



International Actuarial Association  
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# Strategic Modelling and Scenario Planning

PBSS WEBINAR

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# Agenda

Presentation:

1. Statistical and Probabilistic Models
2. Strategic Models
3. Scenario Analysis
4. Questions, Answers, Comments

Purpose: Pick your strategic curiosity



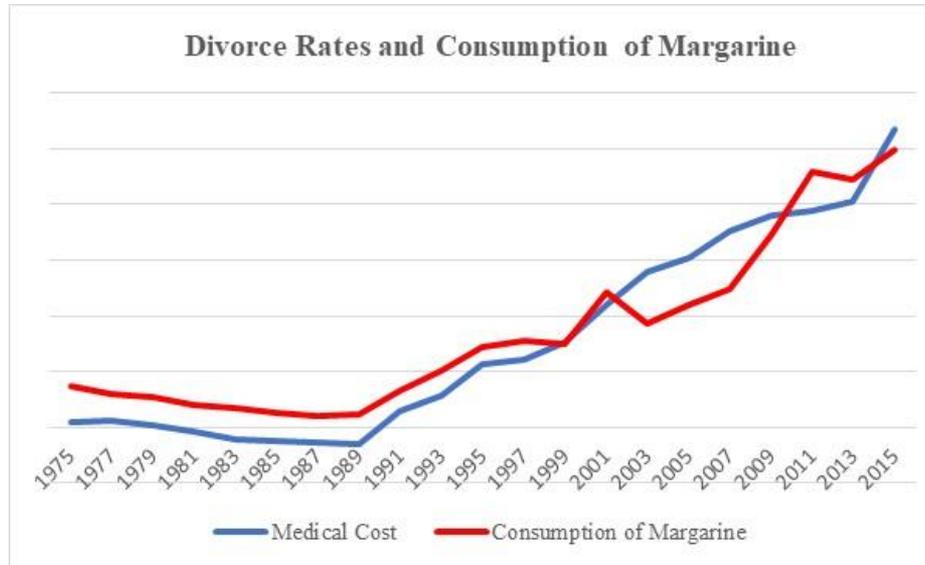
# Regression and Probabilistic Models

- Regression and probabilistic models (also known as tactical models) are useful
- Regression (also known as Predictive Models)
  - Many variations
  - Useful when historical conditions are a valid proxy of future behavior
  - Causation, Correlation, Common Cause
- Probabilistic models
  - Useful when the probabilities can be estimated
  - There are probabilities that cannot be estimated



# Causation, Correlation, Common Cause

- For the curious mind:
  - <http://tylervigen.com/spurious-correlations>
  - <https://hbr.org/2015/06/beware-spurious-correlations>



- The point of view of economists

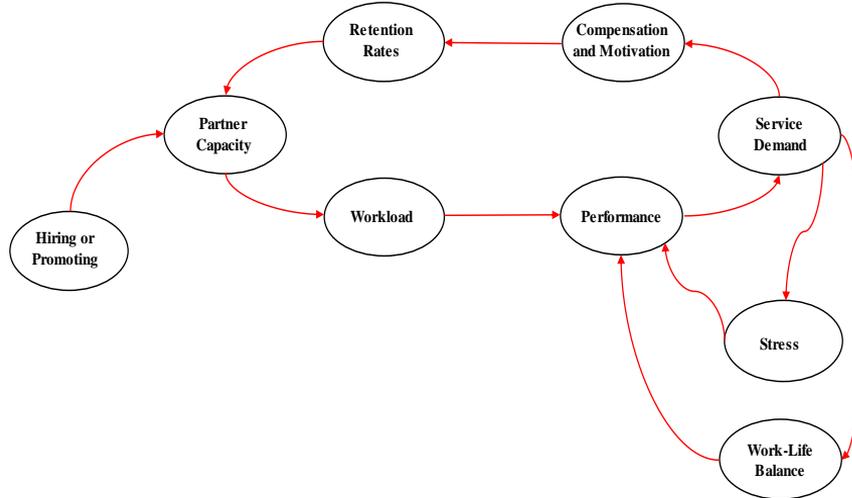


# Strategic Modelling Techniques

- Scenario Analysis
  - “The Futures of the US Health Care System”, Contingencies, Mar/Apr 2016
  - “The Futures of the US Health Care System”, Contingencies, Nov/Dec 2020 (expected)
- Game theory
  - “Winning or Losing the Game?”, Contingencies, Jul/Aug 2016
  - “A Rigged Game? Human Nature and the US Health Care System”, Contingencies, Jul/Aug 2017
- System Dynamics
  - “System Dynamics—Building a Better Model”, Contingencies, Sep/Oct 2011
  - “Making Sense of the Unexpected” The Actuary, Dec 2017

