

Actuarial Analysis of Key Figures from EIOPA

Consultation Paper on Methodology on Value for Money Benchmarks

- Presentation of Master Thesis
- Theresia Deiß, Alexander Kling



Value for Money

Agenda

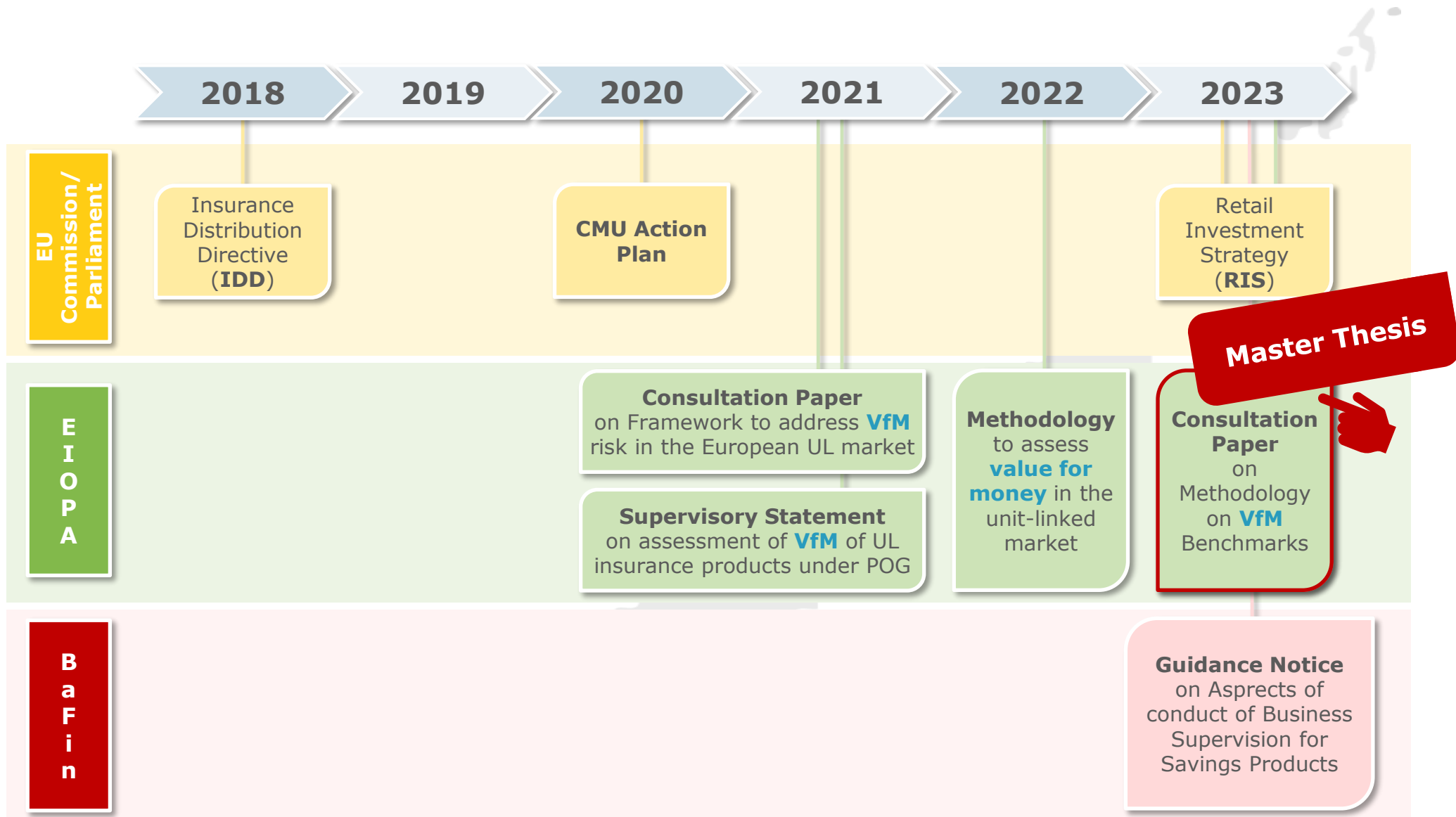
Previous Publications and Context

(EIOPA's) Understanding of Value for Money

Consultation Paper on Methodology on Value for Money Benchmarks
(EIOPA)

Value-for-Money-Indicators

Publications on the Topic of *Value for Money*



Value for Money

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Value for Money

EIOPA's Definition

“EIOPA considers that products offer **value for money** where the **costs and charges are proportionate to the benefits** (i.e., investment performance, guarantees, coverage and services) to the identified target market and reasonable taking into account the expenses born by providers and in comparison to other comparable retail solutions on the market.

This also means that the **product delivers added value for the consumer** given the costs and expected returns and assuming a reasonable holding period. To this end, products are expected to be reviewed and tested.

For products with different components, such as unit-linked policies, value for money is expected from the product in its entirety – as well as from each individual component separately – taking into account the **target market's needs, objectives and characteristics** and all the costs and benefits, as well as possible costs and benefits of offering the different components singularly or as ‘a package’.

*Consultation Paper on
Framework to address value for money risk in the European unit-linked market
(EIOPA 2021)*

adequate costs

added value for customer

in line with target market



Vague Statement: “Product should add value”

How can we measure this Europe-wide consistently?

