

# Solventnost II – modul 3

ALES TOMAZIN, LJUBLJANA -> PODGORICA, 10.12.2020



# Agenda

## ► Radionice

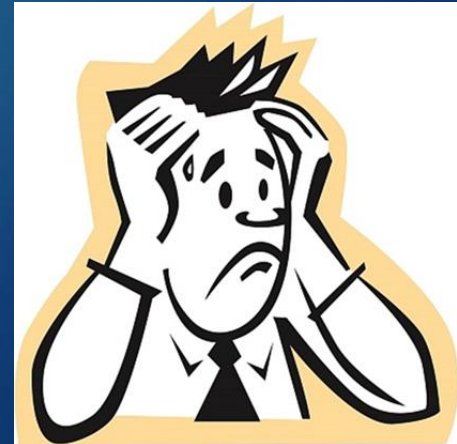
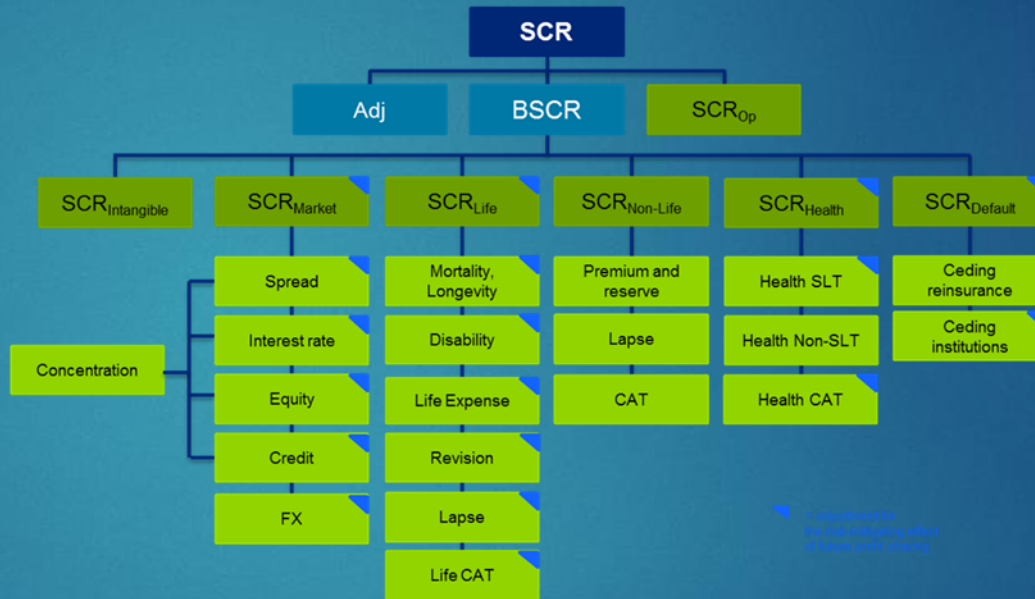
### ► CDR

### ► Nonlife UW risk

### ► Market risk

### ► Risk margin

## ► 15/45 format





# Radionica – wrap-up

- ▶ Cilj je bio CDR modul (na kraju SCR i SII BS)
- ▶ Za CDR modul trebaju nam
  - ▶ Potraživanja iz reosiguranja (RR\_CP + RR\_PP)
  - ▶ Risk mitigation efekat (SCR\_NonLife bez osiguranja – SCR\_NonLife sa reosiguranjem)
  - ▶ Novac u banci
  - ▶ Depoziti
  - ▶ ...?



# Radionica – wrap-up

- ▶ Start-up društvo za osiguranje (AO osiguranja)
- ▶ Imamo IFRS 4 BS i P&L
- ▶ Uradili smo
  - ▶ BEL – CP (štete koje su se već desile)
    - ▶ Run off rezervacija -> CF -> BE CF (90%)
    - ▶ + troškovi (10% BEL)-> diskontovanje = CP
    - ▶ CP\_up & CP\_down; kamatni šok\_gore; šok\_dole
    - ▶ Potraživanja iz reosiguranja – 80% kvota + adjustment (duration i bonitetna procjena društva za reosiguranje)



# Radionica – wrap-up

- ▶ BEL – PP (štete koje će se tek desiti)
  - ▶  $UPR * CR * \text{kamatna stopa}$
  - ▶ PP\_up, PP\_down → kamatni šok
  - ▶ RR dio – 80% kvota i adjustment
- ▶ IFRS 4 podaci – za SCR non-life
  - ▶ GWP + earned dio
  - ▶ Premija za reosiguranje + earned dio
  - ▶ Plan neto zarađene premije za sledeću godinu  
(posebno premija bez reosiguranja za RM efekat)



# CDR

- ▶ CDR - Counterparty default risk
  - ▶ Kapital kojeg moramo imati zbog saradnje sa vanjskim partnerima
    - ▶ Tip 1: reosiguranje (rezervacije i risk mitigation efekat), novac, depoziti kod cedenta (na bankama npr. depoziti po viđenju)
    - ▶ Tip 2: potraživanja prema vlasnicima ugovora, agentima i ostalima partnerima (društvima za reosiguranje)