# General Principles of Strategic Modelling

- Leave out irrelevant details
- Understand interactions
- Combine modelling techniques
- Check results against reality
- Update the models





# The Basics of Scenario Analysis

- The purpose is to describe how potential futures may unfold, not to forecast
- Considerations
  - Relevant
  - Plausible
  - Internally consistent
- Elements of Scenarios
  - Universal elements (e.g., economic crisis)
  - “Forces” or external influences (e.g., political direction, technology, global warming, economic and military conflict)



## Building Scenarios—Best Practices

- Secure input from experts in different fields
- The plots should focus on the question under consideration
- Each scenario must represent a distinctive future
- The plots should be simple and informative. Details can be presented elsewhere
- Scenarios must be written in clear prose. See <https://www.youtube.com/watch?v=Dnkow4y1cyw> for biz-speak
- Choose memorable names for each scenario

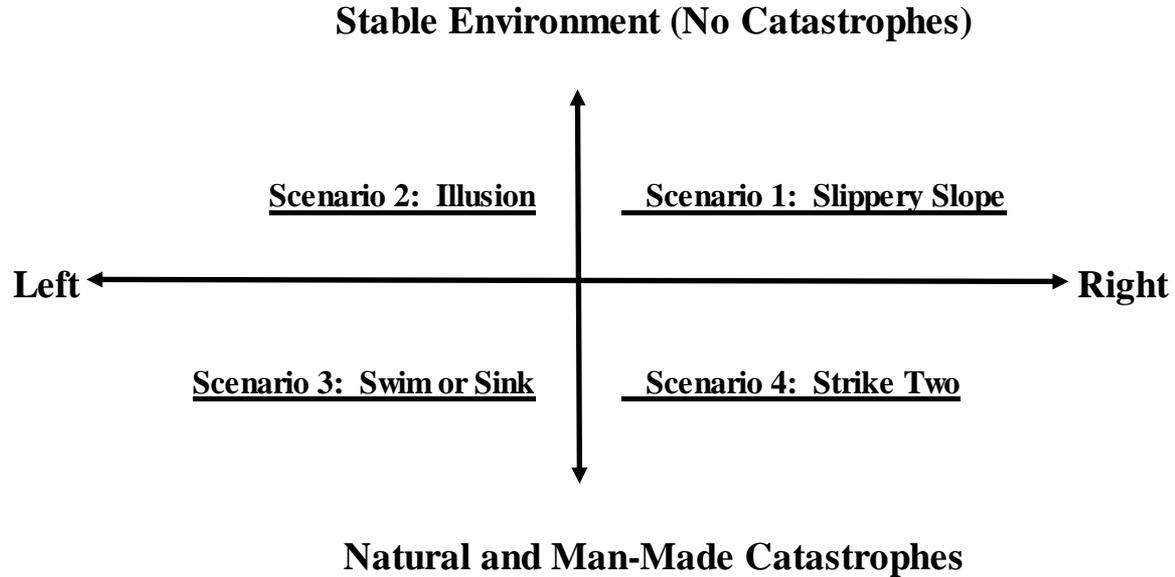


# Insurance Company—20-Year Planning

- Universal Elements
  - Economic depression
  - Growing debt, unbalanced budgets
  - Population ageing
  - Globalization
- Forces
  - *Environment global warming, epidemics, draughts, armed conflict*
  - *Political direction (left or right)*
  - Technology
  - Speed of population growth
  - Migration



# Scenarios





## Scenario 3: Swim or Sink

- Economy in complete disarray
- New diseases. Pandemics. Global warming
- People oppose universal health care despite crippling costs—the unchecked psychology of the masses
- Insurance companies and health providers oppose universal health care
- Employers favor universal health care provided by the government
- Republicans support the initiative, democrats are lukewarm
- Medicare is expanded. It coexists for a while with private insurance
- Private insurers lose substantial market share but a few of them finds a new niche



# Why Strategic Modeling is Absent

- Management unawareness
- Short-term view
- Attraction towards (imaginary) certainty
- Job security via Panglossian forecasts
- Belief that strategic modelling is useless
- Strategic modelling requires time and effort



# The Essence of Scenario Planning

*[W]hen he was in the country with his friends, he would sometimes stop and ask them: ‘suppose there were enemies up in those hills and we were here with our army, who would have the advantage? How could we get at them without breaking ranks? If we wanted to get away, how would we do it? If they tried to get away, how could we cut them off?’ ... As a result of this constant practice, no unexpected difficulty could ever arise when he was at the head of his army, for which he did not have a ready remedy*

“The Prince”, Niccolò Machiavelli

Thank you

