

## Allowance for Surplus Funds under Solvency II:

Adequate reflection of policyholders' contribution in a risk-based solvency framework?

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# Outline

## **Introduction**

Motivation

Existing Literature

## **Analysis of Surplus Funds**

## **Conclusion and Outlook**

# Introduction

## Motivation

### Dual character of the RfB (reserve for premium refunds under local GAAP):

- collective reserve for policyholders' **future surplus participation** (balancing over time)
  - emergency buffer to (partially) **cover future losses** according to § 140 VAG (German insurance supervision act)
    - but: not explicitly specified which proportion of a loss can actually be covered by withdrawals of RfB funds
- How to recognize the risk-reducing character of the RfB under Solvency II? (relevant in particular for Germany and Austria)

# Introduction

## Motivation

### Allowance for Surplus Funds (SF) under Solvency II

- special consideration of **initial RfB** (at the valuation date) that is **available to cover future losses** (“undeclared RfB”)
    - broadly comprises Terminal Bonus Funds (TBF) and free RfB
  - not to be considered as insurance liabilities, but as part of the Basic Own Funds (BOF)
  - to be valued in line with the economic approach
    - nominal local GAAP value **not** to be used
  - in addition: current stochastic valuation models in Germany (e.g. BSM) include an **explicit modelling of § 140 withdrawals** from both, initial and future RfB
- BaFin addresses several aspects concerning valuation of Surplus Funds, however, there exists no analysis concerning impact and adequacy of current implementation.

# Introduction

## Motivation

### Does the allowance for Surplus Funds fit into the Solvency II framework?

- market-consistent valuation of all assets and liabilities
    - in particular: **transfer value concept** for valuation of Technical Provisions (**TP**)
      - TP = amount an insurance undertaking has to pay if it transferred its contractual obligations immediately to another (reference) undertaking
      - TP = Best Estimate of Liabilities (**BEL**) + Risk Margin (**RM**)
        - BEL = expected present value of future cash flows (including future discretionary bonuses)
        - RM = present value of cost of capital for a reference undertaking that takes over the obligations and has to hold SCR for unhedgeable risks
    - derivation of Basic Own Funds (**BOF**)  $\approx$  excess of assets over liabilities
  - standard formula capital requirement reflects quantifiable risks over a 1-year time horizon
    - Solvency Capital Requirement (**SCR**)  $\approx$  change of BOF in pre-specified stress scenarios
- The allowance for Surplus Funds does **not appear in line with the definition of BEL (and RM)** (policyholder cash flows counted as BOF).

# Introduction

## Motivation

### Open questions:

- How does the way to recognize the risk-reducing character of the RfB affect the **Solvency II balance sheet**?
- Is the current implementation (Surplus Funds in combination with § 140 withdrawals) appropriate concerning **double counting of cash flows**?
- Does the allowance for Surplus Funds adequately **reflect the loss-absorbing capacity of the initial RfB**?
- How should Surplus Funds be reflected in the calculation of **Solvency Capital Requirement** and **Risk Margin**?

# Introduction

## Existing Literature

- legal provisions
  - Solvency II Directive (→ implementation in insurance supervision act (VAG))
  - interpretative decisions of BaFin
  
- practical implementation
  - Fachkonzept BSM (version 2.1): practical implementation concerning Surplus Funds
  - Burkhart et al, 2015: Analysis of the Going Concern Reserve
  
- collective reserves
  - Goecke, 2013: return smoothing effects of inter-generational risk transfer in pension schemes
  
- Surplus Funds
  - Wagner, 2013: motivation behind the allowance for Surplus Funds
  - Walter, 2015: Surplus Funds in German health insurance

# Outline

**Introduction**

**Analysis of Surplus Funds**

Valuation Framework

Numerical Results

**Conclusion and Outlook**



# Analysis of Surplus Funds

## Valuation Framework

### Model framework

- stochastic projection model from Burkhart et al, 2015
    - extended by RfB and TBF
  - insurance company
    - assets: coupon bonds and stocks (constant stock ratio)
    - liabilities: participating endowment policies against recurring premium
    - surplus participation in line with German provisions:
      - management rule for § 140 withdrawals: losses shared in the same proportion as raw surplus has been split in the past 10 years
      - Surplus Funds = present value of cash flows to policyholders resulting from the initial RfB
- economic balance sheet derived from cash flow projection until complete run-off

