

Reinsurance Reserving & Portfolio Management

9th Capacity Building Seminar on General Insurance
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Agenda

Reinsurance Reserving

- Overview
- Basis of Reserving
- Types of Reinsurance Contracts
- Reinsurance Reserving Process
- Methodology
- Differences between primary & reinsurance

Portfolio Management

- Role of reserving actuaries
- Diagnostics

Reserving - An overview

Need for reserving

- Under-reserving
 - Future Claims
 - Speeds up payments of dividends & tax
- Over-reserving
 - lead to loss of confidence in the company
 - worsen solvency – more capital!
 - can filter through to premium rating exercise etc
- Volatility in results can reduce shareholder confidence
- Senior management depend on the quarterly results to make business decisions

Responsibilities of reserving actuaries

- Ensure optimal reserving
- Local Statutory Reporting
- Governance/Risk Management Committees

Basis of Reserving

- Companies operates under several valuation frameworks to meet different stakeholder requirements
- For example, Reserves for Swiss Re’s business are calculated under the following frameworks
 - **EVM:** Swiss Re uses its internal EVM methodology to provide an economic view of the business.
 - **US GAAP:** Swiss Re has adopted US GAAP for the preparation of its Group accounts.
 - **Statutory:** Rules are set locally at legal entity / branch level

Frameworks	Purpose	Uses	Methodology
EVM	Economic view (Best estimates)	<ul style="list-style-type: none"> ■ Planning, pricing & steering ■ Performance measurement ■ Asset liability management ■ Analyst information 	<ul style="list-style-type: none"> ■ Best-estimate ■ "Principles" based ■ Swiss Re EVM methodology
US GAAP	Profit recognition US GAAP used for Group Reporting	<ul style="list-style-type: none"> ■ Comparable presentation of results with competitors for investors ■ Profit recognition over time 	<ul style="list-style-type: none"> ■ Primarily "Rules" based for P&C with assumptions locked in at inception
Local Statutory	Regulatory compliance Dividend paying ability	<ul style="list-style-type: none"> ■ Statutory reserves ■ Regulator solvency 	<ul style="list-style-type: none"> ■ Set by local regulators ■ "Principles" based in most other jurisdictions for Swiss Re with emphasis on prudence

Types of Reinsurance Contracts

- **Facultative:** One contract (e.g., bridge, tunnel etc)
- **Treaty:** Covers multiple policies which fit treaty specifications
- **Types of cover**
 - Proportional
 - Quota Share
 - Surplus
 - Non-Proportional
 - XOL (per risk, aggregate)
 - Stop Loss

Reinsurance Reserving Process– An Overview

Incurred but not Reported (IBNR)

- Reserves at inception of business is based on the **expected loss ratio**. If business performs exactly as priced there will be no run-off profit (or loss).
- Initial loss estimates are gradually replaced by **actual loss experience**; with ultimate loss estimates updated quarterly using actuarial techniques such as Chain Ladder or Bornhuetter-Fergusson (BF).
- Actual losses are likely to differ from initial estimates, so producing **reserve development** (favourable or adverse). This can have **multiple causes** including bias in the initial loss ratios, changing assumptions e.g. inflation, normal claims variability and premium development

Case Reserves

- Generally case reserves "follow cedent", however there are cases where claims team deem that a different value would be appropriate
 - In such cases ACRs (Additional Case Reserves) are established

Portfolio Segmentation

- Sufficient data is required to use actuarial techniques
- Reserving actuaries use a “top-down” approach by analysing aggregate losses
- A homogeneous statistical portfolio can be used to derive a credible loss development pattern
- Attributes used on the reinsurance side for segmenting the portfolios
 - Line of business
 - Type of business
 - Duration of risk
 - Market
 - Cession Basis
- Examples
 - Engineering Single Risk Fac (Duration-wise)
 - Property NatCat Non Proportional
 - Property Proportional
 - Marine Cargo Proportional

Portfolio Segmentation

- Casualty vs Property: Casualty has a longer development tail
- Treaty vs Facultative: Show different development patterns
- Excess of loss vs Proportional
 - Different patterns
 - Attritional vs Large Loss
 - XOL: ACRs may be added, reinsurer's claims department, further split by working, high & cat
 - Proportional: Cedent's case reserves

Reserving Triangle: IBNR Calculation

Written Premiums Cumulative (unit: '000)																		
Contract Yr	3	15	27	39	51	63	75	87	99	111	123	135	147	159	171	183	195	207
1995	96.7	479.9	760.7	766.7	767.8	767.8	767.8	767.8	770.4	770.4	770.4	770.4	770.4	770.4	770.4	770.4	770.4	770.4
1996	196.3	880.6	1,171.2	1,187.6	1,201.1	1,201.1	1,201.1	1,201.1	1,201.1	1,201.1	1,200.1	1,200.1	1,200.1	1,200.1	1,200.1	1,200.1	1,200.1	1,200.1
1997	201.3	936.9	1,381.0	1,527.0	1,527.7	1,527.6	1,527.6	1,527.6	1,527.6	1,524.2	1,524.2	1,524.2	1,524.2	1,524.2	1,524.2	1,524.2	1,524.2	1,524.2
1998	255.8	1,122.2	1,418.2	1,415.8	1,426.9	1,439.6	1,446.9	1,446.9	1,446.9	1,446.9	1,446.6	1,446.6	1,446.6	1,446.6	1,446.6	1,446.6	1,446.6	1,446.6
1999	180.0	1,035.4	2,107.6	2,186.7	2,187.7	2,187.7	2,187.7	2,186.6	2,186.6	2,186.5	2,186.5	2,186.5	2,185.4	2,185.4	2,185.4	2,185.4	2,185.4	2,185.4
2000	954.8	5,006.0	7,173.8	7,903.7	7,698.5	7,604.2	7,589.5	6,792.0	6,786.9	6,785.0	6,785.0	6,785.0	6,791.6	6,791.6	6,791.6	6,791.6	6,791.6	6,791.6
2001	323.0	8,129.8	11,849.4	12,015.9	11,956.3	11,935.1	11,939.1	11,892.0	11,884.3	11,884.3	11,884.3	11,891.6	11,891.6	11,891.6	11,891.6	11,891.6	11,891.6	11,891.6
2002	73.2	16,904.2	22,071.8	22,507.5	22,598.1	22,630.6	22,589.9	22,589.9	22,579.7	22,579.7	22,486.8	22,486.8	22,486.8	22,486.8	22,486.8	22,486.8	22,486.8	22,486.8
2003	147.7	18,751.9	23,855.0	24,326.7	24,622.2	24,750.3	24,718.4	24,718.1	24,718.1	24,838.8	24,838.8	24,838.8	24,838.8	24,838.8	24,838.8	24,838.8	24,838.8	24,838.8
2004	233.9	17,073.8	21,362.2	21,729.0	21,756.3	21,861.5	21,799.8	21,884.3	21,644.2	21,644.2	21,657.2	21,657.2	21,657.2	21,657.2	21,657.2	21,657.2	21,657.2	21,657.2
2005	1,550.8	14,922.5	24,037.9	25,789.0	26,573.7	26,614.8	26,789.1	26,623.2	26,623.2	26,623.3	26,623.3	26,623.3	26,623.3	26,623.3	26,623.3	26,623.3	26,623.3	26,623.3
2006	523.7	9,185.3	15,951.5	15,781.9	16,004.7	16,569.7	16,611.3	16,531.5	16,566.5	16,566.5	16,566.5	16,566.5	16,566.5	16,566.5	16,566.5	16,566.5	16,566.5	16,566.5
2007	0.0	3,102.3	4,878.1	4,966.7	5,031.2	5,078.7	5,078.7	5,078.7	5,078.7	5,078.7	5,078.7	5,078.7	5,078.7	5,078.7	5,078.7	5,078.7	5,078.7	5,078.7
2008	142.9	2,148.7	3,997.3	4,478.3	4,492.7	4,512.5	4,514.9	4,514.9	4,514.9	4,514.9	4,514.9	4,514.9	4,514.9	4,514.9	4,514.9	4,514.9	4,514.9	4,514.9
2009	0.0	1,383.7	1,699.8	1,714.7	1,717.0	1,717.0	1,717.0	1,717.0	1,717.0	1,717.0	1,717.0	1,717.0	1,717.0	1,717.0	1,717.0	1,717.0	1,717.0	1,717.0
2010	0.0	773.7	1,255.4	1,255.4	1,255.4	1,255.4	1,255.4	1,255.4	1,255.4	1,255.4	1,255.4	1,255.4	1,255.4	1,255.4	1,255.4	1,255.4	1,255.4	1,255.4
2011	163.5	2,509.6	5,635.5	6,052.4	6,052.4	6,052.4	6,052.4	6,052.4	6,052.4	6,052.4	6,052.4	6,052.4	6,052.4	6,052.4	6,052.4	6,052.4	6,052.4	6,052.4
2012	295.5	5,751.4	9,315.1	9,315.1	9,315.1	9,315.1	9,315.1	9,315.1	9,315.1	9,315.1	9,315.1	9,315.1	9,315.1	9,315.1	9,315.1	9,315.1	9,315.1	9,315.1
2013	13.3	5,506.6	5,506.6	5,506.6	5,506.6	5,506.6	5,506.6	5,506.6	5,506.6	5,506.6	5,506.6	5,506.6	5,506.6	5,506.6	5,506.6	5,506.6	5,506.6	5,506.6
2014	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

