

Risk and the Economy
14th and 15th March, 2010

The Policy Maker's Tale

Stress testing policy and strategy proposals for extreme events – hope for the best, plan for the worst

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www.stat.unc.edu/faculty/rsmith.html

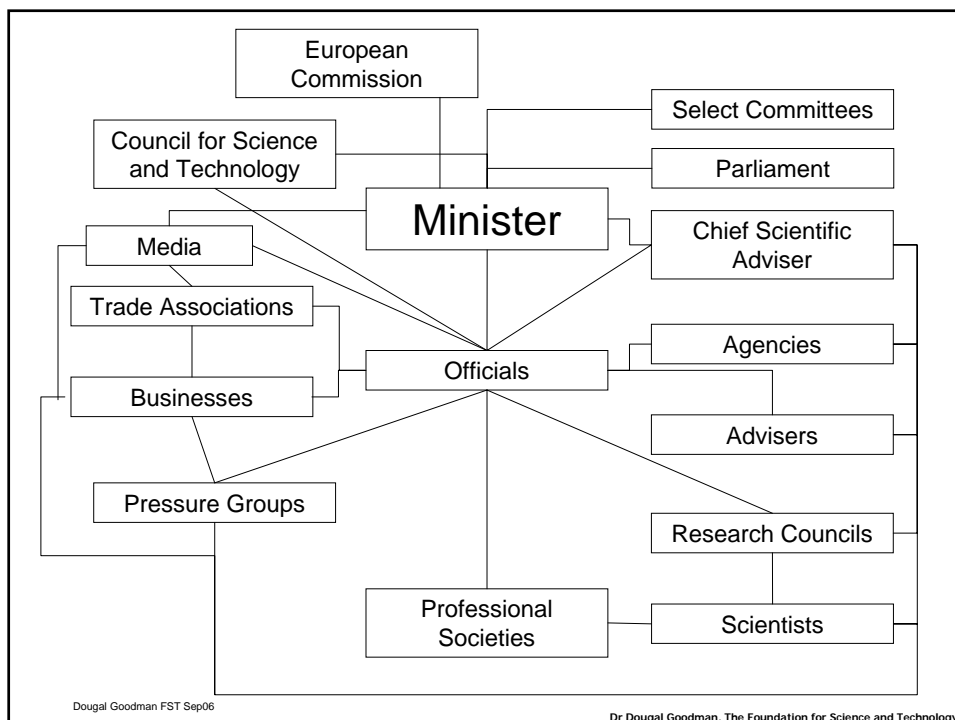
www.math.ethz.ch/~embrechts/

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John Kay – Obliquity, 2010, Profile Books

Like many economists we believed that if our models did not describe the world, the fault lay with the world, not the model. But it isn't just economists that make that mistake. Politicians, investors, bankers and business people believe that although they don't solve problems according to a standard model of rational decision making, they ought to. So they pretend that they do – to others, and perhaps to themselves.

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Resilience

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Deep downsides – only some can be quantified

- Sudden product price or margin fall
- Customers do not pay for goods or services
- Liability claim
- Loss of trust of employees
- Outrage of the public
- Projects fail to complete on time and within budget
- Business interruption from natural catastrophes
- Fire or explosion at a facility
- Fraud, accounting or trading failure
- Collapse of a supplier
- Regulatory or tax step change
- and so on...

