

Analysis of objective oriented perspectives for the calculation of Solvency Capital Requirement for pension funds considering Solvency II and IORP II

Joint work with Andreas Beckstette and Hans-Joachim Zwiesler

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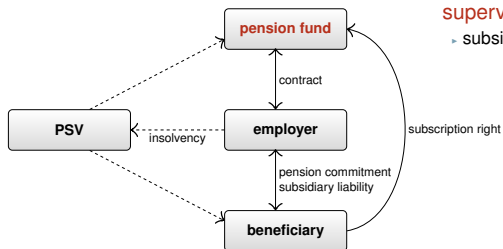
Pension funds in Germany

contract

- increases in contributions (risks explicitly assumed, recovery plans)
- reduction of benefits in case of sponsor default

pension protection schemes

- PSV



national social, labour and supervision law

- subsidiary liability of employer

Problem

- ▶ How to measure the risks and calculate Solvency Capital Requirement (SCR) for a pension fund?
- ▶ Which security mechanisms should be considered in the calculations at all? How can these security mechanisms be taken into account?
 - ▶ conditional benefits
 - ▶ risks explicitly assumed by employer
 - ▶ recovery plans
 - ▶ subsidiary liability
 - ▶ PSV
- ▶ How should reasonable supervision rules for pension funds be designed?

Literature review

Literature on risk measurement, security mechanisms and supervision of IORPs

- ▶ [Queisser 1998]
- ▶ [Brunner, Hinz, Rocha 2008]
- ▶ [van Gaalen 2003], [Mihir 2004], [Gisler 2010]
- ▶ [Haberman, Butt, Megaloudi 2000]
- ▶ [Broeders, Chen 2010]

Discussion on IORP II

- ▶ [CEA 2009]
- ▶ [GCAE 2010], [Hügelschäffer 2011], [Reuss 2008], [Velten 2008], [Wiesner 2009]
- ▶ [EIOPA 2012]

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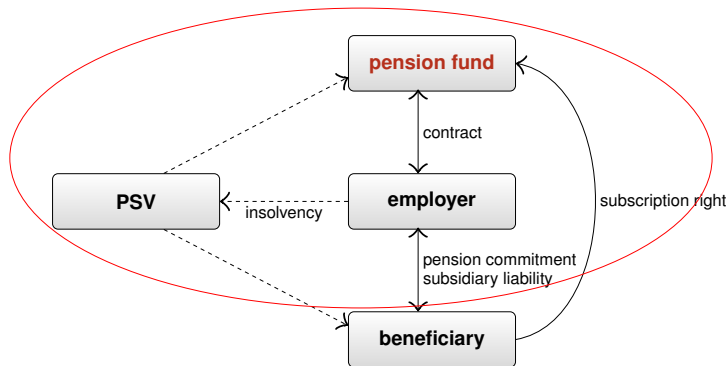
Who should be protected?

Protection ...

- ▶ ... of contractual partner?
- ▶ ... of beneficiary within the system?
- ▶ ... of stability of the system?
- ▶ ... from regulatory arbitrage?

Perspective 1: objectives

- ▶ protection of beneficiary within the system

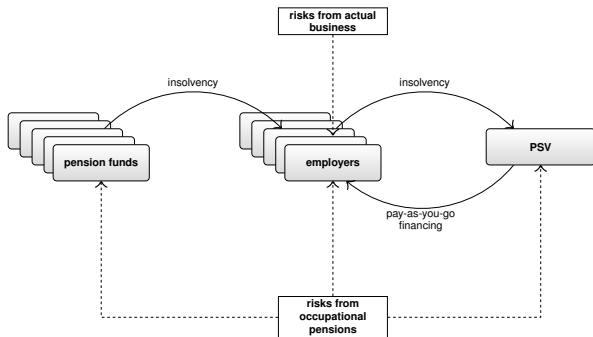


Perspective 1: consequences

- ▶ consider **contractual arrangements** like risks explicitly assumed and recovery plans
- ▶ consider **national law** like subsidiary liability
- ▶ consider **pension protection schemes** like PSV
- ▶ consider **maximum value** of sponsor support and pension protection scheme

