Institute and Faculty of Actuaries

Reinsurance Modelling of PPO Claims – Motor & Liability

Presented by
Lydia Rhodes, Axis Capital
Showvanik Dasgupta, Beach Associates
(Dee Fitzgibbon, Lockton Re)

Pricing Seminar 2017

6th June 2017

Agenda

Introduction	→	• Who are we, what have we set out to achieve and what have we done?
Approach	→	• Outline of the model created and key assumptions
Model output (Motor)	→	• Output from model for Motor PPOs
Liability	→	• Output for Liability
Going Forward	→	• What's next?

Questions Comments

Institute and Faculty of Actuaries

Institute and Faculty of Actuaries

Introduction

6th June 2017

Who are we?

Qualitative questionnaire

Quantitative questionnaire

Bodily injury classification

Bodily injury almanac

Mortality

Reinsurance

Market Solutions

PPO education (including index paper)

Investments

Institute and Faculty of Actuaries

What was our purpose

- Factors to consider when modelling PPOs for Reinsurance Pricing
- Loss Cost implication of key assumptions

What it's not for..

- To provide an answer or an optimal solution
- To provide details of the amount to be charged by the reinsurer
- To duplicate work done in other areas of the working party of by other working parties.

Institute and Faculty of Actuaries

A word of caution before we begin…

- We are presenting our own findings and are not providing recommendations or advice on behalf of the Institute or the companies we represent
- Any figures provided are indicative only and should not be relied upon for any purpose
- The source data is the quantitative questionnaire and other information held centrally by the working party. Therefore the same limitations apply.

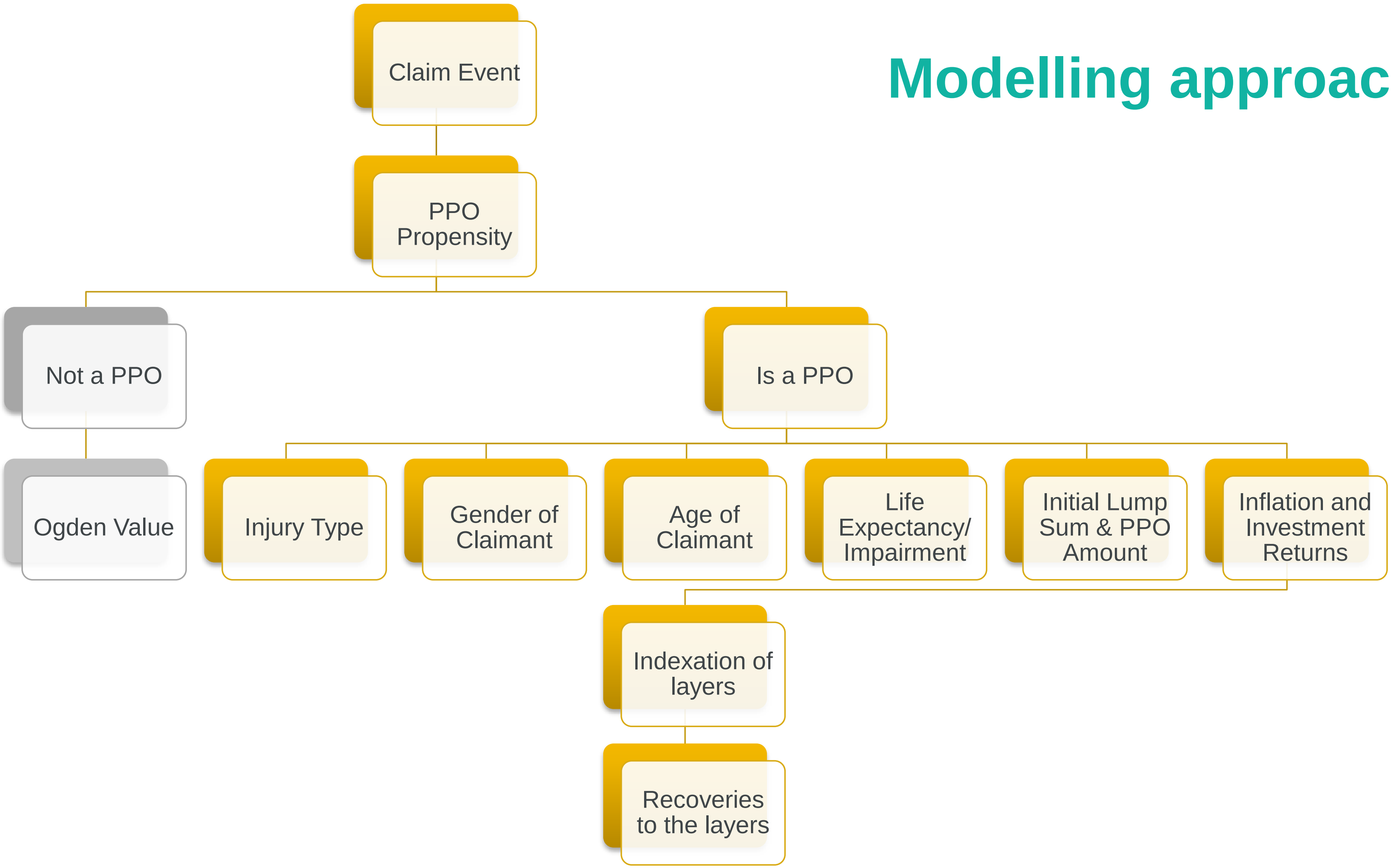
Institute and Faculty of Actuaries

Institute
and Faculty
of Actuaries

Modelling Approach and Assumptions

6th June 2017

Modelling approach



Key assumptions

Scenario : Male aged 22 with a Brain Injury and has a expected life expectancy of 60 years post settlement

