Jak napsat dokumentaci pro Solventnost II

Petr Bednařík – pbednarik@deloittece.com

Petr Dvořák – pdvorak@deloittece.com

Česká společnost aktuárů

Jarní aktuárské setkání 2015

Úvod

Tématem je dokumentace v rámci Pilíře I Solventnosti II.

Dokumentace je hlavním prostředkem, jak prokázat dohledu splnění požadavků. Z naší zkušenosti na ní často ale není kladen dostatečný důraz a nebývá vždy kvalitní.

Kvalitní dokumentace může nejen splnit regulatorní požadavky, ale zároveň může pomoct efektivitě chodu firmy.

Struktura prezentace:

- Požadavky Solvency II na dokumentaci

- Náš přístup k dokumentaci pro SII

- Příklady z praxe

SII Requirements

SII Documentation Requirements

The amount of things which need to be shown in documentation is huge but there is little guidance on how the documentation should look like

Named documents
- Future management actions plan (L2, art. 19)
- Data directory (L2, art. 256)

Explicit documentation requirements (technical provisions) (L2, art. 256)
- Collection of data and analysis of its quality, limitations of data (L2, art. 15)
- Choice of assumptions
- Selection and application of actuarial and statistical methods
- Validation

Internal model requirements (L2, art. 231 – 234)

Implicit documentation requirements
- Data quality – "data policy", description of tests performed and presentation of results proving that requirements on accuracy, completeness and appropriateness (L2, art. 14)
- Assumptions (L2, art. 17) – justify choice, show uncertainty and impact of alternatives on technical provisions
- Management actions (L2, art. 19) – prove that assumptions are realistic through comparison with management actions in the past
- Policyholder behaviour (L2, art. 21) – analysis of past policyholder behaviour
- Grouping (L2, art. 28) – demonstrate grouping appropriately reflects risk
- Proportionality, simplifications and approximations – proving that error introduced is not material (L2, art. 16, art. 47)
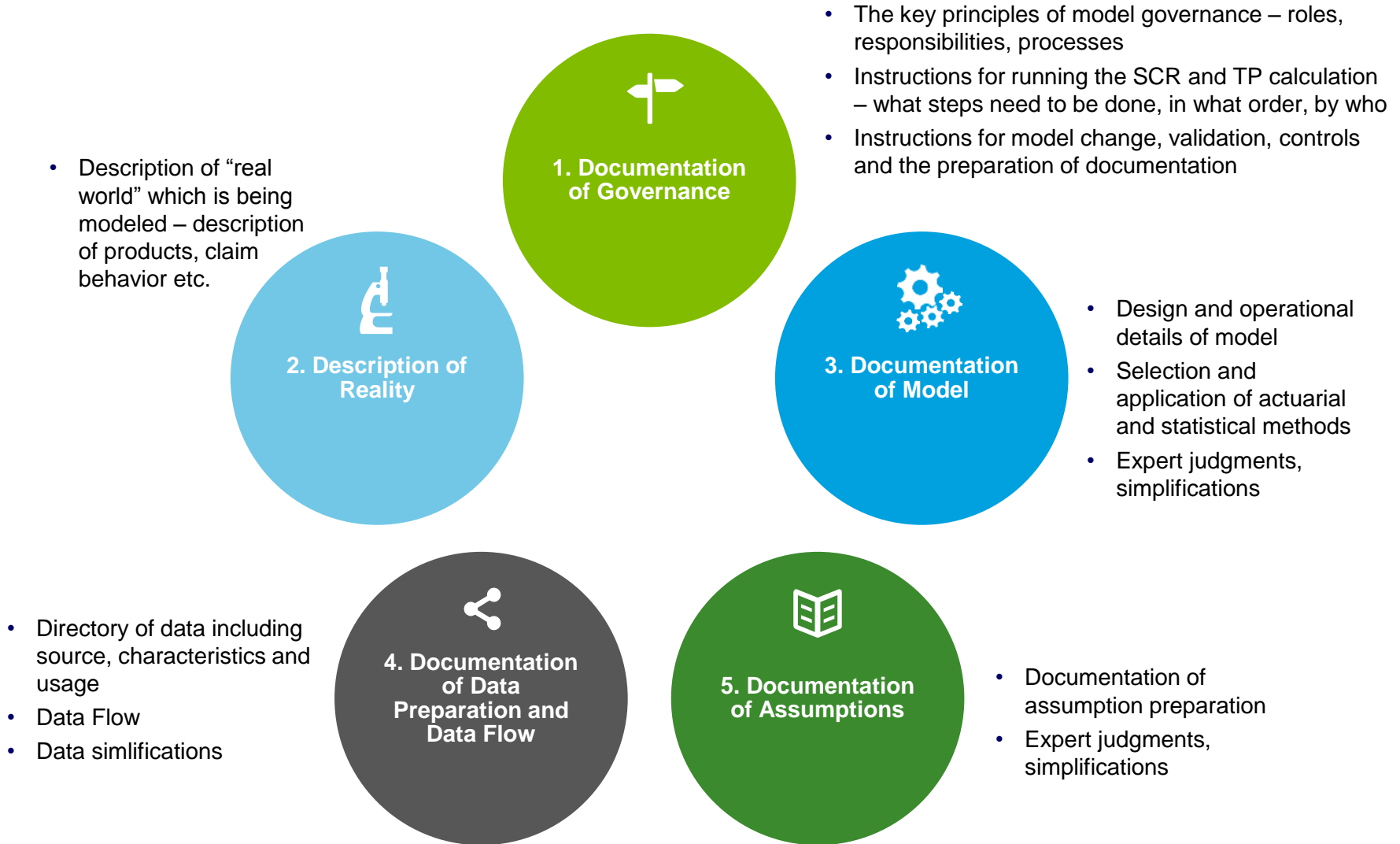
Our Approach

