Insight into the DC-part of the stress test

EIOPA 2017 IORP Stress Test Launch Event
Frankfurt, 18 May 2017

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AGENDA

1. Scope DC Stress Test 2017
2. Changes from DC Stress Test 2015
3. DC Stress Test Tool
   i. Process
   ii. Demo

- Calculate impact of adverse market scenario on overall (investment) assets

- Asses second round effects on:
  - Retirement income of three representative plan members
  - The real economy and financial markets as a result of possible changes to short- and long term investment behaviour

2. Changes from DC Stress Test 2015

- With respect to scenario's:
  - Only one new adverse economic scenario will be given
  - No adverse demographic scenario, i.e. no longevity stress

- With respect to DC tool:
  - Estimated effects of derivative hedging
  - Different asset mixes pre/post stress can be provided

The DC Stress Test part consists of the following 4 documents/files:

1. IORP Stress Test 2017 Specifications

2. EIOPA-17-284-IORP_ST17_DC_Template-(20170518) (Excel template) **[spreadsheet]**

3. EIOPA-17-287-IORP_ST17_DC_Word_Template-(20170518) (Word template) **[word template]**

4. DC Stress Test Tool in Excel
   i. EIOPA DC ST2017 Input Template (20170518).xlsb **[DC tool input spreadsheet]**
   ii. EIOPA DC ST2017 Calculation Tool (20170518).xlsb

Guidance on filling in the questionnaires/reporting templates

In the document "Qualitative/Quantitative Questionnaire - IORP Stress Test 2017 - DC IORPs" references are made according to the following:

- **[word template]**
  qualitative question which should be answered in the word template
- **[spreadsheet]**
  quantitative question which should be answered in the excel template
- **[DC tool input spreadsheet]**
  either qualitative/quantitative input which should be answered in the excel input template for the DC calculation tool

Insight into the DC-part of the stress test

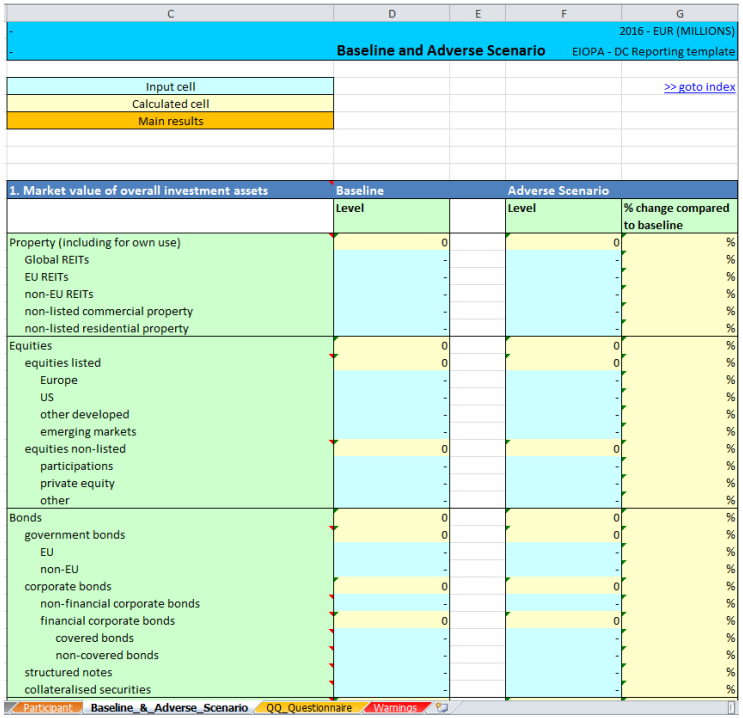
3. DC Stress Test Process & Demo

EIOPA-17-284-IORP_ST17_DC_Template-(20170518).xlsx

[spreadsheet]

-			2016 - EUR (MILLIONS)
-	DC Reporting template Index		EIOPA - DC Reporting template
	Content	Sheet	GoTo
	This sheet	P.Index	GoTo
	Explanations on the structure and content of this template	P.Readme	GoTo
	Participant information	Participant	GoTo
	Assets in the Baseline and Adverse Scenario	Baseline_&_Adverse_Scenario	GoTo
	Responses to the Qualitative/Quantitative Questionnaire	QQ_Questionnaire	GoTo

P.Index | P.Readme | Participant | Baseline_&_Adverse_Scenario | QQ_Questionnaire | Warnings



-				2016 - EUR (MILLIONS)
-	Baseline and Adverse Scenario			EIOPA - DC Reporting template
	Input cell			>> goto index
	Calculated cell			
	Main results			
1. Market value of overall investment assets	Baseline		Adverse Scenario	
	Level		Level	% change compared to baseline
Property (including for own use)	0		0	%
Global REITs	-		-	%
EU REITs	-		-	%
non-EU REITs	-		-	%
non-listed commercial property	-		-	%
non-listed residential property	-		-	%
Equities	0		0	%
equities listed	0		0	%
Europe	-		-	%
US	-		-	%
other developed	-		-	%
emerging markets	-		-	%
equities non-listed	0		0	%
participations	-		-	%
private equity	-		-	%
other	-		-	%
Bonds	0		0	%
government bonds	0		0	%
EU	-		-	%
non-EU	-		-	%
corporate bonds	0		0	%
non-financial corporate bonds	-		-	%
financial corporate bonds	0		0	%
covered bonds	-		-	%
non-covered bonds	-		-	%
structured notes	-		-	%
collateralised securities	-		-	%

Participant | Baseline_&_Adverse_Scenario | QQ_Questionnaire | Warnings

3. DC Stress Test Process & Demo

Guidance on filling in the questionnaires/reporting templates:

Where to answer the questions stated in the document:

"Qualitative/Quantitative Questionnaire - IORP Stress Test 2017 - DC IORPs"

USE TEMPLATE TO ANSWER QUESTION NR			
Question Nr	Word	Spreadsheet	DC tool input spreadsheet
1	×	×	×
2		×	
3			×
4			×
5			×
6			×
7			×
8			×
9			×
10			×
11			×
12			×
13			×
14			×
15			×
16			×
17	×	×	
18	×	×	
19	×	×	
20		×	
21	×	×	
22	×	×	
23	×	×	
24	×	×	
25		×	
26		×	
27		×	
28		×	
29		×	
30		×	
31	×		

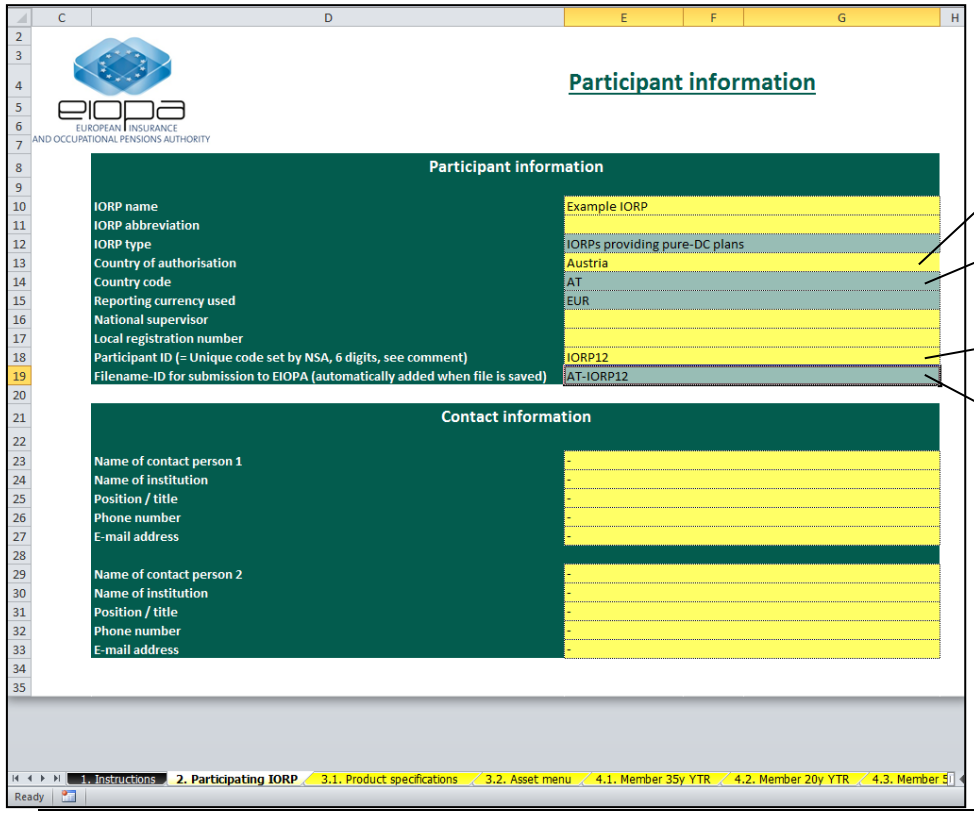
Guidance on filling in the questionnaires/reporting templates

1. In order to process all the submissions in an efficient way NSA's will provide a unique 6-digit identification code to each participant in their jurisdiction.
2. This code has to be used in each document that IORP's submit to their respective NSAs and can be entered under the participant information.
3. This code may consist of numbers and letters and must be 6-digits long.

