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Too Big to Fail: Moral Hazard in Auditing and the Need to Restructure the Industry Before it Unravels

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**TOO BIG TO FAIL:
MORAL HAZARD IN AUDITING AND THE NEED
TO RESTRUCTURE THE INDUSTRY BEFORE IT
UNRAVELS**

*Lawrence A. Cunningham**

Large audit firms may believe that they are too big to fail. Arthur Andersen's 2002 criminal indictment reduced their number from five to four, and the government decided in 2005 to avoid indicting KPMG for crimes it admitted committing. If audit firms interpret the government's reluctance to indict as signaling aversion to tough action against them, moral hazard arises. This offsets auditing improvements mandated by the Sarbanes-Oxley Act of 2002 that are designed to strengthen auditors' reputations with managers for thoroughness and improve financial statement reliability. Neutralizing this moral hazard requires a credible alternative industry structure so that when a large audit firm faces failure from criminal or other malfeasance, it can be allowed to exit the industry without upsetting the financial system that auditing supports.

An alternative industry structure must make auditing at least as effective as it is under the current system and should provide enhancements wherever possible. Examples of enhancements include bolstering auditors' reputations for toughness with client managers and delivering more transparent information to external users of financial information. One way to restructure the industry along these lines is through mandatory financial statement insurance. Such insurance would make it clear that no audit firm is too big to fail, promote strategic detection and deterrence in auditing, produce publicly disclosed indices of financial

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statement reliability, and reduce barriers to entry that potential competitors to the four large firms currently face.

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Introduction

The U.S. government sometimes rescues troubled enterprises whose significance to the national or global economy renders them “too big to fail.” Examples include the government-directed or government-coordinated bailouts of Chrysler Corporation in the late 1970s and of Long Term Capital Management in the late 1990s. Such intervention is controversial because the policy sustains a pillar of the economy at the cost of creating moral hazard that encourages excessive risk taking among organizations that consider themselves too big to fail.

The government is aware of the moral hazard triggered by the too big to fail doctrine, epitomized by banking laws that restrict its use, and by the restraint it showed when allowing Arthur Andersen to fail in 2002. Yet, having allowed Arthur Andersen to fail, the auditing industry is now reduced in size to a historical low of four firms that are competent to audit the vast majority of public enterprises. Allowing another firm to fail would produce acute industry concentration that would eliminate many clients’ choice of auditors. That prospect could precipitate the audit industry unraveling and thus presents a high-magnitude loss risk that may lead those firms to believe that they are too big to fail and the government to agree. Such beliefs may be vindicated by how the government in 2005 chose not to indict KPMG despite its admitted federal crimes in peddling numerous illegal tax shelter schemes.

The probability of audit firm failure in the foreseeable future is considerable, and industry members are able to influence this risk. These facts and the temptation among audit firms to believe that they are too big to fail compel developing mechanisms to counteract that belief and its attendant moral hazard. Otherwise, the lax audits characteristic of the late 1990s may continue, along with the proliferation of unreliable financial statements that could lead to cataclysmic liability judgments against a large audit firm. What is needed is a credible alternative to the prevailing auditing industry structure so that a firm facing failure can be allowed to exit without disrupting the financial system that audit firms support. As the

following analysis explains, financial statement insurance can supply this credible alternative.

Part I discusses the probability that one of the four large audit firms will fail in the near future and the magnitude of such a failure. The probability analysis highlights Professor Eric Talley's innovative model of risk that cautiously suggests that the probability of such a failure is high;¹ it then extends the model's implications by explaining how this risk is within audit firms' control. As to the magnitude of an audit firm's failure, the discussion shows how a single large firm's failure could unravel the auditing industry by eliminating choice in the market for auditing services. Further, Part I considers how the resulting governmental temptation to rescue a failing firm creates moral hazard.

Part II draws insights from parallels between the model of audit firm exit risk and catastrophic risk management tools developed in complexity theory. These tools address the peculiar features of complex dynamic systems in which even low-probability events bear large-magnitude consequences. Insights from complexity theory adapted to auditing prescribe rebuilding impaired auditor reputations with managers for toughness and with investors for reliability. The first point leads to endorsing the controversial audits of internal control required by the Sarbanes-Oxley Act of 2002 and promoting strategic methods of auditing practice. The second point calls for auditors to perform and publicly disclose worst-case scenario analyses concerning particular financial statements.

Part III offers an innovative alternative to the existing auditing industry that would generate the foregoing benefits and eliminate the moral hazard affecting auditors who may believe that their firms are too big to fail. It first explains the drawbacks of existing liability and self-insurance practices prevalent in the contemporary auditing industry and then contrasts these with the structural advantages of financial statement insurance. This creates benefits that would significantly improve the audit function and offer a credible

¹ See Eric L. Talley, Cataclysmic Liability Risk Among Big-Four Auditors, 106 Colum. L. Rev. 1, [8--9] (2006).

alternative to the existing auditing industry structure. Ironically, the threat of such a credible alternative might just help save the auditing industry from itself by increasing auditors' effectiveness and thus reducing the risk of exit-induced industry unraveling.

I. Risk

This Part explores the risk that one of the large audit firms will fail in the near future, considering both the probability and the magnitude of such an event. Part I.A explains how such firms face substantial liability risks and introduces methods to measure and interpret them. Part I.B presents and evaluates Professor Talley's model of the probability of near-term audit firm exit, concluding that the model is a valuable contribution yet subject to important limitations. Part I.C addresses the magnitude of the risk to demonstrate how a single large audit firm's failure could unravel the entire auditing industry, compelling immediate policy attention to the state of current auditing practice.

A. *Exit and Unraveling*

Four firms audit nearly all large public companies. A half-dozen much smaller (but still medium-sized) ones audit the remainder.² This is down from eight large firms two decades ago, when several firms in the next tier also represented viable competitors to the large firms. The transformation resulted from the dissolution of two firms---in 1991 the viable competitor, Laventhol & Horwath, and in 2002 the large firm, Arthur Andersen---and from mergers among all other large firms.³ In 2005, a criminal investigation for peddling illegal tax shelters threatened to provoke

² See U.S. Gen. Accounting Office, Pub. No. GAO-03-864, Public Accounting Firms: Mandated Study on Consolidation and Competition 16, 20--22 (2003), available at <http://www.gao.gov/new.items/d03864.pdf> (on file with the *Columbia Law Review*) [hereinafter GAO, Study on Audit Industry Consolidation] (finding that four largest firms audit 99% of public company sales taken as an aggregate; 97% of public companies with sales exceeding \$250 million; and 78% of all public companies).

³ Mergers were: (1) in 1987, Peat Marwick Mitchell with KMG into today's KPMG; (2) in 1989, Ernst & Whinney with Arthur Young into today's Ernst & Young; (3) also in 1989, Deloitte Haskins & Sells with Touche Ross into today's Deloitte & Touche; and (4) in 1998, Price Waterhouse with Coopers & Lybrand into today's PricewaterhouseCoopers. *Id.* at 10--11.

the dissolution of KPMG, one of the remaining four large firms.⁴ This was averted by the prosecution's decision to pursue individual accountants rather than the firm.

Although no large audit firm has exited the industry solely because of federal securities fraud class actions, and most exits have resulted from mergers, such liability risks have always been considerable and appear to be increasing. Laventhol & Horwath's exit was due, in large part, to a series of money damages in class actions concerning the savings-and-loan industry debacle and a tax shelter scheme.⁵ The impact of these damages was compounded by the firm's resulting inability to attract new work or obtain new clients and by the adverse effects on its existing clients' stock prices.⁶

Arthur Andersen exited due to a criminal prosecution arising from the firm's violating a consent decree and ensuing criminal obstruction of justice charges for witness tampering during investigations into the fraud-plagued Enron Corporation.⁷ But large-scale civil liabilities also loomed, including possible federal securities fraud class actions. During the scandal, client flight also afflicted Arthur Andersen and can be expected to accompany any

⁴ See *United States v. KPMG LLP*, 316 F. Supp. 2d 30, 32--34 (D.D.C. 2004) (detailing facts at preliminary stage of Internal Revenue Service and Department of Justice investigations into widespread criminal conduct at KPMG).

⁵ See John C. Coffee, Jr., *Gatekeeper Failure and Reform: The Challenge of Fashioning Relevant Reforms*, 84 B.U. L. Rev. 301, 318--19 n.51 (2004) [hereinafter *Coffee, Gatekeeper Failure*] (describing causes of Laventhol & Horwath's bankruptcy); Morris W. Macey & Frank R. Kennedy, *Partnership Bankruptcy and Reorganization: Proposals for Reform*, 50 Bus. Law. 879, 885 (1995) (describing how \$73 million judgment entered against Laventhol & Horwath helped push firm into bankruptcy); Charles W. Wootton & Stanley D. Tonge, *Where Do Clients Go When an Accounting Firm Goes Bankrupt?: The Case of Laventhol & Horwath*, 29 *Abacus* 149, 151--52 (1993) (recounting wave of lawsuits that brought down Laventhol & Horwath).

⁶ See William R. Baber et al., *Client Security Price Reactions to the Laventhol and Horwath Bankruptcy*, 33 *J. Acct. Res.* 385, 388--90 (1995) (finding statistically significant price declines in stock of Laventhol & Horwath clients during period surrounding its bankruptcy announcement); Macey & Kennedy, *supra* note 5, at 886 (observing that "as litigation problems continued to increase and negative publicity developed in the press, new work and new clients became practically unobtainable").

⁷ See Kathleen F. Brickey, *Andersen's Fall from Grace*, 81 *Wash. U. L.Q.* 917, 919--21 (2003) (relating chain of events that led Department of Justice to indict Arthur Andersen).

similar contamination that other large audit firms confront in the future.⁸

Auditors thus face a steady flow of liability risks, some of which present staggering consequences, including the possibility of industry exit. Numerous methods for conceptualizing or measuring these risks exist; all approaches appreciate how risk is a combination of probability and magnitude (likelihood and severity). An analysis may explore the likelihood of a victory or defeat in various litigation settings or of a given judgment or total judgments in a given time period. Or an analysis could assess the magnitude of such results, at the firm or industry level, on operations, insurability, or even solvency. Determining total risk involves applying some combination rule that relates the probability and the magnitude assessed. These tools have different utilities depending on the question of interest.

Consider risk as measured by average settlements of lawsuits against auditors, the number of which have steadily increased in recent years.⁹ These can be important metrics for an audit firm's management plans and for policy analysis of the auditing industry.¹⁰ They are particularly useful when audit firms buy third-party liability insurance to address such risks.¹¹ Averages are useful because the essence of most liability insurance is pooling and then diversifying risks, measured using means and standard deviations. This enables insurers to make statistically valid predictions about the relationship between premium and investment income on the one hand and loss payouts and expenses on the other.

⁸ See Paul K. Chaney & Kirk L. Philpich, Shredded Reputation: The Cost of Audit Failure, 40 J. Acct. Res. 1221 passim (2002) (investigating impact of Enron audit failure on stock market valuation assigned to Arthur Andersen's other clients).

⁹ See Coffee, Gatekeeper Failure, supra note 5, at 320 n.56 (citing PricewaterhouseCoopers, LLP, 2002 Securities Litigation Study 7 (2003)).

¹⁰ See Talley, supra note 1, at 6 n.6.

¹¹ Id. at 3.

However, as the number of large audit firms has shrunk, an increasingly important question concerns the probability and magnitude of a cataclysmic liability payout. This is important because, with only four large firms, catastrophic losses incurred by even one of them pose significant systemic consequences. If only three firms are available to serve thousands of global enterprises, many enterprises will lack sufficient choice to obtain required auditing services. As a matter of antitrust policy, the resulting industry concentration would be intolerable. The industry as currently structured could easily unravel. Governmental intervention would be tempting.¹² What is the probability and magnitude of such failure?

Casualty and liability insurers address such questions by conceiving of right-tail risk (RTR)---payouts that appear along the right tail of statistical probability distribution curves. This tool addresses low-frequency, large-loss events that arise from such natural catastrophic phenomena as earthquakes and floods and man-made events like terrorism and financial calamity. A common quantitative tool, called the expected policyholder deficit, measures catastrophic risk as the expected difference between (a) the present value of claims paid plus costs and (b) the present value of premiums collected plus investment income.¹³ Insurers employ varying actuarial measures and methodologies in assessing right-tail risk, including the expected policyholder deficit as well as standard

¹² See Coffee, *Gatekeeper Failure*, supra note 5, at 345 (“The ironic truth is that the four global accounting firms that remain today have become ‘too big to fail.’”); John M. Holcomb, *Corporate Governance: Sarbanes-Oxley Act, Related Legal Issues, and Global Comparisons*, 32 *Denv. J. Int’l L. & Pol’y* 175, 203 (2004) (“[T]he major accounting firms may be politically insulated from further criminal prosecution and, in a sense, may have become too big to fail.”); *The Future of Auditing: Called to Account*, *Economist*, Nov. 20, 2004, at 71--72 (quoting Dartmouth College, Tuck Business School, Dean Paul Danos that “these firms are too important to fail---but there are mechanisms by which they could fail” and Duke University Law School Professor James Cox that “[t]he reality is that the Big Four is very likely too big to fail. Regulators know this ---and that is a huge moral hazard.”).

¹³ See, e.g., Michael M. Barth, *A Comparison of Risk-Based Capital Standards Under the Expected Policyholder Deficit and the Probability of Ruin Approaches*, 67 *J. Risk & Ins.* 397, 397--98, 400--04 (2000) (explaining expected policyholder deficit approach and critiquing it in context of its growing embrace by insurance agencies and regulators); Richard A. Ippolito, *Bankruptcy and Workers: Risks, Compensation and Pension Contracts*, 82 *Wash. U. L.Q.* 1251, 1281--82 (2004) (explaining and using this tool to illustrate and analyze status of Pension Benefit Guaranty Corporation).

deviation, the Gini mean, and innovative tools known as right-tail deviation and right-tail index.¹⁴

Stoked by the amplified magnitude of events like terrorist attacks and phenomena like financial concentration, the academic literature on risk increasingly applies formal models to assess probabilities and magnitudes that take account of catastrophic risk.¹⁵ Strictly in terms of the dollar amounts of auditor liability, the 2000s have brought the largest legal payouts against auditors in history, with several exceeding \$100 million.¹⁶ While scholars may disagree on which is more important, the average or the catastrophic case,¹⁷ for contemporary auditing, “the risk of catastrophic loss, not the increase in average settlement value, is the factor most likely to cause the market for [auditing] services to unravel.”¹⁸

As a matter of intuition, therefore, one may hypothesize that the risk of such a judgment inducing a firm to exit---with resulting

¹⁴ See J. David Cummins, Allocation of Capital in the Insurance Industry, 3 Risk Mgmt. & Ins. Rev. 7, 9, 11--26 (2000) (discussing capital-allocation techniques, including expected policyholder deficit approach, that have been suggested or employed in insurance industry to calculate required capital amounts and pointing out that “long-tail liability policies are likely to lead to different investment objectives than funds raised by issuing short-tail property insurance policies”); Shawn Wang, An Actuarial Index of the Right-Tail Risk, 2 N. Am. Actuarial J. 88 (1998).

¹⁵ See, e.g., Michelle E. Boardman, Known Unknowns: The Illusion of Terrorism Insurance, 93 Geo. L.J. 783 *passim* (2005) (assessing feasibility of terrorism insurance with reference to traditional catastrophic risks such as natural disasters); Robert J. Rhee, Terrorism Risk in a Post-9/11 Economy: The Convergence of Capital Markets, Insurance, and Government Action, 37 Ariz. St. L.J. 435, 464--78 (2005) (assessing applicability of traditional insurability criteria to catastrophic terrorism); see also The Financing of Catastrophic Risk (Kenneth A. Froot ed., 1999) (compiling several articles on catastrophic risk).

¹⁶ See Coffee, Gatekeeper Failure, *supra* note 5, at 342 (detailing four settlements through 2004 exceeding \$100 million: settlements of \$110 million, \$125 million, \$217 million, and \$335 million); Talley, *supra* note 1, at 67 n.105 (noting *Fortress Re* settlement in 2005 of \$250 million).

¹⁷ Compare W. Kip Viscusi, The Social Costs of Punitive Damages Against Corporations in Environmental and Safety Torts, 87 Geo. L.J. 285, 285 (1998) (emphasizing juror awards of punitive damages in rare cases when these reach such large sums as to “pose a catastrophic threat of corporate insolvency”), with Theodore Eisenberg et al., Juries, Judges, and Punitive Damages: An Empirical Study, 87 Cornell L. Rev. 743, 745 (2002) (emphasizing that jury awards of punitive damages are rare and in most cases they “relate strongly to compensatory awards”).

¹⁸ Coffee, Gatekeeper Failure, *supra* note 5, at 342.

industry shrinkage so acute as to threaten industry unraveling---is high in likelihood and severity. This may be so despite various legal reforms of the mid-1990s tending to reduce such risk, given how reforms of the early-2000s install new ones. Thus, for example, while the Private Securities Litigation Reform Act of 1995 (PSLRA) shifted to proportionate from joint liability for auditors,¹⁹ the Sarbanes-Oxley Act imposes new demands on auditors that increase liability risk, including through new audits of internal control over financial reporting.²⁰ How, then, might one measure the likelihood of such an exit-inducing liability imposition against one of the four large audit firms?

B. *Probability*

Professor Talley develops a probability model of near-term audit firm exit based on a measure of right-tail liability risk from federal securities fraud class actions (the “Audit Industry RTR Model”).²¹ The following summarizes the Model and then provides three critiques.

1. Audit Industry Right-Tail Risk --- The Audit Industry RTR Model assesses the likelihood that at least one of the four large audit firms will fail shortly because of liability resulting from federal securities fraud class actions. Professor Talley conceptualizes RTR by relating alternative audit firm viability thresholds to the risk of liability exposure above them over the next one to five years. This

¹⁹ Private Securities Litigation Reform Act of 1995, 15 U.S.C. § 78u-4 (2000) (adopting heightened pleading standards, staying discovery pending motions to dismiss, and shifting to proportional from joint-and-several liability); see also Securities Litigation Uniform Standards Act of 1998, 15 U.S.C. §§ 77p, 78bb(f) (2000)) (effectively banning related legal actions from state and federal court adjudication).