Documentation Model (1/2)

Basic components of documentation

- The key principles of model governance – roles, responsibilities, processes
- Instructions for running the SCR and TP calculation – what steps need to be done, in what order, by who
- Instructions for model change, validation, controls and the preparation of documentation

1. Documentation of Governance

- Description of "real world" which is being modeled – description of products, claim behavior etc.

2. Description of Reality

3. Documentation of Model

- Design and operational details of model
- Selection and application of actuarial and statistical methods
- Expert judgments, simplifications

- Directory of data including source, characteristics and usage
- Data Flow
- Data simlifications

4. Documentation of Data Preparation and Data Flow

5. Documentation of Assumptions

- Documentation of assumption preparation
- Expert judgments, simplifications

Documentation Model (2/2)

There are several views on each basic component

The five components can each be viewed also from these angles (multidimensional model of documentation)

- Stable X Run-specific – some parts of the methodology are stable and not changing, some are very dynamic and specific to each run – we recommend to separate stable methodology and specific run report where exceptions and specifics are captured

- Functional X Technical – fully detailed documentation is not readable, we recommend to have more brief and conceptual functional documentation with good structure complemented by unstructured detailed technical documentation (detailed product descriptions, description of model code, results of tests, etc.). We recommend to collect description of simplifications, judgments and assumptions in functional documentation

- Areas / Process Steps - claims assumptions, premium assumptions, life tables assumptions, claim simulation, assets modeling, …

How to Create the Documentation?

There are several views on each basic component

Common issues:

- it is difficult to align different actuaries to create documentation in the same format and quality

- senior actuaries doing the actual work which needs to be described don't have time

- junior actuaries and not that eloquent in writing and argumenting about simplifications, judgements, etc.

One possible solution, which has worked in our experience:

- Have a couple of senior actuaries (1-3 depending on size of area covered and speed needed) create the functional documentation with standardized structure

- Based on interviews with people actually doing the work – typically this can be a very efficient way to capture the important aspects and enables a more objective look on issues such as expert judgement, choice and justification of assumptions and selection of methods

- Technical documentation does not need to be that standardized and typically it already exists – it only needs to be mapped to the different parts

Case Studies

Case Study 1

Documentation of assumptions – general vs. run-specific

General documentation

Costs
•...

Claims

- **Claim amount**
  - Outputs
  - Required Data Sources
  - Data Preparation
  - Description of Method
  - Actuarial Judgments and Simplifications
- **Claim number**
  - Outputs
  - Required Data Sources
  - Data Preparation
  - Description of Method
  - Actuarial Judgments and Simplifications
- **Claim correlation**
  - Outputs
  - Required Data Sources
  - Data Preparation
  - Description of Method
  - Actuarial Judgments and Simplifications

Premium
•...

Run-specific documentation

Costs
•...

Claims

- **Claim amount**
  - Deviations from Parameterization Cookbook
  - Data and Result Location
  - Actuarial Judgments and Data Approximations
  - Results Summary

- **Claim number**
  - Deviations from Parameterization Cookbook
  - Data and Result Location
  - Actuarial Judgments and Data Approximations
  - Results Summary

- **Claim correlation**
  - Deviations from Parameterization Cookbook
  - Data and Result Location
  - Actuarial Judgments and Data Approximations
  - Results Summary

Premium
•...