# Analysis of Surplus Funds

## Valuation Framework

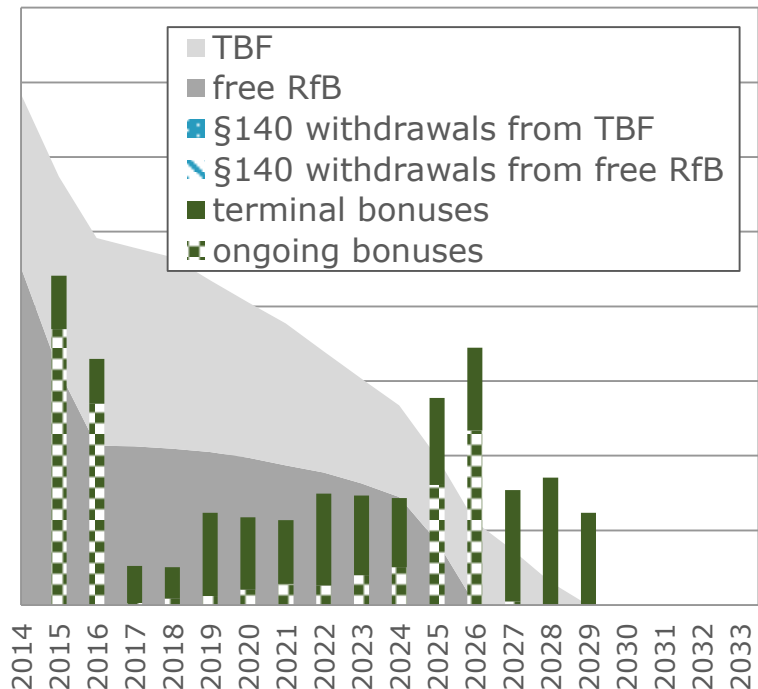
Consideration of **four alternatives** for reflection of risk-sharing between policyholders and shareholders (via the RfB)

Allowance for ...	... Surplus Funds?	
	No	Yes
... § 140 withdrawals?		
No	Alternative 1	Alternative 2
Yes	Alternative 3	<b>Alternative 4</b>

