GIRO 2014 - Workshop A2 Peril-Based Reserving

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Our objectives today…

- Update on progress of this GIROC working party

- Obtain feedback on direction of our research

- Set out what we want to do next year

- Recruit volunteers

Agenda

- Motivating factors - What is peril based reserving?

- Problems (and benefits) with the existing reserving toolkit

- Deconstructing the claims process

- Loss simulation in practice

- Reviewing the performance of models and methods

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Thank you to our working party members who have contributed at various times this year

- Nigel Benbow

- Simon Brickman

- Dan Draper

- Alex Marcuson

- Saheel Master

- Sam Riseborough

- James Turner

- Matthew Welsh

With support and encouragement from:

- Kimberley Hutton

- Sameer Keshani

- James Orr

- Pietro Parodi

- Anthony Wright

Peril-Based Reserving

aka: Driver-based reserving
      Peril-level reserving

But not reserving using insurance perils…!

What is peril-based reserving?

- Thinking about the underlying process, not about the aggregate claims triangle

- Formalising thinking in three dimensions:
  - Exposure
  - Risks
  - Time

- Unspoken objectives are to:
  - Understand which tools work, when, and why?
  - Develop guidance and informal rules of thumb

- In our experience, guidance tends to be a bit vague (at best) for "harder" methods

Motivating factors

- What we consider as "normal" for reserving is quite limited and limiting. Can we do better?

- Is it OK to extend reserving techniques to model reserve variability?

- Resisting the fast-close effect – how do we stop reserving work getting downgraded?

- Boom and bust – can we spot in advance when our standard techniques will break-down?

- New techniques – should we and can we build on Parodi's work to develop a new reserving paradigm?

Tools and techniques

- What is Parodi's method?

- Problems with existing methods

- What makes you use a method?

Commercial break (for new techniques) Parodi's Approach

Have you tried it yet?

Recap:
What is Parodi's Peril Level Framework?

Model distributions for

- "Pure" IBNR

- UPR

- RBNS

Combine these to generate overall reserve distribution

Sounds simple… but not easy in practice

Recap:
Why is Parodi's approach hard work?

Lots of elements to consider…

- Estimate delay distribution for claims (adjusted for bias for smaller delays)

- Model IBNR frequency distribution (Poisson or Negative binomial)

- Model severity distribution for IBNR (include dependence on occurrence date),

- IBNER needs to be modelled to obtain true severity distribution, could include GLM

- Aggregate distribution via Monte Carlo, FFT...

- This process also allows us to model UPR

- Separate analysis for RBNS / IBNER

…so many judgements are needed

- Choice of distributions

- Aggregation model elements

- Choice of correlations

- …

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Problems (and benefits) with the existing reserving toolkit

Is "Normal" good enough?

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The existing reserving toolkit

Or "Why do we need new tools anyway?"

- Mechanical weaknesses of existing methods

- Breaking the 'Reserving Cycle'

