An alternative way of presenting actuarial topics
(on the example of movement analysis of non-life reserves)

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Czech Society of Actuaries
29.05.2014, Říčany
Goals of today’s presentation

- Keep the attention of everyone
- Provide valuable insights on the topic
- Have fun
  (and give an idea about an alternative way of presenting)
What others think actuaries do

Ryan McAllister, FFIC in 2010

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Description vs. illustration

It is much easier to understand something illustrated than something described

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http://www.youtube.com/watch?v=P36xhtpw0Lg
Assessing the experience level of the audience

Actuaries doing Movement Analysis of NL Reserves

Actuaries dealing with Non-Life

Audience
## Reserving basics

### Life vs. Non-Life – What is the main difference between reserving?

<table>
<thead>
<tr>
<th>Reserving Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life</td>
<td>mainly for <em>claims not yet occurred</em> (premium provisions)</td>
</tr>
<tr>
<td>Non-Life</td>
<td>mainly for <em>claims already occurred</em> (claims provisions)</td>
</tr>
</tbody>
</table>

### Non-Life Claims Provisions

- Claims happened, reserves are set
- Uncertainty about reporting, payment, settlement
Reserving basics

Reserves as part of the balance sheet

Estimations at a specific point in time
Uncertainty about adequacy

Measuring the adequacy level

Looking back: run-off analysis
Assessing only the adequacy level from the beginning
Anything happened later is not captured
Run-off reporting in Czechia

Základní obsah dalších informací předkládaných České národní bance podle § 9

Část 1: Další informace k výkazu POJ (ČNB) 10-04 „Rozvaha pojišťovny/zajišťovny pro účely dohledu“

Název: Run-off analýza rezervy na pojistná plnění pro neživotní pojištění

Obsah:
I. Další informace obsahuje run-off analýzu rezervy na pojistná plnění ve struktuře a rozsahu, který pojišťovna nebo zajišťovna vyhotovuje v rámci ověřování souladu hrubé výše rezervy na pojistná plnění s následnou skutečností. V úvahu se přitom bere následující

1. Předložená run-off analýza se zpracovává odděleně pro pojišťovnou nebo zajišťovnou zvolené členění do výpočetních skupin, podle kterých byla k danému období stanovena rezerva na pojistná plnění určená ke krytí závazků z pojistných událostí v období před rozvahovým dnem vzniklých, ale v tomto období nehlášených;
2. V předložené run-off analýze se testují stavy rezervy na pojistná plnění, a to i se zpožděním delším než jeden rok, pokud je to relevantní;
Run-off reporting in Czechia

And now for something completely different
The problem of water consumption during a seminar

A lot of bottles have to be at disposal to cover the water consumption during the workshop.

Some bottles are prepared in the meeting room
Some are kept in the storage room
The problem of water consumption during a seminar

Measuring the adequacy of the prepared amount of bottles

Only this seminar $\Rightarrow$ only the adequacy level from the beginning
Other meetings not $\Rightarrow$ everything estimated later is not captured

beginning  now  end
**Inputs**

Estimation at the beginning and at the end of the period
Consumption in the period

**Approach**

The (old) adequacy is measured by the performance of the period
New occurrences during the period are not assessed
Run-off on a movement analysis chart

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Different views on run-off/ultimate analysis

Fixed accident year
Ultimate/run-off development throughout the financial years

Fixed financial year
Ultimate/run-off development for all accident years

Fixed accident year – Extension
Starting financial year moved

Fixed financial year – Extension
Fixed accident year
**Different views on run-off/ultimate analysis**

### Questions

- Which view do you usually use in your actuarial analysis?
- And in the communication with your management?
- Which view(s) are required in the regulatory reporting?
Why is it important to look back? – Reserving Cycle

Figure 1 shows the U.S. reserving cycle over the past 30 years.

The blue line represents the first-year evaluation of industry ultimate loss indexed to one.