3. DC Stress Test Process & Demo

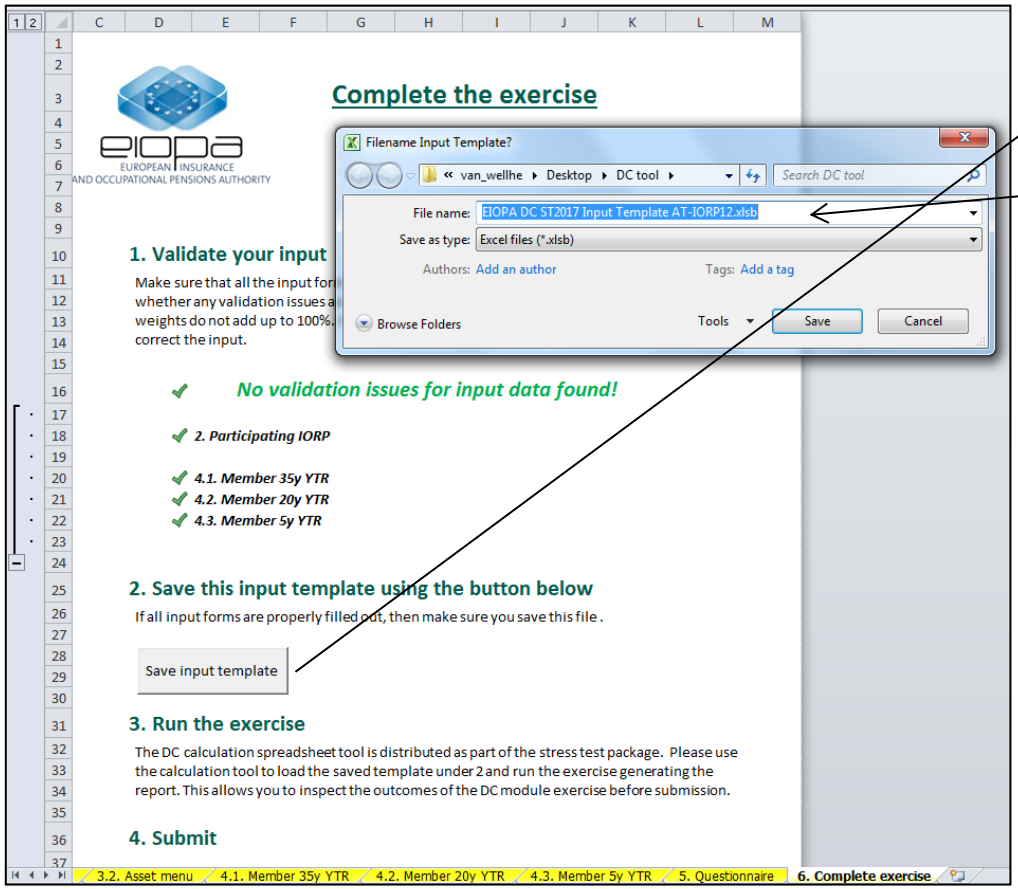
The input and report template for the DC calculation tool will be automatically saved including unique filename ID as part of the filename.

EIOPA DC ST2017 Input Template.xlsb file – worksheet "2. Participating IORP"



1. Select Country from drop down list
2. The Country Code will be generated automatically
3. The respective NSA will provide a unique 6-digit code to each participating IORP
4. The unique filename ID will be generated automatically
5. To save the completed DC Input Template go to worksheet "6. Complete exercise"

Worksheet "6. Complete exercise"



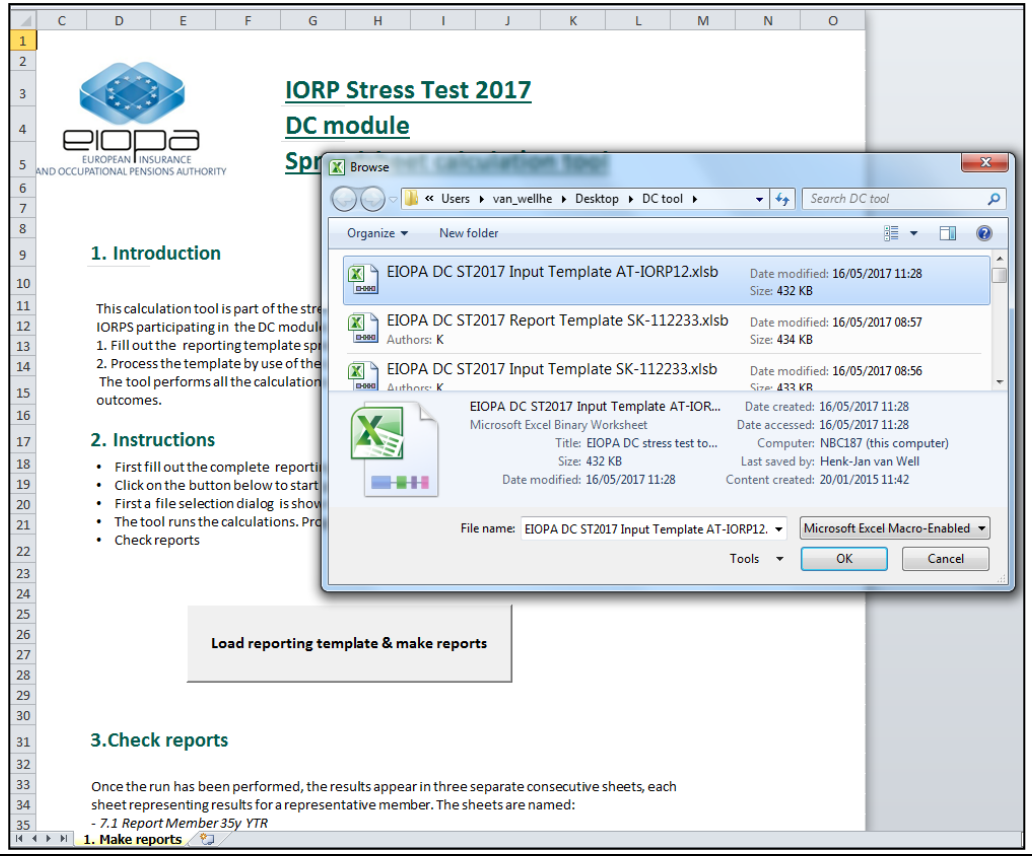
By pressing the "Save input template"-button the dialog "Filename Input Template?" shows up.

The default file name will contain the unique participation code.

Note1: if either the Country or the Unique Code has not been entered correctly the validation of "2. Participating IORP" will fail.

Note2: for own testing purposes or own analysis of alternative inputs IORP's may choose alternative file names.

The IORP specific DC ST2017 Input Template has to be loaded into the IORP DC ST2017 Calculation Tool:



When pressing the button “Load reporting template & make reports” the dialog to select the input template appears.