Value for Money

Agenda

Previous Publications and Context

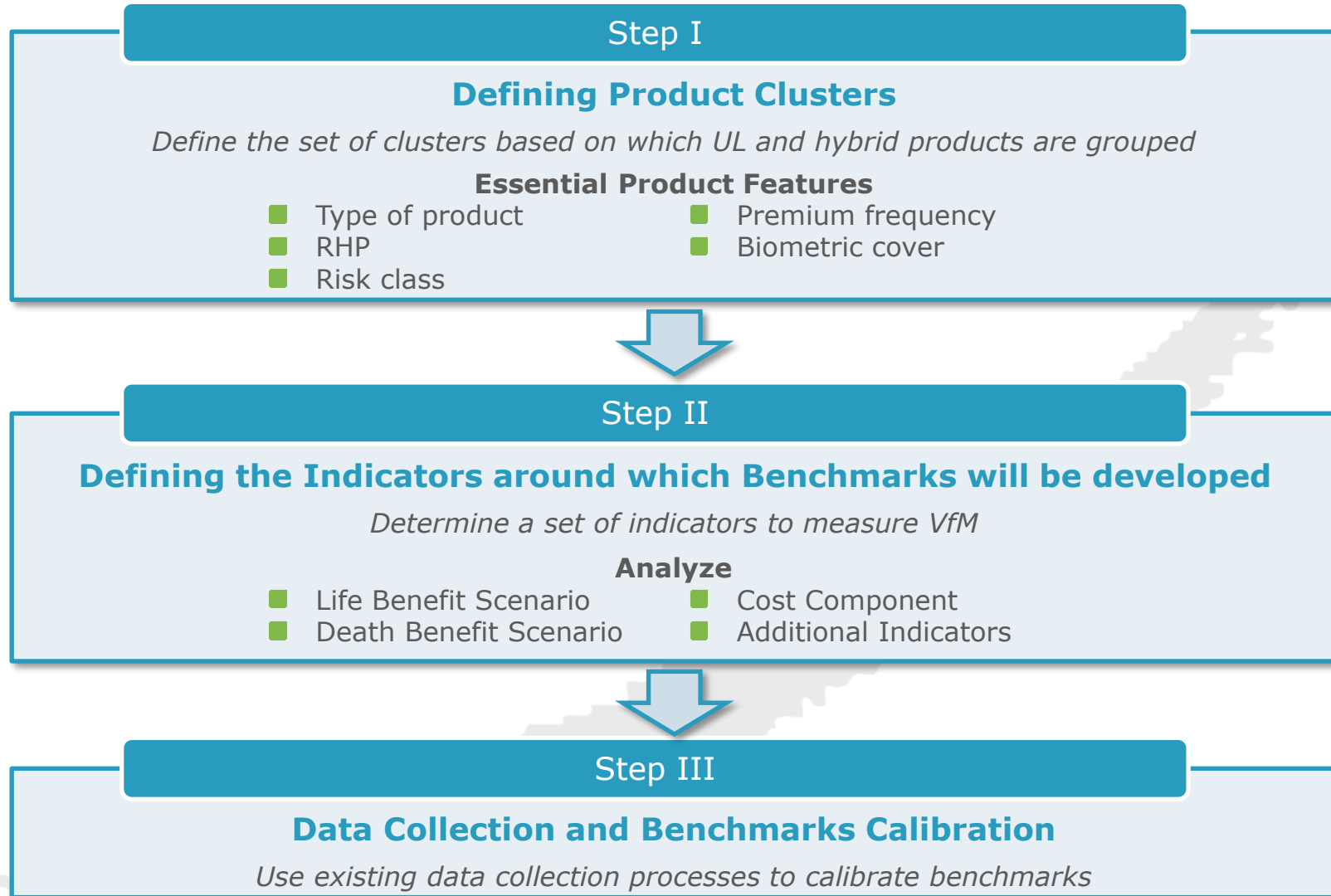
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Value-for-Money-Indicators

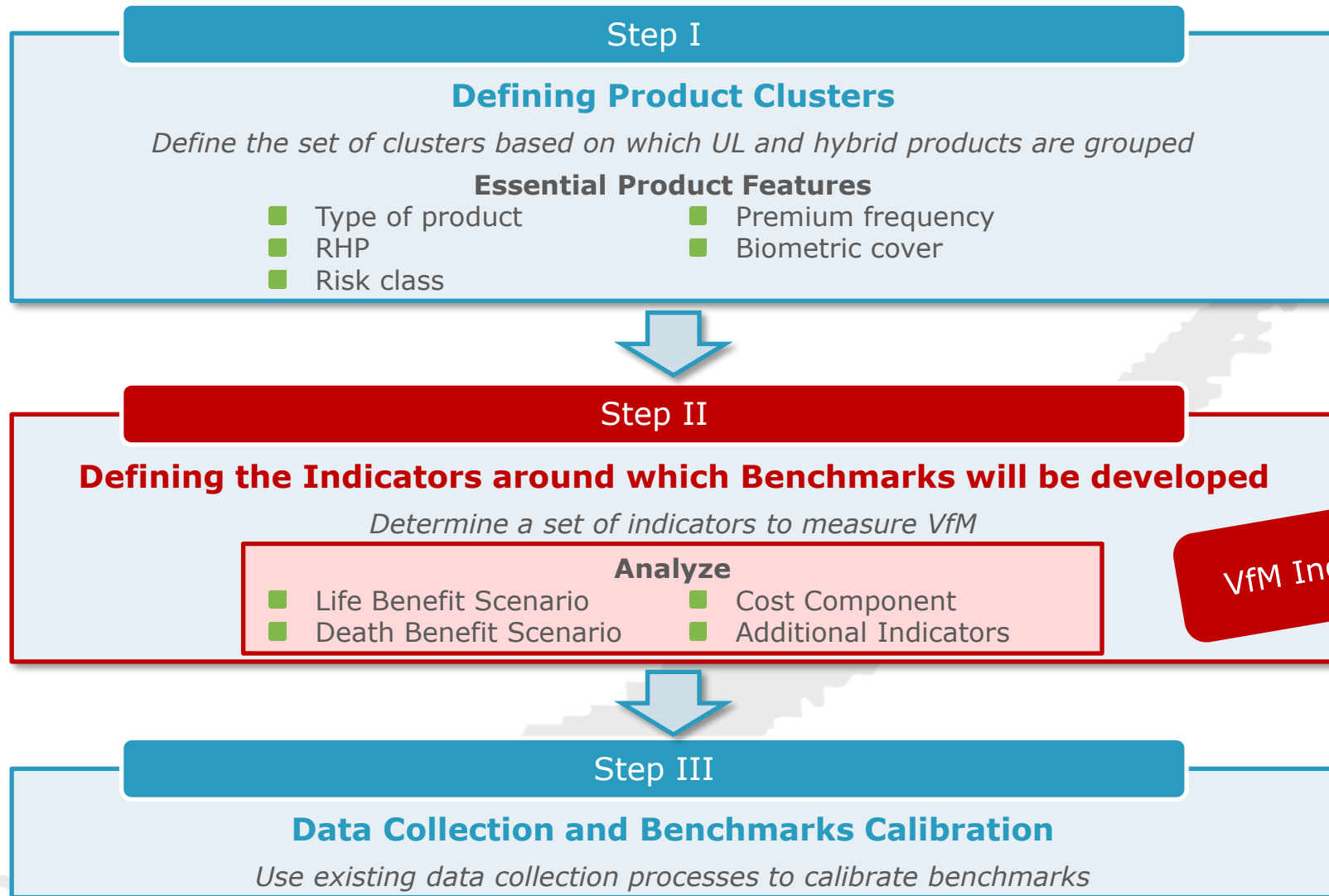
Consultation Paper on Methodology on Value for Money Benchmarks

EIOPA (2023)



Consultation Paper on Methodology on Value for Money Benchmarks

EIOPA (2023)



Value for Money

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(EIOPA's) Understanding of Value for Money

**Consultation Paper on Methodology on Value for Money Benchmarks
(EIOPA)**

Value-for-Money-Indicators

Value-for-Money-Indikatoren

Consultation Paper on Methodology on Value for Money Benchmarks (EIOPA)

Life Benefit / Surrender Scenario

- Surrender Value by Premiums Paid
- IRR

- 5Y
- at ■ Half RHP
- RHP

Death Benefit / Biometric Scenario

- Biometric Risk Benefit by Premiums Paid

- 3Y
- at ■ 5Y
- 10Y

Cost Component

- Total Costs Paid by Premiums Paid
- RIY

- 5Y
- at ■ Half RHP
- RHP

Additional Indicators

- Entry Costs by Total Costs Paid
- Minimum average yearly Return required to Break-Even
- Year of Break-Even of the Surrender Value
- Total Costs by Surrender Value

Do these indicators seem reasonable?