Payment Details – Lump Sum of £1.73m and annual PPO of £187k

Ogden Rate – assumed at -0.75%

**Settlement delay - ** 5 years

Wage – 3.5% per annum

ASHE – 4% per annum

Discounting– 4% per annum

Mortality – Unimpaired Life Table

Reinsurance – Traditional XoL (Uncapitalised)

Indexation – Index at wage inflation until settlement, and ASHE thereafter

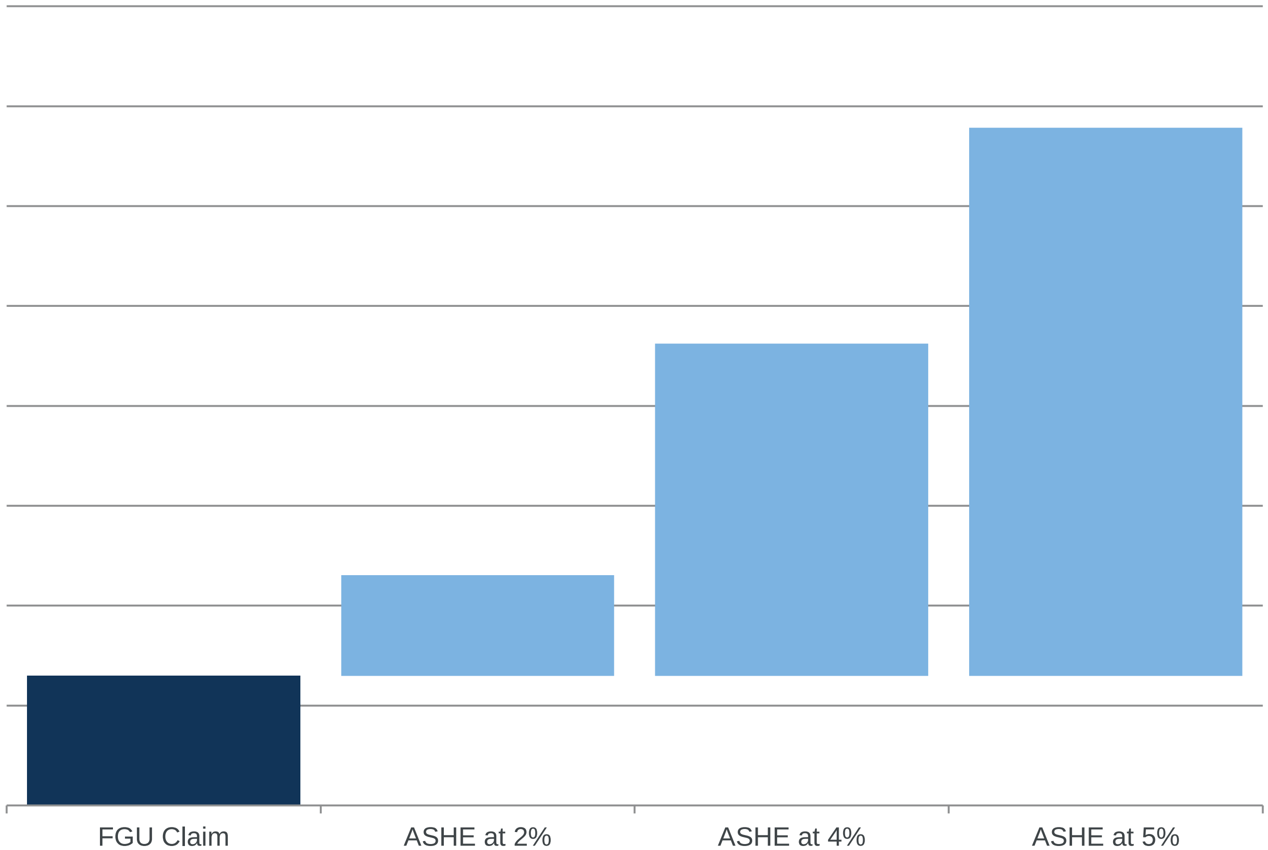
Institute and Faculty of Actuaries

Institute and Faculty of Actuaries

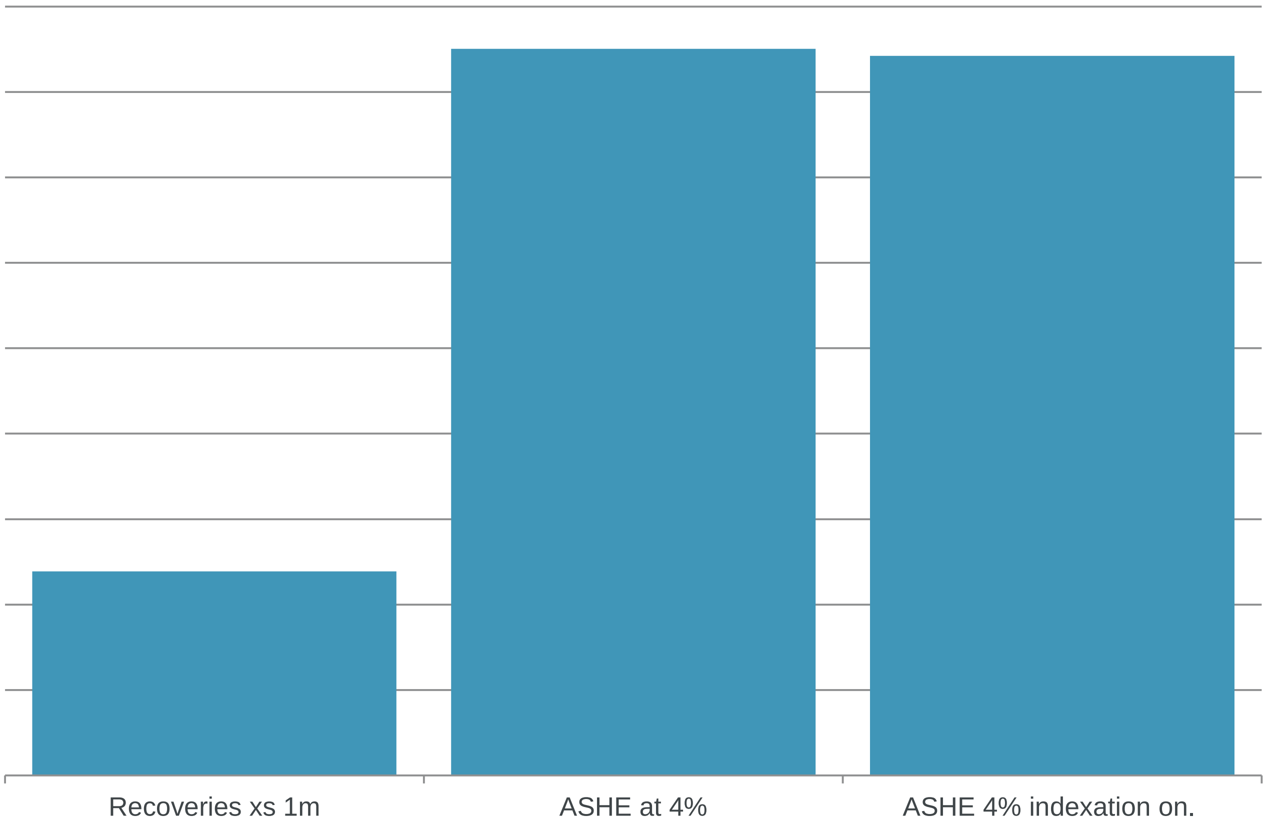
Model output: Motor

6th June 2017

Base model – FGU claim

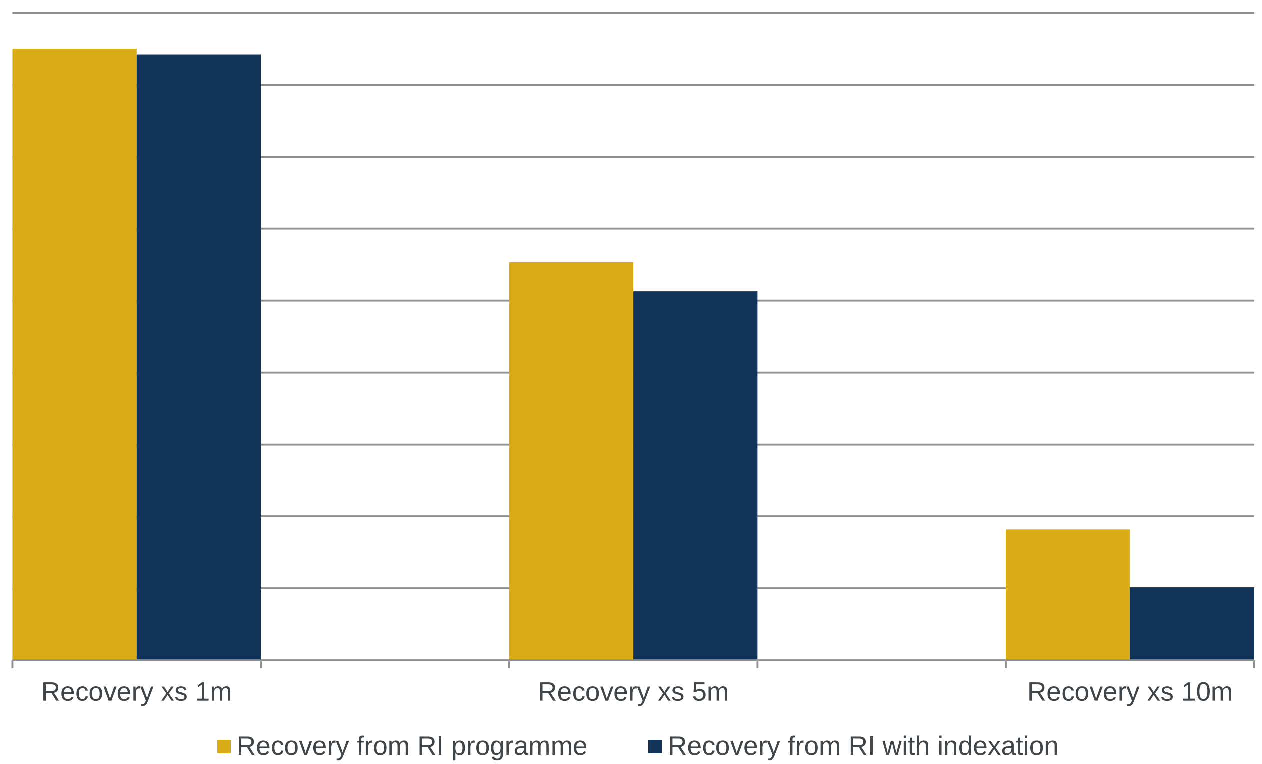


…then you add in traditional RI and indexation…



Institute and Faculty of Actuaries

