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## **EPFIF Swiss Seminar**

# **Cash-flow matching – a real-life example of LDI in Swiss pension funds**

**PPCmetrics AG**

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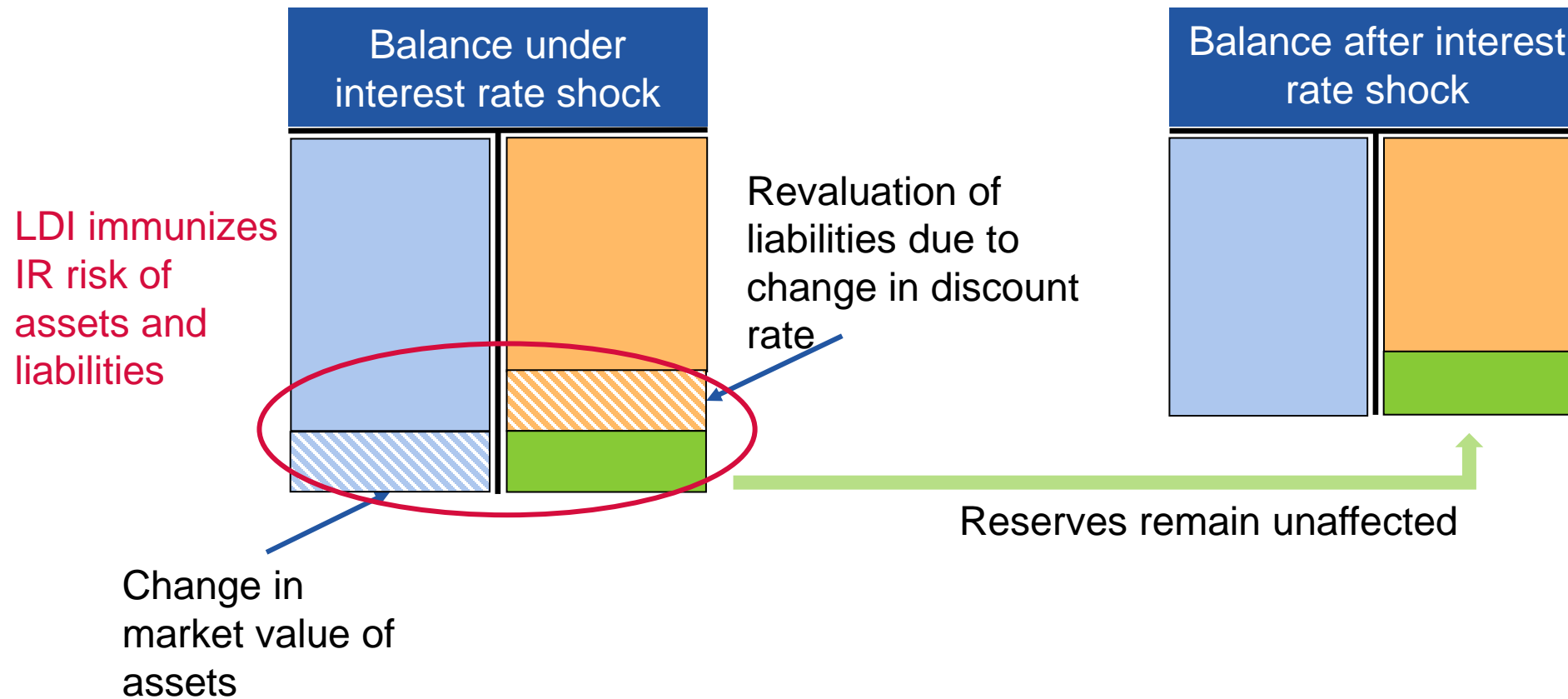
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## Why LDI is not common for Swiss pension funds