Value-for-Money-Indikatoren

Consultation Paper on Methodology on Value for Money Benchmarks (EIOPA)

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Value-for-Money-Indikatoren

Consultation Paper on Methodology on Value for Money Benchmarks (EIOPA)

Idea of Analysis:

■ Step 1: Insurance Market

- Unit-Linked Life Insurance

■ Step 2: Value-for-Money Indicators

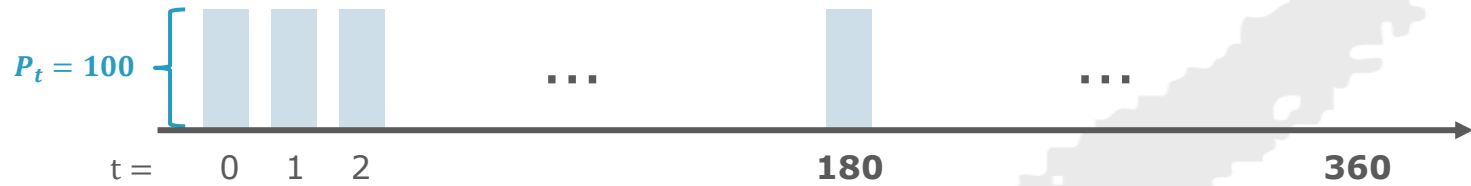
- Calculation of indicators
- Analyze
 - Deterministic Analysis
 - Constant fund development
 - Indicators over time, sensitivities
 - Stochastic Analysis
 - Simulated fund development
 - Probability distribution

Unit-Linked Life Insurance

Value-for-Money-Indicators

Policyholders' view

General Information:	
Maturity	30 years (=RHP)
Regular Premium	$P_t = 100$

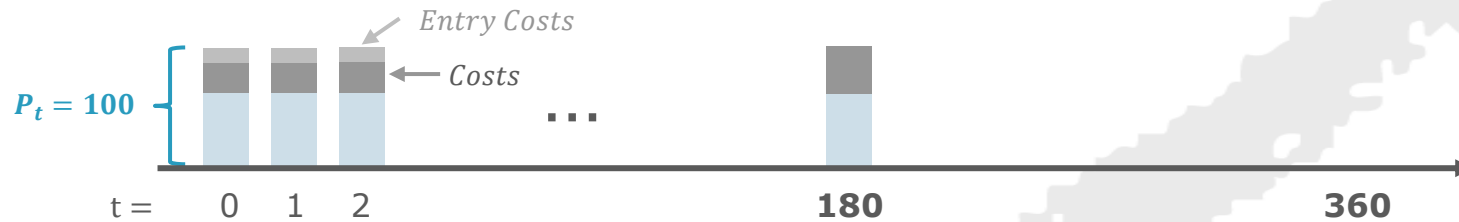


Unit-Linked Life Insurance

Value-for-Money-Indicators

Company's view

General Information:	
Maturity	30 years (=RHP)
Regular Premium	$P_t = 100$
Costs: alpha, beta, kappa, gamma, fund costs	

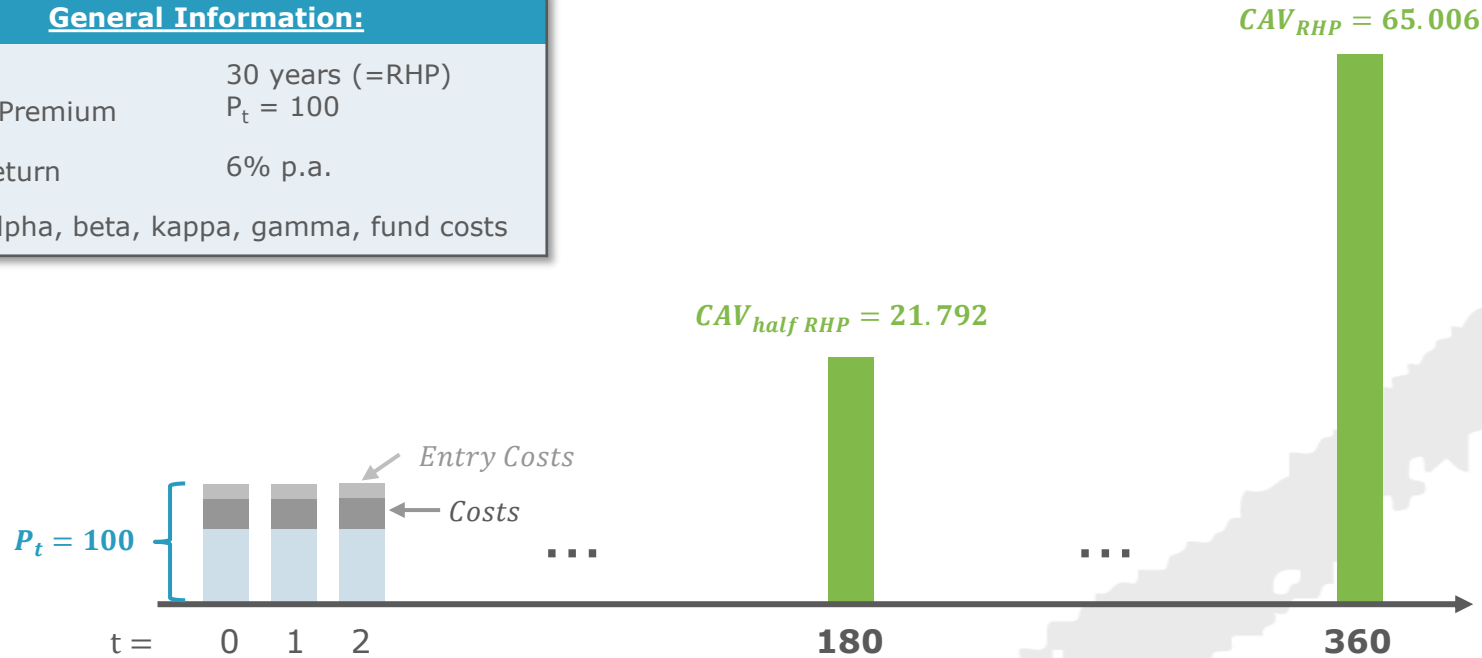


Unit-Linked Life Insurance

Value-for-Money-Indicators

Company's view

General Information:	
Maturity	30 years (=RHP)
Regular Premium	$P_t = 100$
Gross Return	6% p.a.
Costs: alpha, beta, kappa, gamma, fund costs	



