

Enterprise Risk Management

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February 5, 2008**

Enterprise Risk Management (ERM) Key Points

- Get paid for the risks you take
- Best solutions are unique to your company!

Current Case Study

- Societe Generale
 - \$7 billion lost
 - One low level trader
 - Common futures contracts
 - Covered up trades

ERM for Honest/Dishonest

- Honest
 - Focus on exposures
 - What ifs
 - Involve planning dept
 - Optimize results
- Dishonest
 - Focus on controls
 - What could
 - Run by Internal Audit
 - Limit downside

Definition

- Enterprise Risk Management
 - Casualty Actuarial Society, 2003
- “ERM is the process by which organizations in all industries assess, control, exploit, finance, and monitor risks from all sources for the purpose of increasing the organization’s short and long term value to its stakeholders.”

Key Elements of ERM

- Holistic approach to managing risks
 - Risk appetite
 - Common language
 - Common measurement (leading indicators)
 - Guiding policies and limits
 - Risk combinations
- Alternative – crisis management

Objectives of Risk Management

- Value added
- Knowledge
- Culture
- Compliance

Compliance

- COSO, Sarbanes-Oxley legislation, NAIC
 - Provide building blocks to add value
 - Limited financial value
 - Could easily be viewed as bureaucracy
- There must be more to ERM than this!
- COSO – Committee of Sponsoring Organizations
- NAIC – National Association of Insurance Commissioners

Culture

- Starts at the top and builds momentum
 - Alignment
 - Integrity – walk the walk
- Customer impact
- Pricing discipline
- Transparent/Proactive
- Share best practices

Knowledge

- Understand the risks taken
 - Transparency
- Risk
 - Accept risk where you have a competitive advantage (sometimes exploit)
 - Mitigate (e.g., hedging, reinsurance)
 - Avoid
 - Can't transfer risk, can only share it
- Iteratively develop/borrow best practices
- Be skeptical

Value Added

- Building blocks
- Determine risk appetite
- Prioritize risks and optimize risk/return profile
- Cross functional team
- Focus on balance sheet risks – manage across silos
 - Capital
 - Liquidity
 - Asset/Liability Management (interest rate risk)
 - Risk aggregation

Enterprise Level Constraints

- Align throughout firm
- Duration, liquidity, capital
- Publicize constraints
 - Everyone must pull in the same direction
- Determine company's risk appetite
 - Exposure triggers (yellow before red)
- Difference between ownership and measurement

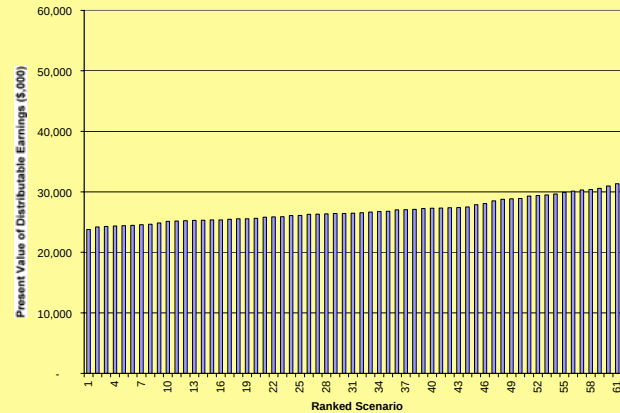
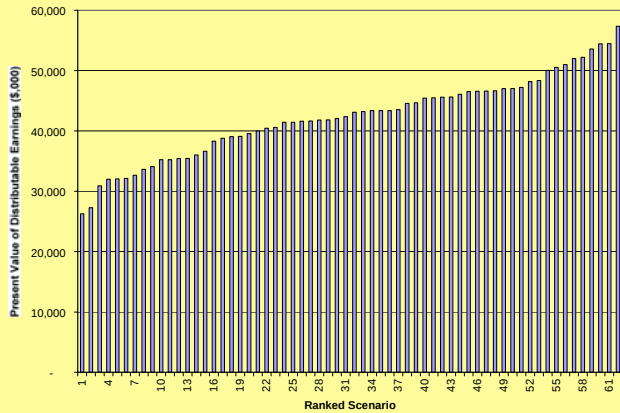
Risk Committee

- Key product officers from across the company
 - Aids succession planning by providing cross training
 - Builds team that is used to working together
- Chance for other experts to review in advance
 - Avoids some major mistakes
 - Checks and balances
 - Pricing discipline
 - Business units buy in
- Risks debated before accepted
 - Proactive

