

Pension Fund Governance Issues in Today's World: What Lessons have we learnt?

Implications of the Financial Crisis on Asset Allocation

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- Today's topic:

'It is better to know some of the questions than all of the answers.'

(James Thurber, US author)

- Some questions and the attempt to give an answer.

Question 1 – Asset allocation

- ***The financial crisis had a significant impact on investment portfolios. Should pension funds change their investment strategy if they are faced with a low funding ratio?***

Asset allocation

Pension Fund XY	Actual Strategy	Strategy minus 10% Equities	Limits According to BVV 2
Cash CHF	1.0%	1.0%	
Swiss Bonds	41.0%	46.0%	
Global Bonds (hedged)	10.0%	15.0%	
Bonds EMU (hedged)	5.0%	5.0%	
Total Fixed Income	57.0%	67.0%	
Swiss Equity	8.0%	5.0%	50.0%
Global Equity	10.0%	6.0%	
Global Equity (hedged)	8.0%	5.0%	
Private Equity	3.0%	3.0%	
Swiss Real Estate	4.0%	4.0%	30.0%
Global Real Estate	4.0%	4.0%	
Hedge Funds (hedged)	3.0%	3.0%	
Commodities	3.0%	3.0%	
Total Real Assets	43.0%	33.0%	
Total	100.0%	100.0%	
Total Foreign Currencies	46.0%	44.0%	
Total Foreign Currencies (unhedged)	20.0%	16.0%	30.0%
Total Global Bonds	15.0%	20.0%	
Total Equities	26.0%	16.0%	50.0%
Total Alternative Investments	9.0%	9.0%	15.0%
Total Equities & Alternative Investments	35.0%	25.0%	
Total long-term Investments	43.0%	33.0%	
Expected Return p.a.	3.98%	3.58%	
Volatility = Risk	6.77%	5.34%	

- Let's analyze the effects of a **risk reduction** (less equity) on future funding ratio changes.

- Simulation of the following economic variables:**

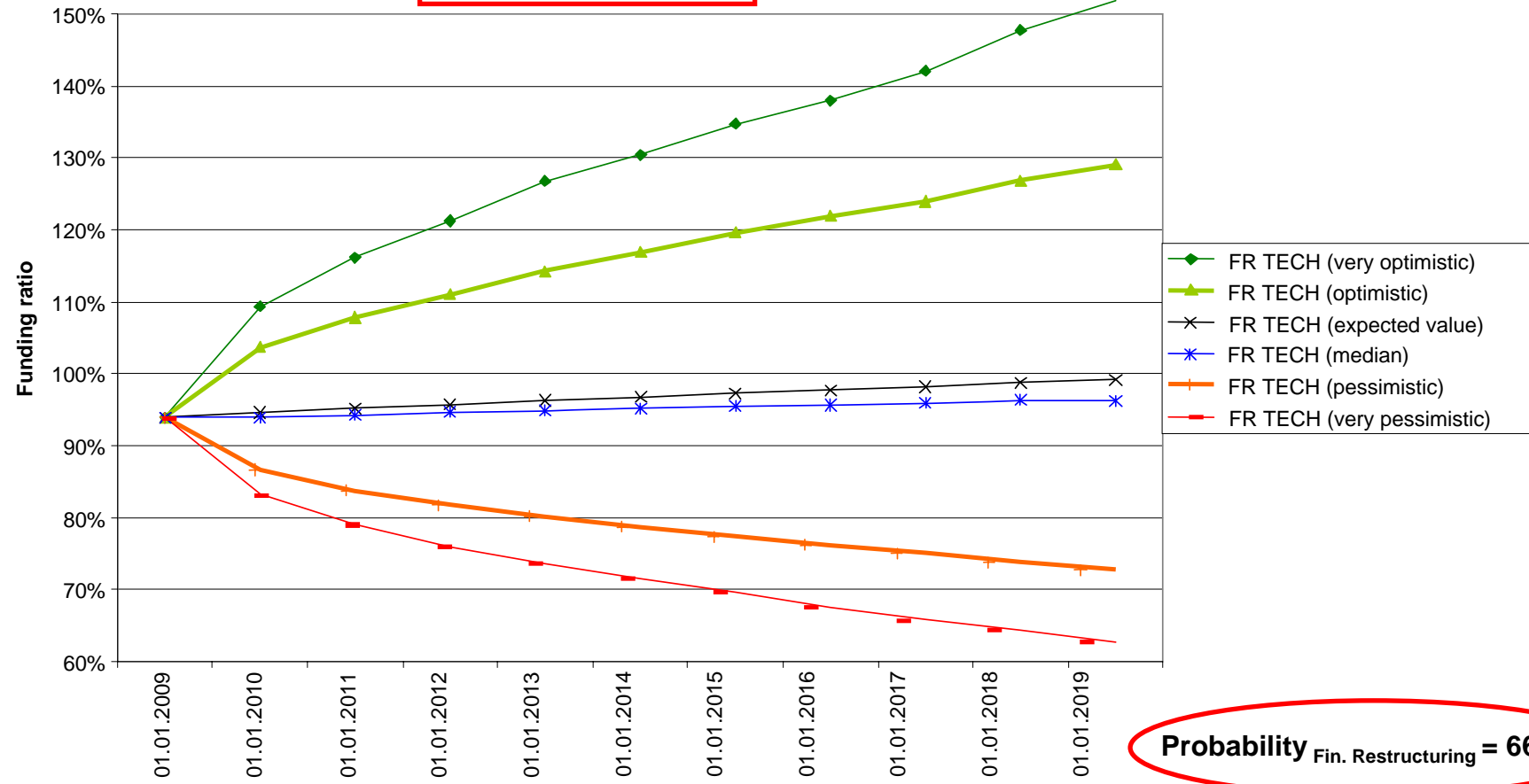
- Portfolio value changes
- Interest rate changes
- Inflation changes

