Institute
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Talk to data (not just to Claims / UW)

How reserving teams are adapting to the changes in the macroenvironment for claims reserving

Presented by William Diffey, Param Dharamshi, Arun Vijay, with input from Malcolm Cleugh on behalf of members of the TORP Working Party

IFoA GIRO Conference 2024

Towards the Optimal Reserving Process (TORP) Working Party Members

William Diffey (Chair)
Apollos Dan
Fergal Dolan
Malcolm Cleugh
Alastair Lauder
Arun Vijay
Laura Dayong
Param Dharamshi
Amerjit Grewal
Michaela Buttigieg
Stuart Vella Bonello

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- Responsiveness to Secondary data with:
  - 3 factors of approaches to Reserving practice
- Framework for engaging with secondary data with:
  - 5 Reserving Example Areas
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Changes in macro environment of reserving

- Value of traditional reserving techniques is under scrutiny.
- Maturity of reserving processes is understood in terms of:
  - Governance: Adequate governance, ownership and challenge
  - Uncertainties: Adequate communication and allowance for uncertainty
  - Data lineage and quality of source system access; overlays of manual processes; secondary data and quality of interactions with finance/claims/Underwriting
  - Assumptions: Realistic, transparent, consistent (with other functions), considering historical experience, relevant
  - Compliance: With regulatory or accounting basis
- But are we missing something important?
- Feature engineering (transformations to identify and use relevant data) is an indispensable step in machine learning. In contrast, the actuarial reserving models are pre-specified – does this create a blind spot by not considering the full universe of relevant data? Should alerts issued by Lloyds/PRA be considered a wake-up call for more fundamental changes?

"*Property and casualty (P&C) reserving processes are still "in the 1990s" and the value of the process must be demonstrated to justify further technology investment*" **Insurance ERM**

"*Given the central role models play in supporting risk assessments, we expect firms to reassure themselves of the continued validity of the models*" **PRA**

Changes in macro-environment makes it even more important than ever to…

- **Utilise the self-serve data capabilities:** make use of the embedded Management Info ('MI') platforms
- **Strike the right balance:** With slick MI (with ability to access for all teams beyond reserving); or reserving functions can end up acting as a companies' internal data centre
- **Orient towards risk:** Understand trends in reserve risk; data and analytics
- **Prioritise analysis:** Focus efforts on key topics such as understanding large or volatile claim analytics
- Consider aspects such as
  - latent claim considerations
  - Scenario based analysis and lag benchmarks
  - Inflation in historic data (e.g. economic) and the prospective (e.g. social)