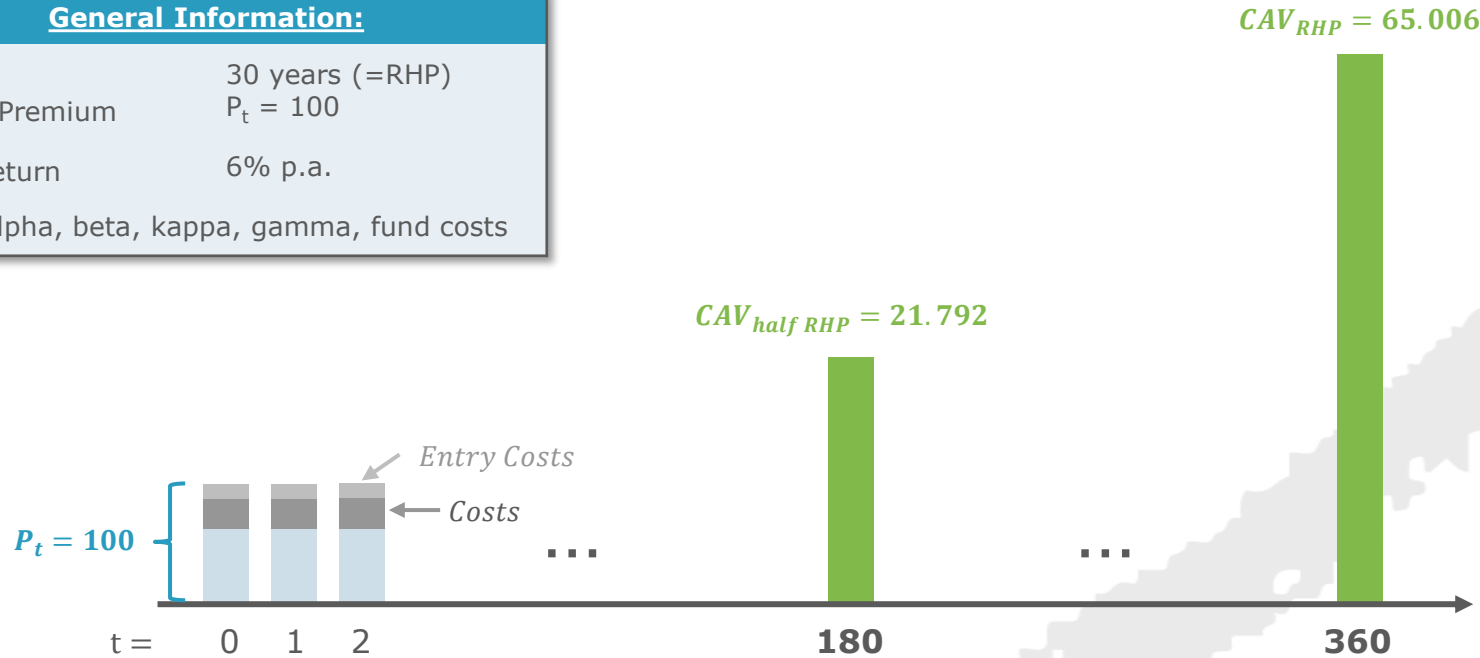
Unit-Linked Life Insurance

Value-for-Money-Indicators

Company's view

General Information:	
Maturity	30 years (=RHP)
Regular Premium	$P_t = 100$
Gross Return	6% p.a.
Costs: alpha, beta, kappa, gamma, fund costs	

Base Case:	
Maturity	30Y
Premium	100€
Return	3%
Alpha	2,5%
Beta	5%
Kappa	3€
Gamma	0,5%
Fund Costs	1%



		Half RHP	RHP
Premiums Paid	$PP_t =$	18.000	36.000
Total Costs	$TC_t =$	4.473	15.183
Entry Costs	$EC_t =$	900	900
Current Account Value	$CAV_t =$	21.792	65.006
Surrender Value	$SV_t =$	21.292	65.006
Biometric Risk Benefit	$BRB_t =$	21.792	65.006

-500

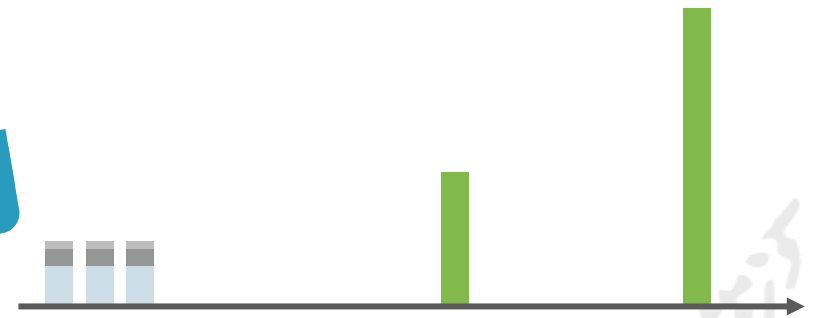
Surrender Value by Premiums Paid

Value-for-Money-Indicators

EIOPA

Time Points and Expected Value

- 5Y
- Half RHP
- RHP
- <1 at inception
- ≥1 at RHP in the moderate case, assuming a long maturity already at half RHP



		Half RHP	RHP
Premiums Paid	$PP_t =$	18.000	36.000
Total Costs	$TC_t =$	4.473	15.183
Entry Costs	$EC_t =$	900	900
Current Account Value	$CAV_t =$	21.792	65.006
Surrender Value	$SV_t =$	21.292	65.006
Biometric Risk Benefit	$BRB_t =$	21.792	65.006

(Naive) Interpretation

- Expected benefit in relation to paid premium

Per 1€ of premium the consumer receives x€.

Calculation (our interpretation!)

- Zum Zeitpunkt T :

$$\frac{SV_T}{\sum_{t=0}^{T-1} P_t}$$

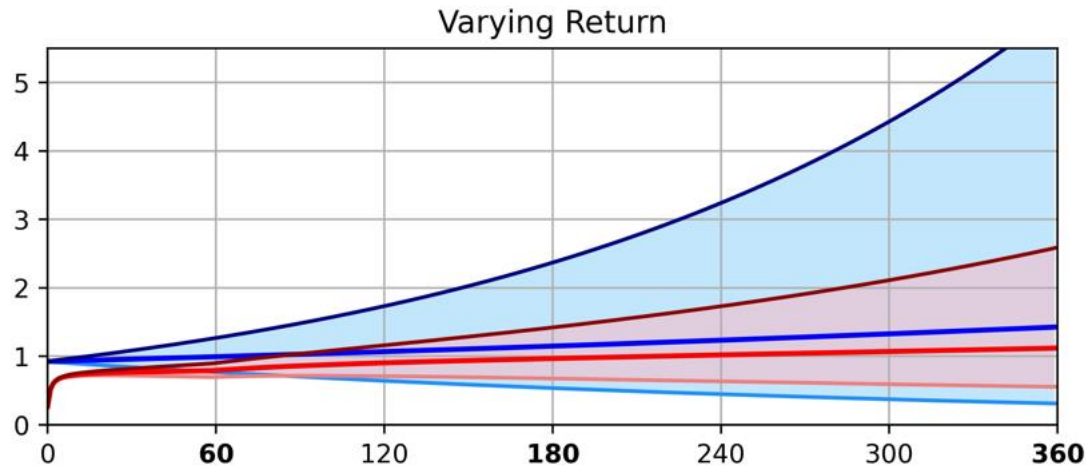
	Half RHP	RHP
$SV/PP = \frac{SV}{PP}$	$\frac{21.292}{18.000} \approx 1,18$	$\frac{65.006}{36.000} \approx 1,81$