- Assumptions:**

- Wage changes/ average inflation: 2% p.a./1.5% p.a.
- Indexing of pensions: 0% p.a.
- Interest rate on old-age credit: 2.5% p.a.
- Technical bases: BVG 2000/TZ = 3.5%

Asset allocation: Funding ratio changes without restructuring measures (1)

- Simulation of the **actual strategy** (without restructuring measures)

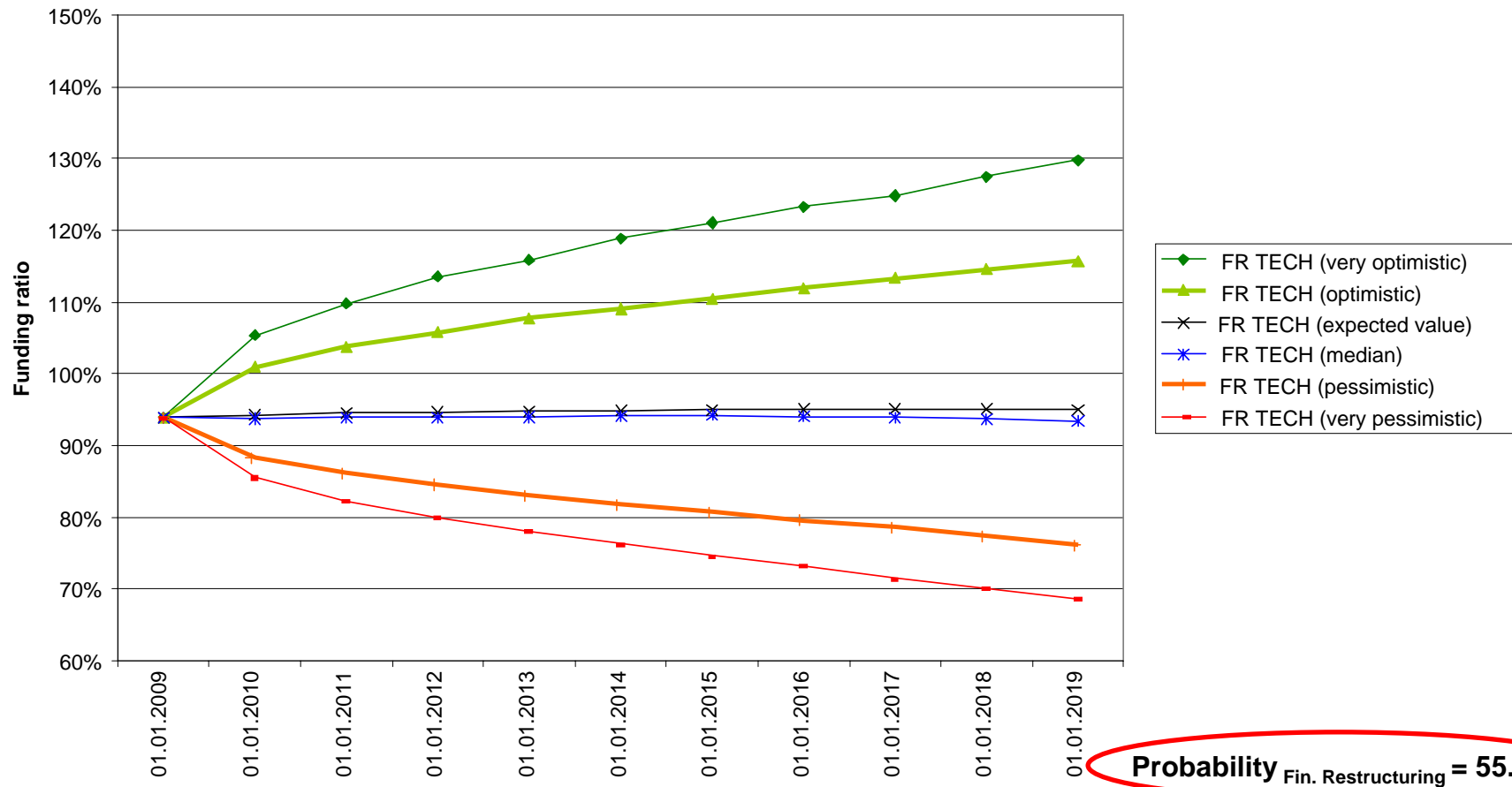


Probability Fin. Restructuring = 66.4%

Probability of financial restructuring: Equal to the probability of a funding ratio above 100% at least once within the next ten years

Asset allocation: Funding ratio changes without restructuring measures (2)

- Simulation „strategy **minus 10% equities,**” (without restructuring measures)

