7th General Insurance & Takaful Actuarial Seminar
Think Different, Go Further
24th & 25th July 2017
DoubleTree by Hilton Hotel KL

IBNR Robot

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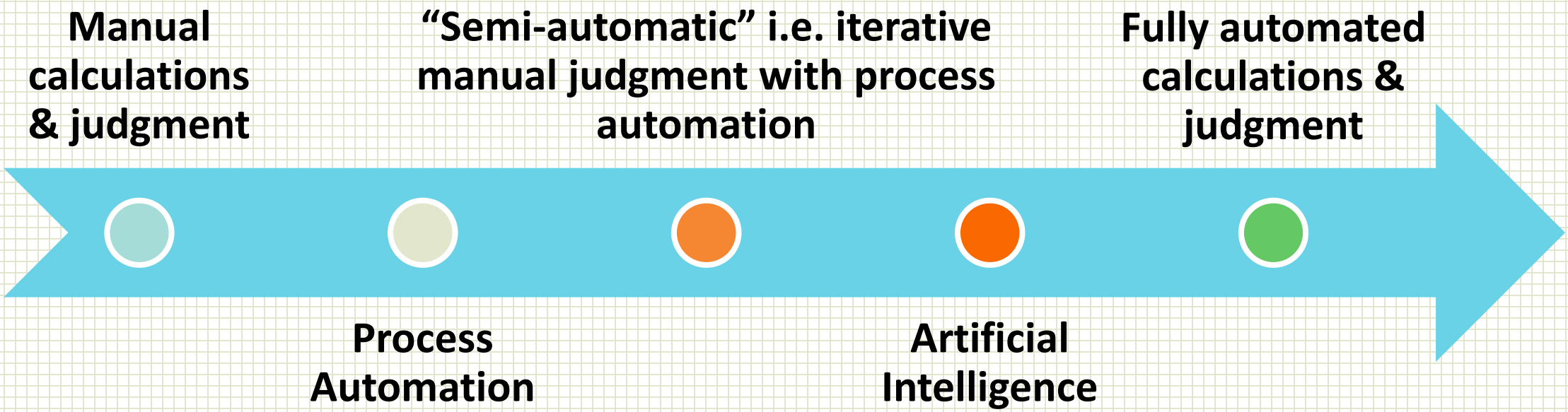
Evolution of Actuarial Work with Technology

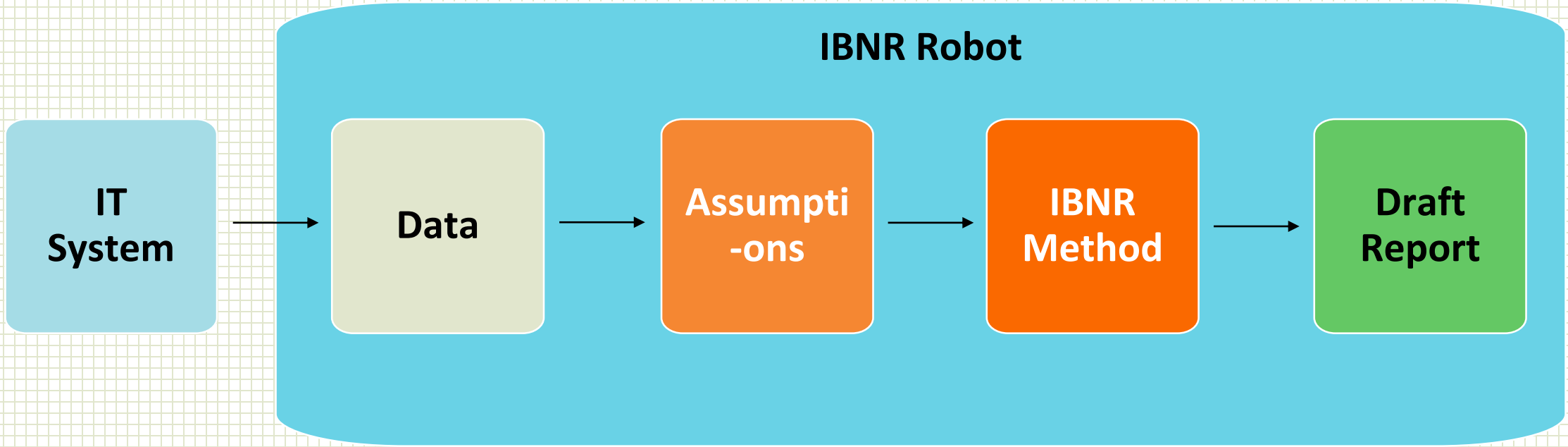


Objective

The starting point of an actuarial reporting exercise shall be the download of a draft actuarial report from the IT system, not a download of raw policy and claims data.

The actuarial team shall work to analyse this draft report, apply critical judgment and deliver useful recommendations to the business. The actuarial team shall not be involved in producing the draft report.

IBNR Robot Workflow



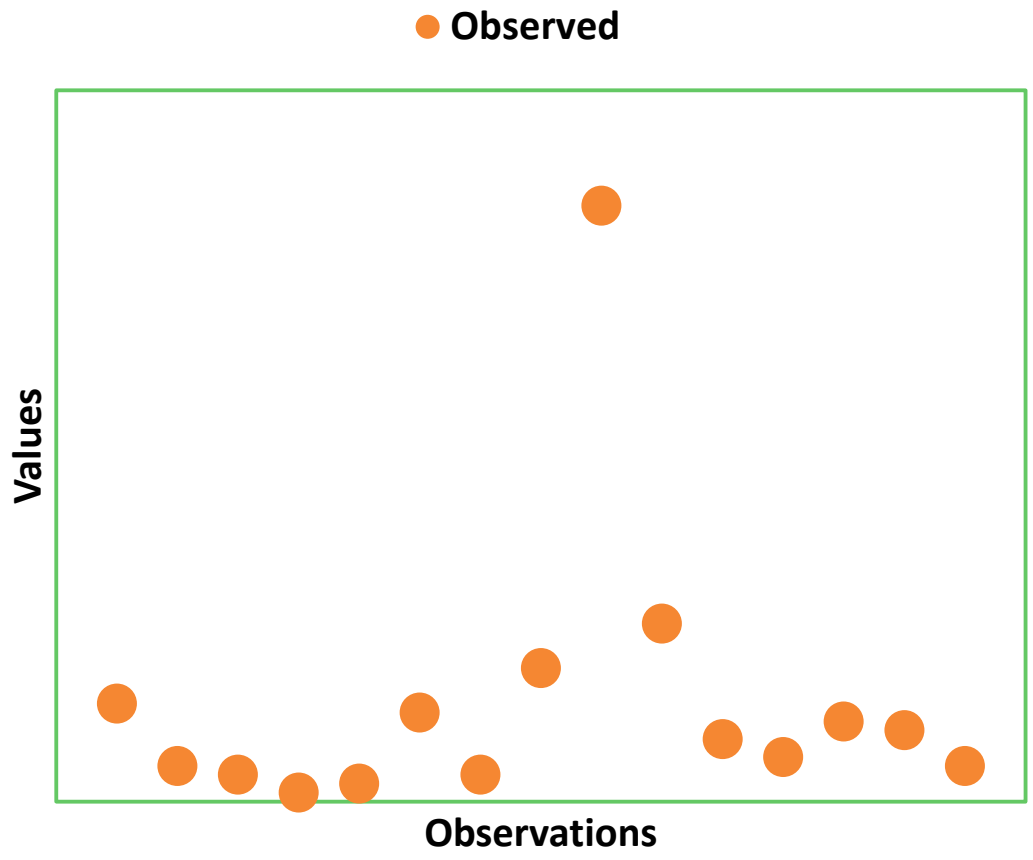
Main Applications of Artificial Intelligence in Actuarial Work