Surrender Value by Premiums Paid

Value-for-Money-Indicators

Single premium
Regular premium

Surrender Value by Premiums Paid over Time



Return (deterministic):

Analyzed Interval	[-2% , 8%]
Base Case	3%

Calculation with

- lowest value (single premium)
- realistic value (single premium)
- highest value (single premium)
- lowest value (regular premium)
- realistic value (regular premium)
- highest value (regular premium)

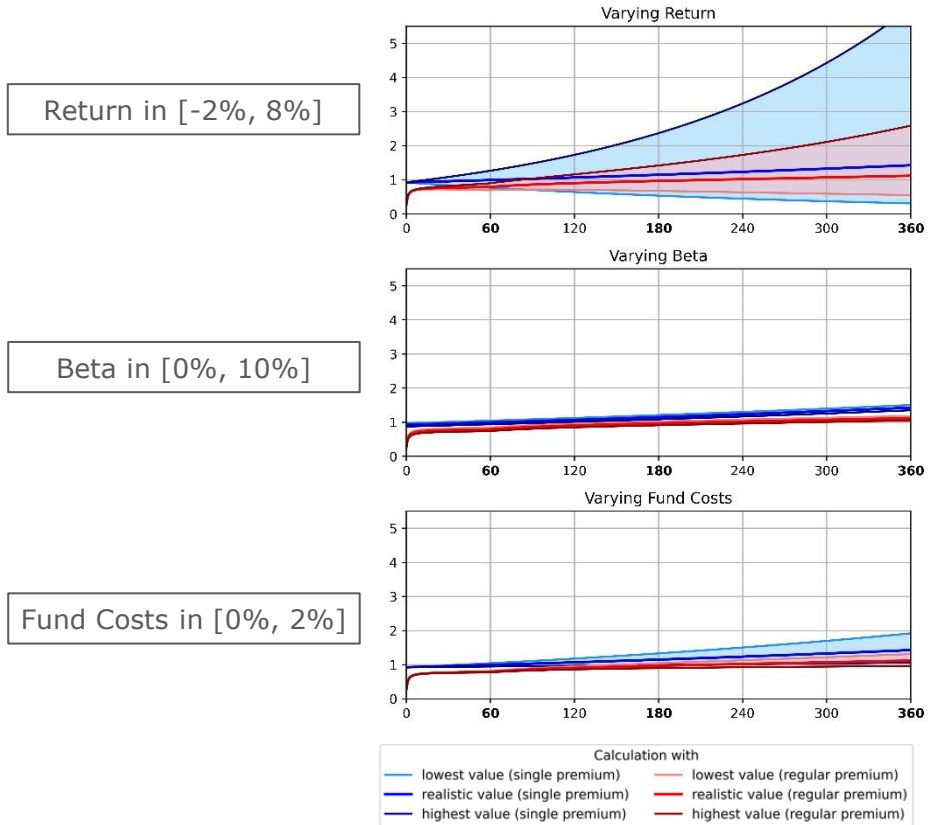
Surrender Value by Premiums Paid

Value-for-Money-Indicators

Single premium
Regular premium

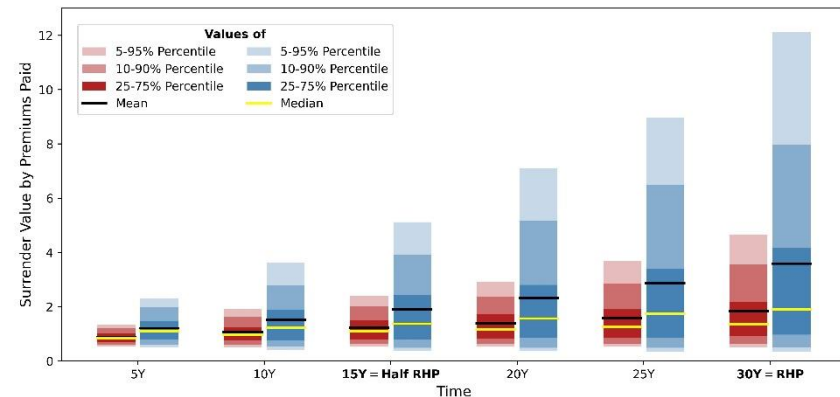
Realistic Scenario

Surrender Value by Premiums Paid over Time
Varying different Parameters



Realistic Scenario

Percentiles of Surrender Value by Premiums Paid at different Points in Time



Indicator measures Return, not Costs!

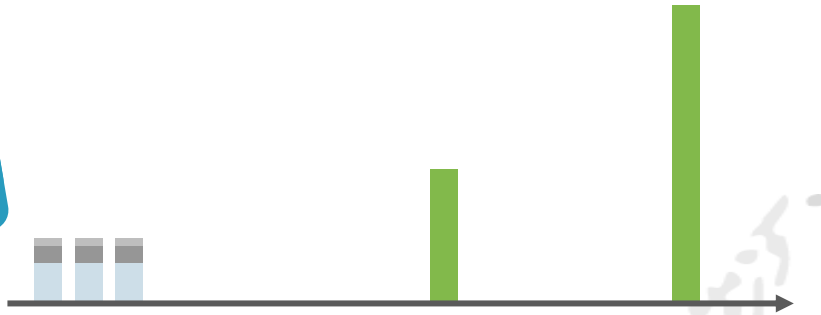
Total Costs Paid by Premiums Paid

Value-for-Money-Indicators

■ Time Points and Expected Value

- 5Y
- Half RHP
- RHP
- As low as possible

EIOPA



		Half RHP	RHP
Premiums Paid	$PP_t =$	18.000	36.000
Total Costs	$TC_t =$	4.473	15.183
Entry Costs	$EC_t =$	900	900
Current Account Value	$CAV_t =$	21.792	65.006
Surrender Value	$SV_t =$	21.292	65.006
Biometric Risk Benefit	$BRB_t =$	21.792	65.006

■ (Naive) Interpretation

- How expensive is the product?

Per 1€ of premium the customer pays x€ of costs

■ Calculation

$$TC/PP = \frac{TC}{PP} = \frac{4.473 + 500}{18.000} \approx 0,276 \quad \frac{15.183}{36.000} \approx 0,422$$

Total Costs Paid by Premiums Paid

Value-for-Money-Indicators

Calculation Example: Single Premium of 100.000€

Calculation Logic:

$$CAV_{EOM} = CAV_{BOM} * (1 + p - fc)^{\frac{1}{12}}$$

p - Return
fc - Fund Costs

1% Fund Costs, **6%** Return p.a.

1% Fund Costs, **3%** Return p.a.

1% Fund Costs, **-2%** Return p.a.

