

# European Pension Fund Investment Forum

## Risk Management Strategies

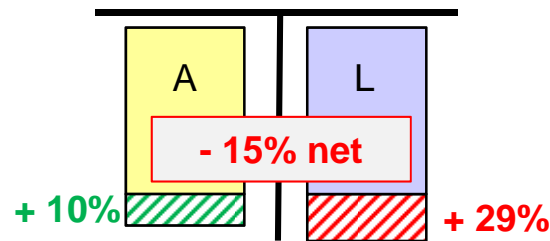
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Zurich, 6 December 2011

# Opinion Poll: Risk Factors

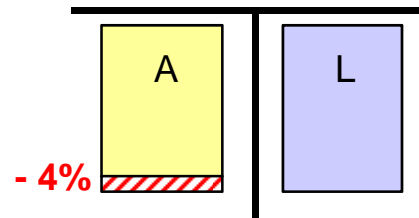
- Which risk factor had the most negative impact on the financial situation of an average Swiss pension fund in the last five years?

Interest



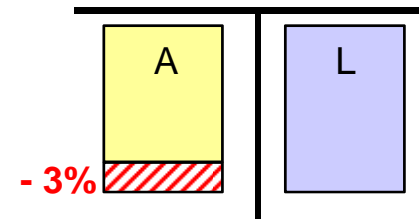
50% bonds (SBI)  
SLIX (govt. rate basis) for liabilities

Currency



20% foreign currency exposure  
Diff. between MSCI World local  
and MSCI World in CHF

Equity



30% equity quota  
MSCI World gross local

- Pension funds' **purpose of investing**:
  - to keep promises about future benefits (art. 50 BVV 2)
  - in other words: to meet the liabilities
  
- Investment risk is **relative to liabilities**
  - liabilities must be considered based on a fair (risk adjusted) valuation
  - risk cannot be managed by neglecting it
  
- Asset volatility is not per se risky, but **deviation** between assets and liabilities is

# Pension Fund Risk Management: Three Figures

## *Financial situation?*

$$\text{Economic Funding Ratio} = \frac{\text{assets (fair value)}}{\text{liabilities (fair value)}}$$

- Comparable to solvency test method, but not based on a liquidation scenario
- Going concern principle applies

## *Risk exposure?*

$$\text{Tracking Error Assets/Liabilities} = \text{Standard deviation assets/liabilities}$$

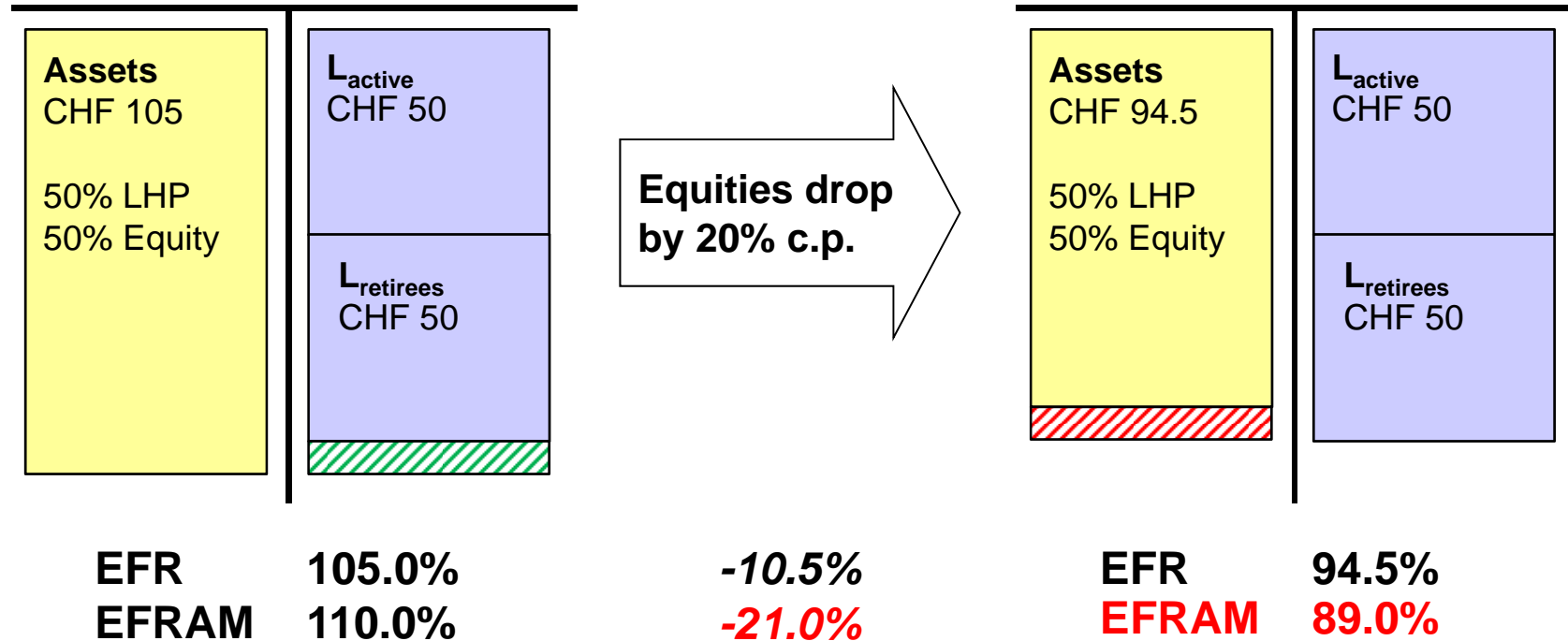
- Instead of asset volatility, deviation between assets and liabilities is measured

