European actuarial academy

an initiative of the 'Deutsche Aktuarvereinigung', the Dutch 'Actuarieel Genootschap', the 'Schweizerische Aktuarvereinigung' and the 'Aktuarvereinigung Österreichs'

Swiss Pension Funds - Possible amendments to benefits, financing and by-laws due to longevity

Roland Schmid

Agenda

- Definitions
- Trends
- Statutory framework conditions
- Responsibilities of the board of foundation
- Solutions
- Musterkasse
- Conclusions

Definitions

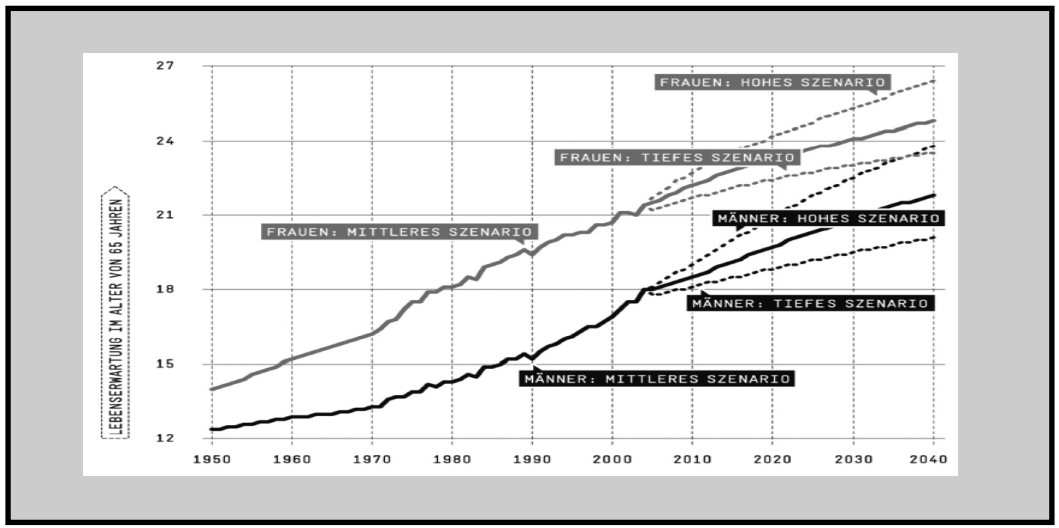
- Interest rate risk arises if the income from the investments of the pension fund fails to reach (or exceeds) the minimum return
- Longevity risk is the risk that the life expectancy will continue to change
- Dynamic target return is the return that must be generated in order to leave the cover ratio at the current level
- Critical cover ratio is reached when the maximum possible restructuring measures are not sufficent to reach a cover ratio of 100%.

Trends

- Increase in life expectancy in Switzerland continues
- Life expectancy of 65 year olds was as follows:

1900	men	9.9 years
	women	10.1 years

- Life expectancy depending on the scenario in 2060 for 65 year olds will be 24 years for men or 27 years for women.



Source BFS

Trends

- Increase in life expectancy of the Swiss population is also perceptible in the technical bases of the pension funds
- Life expectancy of 65 year olds was as follows
  - BVG2000 men 17.8 years
    women 21.1 years
  - BVG2005 men 17.9 years
    women 21.0 years
  - BVG2010

Lebenserwartung mit 65 Jahren	BFS	BFS	Anpassung qx BVG 2010 (2007)	Anpassung qy BVG 2010 (2007)
Jahr	Männer	Frauen	Männer	Frauen
2010	18.12	20.56	0.00%	0.00%
2015	19.20	22.80	-14.00%	-21.00%
2020	19.80	23.30	-21.00%	-31.00%
2025	20.30	23.70	-26.00%	-35.00%
2030	20.90	24.10	-31.00%	-38.00%

Development of the age groups

- Impact of longevity is changing.

Jahr	Anteil unter 20-Jährige in %	Anteil 20-64-Jährige in %	Anteil der 65-Jährigen und Älteren in %	Jugend-quotient 1) in %	Alters-quotient 2) in %	Gesamt-quotient 3) in %
1970	31.0	57.5	11.5	53.9	20.0	73.9
1975	29.6	57.7	12.8	51.3	22.1	73.5
1980	27.5	58.6	13.9	47.0	23.7	70.7
1985	24.9	60.9	14.2	41.0	23.2	64.2
1990	23.4	62.0	14.6	37.7	23.5	61.2
1995	23.3	61.9	14.8	37.7	23.9	61.6
2000	23.1	61.5	15.4	37.6	25.0	62.6
2005	21.9	62.1	16.0	35.3	25.7	61.0
2010	20.9	62.2	16.9	33.5	27.1	60.7
2020	19.8	60.1	20.1	33.0	33.4	66.4
2030	19.5	56.3	24.2	34.7	43.0	77.7
2040	18.6	54.5	26.9	34.1	49.2	83.4
2050	18.2	54.0	27.7	33.8	51.3	85.1
2060	18.4	53.3	28.3	34.5	53.1	87.6

Quellen: ESPOP (1970-2009), STATPOP (ab 2010), SCENARIO (2020-2060)

Verhältnis
1) 0-19-jährig ***zu*** 20-64-jährig
2) 65-Jährig & Älter ***zu*** 20-64-jährig
3) 0-19-Jährig und 65-Jährig & Älter ***zu*** 20-64-jährig

2020-2060 gemäss mittlerem Szenario A-00-2010

Statutory framework conditions

- Federal Law on Old-age and Survivors' insurance (BVG Minimum)
  - mandatory insurance (Art. 2 BVG)
  - guaranteed payment of interest (Art. 15 BVG)
  - guaranteed exchange rate (Art. 14 BVG)
  - pension fund must offer pensions (Art. 37 BVG)
  - consequence: latitude of foundation board restricted
- Protection of current pensions (Art. 65d BVG)
  - Participation of pension recipients in free resources (Art. 36 BVG)
- Restructuring constraint where there is shortage of cover (Art. 65d BVG)
  - Financial risk for employers and employees in BVG Minimum

Swiss GAAP FER 26

- Accounting of pension liabilities under FER 26
  - according to recognised principles (market value principle)
  - generally accessible bases
  - technical interest rate set by the foundation board
  - generation and periodic tables are allowed
  - reserve for longevity in accounting with periodic tables
- One exception to the market value principle in FER 26 is the valuation of the liabilities using the technical interest rate
  - technical interest rate stipulated in professional guidelines of the Chamber of Pension Insurance Experts (FRP 4) as reference size.
  - impact of the method

Anticipated changes in framework conditions

- Pensioner democracy
  - Increasing political influence of the pension recipients
  - Example: exchange rate consultation
  - Participation of the pension recipients in restructuring the pension fund?
- Increasing regulation by the legislator
  - Governance
  - Trend towards regulating specific problem areas
- Employers
  - Holistic consideration of liabilities
  - Increasing need for active risk management
  - Impact of the international accounting

Development of return of low risk investments

25. Januar 2012, 20:13, NZZ Online

Die Zinsen bleiben in den USA noch lange tief

Notenbank will die Nullzinspolitik bis mindestens Ende 2014 beibehalten

In den USA dürften die Zinsen bis Ende 2014 auf rekordtiefem Niveau bleiben, wie die Notenbank am Mittwoch bekanntgab. Vorher sei wegen der schwierigen

