LUX
ACTUARIES & CONSULTANTS

IFRS 17: A Technical Deep Dive

Gulf Actuarial Society Meeting
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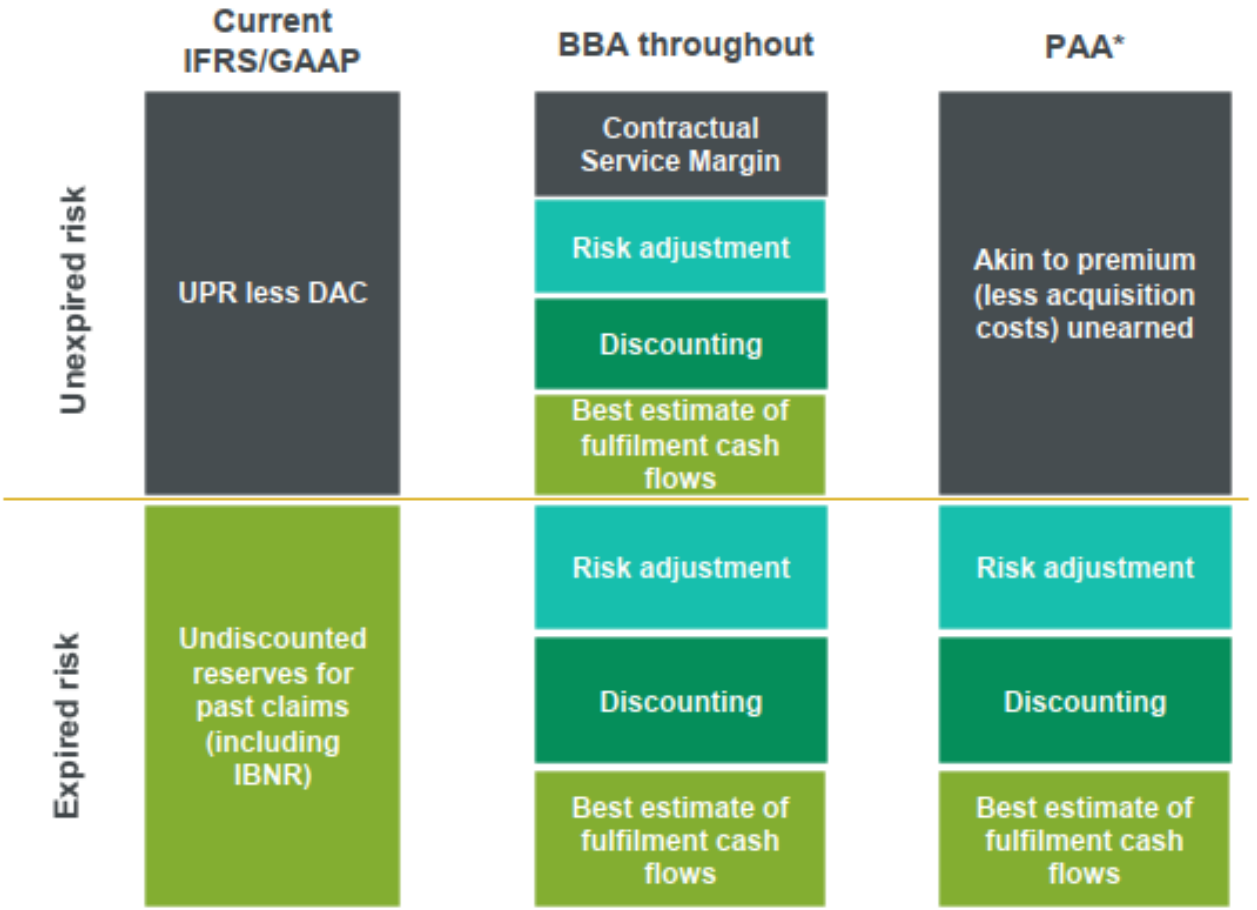
A Snapshot of IFRS 17

IFRS 17 Technical Overview



*Size of box for illustrative purpose only. Specific conditions must be met for PAA

Risk Adjustment within IFRS17

- Paragraph 37 - Definition
  - “An entity shall adjust the estimate of the present value of the future cash flows to reflect the compensation that the entity requires for bearing the uncertainty about the amount and timing of the cash flows that arises from non-financial risk.”

- Paragraph 119 - Disclosure
  - “An entity shall disclose the confidence level used to determine the risk adjustment for non-financial risk. If the entity uses a technique other than the confidence level technique for determining the risk adjustment for non-financial risk, it shall disclose the technique used and the confidence level corresponding to the results of that technique.”

