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Knotty DFA / ICA issues at Lloyd's

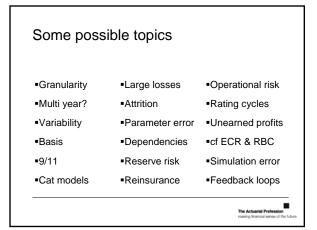
GIRO Workshop 13 October 2004, Killarney phil.ellis@amlin.co.uk

Background to this session

Amlin

- Where we are / are not
- What I am / am not
- Interactive random(ish) walk
- Not exhaustive, but hopefully useful!

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Granularity

- How many classes
- Clump / Subdivide
- Different currencies for some or all
- Must depend on purpose
- Our ICA choices suited for our ICA (!)

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Multi Year Model?

- How long a period
- What do you monitor
- Exactly how do you combine years

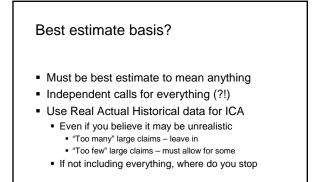
(maybe come back to this later)

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Variability

- We select CV as the base measure
- Seems clearly better than SD
 - Invariant as premium rate changes
- You get used to it

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9/11 experience

- Claim data impacts some classes severely
- Consider taking out (or consider "return period")
 all, part or none
 - sometimes or never
- Third parties can't help much (?)

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Cat models

- Proprietary models for natural cats
- Different models available
- Are lesser regions reliable?
- Cross-class dependencies important
- Double count?
 - · What part of history is replaced

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Large losses

- Frequency, severity models
- As if history (changes in line size &/or terms?)
- Threshold varies by class
- Credible tail data (!)
- Heavy tail Gen Pareto Distns throughout
- Upper limits on some distributions (?)

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Attrition

- Balancing item?
- As if history
 - Consistent with large loss as if, but maybe different
 - eg large loss and portfolio inflation
- Estimating variability parameter
- Simple gamma distributions good enough?

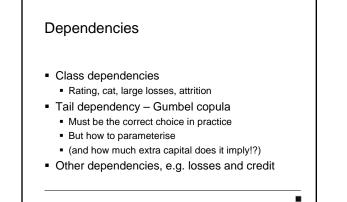
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Parameter error

Partial consideration - class relativities

- Long tail class history is uncertain
- Capture this parameter error
- Additional framework needed
- Overall results must be considered appropriate

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Reserving risk

- Method bootstrap?
 - Anything else?
 - Still choices within bootstrap
- Data Paid and/or incurred
- Level of subdivision and inter-dependence
 All-in ... 4 divisions ... 35 classes
- Precise methodology

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The Act

Reinsurance

- Build in actual, current reinsurances
 May be complex, with loads of rinky-dinks
- Adjust for expectations next year?
- Expected: structure, rate, M&D, adjustments
- What about multi-year models
 - Leave structure, rating cycle depends on direct?
- Allocate umbrella covers to classes

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Operational risks

- Risk register
 - Attempt to strip historic losses from data for DFA
 - or take care over potential double-count
- Monitoring and controls!
- Net risks!?

 Quantification of probability and impact Change of behaviour part of the intention here

> The Act

Rating cycles

- Need something sensible
- Especially for multi year models
- Various structures possible
 - Sensible fit to history
 - Plausible projection
- Credible dependency structure

Aviation market (!)

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Unearned profits

- Need something special here?
- Extra infrastructure if underwriting year model
- Non-essential in multi year model(?)
- Taking unearned losses seems prudent in tail
- Exceed UPR plus plausible AURR In simulations around the 99.5th percentile

The Act



ECR

- Retrospective
- Non-Lloyd's parameterisation
- RBC
 - Company specific data
 - Risk metric
 - Multi year
 - Open year treatment, discounting, etc, etc

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Simulation error

- 99.5th percentile bound to be a challenge(!!)
- How many simulations
- ... and how (efficiency, run time)
- Empirical view on simulation error

A surprise to me this week(!)

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Feedback loops

- ... or "Decision rules" Need real care!
- Relevant for multi year models
- Simple or complex
- Must be totally supportable
 - Historical precedents
 - Processes and ownership
 - Link to operational risks

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That is it!

- Any loose ends or other questions?
- Thanks for your attention
- ... and interest
- ... and interaction
- ... and prospective beers (!)

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