12. Januar 2012, 15:03, NZZ Online

EZB belässt Leitzins bei einem Prozent

Der Entscheid war von den Märkten erwartet worden

Sitz der Europäischen Zentralbank in Frankfurt am Main. *(Bild: Imago)*

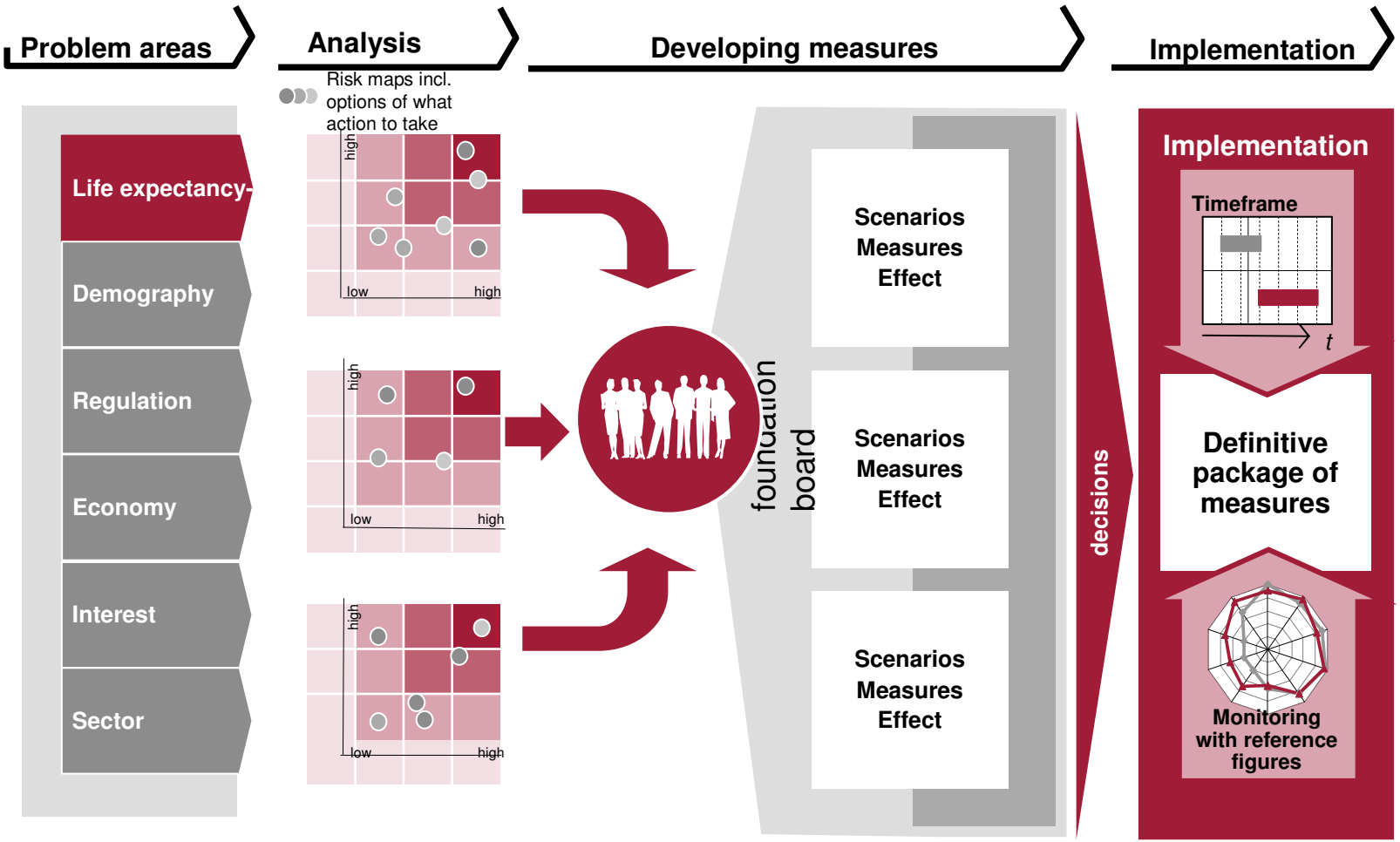
Die Europäische Zentralbank lässt den Leitzins unverändert und legt damit eine Zinspause ein. Dies war von Experten im Vorfeld erwartet worden. EZB-Präsident Mario Draghi will sich allerdings alle Optionen offen halten.

In the medium term continued low returns (particularly with low risk investments)

Responsibilities of the foundation board

- Foundation board is responsible for the financial security of the pension fund
  - Cover ratio almost the only reference figure for foundation board and oversight
- Stabilisation of the pension fund is hard in BVG Minimum
  - Change in benchmark values (e.g. interest, exchange rate etc) not possible
- Structural reform:
  - Responsibilities stipulated at legislative level
  - Responsibility of the foundation board governed similarly to the board of directors of a company
- **Management of the pension fund becomes key**

Management as a process



Risk management

- Identifying the relevant risks
  - pension risks for pension fund and company?
- Quantifying the impact of the risks
  - probability that risks will occur?
  - financial consequences?
- Developing options for action and implementation
  - need for action and what are the options that can be taken to prevent or reduce these risks?
  - How can these be implemented?
- Risk control
  - Monitoring the package of measures
  - Developing the relevant reference figures

Risk capacity of a pension fund

- Financial risk capacity
  - Fluctuations in the assets can be contained without initiating restructuring measures
  - Financial strength of the employer and the willingness to provide financial support to the pension fund in crisis situations
  - The cover ratio reflects the financial risk capacity of a pension fund

- Structural risk capacity
  - Measure for restructuring capacity
  - Measurement of partial aspects of the structural risk capacity with reference figures (as at reporting date)
  - The cover ratio says nothing about the structural risk capacity of a pension fund

Analysis of risks

Correct reference figures shows extend of change

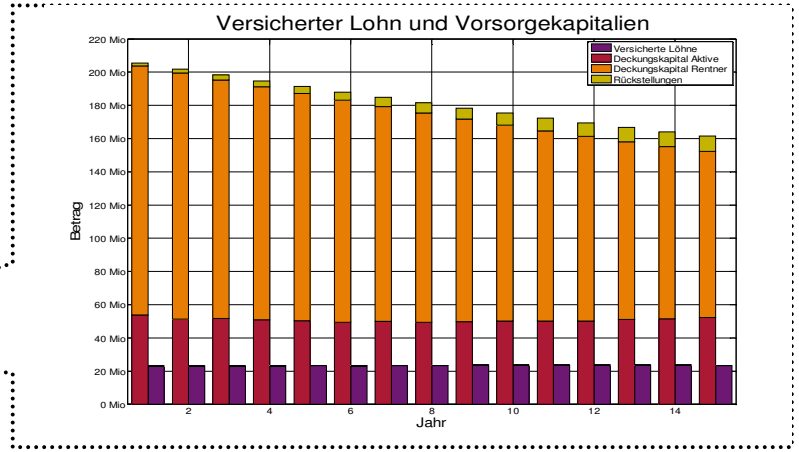
Structural risk capacity

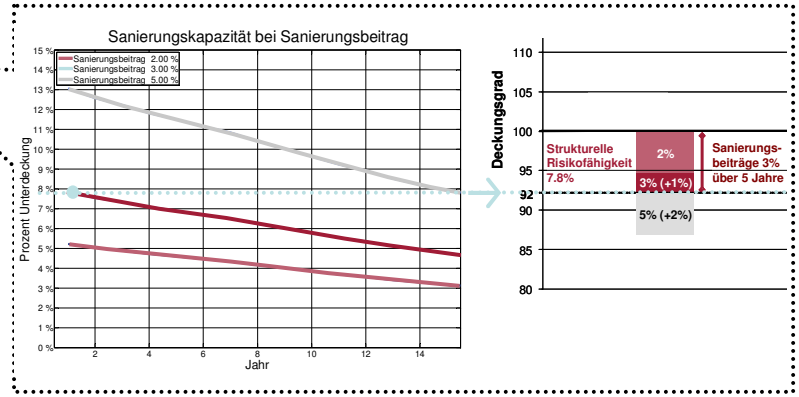
The structural risk capacity is a measure of restructuring capacity.

The restructuring capacity of a pension fund can be defined using reference figures:

- reference figure ratio of the total salary to the pension capital
- quantification of the restructuring capacity results in the appropriate measures being taken by the foundation board