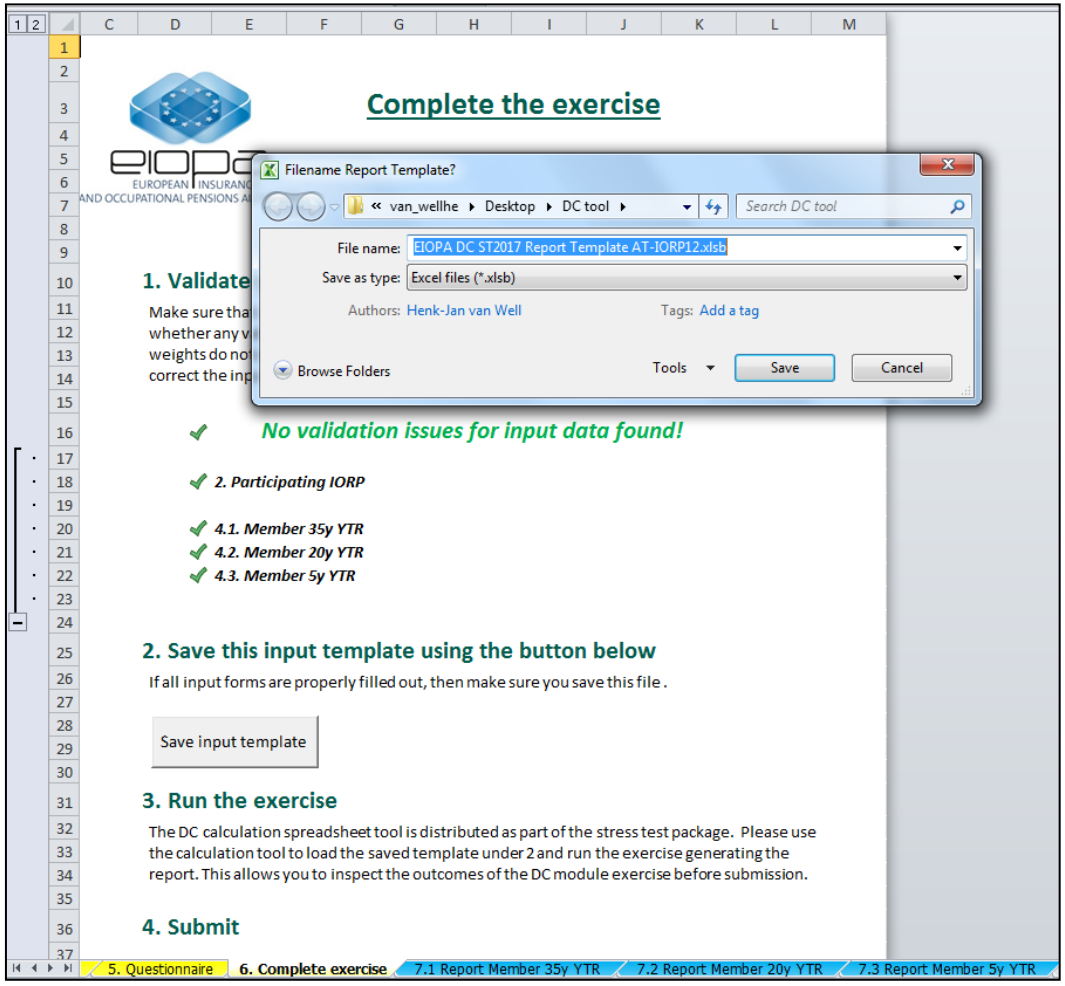
By selecting the just created IORP specific input template, i.e.

“EIOPA DC ST2017 Input Template AT-IORP12.xlsb”

and pressing OK the input template is loaded and the calculations are performed automatically.

Insight into the DC-part of the stress test

3. DC Stress Test Process & Demo



Once the calculations are finished and the report template has been generated the “Filename Report Template?”-dialog appears with the default name for the report template given, i.e.

“EIOPA DC ST2017 Report Template AT-IORP12.xlsb”

By pressing Save the report template is being saved.

Note: for own testing purposes or own analysis of alternative reports IORP’s may choose alternative file names.

Finally each participating IORP has to submit the following files to their respective NSA's

From the qualitative/quantitative questionnaires:

1. EIOPA-17-284-IORP_ST17_DC_Template-(20170518) (Excel template) **[spreadsheet]**

2. EIOPA-17-287-IORP_ST17_DC_Word_Template-(20170518) (Word template) **[word template]**

From the DC Calculation Tool:

3. EIOPA DC ST2017 Report Template CC-XXXXXX.xlsb
   Note: This is not the Input Template but the Report Template after running the tool.

EIOPA DC ST2017 Input Template.xlsb

Worksheets:

1. Instructions
2. Participating IORP

3.1. Product specifications

3.2. Asset menu

4.1. Member 35yr TR

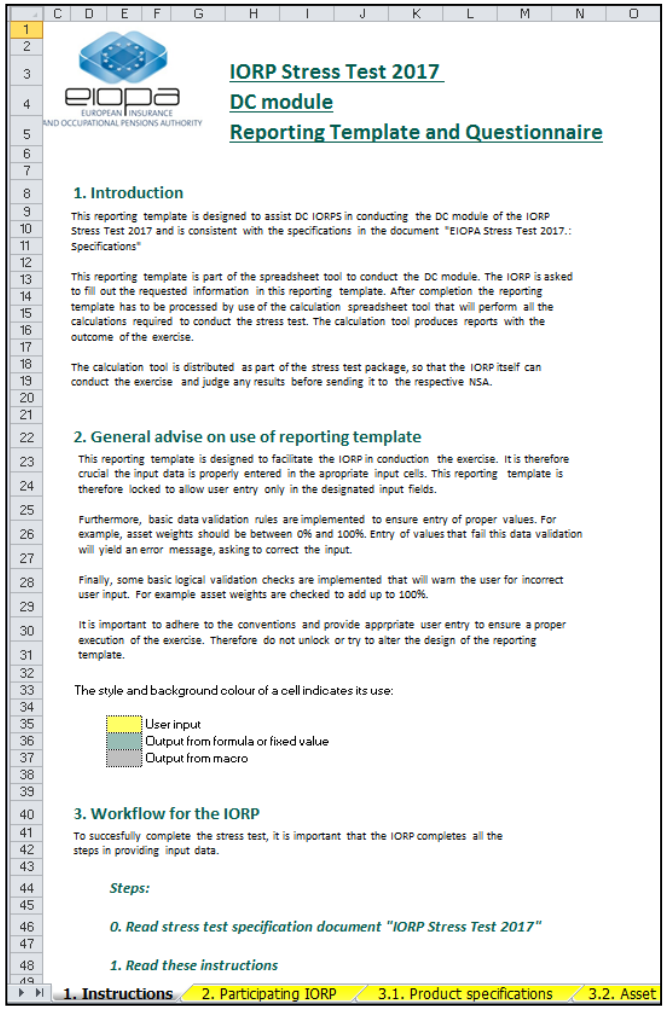
4.2. Member 20yr TR

4.3. Member 5yr TR

5. Questionnaire
6. Complete exercise

Worksheet: 1. Instructions

- General information
- Legenda used
- Workflow



IORP Stress Test 2017
DC module
Reporting Template and Questionnaire

1. Introduction

This reporting template is designed to assist DC IORPS in conducting the DC module of the IORP Stress Test 2017 and is consistent with the specifications in the document "EIOPA Stress Test 2017.: Specifications"

This reporting template is part of the spreadsheet tool to conduct the DC module. The IORP is asked to fill out the requested information in this reporting template. After completion the reporting template has to be processed by use of the calculation spreadsheet tool that will perform all the calculations required to conduct the stress test. The calculation tool produces reports with the outcome of the exercise.

The calculation tool is distributed as part of the stress test package, so that the IORP itself can conduct the exercise and judge any results before sending it to the respective NSA.

2. General advise on use of reporting template

This reporting template is designed to facilitate the IORP in conduction the exercise. It is therefore crucial the input data is properly entered in the apropriate input cells. This reporting template is therefore locked to allow user entry only in the designated input fields.

Furthermore, basic data validation rules are implemented to ensure entry of proper values. For example, asset weights should be between 0% and 100%. Entry of values that fail this data validation will yield an error message, asking to correct the input.

Finally, some basic logical validation checks are implemented that will warn the user for incorrect user input. For example asset weights are checked to add up to 100%.

It is important to adhere to the conventions and provide apprpriate user entry to ensure a proper execution of the exercise. Therefore do not unlock or try to alter the design of the reporting template.

The style and background colour of a cell indicates its use:

User input
Output from formula or fixed value
Output from macro

3. Workflow for the IORP

To succesfully complete the stress test, it is important that the IORP completes all the steps in providing input data.