# CDR

- ▶ CDR rizik modul odražava štete iz neočekivanih propada ili pogoršanja kreditnog stanja partnera ili dužnika za slijedećih 12 mjeseci
- ▶ Za svakog partnera se u CDR modul uračuna sva izloženost do društva u bilo kojem pravnom obliku
- ▶ Razlikujemo dvije kategorije izlaganja: tip1 i tip2



# CDR

- ▶ Tip 1 (izlaganja nisu diverzifikovana, a rejting partnera je poznat)
  - ▶ Ugovori reosiguranja
  - ▶ Sekjuritizacija i derivati
  - ▶ Ostali ugovori za prenos rizika
  - ▶ Gotovina u banci
  - ▶ Depoziti kod cedenta (broj nezavisnih partnera  $\leq 15$ )
  - ▶ Kapital, početni fond, kreditna pisma koja su najavljena a nisu plaćena (... $\leq 15$ )
  - ▶ Garancije, kreditna pisma i bilo koje obaveze koje je dalo društvo i vezane su na rejting



# CDR

- ▶ Tip 2 (izlaganja su diverzifikovana, a rejting partnera nije poznat)
  - ▶ Naknade (potraživanja) od posrednika
  - ▶ Dužnici (vlasnici ugovora) uključujući hipoteke
  - ▶ Depoziti kod cedenta (broj nezavisnih partnera > 15)
  - ▶ Kapital, početni fond, kreditna pisma koja su najavljena a nisu plaćena (broj nezavisnih partnera > 15)



# CDR

## ► Izračun

$$SCR_{def} = \sqrt{SCR_{def,1}^2 + 1.5 \cdot SCR_{def,1} \cdot SCR_{def,2} + SCR_{def,2}^2}$$

$SCR_{def}$  = Capital requirement for counterparty default risk

$SCR_{def,1}$  = Capital requirement for counterparty default risk of type 1 exposures

$SCR_{def,2}$  = Capital requirement for counterparty default risk of type 2 exposures



# CDR

## ► Tip 1

- Glavni input su LGD (loss given default) i PD (vjerovatnost propada)
- **SII delegirana uredba:**
  - $3\sigma$ ,  $\sigma < 7\%$  TLGD (total loss)
  - $5\sigma$ ,  $7\% \text{ TLGD} < \sigma < 20\% \text{ TLGD}$
  - TLGD,  $20\% \text{ TLGD} < \sigma$
  - $\rightarrow \sigma = \sqrt{V}$ , a  $V$  je varijansa distribucije šteta rizika tipa 1



# CDR

## ► Tip 1

► Glavni input su LGD (loss given default) i PD (vjerovatnost propada)

► **QIS5:**

$$SCR_{def,1} = \begin{cases} 3 \cdot \sqrt{V} & \text{if } \sqrt{V} \leq 5\% \cdot \sum_i LGD_i, \\ \min\left(\sum_i LGD_i; 5 \cdot \sqrt{V}\right) & \text{else} \end{cases},$$

where the sum is taken over all independent counterparties with type 1 exposures and

$LGD_i$  = Loss-given-default for type 1 exposure of counterparty i

$V$  = Variance of the loss distribution of the type 1 exposures



# CDR

## ► Tip 1 – detalj : **QIS5 nomenklatura**

$$V = \sum_j \sum_k u_{j,k} \cdot y_j \cdot y_k + \sum_j v_j \cdot z_j$$

$$y_j = \sum_i LGD_i \quad \text{and} \quad z_j = \sum_i (LGD_i)^2$$

$$u_{ij} = \frac{p_i(1-p_i)p_j(1-p_j)}{(1+\gamma)(p_i+p_j)-p_ip_j} \quad v_i = \frac{(1+2\gamma)p_i(1-p_i)}{2+2\gamma-p_i} \quad \text{with } \gamma = 0.25$$

Rating <sub>i</sub>	Credit Quality Step	$p_i$
AAA	1	0.002%
AA		0.01%
A	2	0.05%
BBB	3	0.24%
BB	4	1.20%
B	5	6.04%
CCC or lower	6	30.41%

Solvency ratio	$p_i$
>200%	0.025%
>175%	0.050%
>150%	0.1%
>125%	0.2%
>100%	0.5%
>90%	1%
>80%	2%
≤80%	10%



# CDR

- ▶ Tip 1 – detajl : **SII delegirana uredba nomenklatura**

Varianca porazdelitve izgub izpostavljenosti tipa 1 iz odstavka 4 člena 200 je enaka vsoti  $V_{inter}$  in  $V_{intra}$ .

$$V_{inter} = \sum_{(j,k)} \frac{PD_k \cdot (1 - PD_k) \cdot PD_j \cdot (1 - PD_j)}{1,25 \cdot (PD_k + PD_j) - PD_k \cdot PD_j} \cdot TLGD_j \cdot TLGD_k$$

$$V_{intra} = \sum_j \frac{1,5 \cdot PD_j \cdot (1 - PD_j)}{2,5 - PD_j} \cdot \sum_{PD_j} LGD_i^2$$