- Communication of key assumptions effectively

- Comfort with ranges

- Accuracy and validity

- Modelling drivers of experience

- Inappropriate models being used in a blanket fashion

- Extending existing methods

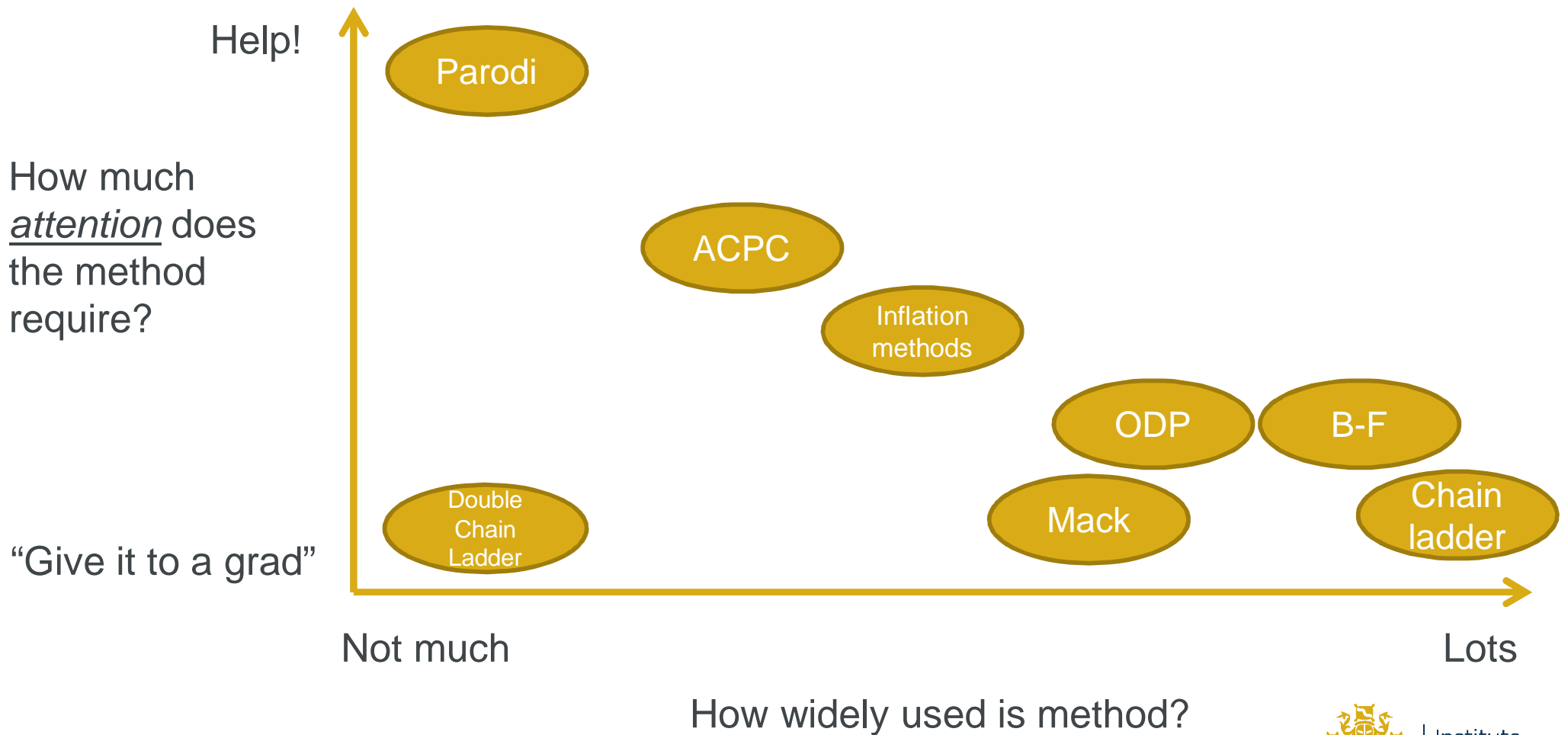- False Confidence

- Loss of information

The existing reserving toolkit

"Why do we need new tools anyway?"

- Belief that our current methods are 'good enough' limits the insight we can bring to the table.

- Reserving actuaries have arguably fallen behind Pricing actuaries in terms of insight generated through methods used.

- We need to be prepared to fight the pressure to reserve quickly so we can get on with reporting. New tools may help this.

What makes you use a method?

Help!

How much *attention* does the method require?

"Give it to a grad"

Parodi

ACPC

Inflation methods

ODP

B-F

Double Chain Ladder

Mack

Chain ladder

Not much

Lots

How widely used is method?