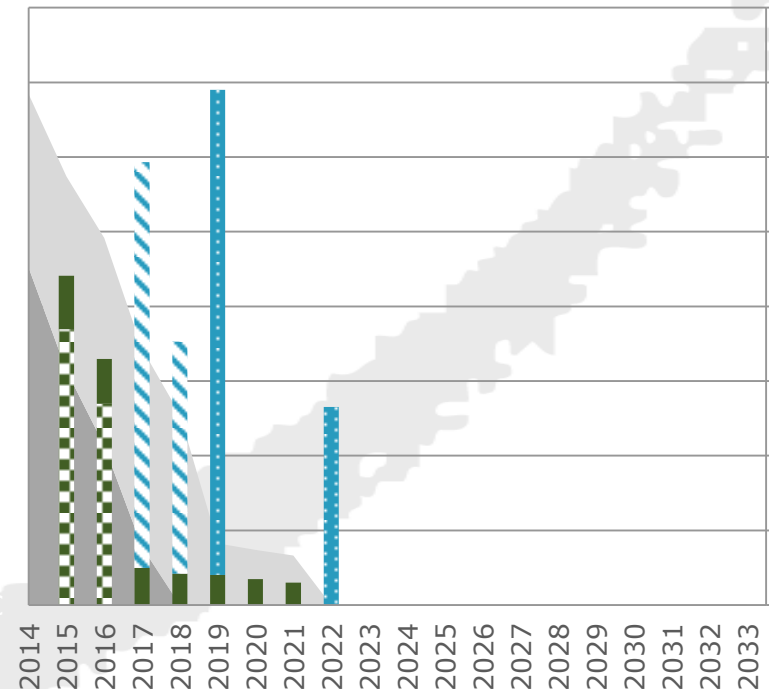
# Analysis of Surplus Funds

## Results – Development of initial undeclared RfB in a single Scenario

Alternatives 1 & 2:  
no allowance for § 140 withdrawals



Alternatives 3 & 4:  
allowance for § 140 withdrawals



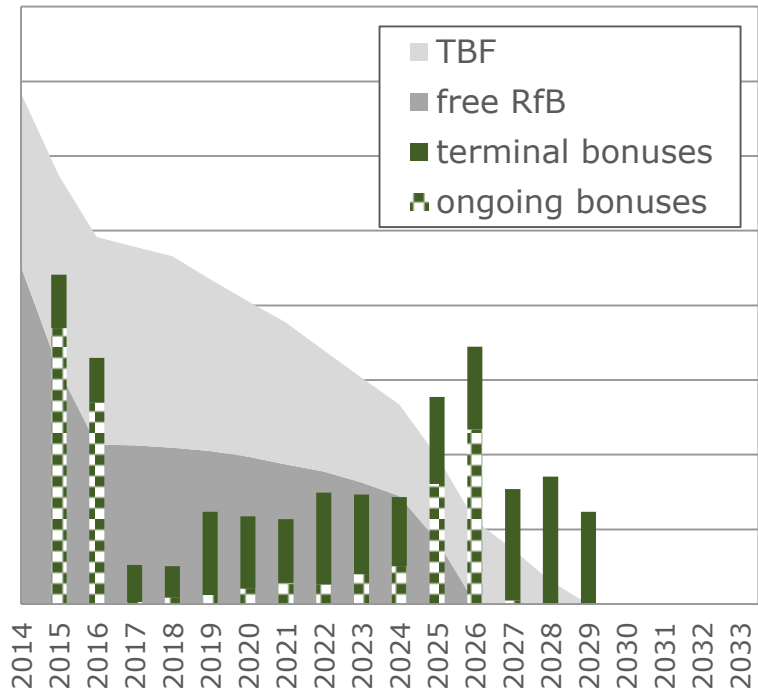
Withdrawals of funds from initial undeclared RfB in line with **§ 140 VAG**:

- are **not** to be counted for valuation of Surplus Funds and
- affect profile of withdrawals relevant for calculation of Surplus Funds.