	Total Costs/ PP	CAV
10Y	0,124	162.889 €
20Y	0,324	265.330 €
30Y	0,650	432.194 €
40Y	1,182	703.999 €
50Y	2,048	1.146.740 €

	Total Costs/ PP	CAV
10Y	0,109	121.899 €
20Y	0,241	148.595 €
30Y	0,402	181.136 €
40Y	0,598	220.804 €
50Y	0,837	269.159 €

	Total Costs/ PP	CAV
10Y	0,089	73.742 €
20Y	0,154	54.379 €
30Y	0,202	40.101 €
40Y	0,237	29.571 €
50Y	0,263	21.807 €



- Naive Interpretation is misleading!
- Ceteris paribus:
Lower Return → lower volume-dependent Costs → better Result for Indicator

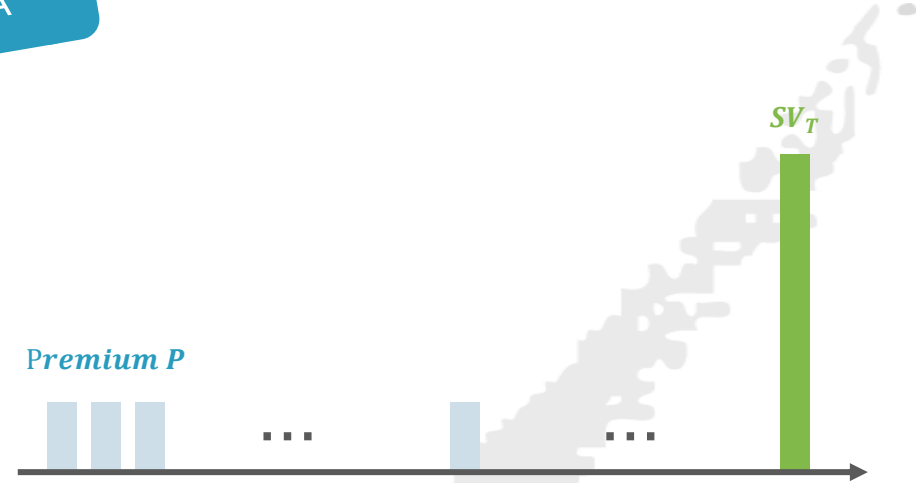
RIY (Reduction in Yield)

Value-for-Money-Indicators

EIOPA

■ Time Points and Expected Value

- 5Y ■ As low as possible
- Half RHP
- RHP



■ (Naive) Interpretation

- Constant reduction of return because of costs
- Difference of return before costs and return after costs
- All costs are translated to volume dependent costs p.a.

■ Calculation (Idea)

- Zum Zeitpunkt T :

p - Return

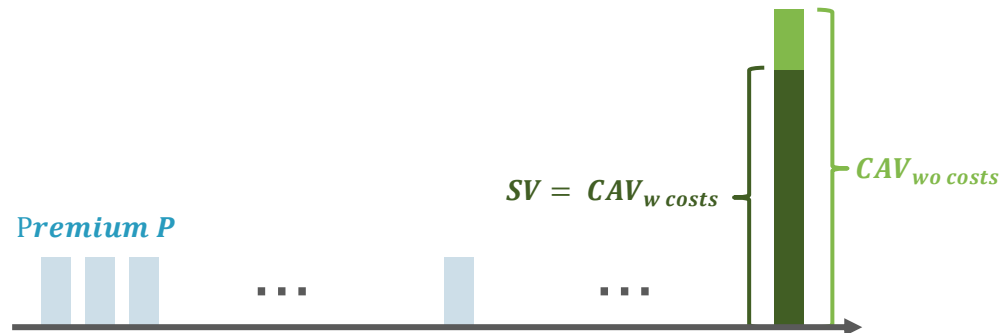
$$RIY = p - IRR$$

$$\sum_{t=0}^{12 \cdot T - 1} P_t * (1 + p - RIY)^{(12 \cdot T - t) / 12} = SV_T$$

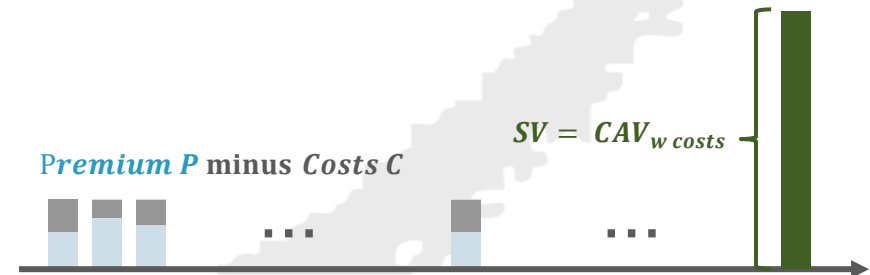
RIY (Reduction in Yield)

Calculation

Method: Modified Benefit



Method: Modified Premiums



$$RIY_{mod Ben} = IRR \begin{pmatrix} -P \\ -P \\ \dots \\ -P \\ CAV_{wo costs} \end{pmatrix} - IRR \begin{pmatrix} -P \\ -P \\ \dots \\ -P \\ CAV_w costs \end{pmatrix}$$

$$RIY_{mod Prem} = IRR \begin{pmatrix} -(P - C) \\ -(P - C) \\ \dots \\ -(P - C) \\ CAV_w costs \end{pmatrix} - IRR \begin{pmatrix} -P \\ -P \\ \dots \\ -P \\ CAV_w costs \end{pmatrix}$$

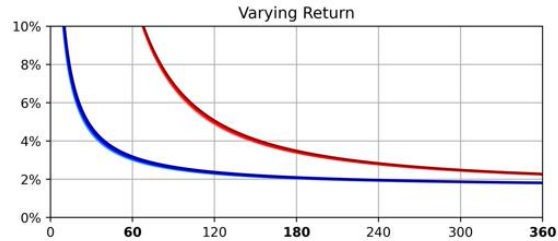
RIY (Reduction in Yield)

Deterministic Analysis

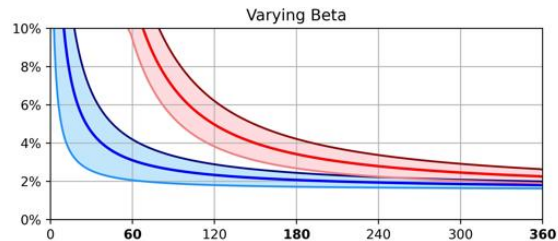
Single premium
Regular premium

RIY over Time

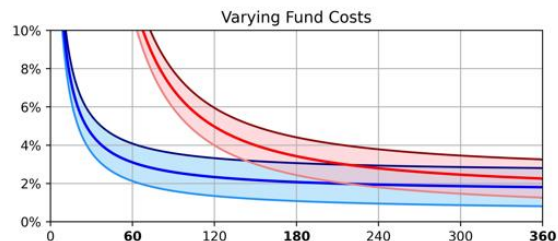
Return in [0%, 2%]



Beta in [0%, 10%]