$$1255.4 / 773.7 = 1.622$$

Age-to-Age Factor																		
Contract Yr	3 - 15	15 - 27	27 - 39	39 - 51	51 - 63	63 - 75	75 - 87	87 - 99	99 - 111	111 - 123	123 - 135	135 - 147	147 - 159	159 - 171	171 - 183	183 - 195	195 - 207	
1995	4.961	1.585	1.008	1.001	1.000	1.000	1.000	1.003	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1996	4.487	1.330	1.014	1.011	1.000	1.000	1.000	1.000	1.000	0.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1997	4.655	1.474	1.106	1.000	1.000	1.000	1.000	1.000	0.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1998	4.387	1.264	0.998	1.008	1.009	1.005	1.000	1.000	1.000	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1999	5.754	2.035	1.038	1.000	1.000	1.000	0.999	1.000	1.000	1.000	1.000	0.999	1.000	1.000	1.000	1.000	1.000	1.000
2000	5.243	1.433	1.102	0.974	0.988	0.998	0.999	1.000	1.000	1.000	1.000	1.001	1.000	1.000	1.000	1.000	1.000	1.000
2001	25.168	1.458	1.014	0.995	0.998	1.000	0.996	0.999	1.000	1.000	1.001	1.001	1.000	1.000	1.000	1.000	1.000	1.000
2002	230.864	1.306	1.020	1.004	1.001	0.998	1.000	1.000	1.000	0.996	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2003	127.000	1.272	1.020	1.012	1.005	0.999	1.000	1.000	1.000	1.005	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2004	72.991	1.251	1.017	1.001	1.005	0.997	1.004	0.989	1.000	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2005	9.622	1.611	1.073	1.000	1.002	1.007	0.994	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2006	17.541	1.737	0.989	1.014	1.035	1.003	0.995	1.002	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2007	15.038	1.572	1.018	1.013	1.009	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2008	15.038	1.860	1.020	1.003	1.004	1.001	1.001	1.001	1.001	1.001	1.001	1.001	1.001	1.001	1.001	1.001	1.001	1.001
2009	15.038	1.228	1.009	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2010	15.038	1.622	1.020	1.021	1.021	1.021	1.021	1.021	1.021	1.021	1.021	1.021	1.021	1.021	1.021	1.021	1.021	1.021
2011	15.346	1.622	1.074	1.074	1.074	1.074	1.074	1.074	1.074	1.074	1.074	1.074	1.074	1.074	1.074	1.074	1.074	1.074
2012	19.460	1.620	1.620	1.620	1.620	1.620	1.620	1.620	1.620	1.620	1.620	1.620	1.620	1.620	1.620	1.620	1.620	1.620
2013	415.519	1.620	1.620	1.620	1.620	1.620	1.620	1.620	1.620	1.620	1.620	1.620	1.620	1.620	1.620	1.620	1.620	1.620
2014	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