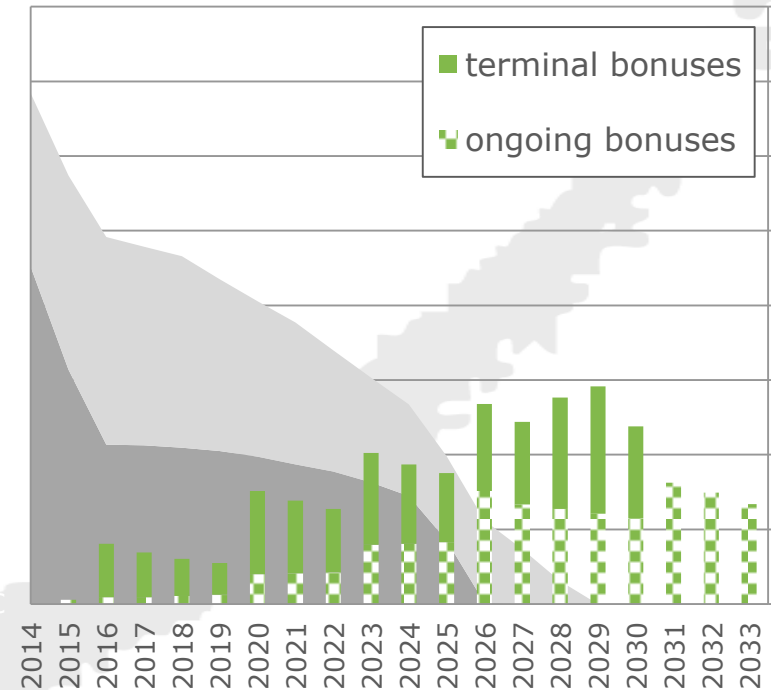
# Analysis of Surplus Funds

## Results – Development of initial undeclared RfB in a single Scenario

**Regular withdrawals** from initial RfB for policyholders' surplus participation



**Cash flows** to policyholders resulting from regular withdrawals from initial RfB



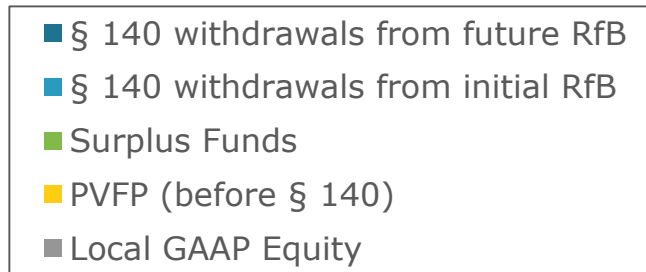
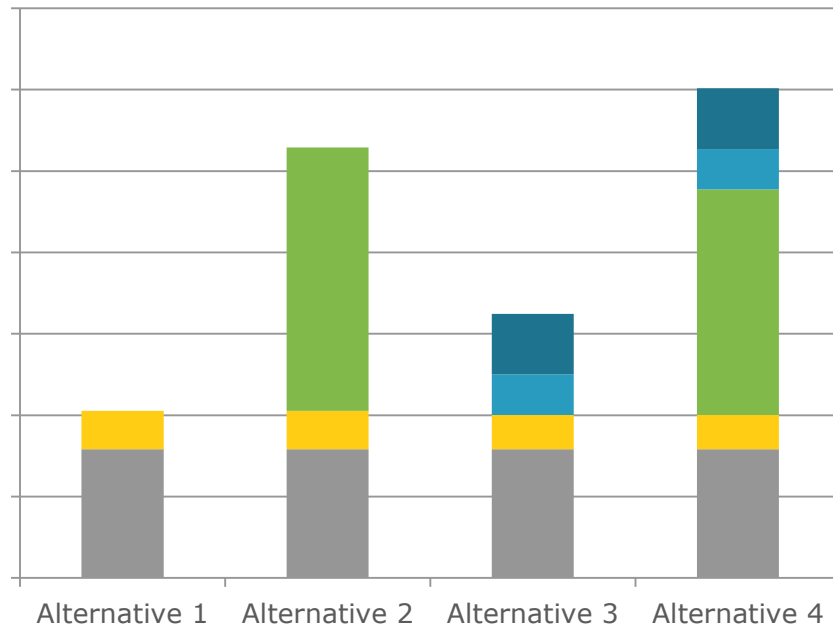
**Cash flows (benefit payments)** are relevant for valuation of Surplus Funds:

- A valuation based on the book value of initial undeclared RfB or withdrawals from initial undeclared RfB neglects shareholders' part of future **investment earnings** on these funds and would result in double-counting of Own Funds.

# Analysis of Surplus Funds

## Results – BOF (before Risk Margin)

BOF (before Risk Margin)