²⁰ See Sarbanes-Oxley Act § 404, 15 U.S.C. § 7262(a) (Supp. 2002); see also Management’s Reports on Internal Control over Financial Reporting and Certification of Disclosure in Exchange Act Periodic Reports, Exchange Act Release Nos. 33-8238, 34-47,986, Investment Company Act Release No. 26,068, 68 Fed. Reg. 36,636 (June 18, 2003) (codified at 17 C.F.R. pts. 210, 228, 229, 240, 249, 270, 274) (noting discussions and comments affecting implementation of various sections of Sarbanes-Oxley Act, including concerning internal control reports); *infra* text accompanying notes 161--166.

²¹ Talley, *supra* note 1, at 71--72. Professor Talley mostly leaves the question of magnitude for further inquiry while offering some useful notes on the issue. See *id.* at 104; *infra* Part I.C.

requires, in turn, estimating both a plausible viability threshold and a probability distribution of exposure.

To approximate viability thresholds, the Audit Industry RTR Model employs assumptions for a “pivotal partner” in a large firm deciding whether to exit or continue.²² Assumptions contributing to higher viability thresholds are, on a per pivotal partner basis: revenue, closing costs, and perishable employee benefits. Those tending to contribute to lower viability thresholds are the pivotal partner’s years to retirement, cash flow from his or her next best option, the search periods required to obtain alternative employment, and that partner’s share of damages, fines, or costs.²³ While these assumptions capture important factors, others may be relevant but not susceptible to scientific verification or even roughly reliable estimation. For example, litigation costs in federal securities fraud class actions are difficult to determine and vary considerably across cases.

So devised and limited, the Audit Industry RTR Model estimates viability thresholds of \$454 million to \$2.15 billion.²⁴ Although in line with anecdotal estimates, Professor Talley expressly recognizes these figures as “very speculative and open to considerable debate.”²⁵ Invoking also the settlement level of a contemporaneous non-class action, for purposes of the Model,

²² The Audit Industry RTR Model uses the concept of a pivotal partner as the median among other partners of a large firm, half of whom may prefer dissolution earlier, and the others later, than the pivotal partner. The pivotal partner’s analysis is thus the tipping point of a firm-wide decision to dissolve or continue. See Talley, *supra* note 1, at 74.

²³ Revenues are estimated as \$312 million to \$2 billion; the next best alternative is deemed the same as that given up; required search periods are assumed to be one year (a hunch based on the smoothness of relocating Arthur Andersen partners); years to retirement is guessed at 15; the time discount factor is taken to be about 9% (extrapolated from the audit industry’s internal rate of return); and rough guesses are made of the other items: perishable employee benefits of \$10 million; 2% partner participation rate in firm profits; and \$5 to \$10 million in closing costs. *Id.* at 77--79.

²⁴ *Id.* at 79--80. This is a large range but it is difficult to develop a prudential model with a narrower one.

²⁵ *Id.* at 80.

Professor Talley sets the low end of the viability threshold at \$250 million.²⁶

To estimate the distribution of exposure, Professor Talley uses historical data on lawsuit filings and settlements.²⁷ He adjusts these data for inflation although, to increase the Model's statistical power, not so much for legal changes.²⁸ Lawsuit data are drawn from multiple sources and are arrayed against data on market volatility as a recognized predictor of filing levels.²⁹ The submodel of market volatility as a predictor of lawsuit filings is a function of various market factors.³⁰ The Audit Industry RTR Model appears to do well at explaining the historical pattern of liability.³¹ Professor Talley uses the resulting coefficient estimates to make out-of-sample predictions about the future distribution of exposure.³²

A total of 132 cases in the sample of federal securities fraud class actions name auditors as defendants.³³ Case outcomes were

²⁶ See *id.* at 80 (settlement concerning audit of Fortress Re).

²⁷ *Id.* at 81--83.

²⁸ Professor Talley addresses some legal change by creating certain statistical lags and time trends. See *id.* at 81.

²⁹ *Id.* at 83--85. Data on lawsuit filings include the SCAA data set dating to 1992 (containing 3600 cases, ninety percent of which are class actions), augmented by separate data from 1960--1995. Market volatility data are obtained from CRSP. Professor Talley states that it is well known that lawsuit filings correlate with market volatility (measured by standard deviation of the average monthly return during a year of the value weighted CRSP portfolio); he maps the 1991--2003 volatility data onto lawsuits to show that volatility is a good predictor of lawsuit filing levels. *Id.* at 81--85.

³⁰ *Id.* at 85. The model is based on the number of public firms, volatility, market capitalization, industry composition, and time trends. *Id.* at 84.

³¹ *Id.* at 87.

³² *Id.* at 91.

³³ This is fewer than ten percent of all actions. *Id.* at 86. The percentage has decreased considerably since the Supreme Court announced that federal securities laws do not authorize private securities fraud actions against those aiding and abetting securities fraud. See *Cent. Bank of Denver v. First Interstate Bank of Denver*, 511 U.S. 164, 177 (1994) ("We reach the uncontroversial conclusion . . . that the text of the 1934 Act does not itself reach those who aid and abet a § 10(b) violation."). In Professor Talley's summary data, 6.55% of cases did so (132 of 2,016 cases), although the summary data did not always expressly identify all defendants; a hand sample adjustment of the undercount led Professor Talley to increase the estimate to 8.41%.

determinable in seventy-nine of the 132 cases, with six of these dismissed altogether and seven dismissing the audit firm. The resulting liability distribution, approximated by the size of related settlement funds, showed a significant right-tail skew with the empirical data fitting well to a log-normal distribution.³⁴ Finally, projecting the proportion of lawsuits to particular firms, Professor Talley assigns one quarter apiece to each of the four large firms, noting that one could use other apportionments, such as market share or interpolations of the historical liability experience of each firm.³⁵

Supposing that one could accurately predict the number of future lawsuits, what is the right-tail risk? Professor Talley offers a synthesis and findings of the Audit Industry RTR Model. The projections array assumed numbers of cases filed (ranging from five to fifty)³⁶ across (x), a horizontal axis depicting viability thresholds (from \$250 million to \$2 billion), and (y), a resulting vertical axis showing right-tail risk (from 0% to 100%). To illustrate, a \$500 million viability threshold and five lawsuits yields a RTR of 2.2%; with twenty lawsuits, the RTR is 23.2%. This increasing RTR suggests a “lawsuit lottery”---the more lawsuits, the greater the likelihood that one of the four large audit firms soon will seek to exit as a result of federal securities fraud class actions.³⁷

Projecting numbers of lawsuits according to varying market volatility and using two different time horizons (one year and five

Talley, *supra* note 1, at 86.

³⁴ Talley, *supra* note 1, at 88–89. That is, the natural log of the settlement amount was normally distributed, with a mean of approximately \$13 million and a standard deviation of 1.81.

³⁵ Talley, *supra* note 1, at 35–36. Extrapolating from historical data, and assuming a reallocation of lawsuits previously filed against Arthur Andersen, resulting distributions were 21% to PWC and 26% to each of the other three; using market share (by registrants or asset values) rendered a distribution of 18%, 26%, 27% and 29%. See *infra* text accompanying notes 50–52.

³⁶ Arraying the data across the range of lawsuits from five to fifty offers a substantially comprehensive picture when one considers that the sample set shows only 132 federal securities fraud class action cases naming auditors (roughly thirteen per year distributed across five to eight audit firms).

³⁷ See generally Jeffrey O’Connell, *The Lawsuit Lottery* 8 (1979) (“Most crucial criteria for payment [to tort plaintiffs] are largely controlled by chance . . .”).

years), Professor Talley draws the following conclusions. Within one year, nearly all viability threshold and market volatility combinations give RTRs of less than twenty percent (with exceptions at the lowest viability threshold and above average volatility) and with none exceeding fifty percent. But for a five year horizon, RTRs are dramatically higher across the board and close in on 100% at combinations of low viability thresholds and high market volatility levels.

These findings suggest a looming crisis---at least in terms of the probability of a large audit firm's exit (that is, setting aside the magnitude of such an exit). The following discussion evaluates the main strengths and weaknesses of the Audit Industry RTR Model for assessing this suggestion.

3. Three Critiques. --- The Audit Industry RTR Model is statistically and conceptually ambitious, although Professor Talley emphasizes the Model's assumptions, judgments, and scope to warn against employing it exclusively as the basis for any policy prescriptions.³⁸ Rather, the Model should be used to provide an additional piece of information that may be useful in studying policy matters, when conjoined with all other available evidence.³⁹ Despite the prudence of this cautionary modesty, the Model is a valuable contribution and sheds specific new light on a widely recognized but underutilized set of insights. The three critiques of the Audit Industry RTR Model that follow, along with further analysis, open into broader policy prescriptions that are explored afterwards.

a. First, in any statistical model of risk, numerous factors can result in assessments that vary widely. The Audit Industry RTR Model illustrates this, given the numerous assumptions it makes when estimating viability thresholds and exposure distributions. Others reasonably could reach different decisions on the various judgments concerning matters such as data reliability, the attributes of participants whose decisions are modeled, the interpretation of

³⁸ Talley, *supra* note 1, at 7--9.

³⁹ *Id.* at 6--9.

ambiguous evidence, and factors that are based entirely on opinion. In the Audit Industry RTR Model, for example, pivotal partners are highly abstract and make decisions according to delineated factors such as revenue, costs, employee benefits, years to retirement, cash flow from next-best options, required search periods, and shares of damages.⁴⁰

Analysts must make judgments when extrapolating from known risks (the historical data) to unknown risks (the future behaving differently according to different environments). While historical data fit well when tested with the Audit Industry RTR Model, Professor Talley's deployment of the data to make out-of-sample predictions could make a purist statistician quiver. After all, among other dynamics, the auditing industry's regulatory structure has changed since 2002, making data from previous periods potentially incomparable with future periods.

Induced by scandals, auditors face new duties, independence standards, and oversight structures. New duties include performing audits of internal control over financial reporting and providing related reports.⁴¹ New independence standards, first established by the Securities and Exchange Commission (SEC) and rendered into law by the Sarbanes-Oxley Act, restrict auditors from rendering for audit clients an extensive catalogue of non-audit services.⁴² New oversight structures include: reposing supervisory authority over auditors in board audit committees rather than in management and creating the Public Company Accounting Oversight Board (PCAOB)

⁴⁰ Id. at 72.

⁴¹ Professor Talley notes this change in canvassing potential sources of auditor liability but explains how it cannot be modeled because there are simply no data as to related enforcement. Id. at 16.

⁴² Under Sarbanes-Oxley, as under SEC rules adopted a few years earlier, auditors may not perform any of the following services for audit clients: bookkeeping; financial information systems; appraisal, valuation, or fairness opinions; actuarial; internal audit; management functions; human resources; broker or dealer, investment adviser, or investment banking; legal and expert services unrelated to the audit. Sarbanes-Oxley Act of 2002 §201(a), 15 U.S.C. § 78j-1(g) (Supp. 2002); see also 17 C.F.R. §210.2-01(c)(1) (2005) (listing services that, if performed, render accountant no longer independent).

to regulate audit firms in ways that industry associations did before 2002.⁴³

Despite environmental changes and overblown rhetoric about them, much about the auditing industry is unchanged compared to periods from which the Model's sampled cases are taken.⁴⁴ For example, apart from some important legal refinements---such as PSLRA's shift to proportionate rather than joint liability for auditors⁴⁵---sources of auditor liability based on performance still hinge on standards that the industry---and now PCAOB---establish.⁴⁶ A stubborn continuity is how auditors are compensated by the enterprises whose financial statements they audit and opine upon---a dependency contributing severe structural infirmities to financial reporting.⁴⁷ Thus, while the future always potentially differs from the past, less has changed in auditing industry regulation than meets many eyes.⁴⁸

⁴³ See Sarbanes-Oxley Act § 101, 15 U.S.C. § 7211(a) (Supp. 2002). Among PCAOB's first orders of business was adopting as governing auditing standards all those standards then in effect as established by its industry-dominated predecessors. See Prof. Standards, Rules 3200T, 3300T, 3400T, 3500T, 3600T (Pub. Co. Accounting Oversight Bd. 2006) (interim standards effective Apr. 25, 2003); Order Regarding Section 103(a)(3)(B) of the Sarbanes-Oxley Act of 2002, Securities Act Release No. 8222, Exchange Act Release No. 47745, 80 SEC Docket 142 (Apr. 25, 2003).

⁴⁴ See Lawrence A. Cunningham, *The Sarbanes-Oxley Yawn: Heavy Rhetoric, Light Reform (And It Might Just Work)*, 35 Conn. L. Rev. 915, 979, 987--88 (2003) [hereinafter Cunningham, *The Sarbanes-Oxley Yawn*].

⁴⁵ Private Securities Litigation Reform Act of 1995, 15 U.S.C. § 78u-4 (2000).

⁴⁶ *Supra* note 43; see, e.g., *Monroe v. Hughes*, 31 F.3d 772, 774 (9th Cir. 1994) (noting that while "good faith compliance with [GAAP] and [GAAS] discharges the accountant's professional obligation to act with reasonable care" courts may also consult general accounting industry standards to determine adequate reporting obligations); *In re Worlds of Wonder Sec. Litig.*, 35 F.3d 1407, 1417, 1426 (9th Cir. 1994) (relying on adherence to GAAP and toy industry standards to refute accusation of bad faith accounting practices); *Adams v. Standard Knitting Mills, Inc.*, 623 F.2d 422, 432--33 (6th Cir. 1980) (same); *In re SmarTalk TeleServices, Inc. Sec. Litig.*, 124 F. Supp. 2d 505, 514--15 (S.D. Ohio 2000) (holding that errors in GAAP that are later revealed may demonstrate negligence but "highly suspicious facts" must be shown to demonstrate reckless and deliberate violation of securities laws).

⁴⁷ See *infra* text accompanying notes 207--208.

⁴⁸ As to other changing features, such as in the legal environment, Professor Talley wrestles with these using a variety of time trends and other devices. See Talley, *supra* note 1, at 35; *supra* note 27 and accompanying text.

Moreover, the Audit Industry RTR Model conceptually replicates similar tools commonly used in casualty and liability insurance markets to grapple with the relation between known data and the unknown future. The Model relates, at a macro level, a pivotal audit firm partner's calculus comparing costs of continuing with costs of exit. As such, it is an impressive adaptation of conventional right-tail risk models. It usefully estimates probabilities of cataclysmic liability judgments from federal securities fraud class actions that could provoke audit firm exit.

The data could be harnessed to illuminate the specific risk of particular firms teetering toward exit. The Audit Industry RTR Model allocates a proportion of lawsuits to particular firms. Professor Talley notes as possibilities: market share, interpolation from historical experience, or equal distributions, and chooses the lattermost.⁴⁹ An unmentioned alternative would account for how audit firms tend to specialize in certain industries.⁵⁰ Some industries use accounting policies for which risk of audit failure and firm liability likely differ from others.⁵¹ This would skew liability risks among firms, meaning different right-tail risks for each of the four large firms.⁵² An Audit *Firm* RTR Model would be a useful adjunct-

⁴⁹ Talley, *supra* note 1, at 35--36; *supra* note 35.

⁵⁰ GAO, Study on Audit Industry Consolidation, *supra* note 2, at 27--30, app. IV at 110--15 (noting that in numerous industries, two firms audit more than seventy percent of assets, highlighting petroleum and coal, communications, primary metals, and fabricated metals); see also *infra* text accompanying notes 97--100.

⁵¹ Accounting irregularities can appear in any industry or enterprise, notably concerning pervasive issues such as revenue and expense recognition. See Securities and Exchange Commission, Study Pursuant to Section 704 of the Sarbanes-Oxley Act. Problems can be especially difficult for businesses experiencing particularly rapid growth or change or those in new and rapidly changing industries. Of late, this means those sectors that increasingly rely upon intangible rather than tangible assets. See Olufunmilayo B. Arewa, Measuring and Reporting the Knowledge Economy: Accounting for Economic Reality Under the Intangibles Paradigm, 54 *Buff. L. Rev.* 1, 7--10 (2006).

⁵² This differs from historical interpolation, which projects firm-specific risk according to the historical loss distribution, without regard to the distribution of engagements or firm specialization. An approach would classify the 132 cases in the sample by industry and relate these to individual firm industry concentration data. Such a model might be dubbed the Audit *Firm* RTR Model. Part I.C.2 contemplates a further refinement called the Audit *Client* RTR Model.

--although admittedly subject to similar limitations as the Audit Industry RTR Model.

b. A second critique of the Audit Industry RTR Model concerns its scope of exit-risk sources. The Model uses frequency data on one source of auditor liability risk, federal securities fraud class actions. This is a practical necessity given available data, but numerous other factors contribute to audit firm exit risk.⁵³

Recall, for example, how a confluence of forces, including client disaffection, contributed to the demise of both Laventhol & Horwath and Arthur Andersen.⁵⁴ The proximate cause of Arthur Andersen's exit was a criminal prosecution precipitated, in turn, by its violation of a consent decree in a previous SEC enforcement action.⁵⁵ In 2005, KPMG narrowly averted a similar plight from its criminal conduct in peddling illegal tax shelters.⁵⁶ Also, as noted, mergers have been the major source of audit firm exit in the past two decades.⁵⁷ Professor Talley speculates, on the other hand, that the Department of Justice would not likely allow exit by merger of any of the remaining large audit firms.⁵⁸

Even so, completing the Audit Industry RTR Model requires incorporating proxies for all such other sources of exit risk. This presents a formidable hurdle, given limited data on such forces. How would one measure the prospects of forthcoming criminal indictments, for example? But this limitation makes the Model's probability estimates conservative. When liability looms from one

⁵³ Professor Talley provides a primer on sources of litigation risk. This includes a table and summary of the legal landscape. Talley, *supra* note 1, at 27. The selection of federal securities fraud class actions has appeal as providing the most comprehensive context for inquiring into national policy implications and is an important piece of the overall public policy analysis. *Id.*

⁵⁴ See *supra* text accompanying notes 3--9.