Tools

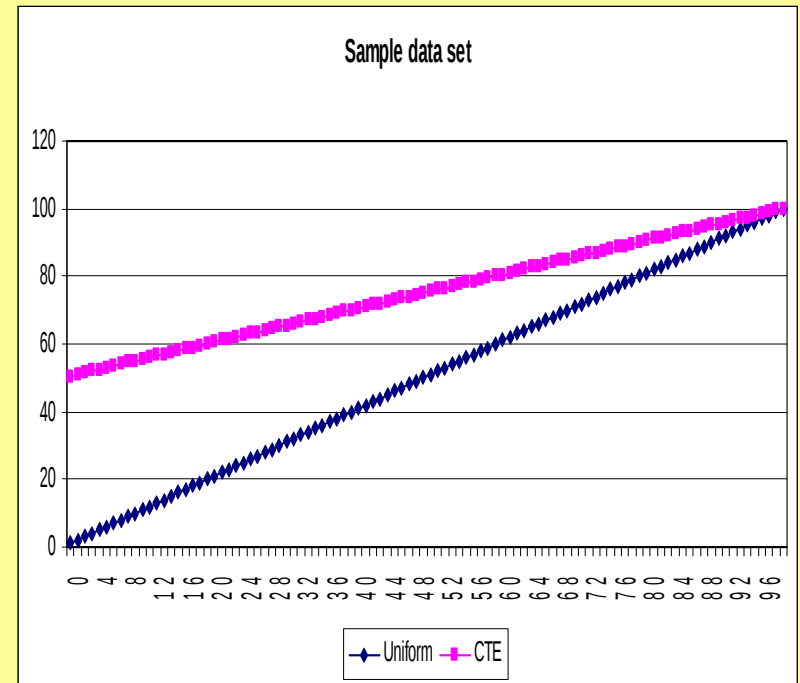
- Graphics/Distributions
- Value at Risk/Conditional Tail Expectation

Risk/Return Profile



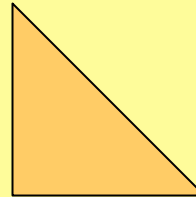
Statistical tools – VaR and CTE

- VaR
 - Value at Risk
 - used by banks
- CTE
 - Conditional Tail Expectation
 - used by insurers
- Graphics
 - Look at entire distribution
- Metric pros and cons



Balance of Risks

- Balanced firm



- Concentrated firm



Economic Capital Models

- Assumes major risks are independent
 - Diversification benefit
- Assumes correlation is constant
 - Copulas may get us past this constraint
- Assumes model risk is minimal
 - Limited data points
 - Complexity

Principles-Based Approaches and Enterprise Risk Management

- ...Use the same tools
- ...Leverage existing models
- ...Use stochastic results (sort/graph)
 - Pick a level of conservatism (CTE)
- ...Are built off cash flows
- ...Allow firms to choose risks to exploit

Practical Uses

- Marginal impact
 - Organic growth
 - Project (aging) current portfolio
 - Introduce new product
 - Reinsurance (with and without)
 - Asset mix
 - Acquisition

Scenario Planning

- Deterministic scenarios
 - Worried about specific event
 - What if once per century hurricane or pandemic
 - Modeling constraint
 - I don't know how to do it
 - Time constraint
 - I can't do it based on lengthy run time

Typical Insurance Scenarios

- Higher/lower (symmetric)
 - New money rates/Claims/Lapses/Sales
- Higher
 - Defaults/Expenses
- No reinsurance
 - Gross/Net (typical ERM view)

Scenario - Event Risk

- Tail risk/Catastrophic risk
- Example – Influenza pandemic
 - 25% morbidity, 0.6% mortality in OECD
- Risk to life insurer
 - Business continuity
 - Claims
 - Liquidity (assets down/claims up)
 - Counterparty (reinsurer solvency)

Qualitative/Quantitative

- Model Risk
 - Does the modeler understand the nuances of your business
- Can you explain your risks in 2 minutes?
- Why are you calculating Economic Capital?
 - Stakeholders
 - Should not be driver
 - Internal management
 - Make strategic/tactical strategy decisions

Don't reinvent the wheel!!!

- Leverage off of existing models
- Weigh run time vs. time spent to explain differences in the models
- Automate - spend time on analysis
- Control cycle - iterative improvement
- Consistency between pricing, projections, reporting