Examples





Risk analysis

Correct reference figures shows degree of change

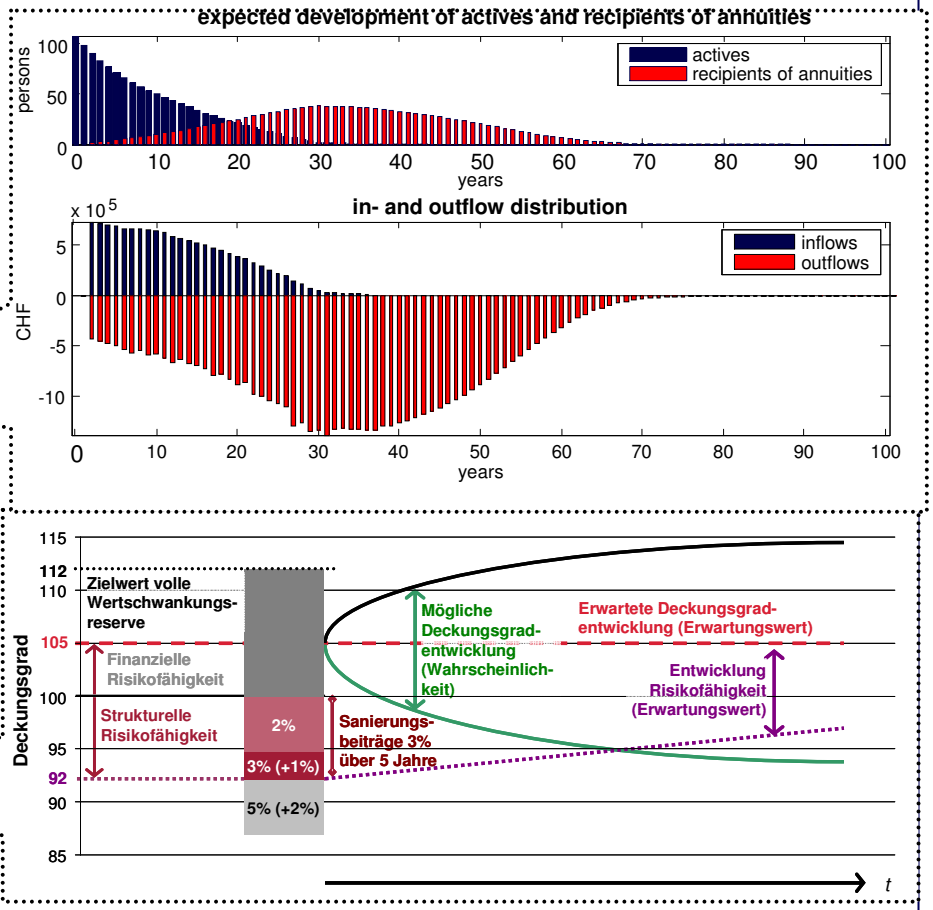
Financial risk capacity

Financial risk capacity is a measure of the stress capacity (ability to neutralise fluctuations on the asset side).

A pension fund's stress capacity can be defined using reference figures:

- reference figure economic cover ratio (liabilities calculated in accordance with expected interest rate curve
- Including the active side results in quantifiable assessment of the overall risk capacity

Examples



Influence of longevity in accordance with FER 26 – influence on cover ratio

- Longevity risks
  - are cover ratio-related
  - are generally financed through third party contribution payers

Transitional profits and losses arise where there is a change in basic principles

- reserves for longevity
- are generally financed through third party contribution payers

And so:

longevity risks are interest rate risks!

Influence of longevity in accordance with FER 26 – influence on cover ratio

- Difference between observed and actually occurred mortality
  - Mortalities vary greatly depending on various factors
  - Affluence, type of profession, health, level of education and other factors
  - For individual types of profession it is known that the mortalities even today are in the area of the mortalities extrapolated to 2030.
  - Profit and loss analysis and where applicable fund-specific adjustment of the basic principles
  - Flows into the annual result and grows stealthily

And so:
longevity risks are interest rate risks!

Managing longevity risk (1)

- Adaptations in the benefit regulation; the following applies as a rule:
  - Increase in the cash inflows or decrease in the cash outflows
    - Decrease exchange rate, increase contributions, etc.
  - "Risk optimised" cash flows
    - Shifting of the longevity risk to the intended recipients
    - Capital constraint

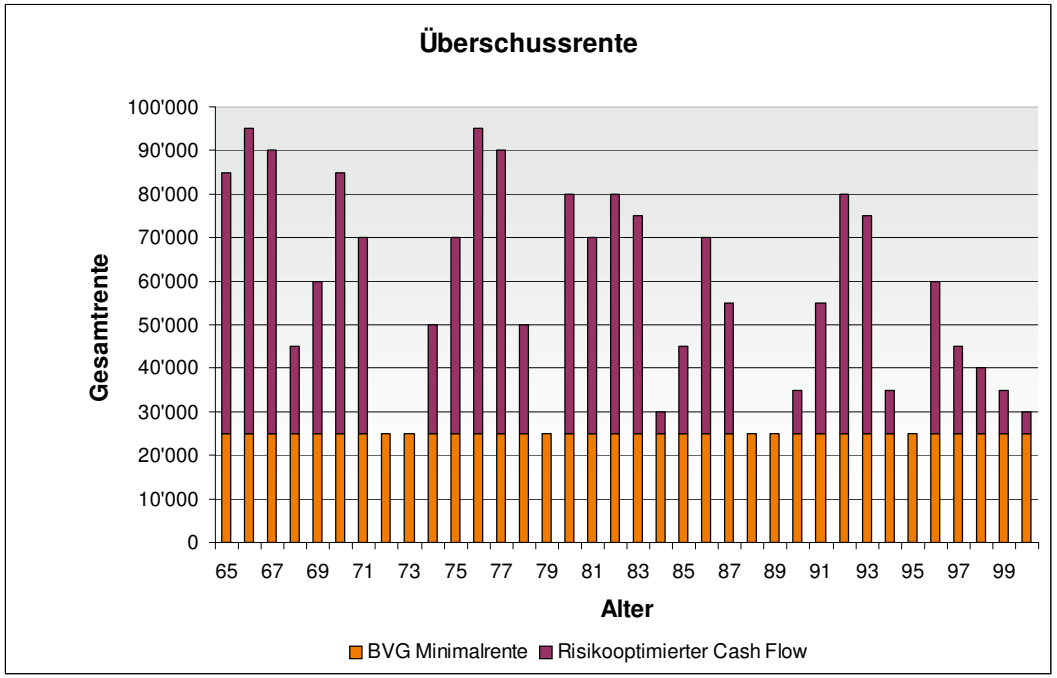
- Shifting of the longevity risk to the intended recipients or to an external risk carrier
  - Reinsurance
  - Longevity swaps

Managing longevity risk (2)

- Reduction conversion rate
- Define longevity contribution
- Capital payments
  - Shifting of longevity risk to the insured
  - BVG minimum pension (!)
- Implementation of Art. 1 lit. e BVV2
- or....

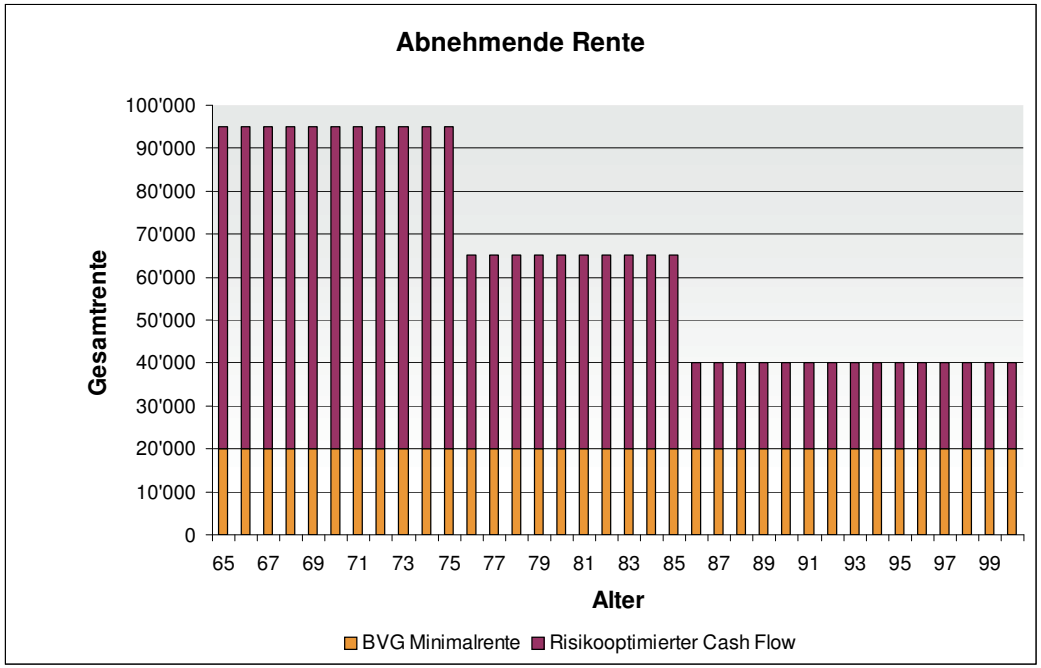
Managing longevity risk (3)

- Breakdown of the pension into a guaranteed share and a surplus share (similar to interest payment retirement funds of the active insured)