Risk Adjustment: Characteristics

No limitation on techniques or prescribed level of diversification

Confidence level techniques, cost of capital, and scenario analysis

Disclosure of technique and confidence interval used

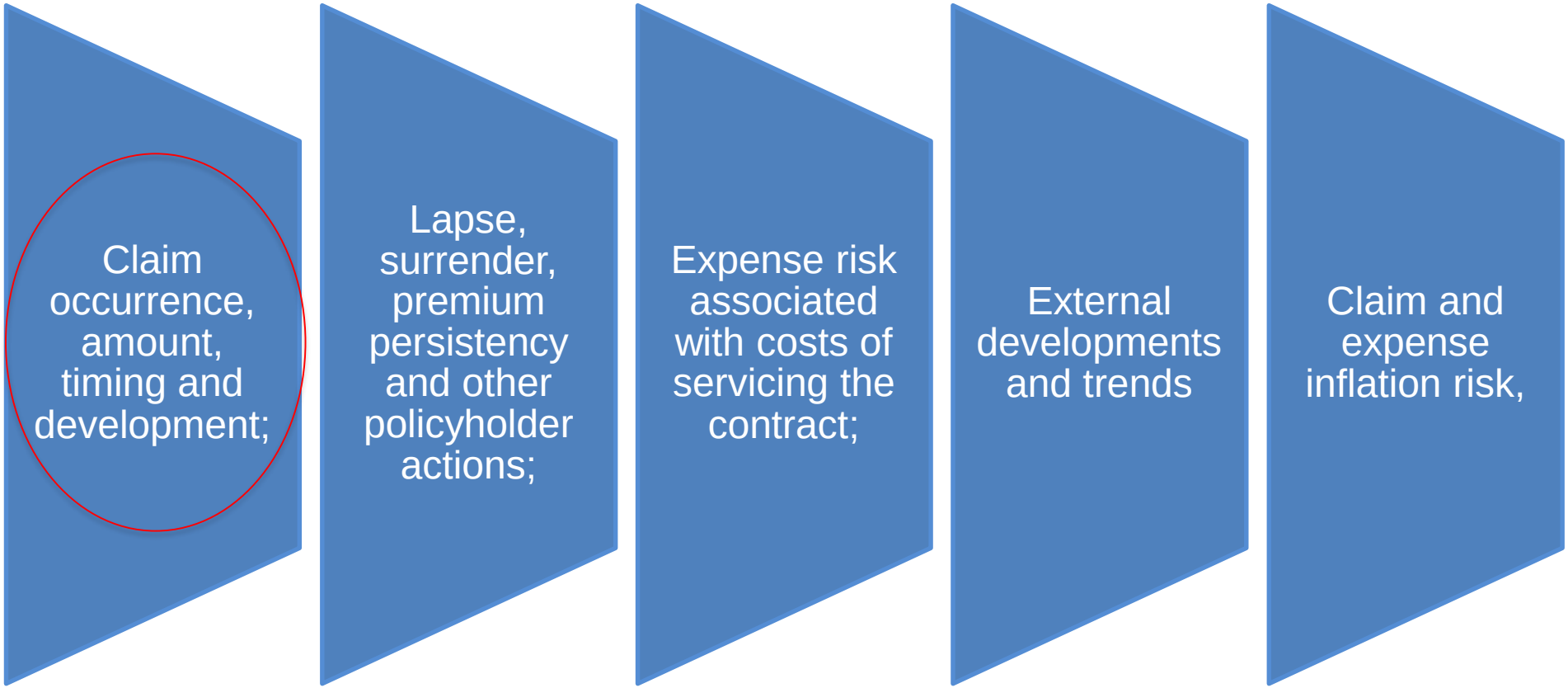
Consider ease, speed, and communication

Consistent with risk assessment

Practicality of implementation and ongoing re-measurement;

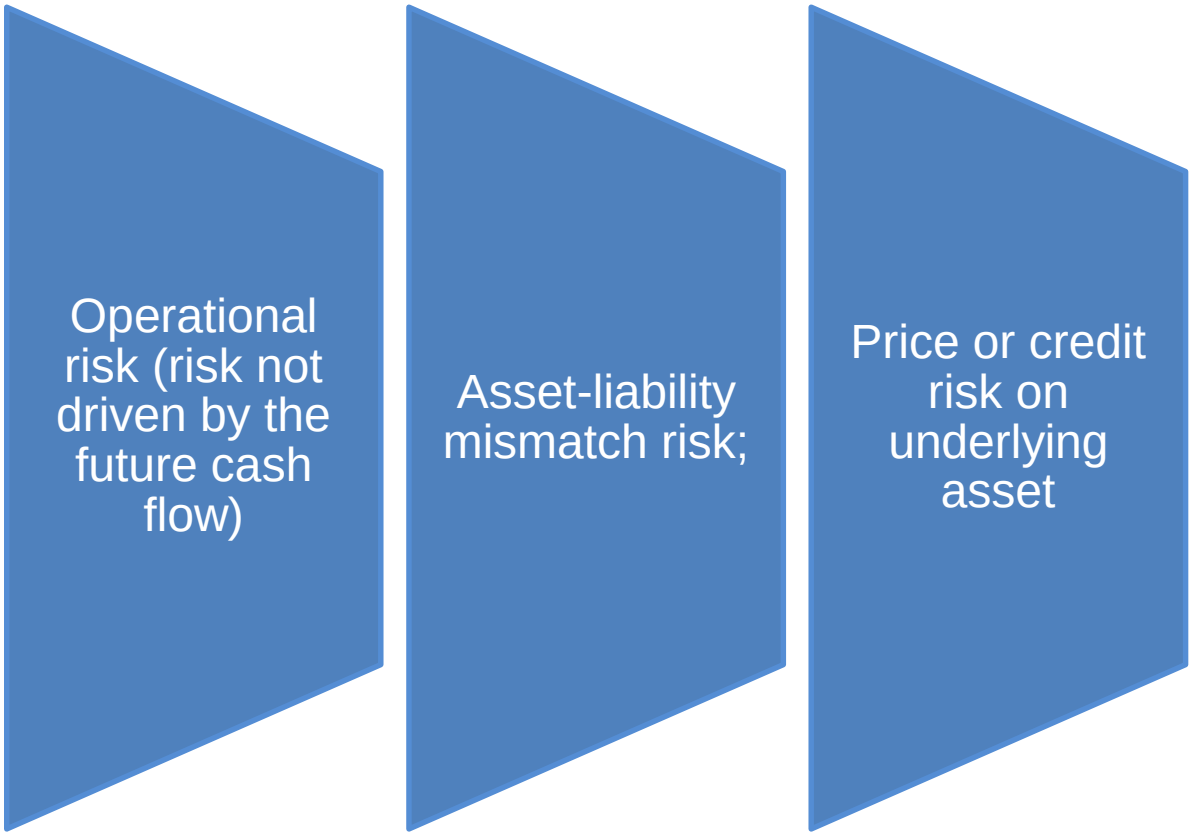
Risk Adjustment – What to include?