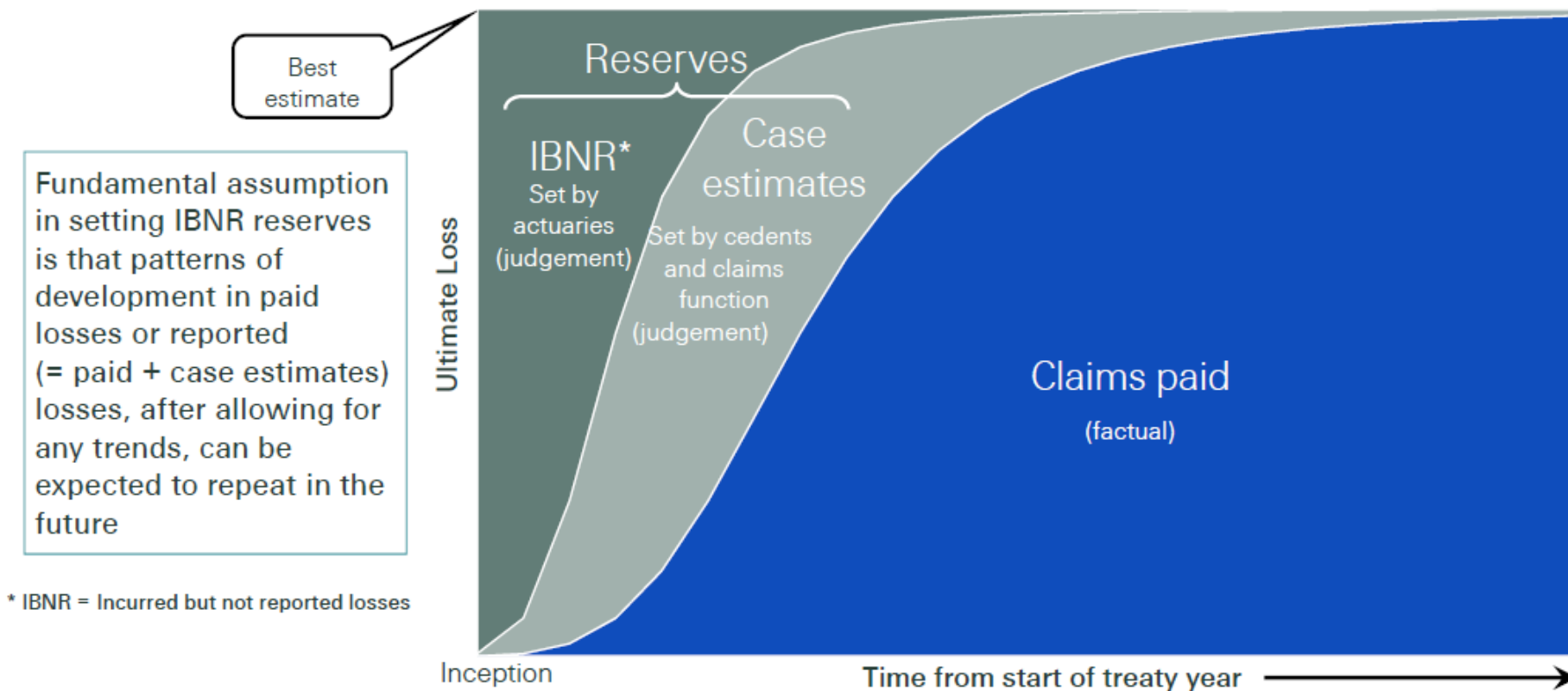
Reserving Triangle: IBNR Calculation

Contract Yr	Age-to-Age Factor																
	3 - 15	15 - 27	27 - 39	39 - 51	51 - 63	63 - 75	75 - 87	87 - 99	99 - 111	111 - 123	123 - 135	135 - 147	147 - 159	159 - 171	171 - 183	183 - 195	195 - 207
1995	4.961	1.585	1.008	1.001	1.000	1.000	1.000	1.003	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1996	4.487	1.330	1.014	1.011	1.000	1.000	1.000	1.000	1.000	0.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1997	4.655	1.474	1.106	1.000	1.000	1.000	1.000	1.000	0.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1998	4.387	1.264	0.998	1.008	1.009	1.005	1.000	1.000	1.000	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1999	5.754	2.035	1.038	1.000	1.000	1.000	0.999	1.000	1.000	1.000	1.000	0.999	1.000	1.000	1.000	1.000	1.000
2000	5.243	1.433	1.102	0.974	0.988	0.998	0.895	0.999	1.000	1.000	1.000	1.001	1.000	1.000	1.000	1.000	1.000
2001	25.168	1.458	1.014	0.995	0.998	1.000	0.996	0.999	1.000	1.000	1.001	1.000	1.000	1.000	1.000	1.000	1.000
2002	230.864	1.306	1.020	1.004	1.001	0.998	1.000	1.000	1.000	0.996	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2003	127.000	1.272	1.020	1.012	1.005	0.999	1.000	1.000	1.005	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2004	72.991	1.251	1.017	1.001	1.005	0.997	1.004	0.989	1.000	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2005	9.622	1.611	1.073	1.030	1.002	1.007	0.994	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2006	17.541	1.737	0.989	1.014	1.035	1.003	0.995	1.002	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2007		1.572	1.018	1.013	1.009	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2008	15.038	1.860	1.120	1.003	1.004	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2009		1.228	1.009	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2010		1.622	1.020	1.021	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2011	15.346	2.246	1.074	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2012	19.460	1.620	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2013	415.519																
2014																	



	Development Factor Selection																
	Selection for Volume Weighted Latest n Average								Selection for Sector Average Shift								
	3 - 15	15 - 27	27 - 39	39 - 51	51 - 63	63 - 75	75 - 87	87 - 99	99 - 111	111 - 123	123 - 135	135 - 147	147 - 159	159 - 171	171 - 183	183 - 195	195 - 207
W Avg 10 ex h/l	26.971	1.459	1.034	1.008	1.003	1.000	0.997	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Vols W all	19.601	1.452	1.033	1.009	1.007	1.003	0.995	0.999	1.001	0.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Vols W Latest 10	21.329	1.481	1.031	1.011	1.006	1.001	0.993	0.998	1.001	0.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Vols W Latest 3	29.148	1.794	1.053	1.006	1.006	1.002	0.995	0.997	1.002	0.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Sect W Avg 3/0 ex h/l	19.460	1.622	1.020	1.003	1.004	1.001	0.995	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Last Rev Sel DF	5.912	1.586	1.039	1.008	1.004	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Surrogate DF																	
User Selection		1.650		1.010	1.005	1.001											
Final Selection	5.912	1.650	1.039	1.010	1.005	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Theoretical development of a single underwriting year



Typical mean terms (yrs)

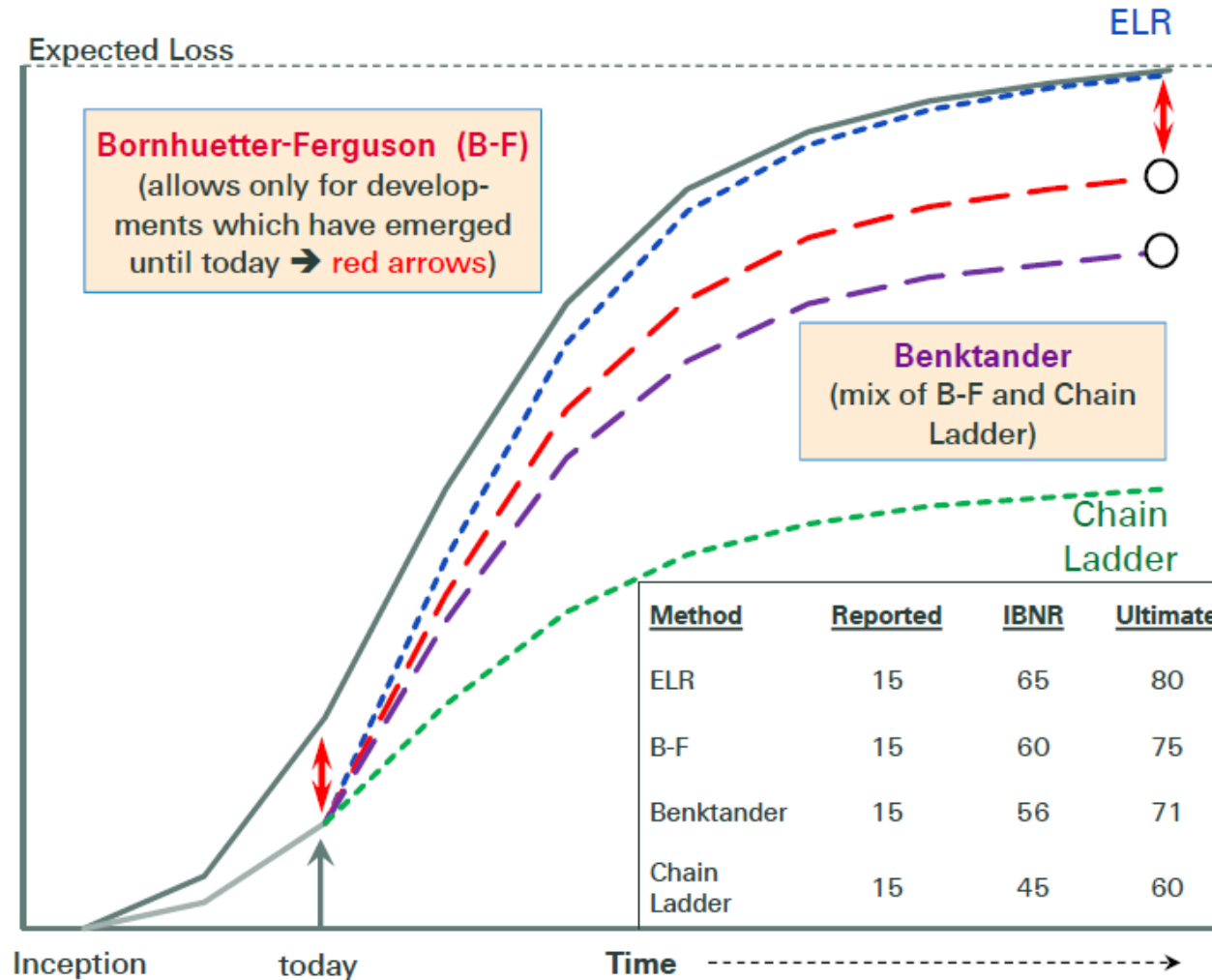
<i>Tail</i>	<i>Reported</i>	<i>Paid</i>	<i>Example of LoB</i>
Short	<2	<3	Property, Personal Accident, Motor Hull, Agriculture
Medium	2-4	3-6	Engineering
Long	>4	>6	Workers Compensation, General Liability, Motor Liability

Areas of judgment which influence reserving decisions

Actuaries have at their disposal several well established and commonly used Reserving techniques based on past historical claims information in order to estimate the level of reserves needed. Within these methods, actuaries have the possibility to apply specific judgment on the selection of various parameters, these include the following:

- **Individual claims assessment**
 - Judgment performed by claims managers, taking into account cedent information and the actual circumstances of the individual claims
- **Adequacy of costing estimation**
 - Judgment is needed if and how long to follow the initial costing estimation and when to switch to a calculation as performed by reserving actuaries
- **Reserving method and development pattern**
 - Judgment is needed on which reserving method is most suitable for the respective portfolios (e.g. Chain-Ladder or Benktander), and how to derive the most appropriate pattern (e.g. how many years of history to take into account, simple average vs weighted average)
- **Paid vs. incurred development**
 - Applying the same method to paid development data and to incurred development data sometimes leads to contradicting answers. A judgment has to be made as to which data is more reliable
- **Tail factors for long tail lines (e.g. motor liability or workers compensation)**
 - Actuaries need to decide how much development is to be expected beyond the last point of reliably available data
- **Allowance for trends (including inflation)**
 - Changes in the environment (e.g. legal, economic or social) can lead to trends in the claims development. Judgment has to be made when to explicitly allow for such a trend
- **Special risks, e.g. asbestos, pollution**
 - Some risks need individual models as standard actuarial methods do not work. Judgment is needed for the most suitable model

Illustration of methods



Example (contd. from previous slide)

The **B-F IBNR reserve estimate** is the original expected claims (80), multiplied by the remaining expected development (0.75, as pricing expected 25% of the total claims to have been reported so far). Thus the B-F IBNR reserve is $80 \times 0.75 = 60$, so that the B-F ultimate estimate is $60 + 15 = 75$.

The **Benktander IBNR reserve estimate** is found by taking a weighted average: 25% of the Chain Ladder IBNR (45) plus 75% of the B-F IBNR (60) to give an IBNR estimate of just over 56. The Benktander ultimate is then $56 + 15 = 71$.

Primary vs Reinsurance

- i. Data: Lesser detail for reinsurance compared to primary. e.g. accident dates, sub-lines of business
- ii. Reporting & Development Lags
 - a. Primary losses develop faster
 - b. Proportional: Statements received 30-90 days after quarter end
 - c. Excess: Reinsurer receives intimation once a threshold is breached which can take a while as the loss may take long to develop
- iii. Premium estimates: RI companies need premium estimates as reserves need to be set-up against business underwritten.
- iv. Special Contracts: RI contracts with special features (e.g. multi-year, multi-line) are reserved for separately.
- v. Things to look out for in RI reserving:
 - a. Changes in underlying cedent behaviour (case reserves, settlement patterns) as the portfolio usually consists of various cedents
 - b. Attachment points, limits – how are these changing over time
 - c. Large loss events
 - d. Aggregate stop loss covers

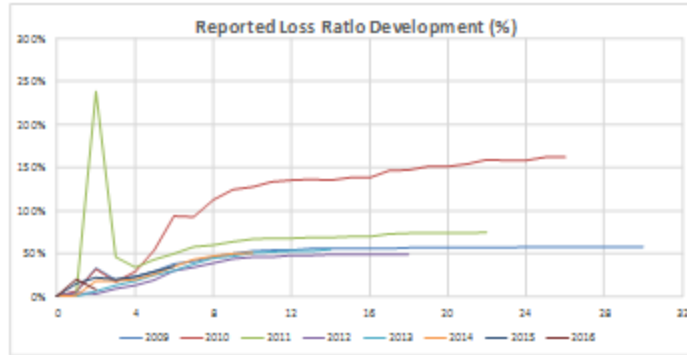
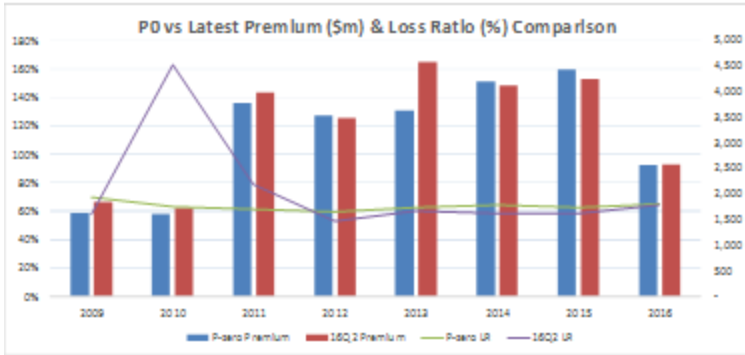
Portfolio Management – How reserving actuaries can help

- Spotting trends in portfolio segments
- Feedback to underwriting
- Data quality issues – Accountants/claims book at a cedent level, Actuaries have a portfolio view
- Diagnostics

Diagnostics

MU: Cedent Ctry: LOB: TOB: Branch: TOB:

2009 2011 2013 2015
 2010 2012 2014 2016

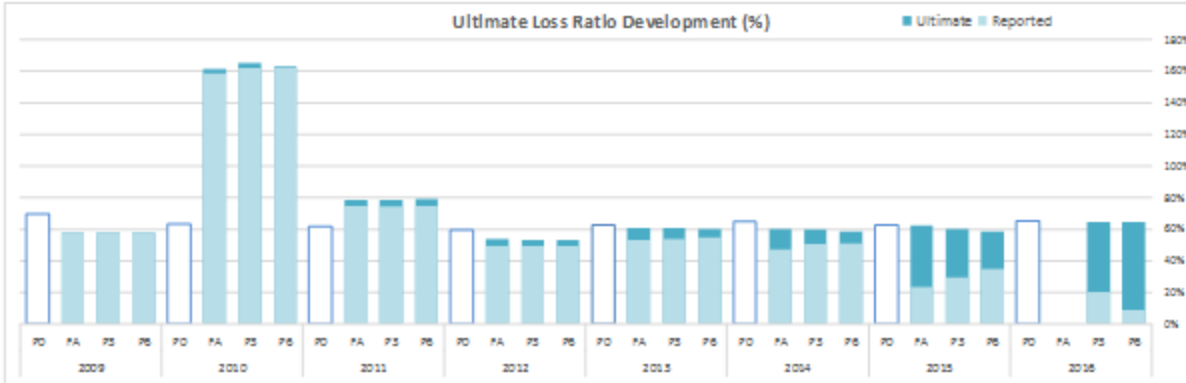


Controls:

- Toggle FullScreen
- Reset Selection
- Export to PPT

Scale Graph: xMax of PO

- 2x PO
- 1x PO
- Reset

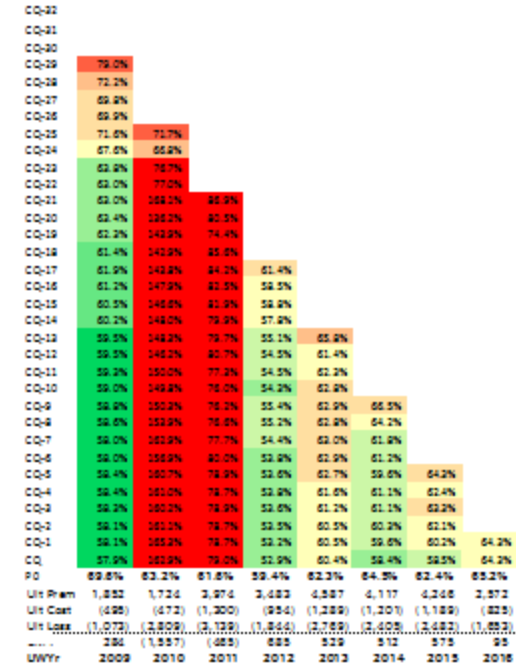


Largest Events (\$USDm)	2009	2010	2011	2012	2013	2014	2015	2016	Total
Earthquake in Christchurch, New Zealand (Magnitude 7.1)									1.1
Earthquake and tsunami off Honshu, Japan (Magnitude 9.0)									1.1
Earthquake - South Island of New Zealand									1.1
Floods in Thailand October 2011									1.1
Cyclone Yasi over Australia - ICA CAT CODE 114									1.1

Largest Claims (\$USDm)