Steps:

0. Read stress test specification document "IORP Stress Test 2017"

1. Read these instructions

1. Instructions | 2. Participating IORP | 3.1. Product specifications | 3.2. Asset

Worksheets

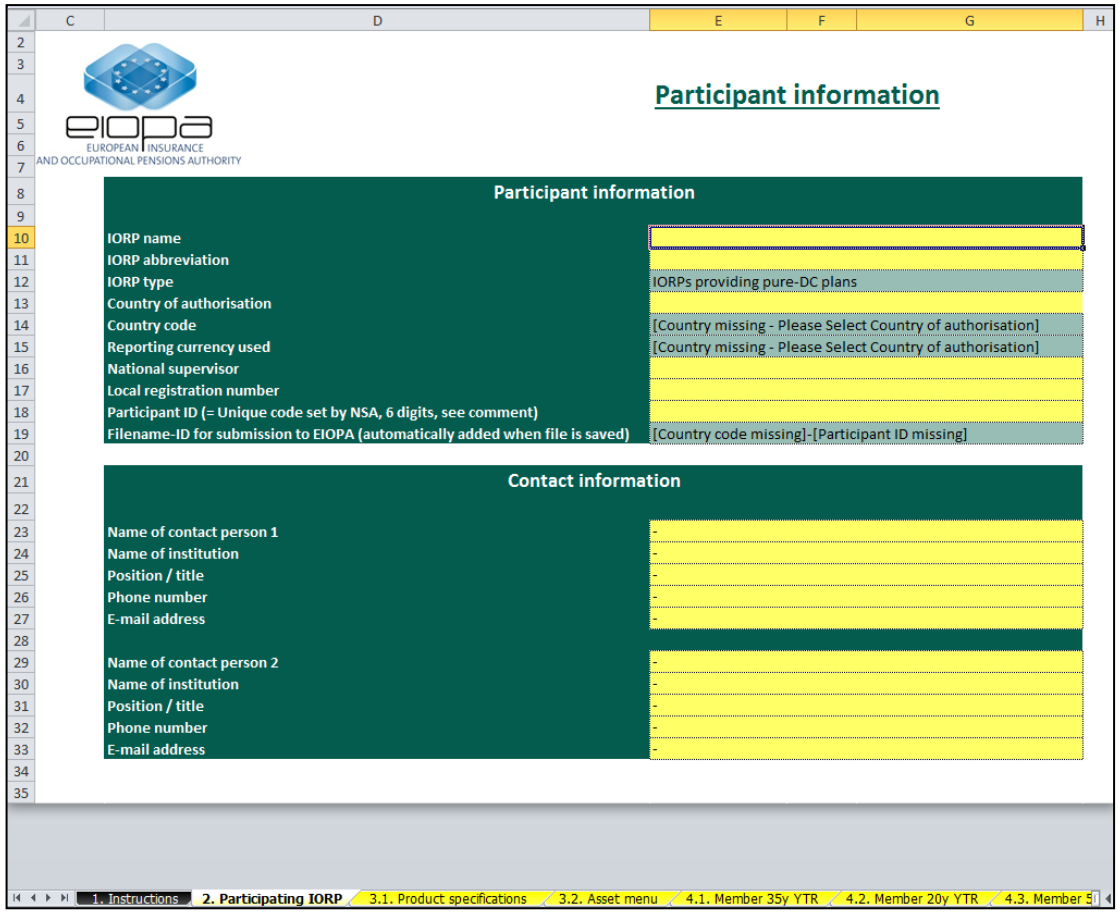
2. Participating IORP

Required inputs:

- Country of authorisation
- Participant ID
  (Unique 6-digit code set and provided by respective NSA)

Note:

Please fill in as much information as possible.



Worksheet

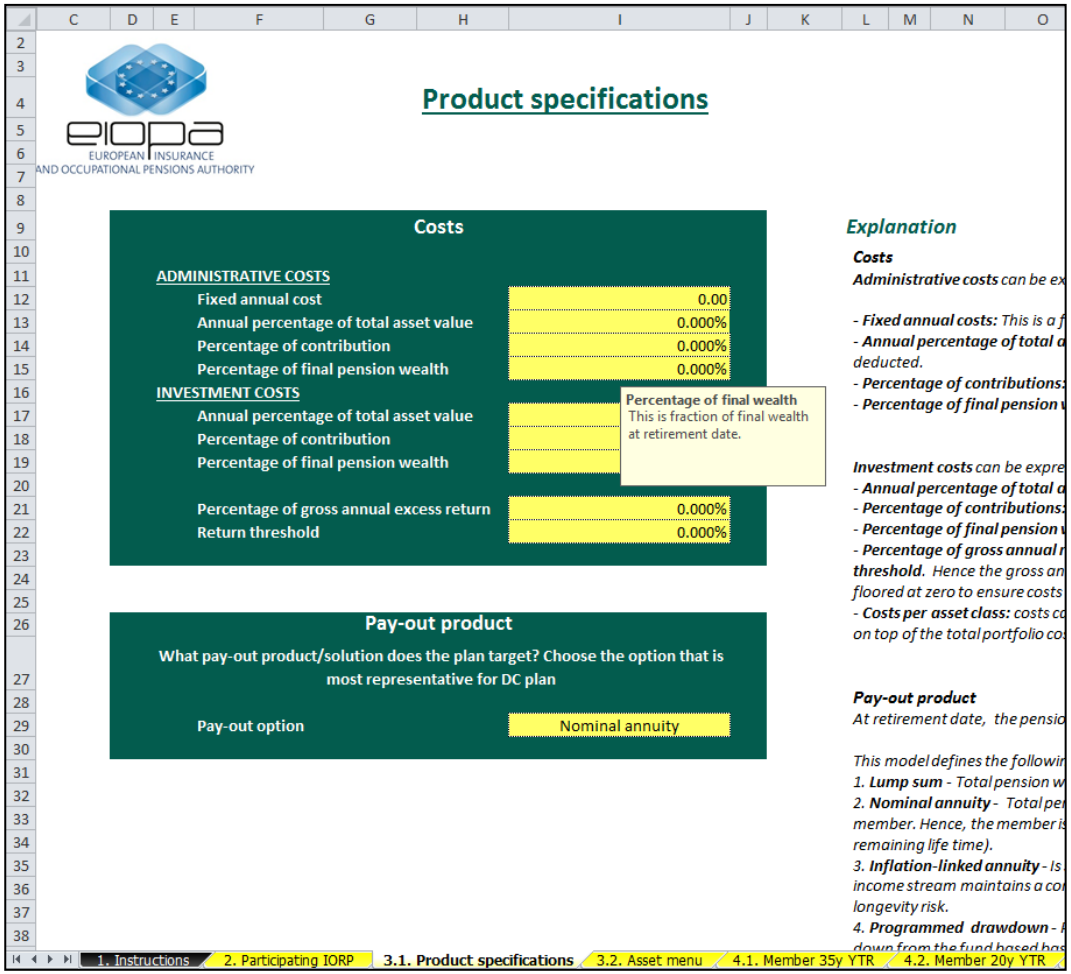
3.1. Product specifications

Specify applicable product specific administrative & investment cost

Note: each cell has its own info pop-up with additional explanation on the right side of the worksheet.

Specify applicable pay-out option at retirement:

- Lump sum
- Nominal annuity
- Inflation linked annuity
- Programmed draw down

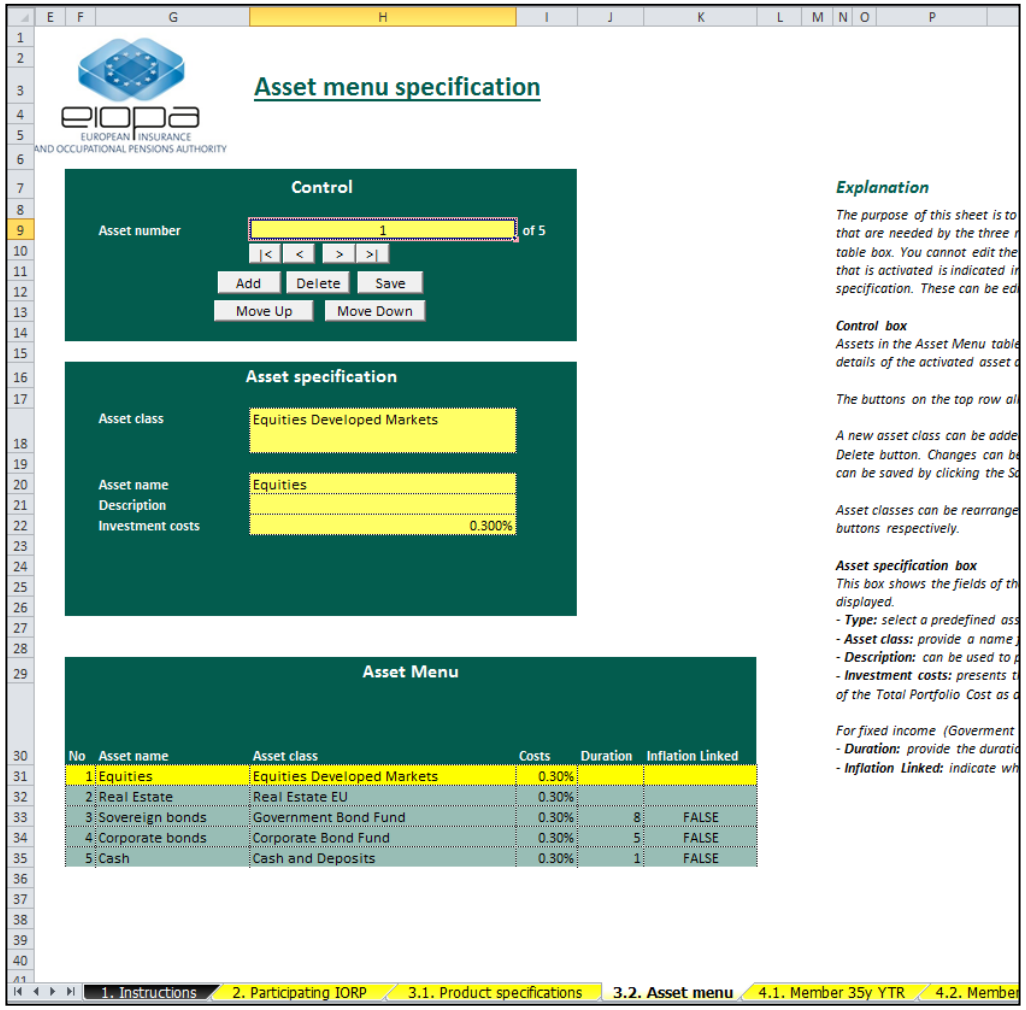


3. DC Stress Test Process & Demo

Worksheet

3.2. Asset menu

- Choose from 20 different assets classes (drop-down-list) to construct the investment mix for the DC plan (up to a maximum of 20 assets might be chosen)
- Use the Control panel to navigate through the Asset Menu at the bottom of the worksheet.
- Use Add + Save to define a new asset class
- Use Delete to delete the selected asset from the asset menu



Worksheet
4.3. Member 5yr TR – PART 1

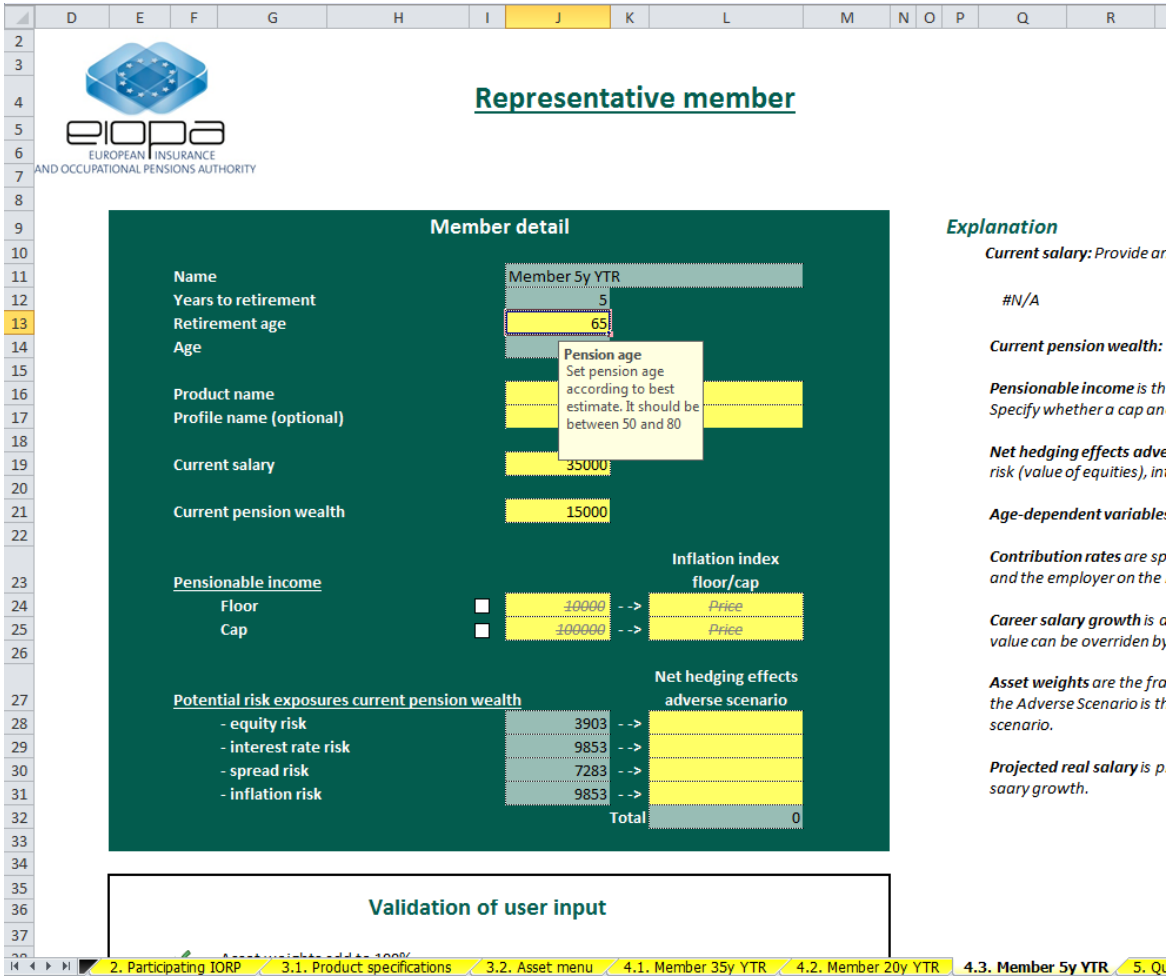
Specify:

- Retirement age
- Product name
- Profile name (optional)

- Current salary
- Current pension wealth, i.e. accumulated value of assets at start of the projection (age 60)

- Pensionable income

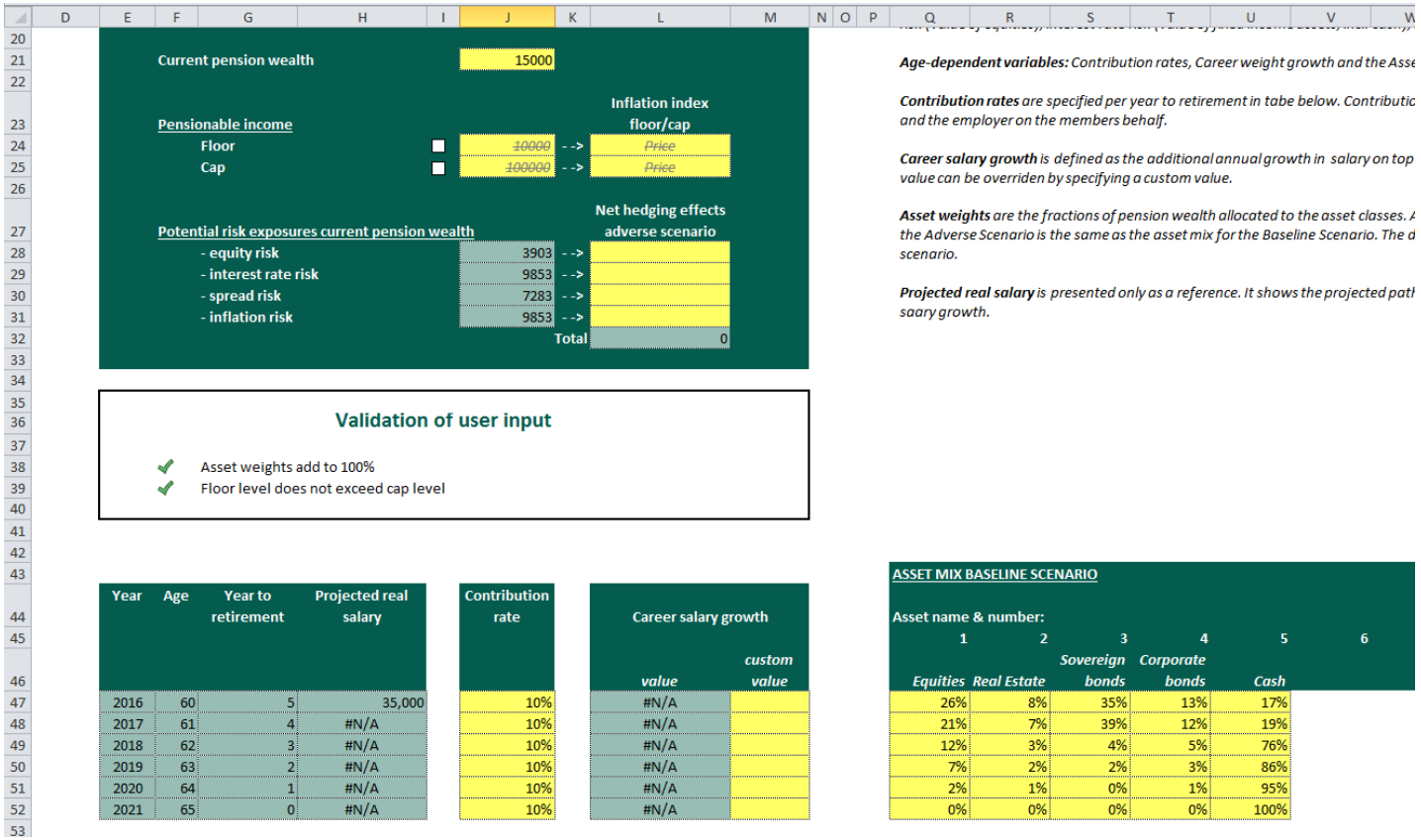
  = Min(Max(Floor,Salary),Cap)