- The risk adjustment would include the uncertainty created by the following non-exhaustive list of risks to estimates of the future cash flows:



Risk Adjustment – What to exclude?

- The risk adjustment for non-financial risk would not include the uncertainty created by the following:



Risk Adjustment – Leverage what you have

INTERNAL CAPITAL MODELS

- Developed within regulatory frameworks (and/or for pricing purposes)

REGULATORY SOLVENCY CAPITAL ADEQUACY MODELS

- May align well with how entity views and assesses risk.

Risk Adjustment – Possible Techniques

Possible Methods?

Value at Risk (VaR)

- Confidence level techniques.
- Requires calculating discounted value of best estimate fulfilment cash flow under a range of scenarios
- Risk Adjustment calculated as VaR/CTE at a specified confidence interval less best-estimate.
- Can also be calculated using correlation method
- Alternative approach is copula method.

Tail VaR (TVaR) / Conditional Tail Expectation (CTE)

Cost of Capital (CoC)

- CoC assess cost of holding capital sufficient to cover relevant risks over lifetime of business.

The CTE Method – An Example

- Data from 2 LOBs – Motor TPL and Engineering as at Q3 2019
- Stochastic Reserve Risk looked at using Bootstrap CL
- Over-dispersed Poisson process error introduced
- Comparing results at 60^{th}, 75^{th}, 95^{th} percentiles for risk adjustment

Bootstrap CL

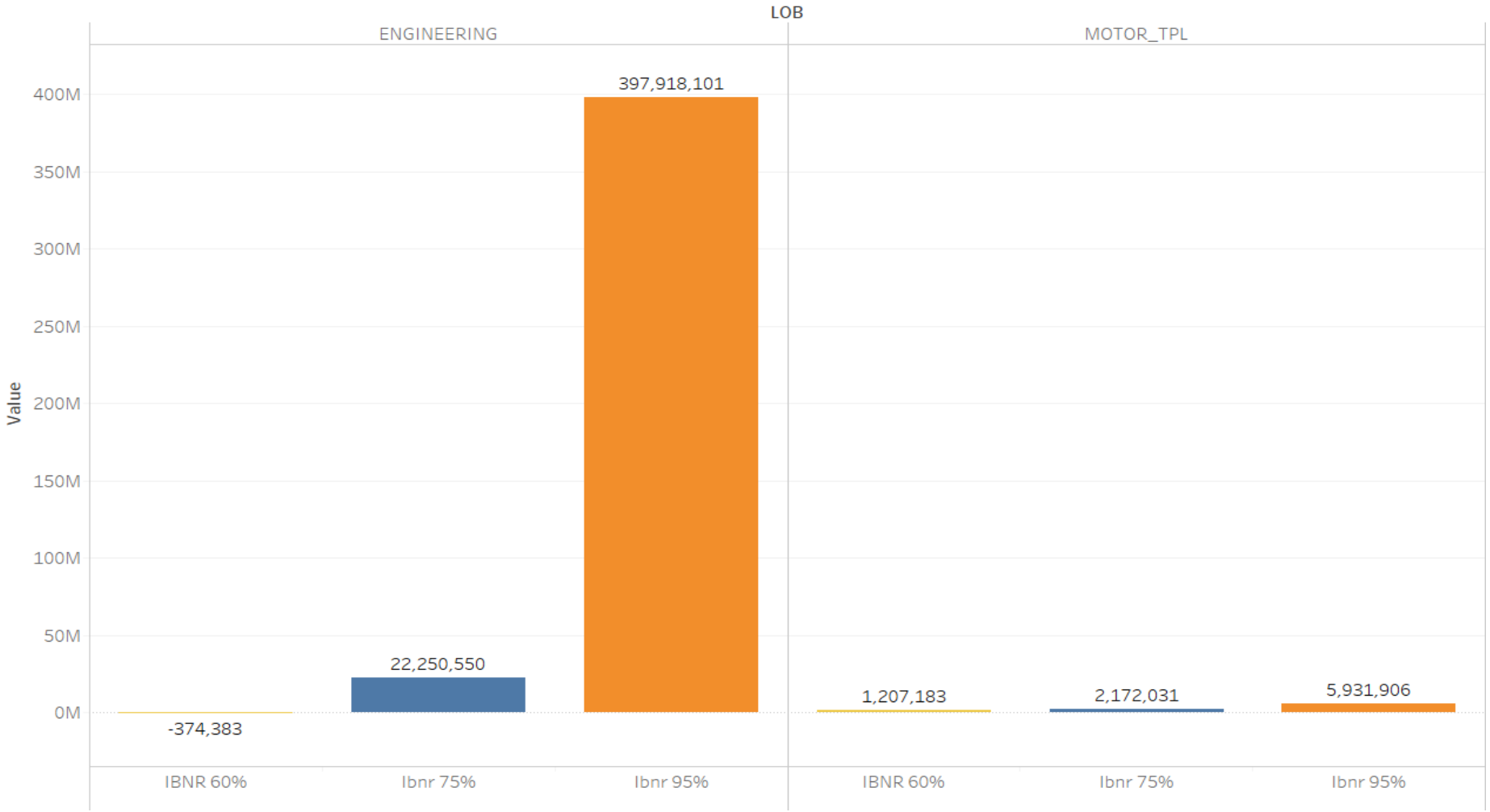
CL fitted to cumulative claims triangle

- Development factors calculated; used to complete triangle
- Back-fit original triangle from predicted triangle and development factors
- Residuals calculated