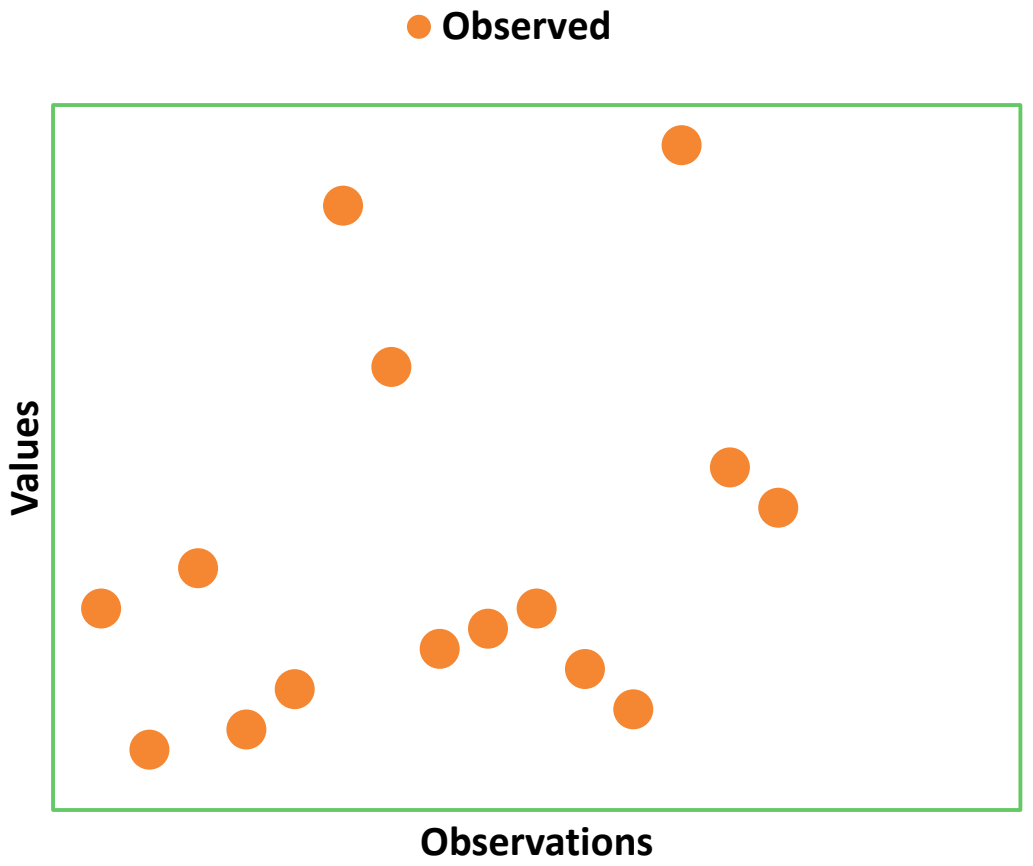
Deal with unusual data values

Select parameters for actuarial models

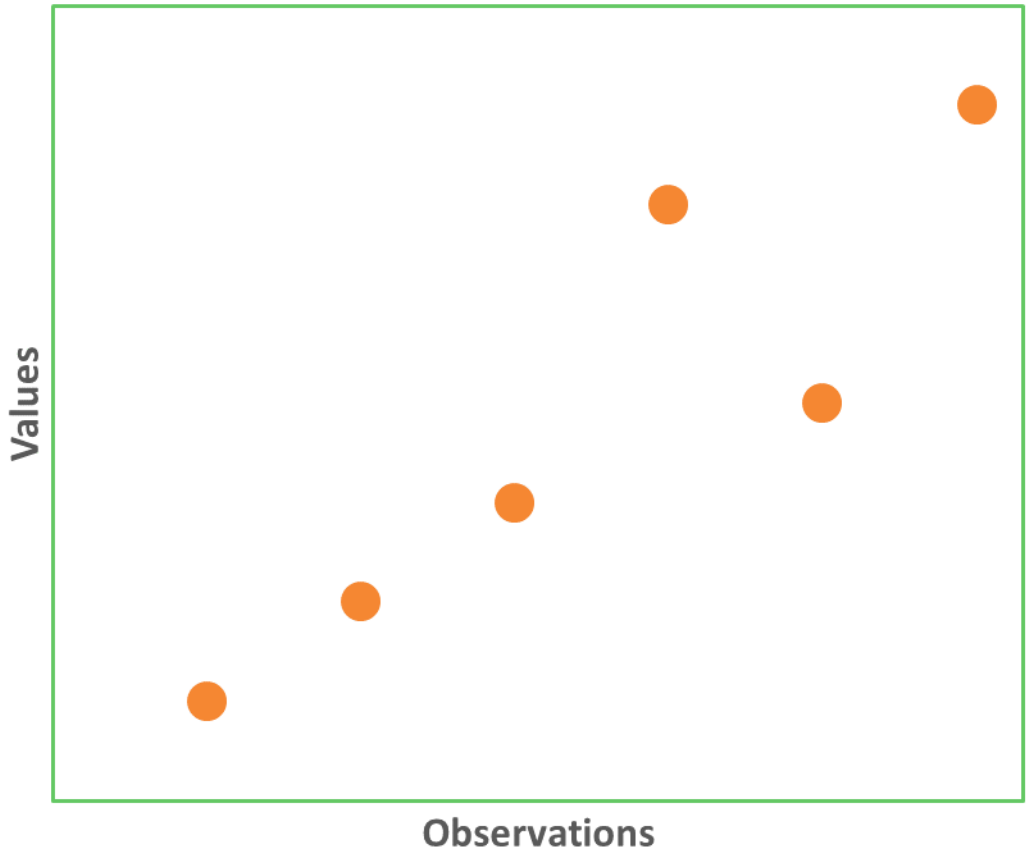
Select most appropriate actuarial method

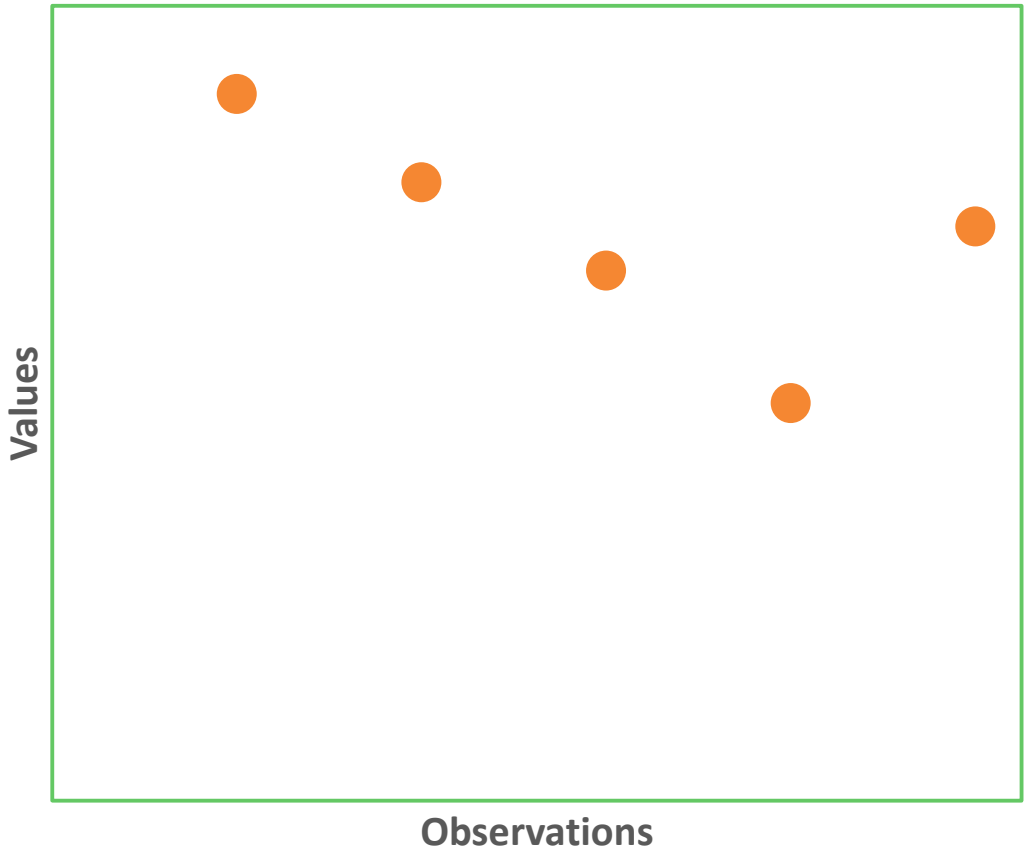
Artificial Intelligence
Unusual Value Treatment