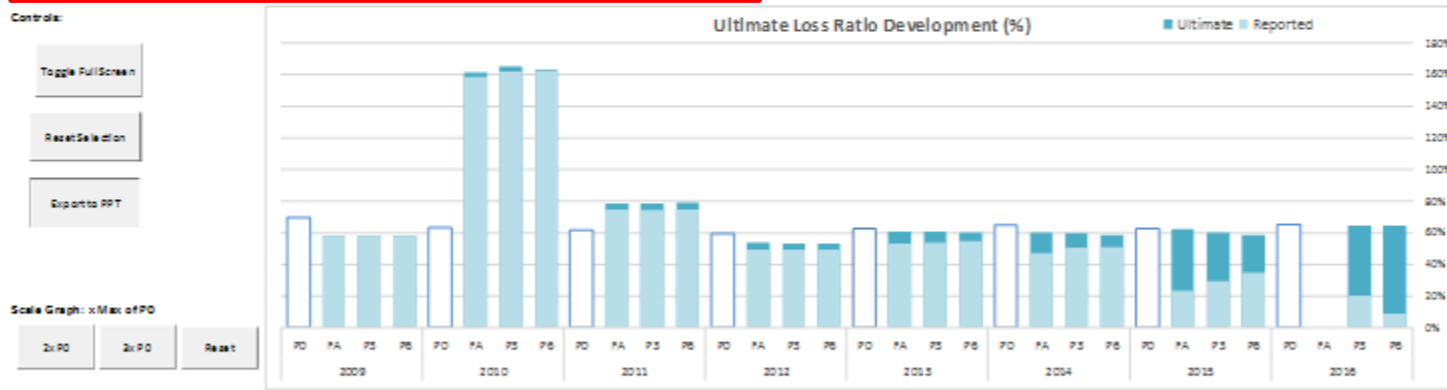
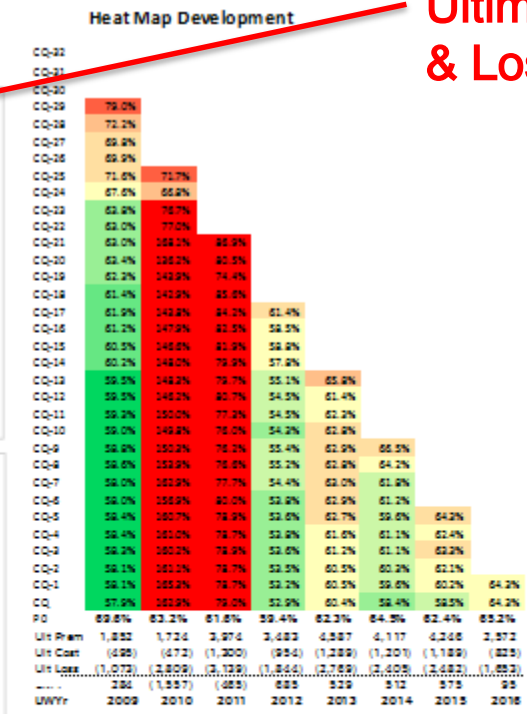
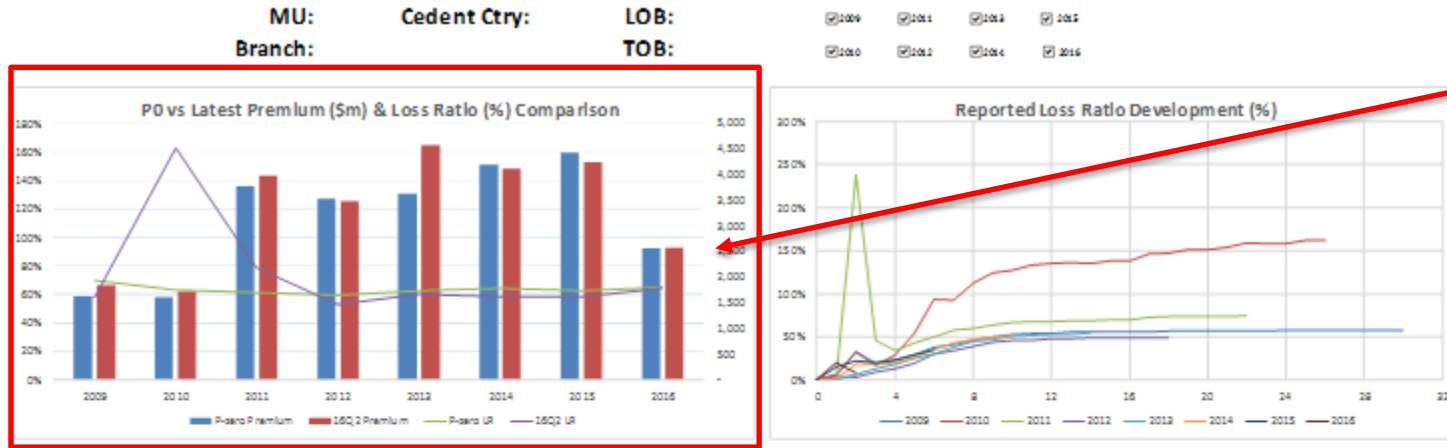


Heat Map Development



Diagnostics

P0 v Current Ultimate Prem & Loss Ratio



Largest Events (\$USDm)

Year	Event	Amount (\$USDm)
2009	Earthquake in Christchurch, New Zealand (Magnitude 6.3)	1,000
2010	Earthquake and tsunami off Honshu, Japan (Magnitude 9.0)	2,000
2011	Earthquake - South Island of New Zealand (Magnitude 6.3)	500
2012	Roads in Thailand October 2011	100
2013	Cyclone Yasi over Australia - ICAO CAT CODE 114	100

Largest Claims (\$USDm)

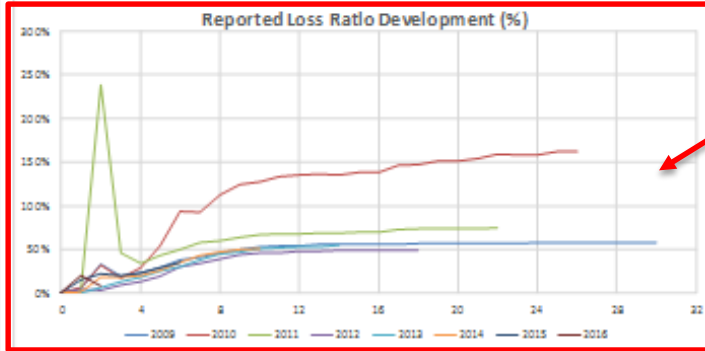
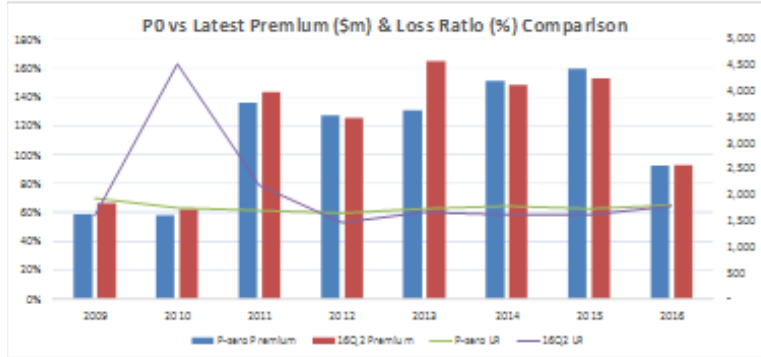
Year	Claim	Amount (\$USDm)
2009	Earthquake in Christchurch, New Zealand (Magnitude 6.3)	1,000
2010	Earthquake and tsunami off Honshu, Japan (Magnitude 9.0)	2,000
2011	Earthquake - South Island of New Zealand (Magnitude 6.3)	500
2012	Roads in Thailand October 2011	100
2013	Cyclone Yasi over Australia - ICAO CAT CODE 114	100