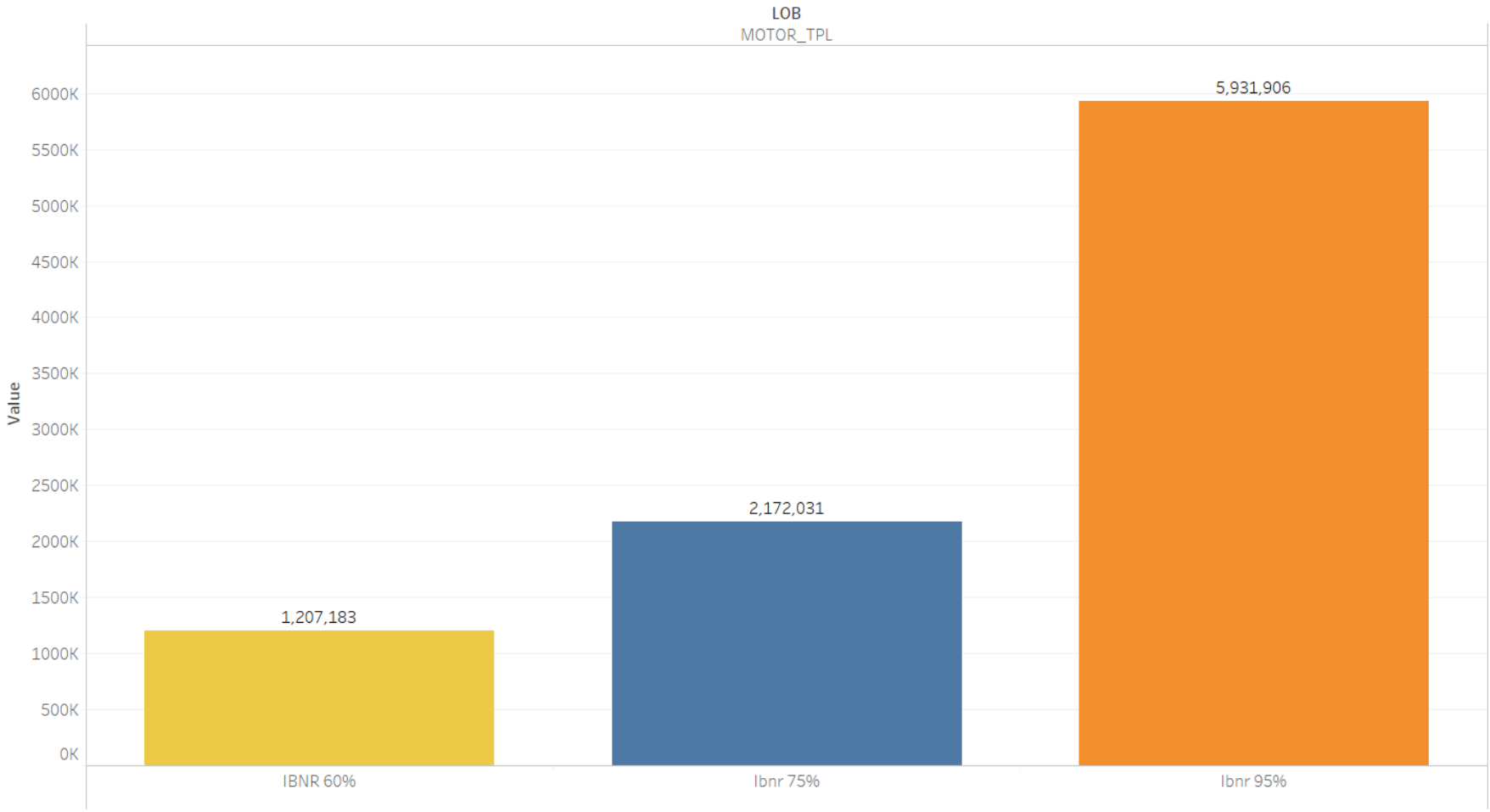
Bootstrap Loop

- Bootstrap residuals and add process error
- Add to original incremental triangle to generate Bootstrapped triangle
- Convert to cumulative Bootstrapped triangle
- Fit CL

Results


LOB
ENGINEERING
MOTOR_TPL
Value
400M
350M
300M
250M
200M
150M
100M
50M
0M
397,918,101
22,250,550
-374,383
1,207,183
2,172,031
5,931,906
IBNR 60%
Ibnr 75%
Ibnr 95%
IBNR 60%
Ibnr 75%
Ibnr 95%