# Basic prerequisite for LDI:

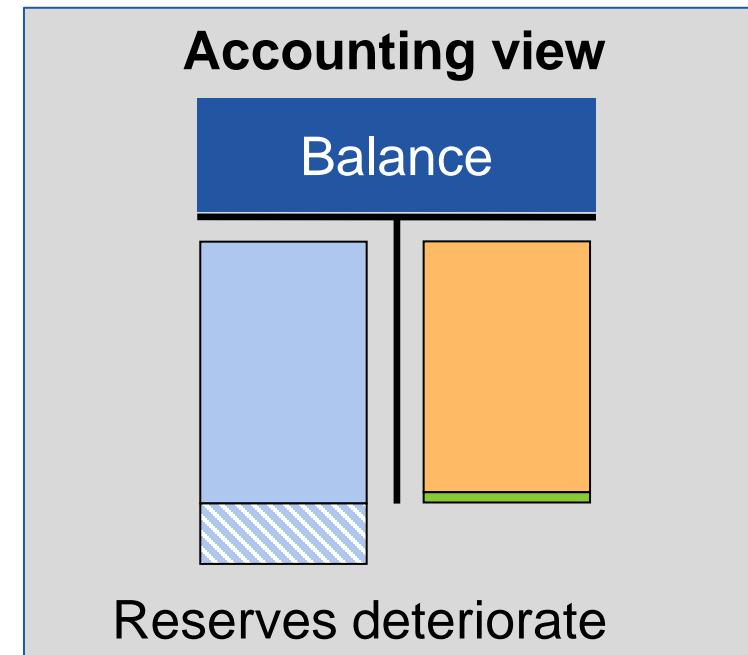
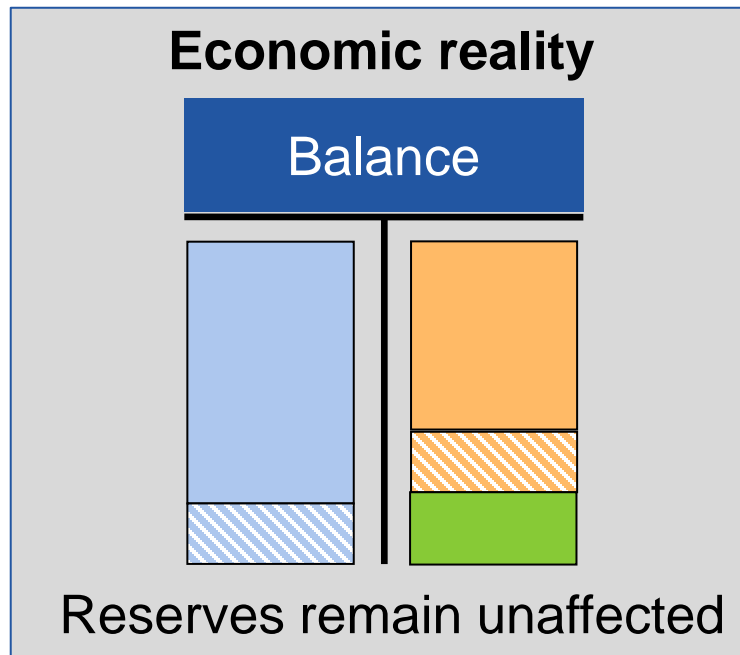
## Asset liability view for interest rate risk management

- ▶ Changes in interest rates are only economically risky to pension funds if the interest sensitivity of assets is unequal to the interest rate sensitivity of liabilities.