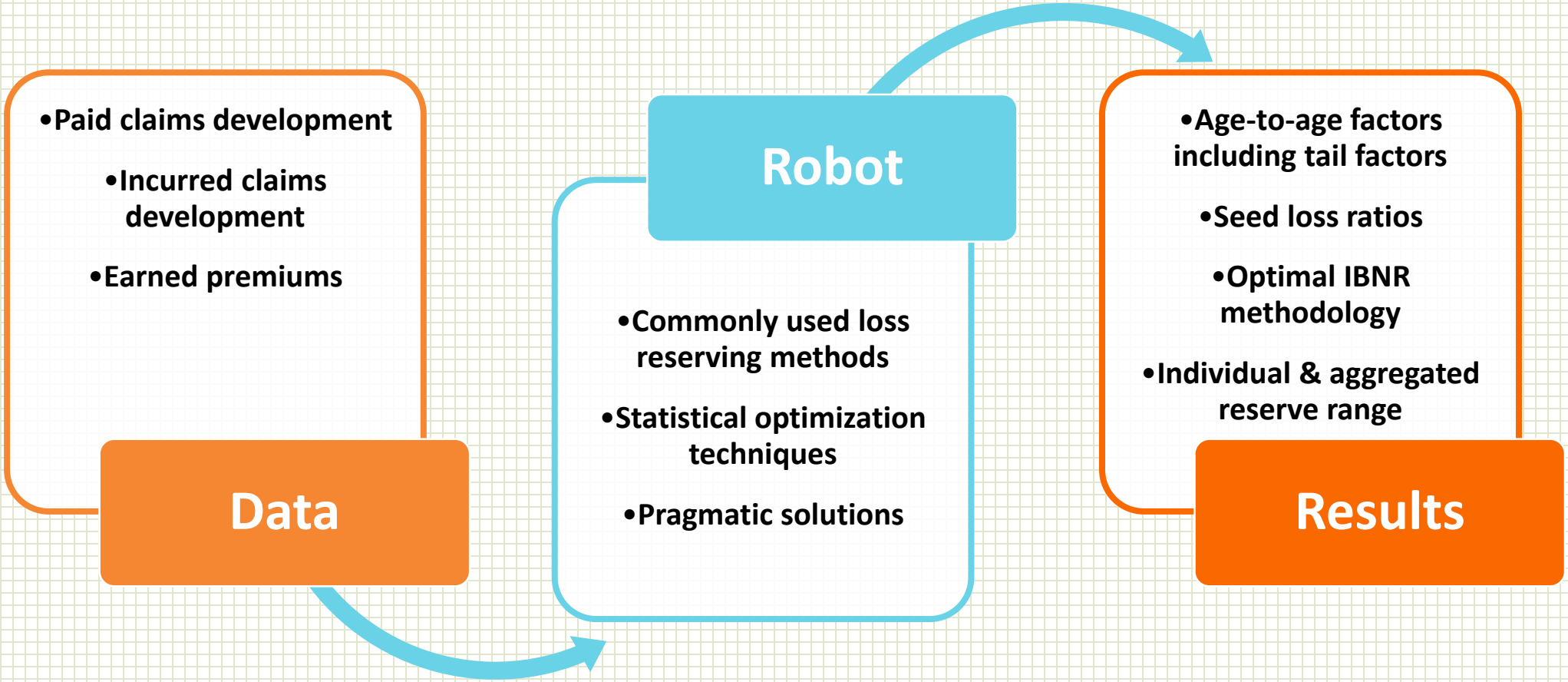


Artificial Intelligence
Pattern Identification





IBNR Robot


•Paid claims development
•Incurred claims development
•Earned premiums
Data
Robot
•Commonly used loss reserving methods
•Statistical optimization techniques
•Pragmatic solutions
•Age-to-age factors including tail factors
•Seed loss ratios
•Optimal IBNR methodology
•Individual & aggregated reserve range
Results