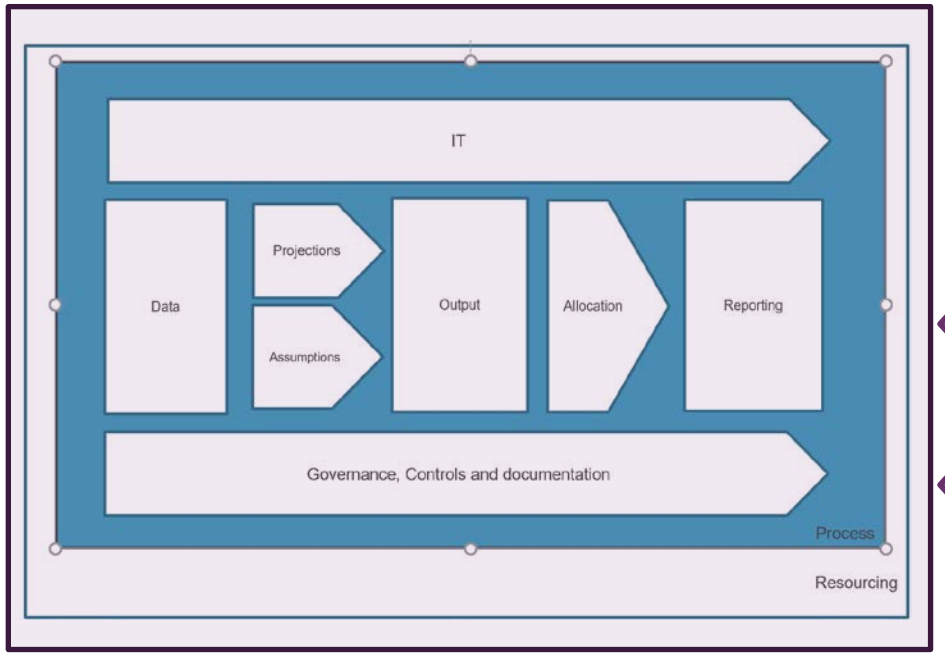
… So secondary data is under spotlight

- Once a good foundation of MI and primary data is in place, secondary data sources (data other than paid/count/incurred) can then be used to adjust within the reserving process
- So secondary data can come into its own as a core feature of the reserving process
- Secondary data has been critical for tackling topics such as Inflation / Covid
- When using secondary data. It is important to:
  - Avoid bias
  - Being overwhelmed by anecdotal information
  - Over reliance on claims and underwriting; Whilst having the right embedded links to these (claims and underwriting teams)

Responsiveness to secondary data from macro-environment

- Advances in data science and machine learning, advances in data lake houses, claims analytics and pricing analytics
- Connectivity and systematic effects on risk drivers e.g. inflation
- Evolution of reserve risk including assessments of impacts like climate change
- Customisation and personalisation of insurance
- Internet of things, social media data, telematics, industrial data repositories

How to change the reserving workflow to be more responsive to secondary data?



Demanding customers

Development

Menti Question 1

What has been the significant recent driver of changes in your reserving process?

- Option 1: Increasing availability of relevant secondary data
- Option 2: Advances in claim analytics and pricing analytics
- Option 3: Extreme risks and new risk categories (e.g. climate change impacts)
- Option 4: Impact of customisation and personalisation (e.g. usage-based covers)
- Option 5: Connected and systematic risks
- Option 6: Demanding finance and business operations
- Option 7: Development in MI / direct self-serve
- Option 8: Drive towards actuarial sign off of business plans
- Option 9: Transaction support
- Option 10: No changes

Approaches to reserving practice

The responsiveness can be characterised as ‘reserving styles’. There are different approaches to reserving practice in terms of rigor of review of secondary data and the approach for analysis. The reserving style depends on the extent of capture and use of secondary data and the rigour and reliance on expert judgments. These in turn depend on three choices that we will cover next.