# Fixed technical rate distorts asset liability management

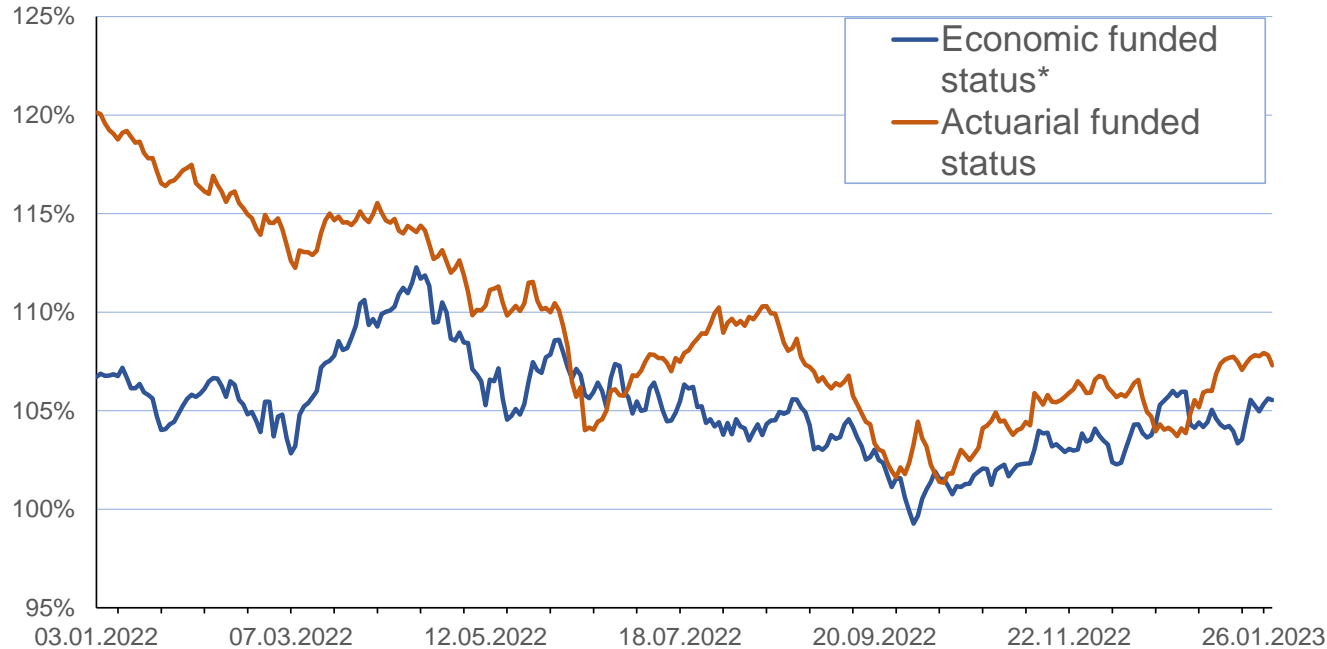
- ▶ Most pension funds do not directly reflect interest rate changes in their discount rates (technical interest rate).



- ▶ Interest rate sensitivity of assets is considered a risk because interest rate sensitivity of liabilities is neglected.

# Swiss pension funds managed well in 2022

## Estimated funded status of Swiss Pension Funds



→ Over the year 2022, there has been hardly any change in the economic funded status.

- ▶ Swiss pension funds are typically positioned short duration
- ▶ They were able to economically absorb losses in equity and real estate markets in 2022.

\* Including economic pension losses (and gains) over each of the next five years.

Source for daily updated values: [www.ppcmetrics.ch/pension-ticker](http://www.ppcmetrics.ch/pension-ticker).