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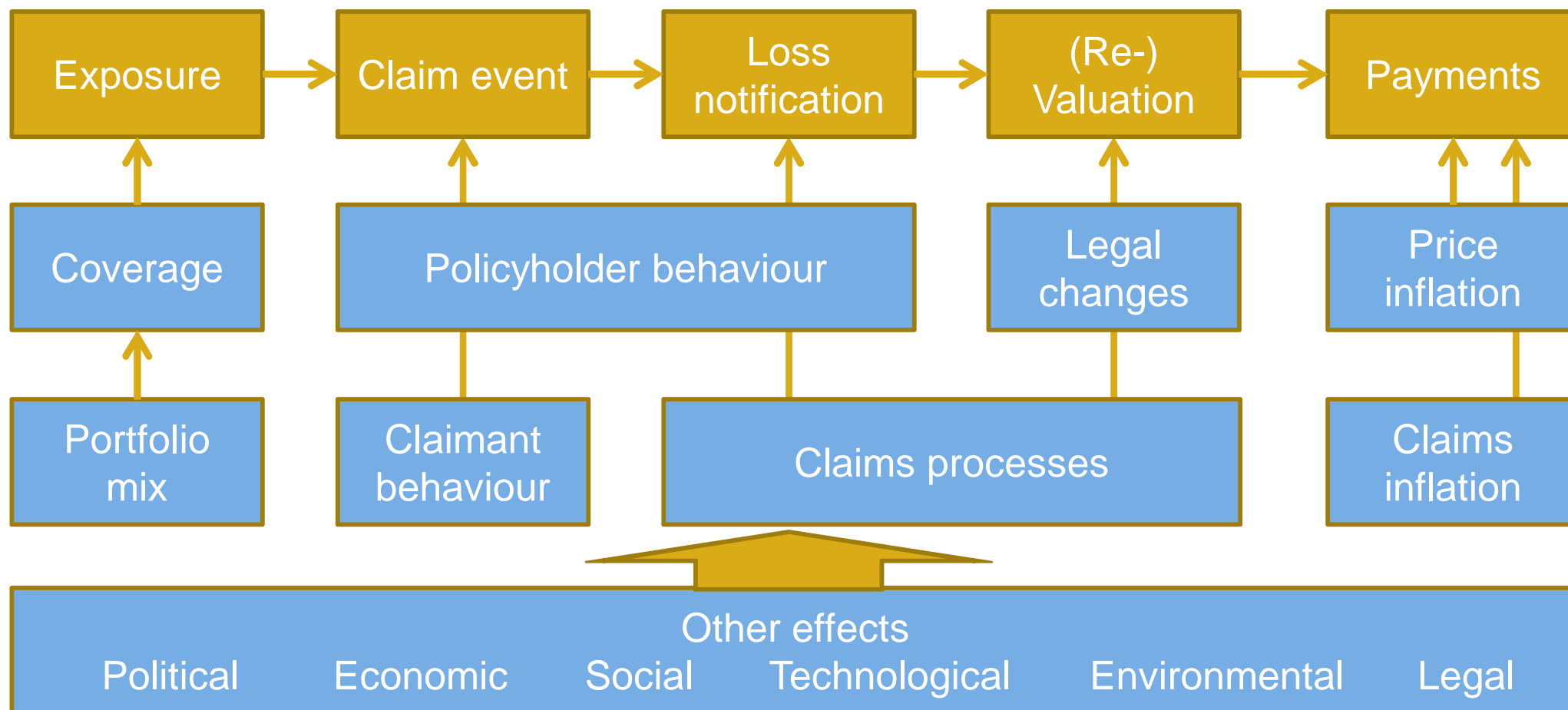
Tools and techniques - summary

- Better guidance need to inform when techniques should be used?

- Concern that cost and convenience drives our choices

- Fear that reserving actuaries are not getting to grips with new techniques

Process and practice

- Breaking down the claims process

- Dashboards and measures

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Breaking down the claims process