⁵⁵ See *United States v. Arthur Andersen LLP*, 374 F.3d 281, 289--91 (5th Cir. 2004), *rev'd on other grounds*, 125 S. Ct. 2129 (2005).

⁵⁶ See *United States v. KPMG LLP*, 316 F. Supp. 2d 30, 31--32 (D.D.C. 2004).

⁵⁷ See *supra* text accompanying note 3.

⁵⁸ Talley, *supra* note 1, at 44--45.

source, associated liabilities often arise from others.⁵⁹ As noted, sources of auditor liability hinge on generally accepted auditing standards (GAAS).⁶⁰ GAAS departures violate laws enforced in federal securities fraud class actions and in many other contexts, including criminal and SEC actions. So while Professor Talley's data do not capture all the components of potential cataclysm facing the auditing industry, adding the others would increase the probability of audit firm exit risk.

c. The third critique of the Audit Industry RTR Model is of greatest policy significance. Professor Talley explains that the "strategy of [his] study is to conceptualize liability risk solely as exogenous, attempting to [assess] whether observed exposure events characterize the types of risk that theory would predict to be uninsurable."⁶¹ In effect, this is a pure frequency model in that it does not allow for Bayesian updating of participant beliefs (that is, as auditors acquire more information, their behavior likely changes and this would alter the risk assessment calculus). Some contrast this latter, updating method with the pure frequency method by denominating the probability assessment exercises as subjectivist and objectivist, respectively.⁶² Each has its limits.

The exogenous factors conceptualization essentially assumes that some litigation risk exists beyond auditors' control. The decision to take this approach is influenced, in part, by an unresolved debate in the academic literature concerning how much the merits of a lawsuit matter in assessing liability risk. Scholars debate the ability of firms to avoid litigation.⁶³ Debate turns further on whether

⁵⁹ Professor Talley notes how sources of liability risk "overlap," "traverse," and interact in complex ways, so that a "comprehensive analysis of cataclysmic liability risk borne by auditors" would need to incorporate all related variables, but this is simply not possible given available data. *Id.*

⁶⁰ See *supra* notes 44, 47, and accompanying text.

⁶¹ Talley, *supra* note 1, at 5. Part III, *infra*, inquires into the implications for insurance theory and practice.

⁶² See Ann Bostrom, Risk Perceptions: "Experts" vs. "Lay People", 8 *Duke Envtl. L. & Pol'y F.* 101, 104 n.15 (1997).

⁶³ See, e.g., Janet Cooper Alexander, *Do the Merits Matter? A Study of Settlements in Securities*

various legal reforms alter related liability exposure.⁶⁴ Amid the academic stalemate, auditors may face risks endogenous to their own actions (that is, within their control), important for any belief in law's deterrent effect; but with the sizable risk of frivolous litigation, auditors cannot effectively change their relevant behavior except by exit.⁶⁵

Apart from this theoretical defense of the exogenous frequency approach, attempting to incorporate variables such as audit quality would inject too much noise into the Audit Industry RTR Model.⁶⁶ This valid point says more about the limits of statistical modeling generally than about this Model in particular. And this conceptualization also renders the Model a conservative estimation in the sense of capturing worst case scenarios that, while not necessarily likely, are cognizable. As well, it would be surprising if cases tripping the Model's viability threshold---ranging from several hundred million dollars to more than one billion dollars---were entirely without legal merit.

Moreover, it is one thing to stipulate that the merits might not matter when estimating liability exposure and establishing a model; it is another to believe that auditors cannot influence the quality of their

Class Actions, 43 *Stan. L. Rev.* 497, 524 (1991) (arguing that structural characteristics of legal system preclude merits being included in settlement calculus); Joel Seligman, *The Merits Do Matter*, 108 *Harv. L. Rev.* 438 (1994); David L. Gilbertson & Steven D. Avila, *The Plaintiffs' Decision to Sue Auditors in Securities Litigation: Private Enforcement or Opportunism?*, 24 *J. Corp. L.* 681, 707 (1999) (finding three opportunism variables to be significantly associated with plaintiffs' attorneys' decisions to name auditors as codefendants in securities class action lawsuits).

⁶⁴ See, e.g., James D. Cox & Randall Thomas, *An Empirical Analysis of Institutional Investors as Lead Plaintiffs in Securities Fraud Class Actions*, 106 *Colum. L. Rev.* ___ (2006); Talley, *supra* note 1, at 5 (comparing literature that reaches differing conclusions on this question and finding PSLRA's lead plaintiff provision does add some value for shareholders); Michael Perino, *Did the Private Securities Litigation Reform Act Work?*, 2003 *U. Ill. L. Rev.* 913, 915 (finding PSLRA did not result in decrease of class actions filed); Hillary A. Sale, *Heightened Pleading and Discovery Stays: An Analysis of the Effect of the PSLRA's Internal-Information Standard on '33 and '34 Act Claims*, 76 *Wash. U. L.Q.* 537, 578-79 (1998) (arguing PSLRA's pleading standard, if strictly applied and interpreted, will be overinclusive and eliminate most private securities-fraud lawsuits).

⁶⁵ Talley, *supra* note 1, at 5.

⁶⁶ See *id.* at 40.

audits that, at least in some ways, contribute to related risks. So, without making conjectures about how auditor behavior may bear on the exact role of the merits in assessing liability risk, consider some evidence of variability of audit quality that suggests auditor capacity to influence risk. It speaks to how auditors can and do make Bayesian updating adjustments, without regard to the academic debate over how the merits matter in litigation.

Auditing is easiest and most effective when auditors enjoy a reputation for conservatism and firmness that deters managers from attempting to engage in accounting deception. As an auditor's reputation for toughness slackens, managerial willingness to pursue accounting shenanigans and even fraud can increase. Considerable evidence supports the view that the reputation of auditors changed during the 1990s from one of scrupulous watchdog to conciliatory lapdog.⁶⁷

First, institutionally, audit firms expanded their services well beyond the audit function. This practice embedded the large audit firms in deeply incestuous relationships with their clients, impairing their independence.⁶⁸ As examples, Ernst & Young developed a business partnership with its client, PeopleSoft;⁶⁹ some of KPMG's illegal tax shelters, for which it narrowly escaped criminal indictment, were provided to clients and their audit committee members;⁷⁰ and both KPMG and PWC owned investments in their

⁶⁷ See, e.g., *AUSA Life Ins. Co. v. Ernst & Young*, 991 F. Supp. 234, 248 (S.D.N.Y. 1997), rev'd, 206 F.3d 202 (2d Cir. 2000).

⁶⁸ This may have been due, in part, to policies of the Federal Trade Commission that induced the American Institute of Certified Public Accountants (AICPA) to rescind a ban on advertising and other methods of client solicitation. See *Edenfield v. Fane*, 507 U.S. 761, 772 (1993) (discussing AICPA report on its decision). This policy may have been improvident. To the extent that it unleashed competition in a market in which the product's external quality is essentially unobservable, the competition can impair product quality. See George A. Akerlof, *The Market for "Lemons": Quality Uncertainty and the Market Mechanism*, 84 Q. J. Econ. 488, 488-89 (1970).

⁶⁹ See *In the Matter of Ernst & Young*, Exchange Act Release No. 46,710 (Oct. 23, 2002), available at <http://www.sec.gov/litigation/opinions/34-46710.htm> (on file with the *Columbia Law Review*).

⁷⁰ See *United States v. KPMG LLP*, 316 F. Supp. 2d 30 (D.D.C. 2004); see also Sheldon D. Pollack & Jay A. Soled, *Tax Professionals Behaving Badly*, 105 Tax Notes 201, 210 (2004).

audit clients.⁷¹ Auditors also impaired their independence by performing for audit clients extensive non-audit services that generated considerable revenue compared to audit revenue.⁷² Impaired independence reduced auditors' reputations as watchdogs, which likely tempted many managers to indulge in accounting aggressions. These infirmities prompted the SEC's ban on auditors performing most non-audit services for their clients, the ban later adopted in the Sarbanes-Oxley Act.⁷³

Second, auditor complicity during the 1990s manifested itself in the growth of extensively catalogued accounting irregularities of the period. These included widespread premature revenue recognition, pervasive use of "big bath" accounting, extensive creation and exploitation of artificial reserves, and other deceptions.⁷⁴ Auditors signed off on these aggressions, suggesting ability to influence audit quality, financial statement reliability, and liability

⁷¹ See In the Matter of PricewaterhouseCoopers, Exchange Act Release No. 40,945 (Jan. 14, 1999), available at <http://www.sec.gov/litigation/admin/34-40945.txt> (on file with the *Columbia Law Review*); Press Release, Sec. & Exch. Comm'n, SEC Censures KPMG for Auditor Independence Violation (Jan. 14, 2002), at <http://www.sec.gov/news/press/2002-4.txt> (on file with the *Columbia Law Review*).

⁷² See William W. Bratton, Jr., Enron and the Dark Side of Shareholder Value, 76 Tul. L. Rev. 1275, 1350 (2002) (stating that fees from audit clients for non-audit services rose from thirteen percent of revenues in the 1970s to fifty percent of revenues in the 1990s); Jeffrey N. Gordon What Enron Means for the Management and Control of the Modern Business Corporation: Some Initial Reflections, 69 U. Chi. L. Rev. 1233, 1237 (2002) (arguing that most important guarantor of auditor independence is saliency of auditor terminations, a material event that must promptly be disclosed, but the value of which drops dramatically when audit firms cross-sell consulting services which give auditors incentives not to sever clients); Robert A. Prentice, The Inevitability of a Strong SEC, 91 Cornell L. Rev. 775, 786 (2006) ("[C]onsulting fees rose from seventeen percent of audit fees in 1990 to sixty-seven percent in 1999 . . .") (citation omitted).

⁷³ See supra note 41. In KPMG's case, the infirmities also led to additional restrictions on its practice. See *United States v. Stein*, No. 05 CR 00888(LAK)(ECF), 2006 U.S. Dist. LEXIS 42915 (S.D.N.Y. June 26, 2006). Despite these restrictions on non-audit services, firms are still permitted to provide tax services to audit clients. See Matthew J. Barrett, "Tax Services" as a Trojan Horse in the Auditor Independence Provisions of Sarbanes-Oxley, 2004 Mich. St. L. Rev. 463.

⁷⁴ See Arthur Levitt, Chairman, Sec. & Exch. Comm'n, The "Numbers Game," Speech at the NYU Center for Law and Business (Sept. 28, 1998), available at <http://www.sec.gov/news/speech/speecharchive/1998/spch220.txt> (on file with the *Columbia Law Review*).

exposure. Subsequent reforms attempt to seal many of these paths to accounting fraud.⁷⁵

Third, evidence of auditor ability to influence audit quality and liability risk appears in dramatic changes in the number of financial restatements, frequency of auditor switching, and percentage of qualified opinions given. Restatements soared to a record high of 160 by 1999,⁷⁶ with all large audit firms inculpated.⁷⁷ These do not automatically signal auditor failure, as they can be due to evolving interpretations of accounting standards or similar innocuous circumstances.⁷⁸ But they show varying auditor ability to influence audit quality and therefore liability risk.⁷⁹

The fact that auditors increasingly began to sever clients after the 1990s era of auditing laxity ended⁸⁰ suggests that the related

⁷⁵ See, e.g., SEC Staff Accounting Bulletin No. 101, 17 C.F.R. pt. 211 (1999) (revenue recognition); Statement of Fin. Accounting Standards No. 146 (Fin. Accounting Standards Bd. 2002) (big bath accounting).

⁷⁶ These averaged forty-nine annually from 1990--1997, jumped to ninety-one in 1998, and then climbed to 150 and 156 in 1999 and 2000, respectively. See George B. Moriarty & Philip B. Livingston, Quantitative Measures of the Quality of Financial Reporting, *Fin. Executive*, July/Aug. 2001, at 53, 54. They have risen more dramatically since reforms created in the Sarbanes-Oxley Act.

⁷⁷ See U.S. Gen. Accounting Office, Report on Financial Statement Restatements: Trends, Market Impacts, Regulatory Responses and Remaining Challenges 4 (2002); Theodore Eisenberg & Jonathan R. Macey, Was Arthur Andersen Different? An Empirical Examination of Major Accounting Firm Audits of Large Clients, 1 *J. Empirical Legal Stud.* 263 (2004).

⁷⁸ See William R. Kinney Jr., Zoe-Vonna Palmrose & Susan Scholz, Auditor Independence, Non-Audit Services, and Restatements: Was the U.S. Government Right?, 42 *J. Acct. Res.* 561, 566 (2004).

⁷⁹ See James D. Cox, Reforming the Culture of Financial Reporting: The PCAOB and the Metrics for Accounting Measurements, 81 *Wash. U. L.Q.* 301, 318 (2003) ("The [rise in] restatements may well portend both a greater diligence on the part of the auditors as well as a stiffening of their resolve."); A. C. Pritchard, The Irrational Auditor and Irrational Liability, 10 *Lewis & Clark L. Rev.* 19, 27 (2006) ("The restatement itself is ambiguous: does it reflect poor auditing in the past, or particularly diligent auditing today?"); see also Coffee, Gatekeeper Failure, *supra* note 5, at 314--15 (attributing restatement levels of late 1990s to managerial ambitions that showed broad willingness to assume greater risks---accompanied by auditor solicitude).

⁸⁰ See Coffee, Gatekeeper Failure, *supra* note 5, at 348 n.148. Professor Coffee explains that

In 2003, over 1460 public companies changed auditors, which was the highest number in at least five years. Although such switches could be because the

reforms led firms to sever high-risk clients.⁸¹ This also suggests that auditors are capable of identifying them (and other evidence strongly supports this conclusion too).⁸² Finally, the percentage of qualified auditor reports increased significantly from 1999 to 2002, signaling similar auditor ability to influence liability risk.⁸³ Assessments of audit firm failure probability should take account of this auditor ability to influence liability risk and the concomitant risk of firm exit.

* * *

To incorporate these three critiques of the Audit Industry RTR Model, the dynamics of auditing practice and the legal and regulatory environment pose difficulties for prognostications based upon data spanning across the previous ten or fifteen years. Those are quite different eras. Professor Talley grapples with these difficulties by using various time trends and proxies. This is a credible attempt to tame a model trained on the exogenous rather than the endogenous but (a) the two are tightly interwoven and (b) the exogenous changes over time. Nevertheless, Professor Talley's estimates are conservative.

client was dissatisfied with the auditor, many were because the auditor considered the client too risky---or because the auditor raised its fees in light of that increased risk. . . . By itself, this evidence may not prove that auditors are becoming significantly more selective with regard to clients, but it is at least consistent with such a hypothesis.

Id.

⁸¹ See Jagan Krishnan, Auditor Switching and Conservatism, 69 *Acct. Rev.* 200, 200 (1994) (attributing auditor switching to auditor determinations to withhold unqualified opinions based on conservative critiques of client reporting); Kannan Raghunandan & Dasaratha V. Rama, Auditor Resignations and the Market for Audit Services, 18 *Auditing: J. Prac. & Theory* 124, 126 (1999) (showing it is rare for large firm to accept engagements by enterprises whose previous auditor resigned).

⁸² See *In re Deloitte & Touche LLP*, SEC Accounting and Auditing Enforcement Release No. 2237 (Apr. 26, 2005) (emphasizing that large audit firm knew its client, Adelphia Communications Corp., was "high-risk"); *infra* notes 190--191 (noting Arthur Andersen's manifest awareness of how acutely risky its client, Waste Management, had been).

⁸³ See Marleen Willekens, Auditor Reporting Conservatism as a Defense Mechanism Against Increased Post-Enron Litigation Risk 10--11 (working paper on file with author) (probing for increases in qualified reports by four large audit firms in post-Enron era and finding: 4.12% in 1999; 5.41% in 2000; 6.84% in 2001; and 6.85% in 2002).

In assessing the Audit Industry RTR Model's robustness and sources of bias, Professor Talley recognizes how several factors may produce downward bias to the estimates. Most significantly, these include how the Model captures solely liability risk associated with federal securities fraud class actions, not other exit inducements.⁸⁴ Including these would increase cataclysmic probability and project greater exit risk.⁸⁵ Conversely, several factors may produce upward bias. Most significantly, the Model implicitly assumes a constant rate of auditor complicity and no decisions to sever high-risk clients.⁸⁶ Changing these assumptions would have opposite effects if auditors are diligent (and would exacerbate the ill effects if auditors are lax).

In the end, these concessions do not diminish the importance or value of attempting to quantify auditing industry right-tail risk. The major open questions---the role of factors other than federal securities fraud class actions and of auditor capacity to influence ultimate risk---are about the causal force that can bring a risk to realization. True, misconceptions about causality can lead to misestimating probability, a core hazard dimension of risk assessment. This can limit the ability to manage risk and prescribe suitable policies to address it. If people believe that auditor exit risk is solely a function of the number of lawsuits, market volatility, and viability thresholds for example, a problem of causation is created or overlooked.

C. Magnitude

Equally important is the other core hazard dimension of risk assessment: magnitude.⁸⁷ If a large audit firm's exit posed no

⁸⁴ Talley, *supra* note 1, at 6--7.

⁸⁵ Less dramatically, the Model ignores litigation costs which, if included, would likewise increase cataclysmic probability and produce greater exit risk. See *id.* at 39.

⁸⁶ Again less dramatically, the Model's estimates may be higher than reality because (a) fees can be increased or matched to offset risk and (b) plaintiffs may restrain themselves lest they kill the goose that lays the golden egg. *Id.* at 40.

⁸⁷ Professor Talley focuses on probabilities, although he offers some notes on magnitude to

significant systemic consequences, even a 100% probability of that occurring would not matter. But, as the following discusses, the systemic consequences of current concentration in the audit industry raise immediate policy concerns. The stakes amplify if, as the Audit Industry RTR Model predicts, one soon were to face exit due to cataclysmic liabilities.⁸⁸ Setting aside the costs of bankruptcy administration and employee dislocation---whose significance is contestable as a matter of theory⁸⁹---a critical component of the magnitude of a large audit firm exiting the industry is its effect on audit industry competition.