IBNR Robot

Large losses

Data issues

Underwriting practices

Benefit changes

Rate changes

Claims processing speed

Claims reserving practices

Reinsurance programme

Business mix changes

Inflation

External factors

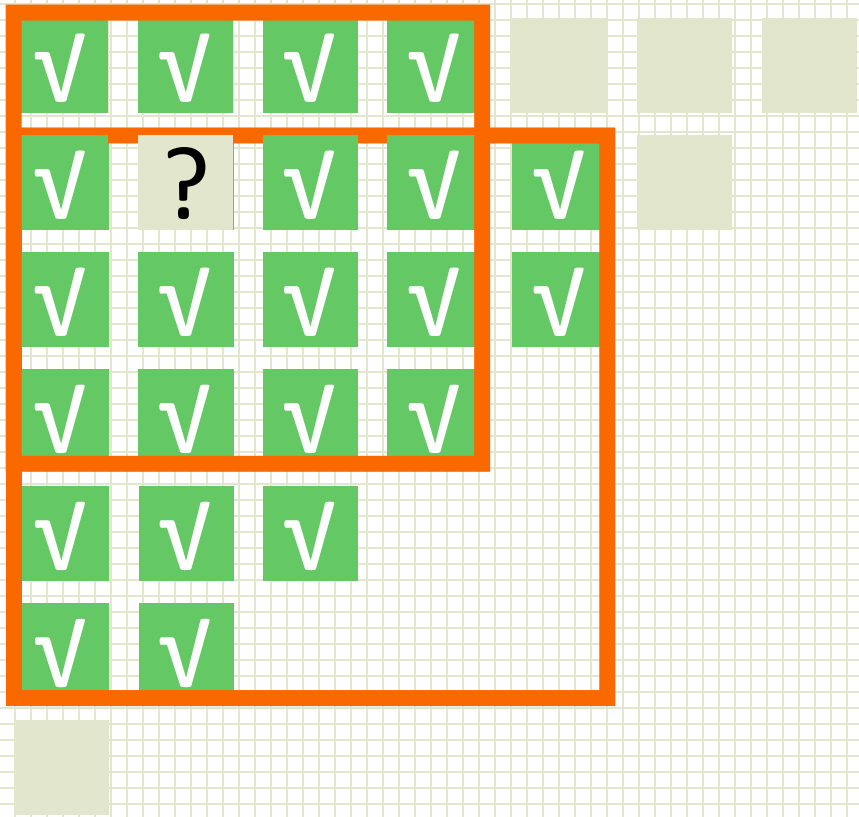
Underwriting cycles

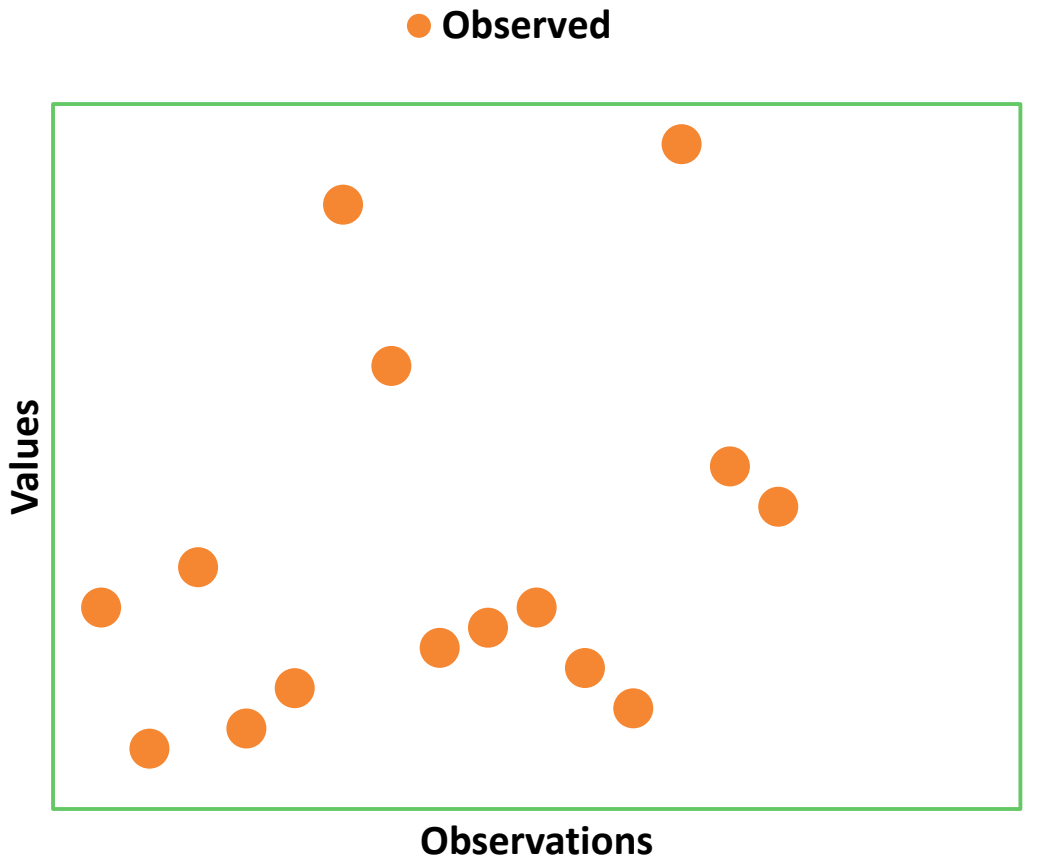
Economic cycles

Calendar effects

A. Link Ratio Method

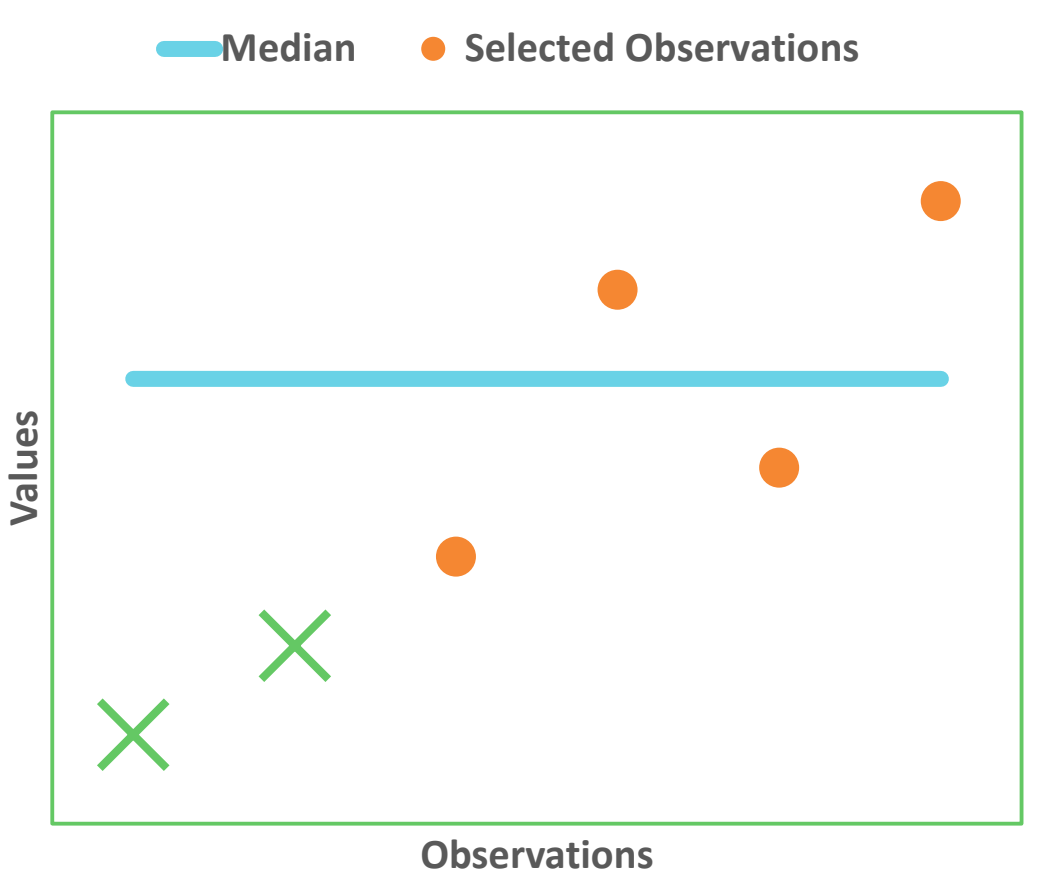
1: Data Acceptance Replacement Test on Cumulative Claims Ratio
Objective: Reduce Distortions from Input Data Errors





Birds of a Feather Flocks Together

2: Development Factors Runs Test
Objective: Optimise Relevance and Credibility Effects in Development Factors