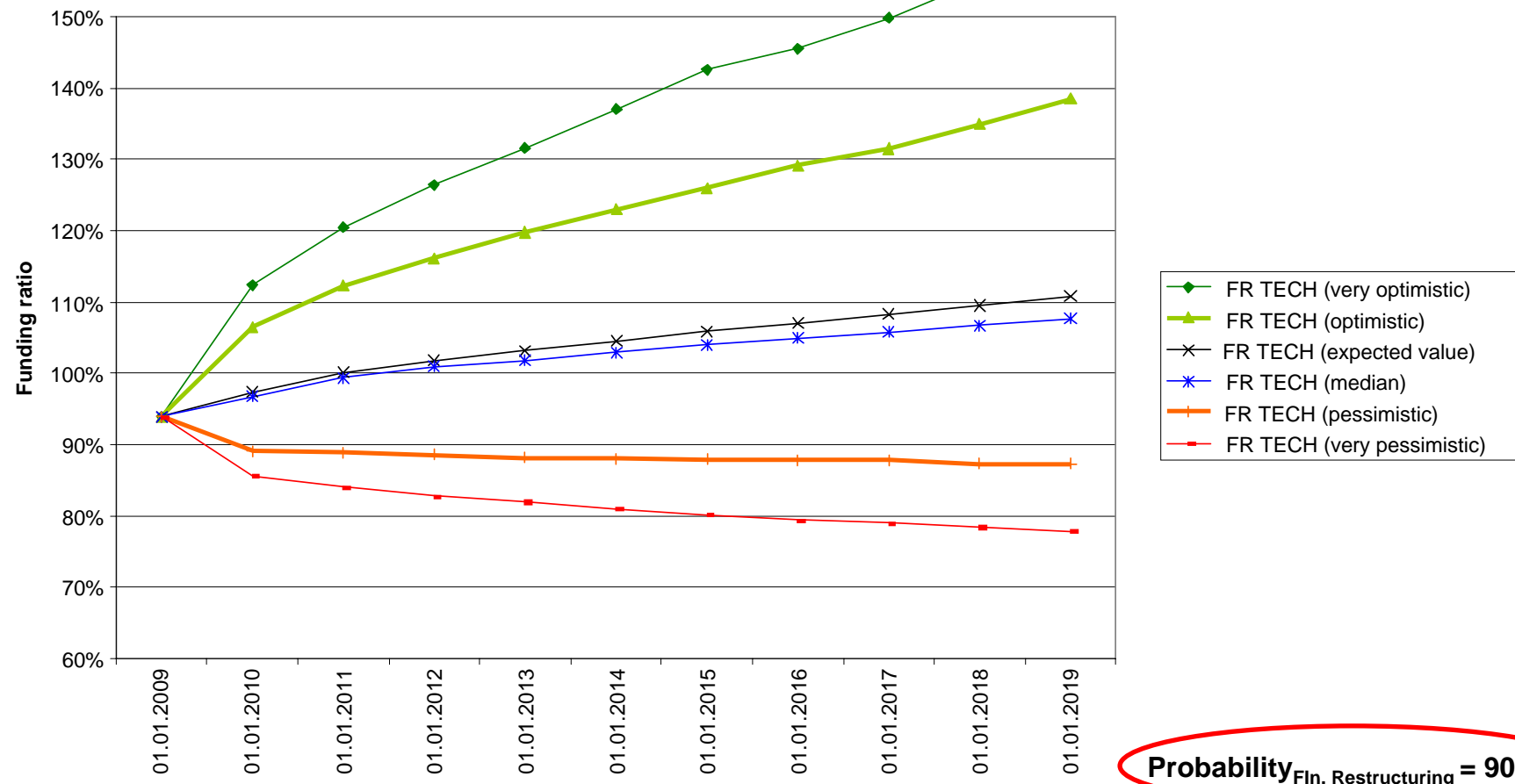


Asset allocation: Funding ratio changes with restructuring measures (1)

- The analysis shows the impact of the following actions to future funding ratio changes:
 1. No interest payments, if the funding ratio is below 100% (“Nullverzinsung”)
 2. Employer contribution reserve with waiver of usage for the next two years within the scope of 3% of the insured wages (“Arbeitgeberbeitragsreserve mit Verwendungsverzicht”).
 3. 3% financial restructuring contribution (“Sanierungsbeiträge“), if the funding ratio is below 100%.

Asset allocation: Funding ratio changes with restructuring measures (2)

- Simulation of the actual strategy (Actions 1 + 2 + 3)