## *Leverage?*

$$\text{Economic Funding Ratio Active Members} = \frac{\text{assets} - \text{liab. retirees}}{\text{liab.} - \text{liab. retirees}}$$

- Sensibility to fluctuation of economic funding ratio is relevant

# Leveraged Pension Funds (1)



Abbreviations:

LHP liability hedging portfolio  
 EFRAM economic funding ratio active members

EFR economic funding ratio  
 c.p. ceteris paribus

# Leveraged Pension Funds (2)

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- Given that...
  - retirees do not bear any investment risk
  - no windup in an underfunding (unlike insurance companies)
  - underfunding has to be made up in the future by:
    - recapitalization payments (active members and employer)
    - lower interest rates on retirement savings accounts
- ...leverage is very important in a going concern perspective.

# Risk Budget vs. Risk Budgeting

**Risk Budget: Total Risk**  
 What is the amount of risk that we should bear?

**Relevant Criteria:**  
 → Financial situation (EFR)  
 → Leverage (ERFAM)

**Total risk approach:  
 Risk Budget contains  
 strategic and active risks**

**Risk Budget 25%**  
 (25% equity / 75% LHP)

**Risk Budget 35%**  
 (35% equity / 65% LHP)

**Risk Budget 45%**  
 (45% equity / 55% LHP)

**Risk Budgeting: Allocation of the Risk Budget**  
 On which factors should we spend the Risk Budget?

**Portfolio Optimization:  
 → Tracking Error**

**RB 35%, Option A**

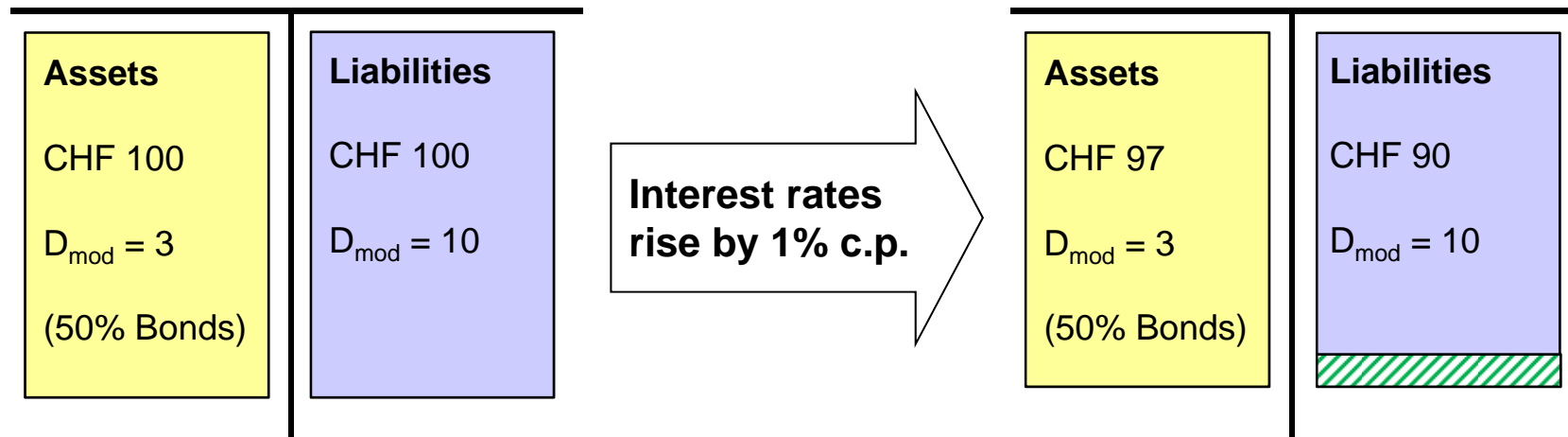
**RB 35%, Option B**

**RB 35%, Option C**

- Interest
- Equity
- Real Estate
- Tactic
- Selectivity

# Managing Interest Rate Risk (1)

- Many Swiss pension funds **bet on rising interest rates**:



- **Does this bet make sense?**

- **Yes**, if you can expect an adequate risk premium or if you have superior forecasting capabilities
- **No**, if this is not the case

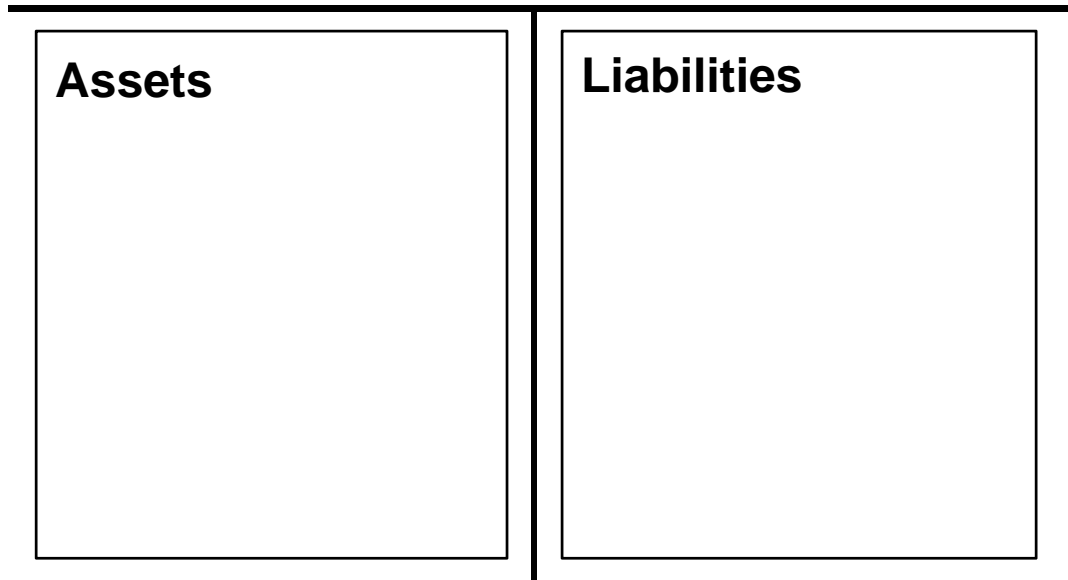


- **Strategic perspective** (without tactical opinion):
  - additional risk is not compensated (no risk premium)
  - short duration increases risk and takes up risk budget
  - if term-premium is assumed, expected return is even lower
  - ▶ **not aligning interest rate risks of the assets to the liabilities is a waste of risk budget**
  