…indexation impact by layer…



Institute and Faculty of Actuaries

Then you need to consider mortality

Approach:

Age of death - deterministic

Probabilistic – based on life table curve

Impairment:

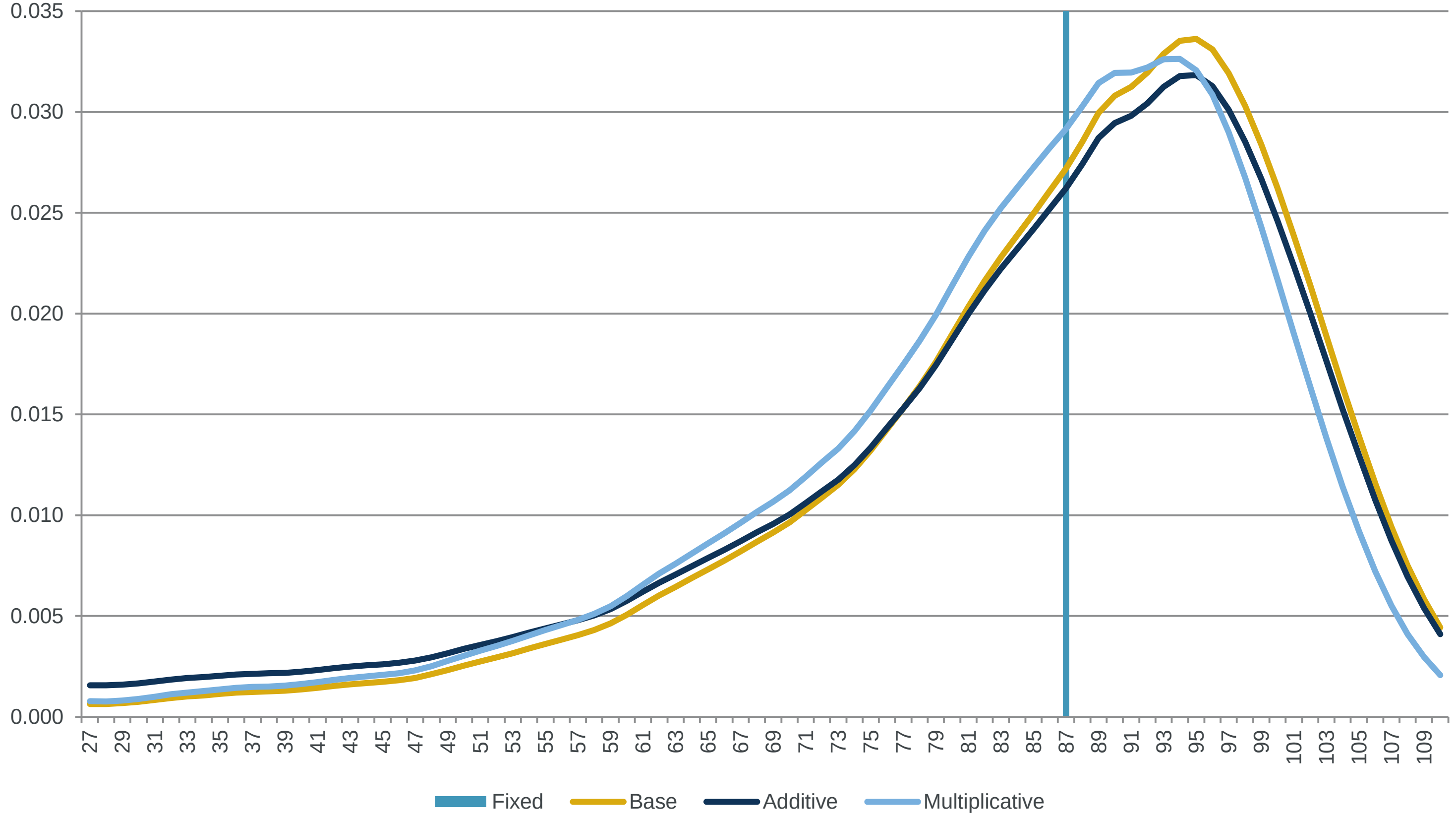
Rated age – future life expectancy as defined by a life table input as a single variable into the model