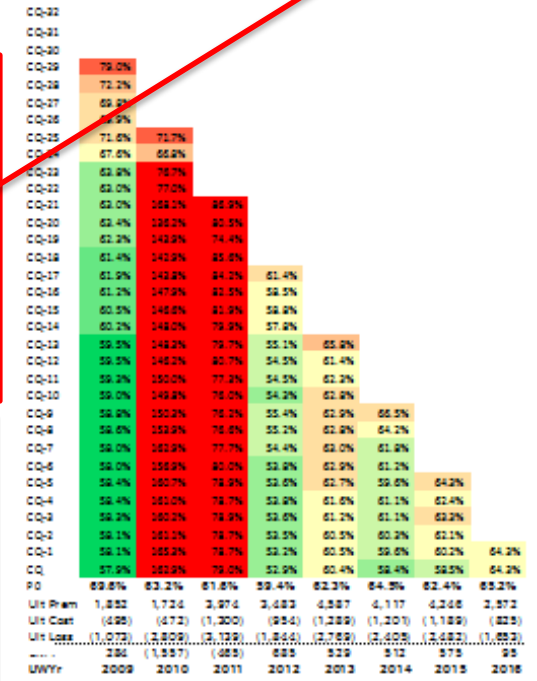
Diagnostics

MU: Cedent Ctry: LOB: Branch: TOB:

2009 2011 2012 2015
 2010 2013 2014 2016



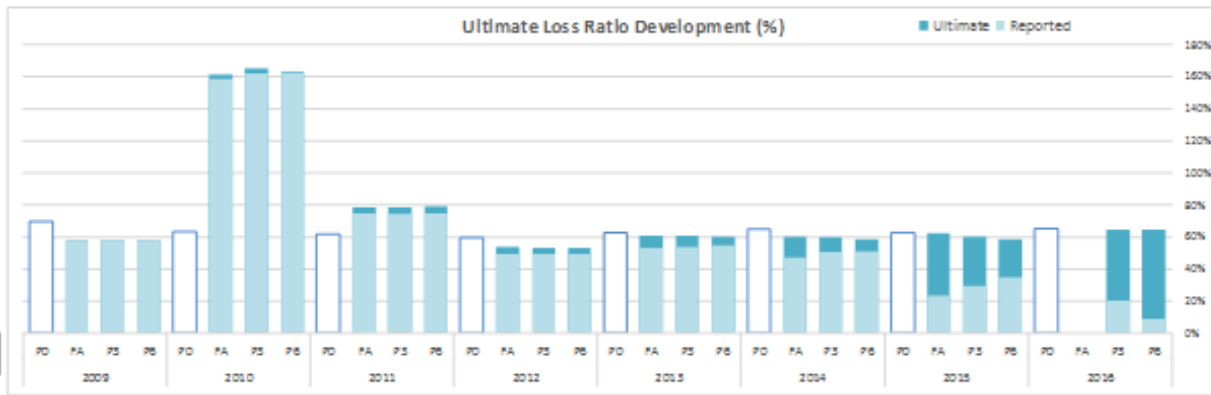
Heat Map Development



Reported Loss Ratio Development

Controls:

- Toggle Full Screen
- Reset Selection
- Export to PPT



Largest Events (\$USDm)

Year	2009	2010	2011	2012	2013	2014	2015	2016	Total
Earthquake in Christchurch, New Zealand (Magnitude)									
Earthquake and Tsunami off Honshu, Japan (Magnitude)									
Earthquake - South Island off New Zealand									
Floods in Thailand October 2011									
Cyclone Yasi over Australia - ICAI C&T CODE 114									

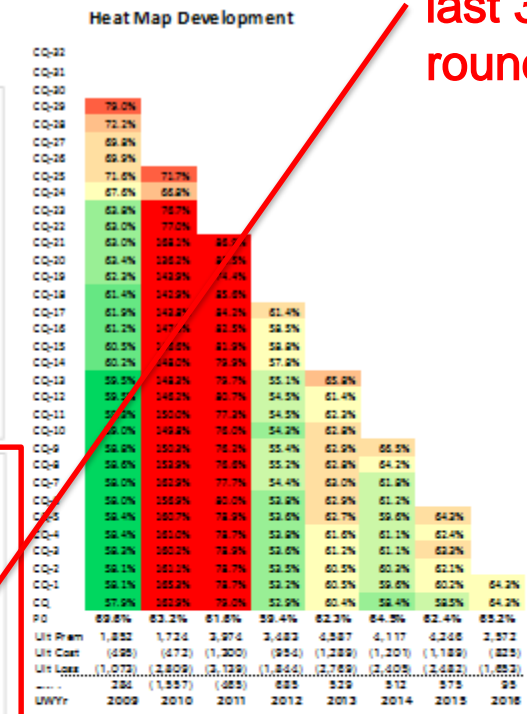
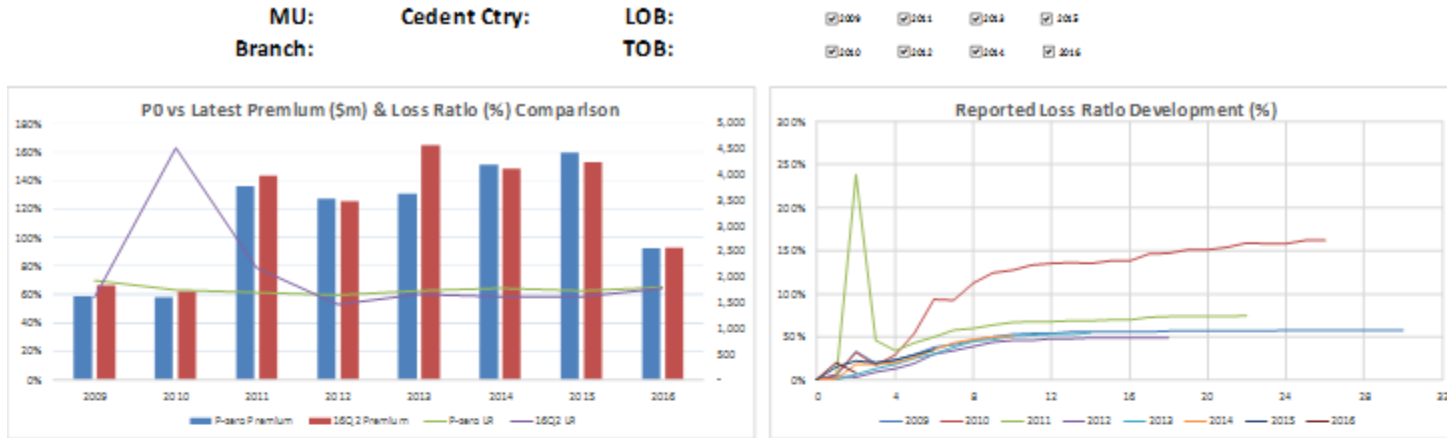
Largest Claims (\$USDm)

Year	2009	2010	2011	2012	2013	2014	2015	2016	Total
% Ultimate Losses	4%	8%	6%	1%	1%	2%	2%	0%	