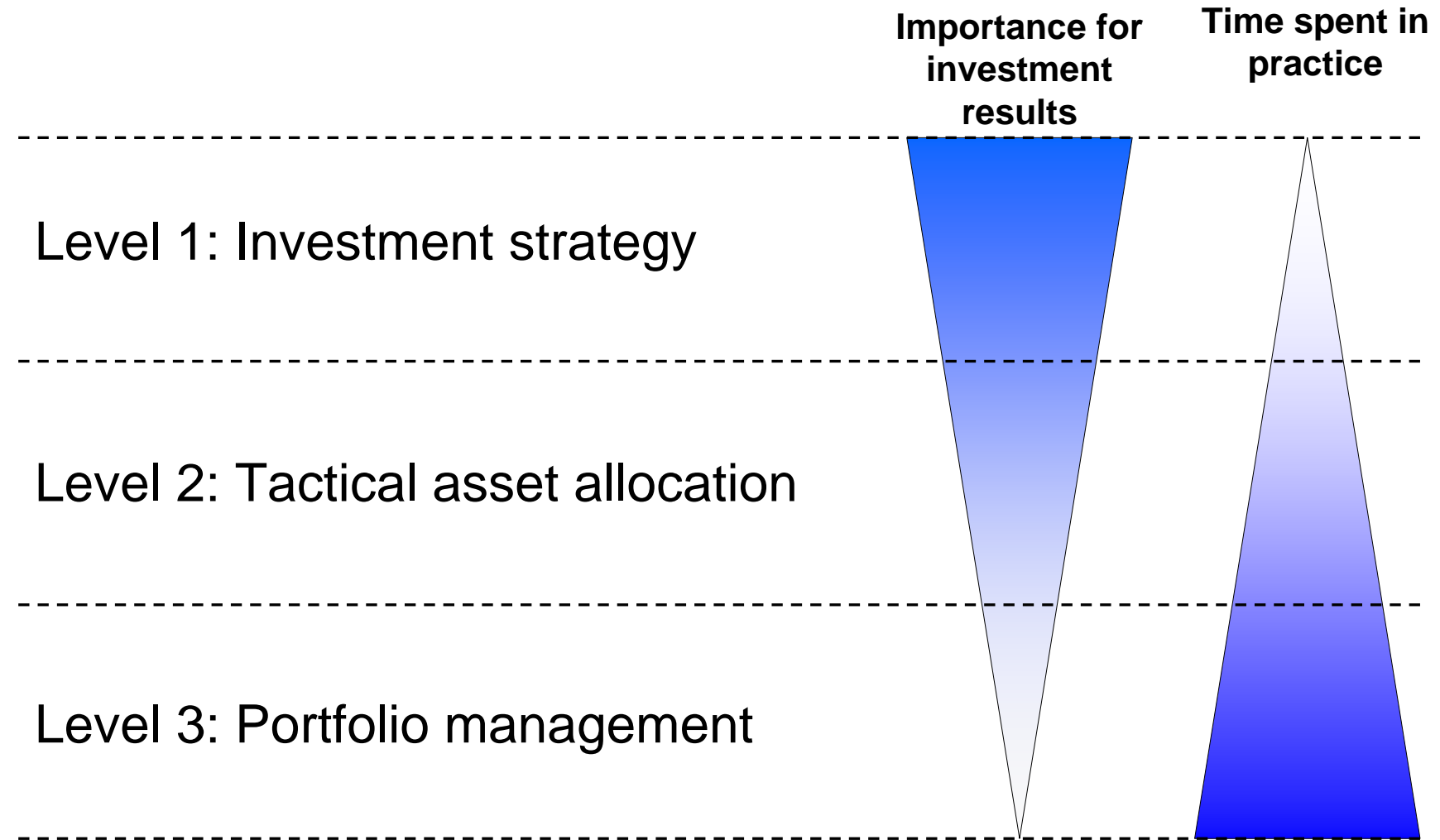
Probability_{Fln. Restructuring} = 90.3%

- Changing the investment strategy in bad times to a less risky strategy (less equity, more bonds) does not guarantee that a funding gap can be neutralized within 10 years. In the shown example, **the risk reduction** leads to lower expected returns and also **lowers the probability of a financial restructuring**. However, the potential risk of a much higher funding gap in the future can be reduced.
- The analysis shows that, assuming the three financial restructuring measures, it should be possible (probability of 90%) to close the funding gap within an adequate time limit, letting the investment strategy unchanged.

Question 2 – Tactical asset allocation

- ***We are certain that the current asset allocation is in line with the risk ability of the pension fund. But the financial crisis changed the portfolio structure dramatically leading to deviations of the actual allocation from the strategic weights. How should we handle rebalancing issues?***

Tactical asset allocation (1)

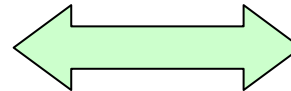


Tactical asset allocation (2)

- Possibilities of tactical asset allocation

Active tactical asset allocation

- Investment Committee
- External advisor
- Overlay manager
- Hedge funds (global macro)
- Active mixed mandates



Rule based rebalancing

- Monthly rebalancing
- Bandwidths
- „Buy and Hold“
- Hedging strategies

- Following **rule based** rebalancing mechanisms could be used in practice:
 - **Monthly Rebalancing (MR)**: Rebalancing at the end of every month.
 - **Bandwidths approach (min/max. bandwidths)**: Investment strategy with lower and upper bandwidths. As soon as one limit gets touched the whole portfolio is rebalanced.
 - **Buy-and-Hold (B&H)**: No rebalancing.
 - **„Constant Proportion Portfolio Insurance“ (CPPI)**: Fixed trading rule which tries to keep a minimal asset value („floor“).
E.g.: Buy equity if stock markets are rising faster than other investment categories; and vice versa.