Exposure	→	Claim event	→	Loss notification	→	(Re-) Valuation	→	Payments

Coverage → Exposure

Policyholder behaviour → Claim event / Loss notification

Legal changes → (Re-) Valuation

Price inflation → Payments

Portfolio mix → Coverage

Claimant behaviour → Policyholder behaviour

Claims processes → Loss notification

Claims inflation → Payments

Other effects

Political   Economic   Social   Technological   Environmental   Legal

Which techniques are most appropriate to model each effect?
What other important types of drivers should we consider?
What form do these drivers take?
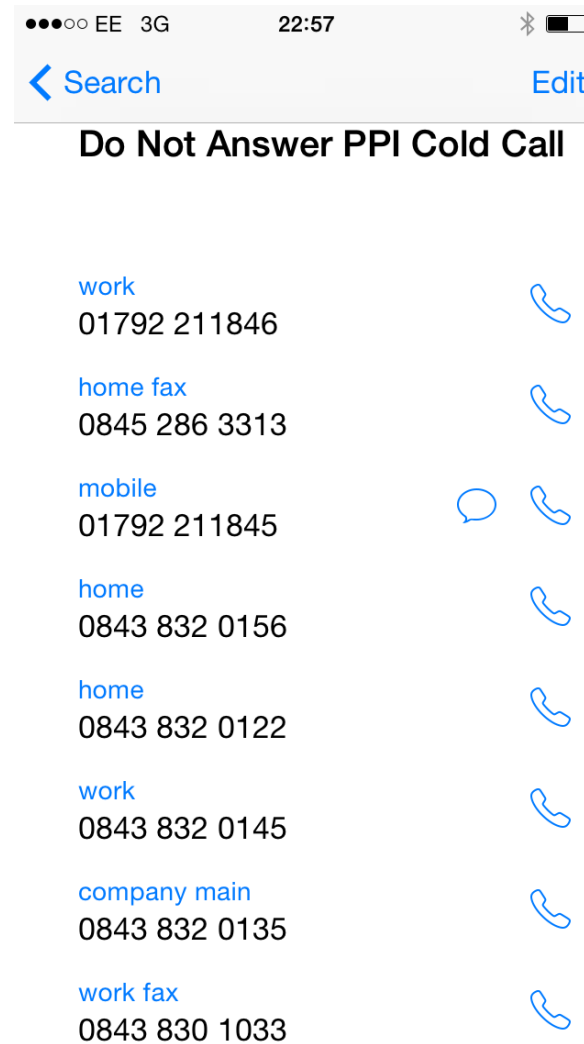
Breaking down the claims process

Legal and technological effects at work…

Dashboards and measures
Question 1

- Do you look at / use dashboards in reserving exercises?

    A. Never

    B. On an ad-hoc basis when something looks odd

    C. "Virtual dashboard" – by keeping informed / reading up on topical issues / water cooler conversations

    D. Yearly review of key items

    E. Routinely, adopt a structured approach each valuation

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Dashboards and measures
Question 2

- Is it appropriate to allow for non-claims measures in AvE analyses?