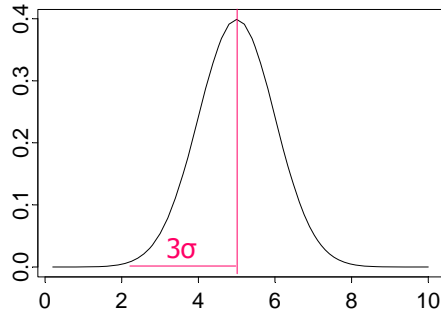
Risk level controlled by elimination, management or transfer

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THE TAIL

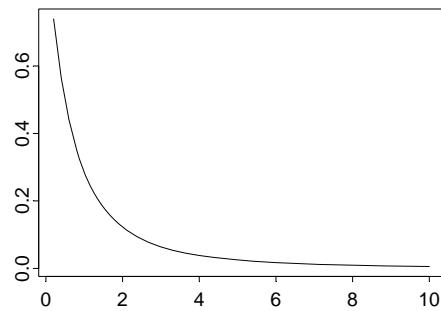
Gaussian

Mean of 5, standard deviation 1



Generalised Pareto

Shape parameter is 0.6, beta is 1



Break out of thinking that all distributions are normal distributions.

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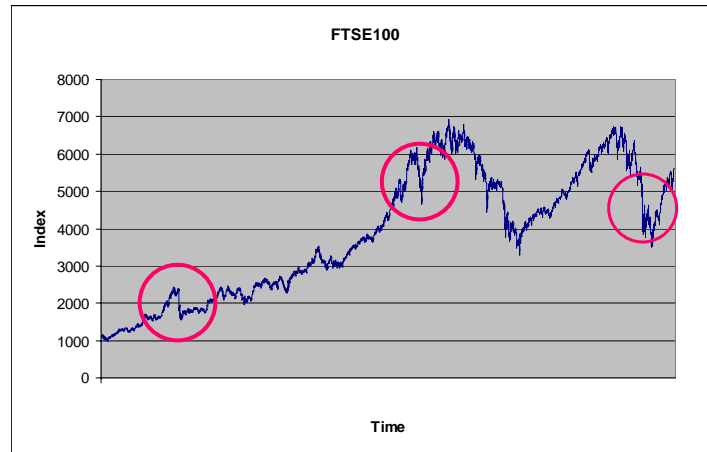
Loss of Trust

Markets depend on trust
between people

People are not always rational

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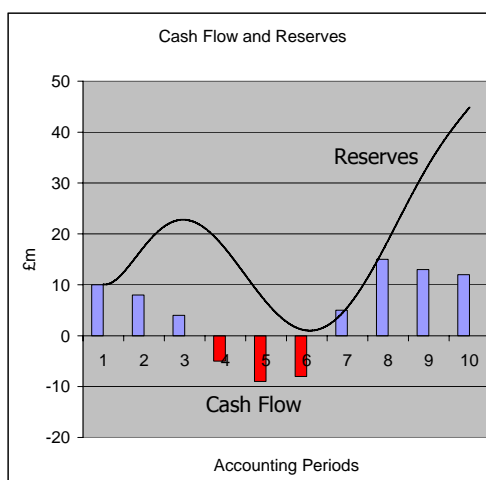
FTSE 100 – Steady growth or decline with occasional abrupt falls – extreme events