Results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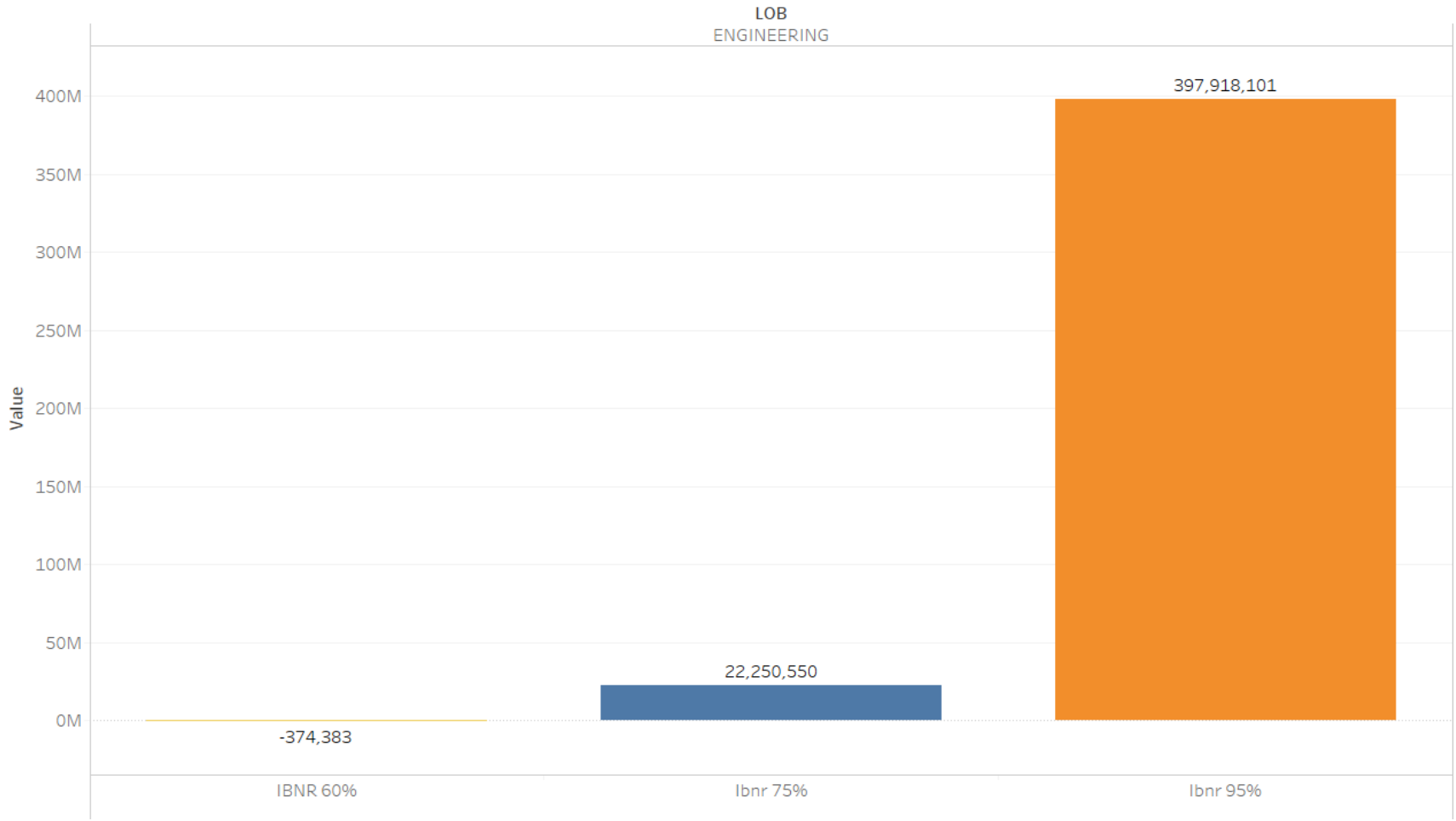
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250M
200M
150M
100M
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22,250,550
-374,383
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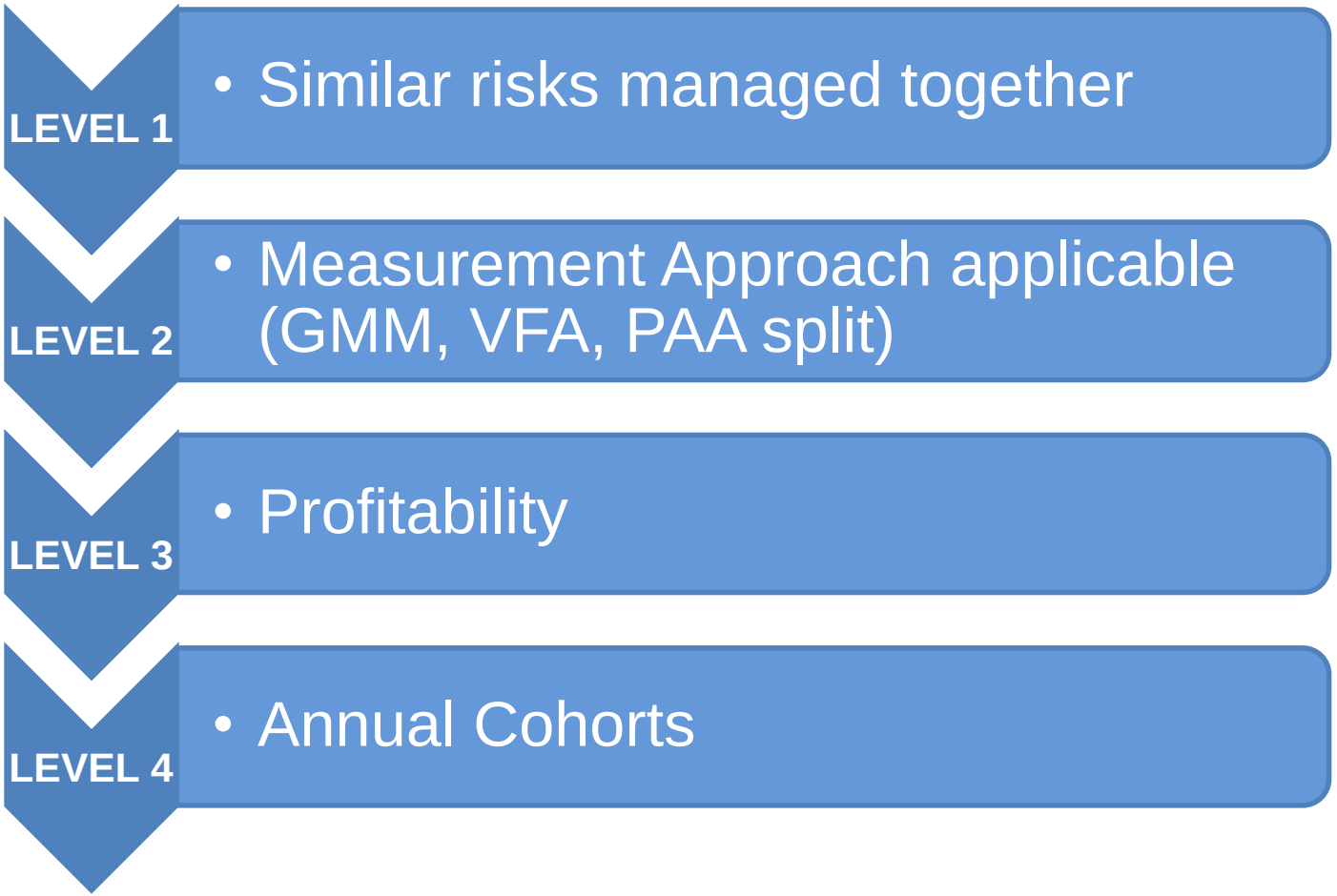
Risk Adjustment – Factors to Consider