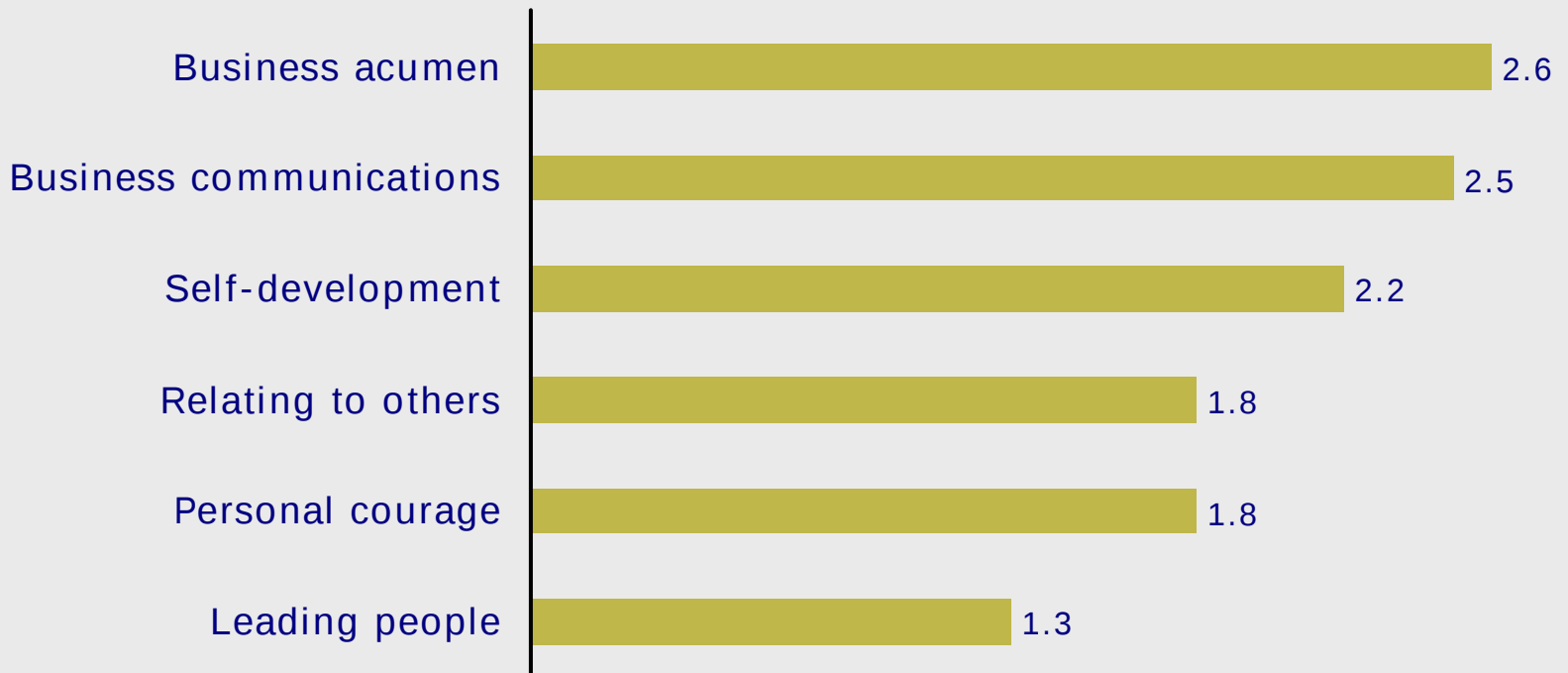
CERA: An ERM Credential

Environment has changed

- Previously
 - Actuaries held most senior executive positions
 - Rapid advancement of technical actuaries
 - Automatic promotions upon FSA / ASA
- Current
 - Pure technical skill not as critical for executives
 - Competition has increased
 - Gramm-Leach-Bliley Act of 1999
 - ERM / Chief Risk Officer (CRO)

Employers want executives with

Employer ranking of importance of business savvy skills



Source: 2002 SOA Market Opportunity Research, Leading Solutions Group

SOA launches CERA July 2007

- Expand opportunities
 - New roles in traditional markets
 - Non-traditional sectors

Chartered Enterprise Risk Analyst: 1st new credential since SOA inception in 1949

ASA Components

Economics

P – Probability

FM – Financial Mathematics

MFE – Models for Financial Economics

C – Construction of Actuarial Models

APC – Associateship Professionalism Course

Corporate Finance, Applied Statistics

MLC – Models for Life Contingencies

FAP – Fundamentals of Actuarial Practice
FAP – Modules (8)

FSA Components

Advanced Finance / ERM

Operational Risk Module

Track Exams (2)
Track Modules (2)

Decision Making and Communication Module

FAC – Fellowship Admission Course

[CERA]

KEY: Exam, Module, Course, Validation by Educational Experience

Global ERM Credential

The SOA would consider amending its CERA requirements to meet international standards.

Competitive Positioning

- Rigorous evaluation
 - Credentialing requirements
- Comprehensive
 - Actuarial approach to risk
 - Ability to apply skills to any risk-bearing enterprise
- Professional
 - Ethical code
 - Professional standards
 - Disciplinary process
 - Education requirements

Marketing campaign

Target Market	Completed	Planned
College students; academic counselors	Direct mail: 23,000+	College Outreach Plan
SOA candidates, ASAs, FSAs	•SOA/CIA publication •SOA events •Direct mail: 13,000	Additional promotions
Holders of other actuarial designations and other risk-related credentials		Partnering with other organizations
Employers / Recruiters		(in-planning)
Media	Interactive press kit to 90+ media outlets	Desk-side interviews

CERA
The International Credential for Enterprise Risk Analysts
ceranalyst.org

[Overview](#)

[Benefits](#)

[Eligibility](#)

[Requirements](#)

[Resources](#)

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Do you want to use your quantitative strengths to bring technical sophistication to a rapidly emerging specialty?

