran & Henry (2004); Ge & McVay (2004); James (2004); Leuz & Verrechia (2000); McTamane (August 2002); Ribstein (2002); Rezaee & Jain (2004); Cunningham (2003); Jain, Kim & Rezaee (March 2004); Klein (2003); Romano (2004); Rosenthal, Gleason & Madura (2005); Carney (Feb. 2005) Nielsen & Main (Oct. 2004); Yakhou & Dorweiler (2005); Leung & Cooper (2003); Brickey (2003); Leech (Nov. 2003); Leech (April 2003); Braddock (2006); Perino (October 2002); Moberly (2006); Baynes (2002); Cherry (2004); Bainbridge & Johnson (2004); Gordon (2002); Langevort (2004); Konstant (2004); Krawiec (2003); Cunningham (2004); Darley (2005); Posner (1996); Backer (2004); Linck et al (August 2005); Murphy (2003); Kaplow (1995); Sutinen & Kuperan (1999); Cullis & Lewis (1997); Cason & Gangadharan (2006); Cullis & Lewis (1997); Alm, Sanchez & De Juan (1995); Murphy (2003); Bose (1995). Bose (1995); Stiglitz & Uy (1996); Stiglitz

(1994); Macey & O'Hara (1999); Schmidt (2005); Liu (2005).

The key aspects of Sarbanes-Oxley Act that could have been applicable to BOSS, GMAC and ESR are:

- *Section 302: Corporate Responsibility For Financial Reports* - requires certification of information by company CEOs and CFOs. The maximum penalties for willful and knowing violations of this section are a fine of not more than \$500,000 and/or imprisonment of up to five years. However, this isn't adequate incentive for CEOs and CFOs to comply, where as in the ESR case, substantial amounts of money and potentially unlimited incentive compensation were at stake.

- Empowerment of audit committees to engage and approve the services provided by independent auditors.

- Auditor independence standards.

- *Section 404 – reports on internal controls.*

Most of the internal control reports would have missed financing-related problems. Senior management of BOSS and GMAC, and Apollo were intent on consummating the series of mergers, and had a history of M&A transactions involving bankrupt entities. Most internal control reports focus on operational issues as opposed to loan covenants. Ge & McVay (2004); Geiger (2002). Greene & Pierre-Mari (2005).

- *Section 303: Improper Influence on Conduct of Audits* (by officers or directors of the company). ESR, BOSS and GMAC's senior management clearly had substantial influence on the conduct of audits of BOSS and GMAC – which resulted in non-disclosure of the bankruptcy/insolvency of BOSS and GMAC for many years. Execution of both GMAC's and BOSS's industry consolidation strategies depended on good audit reports regardless of compliance with loan covenants.

- *Section 204: Auditor Reports to Audit Committees* - the external auditor must report to the audit committee all "critical accounting policies and practices to be used all alternative treatments of financial information within [GAAP] that have been discussed with management ramifications of the use of such alternative disclosures and treatments, and the treatment preferred" by the firm. A close review of BOSS's and GMAC's SEC filings will reveal that their external auditors did not reveal obvious problems related to their insolvencies. Doing so would probably have cost the accounting firms substantial business from the industry consolidation transactions.

- *Section 305: Officer And Director Bars And Penalties.*

- *Section 401(a): Disclosures In Periodic Reports;* Disclosures Required. The periodic disclosures made by BOSS, GMAC and ESR were grossly insufficient.

- *Section 409: Real Time Disclosure* - Issuers must disclose information on material changes in the financial condition or operations of the issuer on a rapid and current basis. BOSS, ESR and GMAC omitted required disclosures.

- The Sarbanes-Oxley Act incorporates the SEC Act of 1934 - a violation of Rules of the Public Company Accounting Oversight Board is considered as a violation of the '34 Act, and results in the same penalties that may be imposed for violations of the 1934 Act.

Ineffectiveness Of SOX

See: Linciano (2003); Jain, Kim & Rezaee (March 2004); Cunningham (2003); Rezaee & Jain (2004); Stiglitz & Uy (1996); Stiglitz (1994); Macey & O'Hara (1999); Schmidt (2005); Liu (2005). The effectiveness of SOX should be measured in terms of:

- Reduction of costs of compliance.
- Companies' and employee Willingness-To-Comply with SOX.
- Maximization of deterrence-effect of sanctions implicit in SOX.
- Reduction of investigation and prosecution costs.
- Reduction/elimination of divergencies in interpretation of information presented to users of financial statements.