Diagnostics

P0 LR relative to last 3 reserving rounds

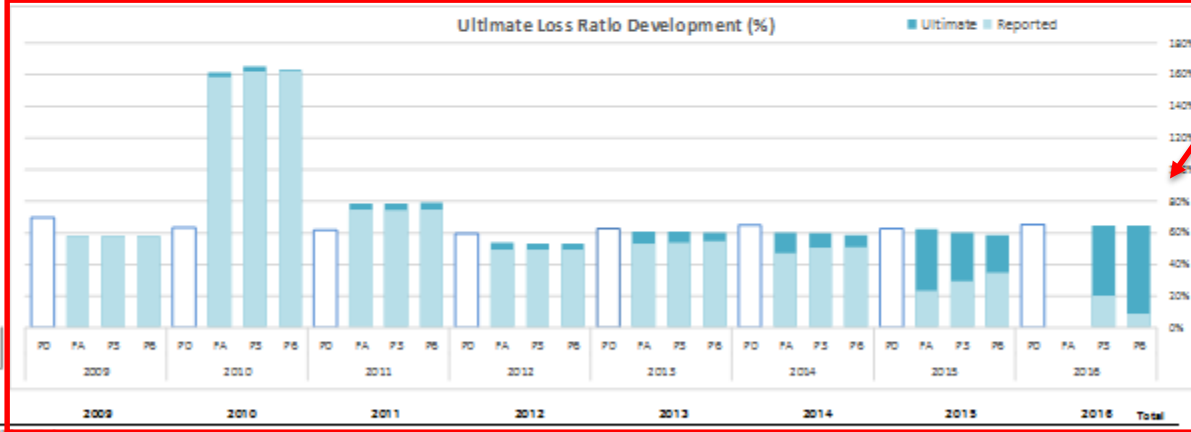


Controls:

Toggle FullScreen

Reset Selection

Export to PPT



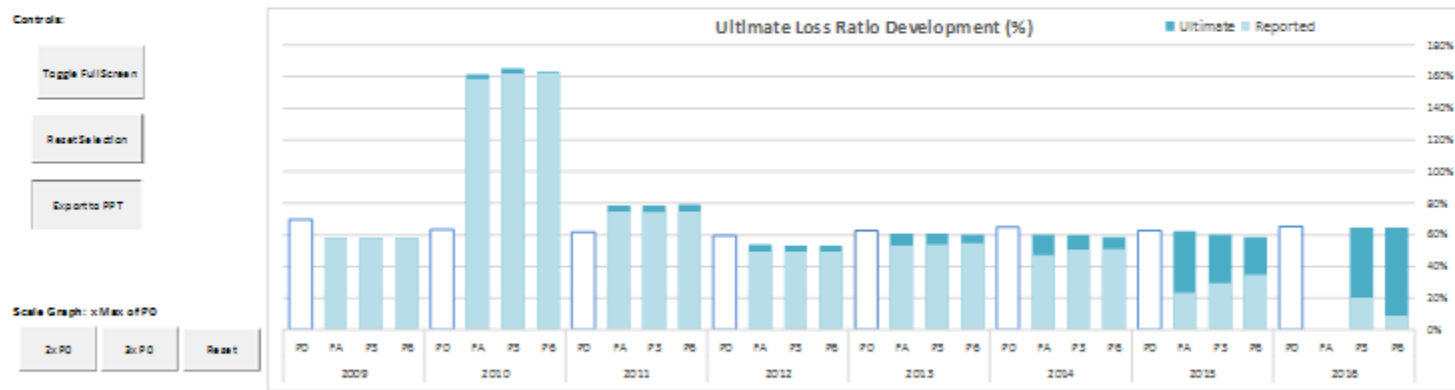
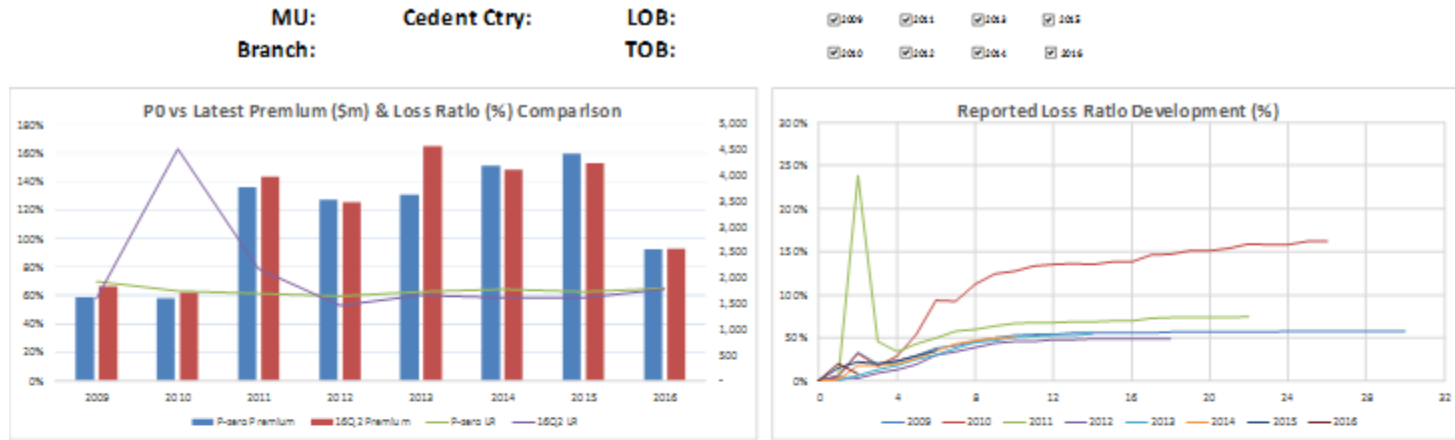
Largest Events (\$USDm)

- Earthquake in Christchurch, New Zealand
- Earthquake and tsunami off Honshu, Japan (Magnitude 9.0)
- Earthquake - South Island of New Zealand
- Roads in Thailand October 2011
- Cyclone Yasi over Australia - ICA C&T CODE 114

Largest Claims (\$USDm)



Diagnostics



Largest Events (\$USDm)

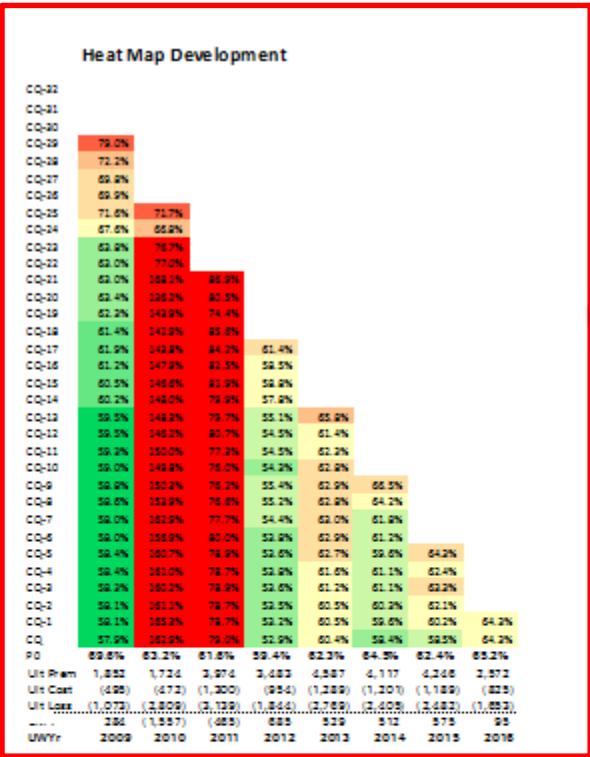
Year	Event	Amount (\$USDm)
2009	Earthquake in Christchurch, New Zealand (Magnitude 7.5)	1,252
2010	Earthquake and tsunami off Honshu, Japan (Magnitude 9.0)	1,726
2011	Earthquake - South Island of New Zealand (Magnitude 6.3)	2,974
2012	Floods in Thailand October 2011	3,483
2013	Cyclone Yasi over Australia - ICA C&T CODE 114	4,557
2014		4,117
2015		4,268
2016		2,372
Total		23,823

Largest Claims (\$USDm)

Year	Amount (\$USDm)
2009	256
2010	1,957
2011	685
2012	625
2013	539
2014	513
2015	575
2016	95