Additive – p values adjusted to reflect reduced life expectancy

Multiplicative – adjust the curve based on a given value

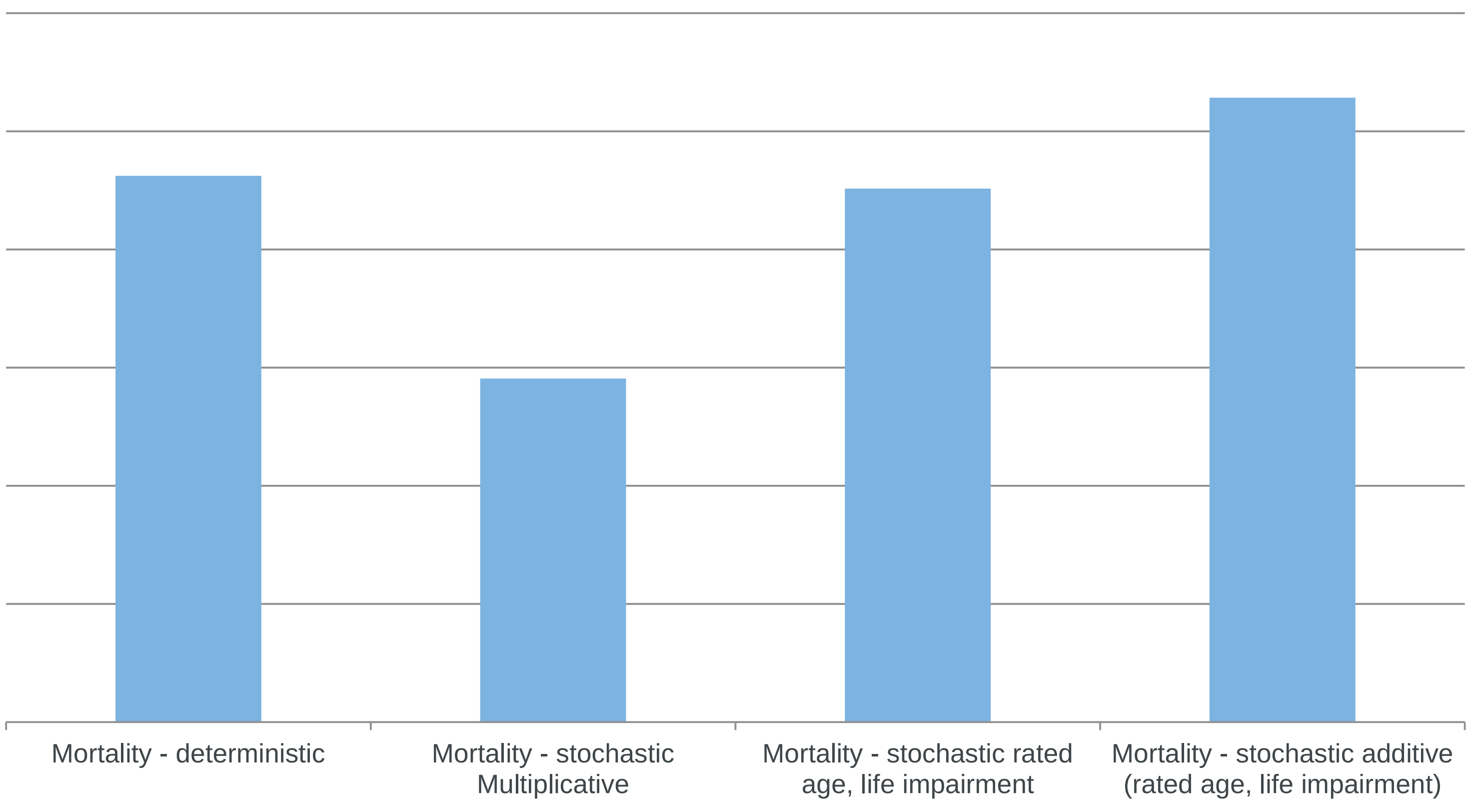
Institute and Faculty of Actuaries

Impact of life expectancy assumptions



Institute and Faculty of Actuaries

Impact of life expectancy assumptions



Institute and Faculty of Actuaries

Merits of each approach..