## Cash-flow matching for Swiss pension funds

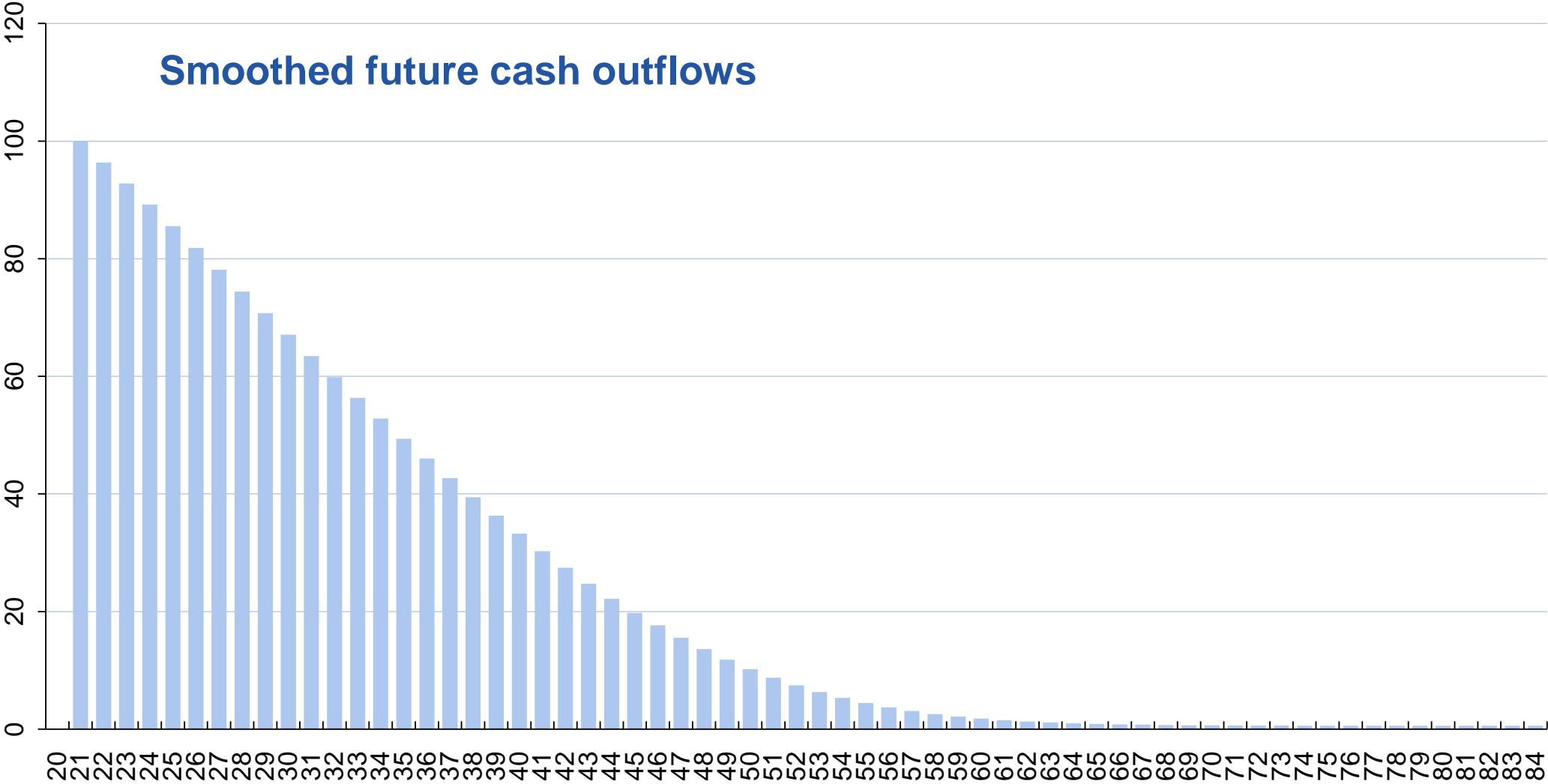


# Introduction

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- There are a few **pension funds** in Switzerland whose **beneficiaries are mostly or even uniquely retirees**.
- For those funds, it is absolutely **necessary** that **assets are sufficient to cover all future outflows** since a recapitalization of those funds is not possible.
- Some of those pension funds implemented a **cash flow matching strategy**, i.e. choose an investment portfolio where **future inflows are aligned with future outflows**.
- In the following, I present an excerpt of an **actual analysis** we made for one of our **clients**.