2 April 1984 to present

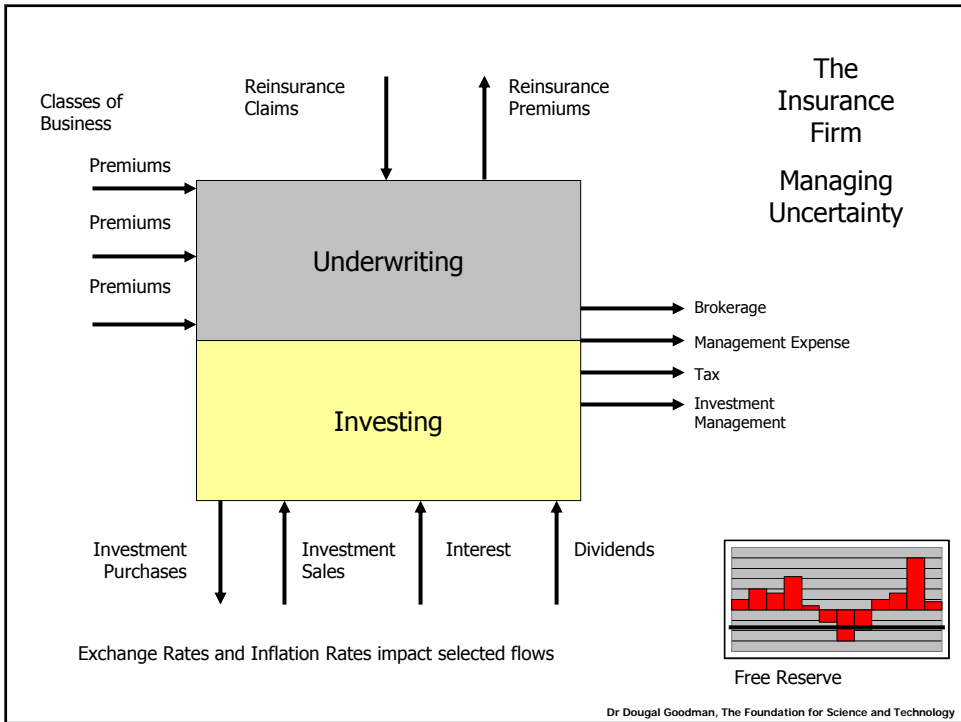
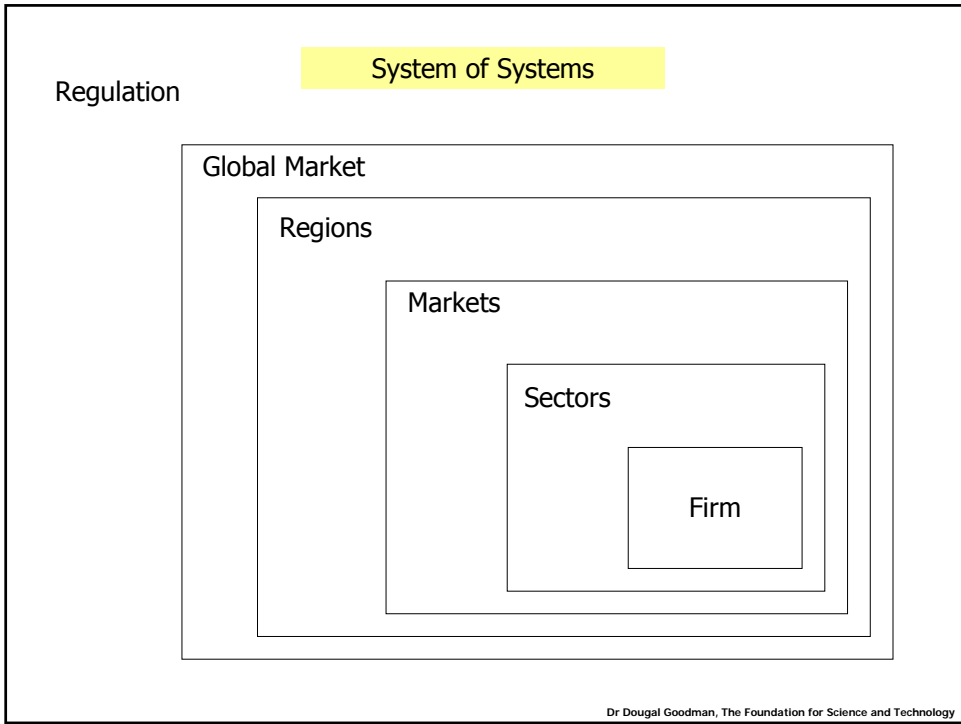
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Risk of ruin



Boards should manage businesses to protect the company from a deep downside rather maximise profit from the most likely outcome.

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New Orleans

Orleans East Bank - 17th Street Outfall Canal



In the tail extra correlations appear

From Dr Scott Steedman

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"AIG unravelled as the worst housing crisis since the Great Depression led to more than \$18 billion of losses in the past year.