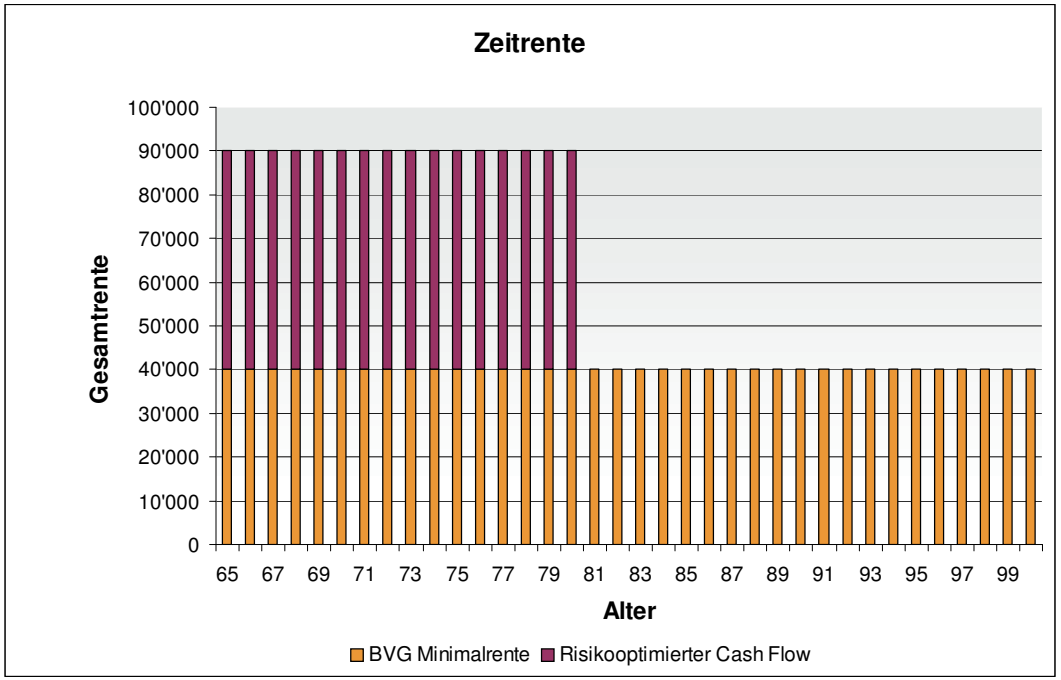
Managing longevity risk (4)

- Pensions which become smaller since the pension requirement decreases as age increases



Managing longevity risk (5)

- Pure annuity (in addition to BVG minimum pension)

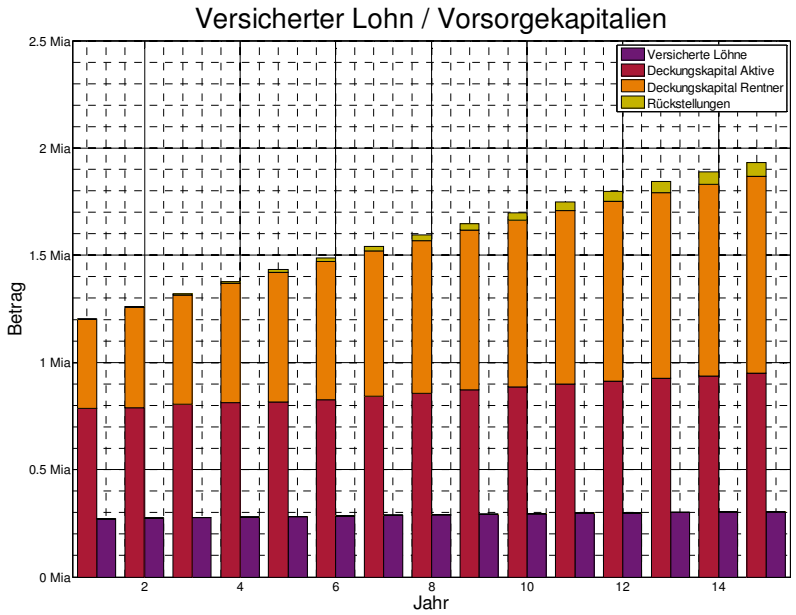


Measuring longevity in a specimen fund

- Projection calculation for a pension fund
  - Interest payment retirement funds active insured 2%
  - Accounting for pension capital pension recipients BVG 2010/3.5%
  - High proportion of retirements in the next 15 years
- Measure for limiting the longevity risk
  - Adaptation of benefit regulation
  - Mandatory benefits as pension; capital payment towards non-mandatory benefit (capital constraint)
- Scenarios for measuring the effectiveness of the measure
  - Status quo (100% pension payment) vs capital constraint
  - Stress test: simulation of a sudden increase in life expectancy after the age of 65 of 5 years

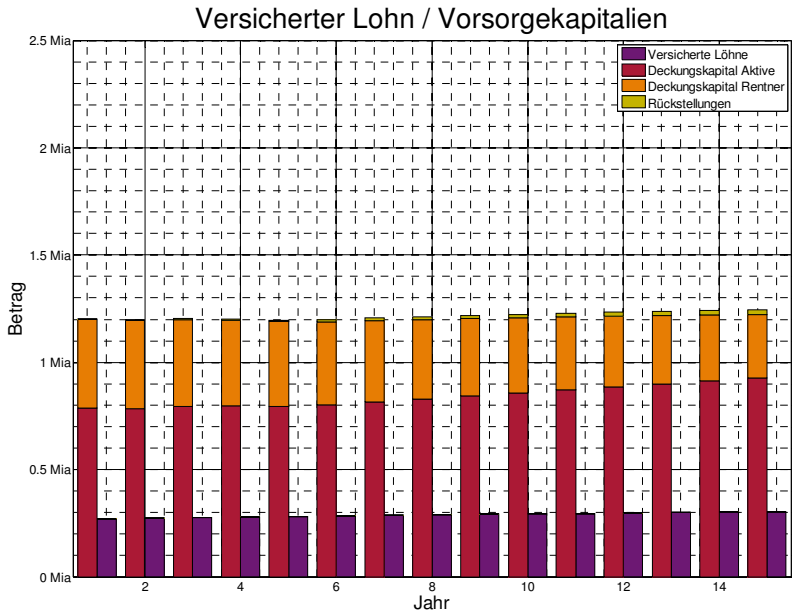
Development of pension liabilities and insured salaries

Status Quo



- Decreasing structural risk capacity
- Restructuring effect of restructuring contributions declines

Capital constraint



- Structural risk capacity remains constant
- Restructuring effect of restructuring contributions remains constant

Reference figures for measuring structural risk capacity

1. $\frac{\text{Current pension payments}}{\text{contributions}}$

2. $\frac{\text{Pension assets}}{\text{Total insured salaries}}$

3. $\frac{\text{Number of pension recipients}}{\text{Number of active insured}}$

4. $\frac{\text{Capital of pension recipients}}{\text{Total pension capital}}$

5. $\frac{\text{Total pension capital and technical reserves}}{\text{Total insured salaries}}$

6. $\frac{\text{Total pension capital and technical reserves}}{\text{Pension Capital of active insured}}$

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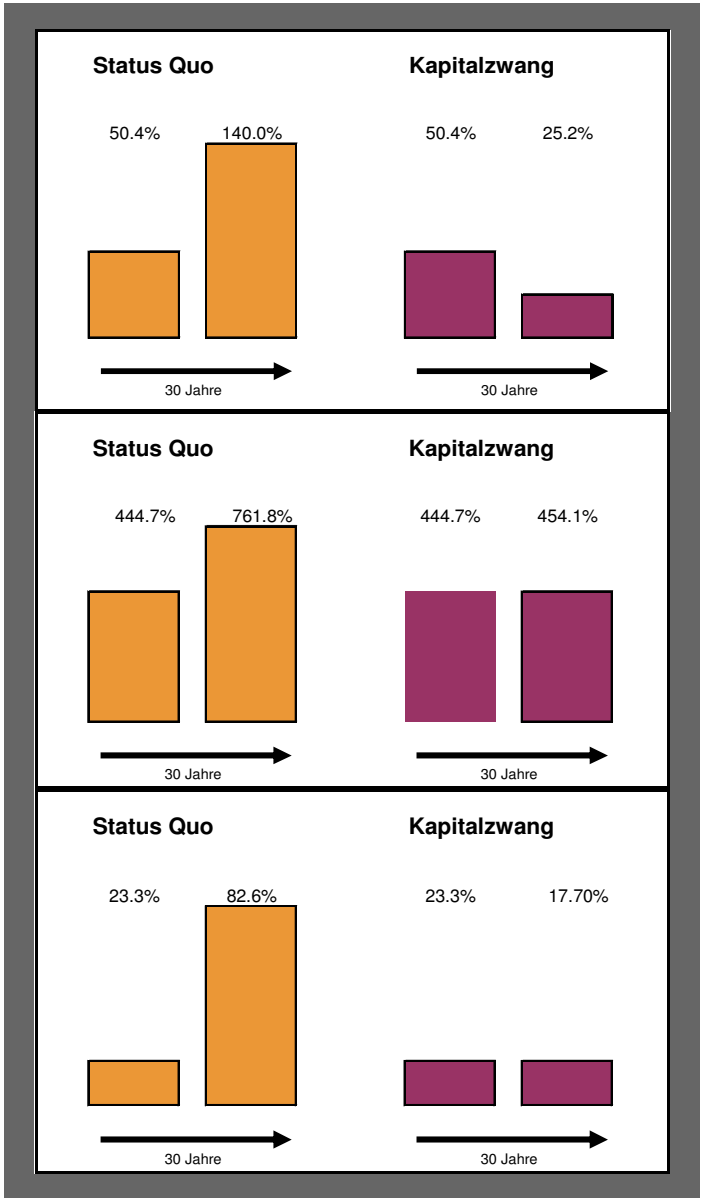
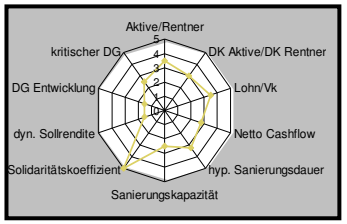
Development of structural reference figures (1)