1. Market Concentration. --- The Sarbanes-Oxley Act directed the General Accounting Office (GAO) to study the factors leading to the four mergers of large audit firms that reduced their number from eight to five (Arthur Andersen's dissolution reduced it further to four).⁹⁰ Factors the GAO identified included keeping pace with client size, global reach, and technology, as well as exploiting economies of scale.⁹¹ Merging with peers was the way to achieve these goals. The resulting oligopoly is tight.⁹²

Consider various measures of concentration using the Herfindahl-Hirshman Index (HHI).⁹³ Indexes below 1000 signal an

justify a tentative conclusion that these are "at least plausibility significant." Talley, supra note 1, at 43.

⁸⁸ See supra Part I.B.1.

⁸⁹ Talley, supra note 1, at 41. Professor Talley observes that classical finance theory denies normative systemic significance to bankruptcy, which is simply a cash flow reallocation without value effects, but notes how this overlooks critical points such as employee dislocation. Id.

⁹⁰ See GAO, Study on Audit Industry Consolidation, supra note 2, at 2.

⁹¹ See id. at 12--15.

⁹² See id. at 20--22 (indicating that four largest firms audit 99% of public company sales taken as aggregate, 97% of public companies with sales exceeding \$250 million, and 78% of all public companies).

⁹³ HHI measures market concentration by summing the squares of each member firm's size measured in terms of market share. An illustrative short-hand formula determines HHI for n equal-size firms as: $n \times (100 \div n) \div 2 = 10,000 \div n$. So, with one firm, HHI = 10,000; with five equal-sized firms, HHI = 2,000; with ten equal-sized firms, HHI = 1,000; and with 100 equal-sized firms, HHI = 100. See Dep't of Justice, Horizontal Merger Guidelines 15 (1997) (explaining HHI).

unconcentrated market while those above 1800 signal a highly concentrated market. Measuring market share in terms of sales, HHI was well below 1000 before the audit firm mergers began, it jumped to just under 1800 following a 1989 merger, rose above 2000 following a 1998 merger, and climbed to 2500 upon Arthur Andersen's dissolution in 2002.⁹⁴ Measuring market share in terms of numbers of clients, HHIs remain not much above 1000 for clients with sales less than \$100 million, but for clients with sales greater than that, today's HHI is well above 1800---indicating a highly concentrated market for the vast majority of large public enterprises.⁹⁵

Despite increasing concentration, the GAO found no evidence of impaired price competition in the market for auditing services.⁹⁶ It used a simulated pure-price competition model to conclude that existing market concentration is not inconsistent with a price-competitive environment.⁹⁷ In fact, much of the U.S. economy is concentrated yet, the GAO noted, remains price-competitive. On the other hand, two points bear emphasizing. First, the GAO's analysis was conducted using data covering the period before Arthur Andersen's demise. Price competition may diminish with four rather than five participants. Second, the lack of alternatives available to clients is a more direct concern for the auditing industry.⁹⁸

⁹⁴ GAO, Study on Audit Industry Consolidation, *supra* note 2, at 18--20.

⁹⁵ *Id.*

⁹⁶ *Id.* at 25.

⁹⁷ *Id.*

⁹⁸ In addition, competition based on audit quality, although more difficult to assess than competition based on price, is important and concentration may reduce it. See Sean M. O'Connor, *Be Careful What you Wish For: How Accountants and Congress Created the Problem of Auditor Independence*, 45 B.C. L. Rev 741, 788 (2004) (arguing that it is "unlikely that an efficient market for reputational intermediaries--necessary to induce them to maintain their reputation through demonstrated integrity and objectivity--can exist in today's highly concentrated market dominated by the Big Four accounting firms"); Prentice, *Inevitability of a Strong SEC*, *supra* note 72, at 786 ("Reputational constraints fail to restrain large accounting firms, both because large firms have a huge competitive advantage over second-tier firms that is difficult to squander and because as a group, large firms are lumped together such that one firm does not profit much from behaving better than its competitors.").

A tight oligopoly in the large company auditing market obviously limits service alternatives for large enterprises. On the surface, with four audit firms, an enterprise engaging one for auditing and another for non-auditing services has but two choices if it were to fire either of those; with three audit firms, it would have but one choice.⁹⁹ The reality is even worse than that.

The four large audit firms each boast special expertise in certain industries and lack the requisite specialization in others: a single audit firm often dominates the market for clients in certain industries, and two firms command more than seventy percent of the reporting in numerous others.¹⁰⁰ Clients in those industries may have nowhere else to go. Thus, if an enterprise using Firm A for auditing and Firm B for consulting is in an industry where Firm A dominates and Firm C lacks expertise, then under the prevailing structure the choice may boil down to a single alternative or even none at all.¹⁰¹

Nor can smaller audit firms fill the gap. They lack the resources necessary to service the needs of many enterprises that routinely engage the large firms.¹⁰² They face other formidable barriers to entry as well. For example, the GAO simulated a merger among the next five largest firms after the big four to see if a viable competitor could emerge.¹⁰³ Those firms together commanded an

⁹⁹ Talley, *supra* note 1, at 44--45.

¹⁰⁰ See *id.* at 35--36; see also Allen T. Craswell, Jere R. Francis & Stephen L. Taylor, Auditor Brand Name Reputations and Industry Specializations, 20 *J. Acct. & Econ.* 297 (1995); Chris E. Hogan & Debra C. Jeter, Industry Specialization by Auditors, 18 *Auditing: J. Prac. & Theory* 1 (1999) (study of trends driving auditor concentration from 1976 to 1993); *The Future of Auditing: Called to Account*, *supra* note 12, at * (citing Public Accounting Report newsletter stating that, in 2004, three of the large firms audited 97.3% of oil and gas industry and that two of them audited 88.2% of casino industry, with similar dominion in air transportation, coal, and other industries).

¹⁰¹ See *The Future of Auditing: Called to Account*, *supra* note 12, at * (providing example of Sun Microsystems, which uses three of the four big firms for non-audit services and fourth firm for audit services, and noting that Sun's size renders all smaller firms inadequate).

¹⁰² See GAO, *Study on Audit Industry Consolidation*, *supra* note 2, at 46--48 (concluding that smaller firms generally lack resources to audit large public companies).

¹⁰³ *Id.* app. 1 at 61--63. GAO's simulation used the model developed in Rajib Doogar & Robert F. Easley, *Concentration Without Differentiation: A New Look at the Determinants of Audit*

8.6% market share in 2002. Under the best-case simulation scenario (where the newly merged firm was maximally efficient measured by the staff-to-partner ratio), the result was an 11.2% market share.¹⁰⁴ In effect, the four largest firms, as a group, lack any competitors.

Among other barriers to entry, smaller firms cite litigation risk and difficulty obtaining insurance.¹⁰⁵ While this is a routine lament in many U.S. industries,¹⁰⁶ the concern bears some legitimacy across sectors, and certainly for the auditing industry. The scandals epitomized by Arthur Andersen's failure and Enron's house of cards meant "insurance companies saw increased risk and uncertainty from insuring firms that audited public companies."¹⁰⁷ Premiums skyrocketed and coverage contracted.¹⁰⁸ While acute for small audit firms, the large four firms confront similar difficulties.¹⁰⁹

However, it is not certain whether such concentration and barriers to entry are entirely lamentable. Scholars disagree about the

Market Concentration, 25 J. Acct. & Econ. 235 (1998).

¹⁰⁴ GAO, Study on Audit Industry Consolidation, supra note 2, at 50--51. Under moderate efficiency assumptions, resulting shares ranged from 4.5% to 6.4% ---a reduction in total market share! Id.

¹⁰⁵ Id. at 49.

¹⁰⁶ See, e.g., Donald P. Judges, Of Rocks and Hard Places: The Value of Risk Choice, 42 Emory L.J. 1, 93--101 (1993) (discussing statutory provisions limiting potential liability for ski area and rock climbing operators); Bryan A. Liang & LiLan Ren, Medical Liability Insurance and Damage Caps: Getting Beyond Band Aids to Substantive Systems Treatment to Improve Quality and Safety in Healthcare, 30 Am. J.L. & Med. 501, 514--17 (2004) (discussing effects of high costs of medical malpractice insurance on physician practice); W. Kip Viscusi & Patricia Born, Medical Malpractice Insurance in the Wake of Liability Reform, 24 J. Legal Stud. 463, 463--64 (1995) (describing negative trends in healthcare associated with rising medical malpractice premiums).

¹⁰⁷ GAO, Study on Audit Industry Consolidation, supra note 2, at 49. The others were Global Crossing Ltd.; Qwest Communications International Inc.; and WorldCom, Inc. See Cunningham, The Sarbanes-Oxley Yawn, supra note 44, at 924--25. Professor Talley notes how, due to such increased costs, most large audit firms currently rely upon self-insurance to address liability exposure rather than use third-party liability insurance. Talley, supra note 1, at 2. Part III, infra, inquires into insurance matters, including distinguishing between liability insurance and other forms, such as financial statement insurance.

¹⁰⁸ GAO, Study on Audit Industry Consolidation, supra note 2, at 49.

¹⁰⁹ Id.

optimal number of audit firms for given markets. Some evidence indicates that concentration produces specialization that reduces financial misstatement risk.¹¹⁰ Other research finds that having a large number of audit firms reduces the risk of a dominant firm establishing accounting policies that could spawn inferior financial reporting.¹¹¹ However too many client alternatives can enable clients, through opinion shopping, to pressure auditors into solicitude that they should resist.¹¹²

Debates that are similarly unresolved concern the benefits or costs of having enterprises rotate their auditors. One tradeoff is between developing client-specific expertise that liberates auditors from reliance on managerial assertions versus developing a complacent attitude that diminishes professional skepticism.¹¹³ Another factor is the effect of audit firm rotation on the ability of smaller firms to compete with the four large firms.¹¹⁴ In any event, auditor rotation is a policy option only if a minimum number of suitable firms exist or could enter into competitive positions.¹¹⁵

¹¹⁰ Joseph V. Carcello & Albert L. Nagy, Auditor Industry Specialization and Fraudulent Financial Reporting, *in* Proceedings of the 2002 Deloitte & Touche/University of Kansas Auditing Symposium [pin], [pin] (James Heintz ed., date).

¹¹¹ GAO, Study on Audit Industry Consolidation, *supra* note 2, at 36.

¹¹² *Id.*

¹¹³ See Joseph V. Carcello & Albert L. Nagy, Audit Firm Tenure and Fraudulent Financial Reporting, 23 *Auditing: J. Prac. & Theory* 55 (2004) (finding no evidence that audit tenures over eight years increases fraudulent reporting and that fraudulent financial reporting is more likely in first three years of auditor-client relationship); Van E. Johnson, Inder K. Khurana & J. Kenneth Reynolds, Audit-Firm Tenure and the Quality of Financial Reports, 19 *Contemp. Acct. Res.* 637 (2002) (finding no evidence of inferior financial reports for enterprises with audit firm tenures of nine or more years as compared to evidence of lower quality reports for enterprises with tenures from two to eight years); Larry R. Davis, Billy Soo & Gregory M. Trompeter, Auditor Tenure and the Ability to Meet or Beat Earnings Forecasts (treating long tenure as fifteen or more years and finding reporting quality deterioration) (manuscript on file with author).

¹¹⁴ See Benito Arrunada, Mandatory Rotation of Company Auditors: A Critical Examination, 17 *Int'l Rev. L. & Econ.* 31, 41--44 (1997) (evaluating competitive implications of mandatory rotation of auditors proposal); *The Future of Auditing: Called to Account*, *supra* note 12, at 71 (quoting Duke University Law School Professor James Cox as suggesting that mandatory audit firm rotation could improve ability of smaller firms to compete with four large audit firms).

¹¹⁵ See U.S. Gen. Accounting Office, Pub. No. GAO-04-216, *Public Accounting Firms: Required Study on the Potential Effects of Mandatory Audit Firm Rotation* 41--42 (2003).

All such points of academic debate may be contestable, but only within a range of audit firm numbers. When there are eight, or five, or even four firms, debaters legitimately can contend that eight, five, or four is the more or less ideal number. It strains credulity to contend that three is optimal--or two or one. At that level, debate dissolves and the question is whether three (or two or one) under the current audit industry structure is merely tolerable or even sustainable. In this view, the *magnitude* of a single additional audit firm exiting the market is essentially overwhelming.

2. Governmental Response. --- So, wholly apart from the Audit Industry RTR Model's probability assessments, momentous policy issues appear from considering the existing structure of the auditing industry, amplified considerably by the prospect of further diminution. Upon recognizing this risk, the GAO prescribed developing policies that would prevent further industry consolidation.¹¹⁶ With Arthur Andersen's dissolution evidently in mind, it suggested balancing firm and individual responsibility, holding people---not firms---liable for harms.¹¹⁷ Moreover, the GAO emphasized, policymakers cannot allow the large audit firms to believe that they are too big to fail.¹¹⁸ However, preventing such a

¹¹⁶ See GAO, Study on Audit Industry Consolidation, *supra* note 2, at 52.

¹¹⁷ *Id.* at 53. Imposing liability on individuals rather than on firms addresses how individuals may have lesser reputation-based incentives, compared to firms, to detect and deter client error or deception. See Jonathan R. Macey, Efficient Capital Markets, Corporate Disclosure, and Enron, 89 Cornell L. Rev. 394, 408 (2004) (arguing that although it was irrational for Arthur Andersen to become captured by Enron it may not have seemed irrational to individual partners because Enron was their only client); Richard W. Painter, Convergence and Competition in Rules Governing Lawyers and Auditors, 29 Iowa J. Corp. L. 397, 411 (2004) (“[I]ndividual partners in the firm may still be interested in getting and keeping a lucrative but risky client--even if it harms the firm as a whole”); Larry E. Ribstein, SarbOx: The Road to Nirvana, 2004 Mich. St. L. Rev. 279, 288 [hereinafter Ribstein, SarbOx] (suggesting that while an audit firm has “an interest in motivating its members to build the firm’s reputation, its members’ careers may depend on pleasing the client executives”). The Department of Justice followed this advice in 2005 by opting to forego indicting KPMG and to pursue instead individual defendants. Its strategy backfired when the pressure it applied to KPMG led it to violate the individual defendants’ constitutional rights. *United States v. Stein*, No. 05 CR 00888(LAK)(ECF), 2006 U.S. Dist. LEXIS 42915 (S.D.N.Y. June 26, 2006).

¹¹⁸ GAO, Study on Audit Industry Consolidation, *supra* note 2, at 53.

belief may be difficult, given conflicting history, policy analysis, and how even a small number of individuals holding the belief could trigger calamity.

As to conflicting guidance from history, governmental flirtations with the too big to fail policy are intermittent. Government willingly bought into the bailout business in the 1970s and 1980s;¹¹⁹ then this habit dissipated in the early 1990s when Congress restricted the policy for banks.¹²⁰ Then again, the government orchestrated a bailout of Long Term Capital Management (LTCM) in 1998.¹²¹ While the government refrained from preserving Arthur Andersen in 2002, many market participants and some policymakers later questioned the reticence.¹²² Whether related to that criticism or not, in 2005 the government refrained

¹¹⁹ An inchoate too big to fail policy emerged in the early 1970s when the federal government provided financial assistance to prevent the failure of Penn Central Transportation Co. and other railroads, as well as Lockheed Aircraft Corporation. See Emergency Loan Guarantee Act of 1971, Pub. L. No. 92-70, 85 Stat. 178 (codified at 15 U.S.C. §§ 1841--1852 (2000)) (providing assistance to Lockheed); William E. Thoms, Clear Track for Deregulation American Railroads, 1970--1980, 12 *Transp. L.J.* 183, 195--205 (1982) (describing railroad bankruptcies and government action to maintain rail service). The policy assumed greater force in the late 1970s with rescues of Chrysler Corporation and the City of New York. See Chrysler Corporation Loan Guarantee Act of 1979, Pub. L. No. 96-185, 93 Stat. 1324, 1324--35 (1980) (expired Dec. 31, 1983); New York City Loan Guarantee Act of 1978, Pub. L. No. 95-339, 92 Stat. 460 (repealed/expired/superseded [date]); New York City Seasonal Financing Act of 1975, Pub. L. No. 94-143, 89 Stat. 797 (amended [?] [date]).

¹²⁰ The government's formal too big to fail policy crystallized in banking regulation in the early 1980s, when the Federal Reserve arranged the bailout of Continental Illinois. See Arthur E. Wilmarth, Jr., Too Big to Fail, Too Few to Serve? The Potential Risks of Nationwide Banks, 77 *Iowa L. Rev.* 957, 994 (1992). This stance changed in the Federal Deposit Insurance Corporation Improvements Act of 1991, which established nonintervention as the basic rule. 12 U.S.C. § 1823(c)(4)(A)-(E) (2000) (requiring FDIC to resolve banking issues using least cost resolution). An exception requires the existence of "systemic risk" from failure, a conclusion that requires agreement of two-thirds of the boards of the FDIC and Federal Reserve plus the concurrence of the Secretary of the Treasury (in consultation with the President). 12 U.S.C. § 1823(c)(4)(G).

¹²¹ See Kevin Dowd, Too Big to Fail? Long Term Capital Management and the Federal Reserve (Cato Inst., Paper No. 52, 1999) (describing Federal Reserve leadership in bailout of Long Term Capital Management and its impact).

¹²² See, e.g., GAO, Study on Auditing Industry Consolidation, *supra* note 2, at 19 ("It is unclear whether and to what extent the Antitrust Division was consulted and to what extent DOJ's Antitrust Division had input into the decision to criminally indict [Arthur] Andersen."); The Future of Auditing: Called to Account, *supra* note 12, at * ("Almost everyone agrees that [Arthur] Andersen's collapse made the financial system more vulnerable.").

from prosecuting a criminal indictment against KPMG although there was no question about the firm's guilt.

As to policy analysis, on one hand, externality justifications for invoking the too big to fail doctrine may be inapplicable to auditing. Such arguments made in the banking sector emphasize preventing runs on banks and spillover effects that disrupt credit flows.¹²³ No such effects are likely in auditing. On the other hand, an audit firm's pending collapse likely would impair investor confidence and provoke clients to flee. It is uncertain whether other firms could absorb fleeing clients swiftly. Fear of a resulting stock market meltdown (the chief justification for LTCM's rescue) could induce regulatory intervention.¹²⁴ After all, second-order effects of a stock market meltdown include capital misallocation and panic that could resemble, on a different scale, runs on banks.