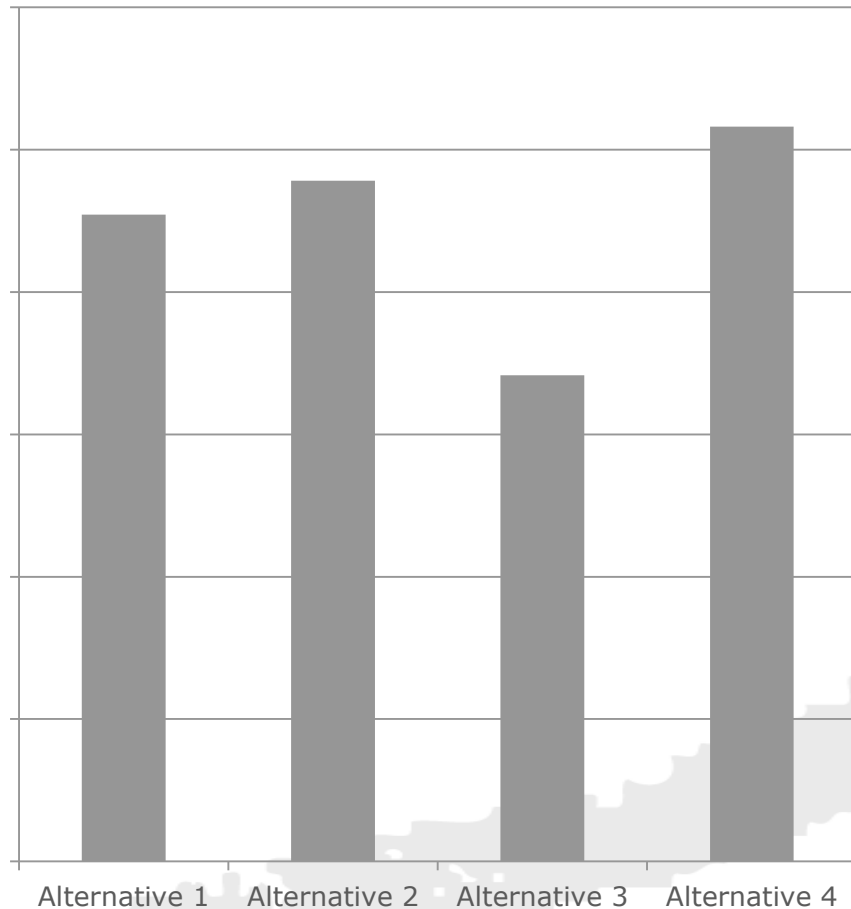


- allowance for Surplus Funds (alt. 2 & 4) results in material increase of BOF
  - note: no adjustment to allow for shareholder part of future losses (cf. § 140 withdrawals)
  - allowance for § 140 withdrawals only (alt. 3) also increases BOF (but less material)
  - expected value of initial RfB used to cover losses (in alt. 3) only 15% of Surplus Funds (in alt. 2)
  - highest BOF in combined approach (alt. 4)
  - note: only withdrawals from future RfB funds create additional BOF (compared to alt. 2)
- ➔ but: Surplus Funds are also “at risk” (and therefore have to be reflected in the SCR).

# Analysis of Surplus Funds

## Results – SCR for Equity Risk

SCR – equity risk



- allowance for Surplus Funds increases SCR (alt. 2/4 vs. alt. 1/3): economic value of Surplus Funds changes in stress
  - without Surplus Funds: additional § 140 withdrawals from RfB in a stress scenario reduce the SCR (alt. 3 vs. alt. 1)
  - highest SCR for combined approach: allowance for Surplus Funds decreases risk-reduction via additional § 140 withdrawals (alt. 4 vs. alt. 2)
- ➔ All effects depend on type of stress (equity vs. interest rate vs. underwriting stresses).

# Analysis of Surplus Funds

## Results - Excess Capital (before Risk Margin)

### Combined impact on BOF and SCR

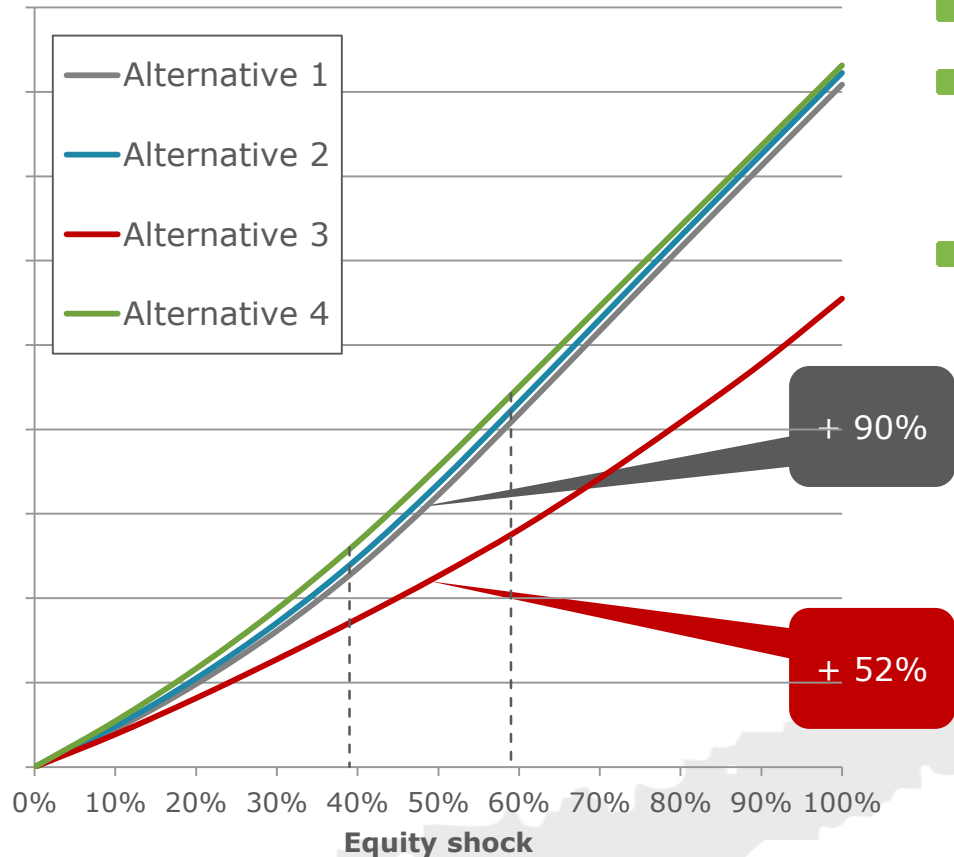
(in 1,000 €)	Alternative 1	Alternative 2	Alternative 3	Alternative 4
BOF (before RM)	4,105	10,578	6,494	12,034
SCR (total)	7,059	7,121	5,459	7,150
Excess Capital (before RM)	-2,954	3,457	1,035	4,884
Solvency ratio (before RM)	<b>58%</b>	<b>149%</b>	<b>119%</b>	<b>168%</b>