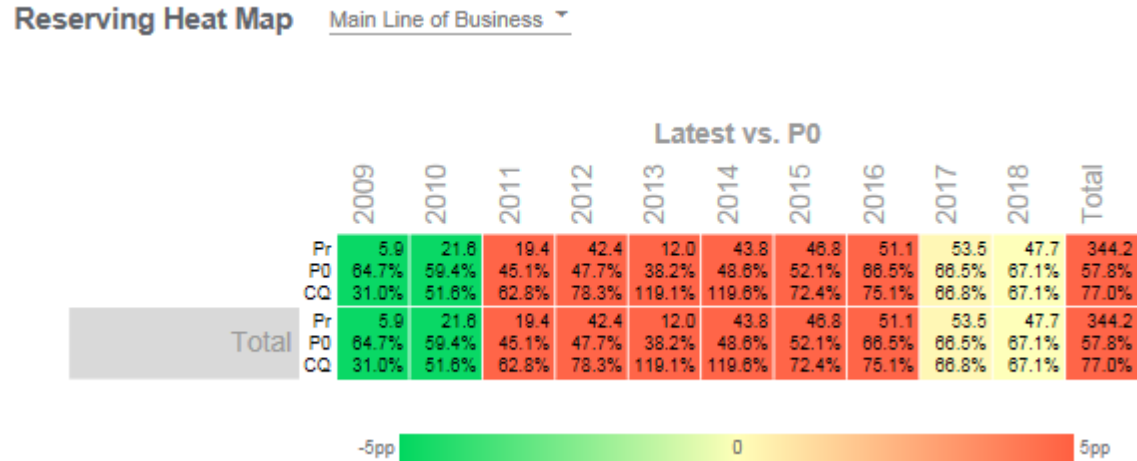
% Ultimate Losses

Year	% Ultimate Losses
2009	0%
2010	21%
2011	40%
2012	1%
2013	1%
2014	2%
2015	2%
2016	0%



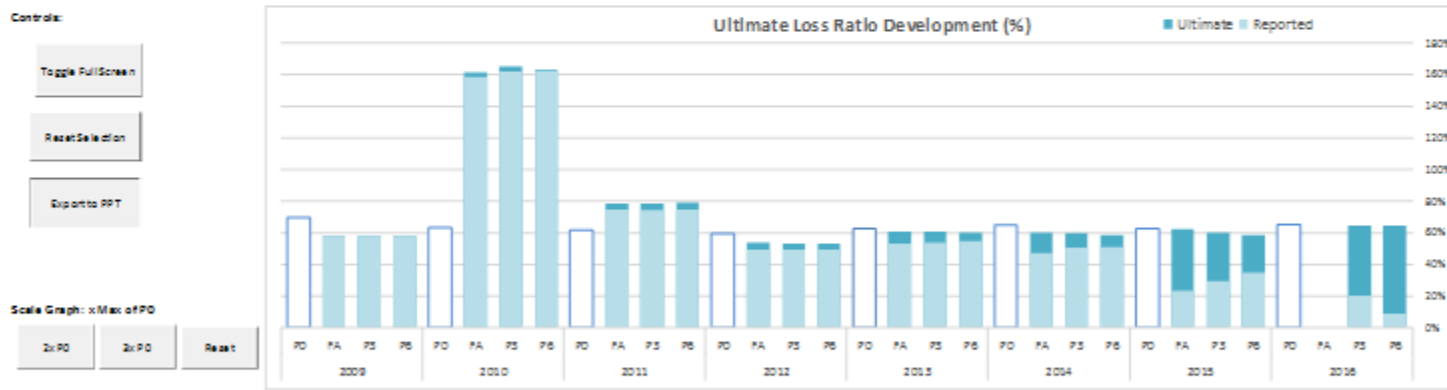
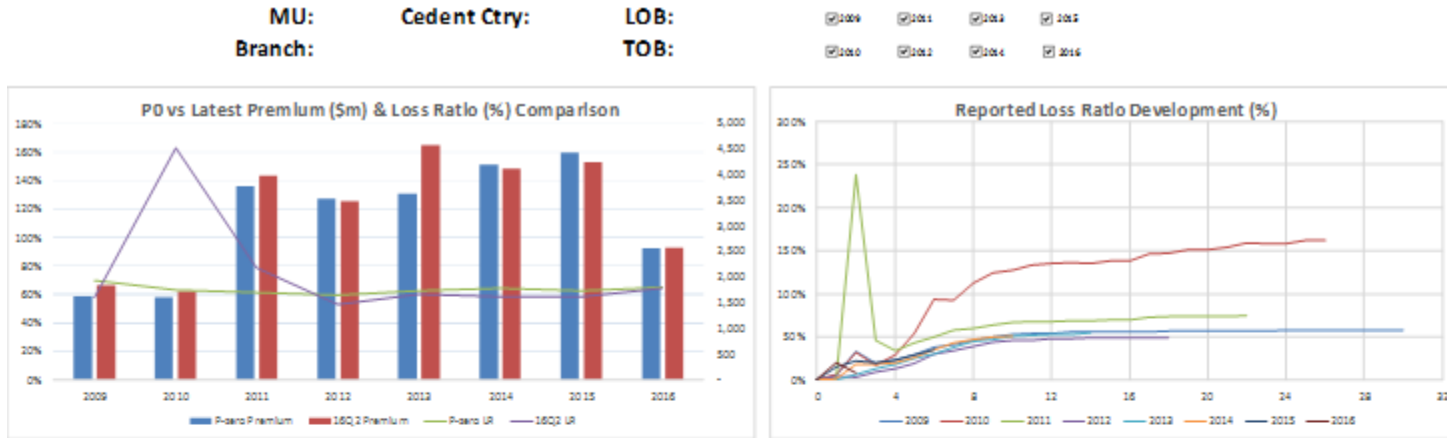
Ultimate LR Development

Heatmap



- Easy to understand & show to senior management rather than just figures
- Can focus on segments of business
- Gives an ultimate view – lines of business may be slow to develop
- Gives a snapshot across years

Diagnostics



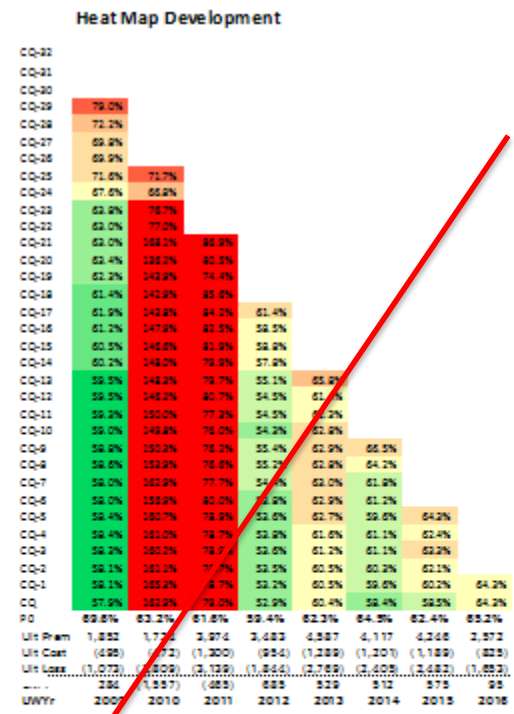
Largest Events (\$USDm)

Earthquake in Christchurch, New Zealand (Magnitude 6.3)	1.0
Earthquake and tsunami off Honshu, Japan (Magnitude 9.0)	1.0
Earthquake - South Island of New Zealand (Magnitude 6.3)	1.0
Roads in Thailand October 2011	1.0
Cyclone Yasi over Australia - ICA C&T CODE 114	1.0

Largest Claims (\$USDm)

Earthquake in Christchurch, New Zealand (Magnitude 6.3)	1.0
Earthquake and tsunami off Honshu, Japan (Magnitude 9.0)	1.0
Earthquake - South Island of New Zealand (Magnitude 6.3)	1.0
Roads in Thailand October 2011	1.0
Cyclone Yasi over Australia - ICA C&T CODE 114	1.0

% Ultimate Losses: 0% 21% 40% 1% 1% 2% 2% 0%



Claims Info: Largest Events

Example



Poor Experience





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