Worksheet: 4.3. Member 5yr TR – PART 2

Specify over projection horizon:

- Career salary growth
- Contribution rate
- Baseline asset mix



Current pension wealth	15000

Pensionable income			Inflation index floor/cap
Floor	10000	-->	Price
Cap	100000	-->	Price

Potential risk exposures current pension wealth		Net hedging effects adverse scenario
- equity risk	3903 -->	
- interest rate risk	9853 -->	
- spread risk	7283 -->	
- inflation risk	9853 -->	
Total		0

Validation of user input

- ✔ Asset weights add to 100%
- ✔ Floor level does not exceed cap level

Age-dependent variables: *Contribution rates, Career weight growth and the Asse*

Contribution rates *are specified per year to retirement in tabe below. Contributic and the employer on the members behalf.*

Career salary growth *is defined as the additional annual growth in salary on top value can be overriden by specifying a custom value.*

Asset weights *are the fractions of pension wealth allocated to the asset classes. A the Adverse Scenario is the same as the asset mix for the Baseline Scenario. The d scenario.*

Projected real salary *is presented only as a reference. It shows the projected patl saary growth.*

Year	Age	Year to retirement	Projected real salary	Contribution rate	Career salary growth value	Career salary growth custom value
2016	60	5	35,000	10%	#N/A	
2017	61	4	#N/A	10%	#N/A	
2018	62	3	#N/A	10%	#N/A	
2019	63	2	#N/A	10%	#N/A	
2020	64	1	#N/A	10%	#N/A	
2021	65	0	#N/A	10%	#N/A	

ASSET MIX BASELINE SCENARIO

Asset name & number:

1	2	3	4	5	6
Equities	*Real Estate*	*Sovereign bonds*	*Corporate bonds*	*Cash*	
26%	8%	35%	13%	17%	
21%	7%	39%	12%	19%	
12%	3%	4%	5%	76%	
7%	2%	2%	3%	86%	
2%	1%	0%	1%	95%	
0%	0%	0%	0%	100%	

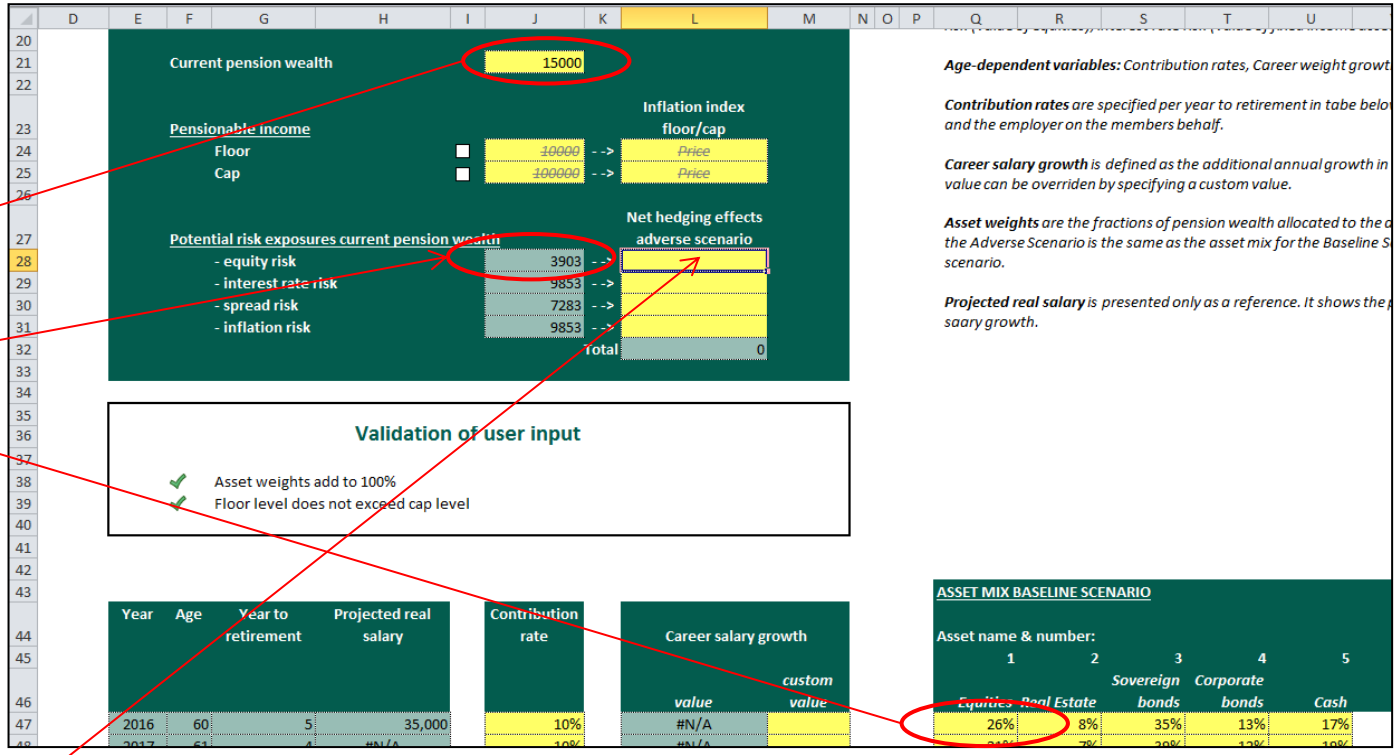
Worksheet: 4.3. Member 5yr TR – PART 3 – Net hedging effects adverse scenario

Potential exposure equity risk
=
Current pension wealth
×
Asset Mix Equities at start

15,000 × 26% = 3,903

Now assume there is a equity derivative position in place which covers 20% of downward equity risk and the equity shock in the adverse scenario is -30%.

The net hedging effect for equity risk is:
20% × 30% × 3,909 = 234



This amount will be added to the pension wealth at the end of projection year 1. Any hedging effect and calculation/estimate thereof should be explained (Section 5 Questionnaire), i.e. what is the nature of the derivative position and how does its value changes as a result of the relevant shock in the adverse scenario.

Worksheet: 4.3. Member 5yr TR – PART 4 – Direct second round effects on assets

When scrolling to the right one will find the possibility to enter a different asset mix for the adverse scenario.

ASSET MIX BASELINE SCENARIO

Asset name & number:

1	2	3	4	5	6	7	8
Equities	*Real Estate*	*Sovereign bonds*	*Corporate bonds*	*Cash*			
26%	8%	35%	13%	17%			
21%	7%	39%	12%	19%			
12%	3%	4%	5%	76%			
7%	2%	2%	3%	86%			
2%	1%	0%	1%	95%			
0%	0%	0%	0%	100%			

ASSET MIX ADVERSE SCENARIO

Asset name & number:

1	2	3	4	5	6	7	8
Equities	*Real Estate*	*Sovereign bonds*	*Corporate bonds*	*Cash*			
26%	8%	35%	13%	17%			
21%	7%	39%	12%	19%			
12%	3%	4%	5%	76%			
7%	2%	2%	3%	86%			
2%	1%	0%	1%	95%			
0%	0%	0%	0%	100%			

By definition the asset mix before shock are equal.

Only after shock a different asset mix may be applicable and be defined in here.