- If impact on both BOF and SCR is considered, the difference between alt. 2/4 and alt. 3 is less pronounced.
- highest amount of excess capital for alt. 4
  - Is the resulting solvency ratio adequate?

# Analysis of Surplus Funds

## Results – Sensitivity concerning Size of Equity Stress

SCR – equity risk



### Consider different size of equity stress

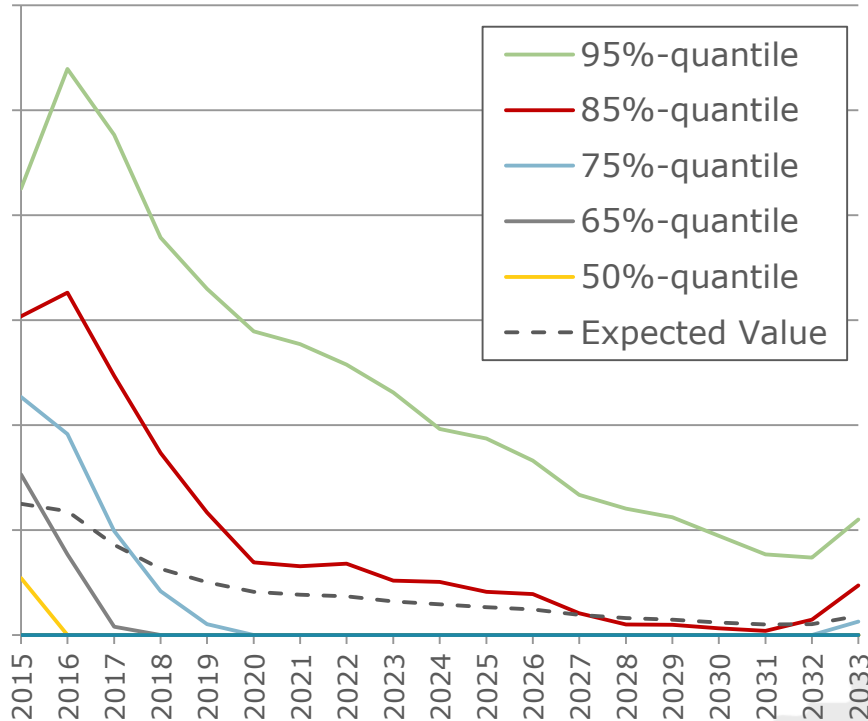
- e.g. 59% stress factor instead of 39%
  - Alt. 3 results in **less volatile solvency ratios**, since additional losses can partly be absorbed by additional § 140 withdrawals of RfB funds.
  - It is unclear which proportion of a loss can actually be covered by § 140 withdrawals.
- critical aspect for alt. 2 & 4 (implicit assumption that losses can be fully covered by initial RfB funds)