Reserving as muddling through

- Key person risk and inefficiencies
- Reserving as an art

Responsive business partner

- Reserving team as the lynchpin
- More than a data centre

Reserving at risk

- Symptomatic deteriorations

Compliance Orientation

- Strong early warning KPIs and other controls compensate

Factor I: methodology repertoire

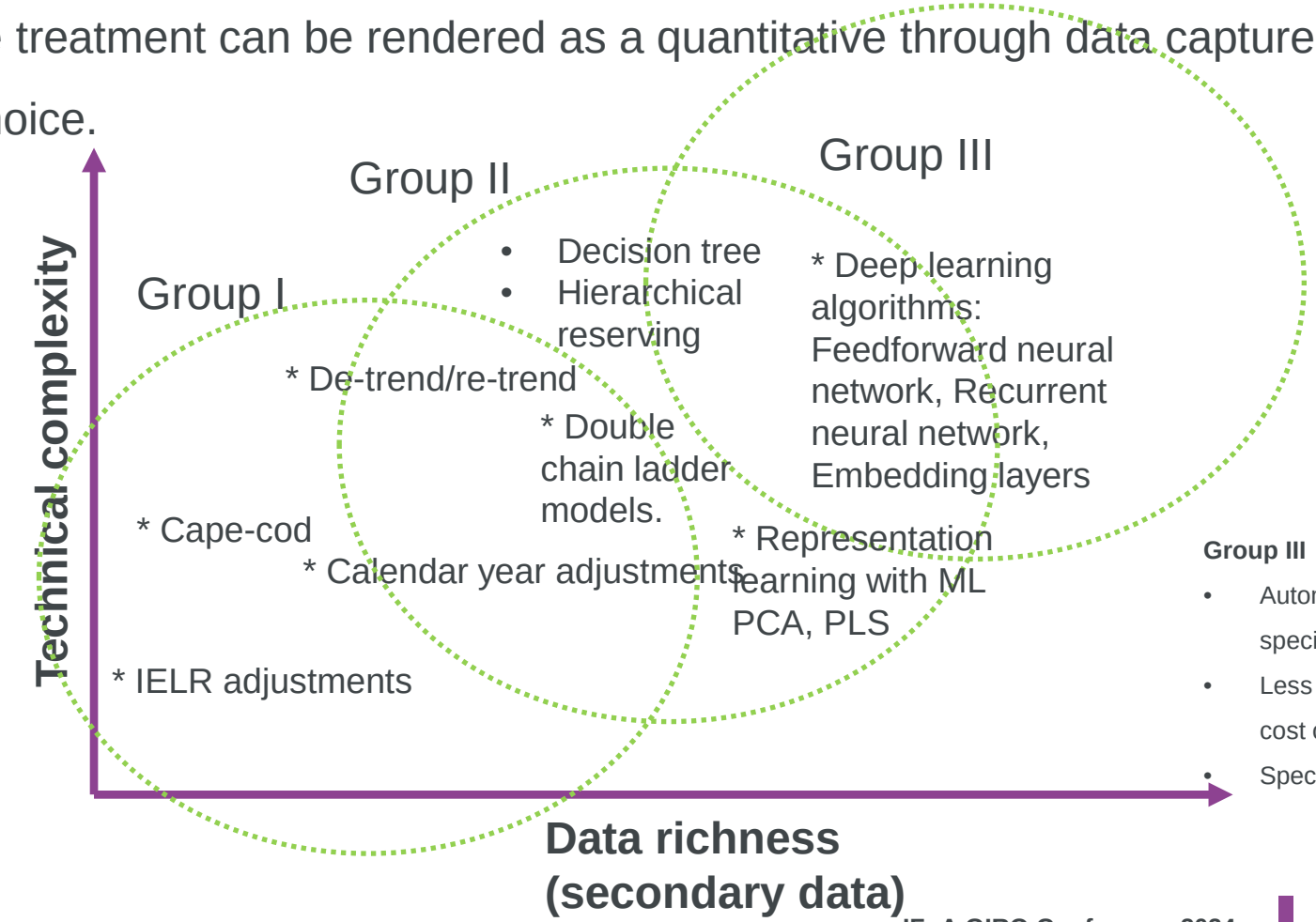
Improving methodology repertoire can improve responsiveness. Some of the secondary data inputs that are amenable only to qualitative treatment can be rendered as a quantitative through data capture and appropriate methodology choice.

Group I

- Focus on appropriate model specification
- Reliance on expert knowledge
- Explainable, familiar, well socialised
- Defining features – challenging, error-prone

Group II

- Systematic feature selection considering wider universe of data
- Hybrid approach with model specification so explainable



Group III

- Automatically provides model specification feature selection
- Less reliance on expert knowledge at the cost of explainability
- Specialised architecture

References: Ronald Richman, 2020 AI in Actuarial Science, Marcus Gesmann and Jake Morris, Hierarchical and compartmental reserving models, 2020 CAS research papers

Menti Question 2

Do you have a rich methodology repertoire in your reserving workflow?

No – only consider triangle based approach overlaid with expert judgment

Nascent – approaches being explored

Somewhat – some consideration of quantitative data overlays and (secondary) trend adjustments

Embedding – reserving repertoire being embedded into the reserving work flow process for BAU

Yes – Consider other many methods (e.g. machine learning) incorporating secondary information

Factor II: reserving philosophy and risk appetite

- Choices in reserving exist around a continuum. There are obvious costs and trade-offs.
  - Efficiency focused versus insight focused
  - Accuracy versus explainability
  - Speed versus rigour
  - Big picture vs granular
  - Internal Stakeholder management and regulatory priorities
  - Best estimate focus versus risk focus

- Identify the level of responsiveness aligned to the risk appetite articulated by the board (reserving example areas). Validate the lens through which the actuary perceives data and understands key drivers
- Carefully manage the transition along the value chain
- Effective use of validations/controls/early warning KPIs with appropriate trigger conditions to monitor risk of deviating from the risk appetite

Factor III: technology

- Variety of relevant feeds, improved access, powerful tools
- Technology stack that makes big data and transactional data available to the reserving actuary for analysis
- Data lake housing technologies that support storage of both structured and unstructured data, improved access to live granular data
- Some use specialised analytical tools that facilitate exploratory analysis with AI assistance. These analytical tools may allow data transformation and rapid prototyping
- Self service options to connect to the data stack simplifying access to secondary data

Menti Question 3

What are the IT tools and technologies indispensable to your work as reserving actuaries?