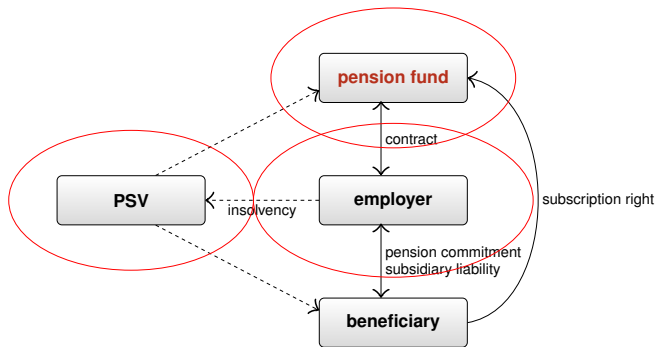
Perspective 1: assessment

- ▶ in line with technical specifications of first QIS
- ▶ not consistent with Solvency II
- ▶ no protection of employer
- ▶ risk for pension fund from financial situation of employer/PSV
- ▶ systemic risk



Perspective 2: objectives

- ▶ protection of stability of the system
- ▶ protection of contractual partner
- ▶ protection from regulatory arbitrage



Perspective 2: consequences

- ▶ consider **contractual arrangements** like risks explicitly assumed and recovery plans

Perspective 2: assessment

- ▶ consistent with Solvency II
- ▶ adequate protection of employer
- ▶ no risk for pension fund from financial situation of employer/PSV
- ▶ adequate protection of beneficiary and stability of the system (within pension fund's area of responsibility)
- ▶ control of employer's risks?

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Stress scenarios

security mechanisms	Net Asset Value NAV_{normal}
market value assets	market value liabilities

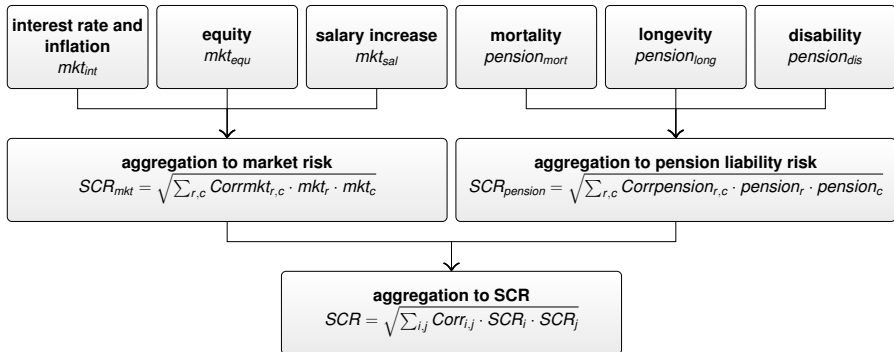
economic balance sheet under normal conditions

security mechanisms (stress scenario)	Net Asset Value NAV_{stress}
market value assets (stress scenario)	market value liabilities (stress scenario)

economic balance sheet under stress scenario

$$\Delta NAV = NAV_{normal} - NAV_{stress}$$

The model - basic idea (without security mechanisms)

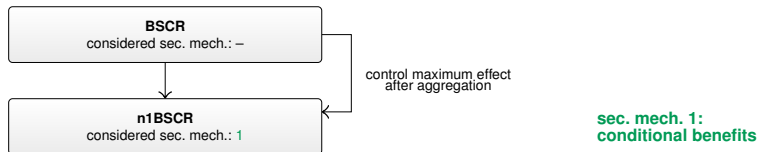


The model with adjustment for security mechanisms

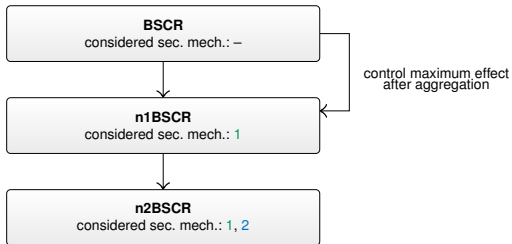
BSCR

considered sec. mech.: –

The model with adjustment for security mechanisms



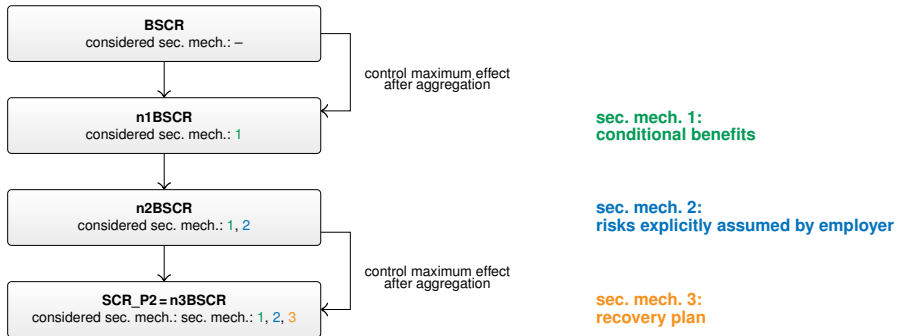
The model with adjustment for security mechanisms