Ref. figure 1

Ref. figure 2

Ref. figure 3





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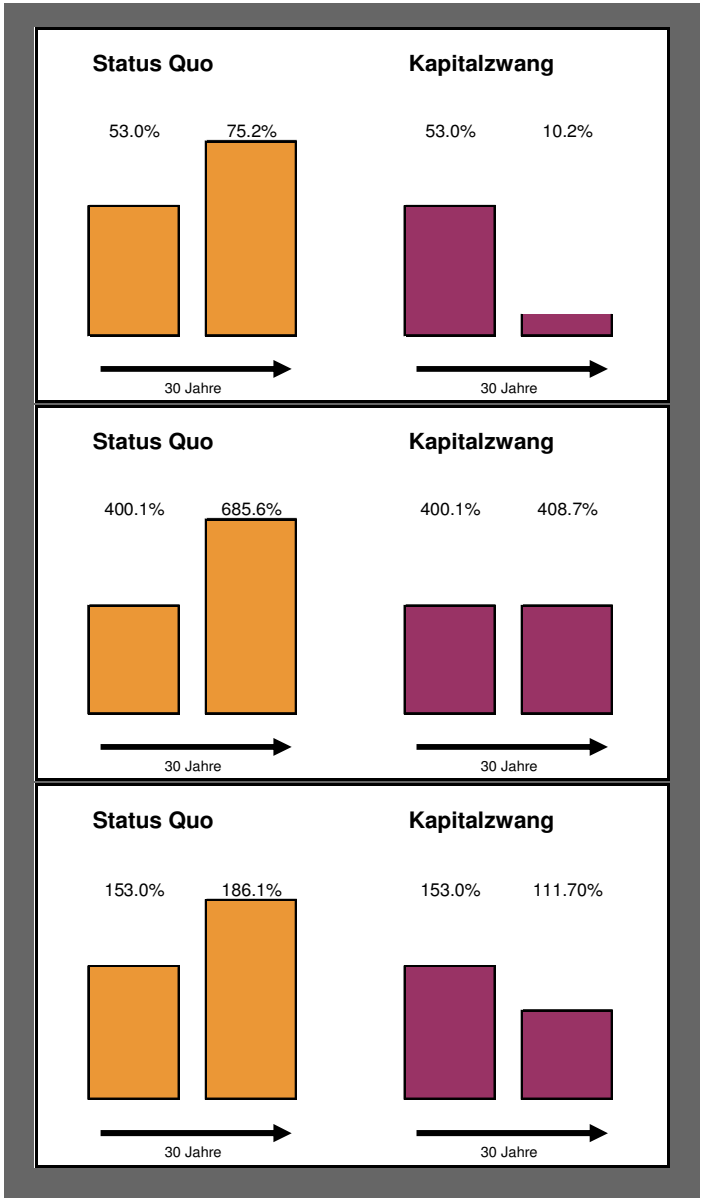
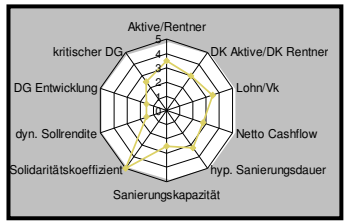
Development of structural reference figures (2)

Ref. figure 4

Ref. figure 5

Ref. figure 6





Change of situation on the time axis

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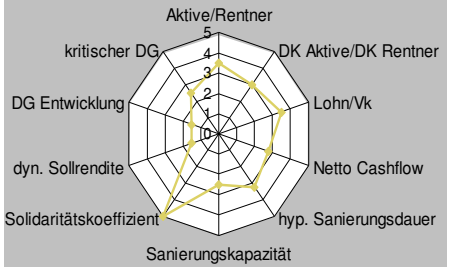
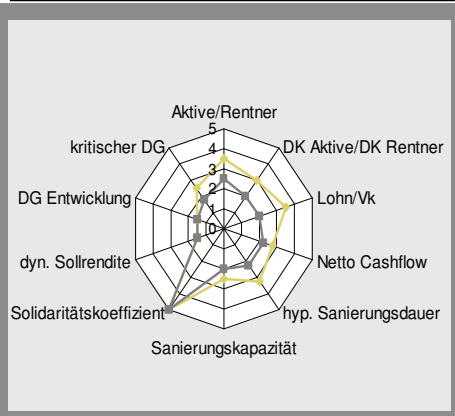
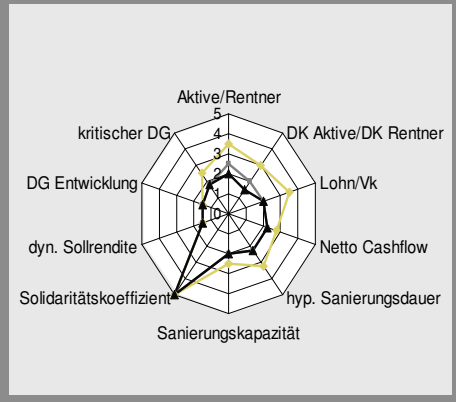
Today | **In 5 years** | **In 10 years**



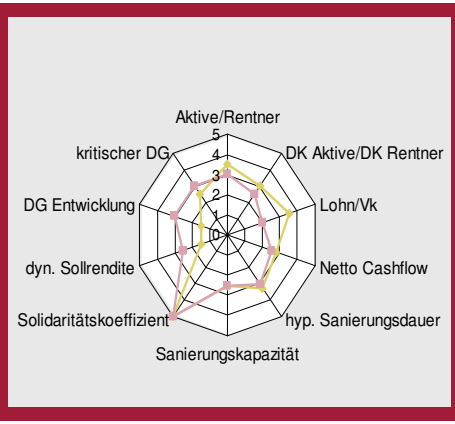
0: High need for action
5: No need for action