[View the CERA press kit.](#)



Risk Management Has a New Face: Chartered Enterprise Risk Analyst

Risk Management Has a New Face: The Chartered Enterprise Risk Analyst, a new international credential encompassing the most comprehensive and rigorous demonstration available of enterprise risk management. CERAs possess the unique ability to anticipate, identify, quantify and optimize risk to bring about creative solutions to complex financial challenges facing business and society.

The CERA credential was developed in response to the business world's increasing reliance on professionals who are best equipped to convert risk into opportunity. CERAs don't merely speak to what we can lose; they focus on what we can gain.

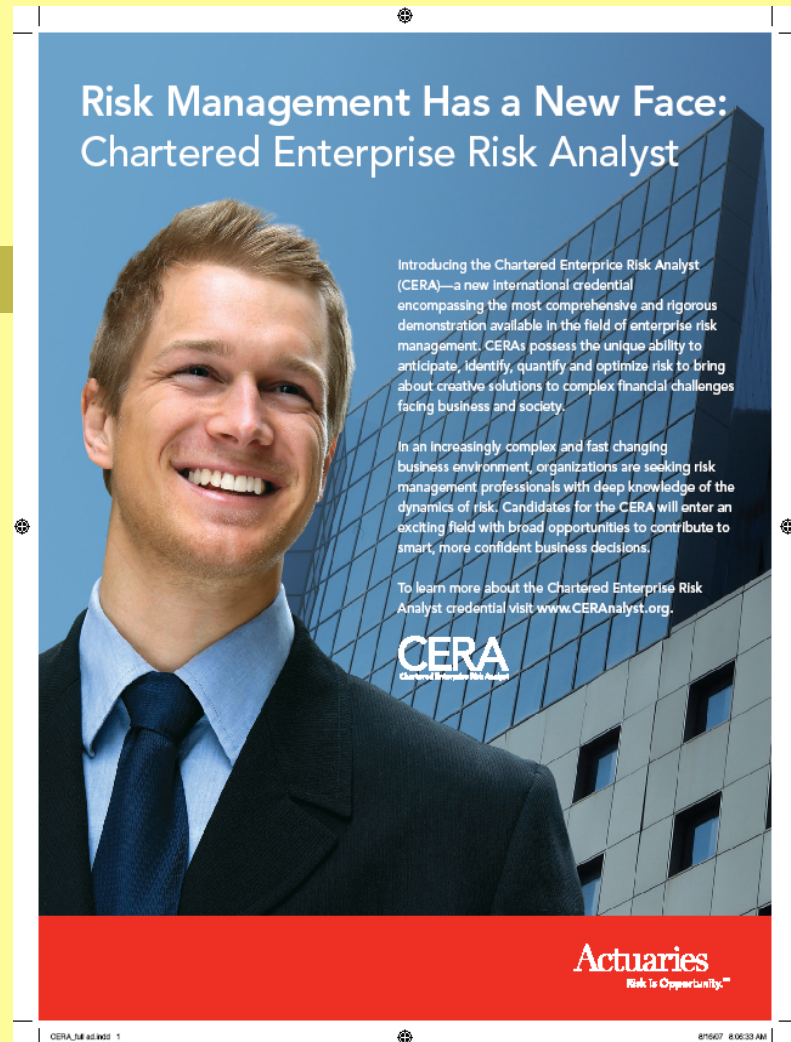
Actuaries
Risk is Opportunity.™

Selected CERA messages

- *“CERAs are trained to have a forward-looking, comprehensive approach to enable smart, more confident business decisions”*
- *“CERAs provide real world solutions to the complex financial challenges facing businesses and society”*
- *“CERAs are trained to apply both qualitative and quantitative insights into risk management”*
- *“CERAs don't merely speak to what we can lose; they focus on what we can gain”*

Advertising

- *The Actuary* (SOA).
- *Beyond Risk* (CIA).
- *Contingencies* (AAA)



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In an increasingly complex and fast changing business environment, organizations are seeking risk management professionals with deep knowledge of the dynamics of risk. Candidates for the CERA will enter an exciting field with broad opportunities to contribute to smart, more confident business decisions.

To learn more about the Chartered Enterprise Risk Analyst credential visit www.CERAnalyst.org.

CERA
Chartered Enterprise Risk Analyst

Actuaries
Risk is Opportunity.™

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Supply

- 92 CERAs
 - Most via syllabus requirements
 - 20+ via thought leaders pathway
 - 0 via experienced practitioner pathway
 - 1st seminar April 2008
 - Applications now being accepted
 - Please email cera@soa.org for more information

Demand

- Markets
 - Insurance companies
 - Broader financial services companies
 - Consulting firms
- Positions
 - CRO
 - ERM department staff

Some companies are starting to request CERA designation in their ERM position descriptions

Break

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Emerging Risks

- Financial
 - Sub prime
 - Municipal insurers
 - Commercial Mortgages
 - Others?