True, such concerns also accompanied Arthur Andersen's pending demise, and yet the government allowed it to fail. But the difference between four instead of five firms is less problematic than the difference would be between three instead of four firms. Indeed, even with four firms, the current auditing market for large enterprises restricts client choices in possibly suboptimal ways. And there is reason to suspect that the Department of Justice would not allow a merger between any of the four large firms.¹²⁵ So, on balance, it would not be irrational for auditors to believe that the government simply would not allow three rather than at least four firms to dominate the industry.¹²⁶

¹²³ See Geoffrey P. Miller, Legal Restrictions on Bank Consolidation: An Economic Analysis, 77 Iowa L. Rev. 1083, 1105--06 (1992); Wilmarth, *supra* note 120, at 998--99.

¹²⁴ See Henry T.C. Hu, Faith and Magic: Investor Beliefs and Government Neutrality, 78 Tex. L. Rev. 777, 868--72 (2000); Mark E. Van Der Weide & Satish M. Kini, Subordinated Debt: A Capital Markets Approach to Bank Regulation, 41 B.C. L. Rev. 195, 254 n. 196 (2000).

¹²⁵ Talley, *supra* note 1, at 44--45.

¹²⁶ Cf. The Future of Auditing: Called to Account, *supra* note 12, at 71 ("[A] fear, shared by many, is that should another Big Four firm collapse, there is a real risk that the government would take over audits and that financial markets would suffer long-term harm.").

Moreover, such a belief can present moral hazard even if held by as few as a critical mass of team members on a single audit engagement. To paraphrase President George W. Bush's response to the emerging fiasco at Enron Corporation, it only takes a few bad apples to spoil the whole cart. For support, individual team members can point to the reversal of the criminal conviction against Arthur Andersen and the dismissal of the criminal indictments against all individual defendants in the KPMG case. Formal probabilities in the Audit Industry RTR Model aside, highly plausible cataclysmic risk scenarios are easy to imagine under the current industry structure.

Peril accompanies actual or potential government intervention to prevent failure of an institution deemed too big to fail. For auditing, moral hazard means greater risk taking than markets alone would tolerate.¹²⁷ This could lead to the kind of laxity that characterized much auditing behavior during the 1990s.¹²⁸ Such laxity can impair the reliability of financial reporting. It offsets, and could even negate, any benefits of more effective auditing and financial reporting otherwise achieved by the reforms contained in the Sarbanes-Oxley Act. A major concern, in other words, is that Arthur Andersen's exit and KPMG's survival may be doing more to impair audit quality than Sarbanes-Oxley is doing to improve it.

A secondary problem of rescuing large failing institutions is neglect of smaller institutions. Government subsidization of large

¹²⁷ See Gary H. Stern, *The Too-Big-to-Fail Problem*, Region, Sept. 1997, at 26. Mr. Stern explains moral hazard as follows:

Once a person or institution is insured, the insured has an incentive to take on more risk than otherwise. This is why, for example, fire and auto insurance policies have deductibles. With deductibles, the insured have more incentive to pick up old paint cans and drive cars more carefully. The moral hazard problem is particularly severe in banking because of the lack of deductibles. Governments often provide 100 percent depositor protection, especially at large banks where a loss could have industry wide repercussions (a practice known as too-big-to-fail--TBTF).

Id.; see also Tom Baker, *On the Genealogy of Moral Hazard*, 75 *Tex. L. Rev.* 237, 272--75 (1996) (noting that moral hazard arises any time one party's behavior influences risk borne by another and using products liability as example).

¹²⁸ See *supra* notes 69--84 and accompanying text.

organizations creates proportional disadvantages for the next tier of industry participants.¹²⁹ In auditing, this further diminishes the ability of smaller firms to compete with the four large firms. The governmental banking policy that restricts the use of the too big to fail doctrine¹³⁰ reflects a prudence that could be appealing if applied to the auditing industry. Such ex ante restrictions often are necessary to constrain regulatory inclinations amid crisis to rescue enterprises deemed too big to fail.¹³¹ Governmental temptation to rescue and the concomitant need for restraint evokes Homer's Odyssey, when government must be "tied to the mast" to fight temptation to hear the "song of the Sirens."¹³²

* * *

Neutralizing moral hazard from any too big to fail conceit at the four large audit firms requires creating credible alternatives to the existing auditing industry structure.¹³³ Particularly appealing would be an alternative that also can improve existing audit quality, increase attention to catastrophic risk, and reduce industry concentration by lowering barriers to entry. The following Part explores incremental reforms directed at improving audit quality by applying perspectives on catastrophic risk from complexity theory. The ensuing Part offers financial statement insurance as a

¹²⁹ See Keith N. Hylton, *Banks and Inner Cities: Market and Regulatory Obstacles to Development Lending*, 17 *Yale J. on Reg.* 197, 241 (2000) (discussing how too big to fail policy creates greater moral hazard in larger banks); Carrie Stradley Lavargna, *Government-Sponsored Enterprises Are "Too Big to Fail": Balancing Public and Private Interests*, 44 *Hastings L.J.* 991, 1013 (1993) (discussing situation where FDIC did not bail out small bank but bailed out large bank two months later).

¹³⁰ 12 U.S.C. § 1823(c)(4)(A)–(E)(2000) (imposing limits on governmental authority to provide assistance to insured depository institutions).

¹³¹ See Miller, *supra* note 123, at 1107–08.

¹³² See Homer, *The Odyssey* 155 (S.O. Andrew trans., J.M. Dent & Sons Ltd. 1948).

¹³³ See Hu, *supra* note 124, at 873 (addressing bailout of Long Term Capital Management and suggesting that "one possible category of techniques that the Federal Reserve should contemplate is to specifically and credibly forswear the use of possible tools to deal with a stock market crash"); Van Der Weide & Kini, *supra* note 124, at 254 ("In order to implement a successful market discipline approach to bank regulation, the federal government must credibly commit not to insure the losses of the relevant market participants.").

revolutionary way to provide these steps and create just such a credible alternative to the existing industry structure.

II. Reform

A meaningful *probability* of near-term audit firm exit due to federal securities fraud class actions that Professor Talley explores is not entirely new. For example, in 1992, total securities fraud litigation costs reportedly consumed fourteen percent of audit revenues (totaling \$783 million, meaning potential loss exposure running into the billions of dollars).¹³⁴ The *magnitude* is much higher, however, after the reduction in industry size to four large audit firms from six and, before then, eight. With such a contraction, the moral hazard that exists when firms believe that they are too big to fail amplifies. Accordingly, even if the probability of audit firm exit were low, the magnitude is so high that immediate policy attention is warranted.

Some low probability, high magnitude events may casually be referred to as worst case scenarios. These often are dismissed, *ex ante*, as too remote to invest preventive resources (although, *ex post*, policymakers scurry to make the requisite investment). This occurs in many contexts, including stock market trading (market crash of 1987), airport security (terrorism of 2001), space exploration safety (Columbia shuttle disintegration in 2003), and artificial levy systems (hurricane destruction of New Orleans in 2005). It could include risks of asteroid collisions with large cities¹³⁵ and of large audit firms exiting the industry (Arthur Andersen's exit in 2002; KPMG's near exit in 2005).

Policy analysts may find it desirable to incorporate such risks in normative evaluations *ex ante*. While analysts use standard tools

¹³⁴ See Coffee, Gatekeeper Failure, *supra* note 5, at 318 n. 51 (citing Private Litigation Under the Federal Securities Laws: Hearings Before the Subcomm. on Securities of the Comm. on Banking, Housing and Urban Affairs, 103d Cong. 103--431 (1993) (statement of Jake L. Netterville, Chairman of the Board, American Institute of Certified Public Accountants)).

¹³⁵ See Richard A. Posner, Catastrophe: Risk and Response 139--98 (2004); Richard A. Posner, Efficient Responses to Catastrophic Risk, 6 *Chi. J. Int'l L.* 511, 515 (2006).

such as the normal curve in statistical probability distributions, an increasingly large number of systems are known to behave in accordance with other probability distributions that require redefining the nature of the unexpected. A relatively new field called complexity theory studies systems that obey such distributions.¹³⁶ The following discussion introduces this theory and considers how selected aspects of auditing may be fit for similar study.

A. *Complexity Theory*

In complexity theory, the remote becomes a more central focus than routine, expectable events. Technically, complexity theory investigates the distinctive nonlinearities of dynamic systems. These systems often can be modeled using traditional tools (such as equilibrium models or geometric equations) but certain outcomes are so sensitive to infinitesimally small changes in the initial conditions as to elude capture or prediction by those tools. Manifestations of these peculiarities include probability distributions that do not follow a normal or bell-shaped curve but instead follow a “power law distribution.”¹³⁷

Earthquakes illustrate this distribution: numerous small quakes occur routinely but very large ones are rare and the distribution of very large quakes along the right tail of the distribution falls more slowly than under a normal distribution’s right tail.¹³⁸ In the auditing industry, one observes a large number of small

¹³⁶ See Manfred Schroeder, *Fractals, Chaos, Power Laws: Minutes from an Infinite Paradise* 103-19 (1991).

¹³⁷ Power law models were developed in physics but related insights have been extended to inform policy challenges in numerous contexts, including environmental law and securities regulation. See, e.g., Benoit B. Mandelbrot, *The (Mis)Behavior of Markets* (2004); Fred Bosselman, *What Lawmakers Can Learn from Large-Scale Ecology*, 17 *J. Land Use & Envtl. L.* 207, 224-25 (2002); Lawrence A. Cunningham, *From Random Walks to Chaotic Crashes: The Linear Genealogy of the Efficient Capital Market Hypothesis*, 62 *Geo. Wash. L. Rev.* 546 (1994); J.B. Ruhl, *Thinking of Environmental Law as a Complex Adaptive System: How to Clean Up the Environment by Making a Mess of Environmental Law*, 34 *Hous. L. Rev.* 933 (1997).

¹³⁸ Other attributes of such distributions include absence of the normal curve’s peak and presence of a continuously decreasing curve capturing the coexistence of numerous small events alongside a small number of massive ones. A stylized example of a population’s height distribution would show a majority of short creatures accompanied by occasional 100-foot tall specimens and the

liability judgments or settlements (in the one to ten million dollar range) and a very small number of very large ones (in the range of more than one hundred million)---and the trailing off along the right tail may be slower than in normal distributions. This is especially so if one uses a capacious sense of exit inducements, such as including criminal indictments, scandal-laden client disaffection, and confluences of these forces.

For power distributions, statistical properties are unusual. Whereas normal distributions sport finite expected values and variances, power distributions can have infinite expected values or infinite variance.¹³⁹ As with any statistical measure, this has limits, such as the fact that these attributes may not hold true over the entire range of the data. Accordingly, as with other statistical measures, these are approximations of reality rather than pure forms.

Despite these limitations, complexity theory can offer useful lessons for catastrophic risk, including for cataclysmic auditor liability---and audit firm exit---risk. The next two subsections explore two particular lessons: subsection II.B endorses using conservative and strategic audit procedures to enhance auditors' reputation with managers for toughness and subsection II.C prescribes publishing worst-case scenario analyses in audit reports to improve the product that auditors provide to external users.

B. Internal Reputation

It is commonly said that an audit firm's most valuable asset is a reputation for honesty.¹⁴⁰ Third parties who rely on audit reports likely assume that auditors are honest with them, but an honest

rare but real mile-high creature. See Albert-László Barabási, *Linked: The New Science of Networks* 67--68 (2002).

¹³⁹ See Benoit B. Mandelbrot, *The Fractal Geometry of Nature* 337--38 (1983).

¹⁴⁰ See *DLeo v. Ernst & Young*, 901 F.2d 624, 629 (7th Cir. 1990) (Easterbrook, J.) ("An accountant's greatest asset is its reputation for honesty, followed closely by its reputation for careful work."); Ross L. Watts & Jerold L. Zimmerman, *Agency Problems, Auditing, and the Theory of the Firm: Some Evidence*, 26 *J.L. & Econ.* 613, 621 (1983) (emphasizing external reputation concern as incentive for auditors to disclose known accounting deceptions).

auditor who cannot deter managerial sloppiness or aggression deserves little credit (or compensation) for her honesty. More important than honesty, auditors must command a reputation, believed by management, for ruthlessly scouring managerial assertions and not allowing questionable reporting.¹⁴¹ Management will incline towards softening an auditor's reputation for thoroughness and, when successful, be able to get away with less diligence and more aggression.¹⁴²

Auditors earn reputations for toughness through traditional investigative auditing practices that require continuing investment to sustain. During periods, such as the 1990s, when industry-wide laxity manifests, rebuilding that reputation requires significant additional investment. This explains the renewed emphasis on auditor independence and is an important theoretical justification for the requirement, in the Sarbanes-Oxley Act, that auditors audit internal control over financial reporting.¹⁴³ When, as now, auditors face industry-unraveling consequences from laxity, complexity theory's insights about catastrophic risk justify such investment.

1. Traditional Auditing Practice. --- Brief background on traditional auditing practice puts these points in perspective. The industry's standard model defines audit risk as: "the probability that an auditor may unknowingly fail to modify an opinion on financial statements that are materially misstated."¹⁴⁴ Audit risk is composed of three sub-risks: (1) *inherent risk* is the susceptibility of an assertion (such as an account balance) to error that could be material,

¹⁴¹ See Srikant M. Datar & Michael Alles, The Formation and Role of Reputation and Litigation in the Auditor-Manager Relationship, 4 J. Acct. Auditing & Fin. 401 (1999) (studying formation and meaning of auditors' internal reputations with managers).

¹⁴² See William W. Bratton, Shareholder Value and Auditor Independence, 53 Duke L.J. 439, 473 (2003) ("Management will always prefer an auditor with a reputation for flexibility respecting aggressive treatments and avoid an auditor with a reputation for conservative probity."); Robert Libby et al., Experimental Research in Financial Accounting, 27 Acct. Org. & Soc'y 775, 781--83 (2002); Mark Nelson & Hun-Tong Tan, Judgment and Decision Making Research in Auditing 33--38 (Mar. 25, 2005), at <http://ssrn.com/abstract=761706> (unpublished manuscript, on file with the *Columbia Law Review*) (discussing auditor-client interactions).

¹⁴³ Sarbanes-Oxley Act § 404, 15 U.S.C. § 7262 (Supp. 2002).

¹⁴⁴ David N. Ricchiute, Auditing and Assurance Services 45 (7th ed. 2003).

assuming there is no related internal control; (2) *control risk* is the likelihood that error could occur and not be prevented or detected by internal control; and (3) *detection risk* is the likelihood that error could occur and not be detected by the auditor's procedures.¹⁴⁵

Audit risk is the product of the three risk types, expressed formally as the "audit risk" model: $AR = IR \times CR \times DR$.¹⁴⁶ Auditors evaluate inherent risk (IR) and control risk (CR) and then solve this equation for an acceptable level of detection risk (DR).¹⁴⁷ An acceptable level of detection risk hinges, in turn, on the desired level of confidence to support an unqualified opinion.¹⁴⁸ The confidence level is the likelihood that audit procedures did not fail. The requisite confidence level depends, further still, on magnitude, usually meaning materiality. The standard of materiality used in auditing is akin to that used in both securities law and financial accounting. All treat as material matters that a reasonable person would consider important in making a decision based on some information base.¹⁴⁹

¹⁴⁵ Id. at 46--48; see also Jens Wüstemann, Evaluation and Response to Risk in International Accounting and Audit Systems: Framework and German Experiences, 29 J. Corp. L. 449, 451 (2004).

¹⁴⁶ Ricchiute, supra note 144, at 46--48; Wüstemann, supra note 145, at 451--52.

¹⁴⁷ Rewriting the equation in these terms yields: $DR = AR \div (IR \times CR)$. This makes detection risk (DR) the dependent variable, controlled by mastering inherent risk and control risk. Wüstemann, supra note 145, at 451--52.

¹⁴⁸ Auditors formalize that confidence level as: $CL = 1 \div DR$. Id.

¹⁴⁹ See, e.g., TSC Indus., Inc. v. Northway, Inc., 426 U.S. 438 (1976) (interpreting materiality under federal securities laws); Objectives of Fin. Reporting by Bus. Enters., Statement of Accounting Concepts No. 2, paras. 123--132 (Fin. Accounting Standards Bd. 1978) (explaining materiality concept in accounting). Practitioners posit an inverse relationship between audit risk and materiality. Ricchiute, supra note 144, at 50. Planning an audit requires estimating materiality. The auditing industry publishes decision aids relating audit risk to materiality and implied requisite audit effort. See, e.g., Audit Risk and Materiality in Conducting an Audit, Statement of Fin. Accounting Standards No. 107 (Fin. Accounting Standards Bd. 2006) (presenting information on minimum sample sizes for tests of internal control given tolerate deviation rates and expected population deviation rates). It also invokes rules of thumb, the commonest of which relates to an item's effect on net income. Effects less than five percent are seen as unlikely to be material and those greater than ten percent are seen as likely to be material. See, e.g., SEC Staff Accounting Bulletin No. 99, 64 Fed. Reg. 45,150 (1999).

Under this model, auditors engage in exercises designed to gather sufficient information to decide whether they are justified in issuing an unqualified report on financial statements (that they fairly present performance and condition in conformity with generally accepted accounting principles (GAAP)).¹⁵⁰ Threshold testing probes the capacity of internal control over financial reporting to catch errors or fraud; further substantive tests seek to detect material misstatements or identify assertions likely to contain them.¹⁵¹ Auditors use statistical sampling, random testing, and similar investigative techniques to form their opinion. In addition to substantive tests of financial statement assertions, auditors cross-examine managers, reason from recognized principles and relationships, and rely upon intuition.

Auditors always face uncertainty about whether they have sufficient evidence to issue an unqualified audit report. Under the traditional audit risk model, an auditor designs an audit plan to reduce risk to an acceptable level. When initial testing exposes potentially material errors or deceptions, auditors expand the scope of substantive testing and/or managerial interrogation. Managers who are aware of pending tests and probing are discouraged from accounting aggression and stimulated to diligence; those aware that auditors are unlikely to test or probe intensively can indulge temptations to cheat or be careless.