Tactical asset allocation (4)

- Example:
 - Investment portfolio of an average institutional investor.
 - Time horizon: January 1960 – December 2008

Category	Min	Strategy	Max	Bandwidths
Swiss Bonds	38.6%	43.6%	48.6%	+/- 5%
Global Bonds	5.6%	10.6%	15.6%	+/- 5%
Swiss Equities	5.9%	10.9%	15.9%	+/- 5%
Global Equities	15.8%	20.8%	25.8%	+/- 5%
Real Estate	9.2%	14.2%	19.2%	+/- 5%

Category	Transaction costs
Swiss Bonds	0.60%
Global Bonds	0.60%
Swiss Equities	0.30%
Global Equities	0.30%
Swiss Real Estate	1.20%

Tactical asset allocation (5)

- Example:

Jan 1960 - Dec 2008	Strategy	Anticyclical		Procyclical	
		Monthly Rebalancing	Bandwidths Approach	Buy-and-Hold	CPPI
Return p.a. (gross)	5.34%	5.34%	5.48%	5.15%	4.95%
Return p.a. (net)	5.34%	5.23%	5.45%	5.15%	4.90%
Volatility p.a.	5.94%	5.94%	6.02%	7.58%	5.98%
Loss of return because of costs p.a.	0.00%	0.11%	0.03%	0.00%	0.05%
Maximal amount of equities	31.68%	34.48%	39.68%	61.61%	52.91%
Minimal amount of equities	31.68%	25.74%	22.89%	24.91%	3.59%
Lowest return	-8.85%	-8.85%	-10.41%	-12.86%	-9.47%
Highest return	5.96%	5.96%	5.95%	6.50%	5.24%
Tracking Error	0.00%	0.00%	0.50%	2.17%	2.02%
Turnover (buys + sales)	0.00%	20.33%	5.13%	0.00%	8.71%

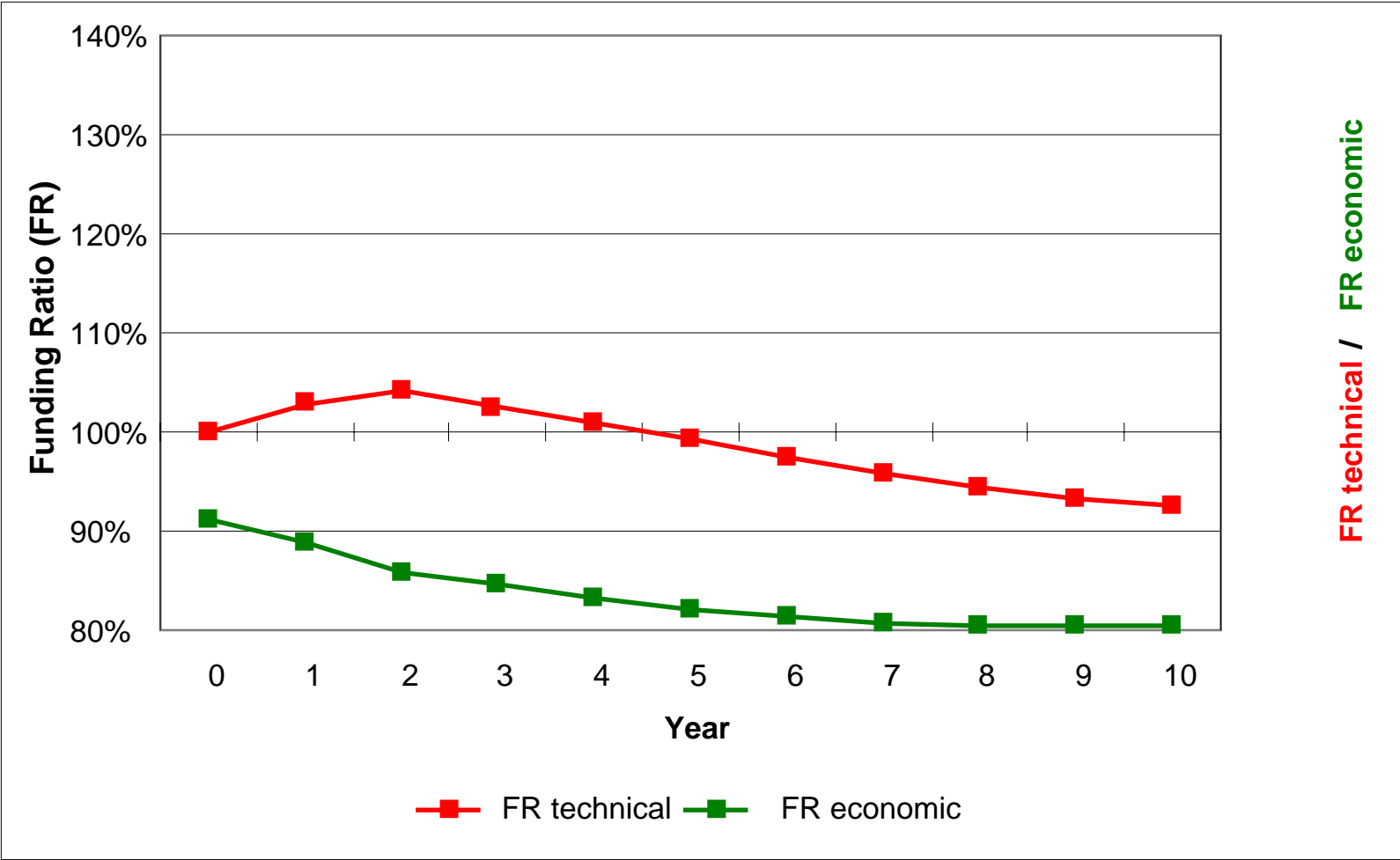
- ***The analysis shows that the bandwidths approach yields the highest return for a period of 48 years. In addition, an attractive risk/return relation can be observed.***