Free form response / Q&A

Framework for engaging with secondary data

- No one size fits all – different operating models possible but need for a conscious approach with regard to secondary data and how it can be used to build on core data platform
- Need to adapt to the macro environment and avoid, at the same time, unconscious bias
- Be inspired by market-level frameworks where available, but have own framework considering:
  - Phased inflation approach proposed by PRA/Lloyd's
  - Lloyd's climate change framework
  - Adaption for run off and M&A situations
- Periodically challenge & validate your understanding of data relevant for reserving, and the key drivers & risks–ideally captured as part of the reserving policy and TAS compliance
- Carefully manage the transition along the value chain making well informed choices. But take the reserving governance forums and stakeholders with you on the journey
- Be clear about the need and communicate effectively – back book reserve transactions vs BAU reserving. It will be useful to establish links to reserving risk. Engage with risk management to embed the framework

Reserving example areas: how is secondary data used by reserving teams

Case studies

- Reserving example area I: Claims analytics for a (motor) insurance portfolio
- Reserving example area II: Climate change risk management for property reserving book
- Reserving example area III: Run-off portfolio book & M&A
- Reserving example area IV: Legacy & M&A
- Reserving example area V: Embedding continuous development for a mid-sized insurance team

Reserving example area I: claim analytics for motor insurance

- Transitioning from traditional reserving to claim analytics offers new insights. This will enable reserving actuaries be effective as business partners
- In this reserving example area, we consider how they can aim to improve the motor own damage claims process:
  - Reduce own damage claim costs
  - Improve claims handler efficiency and measure their performance based on an objective metric
  - Reward faster claim settlements and lower claim costs
  - Enhance accuracy of case reserves to reduce volatility in reported claim triangles
  - How analytics is changing
  - Inflation application
  - Oversight of trends is key for effective management of portfolios
  - Diagnostics to monitor include:
    - Paid and incurred. Absolute amounts and loss ratios..
    - Standard metrics such as : Claim frequency/severity/reported
    - Settlement speed and average case reserve on open claims.
- Application of technology
  - Create a dashboard which can be shared internally within Reserving team
  - Create a "garden walled version" which can be shared with key customers e.g. Claims, Underwriting, Portfolio Management, Pricing and Finance.
  - You may want to control access customers can only see analytics related to their area of work. Appropriate data confidentiality controls.

Reserving example area I (cont): application of claim analytics in motor insurance

- **Claims analysis by parts damaged:** This would help to understand which parts are mainly being impacted by the loss. Whether these parts are being repaired or replaced. This granular data can also help us in estimating inflation impact at a more granular level.
- **Claims analysis by different covers:** For e.g. indemnity, loss of keys, zero depreciation, etc. This will help us in assessing which sub covers within the policy are more loss making and we can suggest to pricing team if any changes in the premium is needed.
- **Repair Vs replacement ratio:** Repair cost will be impacted by labour inflation and replacement costs will be impacted by part inflation. This can help us in estimating/validating our inflation assumptions in reserving.
- **Garage ranking and analysis:** What is the average settlement severity across the garages. If there are garages which have lower labour cost, we can incentivise policyholders to get their cars repaired with them.
- **Measuring claim handler's performance:** What are the amount of claims processed by surveyor and what is the settlement amount of claims. This helps in objective rating of their performance and consider consumer duty metrics.

The above are potential KPIs/metrics which help to inform the reserving process and embeds the role of reserving actuary in helping to support the development of such metrics. Refer to example questions in Annex.

Reserving example area I (cont): challenges for reserving actuaries in motor claim analytics

Data Issues:

- Difficulty obtaining granular, timely data from claims systems
- Reconciliation issues between claims systems and financial data
- Claims linked to expired or non-renewed policies

Non-Standardised Information:

- Car parts data not in standardized formats, requiring extensive cleaning
- Different systems used to capture claims data causing difficulty in standardising information.
- Free-text "Notes" section valuable but hard to process

Pushback from Claims Team

- Reluctance from claims teams to share data, seeing this as their domain.