Case Study 2

Documentation of modelling – functional vs. technical + reality vs. model

Functional Documentation

Model Architecture

Liability modelling

Insurance products in reality
  Endowment insurance
  Hybrid investment insurance

  …

Liability modelling in deterministic model
  Coverage of the deterministic model
  Mapping of products in reality to model
  Model principles and general simplifications
  Summary of main inputs
  Modelling of products and product-specific simplifications

Liability modelling in stochastic model

Asset Modelling

Asset and Liability Interaction Modelling

Technical Documentation

Model Architecture

Liability modelling

Insurance products in reality
  Detailed portfolio statistics, product specifications, actuarial specifications

  …

Liability modelling in deterministic model
Technical documentation of model (variable per variable, piece of code per piece of code)
Structure of model points and inputs

…

Liability modelling in stochastic model
Technical model documentation
Detailed description of credit modelling theory used
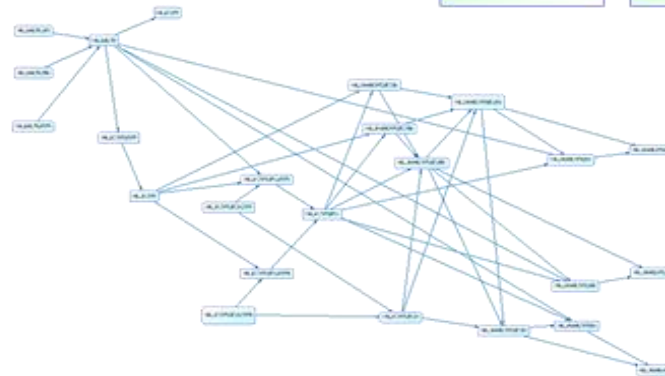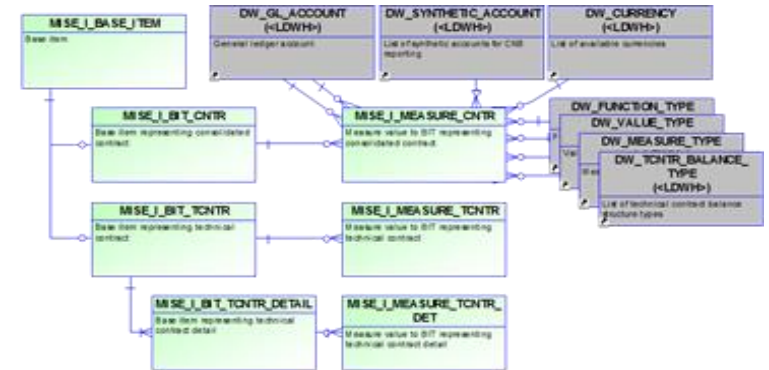
…

Asset Modelling

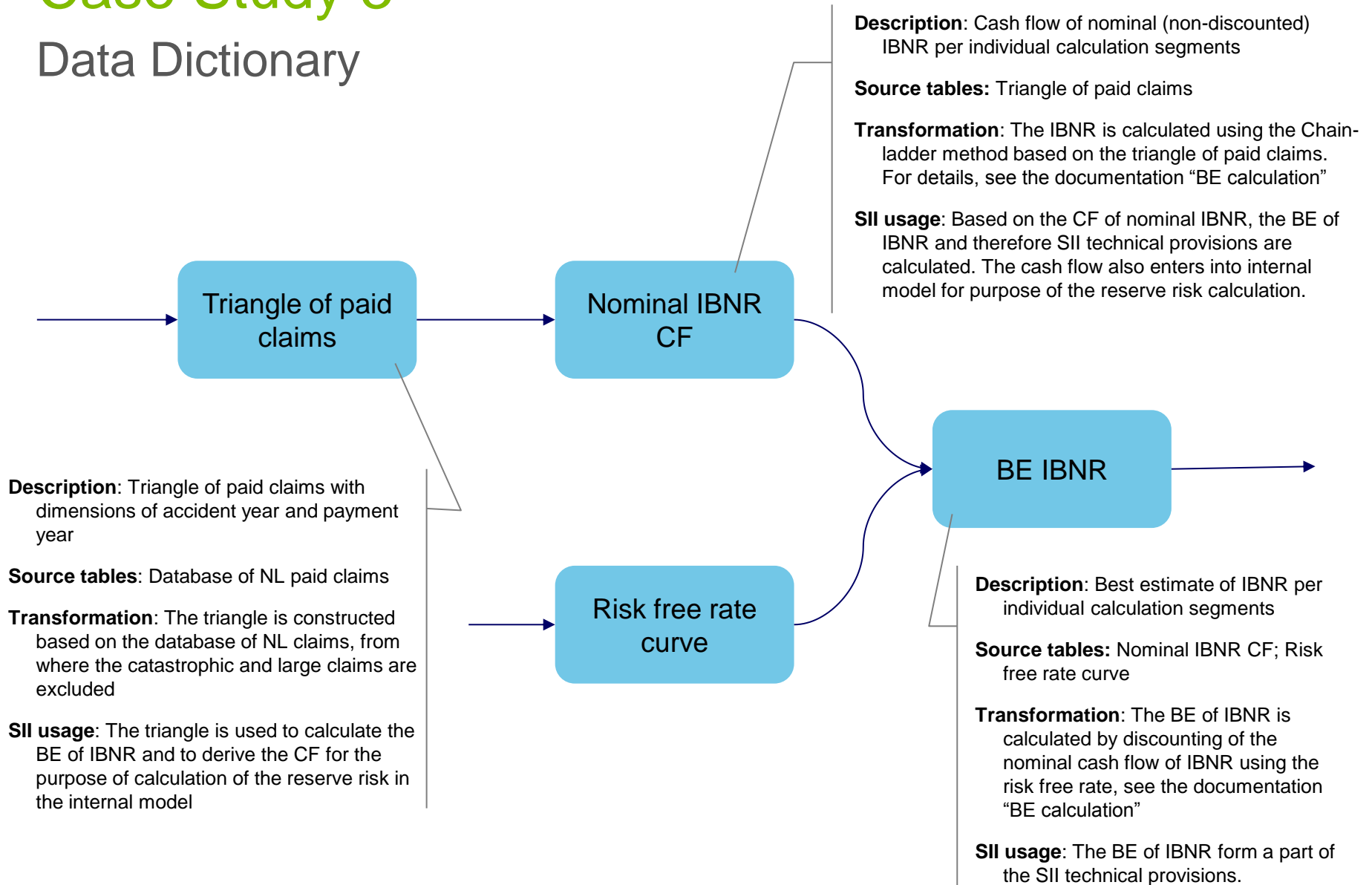| Asset and Liability Interaction Modelling |
| --- |