Multiplicative

- Suitable for injury conditions that deteriorate over time
- Larger effect in older years where mortality is higher (for e.g. claimants with reduced mobility)

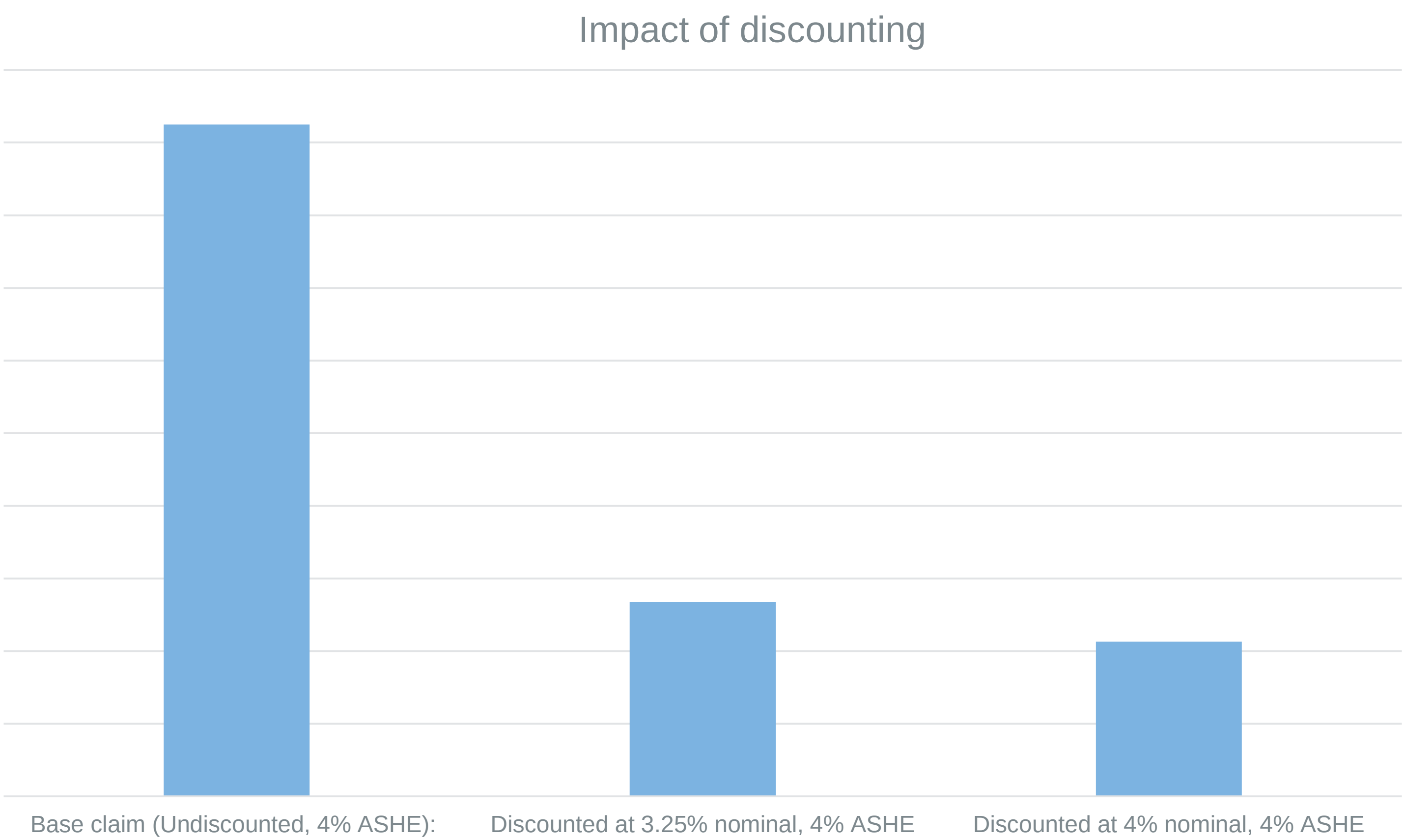
Rated Age

- Easy to model
- Assumes claimant experiences same mortality as someone older

Additive

- Easy to model and parametrisation requires less data
- Assumes claimant has a constant additional risk of death

Impact of Discounting



Institute and Faculty of Actuaries

Model Output: Motor Capitalisation

6th June 2017

Key contract type definitions

Traditional – a traditional excess of loss reinsurance arrangement with no provision for capitalisation

