

## Critical Illness – MOT or Cosmetic Surgery?

Capital & Risk Management  
A Case Study

Hamish Galloway – 6 December 2006

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## Critical Illness and the ICA

### This section will

- Assume ICA methodology in place
- Concentrate on Marginal Effect of adding CI

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## Critical Illness and the ICA

- Base Level
- Trend Risk
- Morbidity Shock Risk
- Operational Risk
- Credit Risk
- Diversification

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## Base Level Incidence Rates

- Core Ages
  - CMI Starting to be credible
  - But do read the caveats attached
- Young and Old
  - Original Pricing Techniques
  - Build Population Table
  - Estimate Insured/Population Ratio

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## Critical Illness Trend Risk

- Trends have been benign
  - Population Trends
  - CMI experience trends
- Stay for the evening for fuller story
  - Are trends turning?
  - Benign picture is dynamic equilibrium
  - Positive effects reaching the end
  - How will medical profession react?

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## Morbidity Shock Risk

- Shocks or Step-ups
  - Mortality worst case is shocks – e.g. flu pandemic
  - Morbidity worst case is step up
- Increased incidence
- Low level disease
- Increased detection

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## Operational Risk

- **Definitional Risk**
  - New Medical detections / techniques
  - New Medical definitions
  - Legal risk that courts will decide definitions
  - FOS
- **New ABI definitions help**
  - But in force book still exposed

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## Credit Risk

- **Retail Firms**
  - Product highly reinsured
  - Simplified Approach
  - Credit Risk to reinsurer

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## Diversification

- **Correlation with Mortality**
  - Not as strong as you might think
    - Worst CI scenario more detection – little effect on deaths
  - Valuation team might be more conservative
- **Reasonably independent of other factors**
  - Correlation with mortality will create positive correlations elsewhere

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## One in 200?

- Nowhere near enough data to quantify
- Future threats have no equivalent in the past
- Take medical opinion
- Run deterministic scenarios of adequate severity
- Discuss with FSA!
- Convince your board – it's their decision!

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## Practical Example

- Base Level
- Core Trends
- Smoking
- Obesity
- Medical Advances/Definitional Drift
- Assume last three are independent
- Diversification Benefits

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## Core trends

- Project CI forward using past population trends
- Split NS/SM
- Split by generation of product
- Assume medical profession will continually reduce effect of biggest contributor to claims
- Add PAD

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## Smoking

- This was our trends shock
- Immediately remove effect as big as that caused by smoking cessation from trends
- Re-run as before

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## Obesity

- Further trends shock
- Mitigated by underwriting
- Many CIs correlated with obesity directly or via diabetes
  - Heart Attack (Strongly – via high cholesterol and BP)
  - Stroke (via BP)
  - CABG (via heart disease)
  - KF & MOT (strongly via diabetes)
  - TPD (musculo skeletal problems, blindness via diabetes)
  - Cancer (Weakly)
- Re-run as before

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## Definitional Drift

- Morbidity Shock and Operational Risk
- Pay the medical definitions in 7 years time
- Many CIs considered
  - Cancer – earlier detection, better cures
  - Heart Attack – troponin deemed sufficient
  - Stroke – access to better imaging
  - CABG/angioplasty - extra funding to treat lower level disease
  - MOT - extra NHS funding
  - TPD – leniency of medical profession
- Re-run as before

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