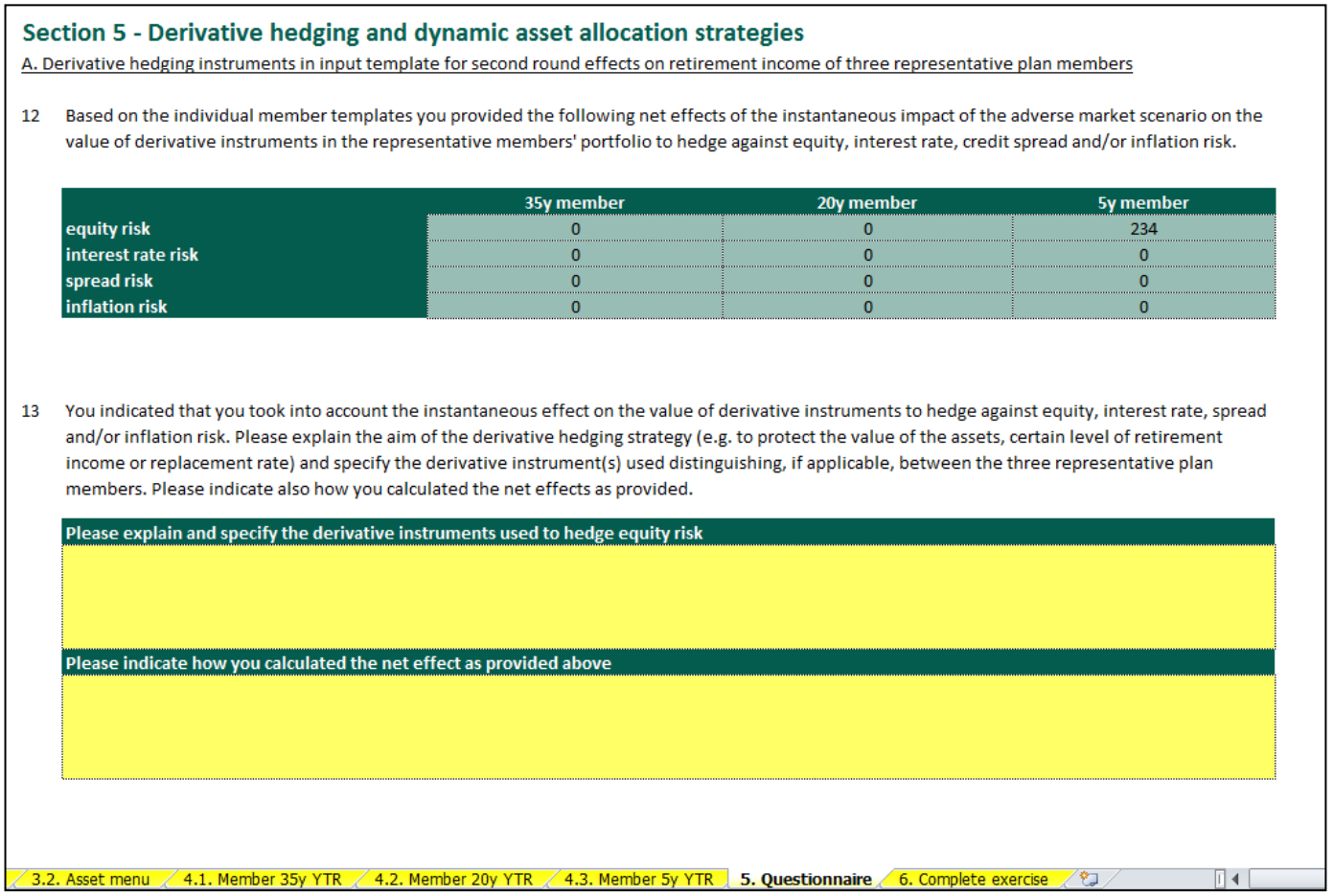
Any additional clarification on this should be entered into Section 6 of the Questionnaire.

Worksheet: 5. – Questionnaire – Section 5 A – Derivative hedging

Lets assume the net equity hedge effect as shown in slide 22 was entered there.

A summary of all net hedge effects over all members is shown in Section 5 sub 12.

Based on the value of the entries the IORP has to enter additional information under sub13 about the derivative positions in place and the calculation/estimate of the net effects shown under sub 12.



Section 5 - Derivative hedging and dynamic asset allocation strategies

A. Derivative hedging instruments in input template for second round effects on retirement income of three representative plan members

12 Based on the individual member templates you provided the following net effects of the instantaneous impact of the adverse market scenario on the value of derivative instruments in the representative members' portfolio to hedge against equity, interest rate, credit spread and/or inflation risk.

	35y member	20y member	5y member
equity risk	0	0	234
interest rate risk	0	0	0
spread risk	0	0	0
inflation risk	0	0	0

13 You indicated that you took into account the instantaneous effect on the value of derivative instruments to hedge against equity, interest rate, spread and/or inflation risk. Please explain the aim of the derivative hedging strategy (e.g. to protect the value of the assets, certain level of retirement income or replacement rate) and specify the derivative instrument(s) used distinguishing, if applicable, between the three representative plan members. Please indicate also how you calculated the net effects as provided.

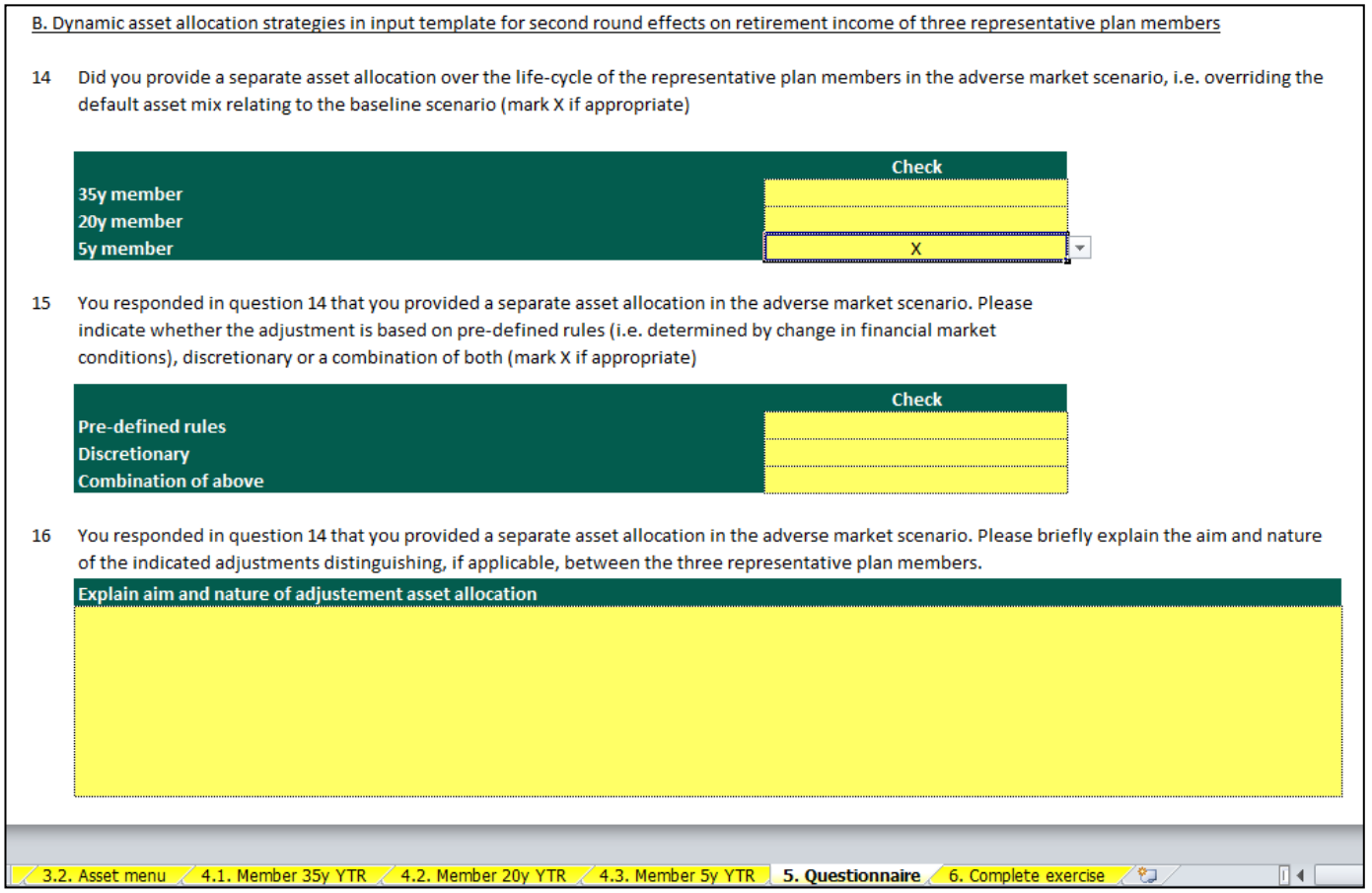
Please explain and specify the derivative instruments used to hedge equity risk
Please indicate how you calculated the net effect as provided above

3.2. Asset menu | 4.1. Member 35y YTR | 4.2. Member 20y YTR | 4.3. Member 5y YTR | **5. Questionnaire** | 6. Complete exercise

Worksheet: 5. – Questionnaire – Section 5 B – Dynamic asset allocation strategies

If use is made of different asset allocations in the adverse scenario this should be indicated under sub 14.