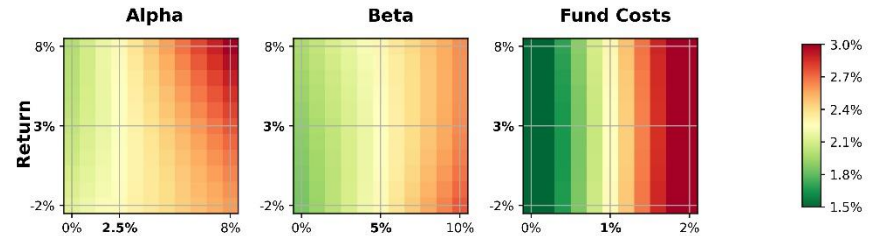


Fund Costs in [0%, 2%]



Calculation with
 — lowest value (single premium) — lowest value (regular premium)
 — realistic value (single premium) — realistic value (regular premium)
 — highest value (single premium) — highest value (regular premium)

Regular Premium, Realistic Scenario RIY (modified Benefit) at RHP Varying different Parameters



In the **deterministic case**, both methods lead to the **same result!**

RIY is mainly independent of Return

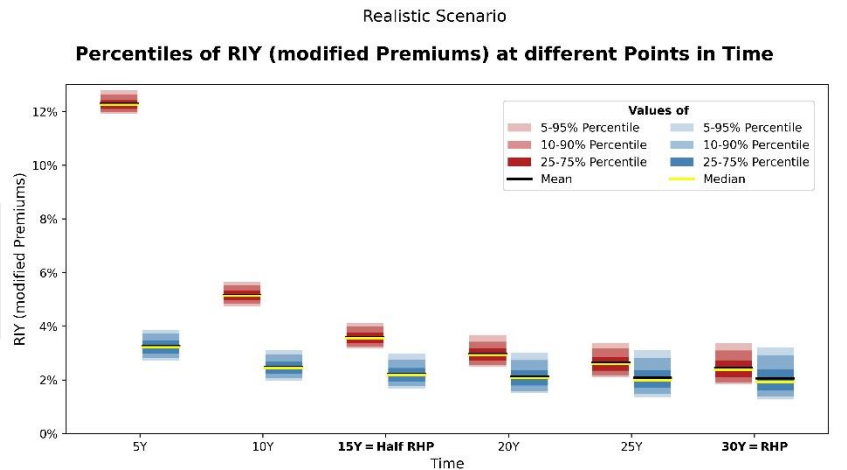
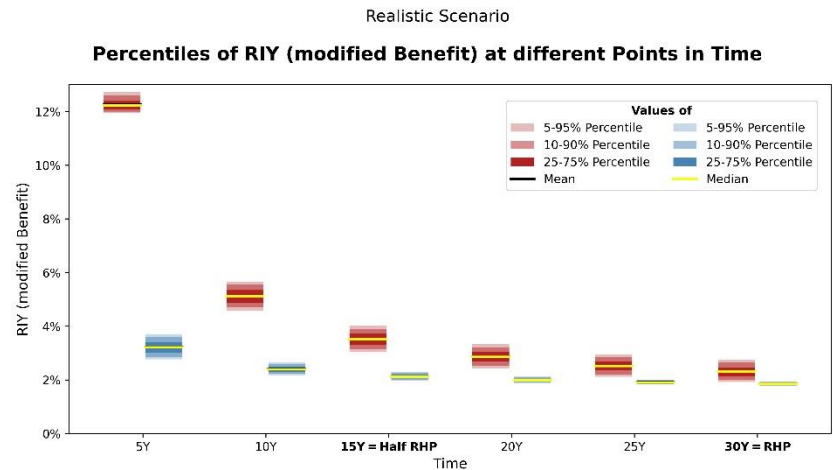
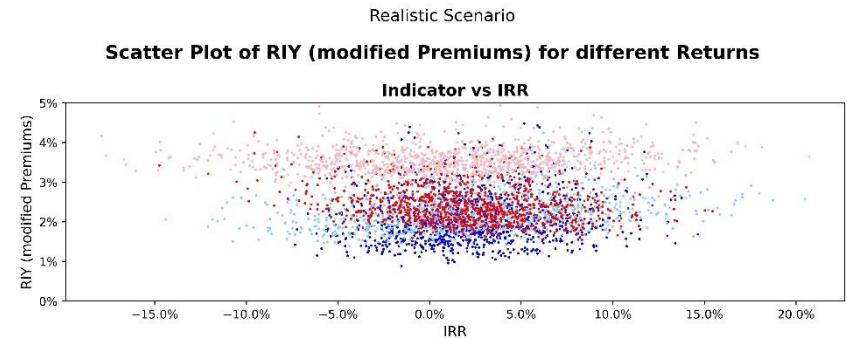
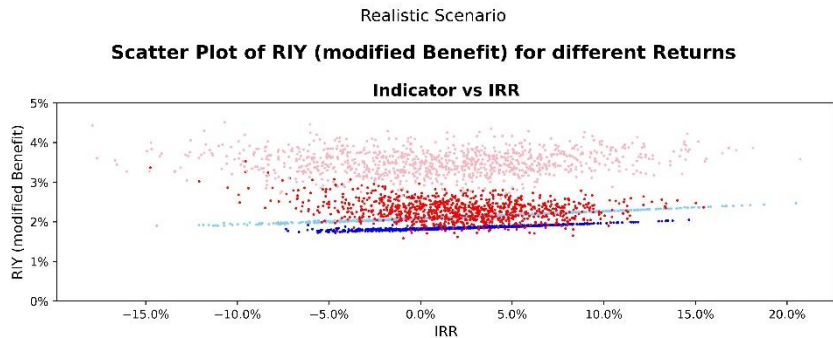
RIY (Reduction in Yield)

Stochastic Analysis

- Values at**
- RHP (single premium)
 - RHP (regular premium)
 - Half RHP (single premium)
 - Half RHP (regular premium)