A meltdown could have cost the financial industry \$180 billion, according to RBC Capital Markets, because AIG provided insurance on more than \$441 billion of fixed-income investments held by the world's biggest institutions, including \$57.8 billion in securities tied to sub prime mortgages."

Bloomberg – 16th September, 2008

Compare to insured losses for Katrina of \$60 billion

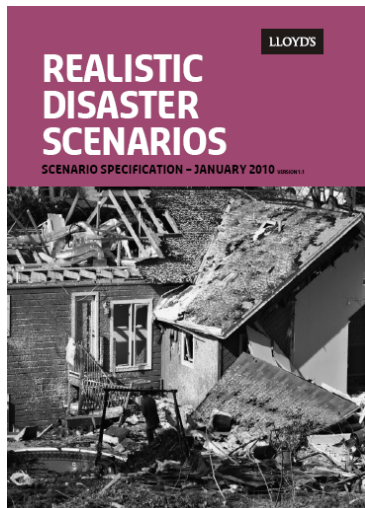
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Stress testing of policy choices – the toolkit

- Scenario testing
- Realistic disaster scenarios
- Analysis of history
- Simulation
- Conversations – what ifs
- An effective challenge process

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Lloyd's Market Process



Lloyd's Realistic Disaster Scenarios

- 1 Two events – North East US hurricane and a Carolinas windstorm event
- 2 Florida windstorm
- 3 Gulf of Mexico windstorm
- 4 European windstorm
- 5 Japanese windstorm
- 6 California earthquake
- 7 New Madrid earthquake
- 8 Japanese earthquake
- 9 UK flood
- 10 Terrorist event
- 11 Marine
- 12 Loss of major complex
- 13 Aviation loss
- 14 Satellite risk
- 15 Liability exposure
- 16 Political risk

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The robustness of policy and strategic choices should be tested for plausible extreme events

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FSA Priority Risks – January 2007

- Existing business models of some financial institutions are under strain as a result of adverse market conditions.
- Increased financial pressures may lead to financial firms shifting their efforts away from focusing on conduct-of-business requirements and from maintaining and strengthening business-as-usual processes.
- Market participants and consumers may lose confidence in financial institutions and in the authorities' ability to safeguard the financial system.
- A significant minority of consumers could experience financial problems because of their high levels of borrowing.
- Tighter economic conditions could increase the incidence or discovery of some types of financial crime or lead to firms' resources being diverted away from tackling financial crime.

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FSA Financial Risk Outlook 2008
– published in January

Consensus forecasts, on which our *Central economic scenario* is based, indicate a less benign economic outlook for the UK and global economies than we have experienced in recent years.

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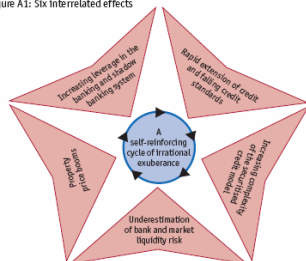
FSA Outlook 2009

- 1 Increased leverage in the banking and shadow banking system
- 2 Property price booms
- 3 Rapid extension of credit and falling credit standards
- 4 Increasing complexity of the securities credit model
- 5 Underestimation of bank and market liquidity risk

“A self-reinforcing cycle of exuberance”

New processes required for the better management of risk

Figure A1: Six Interrelated effects



Source: FSA

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It pays to be a historian?

- Savings and Loans crisis of the 1980s
- 1987 stock market crash
- 1998 US government steps in to save LTCM
- 9/11
- Katrina floods New Orleans - \$60 billion insurance loss
- 2008/2009 Financial Crisis
- etc

Extreme events do happen

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Summary

- Simulations help to communicate a range of outcomes
- Realistic Disaster Scenarios add to historical data to include events that could occur but have not been observed
- Stress testing with plausible scenarios tests the boundaries of the analysis
- Analysis can only go so far – decisions are often based on a combination of analysis and very nebulous information and context
- Plan for deep downsides

Chaucer told tales..

Use stories to promote debate about downsides

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