Hence, the methods used in Linciano (2003) to evaluate the effectiveness and economics of a new laws/regulations are inappropriate in this, and most instances. Granted that one of the aims of SOX is to reduce information asymmetry, that is not the primary objective of SOX. The wording and intent of SOX is geared towards reducing fraud and illegal wealth transfers, but without much consideration for transaction costs inherent in implementation (as is evidenced in current compliance costs).

Social, Economic and Psychological Issues That Affect Effectiveness

The possible reasons for the ineffectiveness of SOX are explained as follows. Recine (2002); Gupta & Leech (2005); Palter, Munck & Leverette (Jan./Feb. 2006); Fairfax (2002); Rouse, Weirich & Hambleton (May/June 2005); Tackett, Wolf & Claypool (2006); Linsley (2003); Ribstein (Oct. 2003); Ribstein (Sept. 2002); Kamar & Karaca-Mandic (2006).

Expectations for profits – which is the primary motivation for fraud. SOX's wording and legislative history and intent does not show any attempt to curtail expectations of legal and illegal profits from disclosure, fraud, manipulation or other misconduct – SOX's focus is on obvious disclosure issues. See: Blanton & Christie (2003); Adams (1997); Arlen (1994); Arlen & Kraakman (1997); Cialdini & Goldstein (2004); Croley (1998); Depoers (2000); Ehrlich (1996); Engelen (2004). Mixer (2001) has

analyzed individual civil liability. Byam (1982) has argued that corporate criminal liability is inefficient – in a world with transaction costs, information asymmetry and information costs, this contention is reasonable. SOX focuses on placing liability on corporate entities - although sections of SOX require penalties for offending individuals (monetary fines and jail sentences): a) the required standard of proof for finding individual liability under SOX is high and probably expensive to achieve, and such costs of evidence and discovery discourages prosecution and civil lawsuits, b) the percentage of possible offenses/violations/non-compliances for which SOX mandates individual liability is relatively small, c) since SOX expressly incorporates SEC rules (1934 Act), courts are very likely to (formally or informally) use the same sentencing guidelines for both 1934 Act and SOX offenses, d)

Insufficient Statutory Definitions. Apparently, given the ESR case, there should be more statutory definitions of matters that should be put to a vote of shareholders and those that should be decided by the boards of directors, because shareholders would probably have reacted much differently than decisions made by BOSS's, GMAC's and ESR's boards of directors.

SOX Does not Address Discovery Issues Sufficiently. SOX does not address pre-litigation and post-conviction discovery issues properly. Hughes (1994). This results in high expected litigation costs (discovery and evidence) which discourages investigation and prosecution.

SOX Does Not Address Excessive Management Discretion In Disclosure. The ESR transactions shows that management typically has a lot of discretion in highly leveraged transactions and situations of financial distress, and that such discretion can and is often abused. SOX does not address this excessive discretion. SOX does not distinguish between: a) regimes of company growth, stabilization and decline, b) regimes of profitability, financial distress, bankruptcy and post-bankruptcy recovery, c) regimes of turbulence or relative calm in financial markets (equity markets, etc.). In all these regimes, the information disclosures mandated by SOX have substantial information content that creates un-necessary volatility. Dann (1993); Bergstrom, Eisenberg & Sundgren (2001); Berkovitch & Khanna (1991). The SEC has rejected several proposals to exempt small companies from SOX compliance on the basis of excessive compliance costs.

The Substantial Information Content Of SOX Requirements. Most of the disclosures and certifications required by SOX carry valuable information content. Jain & Rezaee (2004). Jain, Kim & Rezaee (March 2004) have analyzed the effect of SOX on stock markets. SOX requires disclosure of a stream of information by the firm, almost continuously and at various times during the year. Furthermore, the disclosure required by SOX is now more relevant to a company's suppliers and

customers, than previously required disclosures. Hence, apart from its accounting impact, SOX has substantial financial and information effects, and effects on the company's supply chain. The net effect is increased volatility of share prices, and more information asymmetry among a larger group of entities. SOX fails to distinguish between compliance, corporate privacy and efficient disclosure. Because of potentially substantial information effects and the advent of the Internet (which ensures rapid information diffusion), SOX should have made some disclosures restricted from public view, while being accessible only to regulators – this will reduce adverse selection and moral hazard inherent in the company's, auditor's choices of the amount and quality of information to disclose. Richardson & Welker (2001).