- Risk adjustment (RA) impacts release of CSM
- May impact the classification of contracts
- Allocation methodology for individual contract level will impact the classification
- Potential link of pricing vs derivation methodology for RA subject to auditor approval

Level of Aggregation



Level of Aggregation: Technicalities

Judgment

- What constitutes managed together?

Granularity

- Level of granularity required in assignment of portfolios

Consistency

- Will vary between entities, due to different sizes and complexity

Reporting Systems

- Determining the portfolios will rely on the internal management reporting systems

Level of Aggregation: Considerations

Short Term Contracts	If reissued at renewal date this will be a new contract under the standard.
Grouping	Cohorts based on accident year may not necessarily correspond with contracts issued less than one year apart.
Long Term Contracts	IFRS 17 may treat the renewal date as the contract boundary and reinstatement as creating a new “contract” separate from exiting contract.
Multi Peril Contracts	If not priced explicitly attribution of premium to multiple peril groupings could be challenging.

Level of Aggregation: Considerations

- Separate gross liabilities from any associated reinsurance held.
- Present income or expenses from reinsurance contracts held separately.
- Separate disclosure of contracts issued as assets or liabilities.
- Groups of contracts in a liability position are those where the total insurance contract liability is positive and vice versa.
- Where law or regulation constrains the ability to set different price or then those characteristics can be ignored for allocating policies.

