

Improving the Forecasting and Management of Extreme Events

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CAS In-Focus Seminar



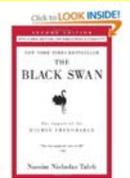
Presenters

- Dr. Guntram Werther
 - Temple University
- Max J. Rudolph, FSA CFA CERA MAAA
 - Rudolph Financial Consulting, LLC



What is a Black Swan?

- Nassim Taleb
 - Outlier
 - Extreme impact
 - Explainable and predictable (after the fact)




Blink or Delay?

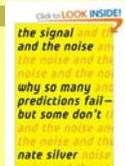
- Frank Partnoy
 - Don't be in a rush
 - Delays can improve quality of life



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Identifying the Signal

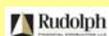
- Nate Silver
 - The signal is the truth. The noise is what distracts us from the truth.
 - Bayesian analysis
 - Power laws



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Hedgehogs (one trick pony) vs. foxes

- Whose predictions are better? Political pundits or generalists
 - Foxes know more about what they don't know
 - Higher demand for experts than accurate forecasts



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The Noise

- Risks we think we have a handle on, but don't (unknown knowns)
- Feedback loops (complex adaptive systems)
 - Complex models generate poor forecasts
- Poor incentives, bad habits, blind adherence to tradition
- Unintended consequences of interactions



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Why we are bad forecasters

- Failures of imagination
- Mistake the unfamiliar for the improbable
- Uncertainty about how much uncertainty there is
- Best model of a cat is a cat (Rosenblueth/Wiener)
- **Once we begin to measure something, its behavior starts to change**
- We tend to latch onto data that supports our theory
 - If it doesn't come true it's bad luck
 - Keynes said "When the facts change, I change my mind. What do you do, sir?"



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Searching for the truth

- High debt eventually leads to bad results
- It's never different
- Being early is no different that being wrong



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Antifragile

- Likes volatility (2nd order)
- Creative destruction
- Darwinistic better than planned
 - Redundancy good
 - Small, decentralized
- Resilience



Failure (lack of resilience)

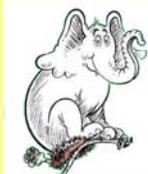
- Culture (ego/overconfidence)
- Exposure (especially in the tail)
- Reliance on external experts
- Incentives
- Leverage
- Contagion (liquidity/systemic risk)

Emerging Risks

- Debt levels
- Climate change
- Big data
- Regulatory changes
- Resource sustainability
- True tail events

Perfect Sunrise

It is better to leave the party early!



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Thank you!
MAX J. RUDOLPH, FSA CFA CERA MAAA

- Rudolph Financial Consulting, LLC
 - ERM and ALM strategist
 - ORSA
 - Leverage models to add real value
 - Research and continuing education: predictions, private investor
 - ERM for Board members
- Professionalism
 - SOA Board of Governors
 - Past chair of ERM Symposium
 - Actuarial Standards Board, ERM Task Force
 - SOA President's Award



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