The other lines show the revisions to that figure at one-year increments: red represents the two-year evaluation, green represents the three-year evaluation, etc., up to the grey line, which shows the ultimate computed loss figure 10 years after the accident year.

Source: Guy Carpenter & Company, L. E. Jones Lighthouse LLC:
Reserving basics

Reserves as part of the balance sheet

Estimations at a specific point in time
Uncertainty about adequacy

Measuring the adequacy level

Looking forward: comparison with an alternative estimation
Assessing the total adequacy at the moment
The problem of water consumption during a seminar

Estimating the future consumption (everybody his/her own)

For the next 10 minutes
For the rest of the day

beginning

now

end

? + ? = ?
Comparison of two estimations

Adequacy by an alternative estimation

The (current) adequacy is the difference between the two

Booked reserves

beginning

now

end

Alternative estimation
## Comparison summary of the adequacy assessments

<table>
<thead>
<tr>
<th>Run-off</th>
<th>Alternative estimation</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Looks back</td>
<td>• Looks forward</td>
</tr>
<tr>
<td>• Only the old reserves</td>
<td>• Reserves at the moment</td>
</tr>
<tr>
<td>• Adequacy:</td>
<td>• Adequacy:</td>
</tr>
<tr>
<td>performance of a period</td>
<td>difference of two estimations</td>
</tr>
<tr>
<td>• Part of the P&amp;L</td>
<td>• Uses a BS item</td>
</tr>
<tr>
<td>• Measures this period</td>
<td>• Measures the whole term</td>
</tr>
</tbody>
</table>

- Adequacy: performance of a period
- Adequacy: difference of two estimations
After 10 minutes passed

Your real consumption in the past 10 minutes
New estimation for the rest of the day
Adequacy of the alternative estimation

Run-off can be produced for any reserve estimation

Estimation at the beginning and at the end of the period
Consumption in the period
What is the fundamental plus of the alternative estimation?

It is (ideally) based on a cash-flow!
Possibility to compare (a part of) the estimation with experience
Actual vs. Expected

Further details in the movement analysis

Decompose the actual payments to expected and difference

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Another option

Keep the actual payments, decompose the run-off
Which option do you prefer?

We elaborate the first one, as it has an advantage – we will see
The run-off may be further detailed

**Mechanical update**: applying the same approach on new data

**Judgment**: modifying the approach

Typically: *mechanical update* is to apply e.g. the same loss development factor approach on the enlarged triangle, *judgment* is to change the approach settings based on this new data.
Completing and extending

Full movement analysis

Inclusion of the estimates for the current period

Possible extensions

The **mechanical update** and the **judgment** part might be extended by reflecting different methods (e.g. Paid/Incurred) stepwise.

The **judgment** might be more detailed (ratios, averages, tail).
Movement of the adequacy

We can have both estimations for two valuation dates

The movement of the adequacy might be produced

Note: the payments are the same
→ the adequacy movement can be captured by the two run-offs

The run-off of the CF-based estimation might be detailed further
### Pillar 3 – QRT – Variation Analysis (VA C2C)

**Variation in Best Estimate shall be provided**

The part related to undiscounted claims provisions:
- Variation of BE due to year N projected in and out flows - risks covered prior to period (C7/CC8)
- Variation of BE due to experience and other sources - risks covered prior to period (C8/CC9)
- Variation of BE due to changes in non economic assumptions - risks covered prior to period (C9/CC10)

These items shall be possible to fill with the amounts included in the movement analysis

### Actuarial Function - DIRECTIVE 2009/138/EC, Article 48

1. Insurance and reinsurance undertakings shall provide for an effective actuarial function to:
   (d) compare best estimates against experience;
   (e) inform the administrative, management or supervisory body of the reliability and adequacy of the calculation of technical provisions;
Goals of today’s presentation – your feedback

- Keep the attention of everyone
- Provide valuable insights on the topic
- Have fun
Questions and comments

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