- **Reduce the not compensated risk** in favour of other risks:
  - duration matching allows increasing other risk factors, e.g., equity or real estate, for which a risk premium can be expected
  - risk/return profile of a portfolio can be enhanced

- **Extend duration of bonds:**
  - take positions in long bonds
    - approx. 150 issues/70 bn in the CHF AAA-AA segment
    - very low market liquidity
  - create synthetic exposure using swaps
    - consider regulatory aspects (art. 56a BVV 2)
    - use of plain vanilla swaps is often limited (covering short leg)
  
- **Reduce duration of liabilities:**
  - boost lump-sum payments at retirement
  - match interest credited to savings accounts to market rates
  - adjust conversion rates depending on market rates

# Managing Currency Risk (1)

- International diversification leads to **currency risk**:

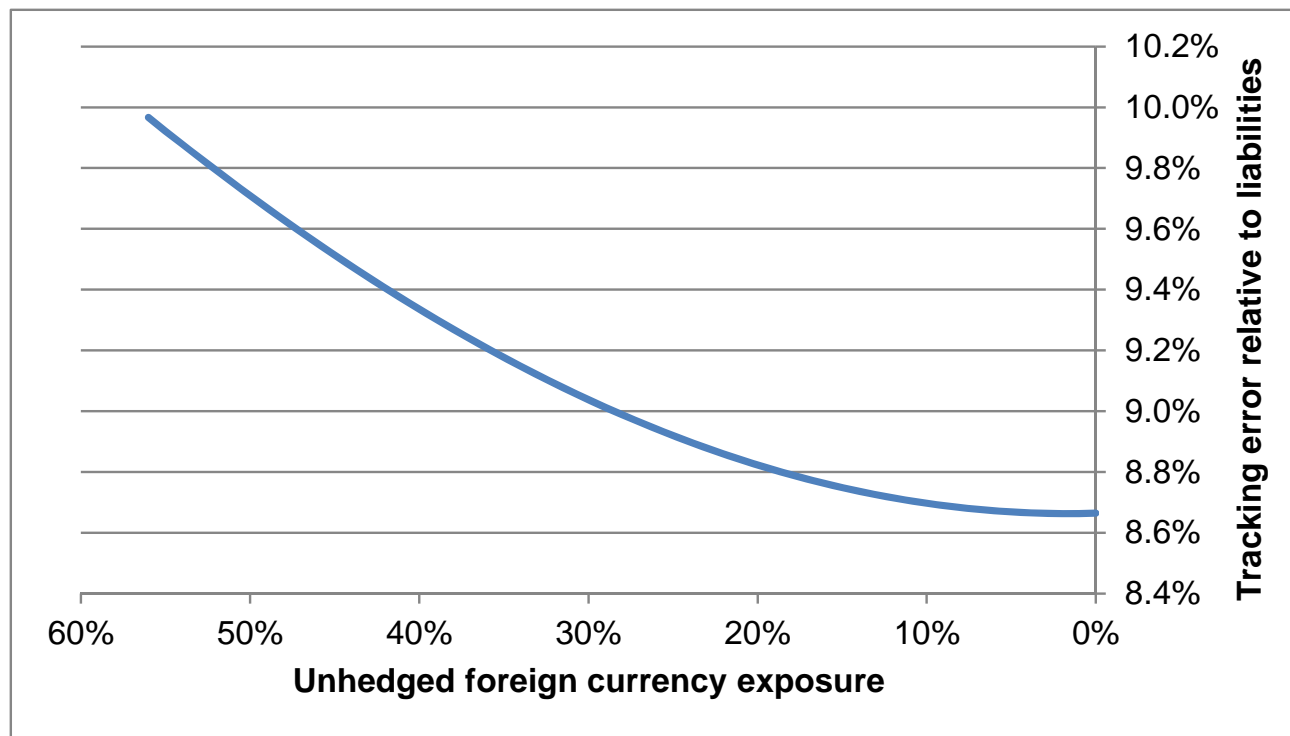


- **Should a pension fund be exposed to currency risk?**
  - **Yes**, if you can expect an adequate risk premium or if you have superior forecasting capabilities
  - **No**, if this is not the case

- **Can we expect a premium?**
  - empirical evidence for a premium is weak
  - who is willing to pay the premium?
  