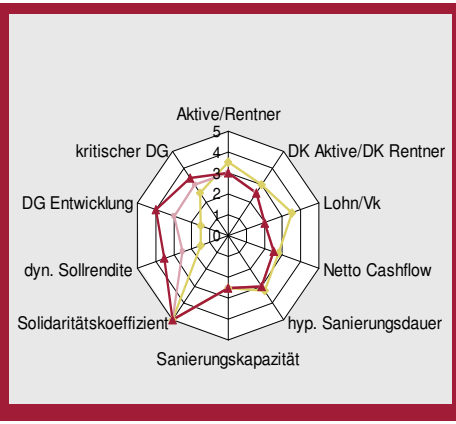
Without measures





With Capital constraint

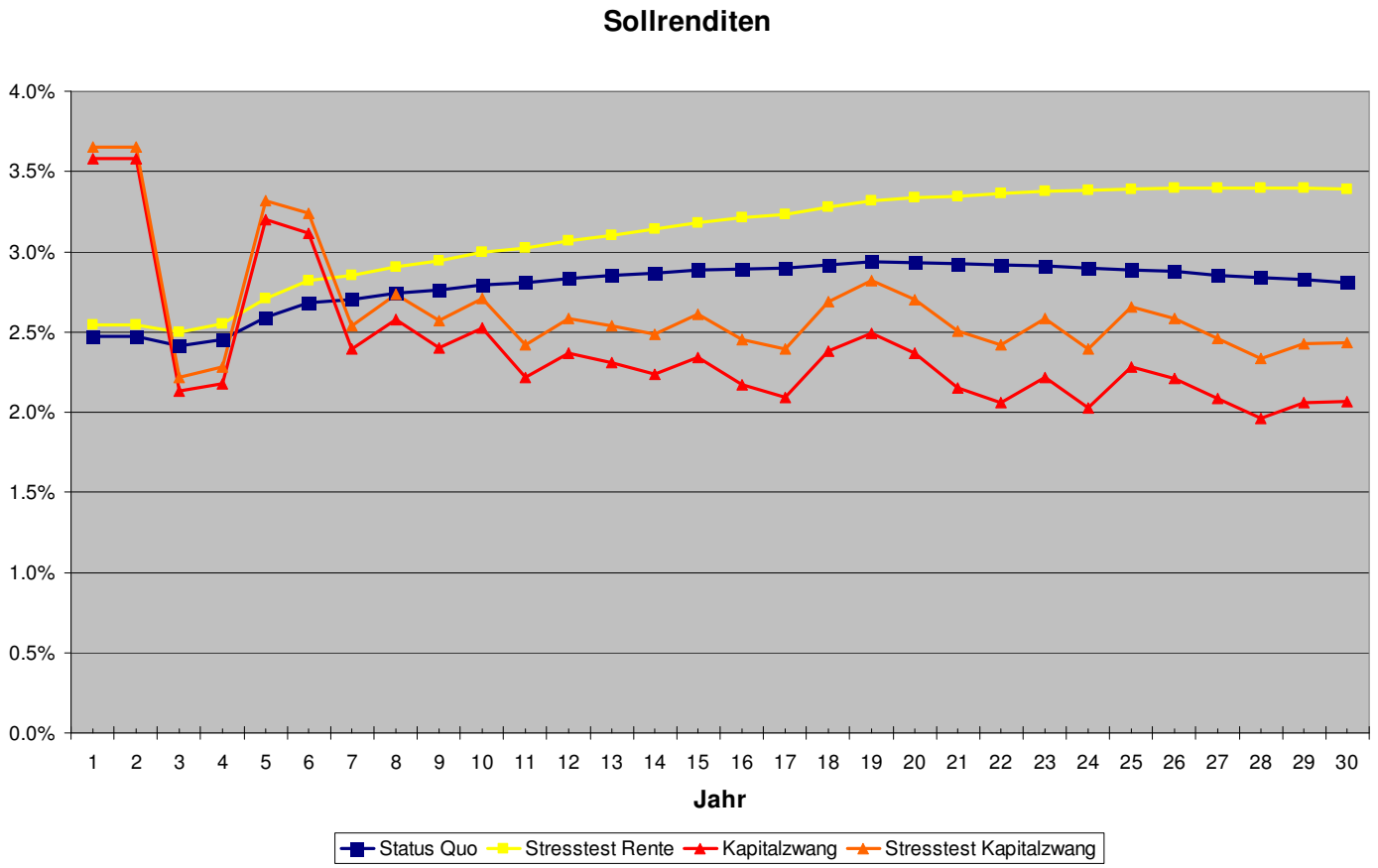




Measuring the influence of longevity on the specimen fund (Dynamic target return)

- Measurement of longevity risk through dynamic target return
  - Consideration of interest requirement (interest on retirement fund, reserves and interest need of pensioners) and cash flow
- Target return is not a measure of structural risk capacity.
- Risk exposure, effectiveness of list of measures and impacts of stress tests can be analysed.
- Impacts on the cash flow streams are taken into account.

Influence of longevity risk on target return



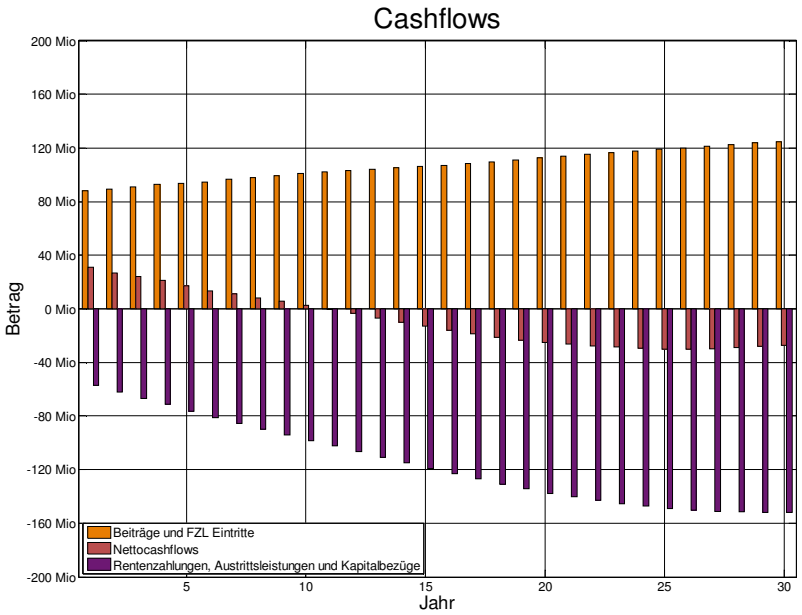
If the technical interest rate drops, for example, to 1.5%, the influence is reduced accordingly. BUT: assets must increase

Interpretation

- In our example the necessary investment return in the status quo scenario where there is a sudden strong increase in life expectancy of 5 years after the age of 65 (stress test) is between 0.1 and 0.35 %.
- The returns expected in the medium term from low-risk investments increase the financial income additionally required and consequently the longevity risk.
- The dynamic target return with the capital constraint measure is significantly higher in the first few years with fluctuations because the cash outflows resulting from strong years that are pensioned have to be offset
  - there are also risks with a capital constraint