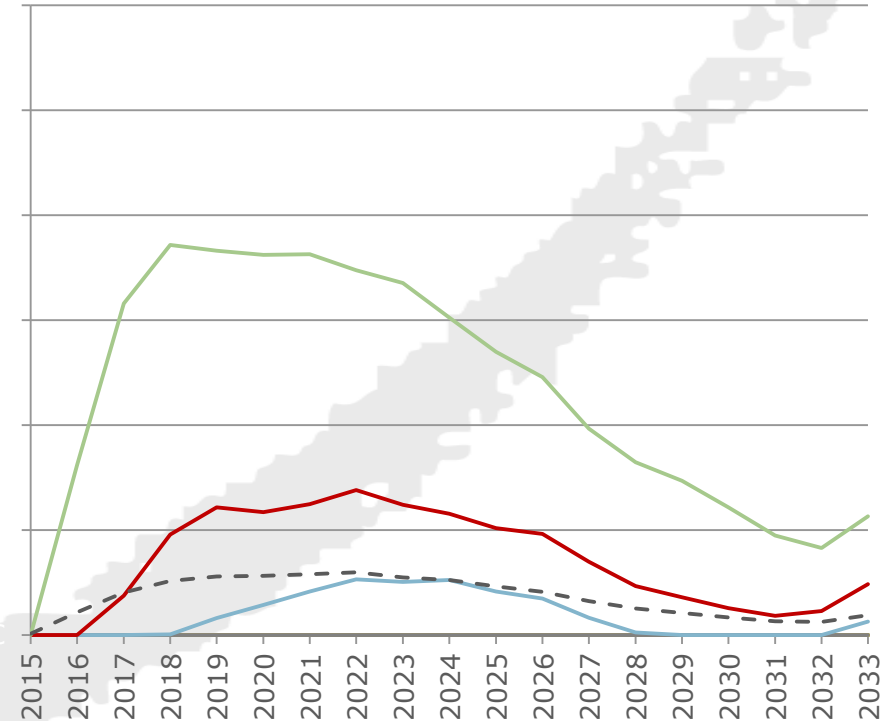
# Analysis of Surplus Funds

Results – Expected § 140 Withdrawals from RfB

Equity risk



Interest rate down risk



The **actual loss absorbency** of the undeclared RfB (by application of § 140)

- is **linked to losses based on local GAAP accounting** and
- therefore depends on how Solvency II stresses affect the local GAAP P&L.

# Analysis of Surplus Funds

## Results – Risk Margin

### Link between SCR and Risk Margin

- Is it necessary to recalculate the SCR used for determining the cost of capital of the reference undertaking?
  - Detailed considerations of the transfer scenario suggest that it is appropriate to calculate RM based on the **original undertaking's SCR** (no need for recalculation of SCR).
  - but: current Solvency II provisions **neglect local GAAP accounting perspective** (which is relevant for the reference undertaking)
- RM depends on approach applied to consider the risk-reducing character of the RfB

	Risk Margin	Solvency ratio (after RM)
Alternative 1	286	54%
Alternative 2	297	145%
Alternative 3	265	114%
Alternative 4	312	164%

## Conclusion and Outlook

- The current valuation approach of Surplus Funds does **not appear in line with the definition of BEL (and RM)**.
    - However, it is **internally consistent** regarding its overall impact on Solvency II results (BOF, SCR and Risk Margin).
    - A careful implementation in stochastic valuation models can ensure that **no double counting** occurs.
  
  - Some underlying assumptions appear critical:
    - In particular, the methodology implicitly assumes that the insurer is allowed to **fully cover losses** by withdrawals from the initial RfB based on § 140 VAG.
    - Current Solvency II provisions **neglect local GAAP accounting perspective** which represents a binding secondary condition for an appropriate Solvency II valuation, e.g.:
      - § 140 VAG may only be applied for losses incurred under local GAAP,
      - a reference undertaking also has to fulfil local GAAP accounting requirements.
- Given the material impact of Surplus Funds on solvency ratios, a **critical review of the corresponding valuation methodology is recommended.**

**Thank you for your attention!**

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# Appendix

## Literature

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