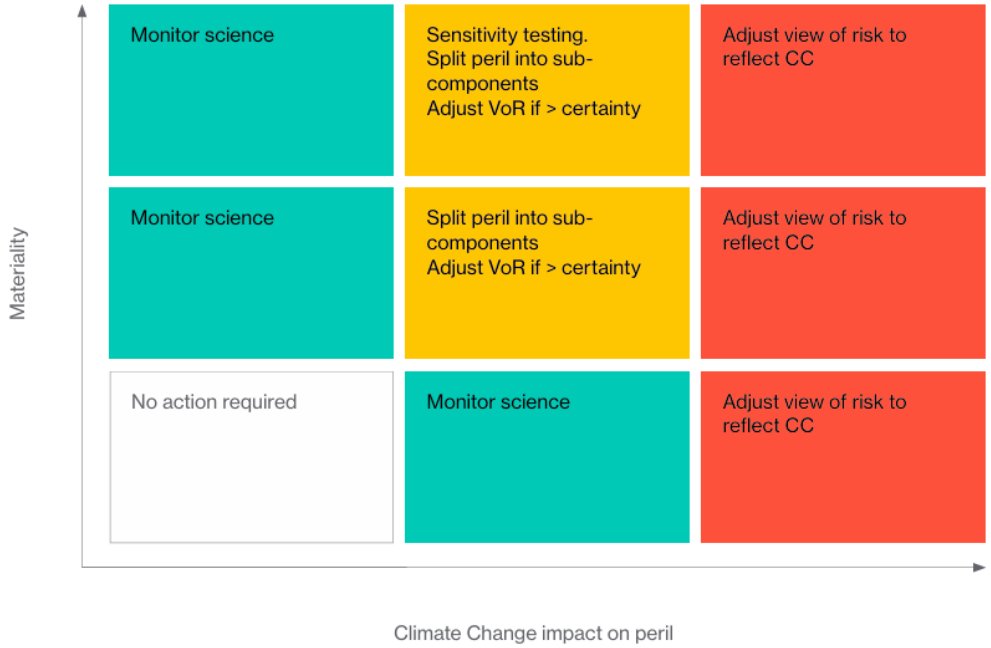
Reserving example area I (cont): advantages of reserving actuaries being involved in claim analytics

- Better Data Understanding: Deeper insight into claims data, benefiting reserving and claims monitoring.
- Key Metrics for Efficiency: Metrics like paid/closed severity help assess claims handler efficiency.
- Standardized Case Reserves: Automatically adjusted for common losses, improving reserve accuracy.
- Fraud Detection Support: Helps identify potential fraud through outlier analysis.
- Inflation Estimation: Supports more accurate future inflation predictions based on parts and labour costs.
- Synergy with Pricing: Collaborating with pricing and claims teams improves overall company strategy.

Reserving example area II: climate change

Climate change risk management for property reserving book

- Regulation
- Reserving and capital valuation
  - Trends; ENIDs; scenarios
- Materiality assessment
  - Baseline climate change; current strategy; physical risks
  - Assessment of Short climate and dark spots in experience (e.g. freeze events rather than flood)
  - Consideration of how manifested in recent historic data used in reserving process
- Challenges
  - Climate change loss; available information
  - How to adjust reserving process to react to any acceleration in climate change
  - Detecting any acceleration in climate change in a data; i.e. bad year vs new norm
  - Adjusting development for any climate latent but incurred events



Reference: Thematic review catastrophe modelling and climate change (February 2022)

Reserving example area III: run-off portfolio book

- In recent years, various insurers have placed parts of their business / particular product classes / years of account into run off
- Question of retaining the risk is considered vs selling to a specialist legacy reinsurer
- Distortion of historic trends as data runs off / increases weight on recent years
- Loss of potentially favourable reserve return off on new / recent business – so fully exposed to tail run off
- Decision on whether to strengthen reserves at time portfolio is exited to avoid drip drip of adverse future run off
- The risk view is equally important as the best estimate and the signals available from secondary data will be useful in the assessment. The risk view will be captured appropriately in IFRS 17 risk adjustment and Solvency II risk margin.

Reserving example area III (cont): run-off portfolio book

- Claim settlement costs may be influenced by a number of factors:
  - Reduction in number of claims to be managed – impact on claim handler numbers. How do you effectively manage down handler numbers over time
  - Loss of economies of scale as number of repairs tails off
  - Loss of more experienced / marketable claim handlers as they "jump ship" to new employer rather than wait for future redundancy or retirement
  - Outsourcing of claims handling to specialist claim providers as book shrinks. Cost benefit vs in-house team
  - Need to consider above issues when setting appropriate unallocated claims handling reserve (ULAE)