    A. No

    B. No, need to remodel if a significant A<>E issue on a measure

    C. Yes, qualitatively only

    D. Yes, for clear quantitative items (eg: inflation)

    E. Yes, identify key factors and work out appropriate dependency relationship on them in advance

Process and practice - summary

- Lots of factors to take account of beyond claims data

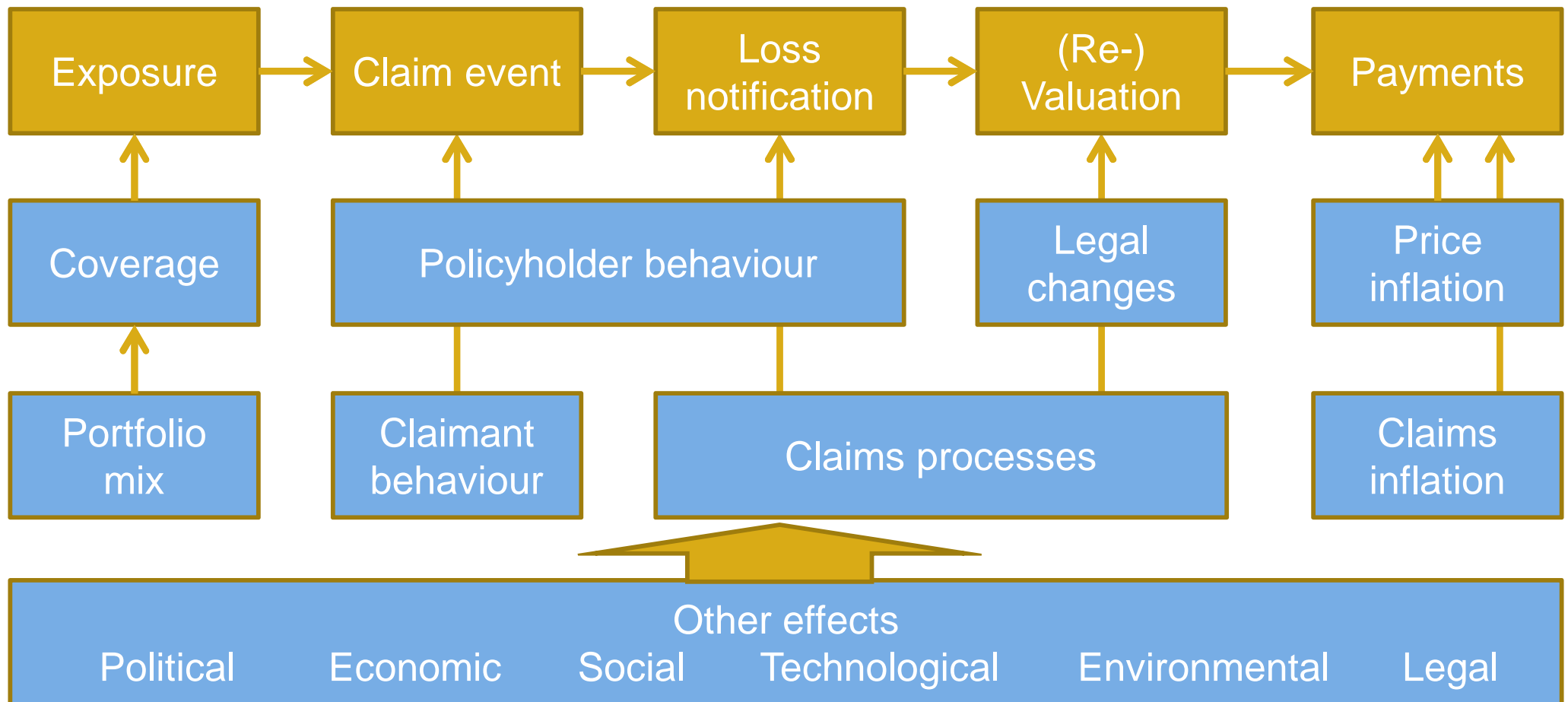- Dashboards and meaningful measures can help make reserving process look outside of the "actuarial cave"