- Rule based bandwidths approach:
 - Pros:
 - Low implementation risk (follows the investment strategy)
 - Anticyclical investment behavior
 - Low transaction costs (assuming reasonable bandwidths)
 - Low monitoring costs
 - No forecasting needed
 - Cons:
 - Investor's forecasts are not implemented
- ***Tactical asset allocation as well as rebalancing mechanisms are often not managed in a systematic manner.***
- ***A „rule based bandwidths approach” leads to a disciplined and anticyclical rebalancing.***

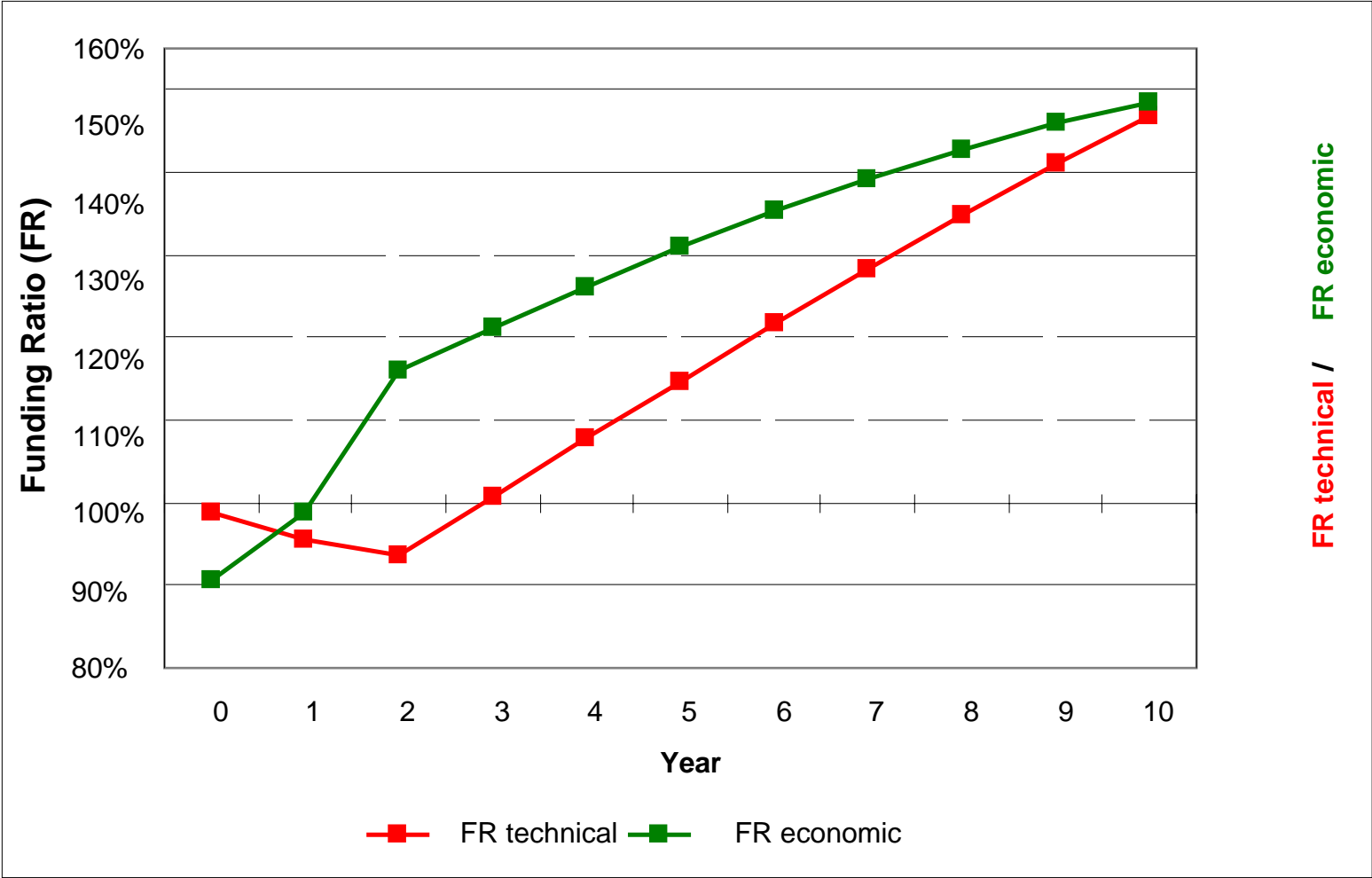
Question 3 – Interest rate risk

- ***Past interest rates are rather low. What are possible consequences of higher interest rates (inflation)? Should pension funds care about inflation risk? Does it make sense to hedge rising interest rates?***

Interest rate risk: Deflation shock



Interest rate risk: Inflation shock



- **Impacts of a deflation:**

- Lower interest rate level leads to lower expected returns
- **Short-term** profits on bonds.
- Liabilities are fixed → present value of all the liabilities is higher if the discount rates are lower
- **Short-term profits on bonds are lower than the loss due to higher present values of liabilities.**