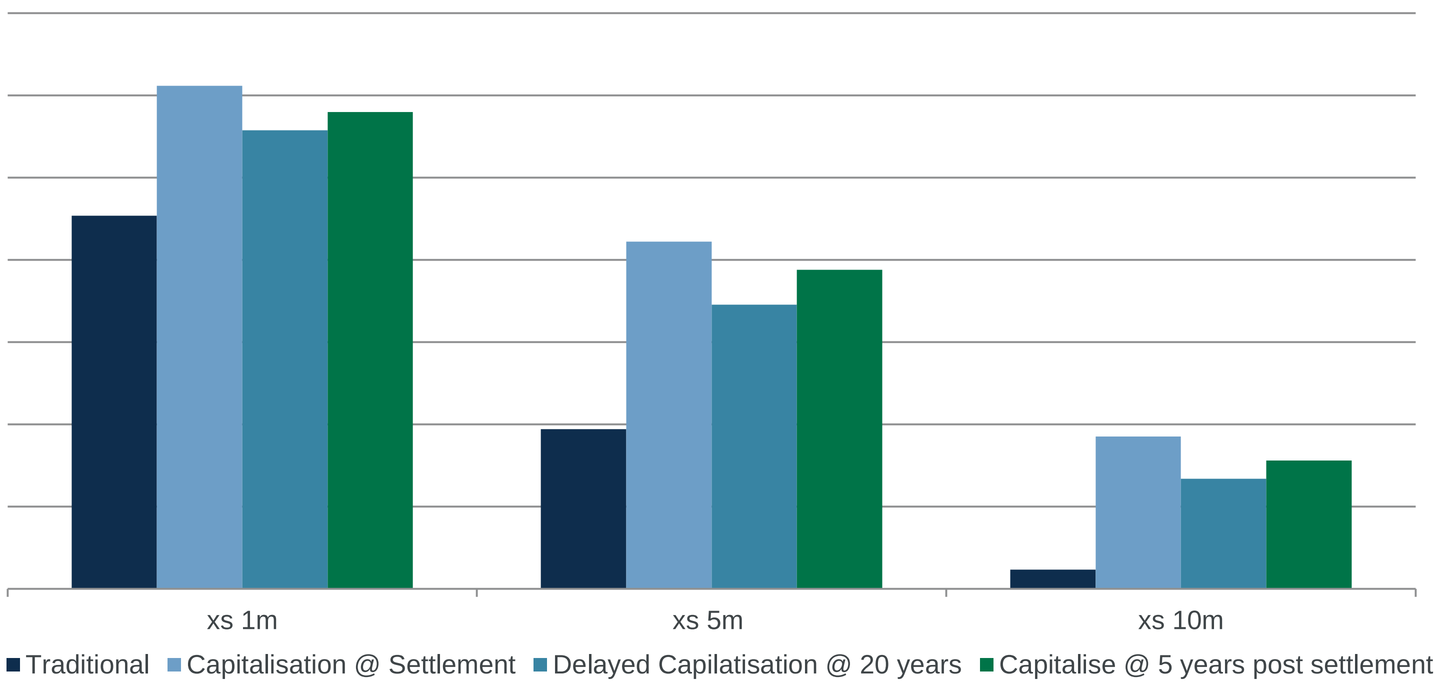
Capitalised – capitalisation takes place at the date of settlement (similar to the IUA contract)

Delayed capitalisation – capitalise 20 years after date of settlement

Capitalise 5 years post settlement – capitalise 5 years after date of settlement

Institute and Faculty of Actuaries

Impact of Different Capitalisation Clauses….



Institute and Faculty of Actuaries

Key limitations

Data:

- Taken from the year end PPO report – based on insurers rather than reinsurers
- A reasonable sample base but limitations still apply

Future environment going forward:

- Economic
- Legal
- Claimant behaviour

Assumptions have been based on a combination of evidence and expert judgement but any changes in these will change the output from the model.

Dependent on the majority of the book written

Institute and Faculty of Actuaries

Summary:

- There are a number of factors to consider
- We've worked with the scenario that a PPO will happen
- Need to consider propensity and in doing so the correlations between life expectancy/ lump sum payment/ PPO amount/ life impairment etc…
- Ogden adds another question mark as to what will happen to PPOs
- The capital implications are also key…
  - Asset liability duration mismatch
  - Capital charge under Solvency II for PPOs