# Projection of future cash outflows



# Cash-flow matching

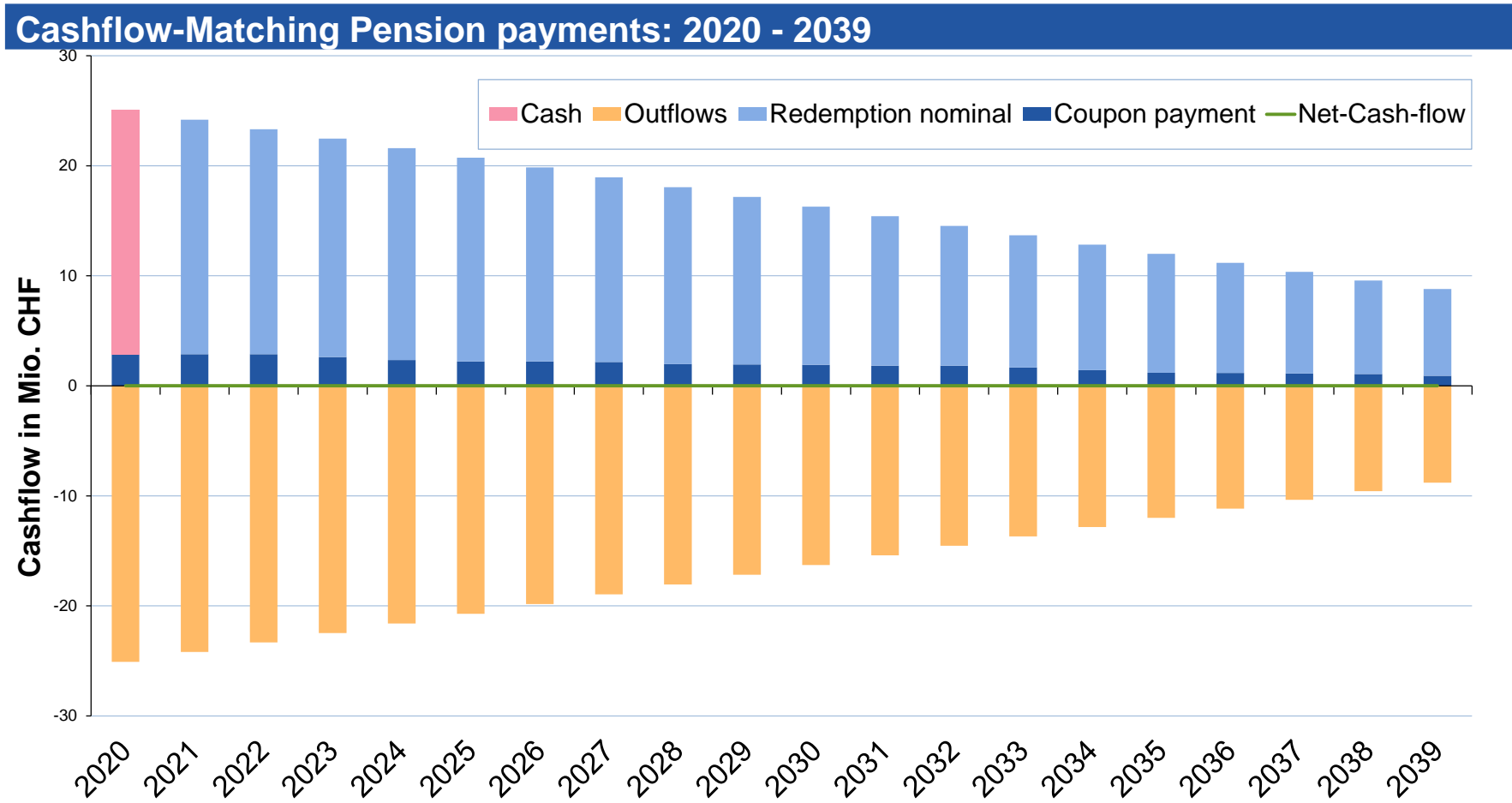
## Accuracy of reproduction and implementation

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- The CFM portfolio presented in the following is developed at an **annual level**.
- But even on an annual level, there is not a corresponding **federal bond available for each maturity**.
- The CFM is thus not limited to federal bonds but also includes **cantonal bonds**:
  - Cantons have tax sovereignty.
  - Only cantons with AAA and AA rating (i.e. without JU and NE)
- In addition, further refinement is possible with **corporate bonds of the highest credit quality** (e.g. AAA rating).
- The use of **interest rate swaps** is also conceivable in principle, but represents an additional challenge from a regulatory point of view (BVV 2 coverage) and with regard to the management of counterparty and liquidity risks.
- ▶ **Due to the Swiss bond market, CFM is thus never precise but always an approximation.**