# CDR

## ► Tip 1

- LGD izlaganja konceptualno je definisan kao šteta osnovnog kapitala koje bi društvo realizovalo u slučaju propada partnera
- LGD se koriguje sa  $(1-RR)$ , gdje  $RR$  je stopa oporavka
- $RR$  se razlikuje za ugovore reosiguranja i sekjuritizacije na jednoj strani i za derivative na drugoj strani



# CDR

## ► Tip 1 – LGD

### ► Za ugovore reosiguranja i sekuritizacije (**prema QIS5**)

$$LGD_i = \max \left( 50\% - \left( Recoverables_i + RM_{re,i} - Collateral_i \right), 0 \right).$$

$Recoverables_i$  = Best estimate recoverables from the reinsurance contract (or SPV) plus any other debtors arising out of the reinsurance arrangement or SPV securitisation

$RM_{re,i}$  = Risk mitigating effect on underwriting risk of the reinsurance arrangement or SPV securitisation i

$Collateral_i$  = Risk-adjusted value of collateral in relation to the reinsurance arrangement or SPV securitisation i.



# CDR

## ► Tip 1 – LGD

- Za ugovore reosiguranja i sekuritizacije (**prema SII delegiranoj uredbi**)

SCR.6.34. For a **reinsurance arrangement or securitisation**  $i$ , the loss-given-default  $LGD_i$  should be calculated as follows:

$$LGD_i = \max(0; 50\%(\text{Recoverables}_i + 50\%RM_{re,i}) - F \cdot \text{Collateral}_i)$$

where

$\text{Recoverables}_i$  = Best estimate recoverables from the reinsurance contract (or SPV)  $i$  plus any other debtors arising out of the reinsurance arrangement or SPV securitisation

$RM_{re,i}$  = Risk mitigating effect on underwriting risk of the reinsurance arrangement or SPV securitisation  $i$

$\text{Collateral}_i$  = Risk-adjusted value of collateral in relation to the reinsurance arrangement or SPV securitisation  $i$ .

$F$  = Factor to take into account the economic effect of the collateral arrangement in relation to the reinsurance arrangement or securitisation in case of any credit event related to the counterparty  $i$ .



# CDR

## ► Tip 1 – LGD

### ► Za derivative – **prema QIS5**

$$LGD_i = \max(90\% \cdot (MarketValue_i + RM_{fin,i} - Collateral_i); 0),$$

where

$MarketValue_i$  = Value of the derivative  $i$  according to subsection V.1.

$RM_{fin,i}$  = Risk mitigating effect on market risk of the derivative  $i$

$Collateral_i$  = Risk-adjusted value of collateral in relation to the derivative  $i$ .



# CDR

## ► Tip 1 – LGD

### ► Za derivative – **prema SII delegiranoj uredbi**

SCR.6.37. For a **derivative**  $i$ , the *loss-given-default*  $LGD_i$  should be calculated as follows:

$$LGD_i = \max(0; 90\%(MarketValue_i + RM_{fin,i}) - F \cdot Collateral_i)$$

where

$MarketValue_i$  = Value of the derivative  $i$  in accordance with Article 75 of Directive 2009/138/EC.

$RM_{fin,i}$  = Risk mitigating effect on market risk of the derivative  $i$

$Collateral_i$  = Risk-adjusted value of collateral in relation to the derivative  $i$ .

The best estimate of the *Recoverables* $_i$  might be netted with liabilities towards the same legal entity to the extent they could be set off in case of the default of the legal entity.

$F$  = Factor to take into account the economic effect of the collateral arrangement in relation to the reinsurance arrangement or securitisation in case of any credit event related to the counterparty  $i$ .



# CDR

## ► Tip 2 – **prema QIS 5**

$$15\% \cdot E + 90\% \cdot E_{past-due},$$

where

$E$  = Sum of the values of type 2 exposures, except for receivables from intermediaries which are due for more than 3 months.

$E_{past-due}$  = Sum of the values of receivables from intermediaries which are due for more than 3 months.



# CDR

## ► Tip 2 – **prema SII delegiranoj uredbi**

SCR.6.53. The capital requirement for counterparty default risk on type 2 exposures shall be equal to the loss in the basic own funds that would result from an instantaneous decrease in value of type 2 exposures, by the following amount:

$$0.9 \cdot LGD_{receivables > 3 months} + 0.15 \cdot \sum_i LGD_i$$

where:

- (a)  $LGD_{receivables > 3 months}$  denote the total losses-given-default on all receivables from intermediaries which have been due for more than three months
- (b) the sum is taken on all type 2 exposures other than receivables from intermediaries which have been due for more than three months;
- (c)  $LGD_i$  denotes the loss-given-default on the type2 exposure  $i$ .



Hvala 😊