These realities explain why official auditing standards require auditors to seal gaps in their knowledge by adopting the fundamental habit of professional skepticism.¹⁵² This involves routinely second

¹⁵⁰ See Codification of Statements on Auditing Standards, AU § 411 (Am. Inst. of Certified Pub. Accountants 2001).

¹⁵¹ Substantive tests are of two types: (1) “tests of detail” are designed to detect material misstatements in accounts and (2) “analytical procedures” are evaluations of data drawing on comparisons such as in relevant trends, baselines, or forecasts. Ricchiute, *supra* note 144, at 45.

¹⁵² See Codification of Statements on Auditing Standards, AU § 508 (Am. Inst. Certified Pub. Accountants 2001); Consideration of Fraud in a Financial Statement Audit, Statement of Fin. Accounting Standards No. 82 (Fin. Accounting Standards Bd. 1997) (“Due professional care requires the auditor to exercise professional skepticism--that is, an attitude that includes a questioning mind and critical assessment of audit evidence.”); see also Vicky B. Heisman-Hoffman et al., The Warning Signs of Fraudulent Financial Reporting, 182 J. Acct. 75, 75--77 (1996) (assessing commonly cited cause of audit failure as auditors lacking awareness of

guessing managerial assertions and judgments. Failure to adhere to the requirement exposes auditors to legal liability and sanction.¹⁵³ Since all the testing in the world could not uncover all mistakes or fraud, the indispensable auditing trait is a commanding reputation among managers for thoroughly rooting them out.¹⁵⁴ That, more than the actual testing, is the value of auditing.¹⁵⁵ Auditors suffered severe reputation damage during the 1990s, after compromising their independence from clients by joining in relationships with them.¹⁵⁶ These relationships increased managerial temptation for carelessness and deception.

2. Rebuilding Reputation --- Complexity theory endorses the conservative testing and skepticism at the heart of the audit risk model and traditional practice---and supports expanding methods in two main ways. First, it offers a defense of the controversial procedures mandated in the Sarbanes-Oxley Act that require auditors to provide separate testing of and opinions upon the effectiveness of internal control over financial reporting.¹⁵⁷ These exercises involve comprehensive examination of all procedures and policies governing

warning signs that could be uncovered by applying requisite professional skepticism).

¹⁵³ See, e.g., SEC v. KPMG LLP, SEC Accounting and Auditing Enforcement Release No. 2379 (Feb. 22, 2006) (failure to exercise professional skepticism in connection with failed audits of Xerox Corp.); In re Deloitte & Touche LLP, SEC Accounting and Auditing Enforcement Release No. 2237 (Apr. 26, 2005) (failure to exercise professional skepticism in connection with failed audits of Adelphia Communications Corp.); In re PricewaterhouseCoopers LLP, SEC Accounting and Auditing Enforcement Release No. 1787 (May 22, 2003) (failure to exercise professional skepticism in connection with failed audits of SmarTalk TeleServices Inc.).

¹⁵⁴ See Larry E. Ribstein, Market vs. Regulatory Responses to Corporate Fraud: A Critique of the Sarbanes-Oxley Act of 2002, 28 J. Corp. L. 1, 31 (2002) [hereinafter Ribstein, Market] (“[T]he . . . serious issue is whether even strong regulation will change auditors’ practical ability to find corporate fraud when determined corporate insiders want to hide it.”).

¹⁵⁵ It is therefore incomplete to say that auditors earn their keep by “renting their reputations.” See Reinier Kraakman, Gatekeepers: The Anatomy of a Third-Party Enforcement Strategy, 2 J.L. Econ. & Org. 53, 93--94 (1986). This viewpoint also makes less relevant the behavioral critique of the honesty proposition that attempts to explain how “irrational” auditors might jeopardize their external reputations for honesty and diligence unwittingly. See Robert F. Prentice, The Case of the Irrational Auditor: A Behavioral Insight into Securities Fraud Litigation, 95 Nw. U. L. Rev. 133, 141--42 (2000).

¹⁵⁶ See supra text accompanying notes 69--84.

¹⁵⁷ Sarbanes-Oxley Act § 404, 15 U.S.C. § 7262 (Supp. 2002).

the internal processing of financial information and production of financial statements.¹⁵⁸ Auditors now provide written reports on internal control, including publicly disclosing and explaining material weaknesses in it.

Many analysts criticize these new procedures as unnecessary and too costly.¹⁵⁹ Complexity theory offers a different view that supports proponents of these exercises. The procedures are necessary to rebuild auditors' reputations for toughness, and are cost-effective given how infirmities in these reputations pose risks of audit failure with concomitant risk of audit firm exit that could unravel the industry.

Complexity theory prescribes a conservative approach to risk--probably more conservative than traditional auditing practice. In auditing, this could mean identifying and addressing all audit risk components necessary to justify issuing an unqualified report. Benefits arise from making managers aware of such procedures to increase the deterrent function of auditing. The ultimate payoff is to eliminate the cataclysmic risk of audit failure that could induce audit firm exit. But costs of eliminating this risk are extraordinary, and may be prohibitive.

Costs of undertaking such conservative procedures stem from taking steps that are strictly unnecessary in the sense that the underlying data ultimately support the existing financial statement assertions (call these "safe zones").¹⁶⁰ By so expanding an audit's scope to test areas wrongly supposed to be dangerous---false positives---the auditor can reduce the chances of missing real danger zones---true positives. A measure of conservatism is the ratio of true

¹⁵⁸ Id. For an attempt to provide a comprehensive description of the requirements, see Lawrence A. Cunningham, *Facilitating Auditing's New Early Warning System: Control Disclosure, Auditor Liability and Safe Harbors*, 55 *Hastings L.J.* 1449 (2004).

¹⁵⁹ See, e.g., William J. Carney, *The Costs of Being Public After Sarbanes-Oxley: The Irony of "Going Private,"* 55 *Emory L.J.* 141, 147 (2006); Roberta Romano, *The Sarbanes-Oxley Act and the Making of Quack Corporate Governance*, 114 *Yale L.J.* 1521, 1587--88 (2005).

¹⁶⁰ Cf. Daniel A. Farber, *Probabilities Behaving Badly: Complexity Theory and Environmental Uncertainty*, 37 *U.C. Davis L. Rev.* 145, 160--61 (2003) (using these concepts to develop model for environmental law).

positives to false positives. A one-to-one ratio means half the inquiries are danger zones and half are safe zones; a one-to-four ratio means that only a fifth were real danger zones and others tested as safe zones. Conservative procedures over audit, but minimize the chance of missing a real danger, and suffering the consequent cataclysmic loss.

The new mandatory audits of internal control are a substitute for such comprehensive scouring but furnish much of the same function at less cost. Some prescribed steps are not strictly necessary in that they involve testing many more safe zones than danger zones. But they provide two benefits. First, they vastly reduce the chances of failing to identify danger zones. These exercises have identified numerous control weaknesses and have produced financial restatements showing that these steps enable auditors to exercise their ability to pressure management into more faithful reporting.¹⁶¹ Second, this manifest ability reflects that auditors are regaining a reputation with management for toughness.

Costs of auditing internal control over financial reporting are nevertheless significant.¹⁶² Some speculate that this is a product of auditors performing excessive work that is, in turn, motivated by fear of litigation.¹⁶³ While possible, the investment's instrumental value is principally a way to rebuild auditors' impaired reputations for toughness versus management. Formal audits and opinions on internal control are far more conservative than the limited testing of internal control that auditors performed under the traditional audit risk model. That conservatism is justified, under complexity theory, given the staggering systemic consequences that audit firm exit poses.

¹⁶¹ See Weili Ge & Sarah McVay, *The Disclosure of Material Weaknesses in Internal Control After the Sarbanes-Oxley Act*, 19 *Acct. Horizons* 137 (2005) (noting sample of 261 companies disclosing material weaknesses, most of which reflect lack of resource commitment to accounting controls).

¹⁶² See Susan W. Eldridge & Burch T. Kealey, *SOX Costs: Auditor Attestation Under Section 404* (Univ. of Neb., Working Paper No. *, 2005) (noting that auditing fees paid by sample of 97 companies increased, on average, from \$3.5 million to \$5.8 million, attributed to section 404 compliance costs).

¹⁶³ See Pritchard, *supra* note 79, at 21.

Consider an analogy from aviation security.¹⁶⁴ In this context, the risk distribution does not follow a bell curve but resembles a power curve: Nearly all passengers pose no risk while a tiny few threaten catastrophic loss. Security personnel must regularly decide whether to permit passengers through a security checkpoint (equivalent to issuing an unqualified audit report). Security procedures must develop a reputation for interdiction to deter hijacking or terrorist attempts. Doing so requires a large number of stoppages.

While any screening procedure inconveniences some safe passengers, catching a single dangerous one justifies a large number of stoppages. Stopping all passengers is impractical but stopping vastly more safe than dangerous ones is necessary because the greater the stoppage rate, the greater the chances of catching dangerous passengers. In auditing, expanding audit procedures---including formal audits of and opinions on internal control---can be justified to reduce the chances of failing to identify danger zones, despite the cost of exploring what turn out to be safe zones.

The costs of expanded testing of one zone may deprive “gatekeepers” (whether airport security or auditors) of resources to expand testing in another. In airports, stopping one passenger may mean the next one goes through unchecked. The latter may be a danger, yet on board he or she goes. But the chances that a randomly selected passenger is a danger are lower than the chances that a hijacker or terrorist appears among a larger group of stopped passengers. As a result, the costs of letting an untested passenger through are lower than the benefits of testing the larger group. Moreover, having invested in a reputation for toughness that deters, resources are liberated for reallocation.

Of course, any security or investigative technique can be made more conservative when performing more procedures is possible, as with airport security and auditing. This raises a second set of

¹⁶⁴ See Farber, *supra* note 160, at 162--63 (providing basis for this analogy).

improvements in auditing that complexity theory supports in the area of strategic detection. Performing the maximum possible number of procedures is not likely a prudent method, even if extensive testing increases both deterrence and the chance of detection. In airport security, it is necessary to use strategic methods of identifying and stopping particularly high-risk passengers, such as those named on governmental watch lists.

For auditing, auditors must supplement expanded testing by deploying strategic methods of detection that demonstrate to managers that even the cleverest schemes are unlikely to succeed. This is the theory behind innovations developed by auditing scholars in recent years. These prescribe that auditors develop refined tools to aid in deciding when to expand testing to investigate for deception. For example, scholars explore how weak internal control can signal high fraud risk but, unless auditors use strategic procedures that distinguish error from fraud, they will treat discrepancies as due to error and allow fraud to go undetected.¹⁶⁵ Strategic reasoning is particularly productive in high-risk environments.¹⁶⁶ Complexity theory's prescriptions for broad-gauged screening to avert catastrophic loss add support to the analytical arguments these scholars mount for a strategic approach to auditing.

To summarize, the possibility that auditor liability risk may resemble a power law distribution means that missing true positives can be cataclysmic. True, costs of expanding an audit for a client or context may mean impairing resources to expand audits for others. But expanded---and more strategic---testing reduces cataclysmic risk. Such methods strengthen auditors' reputations among managers for

¹⁶⁵ See Dennis H. Caplan, Internal Control and the Detection of Management Fraud, 37 J. Acct. Res. 101, 101 (1999).

¹⁶⁶ See, e.g., Stephen K. Asare & Arnold M. Wright, The Effectiveness of Alternative Risk Assessment and Program Planning Tools in a Fraud Setting, 21 Contemp. Acct. Res. 325 *passim* (2004) (questioning effectiveness of standard audit tools in context of fraud and calling for strategic reasoning methods in high-risk contexts); T. Jeffrey Wilks & Mark F. Zimbelman, Using Game Theory and Strategic Reasoning Concepts to Prevent and Detect Fraud, 18 Acct. Horizons 173, 173--74 (2004) (urging change in current auditing standards and developing tools useful in performing critical audit tasks).

toughness, creating a deterrent effect that ultimately would permit less testing.

While audits of internal control help, most aspects of traditional auditing practice remain unaffected by the reforms begun in the Sarbanes-Oxley Act and PCAOB's ensuing standard setting.¹⁶⁷ For example, traditional auditing practice, and its audit risk model, is designed within a framework of concluding whether an unqualified audit report can be issued or not. The practice is not geared toward assessing the relative integrity of individual or overall financial statement assertions. This raises the second broad lesson for auditing from complexity theory, concerning external information that auditors generate, including worst case scenarios.

C. External Information

Scholars debate whether effective alternative means of communicating accounting information are underutilized.¹⁶⁸ After all, auditors provide no specific assessments of how reliable a particular set of financial statements are when compared to others. Complexity theory suggests that auditors could provide more useful information by developing tools that assess and publicize worst case scenarios. This can be done by creating more tailored audit reports than presently exist.

1. Monotonic Audit Reports. --- The standard form of an unqualified audit report contains three prescribed paragraphs.¹⁶⁹

¹⁶⁷ See Charlie Cullinan, *Enron as a Symptom of Audit Process Breakdown: Can the Sarbanes-Oxley Act Cure the Disease?*, 15 *Critical Persp. Acct.* 853, 861--62 (2004) (showing how Sarbanes-Oxley Act's reforms are directed heavily towards auditor independence with insufficient attention paid to critical steps in auditing process shown to contribute to audit failures).

¹⁶⁸ For a view contrary to that suggested here, see, e.g., Joseph V. Carcello et al., *Auditors' Reporting Options and Client Disclosure*, 18 *Res. Acct. Reg.* (2005) (examining one context in which such options had been restricted and concluding that fewer auditor options did not impair enterprise disclosure).

¹⁶⁹ Codification of Statements on Auditing Standards, AU § 508 (Am. Inst. Certified Pub. Accountants 2001) ("The auditor's standard report identifies the financial statements audited in an opening . . . paragraph, describes the nature of an audit in a scope paragraph, and expresses the auditor's opinion in a separate paragraph.").

Each year, more than 90% of audit reports for public companies receive this standard form of auditor blessing.¹⁷⁰ These reports sing a single tune for the financial statements of a regional restaurant chain as for those of a multinational conglomerate and every shape and size of enterprise in between. To use an academic analogy, auditors grade financial statements on a pass/fail basis---the approach taken to non-competitive school course work---and all but a handful pass.

As for the small minority of financial statements that do not pass, auditing industry standards allow for a limited variety of likewise standardized modified reports (currently limited to “qualified” or “adverse”).¹⁷¹ An even rarer subset of the population of audit reports expresses a qualification as to whether an enterprise is capable of continuing as a “going concern,” and these, notoriously, predict only half of the actual observed bankruptcies.¹⁷²

Two important, but still modest, recent improvements in communicating accounting information have been made. First, SEC regulations require narrative disclosure concerning critical accounting policies.¹⁷³ This innovation, enacted as the accounting scandals of the late 1990s and early 2000s were brewing, requires detailed disclosure as to areas where assumptions and judgments

¹⁷⁰ See Willekens, *supra* note 83.

¹⁷¹ See Codification of Statements on Auditing Standards, AU § 508 (listing alternatives to standard audit report).

¹⁷² See Kannan Raghunandan & Dasaratha V. Rama, *Audit Reports for Companies in Financial Distress: Before and After SAS No. 59*, 14 *Auditing: J. Prac. & Theory* 50, 51 (1995) (summarizing prior studies). Auditors routinely fail to provide going-concern warnings unless the signs of impending doom are painfully obvious. *Id.* at 58. For example, no going-concern opinion appeared ahead of nearly half the 228 bankruptcies occurring from January 2001 to June 2002, even though afflicted enterprises showed telltale warning signs: negative working capital, negative retained earnings, and net income loss. See Weiss Ratings, Inc., *The Worsening Crisis of Confidence on Wall Street: The Role of Auditing Firms* 7 & tbl.4 (2002); see also Marshall A. Geiger & K. Raghunandan, *Going-Concern Opinions in the “New” Legal Environment*, 16 *Acct. Horizons* 17, 24 (2002) (finding auditors less likely to issue going-concern reports to stressed companies in 2000 than in 1992).

¹⁷³ See Commission Guidance Regarding Management’s Discussion and Analysis of Financial Condition and Results of Operations, Securities Act Release No. 8350, Exchange Act Release No. 48,960, 68 Fed. Reg. 75,056, 75,064--65 (Dec. 9, 2003); Cautionary Advice Regarding Disclosure About Critical Accounting Policies, Securities Act Release 8040, Exchange Act Release No. 45,149, 66 Fed. Reg. 65,013, 65,013--14 (Dec. 9, 2001).

expose an enterprise's financial statements to particular volatility or variability.¹⁷⁴

Such sensitivity disclosure can give financial statement users a basis for gauging the reliability of those financial statements, including some clues concerning worst case scenarios. While helpful, this disclosure is management's responsibility and not subject to the ordinary financial statement audit.¹⁷⁵ As company specific narrative, moreover, it is not easily rendered into an objective form that enables intercompany comparisons.

Second, the new reports on internal control over financial reporting aim in the same direction as worst case scenario analysis.¹⁷⁶ They serve, in part, as an early warning system to external users about the reliability of given financial statements. When auditors determine that a material control weakness exists (one posing a more-than-remote risk of material financial misstatements), their report must describe the weakness and give "specific information" about "its actual and potential effect on the presentation of the company's financial statements issued during [its] existence."¹⁷⁷

¹⁷⁴ See Commission Guidance Regarding Management's Discussion and Analysis of Financial Condition and Results of Operations, 68 Fed. Reg. at 75,056--57, 75,062--63, 75,065 (referencing variability); Cautionary Advice Regarding Disclosure About Critical Accounting Policies, 66 Fed. Reg. at 65,013 ("[W]e believe it is appropriate to alert companies to the need for greater investor awareness of the sensitivity of financial statements to the methods, assumptions, and estimates underlying their preparation.").