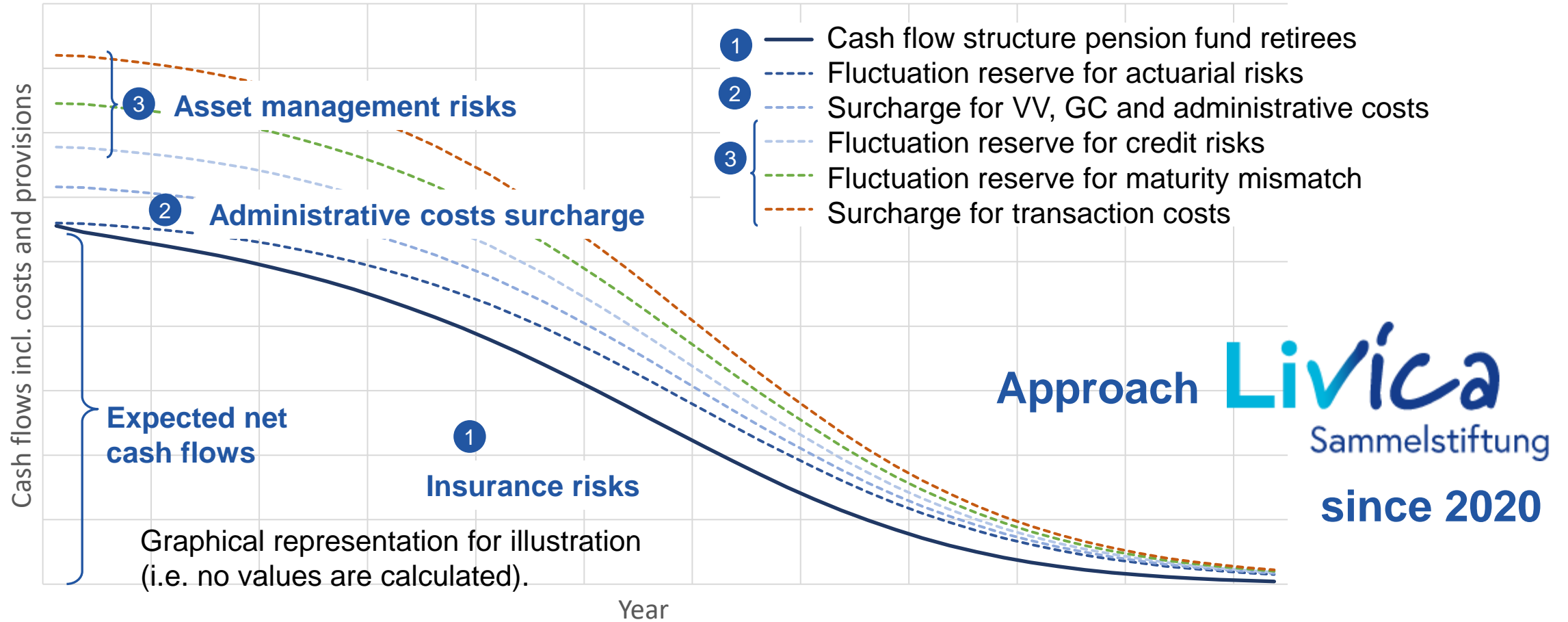
# Cash-flow matching of pension payments

Excerpt cash-flow matching from 2020 to 2039



**Notification:** Due to a different interest rate curve and non-intra-year portfolio data, the retirees are not exactly congruent with the cash flow valuation shown here.

# Remaining risks of cash-flow matching



▶ Mitigating these risks requires an initial funded status of more than 100%.