Reserving example area III (cont): run-off portfolio book

- Portfolio in run-off has two distinct claim types with different issues considering a motor example:
- Damage:
  - High volume claims but quick run-off, with most settled within 2 years. Third Party Damage would normally be slowest to settle
- Injury:
  - Will typically take longer to settle than damage claims
  - Low value injury claims may take 3 to 5 years to settle depending upon Portal, Medical Information and Legal delays
  - Challenge will be the serious injury claims and in particular injuries to minors. These may not see legal settlement and court decision until age 21 or 25
  - Case reserves will take time (potentially many years) to fully reflect final claim cost as prognosis and severity of injury develops creating a challenge for Reserving team setting IBNR to get to ultimate claim cost
  - Brain injuries and similar are normally one-way so would expect to see adverse reserve run-off unless significant reserves booked at time of exit for likely deterioration in tail reserves

Reserving example area IV: legacy / M&A

- Single shot at pricing legacy book. So need to understand topics such as:
  - Large claims / volatility
  - Risk of under-reserving
  - Process of drawing order from chaos from dis-orderly data and information
- Key metrics
  - Situations where the ratios fail (as no ongoing business to balance out)
  - Scenarios based / building block approach
  - Consider true downside risk scenarios
- Better reserve risk assessments are key
  - Combine best of first principles with quantifications/risk management
  - Impact of high uncertainty and reduction in risk appreciated – desire to offload business to free up business capacity
  - Impact on model validation cycles
  - Exposure based assessments

Reserving example area V: Embedding development

Continuous development for making reserving process development safe within companies. Looks at the following aspects:

1 People

-Staffing; training ; structure; planning (BAU vs development)

2 Governance

-Oversight; Sign-offs; user controls/manual processes restrictions; tools; action plans

-Development vs BAU version control; levels of access control (i.e. model controller)

3 Systems

-Software; (end-to-end) processes; cloud; not using excel as a database; use of BI platforms and data self-serve;

4 Data

-Access control; systems

-Adjustments for secondary data, and sources/controls/use cases over secondary data

-Validation of data (and other aspects of process; systems) as part of development

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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Talk to data

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Annex

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Aspects to look at with claims / questions to ask

- Reserving Methods:
  - How do you determine initial case reserves for new claims?
  - What guidelines or frameworks are followed for setting and adjusting case reserves?
  - Are there specific criteria or thresholds for automatic vs. manual reserve adjustments?

- Data and Systems:
  - What systems and tools are used for recording and tracking case reserves?
  - How frequently are reserves reviewed and updated?
  - How do you ensure data accuracy and consistency in the reserving process?

- Involvement and Oversight:
  - Who is involved in the reserve setting process (e.g., adjusters, managers, specialists)?
  - How is the reserve adequacy monitored over the life of a claim?
  - What role does the actuarial team play in reviewing and validating case reserves?

- Challenges in Case Reserving:
  - What are the primary sources of uncertainty in your case reserving process?
  - How do you handle large or complex claims where future costs are highly uncertain?
  - How do you address the impact of external factors (e.g., economic conditions, legal environment) on reserves?

Aspects to look at with claims / questions to ask (2)

- Consistency and Accuracy:
  - What challenges do you face in maintaining consistency across different adjusters and claims?
  - How do you manage discrepancies between initial reserves and actual claim settlements?
  - What steps are taken to reduce the occurrence of under-reserving or over-reserving?

- Communication and Collaboration:
  - How effective is the communication between the claims team and the actuarial department?
  - What challenges do you encounter in conveying the rationale behind reserve changes?
  - How do you ensure that both teams are aligned on reserving practices and expectations?

- Training and Development:
  - What training programs are in place to enhance the reserving skills of claims adjusters?
  - How do you keep the team updated on changes in reserving guidelines or best practices?
  - What are the main areas where adjusters seek additional training or support?

Aspects to look at with claims / questions to ask (3)

- Technology and Innovation:
  - Are there any recent technological advancements or tools that have improved your reserving process?
  - What challenges do you face in integrating new technologies or data sources into the reserving workflow?
  - How do you see technology evolving in the next few years, and what impact will it have on reserving?

- Historical Analysis:
  - Can you provide examples of cases where initial reserves were significantly different from final settlements?
  - What lessons were learned?
  - What types of claims typically present the most difficulty in accurate reserving?

- Feedback and Improvement:
  - How do you incorporate feedback from the actuarial team into your reserving process?
  - What initiatives are currently underway to improve the accuracy and efficiency of case reserving?