SOX Does Not State Minimum Standards For Internal Audits. See: James (2003). While SOX states internal control requirements, SOX does not state minimum standards for the organization of internal audits - in this instance, audit organization is just as important as, and determines the quality of internal audit reports.

SOX Does Not Address Major accounting Issues. To the extent that SOX did not expressly or impliedly resolve or even address existing major accounting standards issues (intangibles, goodwill, employee stock options, pensions accounting and leases), disclosures made by SOX don't have a meaningful effect in terms of reducing information asymmetry – instead, additional disclosures simply magnify information asymmetry problems.

SOX does not address the Role Of Bond Trustees And US Securities And Exchange Commission's Approval Processes (although SOX expressly incorporates SEC rules (The 1934 Act). The ESR transactions involved the sale of publicly traded bonds. In the case of publicly traded bonds, the role of the bond trustee should be mandatorily expanded to include periodic certifications that the issuer is solvent, and such reports should be made mandatory SEC filings. The second issue is whether bond indentures should contain specific language about bondholders' recourse if the issuer is deemed insolvent – bank loans and private debt often contain such terms and conditions. The inaction of the bond trustee in the ESR case illustrates why the SEC should improve their processes for pre-transaction and post transaction due diligence in leveraged transactions. The very essence of disclosure filings at the SEC is the protection of holders of public securities. The SEC has an implied duty to the holders of publicly traded bonds to monitor filings for the types of problems that arose in the BOSS, GMAC and ESR filings. The Sarbanes-Oxley Act requires certification by CEOs and CFO as to accuracy of financial statements; but does not explicitly require tests for solvency, or certification as to solvency, and does not require solvency certification from external auditors, internal auditors and lawyers. Defond & Jiambalvo

(1994). Geiger (2002); Hodder, Koonce & McAnally (2001); Hope (2003); Langevoort (1997); Schmitz, et. al. (1998); Abarbanell & Meyendorff (1997).

SOX does not address moral hazard, information asymmetry, and adverse selection inherent in relationships between banks/lenders and corporate clients. Chen & Daley (1996). The ESR case illustrates the importance and consequences of transparency, disclosure and monitoring in these relationships.

SOX Does Not Sufficiently Address The Role Of The Audit Committee. SOX does not address the role of the audit committee adequately in a manner that compels pro-active over-sight and coordination. The ESR transactions also indicates that the audit committees of the boards of directors of banks must be statutorily required to: a) Establish and ensure conformance with standards for loan reviews and monitoring of portfolio companies; b) Become very familiar with risk management procedures as they pertain to capital adequacy and default risk; c) Establish and ensure conformance to standards and procedures for dealing with non-performing loans; d) Establish and regularly review standards for loan originations and related-party transactions; e) Establish and regularly review standards purchasing of syndicated loans; f) Establish and regularly review standards for compliance with regulations; g) Monitor and assess activities and quality of external auditors. In essence the audit committees now have a broader implied mandate with respect to risk management, risk reduction and compliance issues at banks. In particular, the ESR transactions indicate that the audit committees of the boards of directors of technology companies must now be required to become more involved in the activities of the internal audit team, and must closely monitor the quality/performance of external auditors and third-party consultants (that are retained to assess intangible assets). The audit committee's implied and actual mandate now includes bringing critical issues before the full board of directors, and constantly identifying issues, legal/regulatory problems and potential liabilities that may affect firm value. Given that many technology companies have substantial intangible assets, the audit committee must be statutorily required to develop acceptable and defensible standards for accounting, impairment of, and valuation of intangible assets. The audit committee now has a justifiably broader implied mandate with regard to the operations of technology companies.