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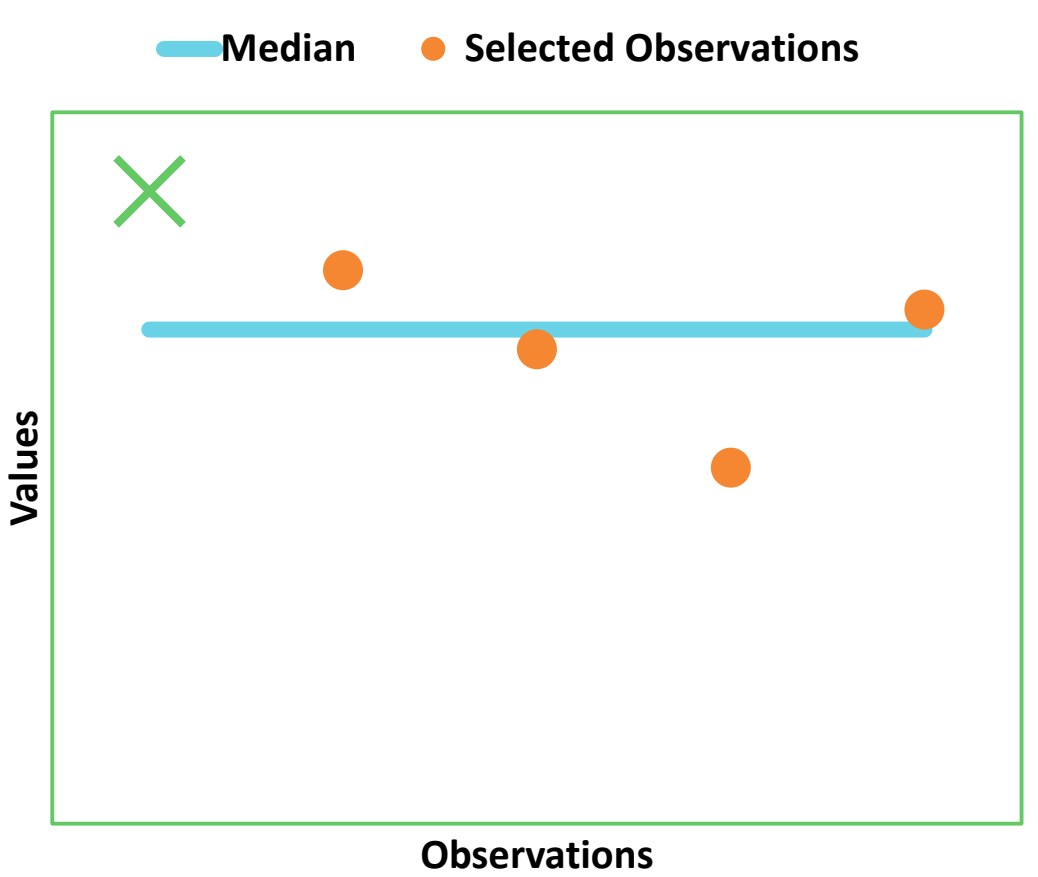
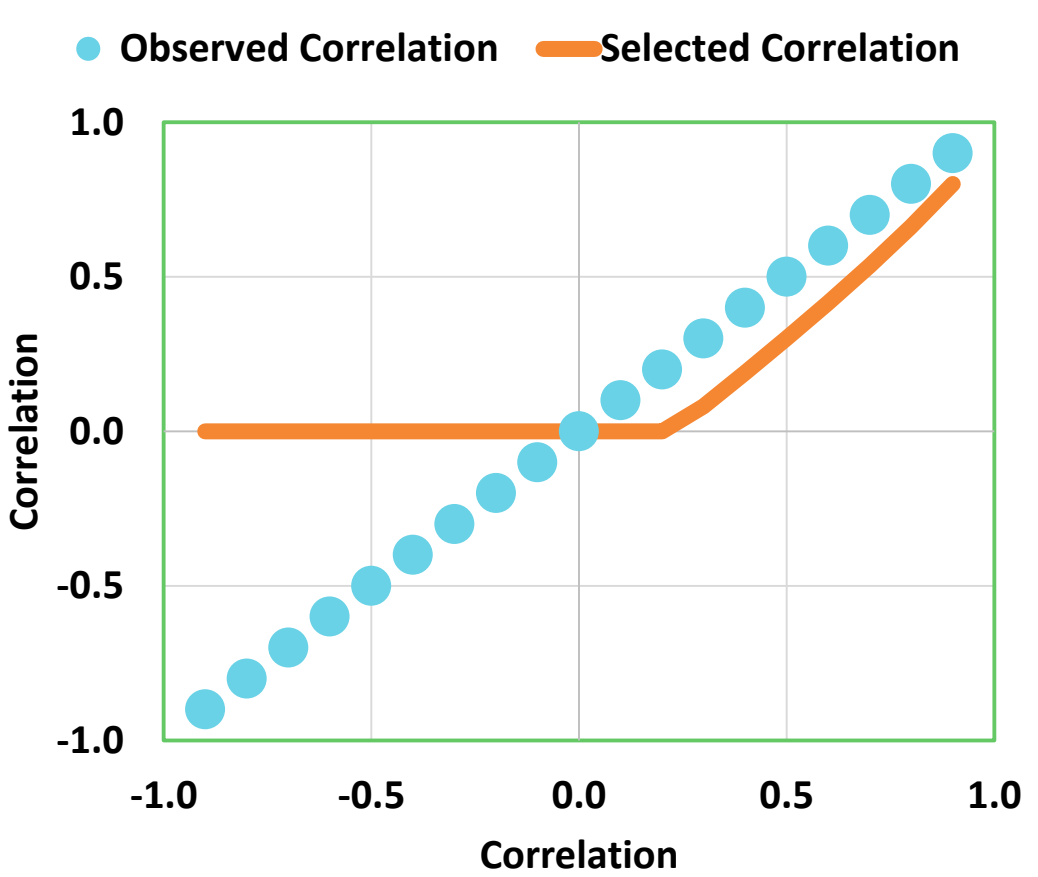
3: Decay Factors Runs Test
Objective: Optimise Relevance and Credibility Effects in Tail Factor



Include or Exclude?

4. Significance Test on Correlation Between Methods
Objective: Optimise Standard Deviation Estimate



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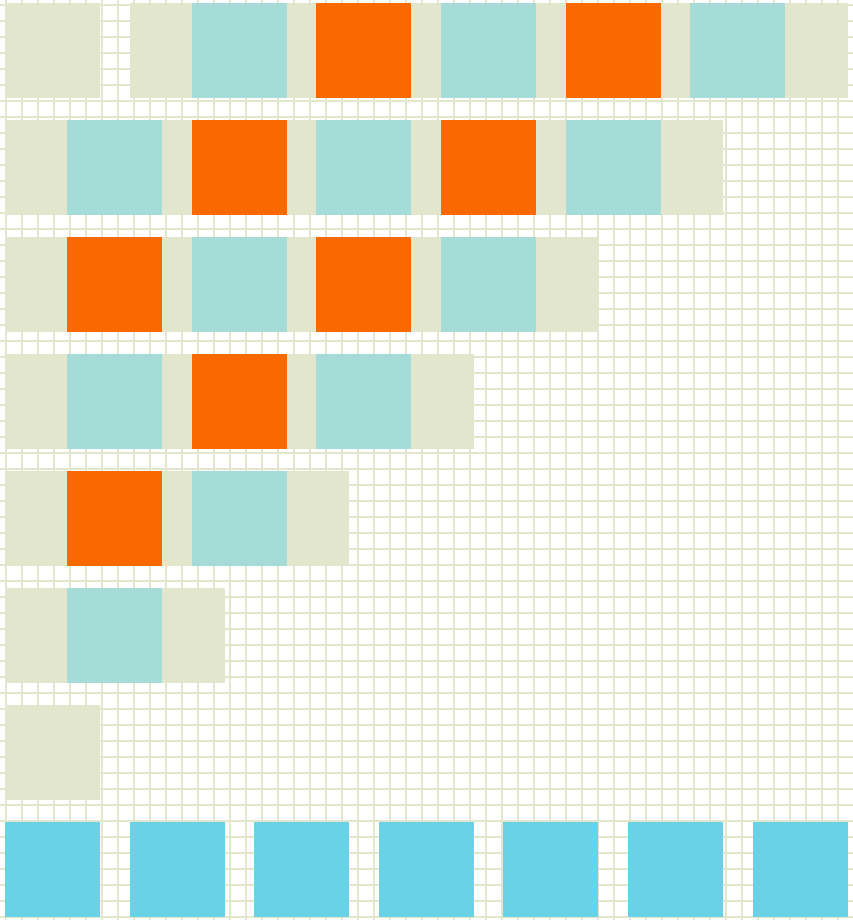
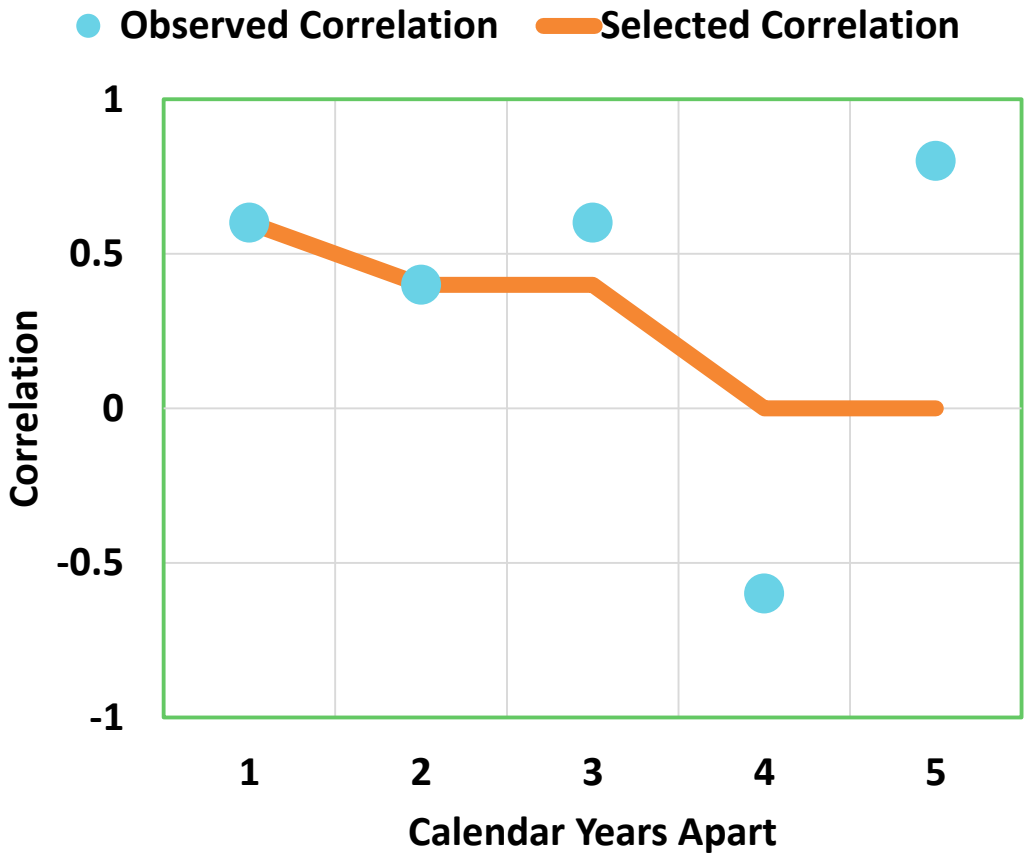
Similar but Different