¹⁷⁵ See SEC Regulation S-K, Item 303, 17 C.F.R. § 229.303 (2006) (indicating that management is responsible for providing MD&A disclosure). Auditors do participate in the process of formulating the MD&A disclosure. See Cautionary Advice Regarding Disclosure About Critical Accounting Policies, 66 Fed. Reg. at 65,013 ("As part of the normal audit process, auditors must obtain an understanding of management's judgments in selecting and applying accounting principles and methods. Special attention to the most critical accounting policies will enhance the effectiveness of this process."). Auditors may provide limited written assurance on MD&A disclosure. See Disclosure in Management's Discussion and Analysis About the Application of Critical Accounting Policies, Securities Act Release No. 8098, Exchange Act Release No. 45,907, 67 Fed. Reg. 35,634 & n.100 (May 2, 2002).

¹⁷⁶ See Management's Reports on Internal Control over Financial Reporting and Certification of Disclosure in Exchange Act Periodic Reports, Securities Act Release No. 8238, Exchange Act Release No. 47,986, Investment Company Act Release No. 26,068, 68 Fed. Reg. 36,636 (June 18, 2003).

¹⁷⁷ See Auditing and Related Prof'l Practice Standards, Auditing Standard No. 2, para. 176 (Pub. Co. Accounting Oversight Bd. 2004).

Again, while helpful, these reports are of limited utility. Like financial audit reports, these generally say the same thing as a matter of form;¹⁷⁸ they do not provide statistical or comparative information about financial statement reliability.

So, in financial reporting, there is no index of financial statement reliability. Yet, in auditing, some risk always exists after conducting an expansive set of tests or obtaining extensive corroboration. For example, a financial statement assertion that auditors flag for expanded testing may reveal itself as safe but in fact still be dangerous. Despite the many degrees of relative danger and safety, auditors have no choice among the class of unqualified reports to provide any useful gradations, and internal control reports have provided only incrementally greater transparency.

Since no audits are alike and no financial statements exhibit exactly comparable reliability risk, all unqualified audit reports are not alike. To reflect this, auditors could analyze and disclose grades on the overall reliability of given financial statements, resembling how teachers assign grades to students for their course work. In auditing, grading financial statements would include generating and disclosing formal worst case scenarios for each. Such granular assessments of accounting information would improve user understanding of an enterprise's financial condition and performance and thus make capital allocation more efficient. It also would exert competitive pressure on managers to achieve high grades for reliability, not just to report high profits.

2. Graded Financial Statements --- To produce graded financial statements, auditors could adapt analytical methodologies used in corporate finance. Credit rating agencies test a borrower's capacity to pay its debts as they come in the ordinary course of business.¹⁷⁹ They simulate varying firm-specific or economy-wide

¹⁷⁸ Id.

¹⁷⁹ See Standard & Poor's, Corporate Ratings Criteria 4 (2003), at <http://www2.standardandpoors.com/spf/pdf/fixedincome/CorpCrit2004.pdf> (on file with the *Columbia Law Review*). I suggest adapting the analytical methodologies of rating agencies without opining upon that industry's structure or integrity, which has been the subject of considerable criticism. See, e.g., Claire A. Hill, Regulating the Rating Agencies, 82 Wash. U.

environments, including worst case scenarios, to test an enterprise's ability to withstand a range of adversity, and then assign ratings (A, B, C and so on). For auditing, an analogous exercise could assess the quality of reported figures and their reliability, assuming certain worst case scenarios of auditing error or accounting volatility.

Although worst case scenario analysis is conducted in numerous fields,¹⁸⁰ it can be sufficiently controversial to warrant careful reflection. Consider experience with it in environmental administrative law. Regulations once required agencies, when preparing environmental impact statements, to include, amid uncertainty about the actual impact, "worst case analysis and an indication of the probability or improbability of its occurrence"¹⁸¹ and later "reasonable projections of the worst possible consequences of a proposed action."¹⁸²

Critics complain that worst case scenario analysis is too pessimistic, that it entails a limitless exercise of conjuring up the ultimate worst case, and that expert risk management analysts shun the notion as of limited utility.¹⁸³ Regulations were revised to jettison the express "worst" case or consequence requirement, and instead required evaluating reasonably foreseeable significant adverse impacts. Yet "reasonably foreseeable" was defined to include effects bearing "catastrophic consequences, even if their probability of occurrence is low"¹⁸⁴ As a result, the implicit

L.Q. 43, 64-71 (2004); Frank Partnoy, *The Siskel and Ebert of Financial Markets? Two Thumbs Down for the Credit Rating Agencies*, 77 Wash. U. L.Q. 619, 654-81 (1999).

¹⁸⁰ See William J. Aceves, *Predicting Chaos? Using Scenarios to Inform Theory and Guide Practice*, 45 Va. J. Int'l L. 585, 589-91, 612-18 (2005).

¹⁸¹ Farber, *supra* note 160, at 164 (quoting 40 C.F.R. § 1502.22(b) (1984) (amended 1986)).

¹⁸² *Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations*, 46 Fed. Reg. 18,026, 18,032 (Mar. 23, 1981).

¹⁸³ See, e.g., Edward A. Fitzgerald, *The Rise and Fall of Worst Case Analysis*, 18 U. Dayton L. Rev. 1, 2-3 (1992) (reviewing cases as reaction to federal agency rejection of worst case scenario analysis); Cass R. Sunstein, *Probability Neglect: Emotions, Worst Cases and Law*, 112 Yale L.J. 61, 96-98 (2002) (reviewing cases in broader context of worrying that people might worry too much about worst cases).

¹⁸⁴ Farber, *supra* note 160, at 166 (citing 40 C.F.R. § 1502.22(b) (2003)).

directive remains to discuss low-probability but high-magnitude events---even if the rhetoric of “worst” is gone.¹⁸⁵

The relationship of complexity theory and worst case scenario analysis gives rise to conflicting implications.¹⁸⁶ First, power laws deny the existence of a genuine “worst case,” in that “ever-worse” cases always exist. In other words, it is fair to criticize the entire concept (as an analytical construct) given the inherent arbitrariness of denominating a particular illustration as the worst. But, second, as Professor Farber points out, “one characteristic of power laws is that the unlikely events on the right tail of the curve have a strong cumulative effect.”¹⁸⁷ Concentrating on the probable can prevent appreciating the catastrophic. Thus worst-case analysis provides an essential focus, compensating for the tendency to overlook the spectrum of worst case types.

Existing auditing practice does not reflect these insights. As noted, a single large scale judgment could wipe out the auditing industry---not just a single firm---and even a dozen moderately sized judgments could have this effect. This omission can be corrected by further refining the Audit Industry RTR Model. In the preceding Part, I suggested refining the Audit *Industry* RTR Model by one degree of resolution to produce an Audit *Firm* RTR Model.¹⁸⁸ This can be taken another degree of resolution further, to assess which clients are likely to populate the right tail for a given firm (call this an Audit *Client* RTR Model). Auditors can adapt the audit risk model, either as it currently exists or as enhanced by the insights from complexity theory just described, to identify these clients.

Which clients are candidates for an RTR watch list? In general, they are clients whose financial statements, if materially misstated, would produce cataclysmic auditor liability. That includes

¹⁸⁵ Id. at 167 (citing *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332 (1989)).

¹⁸⁶ Id. at 167--168.

¹⁸⁷ Id. at 167.

¹⁸⁸ See *supra* notes 50--53 and accompanying text.

all very large clients, and could include a number of moderate to large clients if their combined size could produce, in aggregate, cataclysmic results. Furthermore, auditors and researchers recognize certain high-risk accounting areas. These can congregate in certain industries or types of business, which can pose greater accounting risk than others.¹⁸⁹ Risk of accounting or auditing error also congregates in certain subject areas, such as standards regarding revenue or expense recognition.¹⁹⁰ Given such variables, a formal model should be tractable to enable assessing Audit Client RTR as well as assign grades to financial statements more generally.

Informally, clients on the RTR watch list are those whose audits under the audit risk model (or conservative and strategic refinements of it) require expanded audit testing and exhibit other signals of high risk. Auditors typically know who they are, as Arthur Andersen's failed audits of Waste Management made overwhelmingly clear.¹⁹¹ Yet in the late 1990s and early 2000s, while auditors knew their "scary" clients, they imparted no such knowledge to the public.

¹⁸⁹ See supra note 50.

¹⁹⁰ See Sec. & Exch. Comm'n, Report Pursuant to Section 704 of the Sarbanes-Oxley Act of 2002 (2003). This study of SEC enforcement actions indicated that the accounting areas most susceptible to misconduct are revenue recognition (126 cases) and expense recognition (101). *Id.* at 2. Other areas are MD&A disclosure (43), related party disclosure (23), business combination accounting (23), non-monetary and roundtrip transactions (19), foreign payments (6), off-balance sheet arrangements (3), and improper use of non-GAAP financial measures (2). *Id.* at 6.

¹⁹¹ See Arthur Andersen LLP, Exchange Act Release No. 44,444, Accounting and Auditing Enforcement Release No. 1405, 7 Fed. Sec. L. Rep. (CCH) ¶ 74,920 (June 19, 2001). Arthur Andersen recognized that Waste Management engaged in "aggressive" accounting practices to enhance earnings and saw the company as a "high-risk client," putting it on the firm's "monitored client list--a list that it used to monitor clients that posed a significant audit risk to the Firm." *Id.* The auditors routinely furnished company management with "proposed adjusting journal entries" (PAJEs) which the company equally routinely refused to accept or make, leading the audit firm to compromise by reclassifying the PAJEs according to categories of "must do," reasonable to conservative. Notably, Arthur Andersen considered Waste Management a "crown jewel" client; from its initial public offering in 1971 through 1997, every chief accounting officer at Waste Management was a former Arthur Andersen partner. "During the 1990s, approximately 14 former Arthur Andersen employees worked for Waste Management, most often in key financial and accounting positions." *Id.*

Again, this is because, in major part, the standard audit report is always the same three paragraph document. Such information asymmetries between the public and the auditors would be curtailed if auditors would capture and publicly disclose the resulting assessments in a formal index reflecting worst-case scenario analyses. As explained next, financial statement insurance can supply an index to capture not only worst case scenarios, but also grades on financial statement reliability from strong to weak (A to F).

III. Revolution

A viable alternative to the auditing oligopoly is needed. It must provide a credible threat to allow the exit of any of the four large firms that are on the brink of failure. Ideally, the alternative would enable restructuring the industry in the short or medium term, before one of the four large firms faces exit. This restructuring can be achieved by shifting from the existing model (involving clients paying auditors for audits backed by auditors' balance sheets or liability insurance) to one where clients buy tailored insurance directly and insurers hire and supervise auditors. Not incidentally, such a financial statement insurance approach would also improve audit quality, promote public assessment of worst case scenarios, and reduce barriers to entry that smaller firms currently face.

In previous articles, I recommended financial statement insurance (FSI) as a potentially useful method of improving the effectiveness of auditing.¹⁹² My endorsement was limited to the cautious proposal that legislation be enacted permitting companies, on a voluntary basis and with shareholder approval, to opt in to this method of backstopping financial statements. Several factors now incline me to support making this a mandatory component of U.S. federal securities regulation.

¹⁹² See Lawrence A. Cunningham, Choosing Gatekeepers: The Financial Statement Insurance Alternative to Auditor Liability, 52 UCLA L. Rev. 413 (2004) [hereinafter Cunningham, Choosing Gatekeepers]; Lawrence A. Cunningham, A Model Financial Statement Insurance Act, 11 Conn. Ins. L.J. 69 (2004) [hereinafter, Cunningham, A Model FSI Act].

First, scholarly and general interest in the concept of using FSI to reduce the frequency and magnitude of audit failure has grown.¹⁹³ Second, as Professor Talley's Audit Industry RTR Model suggests, the probability of an audit firm exit is high; my own analysis indicates that the magnitude of such an event is enormous. The resulting moral hazard may be impairing current audit quality and financial statement reliability even though considerable resources are being invested in internal control. Third, these points imply that it is becoming urgent to develop credible alternatives to the existing auditing industry structure. Yet none of the few available such alternatives are as attractive as FSI.¹⁹⁴ Fourth, mandating FSI achieves auditing reform while preserving companies' abilities to design approaches tailored to their needs.¹⁹⁵

Accordingly, the following discussion endorses the adoption of mandatory FSI as the best way to restructure the auditing industry and thereby neutralize moral hazard and improve audit practice. Part III.A exposes the peculiar limitations of using traditional liability and self-insurance techniques to backstop auditor liability. Part III.B then discusses FSI, outlining its features and describing its

¹⁹³ See Amy Shapiro, *Who Pays the Auditor Calls the Tune?: Auditing Regulation and Clients' Incentives*, 35 *Seton Hall L. Rev.* 1029, 1085--94 (2005) (suggesting FSI as one of several possible schemes for protecting investors from corporate fraud); David Skeel, *Icarus in the Boardroom: The Fundamental Flaws in Corporate America and Where They Came From* 212--14, 234 (2005) (same); see also Sean J. Griffith, *Uncovering a Gatekeeper: Why the SEC Should Mandate Disclosure of Details Concerning Directors' & Officers' Liability Insurance Policies*, 154 *U. Pa. L. Rev.* 1147, 1148 (2006) ([*parenthetical]); Barney Jopson, *An Industry Still Skulking in the Shadow of Enron*, *Fin. T.* (July 27, 2006) at 12 ([*parenthetical]); Don A. Moore, *SarbOx Doesn't Go Far Enough*, *Bus. Wk.* (Apr. 17, 2006), at 112 ([*parenthetical]).

¹⁹⁴ See Cunningham, *Choosing Gatekeepers*, *supra* note 192, at 423--27 (reviewing several alternative proposals and concluding that they are inferior to FSI); see also Stephen J. Choi & Jill E. Fisch, *How to Fix Wall Street: A Voucher Financing Proposal for Securities Intermediaries*, 113 *Yale L.J.* 269, 336--38 (2003) (proposing use of voucher financing to pay intermediaries such as securities analysts but expressly disclaiming concept for auditors because of auditing complexities that may impair its utility in that context); Ribstein, *SarbOx*, *supra* note 117, at 289 (mentioning with little enthusiasm idea of having stock exchanges coordinate and compensate auditors) (citing Paul M. Healy & Krishna G. Palepu, *How the Quest for Efficiency Corroded the Market*, *Harv. Bus. Rev.*, July 2003, at 76)); Steven L. Schwarcz, *Rethinking the Disclosure Paradigm in a World of Complexity*, 2004 *U. Ill. L. Rev.* 1, 29 n.180 (suggesting but discounting possibility of having auditors paid through public funding).

¹⁹⁵ See *id.* at 467 n. 213 (providing chart summarizing framework and highlighting FSI policy provisions that can be tailored and disclosed); Cunningham, *A Model FSI Act*, *supra* note 192, at 79--80 (outlining FSI policy provisions that can be tailored and disclosed).

advantages. Finally, Part III.C compares FSI to other proposed reforms and responds to criticism of the proposal.

A. *Limits of Liability Insurance*

Traditionally, auditors could buy liability insurance to backstop their exposure to legal claims. These policies are called errors and omissions (“E&O”) insurance. When underwriting this form of coverage, insurers use general analytical methods not tailored to particular engagements or associated risks of audit failure. Rather, they apply conventional actuarial models that rely on risk pooling and diversification.¹⁹⁶ These techniques reflect how liability insurance works when covered risks are substantially independent, so that coverage distributes and thus diversifies risk across participants pooled according to similar circumstances.¹⁹⁷ Good examples are coverage for property owners facing earthquakes along the West coast of the United States or those on its Eastern seaboard facing risk of floods.

Two problems arise for using liability insurance in auditing. First, the risk pooling function will be diminished if the risk of financial misstatement lacks characteristics of independence. This can occur when financial misstatement risks multiply during particular socioeconomic climates, congregate in certain industries, or cluster around certain innovations or practices.¹⁹⁸ Such attributes can render related catastrophic events uninsurable. They are akin to “acts of war” that insurance policies long have expressly excluded.

¹⁹⁶ Anne Gron & Alan O. Sykes, *Terrorism and Insurance Markets: A Role for the Government as Insurer?* 36 *Ind. L. Rev.* 447, 449 (2003) (noting that “essence of insurance is risk pooling and diversification, so that aggregate losses become predictable and insurers” can be confident that premiums plus income will cover loss payouts plus expenses).

¹⁹⁷ See Gron & Sykes, *supra* note 196, at 455 (noting that insurance policies typically do not cover damages caused by war because associated risks are too highly correlated); George L. Priest, *The Current Insurance Crisis and Modern Tort Reform*, 59 *Yale L.J.* 1521, 1539-40 (1987) (explaining fundamentals of insurance and imperative that covered risks be uncorrelated).

¹⁹⁸ See David B. Kahn & Gary S. Lawson, *Who’s the Boss? Controlling Auditor Incentives Through Random Selection*, 53 *Emory L.J.* 391, 428-29 (2004) (arguing that financial misstatement risk is correlated since lawsuits are more likely during recessions).

These catastrophes do not satisfy the pooling and diversification model because losses are highly correlated across policyholders.¹⁹⁹

In general, when losses associated with an event will tend to be highly correlated across policyholders---as with acts of war and perhaps certain high-risk audits---rational insurers using pooling and diversification strategies will shun them.²⁰⁰ Those offering the insurance will charge extraordinarily large premiums for doing so, which will be unappealing to the marketplace when premiums exceed a policy's expected value. The upshot: Some losses are uninsurable.²⁰¹

Recently, auditors have self-insured,²⁰² which is often a signal that related risks are uninsurable. However, Professor Talley's analysis suggests that this is not a good explanation for current self-insurance practice in the auditing industry. Professor Talley's frequency method generates out-of-sample predictions that provide a basis for assessing whether the data support the conclusion that the risks are uninsurable.²⁰³ Is the right-tail risk so thick that it cannot be diversified through third-party liability insurance markets? The data do not support this conclusion: Allowing that liability risk plays some role in the audit firm's decision substantially to self-insure these risks, Professor Talley concludes that other factors play a role, including agency costs and adverse selection.²⁰⁴

These points lead to the second problem that arises when liability insurance is used in auditing---which also afflicts self-

¹⁹⁹ Gron & Sykes, *supra* note 196, at 455.

²⁰⁰ *Id.*

²⁰¹ *Id.* ("Some potential losses are so catastrophic and non-diversifiable that no insurer will insure them for a price that customers will pay.")

²⁰² See *supra* note 106.