Catastrophic Risks

- RMS
 - Anthrax in Chicago
 - Trains in Chicago
 - New York City - water

Other Risks

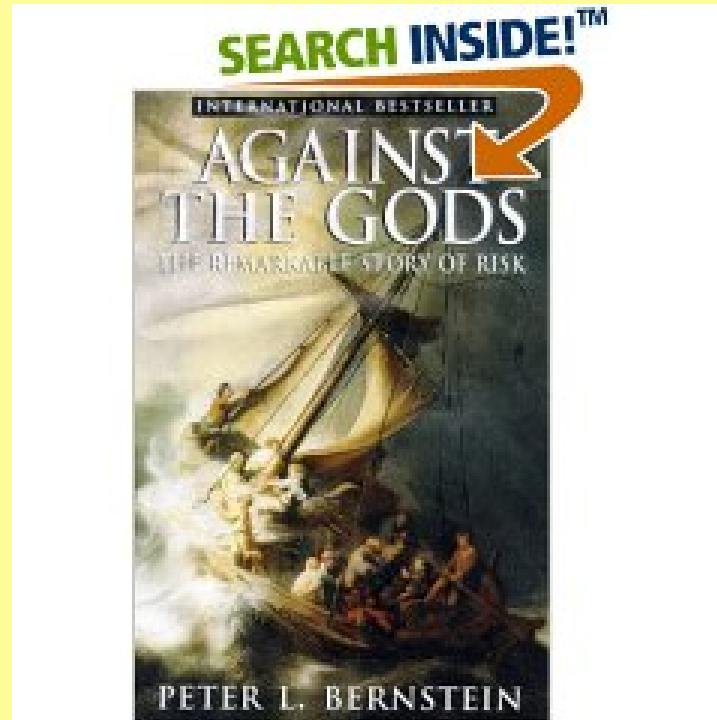
- Political assassinations

Financial Risk Management Failures

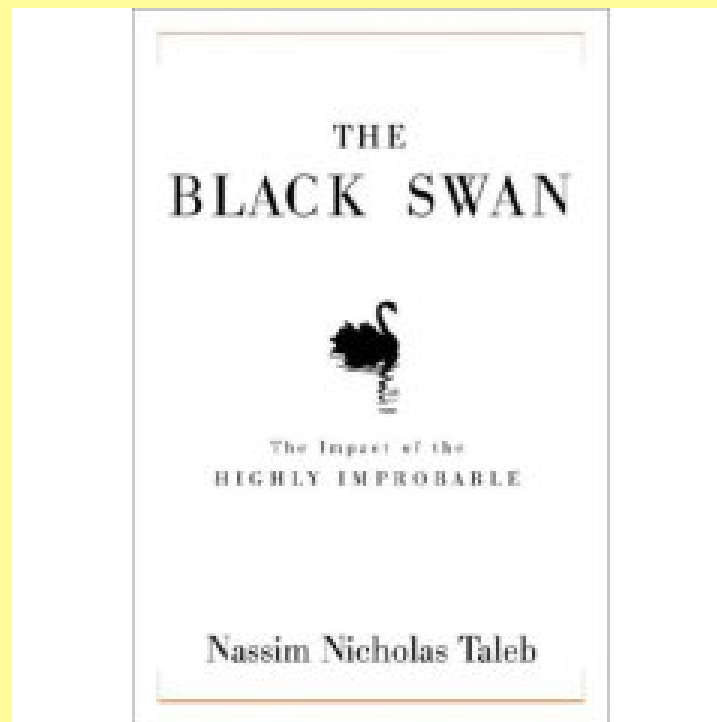
- 1973: Equity Funding Fraud**
- 1983: Baldwin United Shell Game**
- 1984: Continental Illinois Bank Run**
- 1986: The ZZZ Best Carpet Scandal.**
- 1988: Equitable (NY) GIC losses.**
- 1989: The US S&L Crisis.**
- 1991: Salomon Brothers Bond Scandal.**
- 1991: BCCI Scandal.**
- 1991: Executive Life / First Capital Life Junked**
- 1991: Mutual Benefit Liquidity Squeeze**
- 1991 – 1996: Lloyd's Asbestos Liabilities**
- 1994 – 2002: Japanese Real Estate & Banking**
- 1994: Orange County Default**
- 1994: Kidder Peabody Fiasco.**
- 1994: Confederation Life Failure**
- 1994: Monarch Life Seizure**
- 1995: The Barings Derivatives Scandal.**
- 1996: Sumitomo Copper Scandal.**
- 1997: The Natwest Hole.**
- 1997: The Bre-X Mining Scandal.**
- 1997: Smith Barney Investor Fraud.**
- 1997: Bank of Tokyo-Mitsubishi Derivatives Loss.**
- 1997: UBS Derivatives Model Problems.**
- 1997: Prudential Insurance US Market Conduct**
- 1997: Nissan Mutual ALM Failure**
- 1998: Griffin Trading Bond Futures losses.**
- 1998: Russian Bond Debacle.**
- 1998: The LTCM Risk Model Failure.**
- 1998: Asian Economic Flu Crisis**
- 1999: Toho Mutual & Daihyaju Mutual**
- 1999: General American Liquidity Failure**
- 1999: Korea Life ALM Losses & Failure**
- 1999: Unicover Fiasco**
- 2000: Equitable UK Pension guarantees**
- 2001: American Express CBO Losses**
- 2001: World Trade Center**
- 2002: Enron & Worldcom**
- 2002: Conseco chokes on Green Tree**
- 2002: HHH Surprise**
- 2002: Amer Skandia VA problems**
- 2003: Parmalat Accounting Scandal**
- 2003: Allmerica VA reserving**
- 2003: Annuity & Life Re Overgrowth**
- 2004: Marsh Contingent Commissions**
- 2005: AIG Finite Re**
- 2006: Scottish Re Tax Asset**
- 2006: Hurricane Katrina**
- 2007: Bear Stearns/Countrywide/??? Sub Primes**