5. Significance Test on Correlation Between Calendar Years
Objective: Optimise Standard Deviation Estimate





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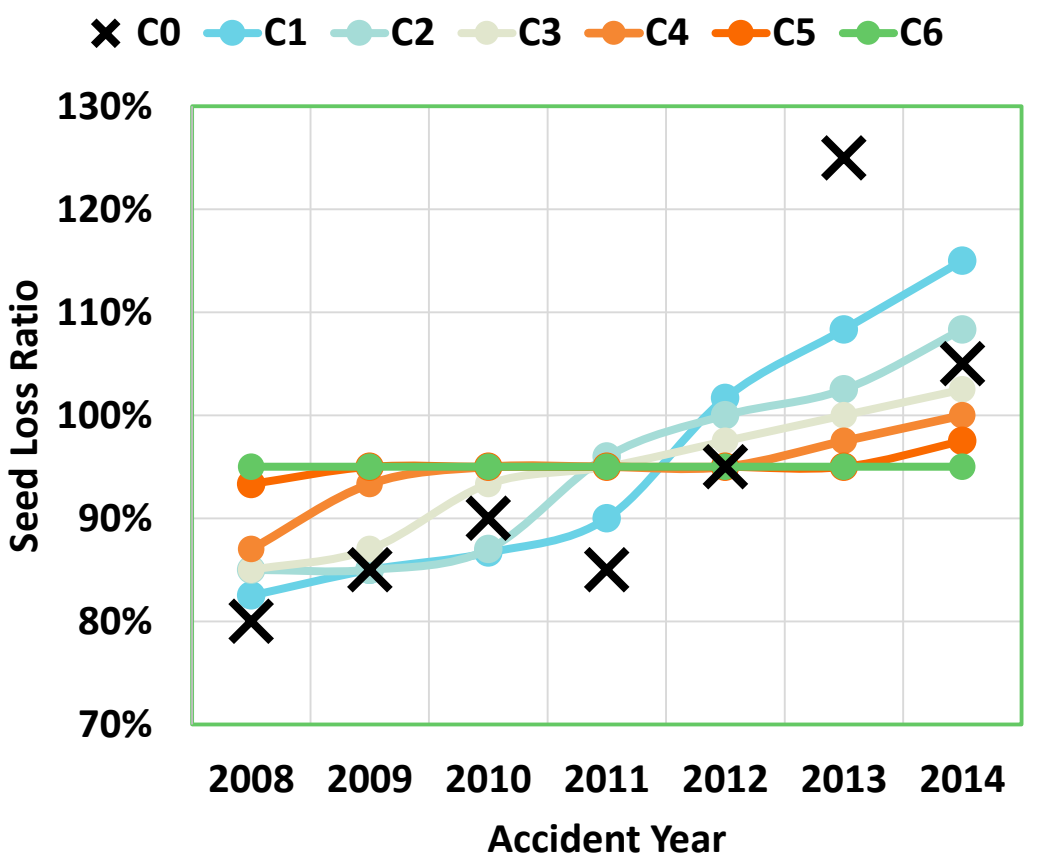
Alike or Unlike?

B. BF Method

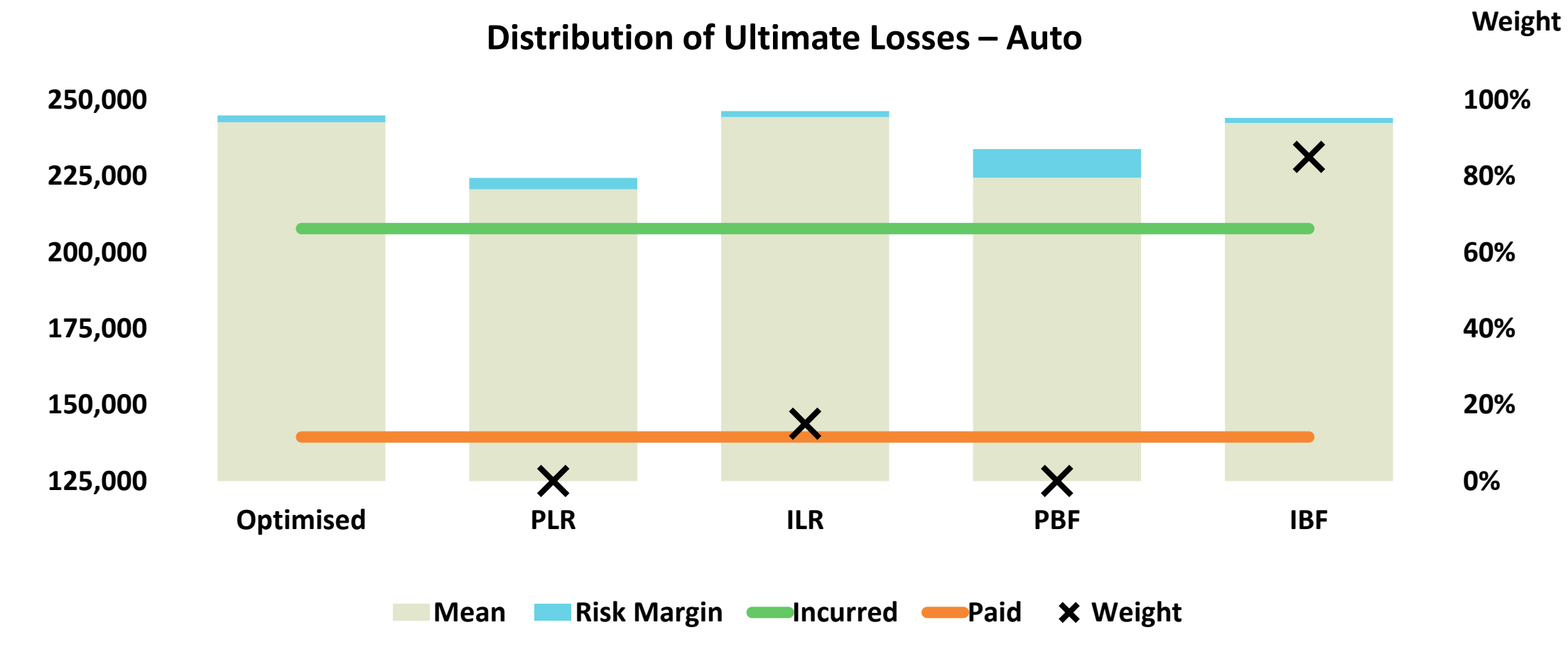
6: Seed Loss Ratios Generation
Objective: Optimise Homogeneity Effects Between Accident Years