Case Study 3
Data Dictionary

- Two levels of detail
  - Entities / Tables
  - Attributes / Table columns
- Include
  - Name
  - Description
  - SII Usage
  - Source Tables
  - Transformation Description
  - Data Type
  - Workflow Step
  - Data source name
  - Data owner

Case Study 3
Data Dictionary

Description: Cash flow of nominal (non-discounted) IBNR per individual calculation segments

Source tables: Triangle of paid claims

Transformation: The IBNR is calculated using the Chain-ladder method based on the triangle of paid claims. For details, see the documentation "BE calculation"

SII usage: Based on the CF of nominal IBNR, the BE of IBNR and therefore SII technical provisions are calculated. The cash flow also enters into internal model for purpose of the reserve risk calculation.

```
Triangle of paid
claims        →        Nominal IBNR
                        CF
```

```
Risk free rate
curve
```

```
BE IBNR  →
```

Description: Triangle of paid claims with dimensions of accident year and payment year

Source tables: Database of NL paid claims

Transformation: The triangle is constructed based on the database of NL claims, from where the catastrophic and large claims are excluded

SII usage: The triangle is used to calculate the BE of IBNR and to derive the CF for the purpose of calculation of the reserve risk in the internal model

Description: Best estimate of IBNR per individual calculation segments

Source tables: Nominal IBNR CF; Risk free rate curve

Transformation: The BE of IBNR is calculated by discounting of the nominal cash flow of IBNR using the risk free rate, see the documentation "BE calculation"

SII usage: The BE of IBNR form a part of the SII technical provisions.

Case Study 3
Data Dictionary

Calculation segment: NL1

Development year
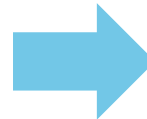
Accident year

Calculation segment	Accident year	Development year	Paid claim
NL1	1	1	
NL1	2	1	
NL1	3	1	
NL1	4	1	
NL1	5	1	
NL1	6	1	
NL1	1	2	
NL1	2	2	
NL1	3	2	
NL1	4	2	
NL1	5	2	
NL1	6	2	
NL1	1	3	
NL1	2	3	
NL1	3	3	

Case Study 3
Data Dictionary

Triangle of paid claims
- Calculation segment
- Accident year
- Development year
- Paid claims

Nominal IBNR CF
- Calculation segment
- Calendar year
- IBNR non-discounted

Risk free rate curve
- Calendar year
- Discount rate

BE IBNR
- Calculation segment
- BE IBNR

Case Study 3
Data Dictionary

Triangle of paid claims

- Calculation segment
- Accident year
- Development year
- Paid claims

Description: Calculation segment for the purpose of the BE calculation consistent with the SII segmentation

SII usage: The technical provisions are calculated separately per calculation segment. The calculation segments are used by the internal model for SCR calculation

Data type: CHAR(20)

Mandatory field: Y

Description: Year of an accident of a claim

SII usage: Accident year forms one dimension of a paid claim triangle, which is used to calculate the BE of IBNR

Data type: INT(4)

Mandatory field: Y

Description: Amount of paid claims in EUR

SII usage: Paid claims included in the claim triangle is a basis for the calculation of BE IBNR

Data type: NUM(16,4)

Mandatory field: Y

Nominal IBNR

Risk free rate

BE IBNR

- Calculation segment
- BE IBNR