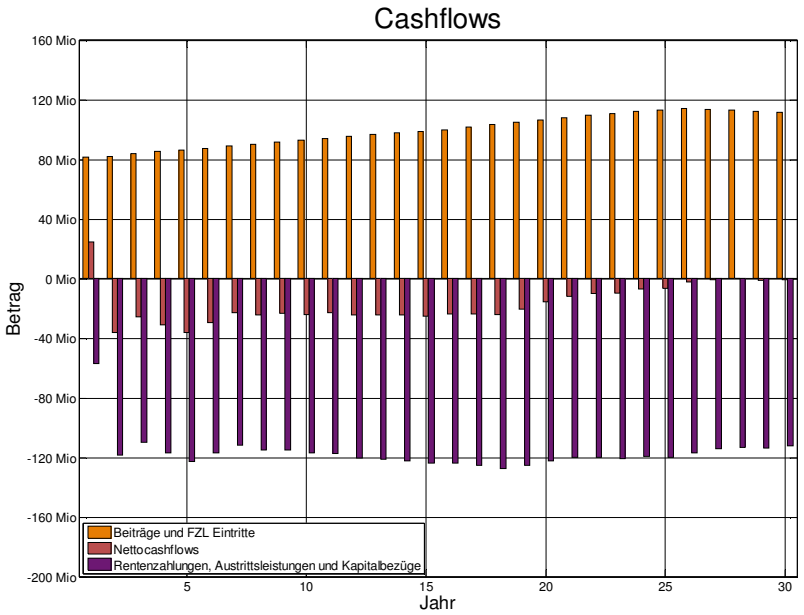
Development of the cash flows

Status Quo



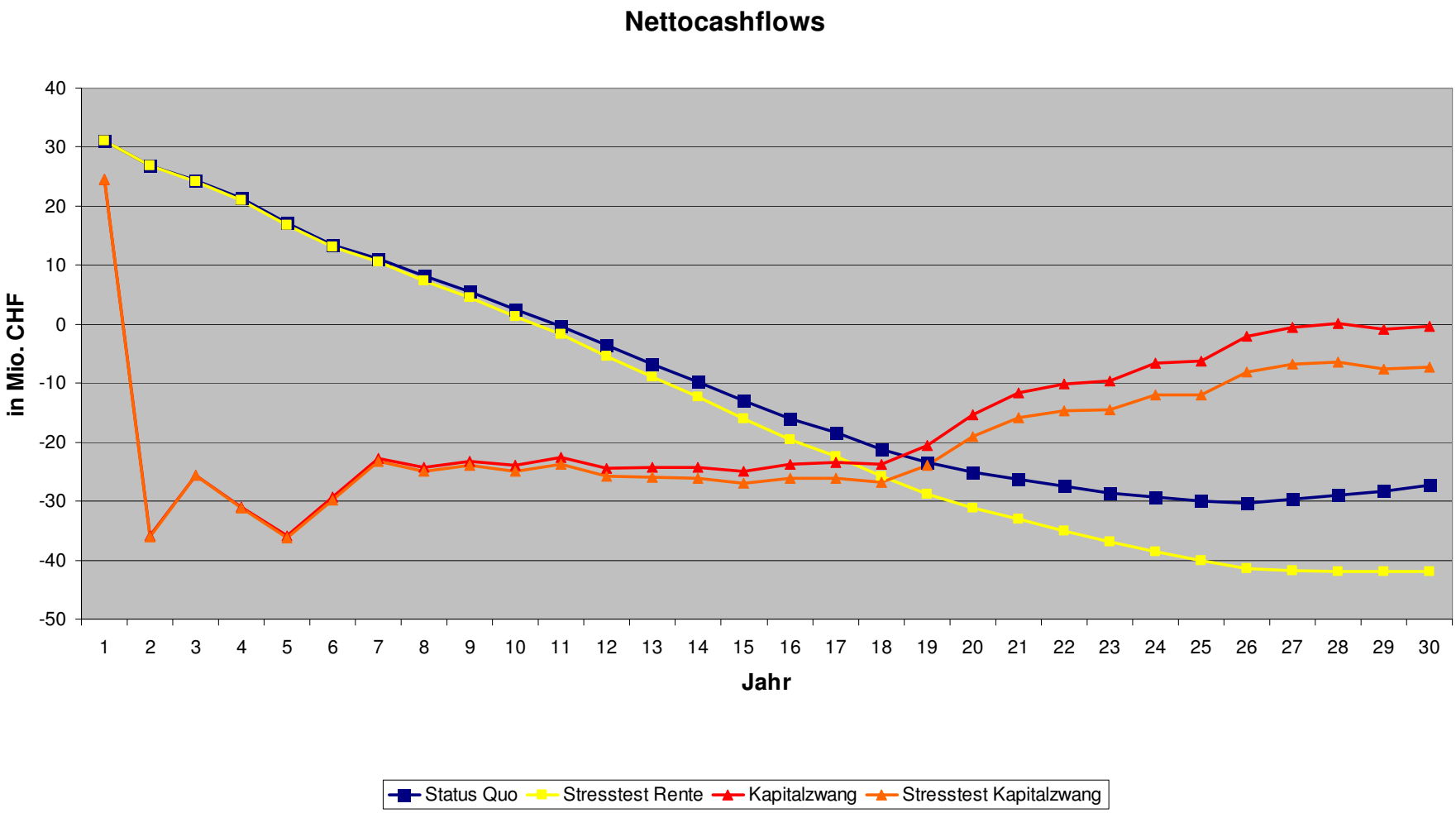
- Positive cash inflow initially, and then negative
- Great dependence of future new entrants and/or the economic risk capacity of the employer

Capital constraint

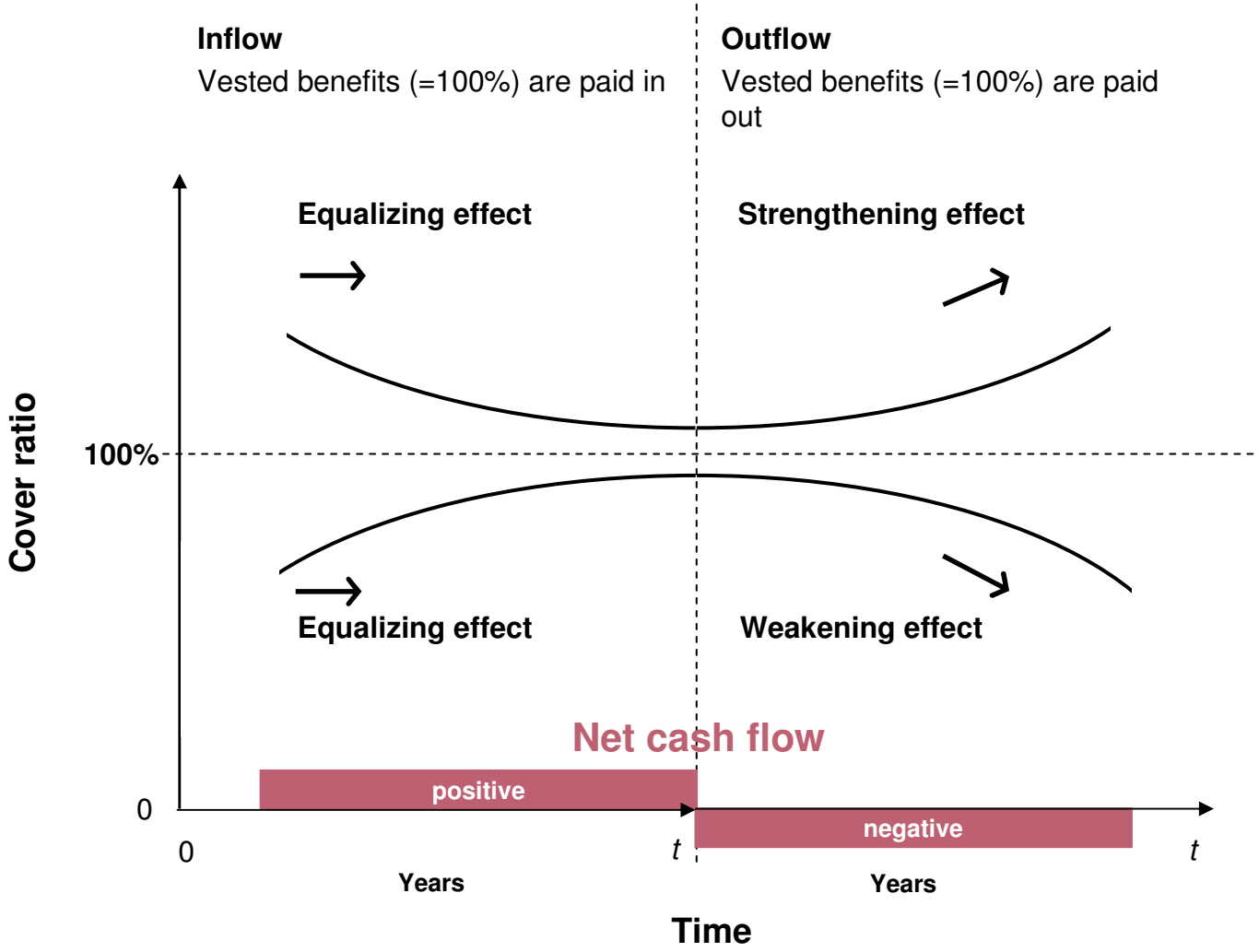


- Highly fluctuating cash flows
- Negative even from the 2nd year and tends to improve
- Lesser dependence of future new entrants and/or the economic risk capacity of the employer

Influence on net cash flow

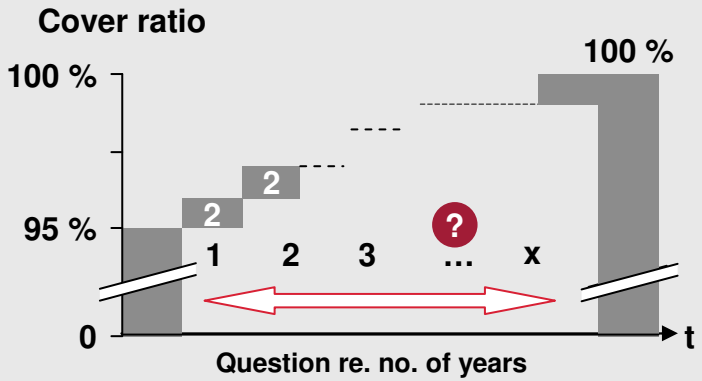


Risk of capital constraint



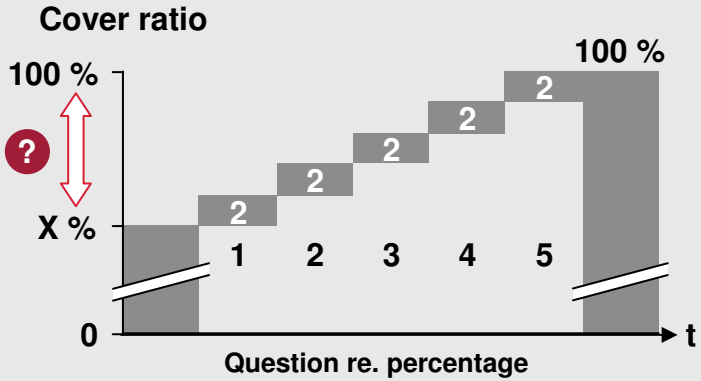
Concept of hypothetical restructuring duration and capacity

1. Hypothetical duration of restructuring



- Should the fund incur a shortage of cover with a cover ratio of 95%:
  How long would restructuring by means of a fixed restructuring contribution take?
  The duration of restructuring is based on a restructuring contribution amounting to 2, 3 or x% of the insured salaries or an interest rate reduction of 1, 2 or x%.
- The question is: *How long must the measure be carried out in order to return to 100%?*
- These considerations are carried out for each projection year.