SOX does not address inherent conflict between corporate strategy and corporate disclosure requirements. In the ESR case (Nwogugu (2004)), execution of BOSS's and GMAC's corporate strategy was more important to them than compliance with GAAP and SEC rules, and this choice eventually led to the collapse/bankruptcy of ESR. In many instances, there is often inherent conflict between corporate strategy and corporate disclosure requirements, primarily because: a) disclosure has

information effects that may complicate or deter corporate strategy, b) disclosure requirements and execution of corporate strategy can have opposing/conflicting and simultaneous effects on incentive compensation schemes. These issues are not addressed by SOX. There should be specific and express rules that mandate approval of corporate strategy by the audit committee of the board of directors, and certification by senior executives without public disclosure (much like SOX requires certification of financial statements).

SOX compliance and analysis has substantial opportunity costs. The immediately obvious opportunity costs of SOX include: a) additional auditing costs, b) distraction of management and employees that now have to spend more time on compliance and controls matters. Braddock (2006: 194-196). The other opportunity cost attributable to SOX compliance include: a) reduced capital formation opportunities – companies that would have otherwise become public, remain in the private markets; b) reduced transparency – as more companies remain in the private market, there less overall transparency since less information is in the public domain; c) increased volatility – due to more market-changing information; d) increased transaction costs which are distinct from compliance costs – with SOX, the costs of executing corporate transactions.

SOX does not address group decision processes at banks and at investment firms. These entities have access to as much information, and sometimes have as much influence on company management as law firms and accounting firms, but are not subject to the same expectations/standards/rules pertaining to due diligence and disclosure.

SOX does not address moral hazard and adverse selection in external auditors. There should have been mechanisms/statutes that would have triggered the removal of BOSS's and GMAC's external auditors during their industry consolidation acquisitions.

SOX complicates the Agency problems inherent in hiring external auditors. SOX does not address, and complicates the principal-agent problems inherent in hiring external auditors. Under SOX, the external auditor's role has become much more prominent, and the external auditor's compensation has increased. Under SOX, the external auditor's incentives to report fraud to regulators are much lower, because: a) the external auditor is likely to lose both SOX and traditional audit work, if the relationship deteriorates – loss of SOX engagements at one client is likely to substantially affect the accounting firm's probability of getting other audit or SOX engagements; b) SOX has shifted more responsibility for accuracy of disclosure to company management (via certifications); c) SOX has broadened the potential pool of claimants that can sue external auditors.

These principal-agent problems are compounded by the fact that under SOX, external auditors effectively serve as the agents of various parties – the

public, investors/shareholders, regulators and the company's management. The external auditor's role as an agent of shareholders directly conflicts with the external auditor's duty to the public and to regulators. With regard to external auditors, there are substantial moral hazard problems and principal-agent problems in implementation of SOX - accounting firms have an inherent incentive to delay the reporting of negative financial information about clients. Cialdini & Goldstein (2004); Diamond (1980); King & Wallin (1995); Lai-Yee & Leung (2005); Street & Gray (2001); Lerner & Tetlock (1999); Verrecchia (2001). These moral hazard problems can be solved or reduced by statutory restrictions and guidelines which are lacking in many national jurisdictions. SOX has only worsened the moral hazard problems by effectively granting more control over companies' internal controls to public accounting firms.

SOX's requirement that CEOs and CFOs certify financial statements increases principal-agent problems and provides more incentives for fraud. This requirement places undue psychological burdens on executives who are already burdened with management responsibilities, accountability to shareholders, burden. The certification requirement does not help in terms of apportioning liability (for misconduct) among employees, because many of the documents that require certification are large complex documents, produced from many departments by many people over time. These people may have different departmental cultures, incentive/compensation systems, performance measurement systems, departmental internal controls and education. Essentially holding one person criminally responsible for internal controls of the firm is not reasonable, logical or appropriate.

These points raise the issue of the role of internal auditors in large multinational technology companies. Most of the problems at BOSS and GMAC could have been identified by effective internal audits conducted by independent internal audit teams that report only to the board of directors, coordinate with external auditors and have proper incentive compensation – that, the hiring criteria, performance criteria and incentive compensation for internal audit professionals are tied directly to the quality of external audits, incidences of fraud, improvement in operations, quality of recommendations, reduction of business risk, and reduction/elimination of existing/potential/contingent liabilities. The internal audit function must now go beyond traditional analysis of operations, marketing and finance functions, and mandatorily include legal, regulatory, political, labor and environmental analysis.