Determining Onerousness – Example

Age (18 years - 65 years)
Term (5 years to 25 Years)
Maximum Coverage till 70

Expenses include Commission and Administration Expenses

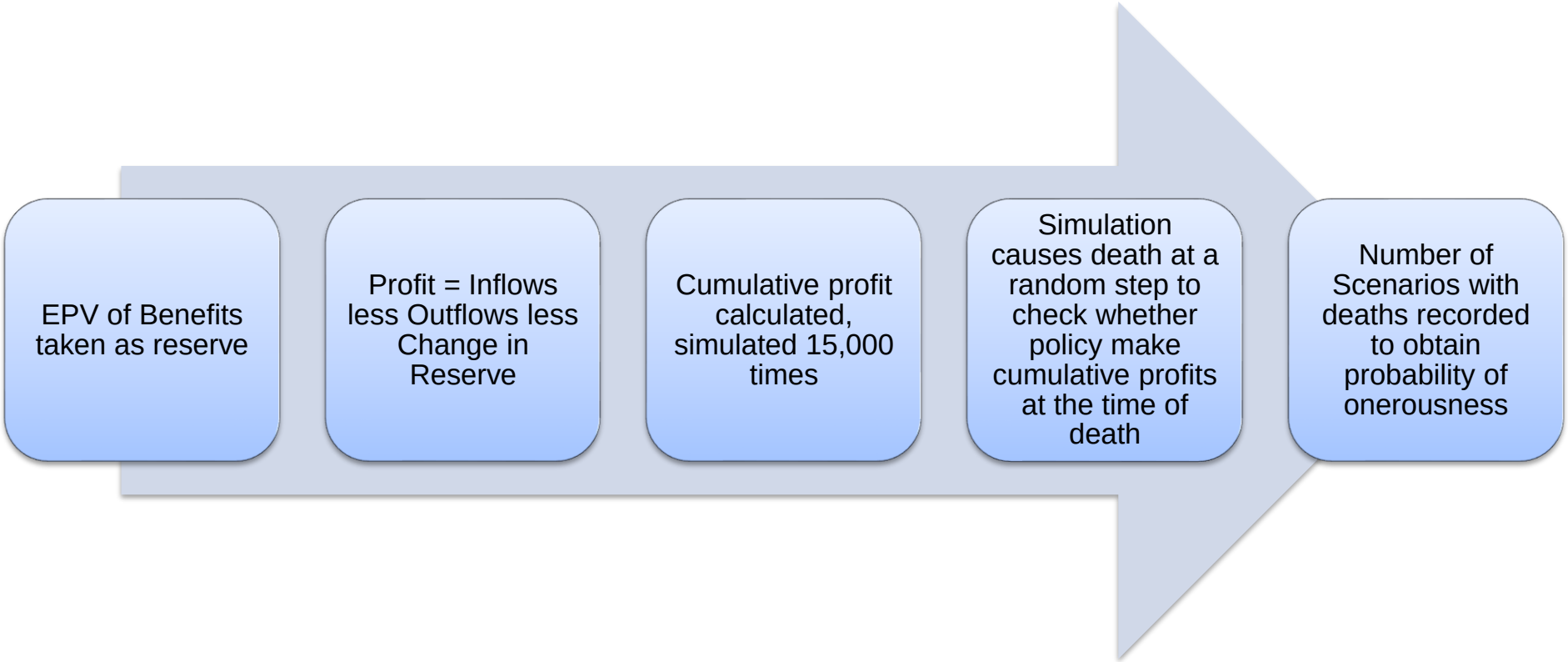
Flat Sum Assured Single Premium Term

Mortality: AM 67-70 Ultimate Rates,
No Lapse,
Reinsurance: 85% QS

No investment income,
990 Model Points for each combination of age and term

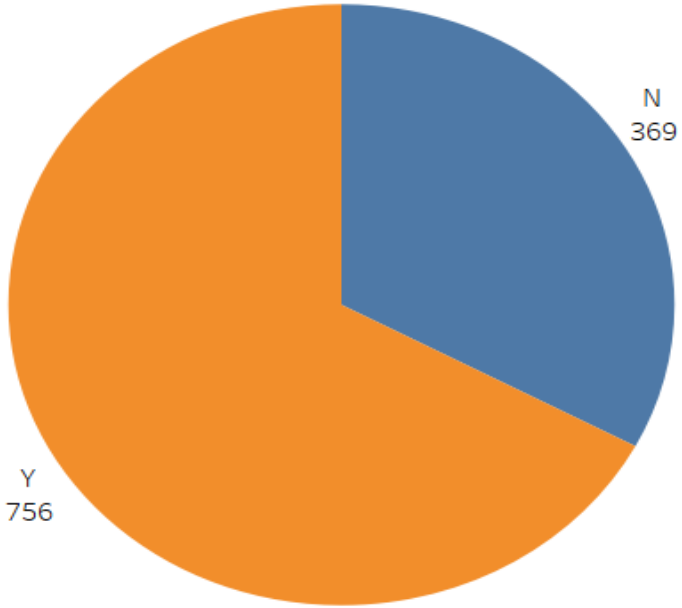
Measuring Profitability

- Point estimates won't do – want to see how likely a policy can become loss-making
- Need to simulate



Grouping Policies based on Profitability

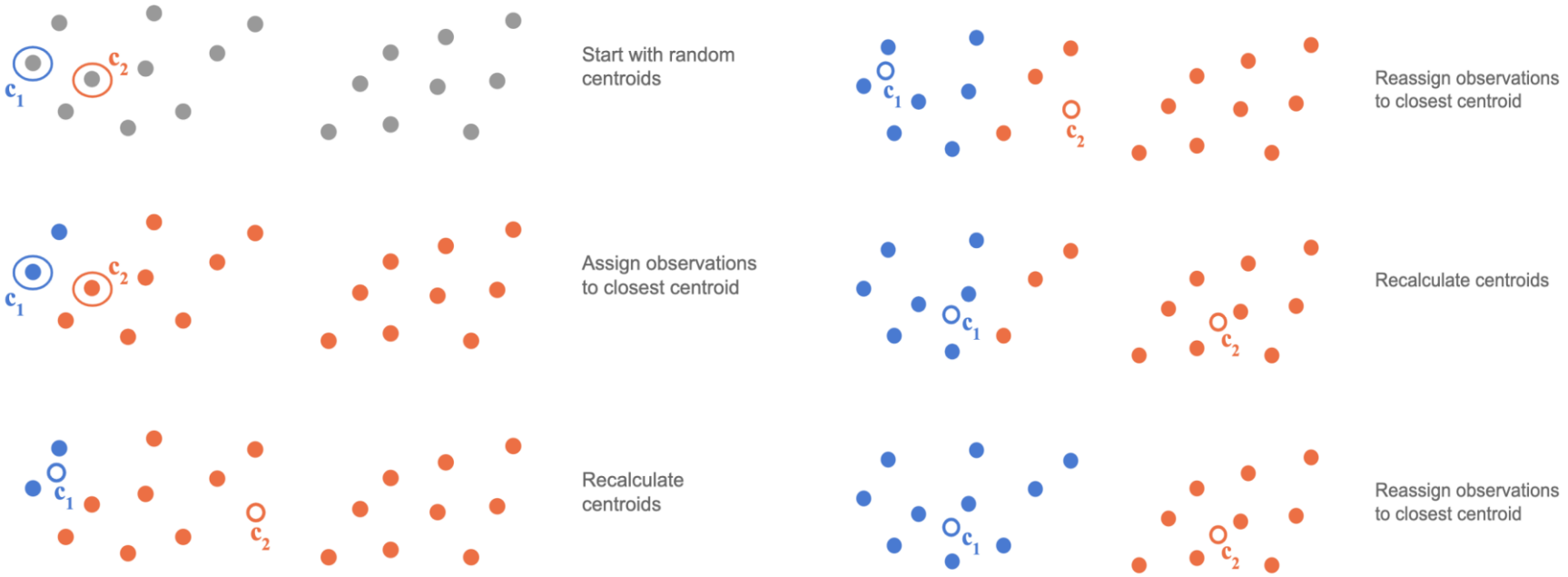
- 1,125 model points with an estimated likelihood of loss-making behavior