Trial and Error

C. Putting it together

7a. Repeat Steps 4 & 5 for BF Method
7b. Apply Method of Lagrange Multiplier
Objective: Optimise Individual Class Ultimate Loss Estimate



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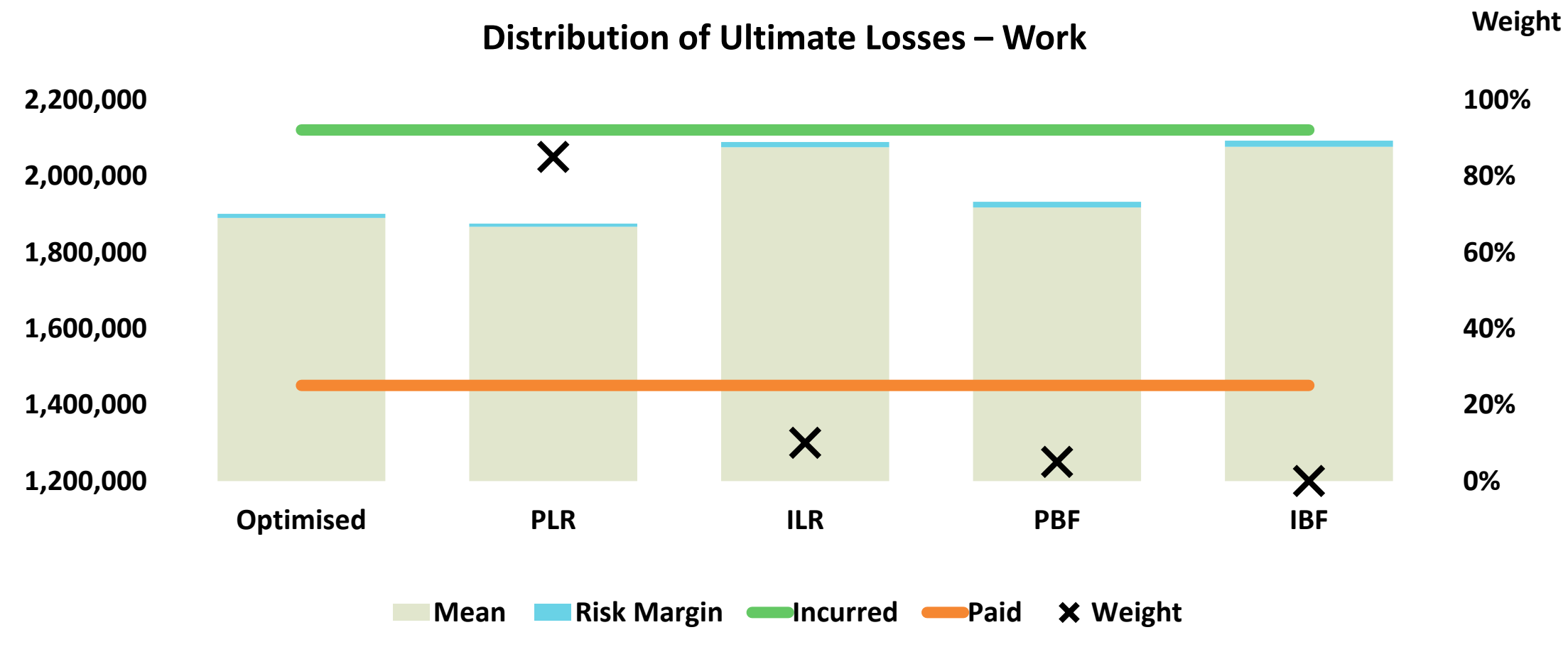