Based on the value of the entered checks each IORP has to enter additional information under sub 15 on how the asset mix adjustments are defined plus under sub 16 on the objective of the changes.



B. Dynamic asset allocation strategies in input template for second round effects on retirement income of three representative plan members

14 Did you provide a separate asset allocation over the life-cycle of the representative plan members in the adverse market scenario, i.e. overriding the default asset mix relating to the baseline scenario (mark X if appropriate)

	Check
35y member	
20y member	
5y member	X

15 You responded in question 14 that you provided a separate asset allocation in the adverse market scenario. Please indicate whether the adjustment is based on pre-defined rules (i.e. determined by change in financial market conditions), discretionary or a combination of both (mark X if appropriate)

	Check
Pre-defined rules	
Discretionary	
Combination of above	

16 You responded in question 14 that you provided a separate asset allocation in the adverse market scenario. Please briefly explain the aim and nature of the indicated adjustments distinguishing, if applicable, between the three representative plan members.

Explain aim and nature of adjustement asset allocation

3.2. Asset menu | 4.1. Member 35y YTR | 4.2. Member 20y YTR | 4.3. Member 5y YTR | 5. Questionnaire | 6. Complete exercise

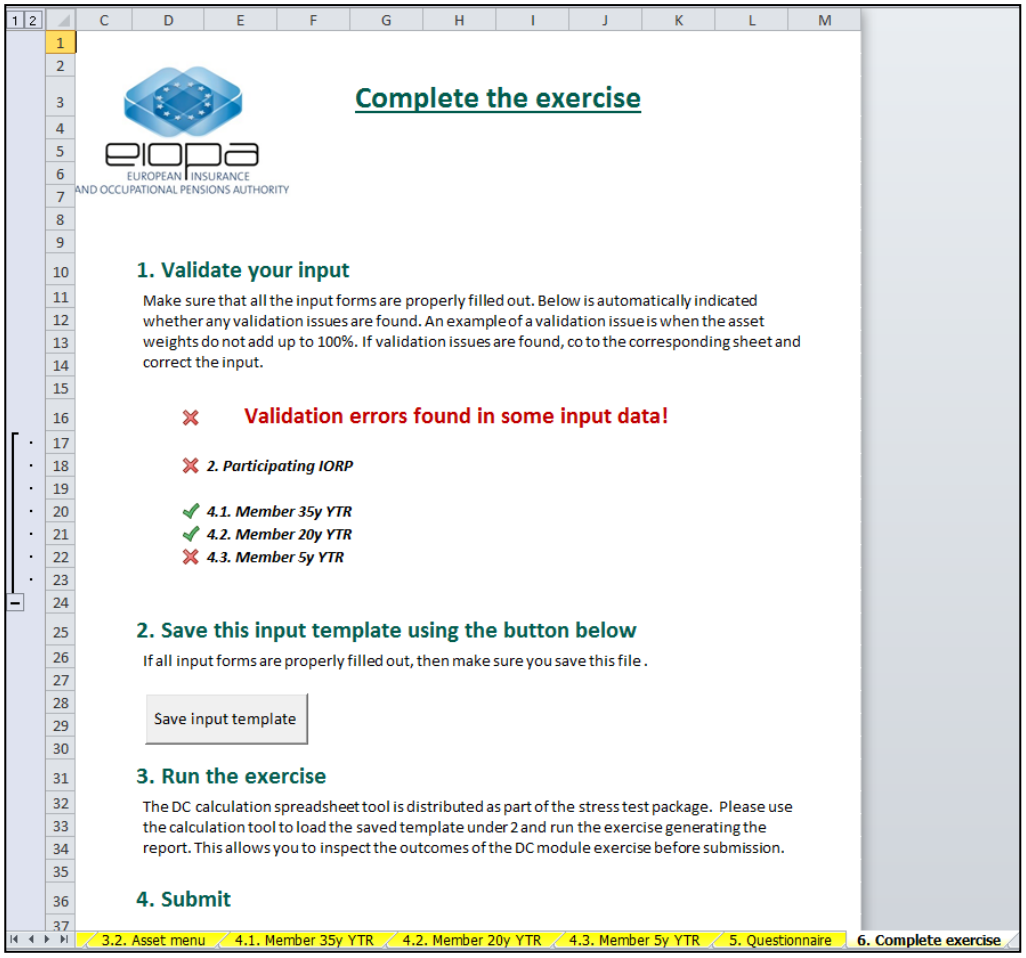
Worksheet: 6. Complete exercise

After entering all relevant inputs of the DC plan in place as well as all answers to the questionnaire the input template should be saved by pressing the “Save input template”-button (see also slide 13 of this presentation)

Please make sure all validation marks are green!

In the example to the right:

- Either the Country of authorisation and/or the Unique 6-digit code have not been entered correctly on sheet 2. Participating IORP.
- Either the Baseline asset mix or the Adverse asset mix does not sum to 100% for at least one future projection year. Check the respective member worksheet to correct for this.

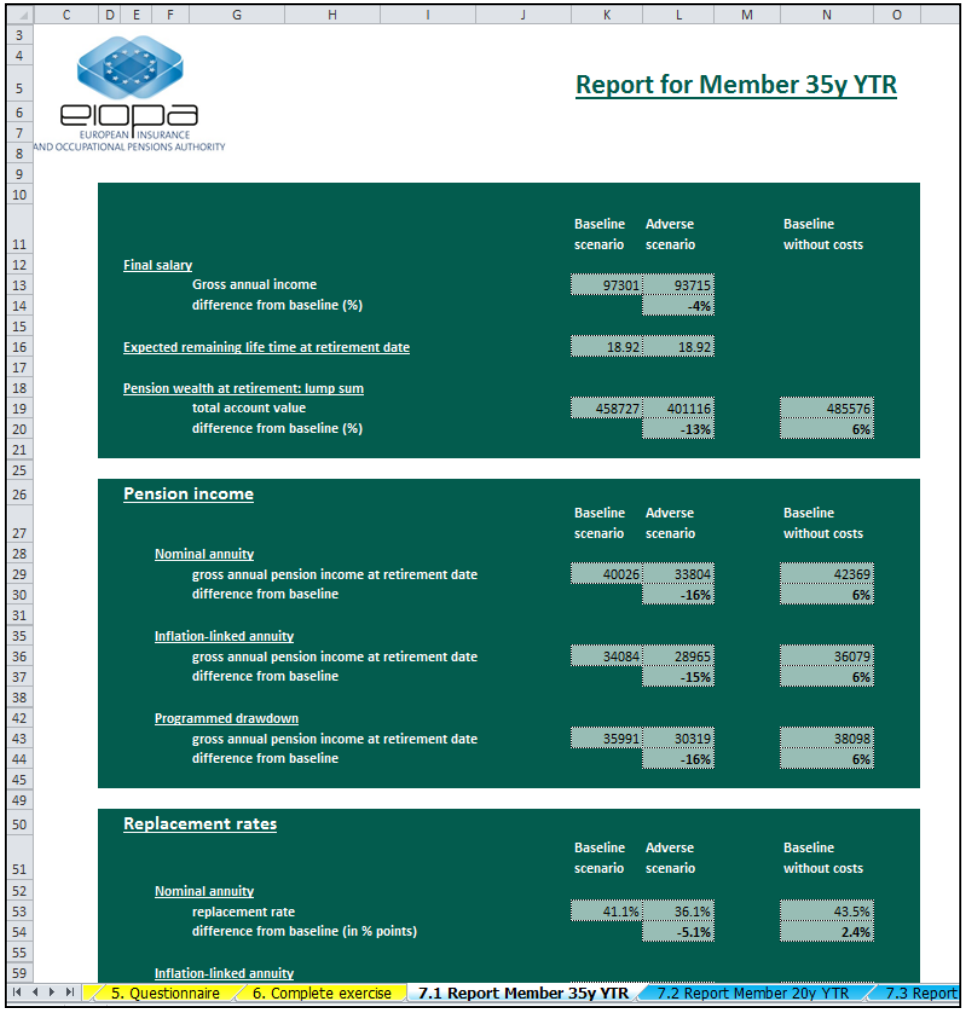


Running the Calculation Tool

After finishing and saving the input template it should be loaded into the DC Calculation Tool (see slide 11 of this presentation).

A report template will be generated which is equal to the input template + three additional worksheets with the results for each member.

From these results any second round effects on retirement income could be inferred.



EUROPEAN INSURANCE
AND OCCUPATIONAL PENSIONS AUTHORITY

Q&A

https://eiopa.europa.eu/Pages/Financial-stability-and-crisis-prevention/Occupational-Pensions-Stress-Test-2017