# Pure cash flow matching vs. Combination with risky assets

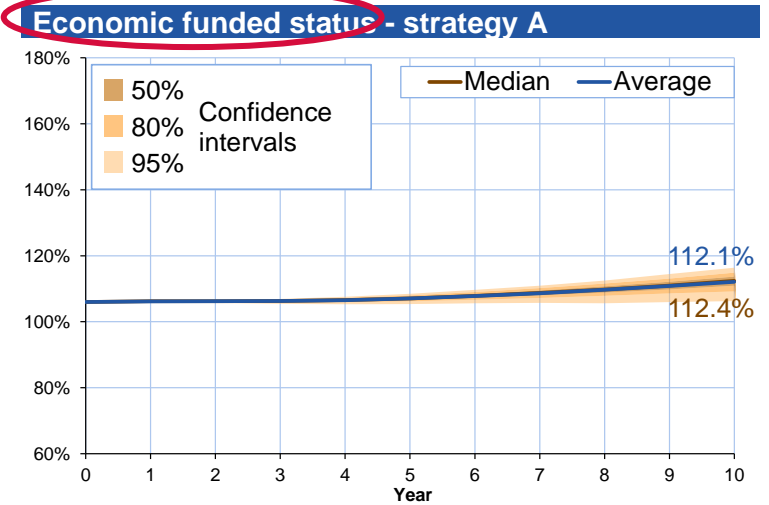
- ▶ If the pension fund has an **economic funded status** that is significantly **higher than 100%**, a **pure cash-flow matching** is **not required**.
- ▶ Such a pension fund may also **combine its CFM-Portfolio with risky assets**.

## Simplified example

Comparison of strategies	Alternatives		Limits according to BWV 2
	Strategy A	Strategy B	
CFM-Portfolio	100%	90%	
Global Equity (hedged)	0%	10%	50%
Total	100%	100%	
<b>PPCmetrics expected net return p.a.*</b>	1.88%	2.57%	
<b>Volatility = Risk</b>	4.00%	4.29%	
<b>Tracking Error to Liabilities</b>	1.50%	2.35%	

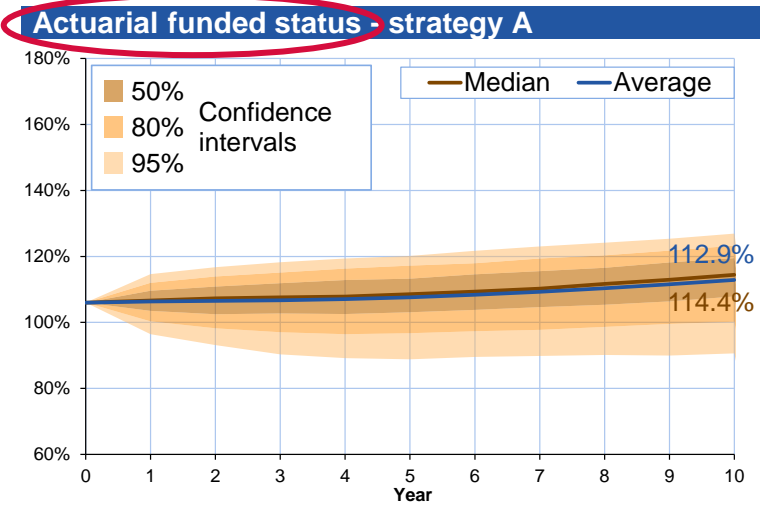
\* Basis: Current risk-free interest rate 10 years at 31.12.2022 (1.55%); Risk premiums according to PPCmetrics fundamental model; net Asset management costs

# Simulation of funded status – strategy A



- Start of funded status at 106%.
- The economic funded status never falls below 100%.