Method: Modified Benefit

Method: Modified Premiums

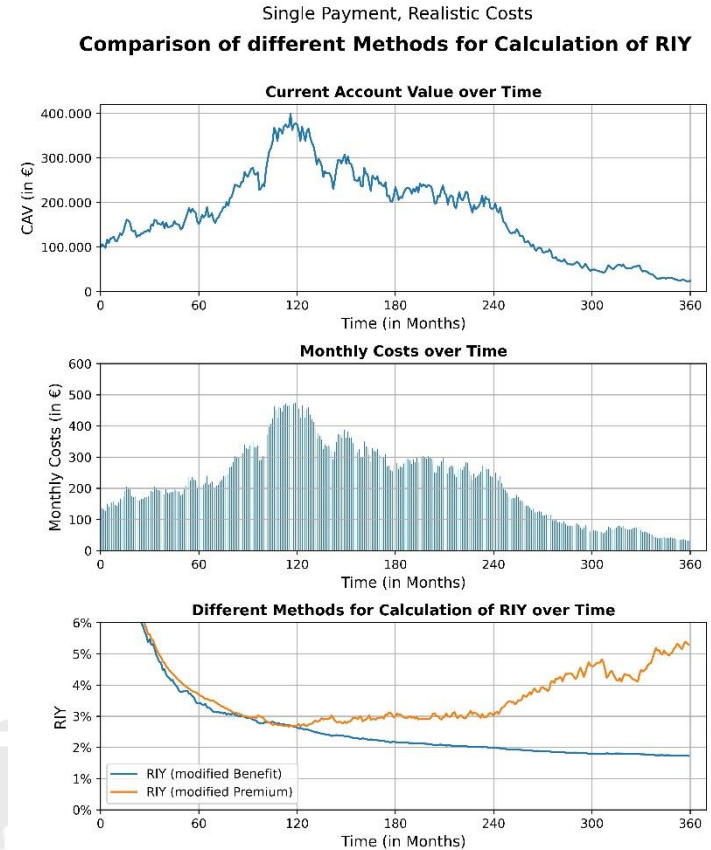
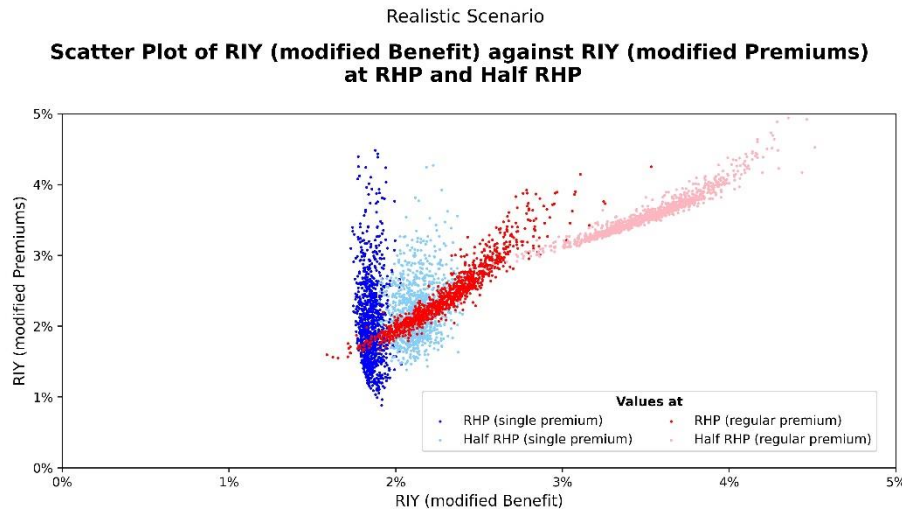


RIY (Reduction in Yield)

Stochastic Analysis

- Values at**
- RHP (single premium)
 - RHP (regular premium)
 - Half RHP (single premium)
 - Half RHP (regular premium)

■ Comparison of Different Methods



In the **stochastic case**, both methods lead to very **different results**!



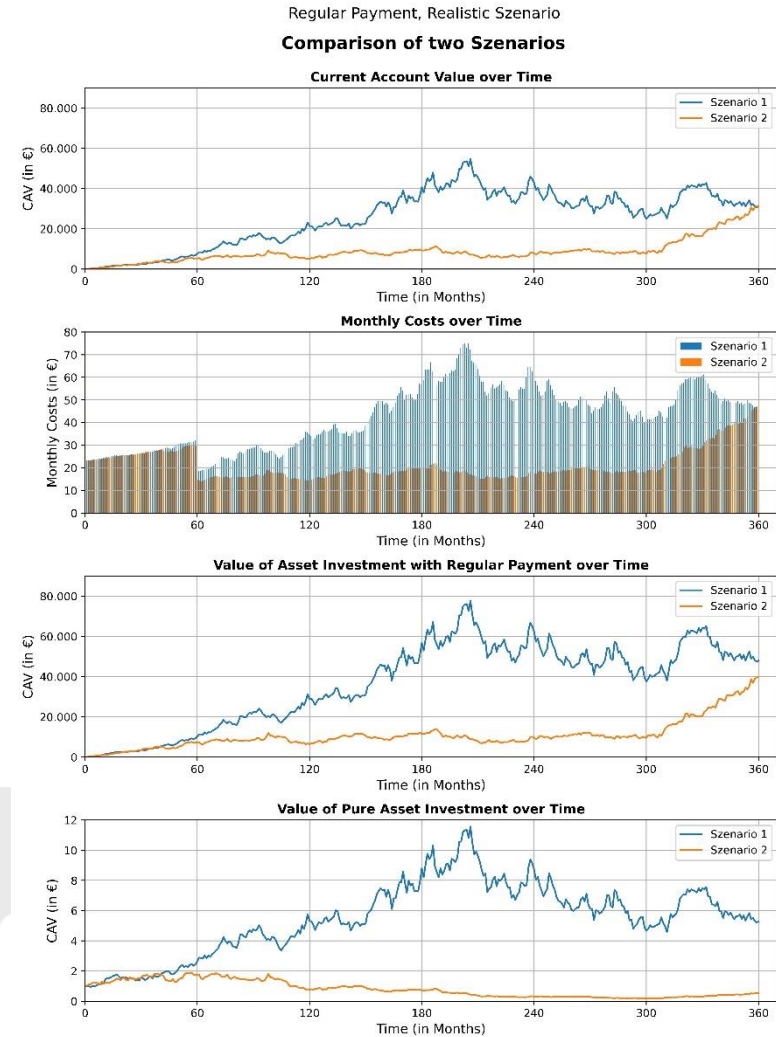
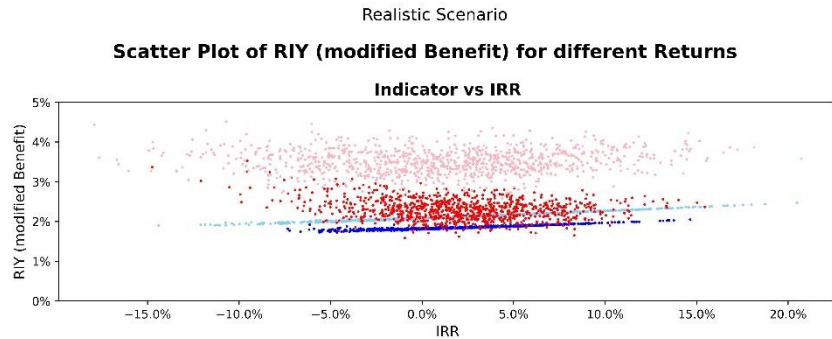
**Thank you for
your attention!**

RIY (Reduction in Yield)

Stochastic Analysis

Additional

Method: Modified Benefit



	CAV (End)	Total Costs	RIY_MB
Szenario 1	31108	15325	2.84%
Szenario 2	31291	7681	1.59%

RIY (Reduction in Yield)

Stochastic Analysis

Additional

Time	Asset Investment		Account of Customer		
	Asset Course	Return	Premium	CAV BOY	CAV EOY
0	100	0%	100	100	100
1	100	3%	0	50	51,5
2	103		0	51,5	

-50 costs

mod Premium	Approximation	
CF	Shares invested	Return
-100	1	0%
50	0,5	3%
51,5		

mod Benefit	Approximation	
CF	Shares invested	Return
-100	1	0%
0	1	3%
103		

Return before Costs:

0,99%

weighted average:

1,00%

Return before costs

1,49%

weighted average

1,50%