Book Recommendations

Peter Bernstein



Nassim Taleb



CATASTROPIC LOSSES AND “THE BLACK SWAN”

- The Black Swan: The Impact of the Highly Improbable
 - By Nassim Nicholas Taleb
- Mediocristan and Extremistan
- Health and Accident Mortality belong in Mediocristan
- Catastrophic events belong in Extremistan
- Biggest problem is that the data aren't any good for predicting the future.

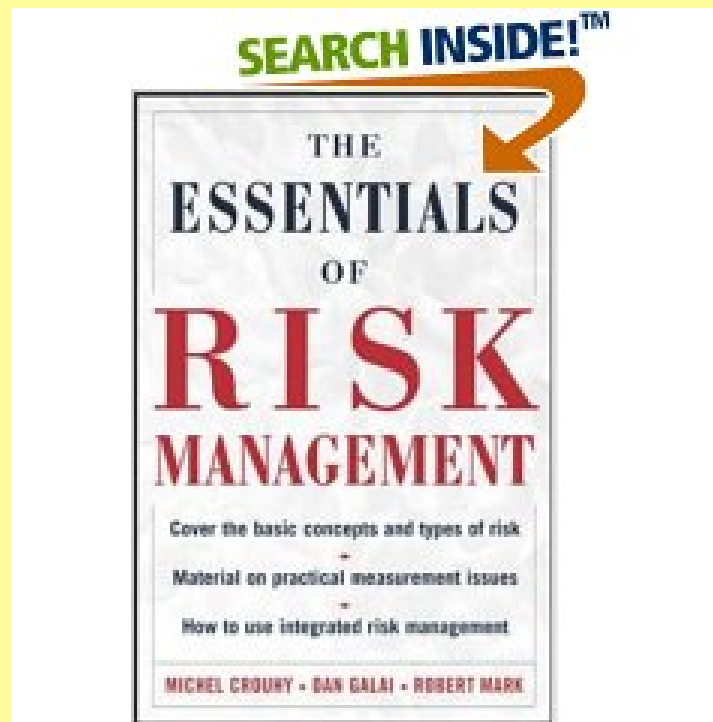
WHAT COULD POSSIBLE GO WRONG?

- Plane Crash ~250 deaths
- Small Pandemic ~800 death from SARS in 2003
- Small Natural Disaster ~2000 Dead from Katrina
- Terrorism ~3000 WTC Dead
- Nuclear Accident 56 plus ~4000 – 100,000 in Chernobyl
- Large Natural Disaster Christmas Tsunami killed ~10,000 in Sri Lanka
- Industrial Accident ~20,000 killed by Union Carbide in Bhopal, India

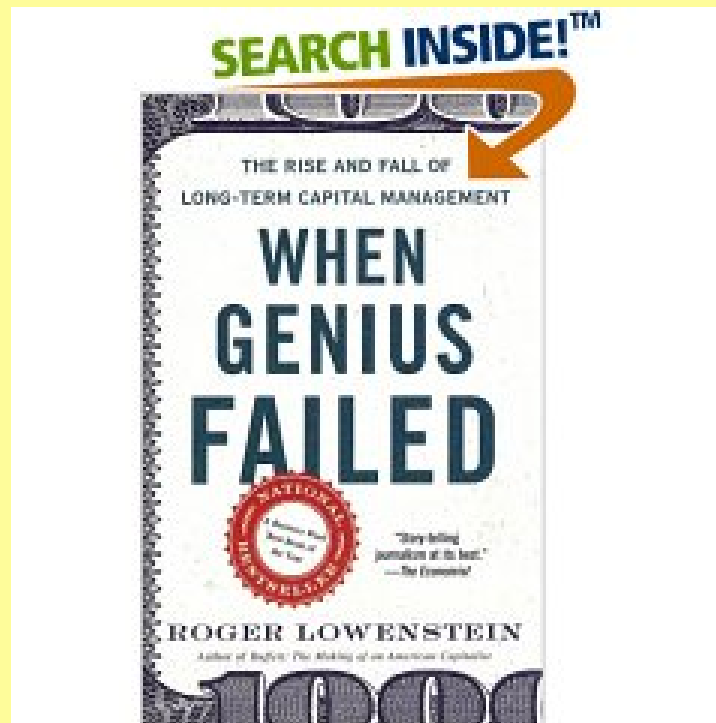
WHAT COULD POSSIBLE GO WRONG?