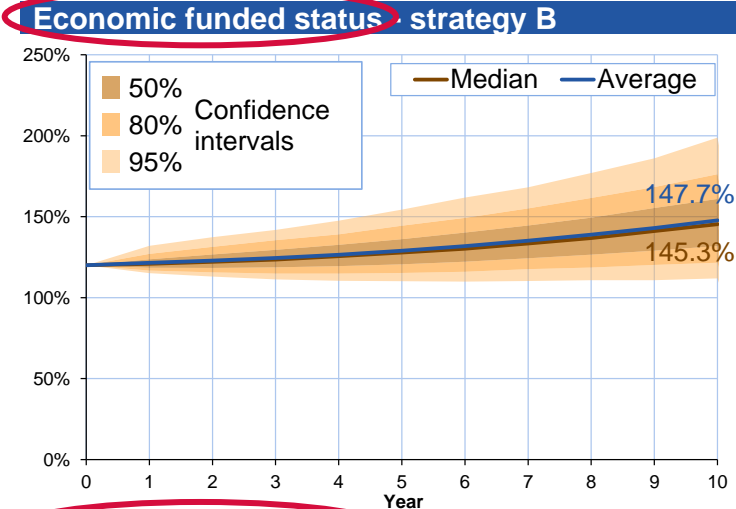
Distribution of econ. funded status			
in year	1	5	10
above 120%	0%	0%	0%
100% - 120%	100%	100%	100%
under 100%	0%	0%	0%



- Start of funded status at 106%.
- Liabilities **not** Mark-to-Market: biased view of risk
- High probability that funded status falls below 100%.

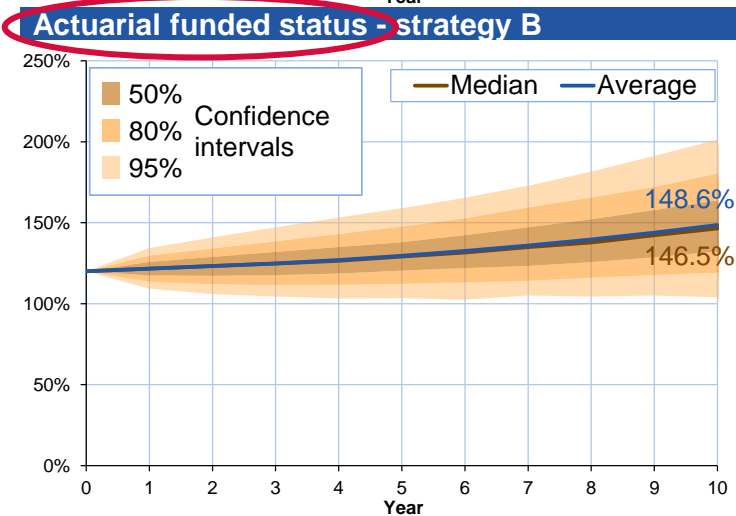
Distribution of actuarial funded status			
in year	1	5	10
above 120%	0%	3%	23%
100% - 120%	91%	81%	68%
under 100%	9%	16%	10%

# Simulation of funded status – strategy B



- Start of funded status at 120%
- The economic funded status never drops below 100%.
- Higher funded status ensures higher risk capacity.

Distribution of econ. funded status			
in year	1	5	10
above 120%	48%	73%	90%
100% - 120%	52%	27%	10%
under 100%	0%	0%	0%



- Start of funded status at 120%.
- Due to higher investment risk, the lack of Mark-to-Market valuation of liabilities is much less significant as for strategy A.

Distribution of actuarial funded status			
in year	1	5	10
above 120%	54%	73%	87%
100% - 120%	46%	25%	11%
under 100%	0%	2%	2%



# Conclusion

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- **LDI is not common in Switzerland** as most pension funds **do not directly consider interest rate changes in their discount rates.**
- **Still, for Swiss pension funds where beneficiaries are mostly retirees, LDI is important.**
- **Some of these pension funds choose to implement a cash flow matching strategy.**
  - **Cash-flow matching** ensures that **future outflows** correspond as exact as possible with future **cash inflows**, which reduces future funding risk as much as possible.
  - **Depending** on the **economic funded status** a **cash-flow matching portfolio** can be still **combined** with **risky assets to increase expected returns and enables potential benefit increases.**



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