- **Strategic perspective:**
  - currency risk increases investment risk and takes up risk budget
  - additional risk is not compensated (no risk premium)
  - **taking (too much) currency risk is a waste of risk budget**
  
- **Reduce the not compensated risk** in favour of other risk factors (e.g., equity, real estate)

# Managing Currency Risk (3)

- **Estimating the optimal hedge ratio is difficult:**
  - full hedging can be costly (exotic currencies)
  - hedging of main currencies (\$, €, ¥, £) as a pragmatic solution

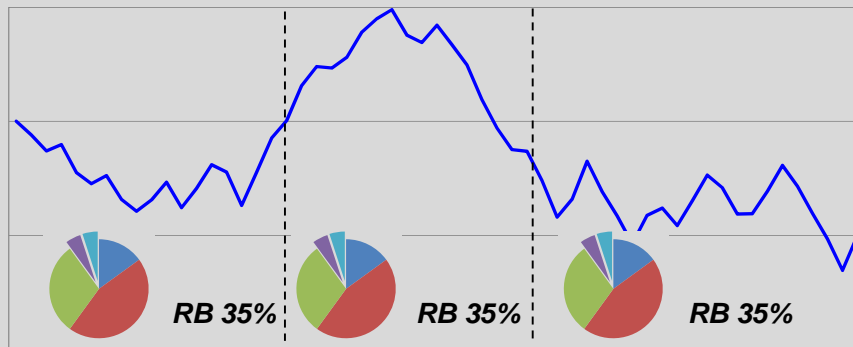


# Managing Equity Risk (1)

## Fixed Strategy:

→ *anti-cyclical strategy*

variable willingness to bear risk

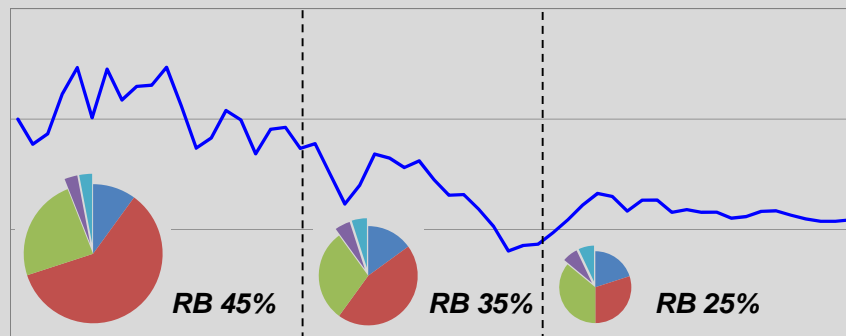


**“buy low – sell high”**  
(optimal for oscillating markets)

## Dynamic Strategy:

→ *cyclical strategy*

limited willingness to bear risk



**“sell after losses”**  
(optimal for trending markets)

- **Different concepts** for dynamic strategies:
  - based on **key figures** (e.g., implicit volatilities) or **fundamental reasoning**
  - ▶ forecasting capability (or superior model) is necessary (if you have it – use it!)
  - based on **risk capability**
  - ▶ systematic approach for defending a “floor”
- Dynamic strategies can **reduce risk significantly**
- However, **what price** do we have to pay for risk reduction?

- **Strategic perspective:**
  - for defending a certain funding ratio a dynamic strategy has to be put in place (or an economically similar strategy like “long put”)
  - however, reducing equity risk leads to lower expected return
    - ▶ **“price of the insurance”**
  
- **Consequences** for a (going concern) pension plan:
  - **adjust pension schemes** (contributions, benefits) if equity exposure is reduced
  - **Pay-in additional funds** to cover losses
    - ▶ reduction of equity exposure is not necessary