- **Impacts of inflation:**

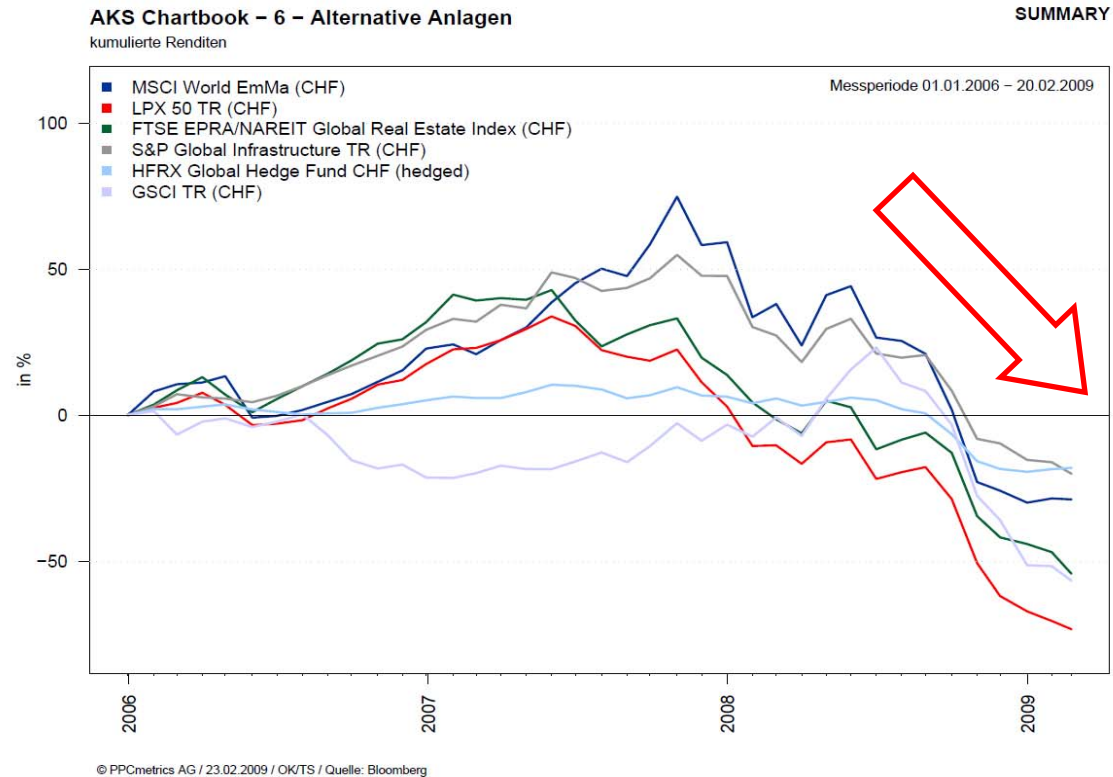
- Rising interest rate level leads to higher expected returns
- **Short-term** losses on bonds
- Liabilities are fixed → present value (economic value) is lower due to higher discount rates. Liabilities can be financed much easier
- **Short-term losses on bonds are lower than profits due to lower present values of liabilities**

- **Deflation** (falling interest rates) has a significant impact on the financial situation of pension funds. Given a long term deflation, restructuring measures have to be introduced quickly to stabilize the financial situation of the fund.
- **Inflation** (rising interest rates) has overall **positive** impacts on the financial situation of pension funds. The minimal requirements can be achieved by having a less risky investment strategy. Further, unequal treatment of active lives and pensioners can be reduced.

Question 4 - Diversification

- ***Even though the portfolio was heavily diversified we experienced significant losses in 2008. Is the concept of diversification dead?***

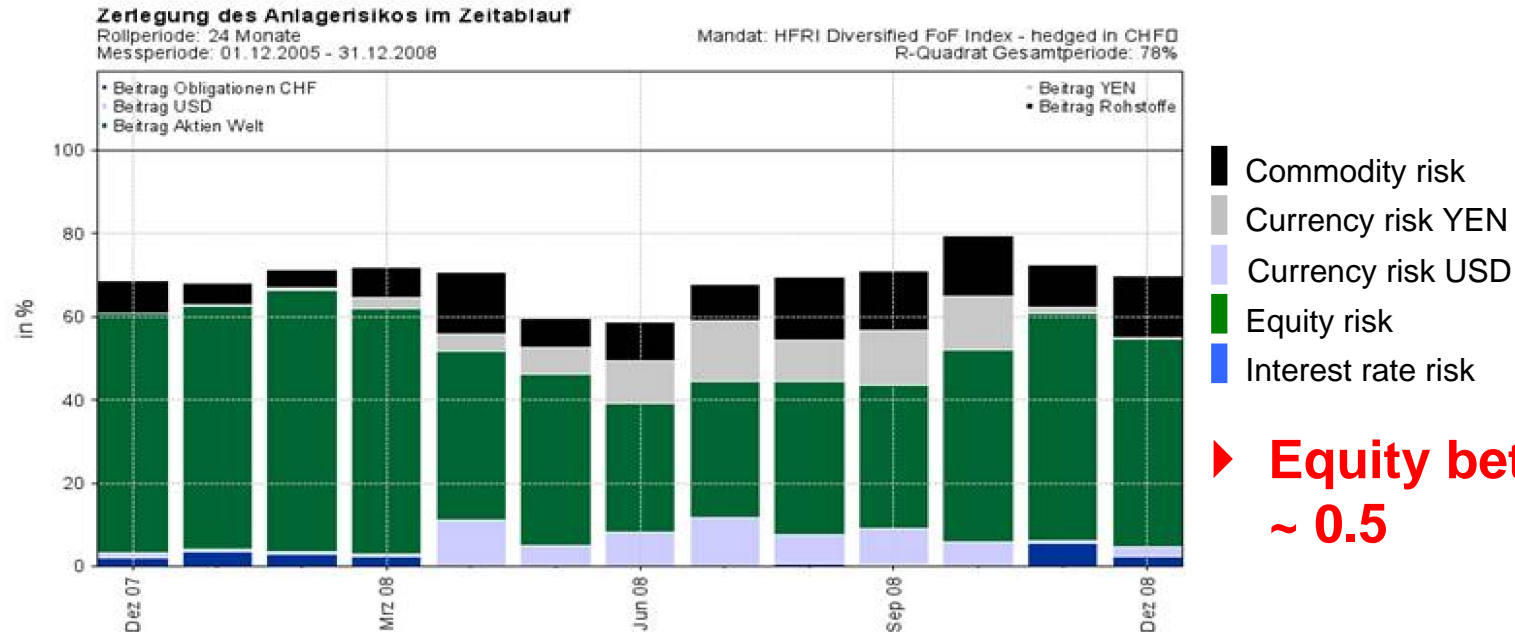
Diversification (1)