²⁰³ Professor Talley explains his conceptualization of liability risk as solely exogenous in order to assess "whether observed exposure events characterize the types of risk that theory would predict to be uninsurable." Talley, *supra* note 1, at 5.

²⁰⁴ *Id.* at 4. Nor can the possibility be ruled out that the current auditor insurance market is experiencing a transitory coverage shortage. See Gron & Sykes, *supra* note 195, at 451--55.

insuring by the auditing industry. Both liability insurance and self-insurance pose a similar problem for auditing by relying upon general actuarial models of risk pooling and diversification.²⁰⁵ Those actuarial models imply, wrongly under my analysis in Part I,²⁰⁶ that auditors lack the ability to influence audit quality, financial statement reliability, or legal liability. Instead, audits and audit risk are treated like earthquakes and floods. But unlike earthquakes and floods, audits and audit risk are susceptible to human control. Based on these faulty models, the E&O market and self-insurance currently operate off an inferior baseline of risk pooling and diversification. Thus, a superior approach would be tailored to particular audit engagements.

This conclusion invites another lesson from complexity theory. Contexts where casualty or liability insurance is unavailable may resemble a power law function in complexity theory.²⁰⁷ Power laws tend to exhibit large variances (even potentially infinite variance). For such distributions, insurance premiums may be higher than for conventional statistical distributions.²⁰⁸ But risk management, including through insurance, is critical for systems bearing significant social import, including the audit function's role as the gateway to capital formation and allocation. This means that the issue is less one of distributing risk using pooling and diversification and more one of allocating risk to their particular probable sources---particular audit engagements.

B. *Financial Statement Insurance*

To summarize the concept of financial statement insurance, (1) companies buy insurance policies for a given premium and coverage mix, based on a preliminary insurer investigation, yielding a financial statement reliability index that is informative in ways that the opaque

²⁰⁵ It is as if, qua the Audit Industry RTR Model, the risks are fortuitous or random.

²⁰⁶ See supra notes 68--84 and accompanying text.

²⁰⁷ See supra notes 135--137 and accompanying text.

²⁰⁸ Farber, supra note 160, at 170--71.

monotonic three-paragraph audit report is not; (2) the insurer engages and pays an auditor to conduct a full audit, making the auditor beholden to insurers, not clients; and (3) financial misstatements yield policy payouts up to the pre-determined policy coverage level. In addition to essentially refashioning the auditing industry by installing the insurance industry as a force, FSI contributes several structural advantages and potential competitive benefits.

1. Structural Advantages --- First, conventional wisdom sees the conflict of interest that arises when clients pay auditors as an unavoidable fact of life.²⁰⁹ It is not. With FSI, companies buy insurance policies and insurers hire and pay auditors to perform audits, making the auditor's boss insurers, not management or audit committees. Following the proverb *whose bread I eat, his song I sing*, when auditors are paid by insurers rather than those they audit, audit quality should improve. Auditors would boast stronger reputations as watchdogs with attendant deterrent effect and would wield greater power to pressure managers when necessary to apply accounting policies promoting more reliable financial statements. These effects would support the conservative and strategic approaches that complexity theory endorses for improving traditional audit practice and its audit risk model.²¹⁰

Second, conventional auditing results in the monotonic three-paragraph audit report which provides no comparative or statistical information about financial statement reliability.²¹¹ Except in the unusual cases when auditors provide qualified or adverse opinions, all audit reports say exactly the same thing. With FSI, insurers gauge financial statement reliability and reflect this in the policy premium they charge a *particular* company for a *particular* level of coverage. This premium-coverage mix creates a transparent financial statement reliability index providing financial statement users with specific,

²⁰⁹ See, e.g., Darin Bartholomew, *Is Silence Golden When It Comes to Auditing?*, 36 J. Marshall L. Rev. 57, 89--90 (2002); Norman Bowie, *Accountants, Full Disclosure, and Conflicts of Interest*, 5 Bus. & Prof. Ethics J. 60, 68 (1986); Dale R. Rietberg, *Note, Auditor Changes and Opinion Shopping---A Proposed Solution*, 22 U. Mich. J.L. Reform 211, 213--14 (1988).

²¹⁰ See supra notes 155--166 and accompanying text.

²¹¹ See supra text accompanying note 165.

digestible public information about the quality of a company's financial reporting. It implements the concepts of worst case analysis and graded financial statements.²¹²

Third, by insuring financial statements instead of auditors, the FSI risk model is based on specific information, not inference from abstract generalities. It eliminates concern about whether right-tail risk renders auditors uninsurable. Instead of using pooled-risk and diversification models, FSI's risk model is based upon investigation, including the audit. Most insurance underwriting exercises involve classifying risks using general actuarial tools rather than specific investigation. FSI does the opposite.

FSI is thus akin to title insurance, not liability or casualty insurance.²¹³ Title insurance is unusual among insurance lines in that a substantial portion of premiums are dedicated to investigation, not to expected payouts and profits.²¹⁴ The central activities in assessing risk are specific investigations of property and transaction character, including research on filings, surveys, zonings, and permits; they are not based on pooled and diversified actuarial probabilities netted out.²¹⁵ This approach to insurance is infeasible for most lines, but is the essence of both title insurance and FSI.²¹⁶

²¹² See supra notes 179--189 and accompanying text.

²¹³ Title insurance is coverage concerning risks of defects in legal title to real property. Robert H. Jerry, II, *Understanding Insurance Law* 48 (3d ed. 2002). Home sellers represent ownership of title to buyers and, when transferring their interest, provide buyers title insurance policies backstopping this representation. If the seller breaches this representation, the insurer defends the buyer's claim of title against third parties and pays the buyer's damages arising from the third party's successful assertion against the buyer's title. *Id.* at 48--49.

²¹⁴ See James L. Gosdin, *Title Insurance: A Comprehensive Overview* 1 (2d ed. 2000) ("[A] substantial part of title insurance cost generally [is] allocated to search, evaluation/examination, or clearing underwriting objections.").

²¹⁵ *Id.* at 2.

²¹⁶ Costs make specific investigation infeasible for most insurance lines. FSI costs would not be greater than current auditing practice costs. FSI-based auditing likely would be even more cost-effective than traditional auditing exercises. See Alex Dontoh, Joshua Ronen & Bharat Sarath, *Financial Statements Insurance* (Aug. 2, 2005) (unpublished manuscript, on file with *the *Columbia Law Review*) (providing formal proof of FSI's relative efficiency).

To illustrate further, consider how FSI resembles other new insurance products that operate similarly to title insurance rather than to liability or casualty insurance. Some involve a professional's opinion based on investigation that is, in turn, backed by insurance. In tax opinion insurance, for example, a tax lawyer evaluates the tax treatment of a proposed transaction;²¹⁷ in fiduciary audit insurance, an ERISA lawyer evaluates an ERISA plan's compliance with law and company policy.²¹⁸ Another example is representations and warranties insurance, increasingly used in private mergers and acquisitions.²¹⁹ A seller represents that its financial statements fairly present its performance and condition in conformity with GAAP; an insurer engages an auditor to review the statements and backs the representation with insurance.

FSI's affinity with these nonliability insurance products renders the analysis applicable to E&O insurance or self-insurance inapt to FSI. Whatever the reasons for widespread audit industry self-insurance---inability to pool and diversify the risk or other forms of market failure---they do not carry over to FSI. After all, neither E&O insurance nor even self-insurance bears any relation to particular audit quality. But audit effectiveness and auditors' reputations with management bear directly on financial statement reliability and, under FSI, auditor examination and reports are integral monitoring functions.

FSI also provides monitoring incentives on insurers that differ from those insurers face when underwriting auditor E&O liability insurance. In the latter case, umbrella policies cover a broad range of

²¹⁷ See Kenneth A. Gary, *New Opportunity for Tax Lawyers: Insuring Tax Transactions*, 104 *Tax Notes* 26 (2004) (discussing proliferation of tax insurance); Kyle D. Logue, *Tax Law Uncertainty and the Role of Tax Insurance*, 25 *Va. Tax L. Rev.* 339 (2005) (analyzing normative appeal of tax insurance in context of characteristics of tax code).

²¹⁸ See Jeffrey D. Mamorsky & Terry L. Moore, *Greenberg Traurig LLP, Fiduciary Audit Insurance: Risk Management for Post-Enron ERISA Compliance*, *GT Alert*, June 2002, at 4, available at http://www.gtlaw.com/pub/alerts/2002/mamorskyj_06a.asp (summarizing terms of audit as condition to insurance eligibility).

²¹⁹ See Darian M. Ibrahim, *The Unique Benefits of Treating Personal Goodwill as Property in Corporate Acquisitions*, 30 *Del. J. Corp. L.* 1, 41--42 (2005); Dale A. Oesterle, *The Law of Mergers and Acquisitions* 289 (2d ed. 2002).

auditor activities, including all audit engagements. For FSI, each policy is tailored to a particular audit engagement with associated risk, premium, coverage, and other tailored policy terms.²²⁰ With FSI, specific financial statements may be uninsurable, but not the entire auditing industry.²²¹

2. Promoting Competition --- In addition to the foregoing structural advantages that FSI offers, FSI likely would improve competition in the auditing industry. Liability risk and high insurance costs constitute barriers to entry to otherwise potentially viable competitors of the four large firms.²²² High E&O costs may be due to the fact that policies are insuring the auditor, based on pooling and diversification models that implicitly assume no or limited auditor ability to influence audit quality, financial statement reliability, and risk of audit failure. But once auditors' abilities are recognized, a different model of backstopping the opinions emerges. Tailored to the individual audit and specific financial statements, FSI should reduce some barriers to entry that smaller firms otherwise face from limitations on existing insurance markets.

FSI insurers entering the current environment would begin by engaging auditors from the existing population of firms. So, for example, AIG could hire Deloitte & Touche to audit Procter & Gamble; and Chubb could hire Grant Thornton to audit Bojangles, the mid-cap regional restaurant chain. The large four firms could, in theory, maintain all existing work assignments, and the FSI insurers could continue to hire the smaller firms to audit the minority of public companies they currently audit. Ensuing dynamics could change this allocation of assignments, however, and ignite competition among audit service providers that should increase the

²²⁰ Criticisms of existing auditor limitations, see Joseph A. Grundfest, Punctuated Equilibria in the Evolution of United States Securities Regulation, 8 *Stan. J.L. Bus. & Fin.* 1, 7 (2002), are not transplantable as criticisms of FSI.

²²¹ A condition to the issuance of an FSI policy is the production of an unqualified audit report. See Cunningham, *Choosing Gatekeepers*, supra note 192, at 432--37. Enterprises unable to obtain mandatory financial statement insurance cannot issue financial statements and would not be eligible to access public markets that require such financial statements.

²²² See supra text accompanying notes 101—104.

number of alternatives available to FSI insurers beyond the current crop.

Barriers of scale and expertise could persist. FSI's effects on these would depend on how FSI influences the related insurance industry structure. FSI insurers could assemble in-house audit teams or establish a network of captive audit firms along the lines of the captive law firms that insurers currently use to provide insurance defense work. If the resulting units generate the scale and expertise to audit public companies, then FSI insurers would provide competition directly to the current oligopoly. After all, there are many more insurers capable of underwriting FSI than audit firms capable of auditing large public companies,²²³ and they operate in a highly competitive industry unlike the current auditing industry.²²⁴ Prospects for overcoming barriers of scale and expertise seem more likely in that market environment than in the current auditing market.

C. Comparison and Imperfections

FSI compares favorably to the current environment. FSI also has its share of imperfections. The following summarizes the comparisons and imperfections before concluding.

1. *Recent Reforms.* --- Recent reforms do not achieve any of the objectives stated in the previous section. The Sarbanes-Oxley Act and PCAOB address auditor independence by putting supervisory authority in the hands of board audit committees rather than in managers, restricting non-audit services, and enhancing regulatory oversight.²²⁵ These reforms may reduce audit failure, but

²²³ The number of insurers offering E&O insurance to auditors has declined in recent years from more than 100 to around ten. The Future of Auditing: Called to Account, supra note 12, at * (quoting Ernst & Young partner: "Ten years ago, there were 150 commercial insurers providing indemnity to the major auditors [and] now there are ten.").

²²⁴ Among household names in the property/casualty insurance sector are the following companies: AIG, Berkshire Hathaway, State Farm, Allstate, Hartford, St. Paul, Nationwide, Liberty Mutual, Loews, Progressive, Chubb, USAA, Greenworth Financial, and Fidelity National. Top Twenty U.S. Property/Casualty Companies by Revenues, 2005, at <http://www.iii.org/media/facts/statsbyissue/industry> (last visited Aug. 8, 2006) (on file with the *Columbia Law Review*).

²²⁵ See supra text accompanying notes 41--43.

companies are still paying the auditor. Worse, auditor independence standards may reduce the ability of small firms to compete and increase a sense among the large four firms that they are too big to fail. No reform offers a financial statement reliability index.

A leading academic proposal reinforces FSI's appeal: Some advocate strict auditor liability by establishing an ex ante damages formula intended to raise the stakes auditors face for audit failure.²²⁶ Proponents consciously attempt to make auditors act more like insurers, an effort that FSI completes. The debate concerning how to establish an appropriate damages formula also shows the difficulty in implementing such quasi-insurance models.²²⁷ FSI solves the damages measurement problem by using market-based policy coverage that establishes predetermined caps on total payouts.

2. *Continuing Limitations.* --- FSI is not perfect. While existing auditing market imperfections will endure or reappear in different forms, FSI will shrink the frequency of such manifestations. For example, under FSI, insurers and their auditors have incentives to detect and correct discovered irregularities in any given year's audit.²²⁸ But they may be tempted to suppress discoveries made in later years covered by a previously issued policy. Yet auditors face such temptations under the existing system, and FSI's capacity to improve audit effectiveness, produce transparent worst case scenarios, and lower barriers to entry should all make this situation arise less frequently.²²⁹

²²⁶ See, e.g., Frank Partnoy, *Strict Liability for Gatekeepers: A Reply to Professor Coffee*, 84 *B.U. L. Rev.* 365, 375 (2004) [hereinafter Partnoy, *Strict Liability*].

²²⁷ Compare Coffee, *Gatekeeper Failure*, supra note 5, at 346--53 (prescribing damages measured as multiple of audit-engagement revenues to minimize risk of large awards inducing large firm exits by bankruptcy), with Partnoy, *Strict Liability*, supra note 226, at 373--74 (contending that damages measured as percentage of total losses would not pose meaningful bankruptcy risks). See generally Donald C. Langevoort, *Capping Damages for Open-Market Securities Fraud*, 38 *Ariz. L. Rev.* 639 (1996) (reviewing literature and law to evaluate potentially appropriate types of liability caps and damages formulae in non-privately federal securities fraud cases).

²²⁸ See John C. Coffee, Jr., *Gatekeepers: The Professions and Corporate Governance* 340--43 (2006).

²²⁹ See Cunningham, *Choosing Gatekeepers*, supra note 192, at 436--37.

Another imperfection is skimming, the risk of a race to the bottom among insurers to increase premium volume by offering lenient audits. Again, kindred opinion shopping can occur in existing audit practice. Under FSI, even if insurers wish to engage in this practice, auditors would continue to face professional licensing and SEC constraints that should interfere with such efforts. Individual auditors continue to be licensed professionals with related personal assets and reputation at stake, and this should make them effective monitors---not only of management, but also of insurers.²³⁰

Conclusion

Suppose one of the large four audit firms faced imminent exit. How would the government likely respond? Given doubts about whether it would allow merger among two or more of them,²³¹ the federal government's decision not to pursue a criminal indictment against KPMG, and a sense among some auditors that their firms are too big to fail, what would the government likely do? Following a well-traveled path, there is a reasonable basis for concern that the government would intervene with financial support that would enable the firm to survive or offer funds to provide compensation or restitution to victims of audit failure.

But such alternatives are not appealing, in large part because of the moral hazard they reinforce and also because the government is likely not as good as private insurance markets at pricing risk or otherwise managing it.²³² And government intervention is not the only solution, even if E&O insurance for auditors is tight or unavailable. For example, a variety of financial instruments traded in capital markets increasingly are available to allocate risk of

²³⁰ FSI's limitations can be minimized in other ways too: For example, suppression can be minimized by imposing stiff penalties, and skimming can be stopped through various regulatory approaches to insurer oversight. See *id.*

²³¹ See *supra* text accompanying notes 58, 120.

²³² Cf. Gron & Sykes, *supra* note 196, at 461--63 (examining government insurance arrangements for terrorist attacks).

catastrophic loss from events such as terrorist attacks.²³³ Similar tools can be developed to address financial statement risk.²³⁴

Better yet would be to redesign the existing approach to backstopping audits using financial statement insurance to cover statements rather than auditors. As a credible alternative to the existing auditing industry structure, a mandatory FSI program signals to the large four audit firms that they are not too big to fail. This neutralizes the moral hazard of auditors thinking that they are too big to fail and provides a financial statement reliability index that is unattainable under the current practice that relies upon a monotonic three paragraph auditor report.

Finally, suppose that FSI is a second-best solution, compared to the existing auditing industry model. Ironically, the very threat of a credible alternative industry structure could support the existing structure---and improve current practice---by reducing the risk of audit firm exit and the corresponding market unraveling that might otherwise lead to imposing the alternative or more radical measures in the unreflective heat of crisis. Allowing Arthur Andersen to fail left four large firms exposed to serious moral hazard from too big to fail conceits. Creating a credible alternative to those four might just save the industry from self-destruction.

²³³ See *id.* at 457 (citing Christopher M. Lewis & Kevin C. Murdock, *Alternative Means of Redistributing Catastrophic Risk in a National Risk-Management System*, in *The Financing of Catastrophic Risk* 51, * (Kenneth A. Froot ed., 1999)); Rhee, *supra* note 15, at 508-09 (discussing mid-1990s catastrophe bond securitization transactions as way to transfer risk of natural catastrophes from insurance markets to capital markets).

²³⁴ Joshua Ronen, *Post-Enron Reform: Financial Statement Insurance and GAAP Revisited*, 8 *Stan. J.L. Bus. & Fin.* 39, 54-55 (2002) (explaining how insured losses under FSI or E&O insurance can be hedged in capital markets such that insurers are reinsuring portions of related risk of loss).