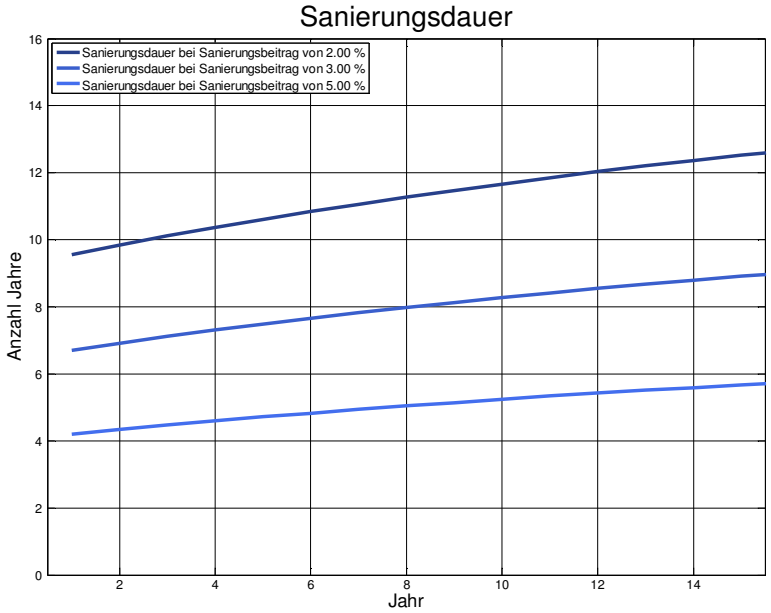
2. Restructuring capacity



- The restructuring capacity shows the percentage by which the cover ratio can be increased with a given restructuring budget
- For example, by how many percent can the cover ratio be increased with a restructuring budget of 2, 3 or x% of insured salaries over five years?

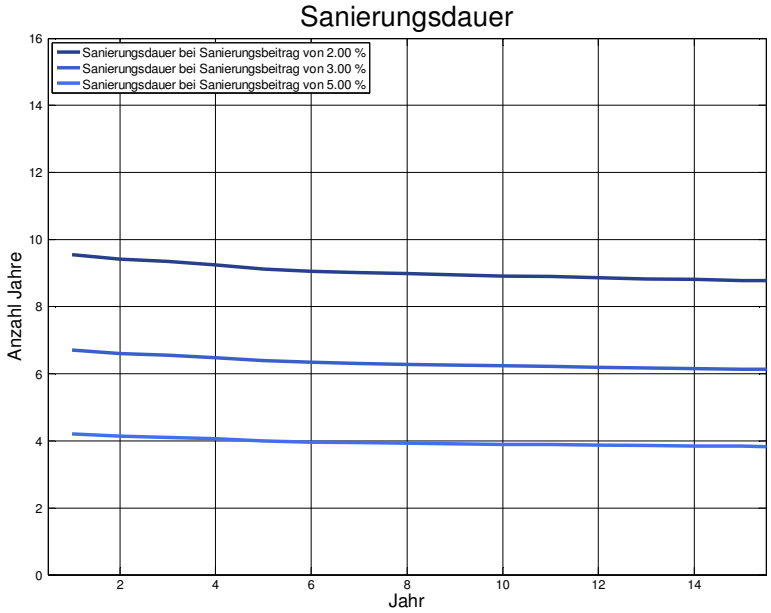
Development of hypothetical restructuring duration

Status Quo



- Restructuring duration through restructuring contributions increases
- Declining structural risk capacity

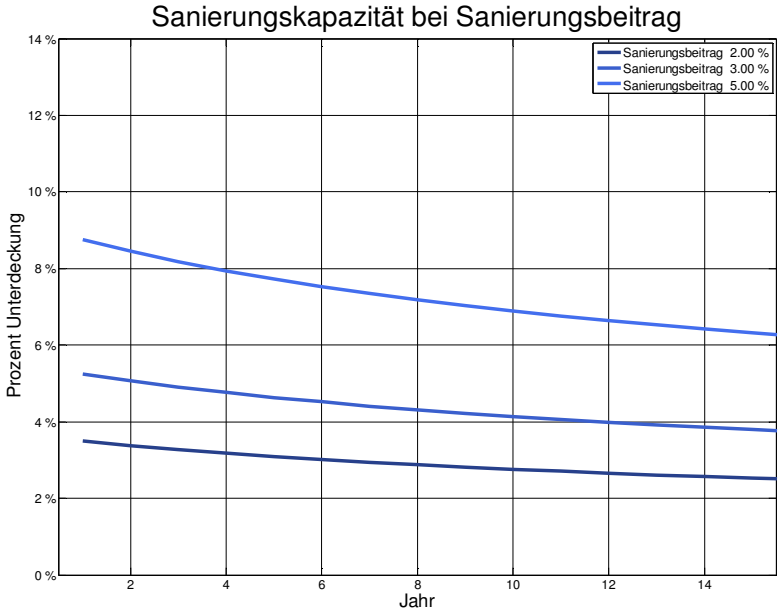
Capital constraint



- Restructuring duration through restructuring contributions tends to improve
- Structural risk capacity remains constant

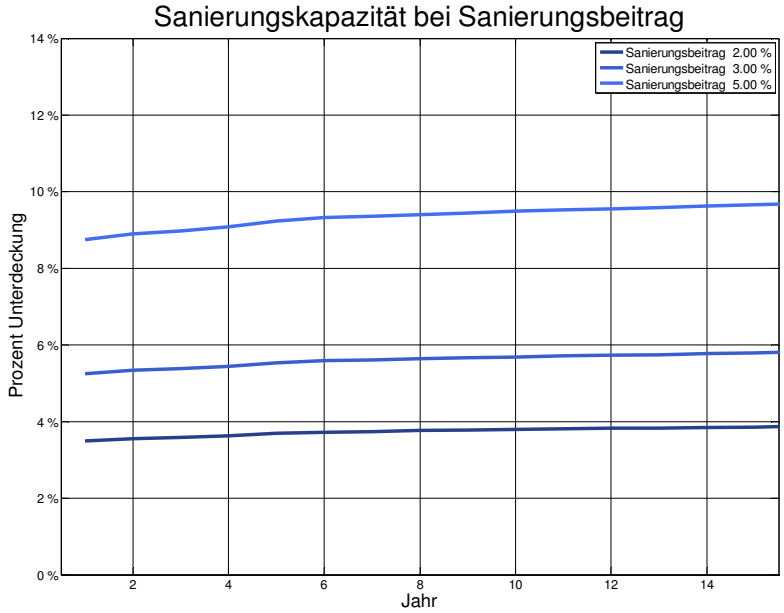
Development of restructuring capacity

Status Quo



- Critical cover ratio declines
- Investment policy risk capacity (Art. 50 (2) BVV2) declines
- Risks on the investment side must be reduced

Capital constraint



- Critical cover ratio increases
- Investment policy risk capacity (Art. 50 (2) BVV2) increases
- More risks on the investment side can be taken

Conclusion

- Longevity is a fact
  - Regulatory stipulations of technical insurance parameters exacerbate this problem
  - Trend for basic minimum provisions of the BVG being declared to be binding exacerbates the issue
- Structural risk capacity
  - The impact of longevity risk correlates with the structural risk capacity and is different for every pension fund
  - Change needs fundamental discussion
- Financial risk capacity
  - Financial risk capacity depends on the employer and economic situation
  - Impact of International Accounting Regulations (and the change in these)

The foundation board fulfils its responsibility if measures are always checked to see what their future effect & consequences will be