- In 2008 alternative investments were not able to generate absolute returns.

Diversification (2)

- Why did the diversification did not work for many pension funds?
- **Risk accumulation:**
 - For example: Risk decomposition of the HFRI Fund-of-Fund-Index:



► **Equity beta:**
~ 0.5

Diversification (3)

- **Risk accumulation:**

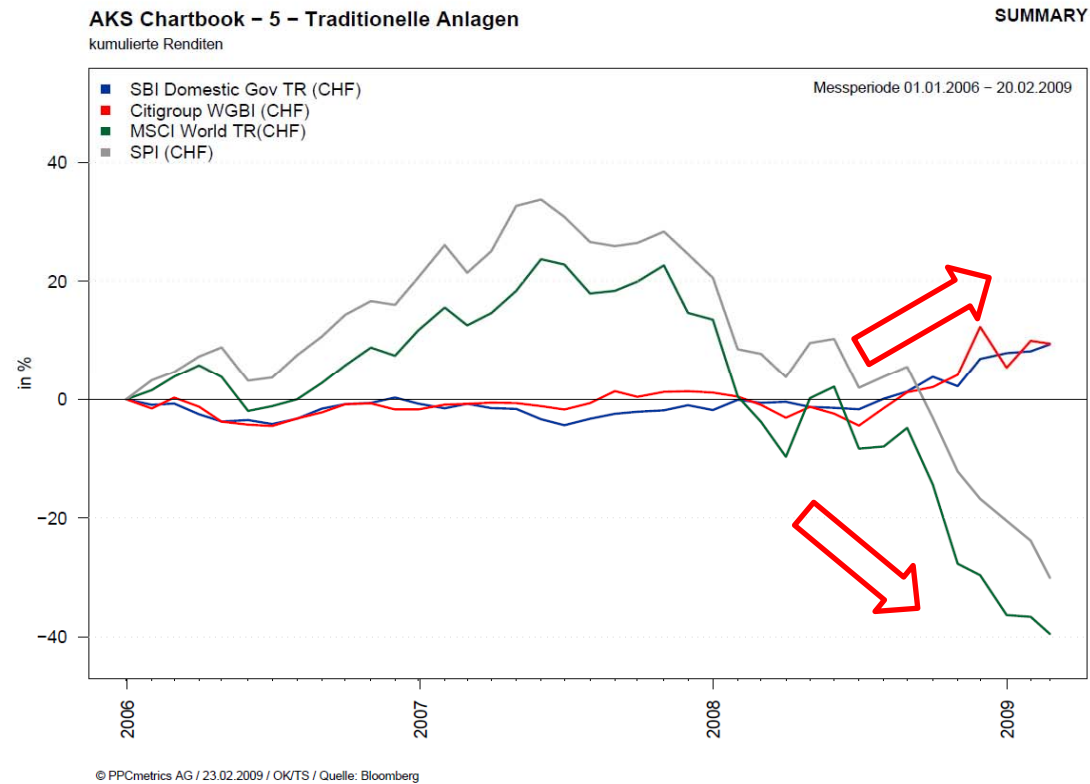
- Hedge Funds = Equity beta = 0.5
- Corporate Bonds = Government Bonds + Equity
- Convertibles = Government Bonds + Equity
- Private Equity = Pure equity risk
- Structured Products = Counterparty risks (equity related)
- ...

➤ **The diversification often led to an implicit increase of the equity quota.**

- **But Diversification is still not dead:**

- Not the number of investment categories is relevant but their **independence**. An investment category should not be replicable by other categories.
- Pure, traditional investment categories (e.g. Government Bonds) still had a diversification effect in 2008.

Diversification did work, even in 2008 ...



➤ „Puristic“ diversification did work.

- Changing the investment strategy after a stock market crash to a less risky strategy might not be the optimal solution to restructure a pension fund.
- Given that a pension fund is certain that the current asset allocation is in line with the risk ability, its advisable to have a systematic approach regarding rebalancing.
- Inflation has a positive impact on the financial situation of a pension fund. A long term deflation is a worst case scenario.
- Diversification with asset classes having an equity exposure often led to an implicit increase of the equity quota.