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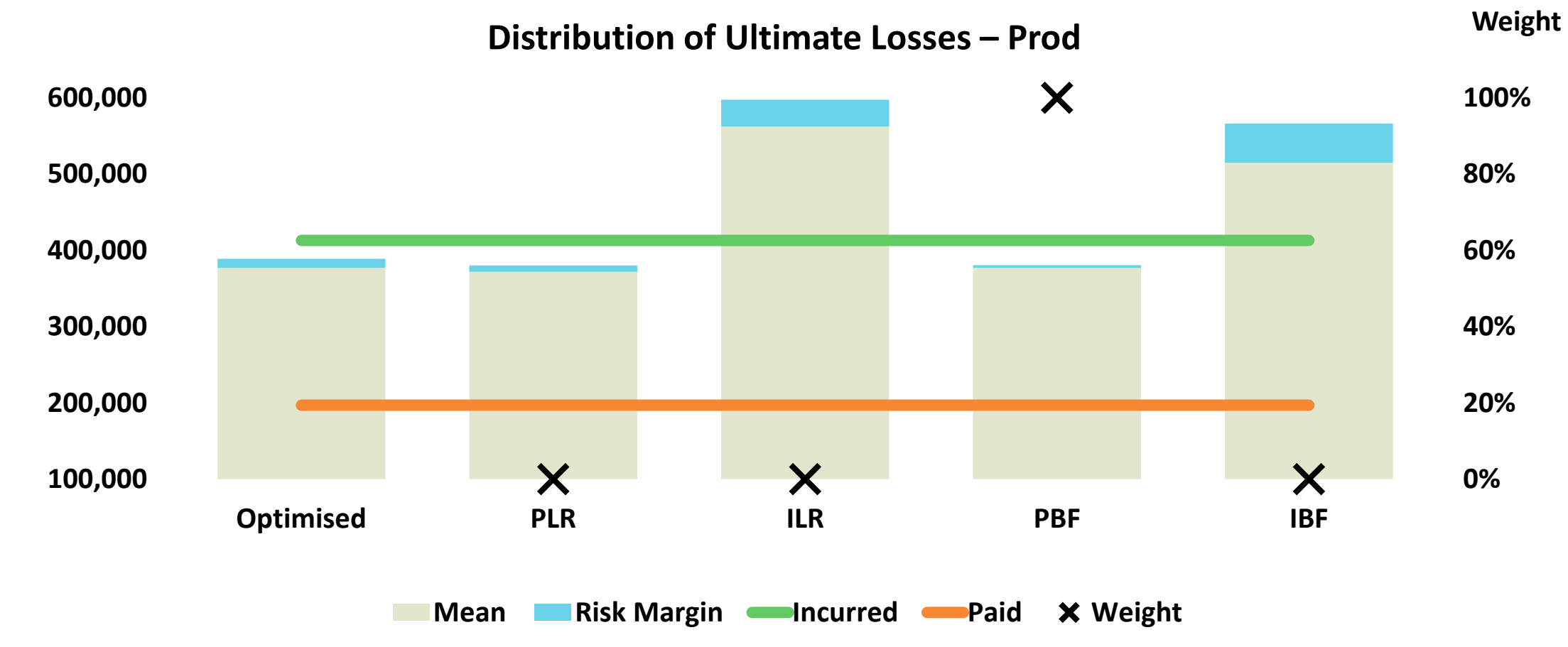
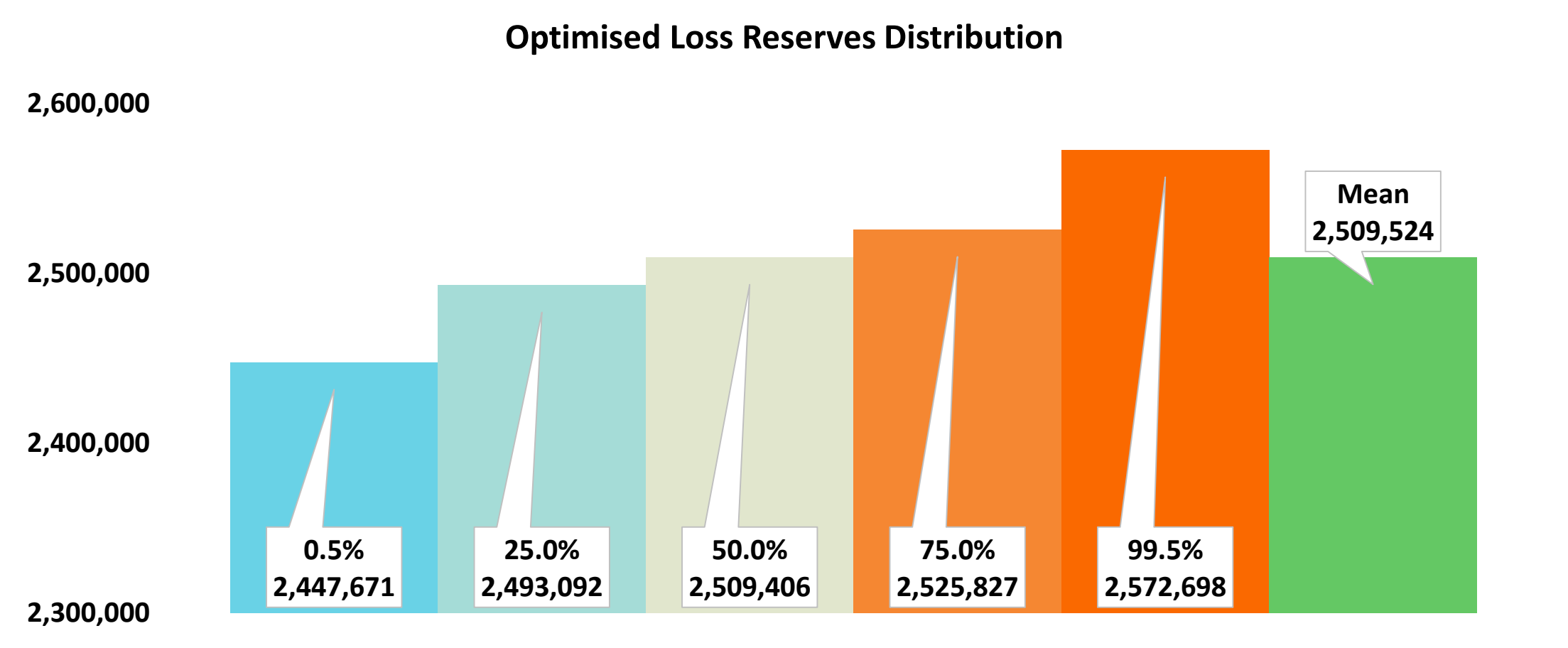
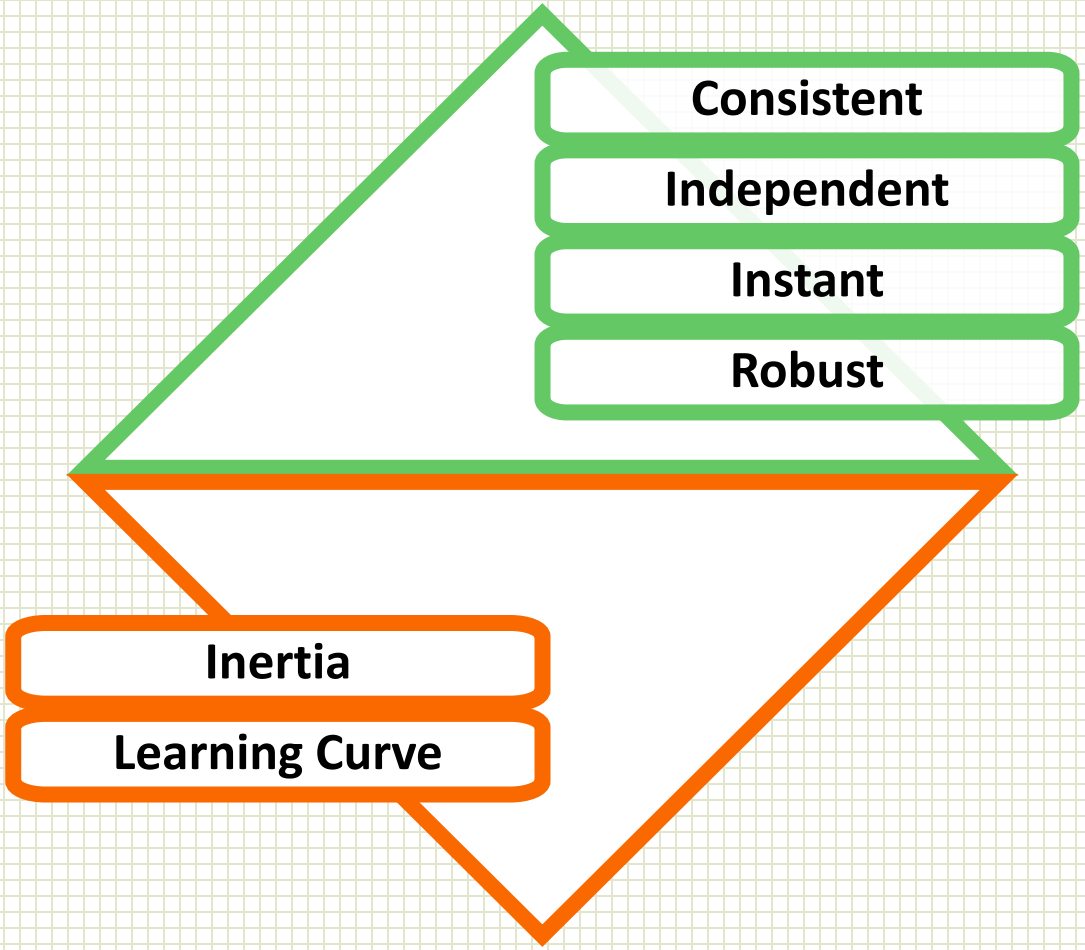


Consistency is the Key

8. Repeat Step 4 Across Business Classes
Objective: Optimise Aggregate Ultimate Loss Estimate



Strengths & Challenges



Coefficient of Variation Study	Industry Wide Benchmarking
Independent Reserves Review	Confidence & Compliance
Robot Actuarial Analyst	Operational Efficiency

Annexure
Stepwise Explanation

Step	Data – Paid & Incurred Claims, Earned Premiums	Paid & Incurred Link Ratio	Paid & Incurred BF	Individual Class Reserves	Aggregate Reserves
1	Data Acceptance Replacement Test				
2	Input	Development Factors Runs Test			
3		Decay Factors Runs Test			
4		Inter-Method Correlation Significance Test			
5		Calendar Year Correlation Significance Test			
6		Input	Seed Loss Ratios Generation		
7			Repeat Steps 4 & 5 with BF Method	Apply Method of Lagrange Multiplier	
8			Input		Repeat Step 4 Across Classes

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Thank you!
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and
Email me at ibnrrobot@n-actuarial.com to get a partial learner's licence!

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