Similarly, at banks, the internal audit function has become more relevant and has to be changed. The hiring criteria, performance criteria and incentive compensation for internal audit professionals should be directly linked to abilities pertaining to the quality of external audits, incidences of fraud, improvement in operations, quality of recommendations, reduction

of business risk, and reduction/elimination of existing/potential/contingent liabilities.

Compliance Costs

The costs of complying with SOX have been higher than expected. See: Braddock (2006); Leech (Nov. 2003); Leung & Cooper (2003). Only public companies with market capitalization of \$75 million or more are required to comply with the Sarbanes-Oxley rules in 2005, but smaller companies must comply by 2006. A 2005 study estimated that the annual cost of SOX implementation at US companies is about \$1.4 trillion. The SOX burden is heavy for small and medium sized companies. Some reports have estimated that compliance with SOX in 2005 incurred about \$35 billion of additional costs for American companies in 2005 — this about twenty times more than the US SEC originally estimated.

Although Sarbanes-Oxley has introduced some beneficial reforms, much of this good is outweighed by the unexpected negative consequences of SOX's Section 404, which regulates internal company controls. According to a July 2004 report by Financial Executives International (FEI), the total cost of Section 404 compliance per company was estimated at \$3.14 million. Public companies expect to spend an average of 25,667 internal hours and 5,037 external hours for compliance with Section 404. Companies also expect to spend an additional \$1,037,100 on software and IT consulting. Furthermore, with SOX, the external public auditing firms that cause many of the corporate fraud scandals (arising from inadequate disclosure) now have more power than before, and effectively regulate the information technology operations of publicly-traded US companies. The crux of the problem is that under SOX, while revenues of public accounting firms have increased, their role as a balance against executive malfeasance and corporate crime has not changed substantially. This is directly attributable to the drafting and specifications of SOX. SOX focuses on micro-operational details of companies, and (Section 404) does not adequately regulate the high-level fraud and deception perpetrated by top management (such as reserves, capitalization instead of expensing some items, asset values, etc.).

Unfortunately, SOX has the most impact on small public companies and venture capital start-ups, which generate more than seventy percent of new jobs in the United States. Because of SOX, many start-ups have been hesitant to execute IPOs; and approximately one-fifth of all small publicly-traded companies in the US have considered going private because of the costs of complying with SOX (source: Thomson Venture Economics, and the National Venture Capital Association). In addition, and for the first time in the history of US capital markets, during 2004-2006, many US companies were considering delisting from traditional stock exchanges to pink-sheets, or to go private. This exodus also involves

foreign-domiciled companies who must comply with Sarbanes-Oxley because of being listed on one of the

U.S. stock exchanges.

Table 1. Costs of Compliance With Sarbanes-Oxley Act (including internal costs and auditing).

<i>Company revenue</i>	<i>Average cost</i>
• Less than \$100 million	\$800,000
• \$100 million to \$499 million	\$1 million
• \$500 million to \$999 million	\$1.3 million
• \$1 billion to \$4.9 billion	\$2.4 million
• Over \$5 billion	\$8 million

Source: Financial Executives International

Willingness To Comply

SOX raises the issue of employees' Willingness-To-Comply (WTC) with laws/regulations, which in this instance, is intertwined with the Willingness-to-disclose (WTD) financial information. Laussel & Le Breton (2001); Arora & Gangopadhyay (1995); Zheng (2002). Ge & McVay (2004); Jahangar, Kamran & Henry (2004); Leuz & Verrecchia (2000); Tackett (2004); Carney (Feb. 2005); Teles (2004). Chapman (1996); Ehrlich (1996); Kyung & In-Gyu (2001); Healy & Palepu (2001). Lai-Yee & Leung (2005); Lerner & Tetlock (1999); Blanton & Christie (2003); Braun, Mukherji & Runkle (1996); Street & Gray (2001); Verrecchia (2001); King & Wallin (1995); Cialdini & Goldstein (2004); Diamond (1980); Byam (1982); Croley (1998); Arlen (1994); Arlen & Kraakman (1997); Hughes (1994); Khanna (1996); Kornhauser (1982); Feinstein (1990); Kingston, Schafer & Vandenberghe (2004); Hage (2001); Schild (1998); Tata (1998); Raghupatti, Schkade, Bapi & Levine (1991); Franklin (2003); Jackson (2004); Zeleznikow (2002). SOX has both civil and criminal penalties for non-compliance. The deterrence effect of SOX has not been proven or analyzed in detail – indeed, even after its implementation, companies are still reporting problems with internal controls. The ideal level of deterrence is complete deterrence (ie. Complete-compliance, which is different from over-compliance). Hence, the sanction must be sufficient to prevent recurrence by sufficiently reducing perpetrators' resources and providing a deterrence effect (or sufficiently reduce the probability of recurrence).