- Gigantic Natural Disaster: an Isle of Man-sized chunk could fall of Canary Islands
Tsunami
- Major War
 - WWII 40 – 70 million
 - Vietnam 2.5 – 5 million
- Famine
 - Russian 6-8 million 1932
 - Chinese 20-40 million 1960
- Spanish flu 20-40 million 1918
- Asteroid (Extinction?)
- Yellowstone eruption
- California levees

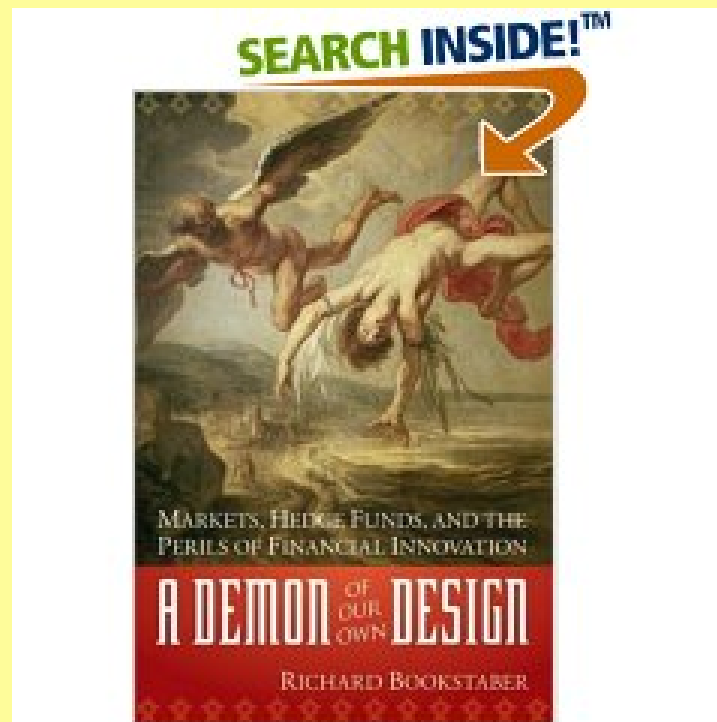
Michel Crouhy, Dan Galai, Bob Mark



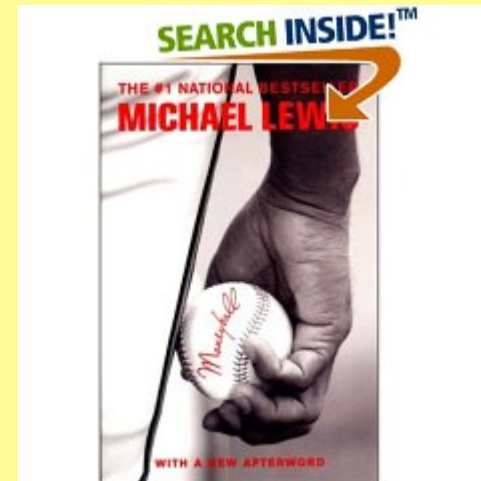
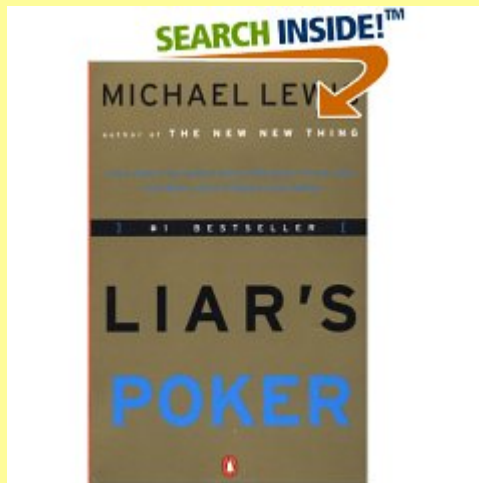
Roger Lowenstein