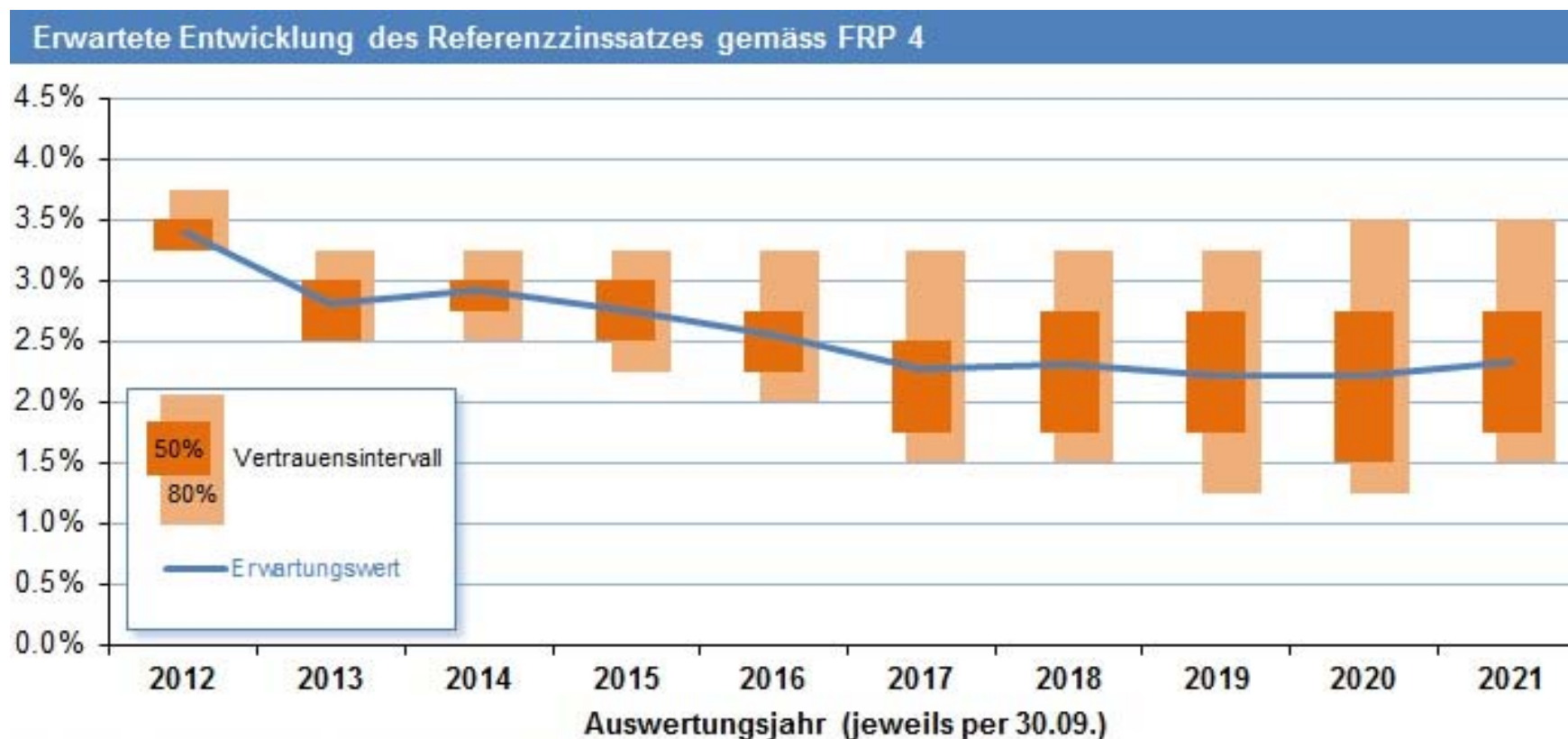


- Investment risk is **relative to liabilities**
- **Interest rate** and **currency risk** can often be reduced without lowering expected return, which makes room for **increasing other risk factors** like equity or real estate
- **Dynamic strategies** allow defending a certain floor, but no insurance is for free
- **Risk budgets are always tight**  
→ use them wisely

# Appendix

# Technical Interest Rate

- Technical perspective converges into economic view:



Berechnungen: PPCmetrics; Datenquellen: SNB, Pictet BVG-Indizes; Stand: 31.10.2011

Source: [www.technischer-zinssatz.ch](http://www.technischer-zinssatz.ch)



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