Let:

P_{pn} = probability of prosecution under non-compliance. $P_{pn} \in (0, 1)$.

P_{pc} = probability of prosecution under complete-compliance. $P_{pc} \in (0, 1)$.

P_{ta} = probability of corporate tax audit. $P_{ta} \in (0, 1)$.

F_c = estimated/statutory fine/penalty for company if convicted – lost wages, monetary fines, etc. $F_c \in (0, \infty)$.

F_e = estimated/statutory total fines/penalties for top ten managers if convicted. $F_e \in (0, \infty)$.

C_c = company's compliance costs required to achieve complete compliance with SOX.

G_c = present value of potential benefits to company from falsifications in reporting period t. more ESO awards, higher repricing, etc.. $G_c \in (-\infty, \infty)$.

G_e = present value of potential benefits to employee from falsifications in reporting period t. $G_e \in (-\infty, \infty)$.

M = average employee propensity to commit fraud. $M \in (0, 1)$. $M \rightarrow 1$, as the employee becomes more likely to commit fraud.

CE = control environment – company size, culture, geographic scope of operations, centralized/decentralized operations, manager's ability to coordinate fraud, etc.. $CE \in (0, 1)$. $CE \rightarrow 1$, as the Control Environment becomes stricter, and management has more control over procedures/processes.

S = savings from complete compliance with SOX – absence of investigations, fraud, etc.

L_e = percentage of total liability imposed on employee, upon conviction.

L_c = percentage of total liability imposed on company, upon conviction.

R = company's/employee's Regret. $R \in (-1, 1)$. $R \rightarrow 1$, as the employee/company becomes more likely to regret any misconduct, due to prior penalties, financial position or fear of consequences.

H = horizon of influence/falsification (time in years/months/week). $H \in (0, \infty)$.

T_{cr} = transaction costs involved in falsifying corporate records. $T_{cr} \in (-\infty, \infty)$.

T_p = company's transaction costs for prosecuting falsification. $T_p \in (-\infty, \infty)$.

T_i = company's transaction costs for investigating falsification. $T_i \in (-\infty, \infty)$.

T_{pg} = government's transaction costs for prosecuting falsification. $T_{pg} \in (0, \infty)$.

T_{ig} = government's transaction costs for investigating falsification. $T_{ig} \in (0, \infty)$.

EM = employee collusion-motivation index. $0 < EM < 1$. This factor refers as to the degree of estimated and feasible collusion among employees, and between employees and external auditors. $EM \rightarrow 1$, as the employee becomes more likely to collude with other employees and external audit staff, suppliers and vendors

SR = expected stock market reaction from any major change in reporting. $SR \in (-1, 1)$. $SR \rightarrow 1$,

as the stock market reacts more positively to any change (positive or negative) in ESO reporting, and vice versa.

EP = employee's propensity to falsify records. $EP = f(P, T, I, C, K, PI, IR, D, E)$. $EP \in (0, 1)$. EP is different from EM because EM pertains to collusion with internal staff and auditors, while EP pertains to possibility of actual fraud by the employee. $EP \rightarrow 1$, as the employee's propensity to falsify records increases.

Where:

P = personality; T = amount of company's tax burden before falsification, I = intensity of enforcement efforts; C = complexity of the tax system; K = employee's knowledge and skills in law and accounting; PI = peer influence; IR = influence of reference groups; DE = employee's direct experience with the government's tax system. $P, T, I, C, K, PI, IR, D, E \in (0, 1)$

IN = perceived inequity index – which reflects the average employee's perceptions about inequity of the tax system/regime and internal controls. $IN \in (0, 1)$. $IN \rightarrow 1$, as the average employee's perception of the tax system as inequitable increases.