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Laboratory reserving

- Building test data

- Evaluation methodology

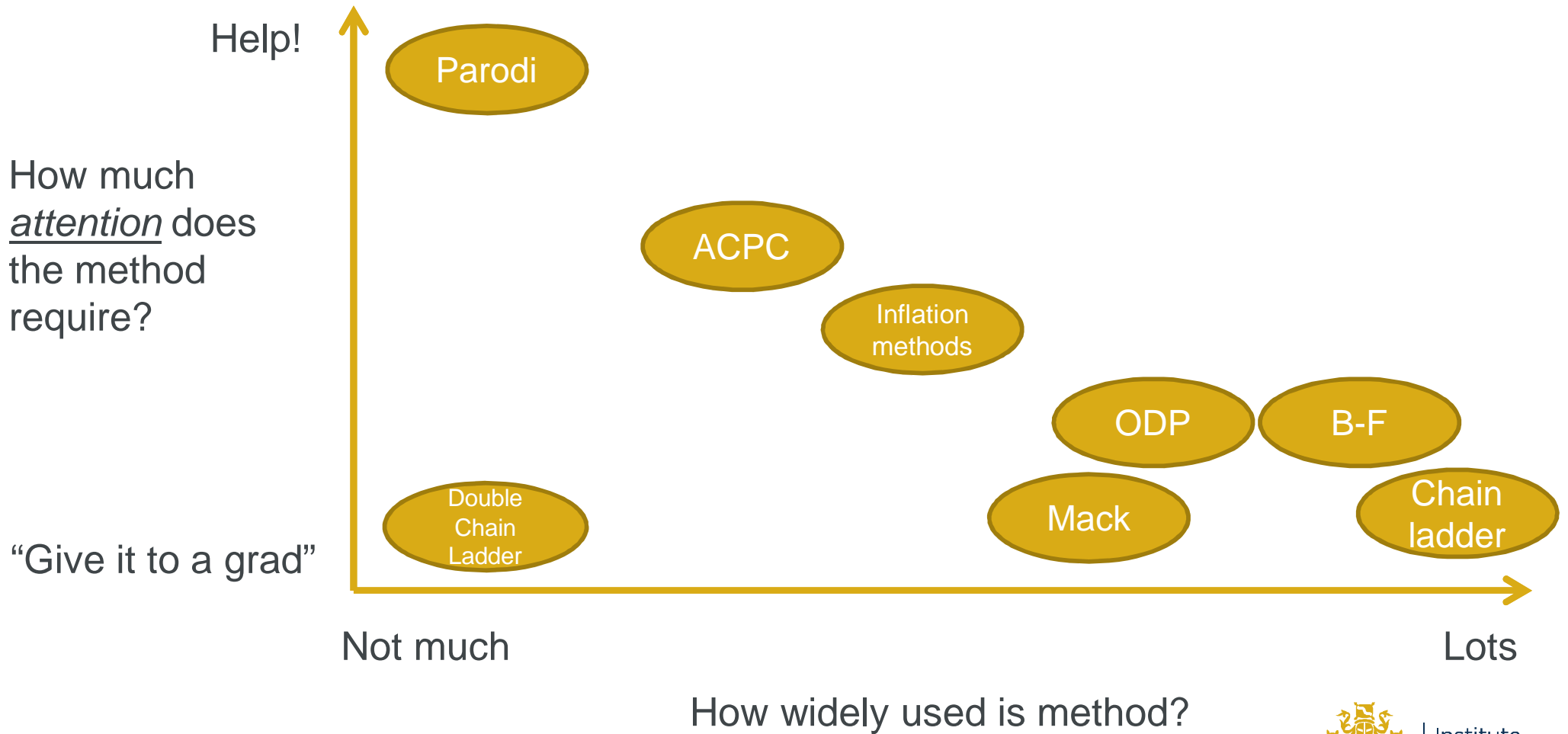- Policy implications

Building test data
Features to capture

Building test data
Demonstration

Methods to be tested

Help!

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How widely used is method?

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Evaluation methodology
Tests we plan to apply

- Distributional tests – to evaluate how well methods estimate true outcome, and whether better in the tail or the centre of distribution

- Mean prediction performance – which methods require more intervention? Can we replicate the overlay of expert knowledge (good and bad?)

- Convergence test – which tests are most adaptive? – "all models are wrong, but some realise they are wrong more quickly"

  Questions:
  What other tests might we apply
  Where might we run into difficulty?

Policy implications

- Which are the "best models to use"?

  – Models that minimise the maximum error (for a given question)

  – Models that err on prudent side

  – Models that adapt most quickly

- Legitimate trade-off between effort and performance

- What external indicators required for good practice?

- How important is it that methods are easy to understand and apply?

Laboratory reserving - summary

- Absence of good test data set

- Intention to build a standard set of data against which new and existing models can be evaluated in a transparent fashion

- Diverse range of ideas of what makes a good method

Concluding comments

- Summary

- Final thoughts and next steps

- Questions

Summary

- Concern that our choice of method may be guided by how easy to apply, not by how suitable to circumstances

- Little research to date on when we need to "switch the cruise-control off"

- Quantitative and qualitative techniques need to be brought together – enable framework in which dashboards and indicators inform and enhance methods

- Busy year ahead testing out techniques in our laboratory

Final thoughts

- Lessons learned

  – No reliable source of data to test our ideas

  – Limited consisitent "back to basics" testing of methods

  – Proceeding steadily to ensure sensible approach

- We need your help to achieve our goals over the coming year

  – Sign up now, at the GIRO exhibit stand, or on the web-site

  – Screening process is to make sure you are committed

  – Skills needed: Wiki, managing and analysing lots of data, stochastic reserving, pricing skills, appetite to get stuck in!

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Questions

Comments

Expressions of individual views by members of the Institute and Faculty of Actuaries and its staff are encouraged.

The views expressed in this presentation are those of the presenter.

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