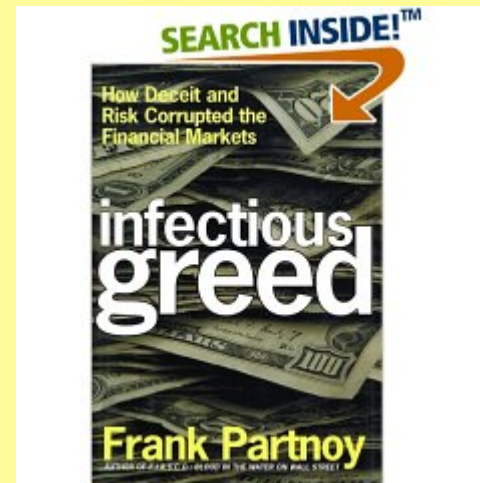
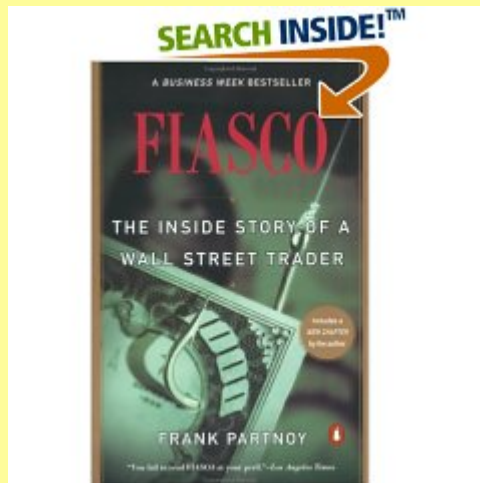
Richard Bookstaber



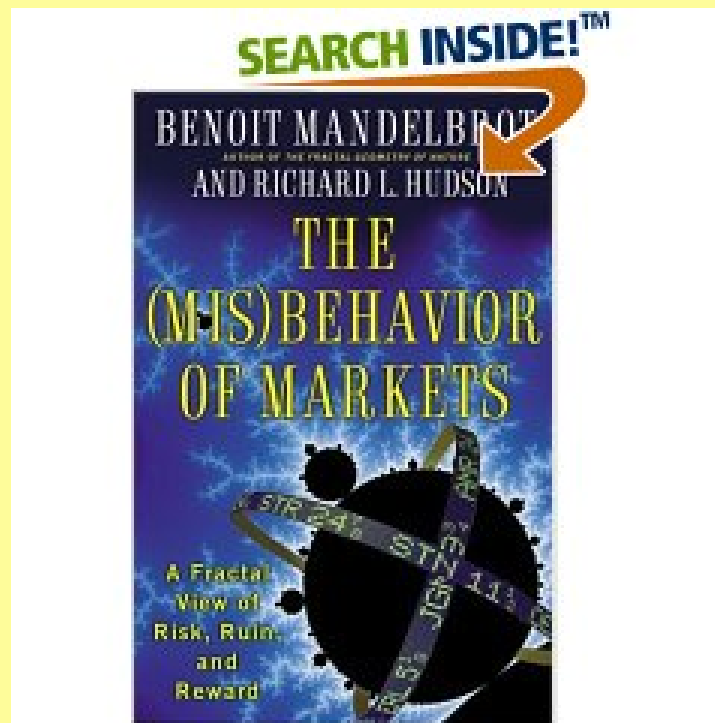
Michael Lewis



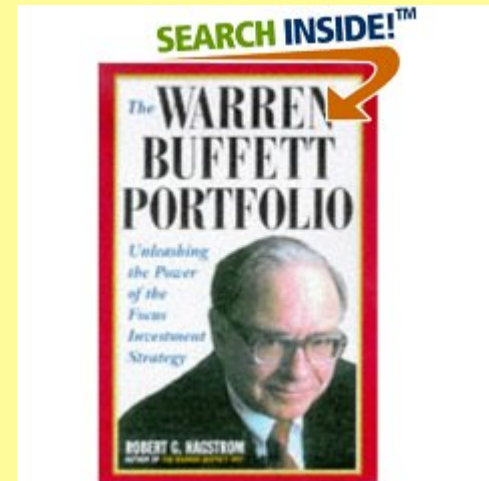
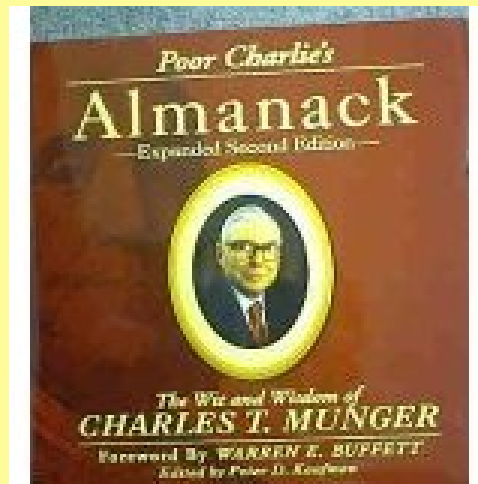
Frank Partnoy



Benoit Mandelbrot



Berkshire Hathaway



Thank you!

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