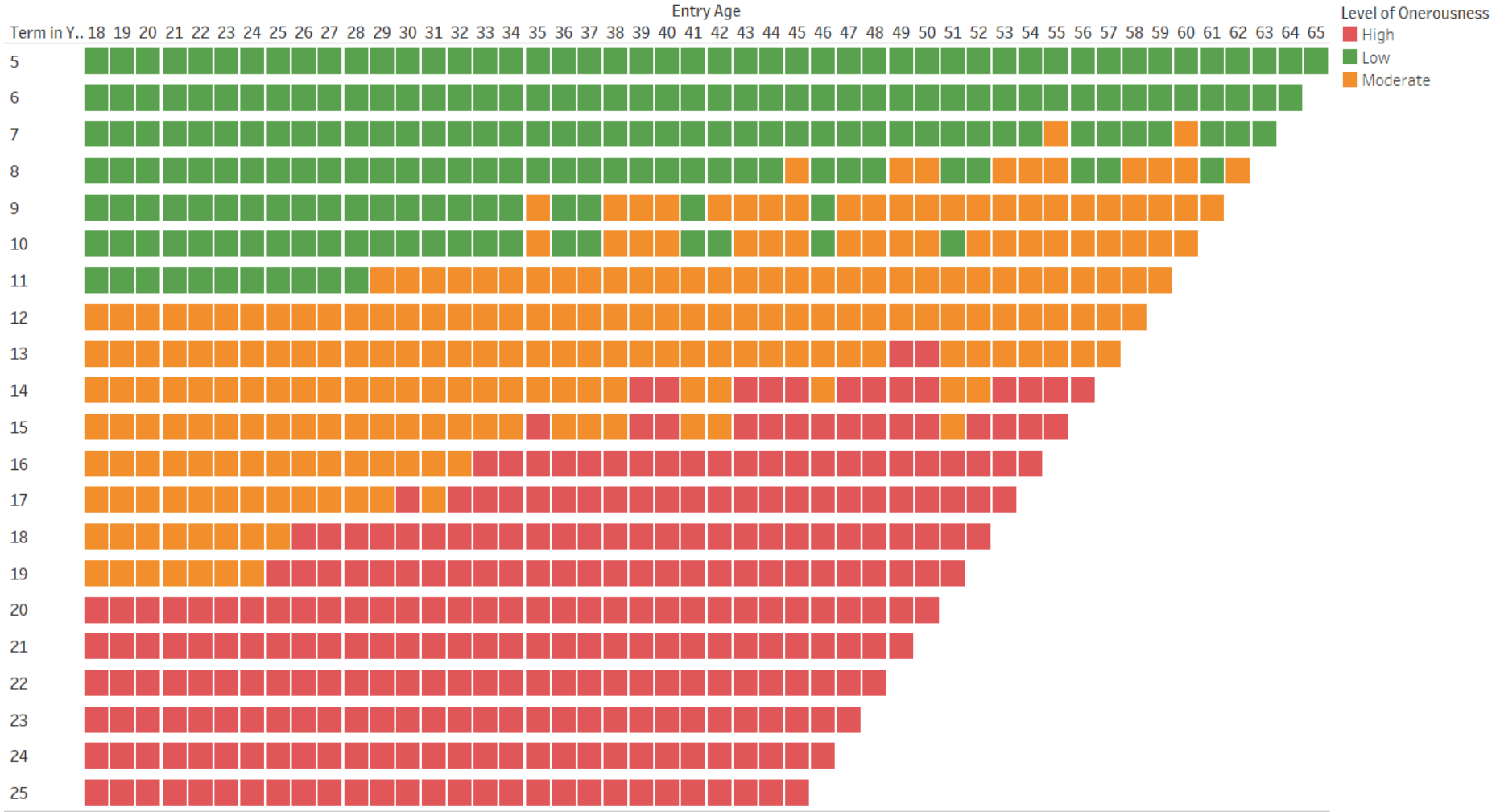
- How to group these?
- **Machine Learning** can provide a handy solution!

K-Means Clustering

- Attempts to group data points that are most similar to each other
- K-Means clustering performed on Likelihood of Loss variable



Results


Entry Age
Term in Y.. 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65
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25
Level of Onerousness
High
Low
Moderate

Summary

- **RISK ADJUSTMENT**
  - Risk Adjustment must be calculated on net basis
  - Judgement involved in selection of approach
  - Differences between approaches need to be assessed carefully.

- **LEVEL OF AGGREGATION**
  - Judgement involved in identification approach
  - Granularity and Systems are the key
  - Onerousness can be contentious
  - Multi Peril Contracts and Life Contracts with Riders to be carefully assessed
  - ML can potentially be leveraged

Questions?

Sources

1. CIA Educational Note: Application of IFRS 17 Insurance Contracts
2. CIA Educational Note: IFRS 17 Risk Adjustment for Non-Financial Risk for Life and Health Insurance Contracts
3. EIOPA's analysis of IFRS 17 Insurance Contracts
4. IFRS17 Complexity in Practice: PAA and Onerous Contracts (Alice Boreman, IFRS 17 Working Party)
5. IFRS 17 Risk Adjustments, and Risk Margins using the Cost-of-Capital approach: Estimating Future Capital Requirements (Peter England and Matt Facey)
6. IFRS 17 Risk Adjustments: Reserving or Capital Modelling? (Peter England)
7. Level of Aggregation in IFRS 17 (Massimiliano Neri)