$$WTC_1 = \frac{LN\{((1 - P_{pc}) * (S - C_c)) / (((1 - P_{pn}) * (G_c + G_e)) - ((F_c + F_e) * P_{pn}))\}}{M * CE^{-1}}$$

$$WTC_2 = \frac{\int^H \{[(P_{pn} | P_{ta}) * (L_e)] / [(SR * (L_c) * (1 - (P_{pn} | P_{ta}))]\}}{\partial(T_p + T_i) / \partial(T_{pg} + T_{ig})} * (\partial CE / \partial EM)}{(\partial EP / \partial IN) * (\partial(T_{pg} + T_{ig}) / \partial EM)}$$

$$WTC_3 = \frac{\int^H \{[(P_{pn} | P_{ta}) * (L_e)] / [(SR * (L_c) * (1 - (P_{pn} | P_{ta}))]\}} * \{\partial(T_p + T_i) / \partial(T_{pg} + T_{ig})\} * (\partial CE / \partial EM)}{(\partial EP / \partial IN) * (\partial(T_{pg} + T_{ig}) / \partial EM)}$$

$$WTC_4 = \frac{[(L_c / L_e) * \{(T_p + T_i) / (T_{eg} + T_{ig})\}] * (CE / EM) * (EP / IN) * (SR / CE) * (EP / EM) * (IN / (CE * SR * EM))}{}$$

$WTC \in (-\infty, +\infty)$.

$WTC \rightarrow 1$, as the company becomes more likely to comply with SOX standards.

Knowledge Management in Technology Companies and Banks

ESR's transactions and subsequent bankruptcy is partly attributable to its management's failure to manage knowledge creation and knowledge delivery. Beesley (2004); Gal (2004); Camelo-Ordaz, Fernandez-Alles, et al (2004); Christensen & Bang (2003); Wagner (2003); Perez & Ordóñez De Pablos (2003); Cimon (2004). ESR's main assets were its human capital. ESR's business was providing expert services and advisory services in building/facilities engineering. The merger resulted in BOSS providing services in new segments where it was not previously active. The combination of inadequate union involvement in critical decisions, and failure to

adequately manage knowledge-based work teams, and also customers' negative perceptions of ESR's ability to deliver adequate services eventually resulted in ESR's inability to win enough profitable service contracts. This phenomenon occurred even though immediately after the merger in April 2000, ESR was the industry leader, and had the most resources (in the industry) to provide such services – but customers actually choose to hire smaller competitors with presumably less knowledge and geographical coverage. ESR apparently failed to develop marketable and well-defined internal systems of knowledge creation, or knowledge management or knowledge storage, that prospective clients could rely on for adequate service. Any additional skills that BOSS/GMAC did not have could have been developed in-house or obtained using strategic alliances and joint ventures. Nwogugu (2004). Several principles can be derived from the ESR transactions:

- Management's ability to manage knowledge is a direct function of worker cohesion and status of labor unions.
- Management's ability to manage knowledge across partner organizations (strategic alliances) or recently merged companies is a direct function of integration of information systems, ability to assess customer needs, strength of client relations, and assessment of workers' skills.

Similarly, that the ESR's advisors allowed the transactions to occur, is also attributable to knowledge management problems. Human capital is the key distinguishing factor at banks, accounting firms, law firms and consultants that worked on BOSS, GMAC and ESR's transactions. These entities were apparently not able to manage knowledge networks within their organizations and outside their organizations. The loan origination function, the credit function, the risk management function and advisory function of banks are all knowledge-intensive processes. The modern bank and financial institution are essentially technology companies that rely heavily on information management in their daily operations. Thus, senior management and the boards of directors at banks must emphasize and implement knowledge creation and knowledge management processes in order to reduce risk and increase shareholder value. Government regulators should also develop and implement supervision rules that require financial institutions to develop better knowledge creation and knowledge management systems, and to file periodic reports about the configurations and performance of such knowledge management systems.

Knowledge management must be coordinated with internal audit and corporate governance efforts. Unfortunately, SOX does not address or establish standards for integrating knowledge management and internal audit systems.

Conclusion:

The ESR transactions illustrate some of the inadequacies of the Sarbanes-Oxley Act. The implementation and enforcement of the Sarbanes-Oxley Act often results in excessive compliance costs, over-compliance, agency problems, regulatory friction, misallocation of liability, inadequate/improper penalties, and information asymmetry.

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