Institute and Faculty of Actuaries

Institute and Faculty of Actuaries

Liability PPOs

6th June 2017

Considerations Regarding Liability

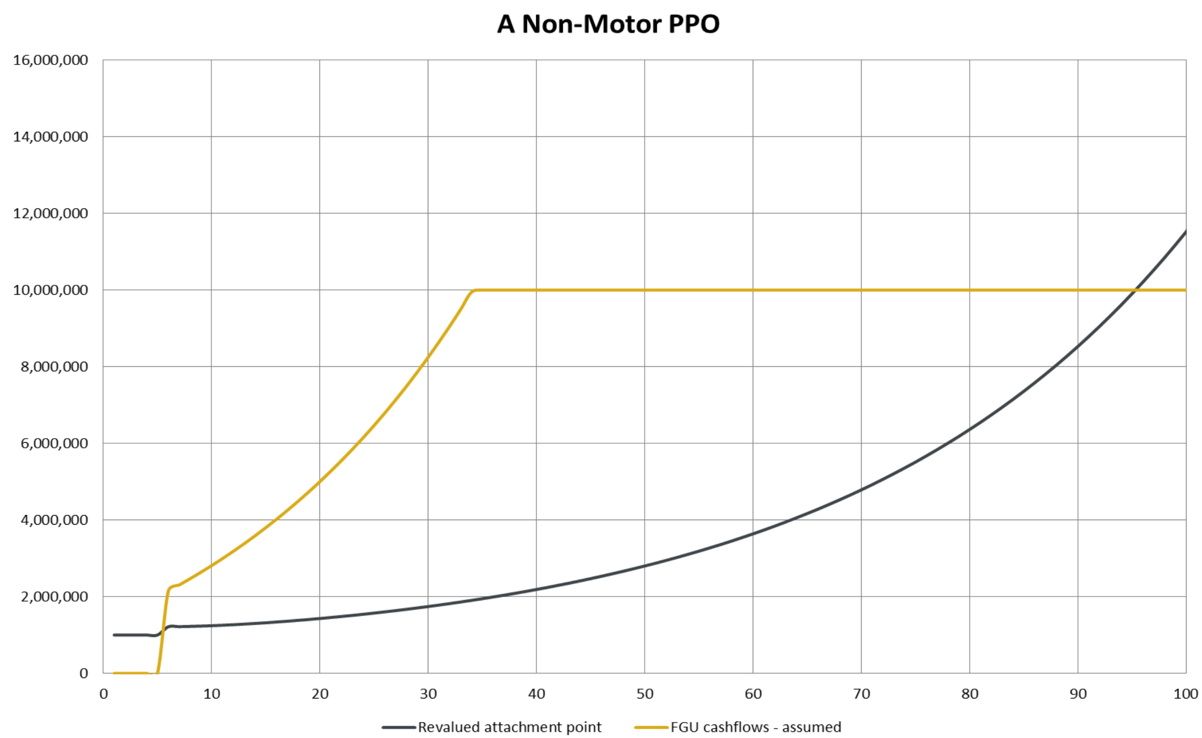
- Between 2005 – 2015, we have observed 52 settled non-Motor PPOs*
- One tenth as many as motor PPOs
- Main difference is the original policy limit with the underlying general liability contracts
- Most excess of loss reinsurance contracts do not contain capitalisation clauses and are not unlimited
- Limits and attachments can increase relative to an index

Institute and Faculty of Actuaries

Considerations Regarding Liability Cont.

An illustration of a non-Motor PPO on the next slide

- A PPO claim has arisen on a general liability policy with original policy limit of £10m
- Initial lump sum of £2m, with annual payments thereafter of £150,000



Institute and Faculty of Actuaries

Considerations Regarding Liability Cont.

We can see that:

- The **reinsurance attachment point (grey line)** indexes continuously
- The **cumulative cashflows for claims payments (gold line)** has:
  - a jump 6 years in to represent date of settlement and payment of the initial lump sum
  - Then increases linearly for the next 28 years until the cumulative claim amount hits the original policy limit, where the chart flattens out

Institute and Faculty of Actuaries

Impact of Ogden Discount Rate Change on Non-Motor PPOs

- Prior to the change in discount rate, the PPO propensity for non-motor claims was approx. 10%
- Typically companies preferred a lump sum settlement as it was far less likely to breach the original policy limit than an on-going PPO
- This aligned with insurer's appetite
- Under the new discount rate, there are arguments for the propensity dropping even more
- But there may be an increase in the policy limits companies are wanting to buy, which could have a knock on effect on reinsurance programmes going forwards

Summary:

- Liability PPOs are a lot harder to model based on the dataset available
- Unlike Motor PPOs, if we try to divide up the liability PPOs by injury type, the number of claims in each set would be too small to be credible, and far too volatile
- Therefore we haven’t parameterised our model for injury type
- Something to consider is how reinsurance recoveries are affected once the underlying policy limit has been breached

Institute and Faculty of Actuaries

Institute and Faculty of Actuaries

Going Forward

6th June 2017

What's next?

- The Ministry of Justice ran a Consultation between 30 March – 11 May 2017
- The paper examined issues surrounding:
  - What principles should guide how the rate is set?
  - How often should the rate be set?
  - Who should set the discount rate?
- The PPO Working Party as a whole submitted a response
- Currently awaiting announcements from the MoJ, but the election is eclipsing it
- Could Ogden discount rate change again in the near future?

Institute and Faculty of Actuaries

What's next?

Institute and Faculty of Actuaries

What's next?

Some of our ideas…

- Consideration of utility curve – when is it favorable to get a PPO compared to Ogden
- Survey to consider industry norms from an RI perspective
- Capital modelling of PPOs

Institute and Faculty of Actuaries

Questions

Comments

The views expressed in this [publication/presentation] are those of invited contributors and not necessarily those of the IFoA. The IFoA do not endorse any of the views stated, nor any claims or representations made in this [publication/presentation] and accept no responsibility or liability to any person for loss or damage suffered as a consequence of their placing reliance upon any view, claim or representation made in this [publication/presentation].

The information and expressions of opinion contained in this publication are not intended to be a comprehensive study, nor to provide actuarial advice or advice of any nature and should not be treated as a substitute for specific advice concerning individual situations. On no account may any part of this [publication/presentation] be reproduced without the written permission of the IFoA [*or authors, in the case of non-IFoA research*].

Institute and Faculty of Actuaries