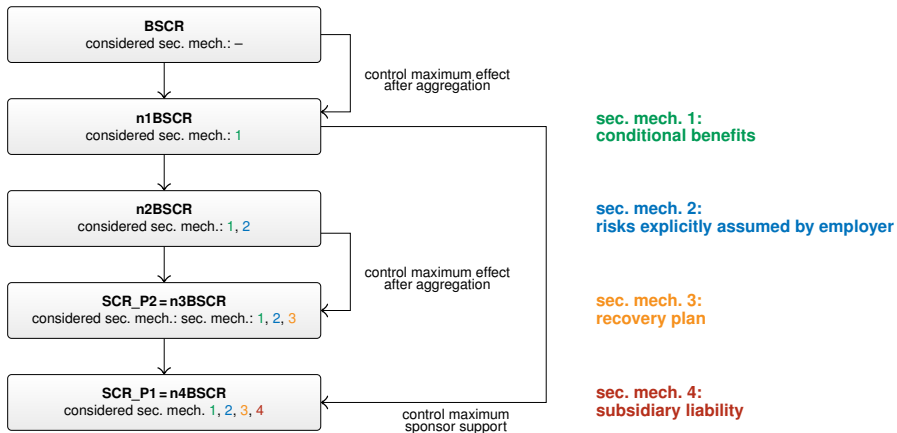
sec. mech. 1:
conditional benefits

sec. mech. 2:
risks explicitly assumed by employer

The model with adjustment for security mechanisms



The model with adjustment for security mechanisms



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Example for Analysis

beneficiary

- ▶ retired male beneficiary of age 70
- ▶ annuity payment of 1000 EUR / survivorship annuity of 600 EUR per month
- ▶ no contractually specified pension dynamics

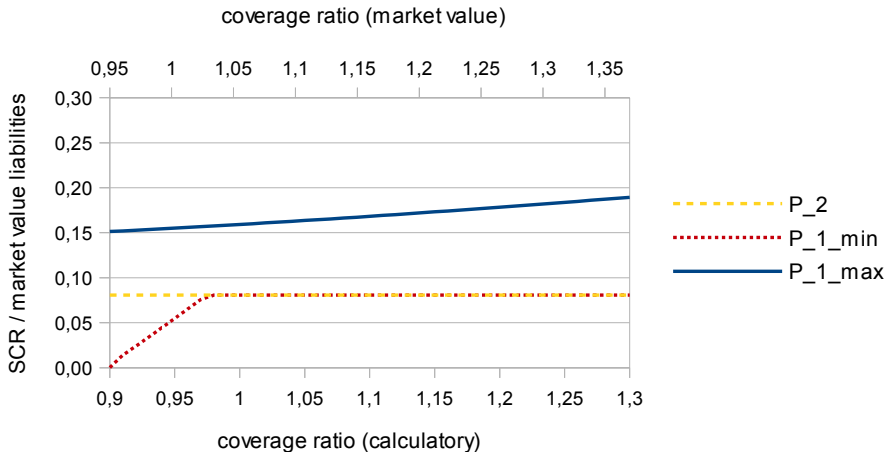
possible contractual risk sharing with employer

- ▶ market risks
- ▶ biometric risks
- ▶ recovery plan

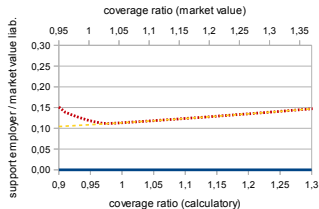
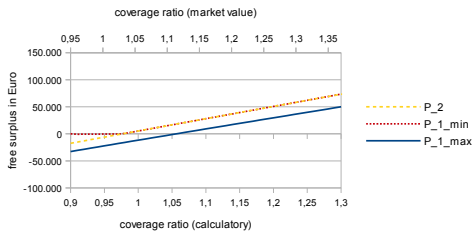
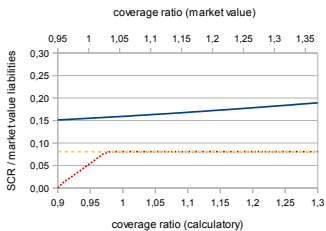
pension fund

- ▶ assets: varying coverage ratio of pension account, additional own funds 5 %
- ▶ investment of assets: 35 % in shares, 65 % in fixed interest bearing securities
- ▶ calculatory interest rate: 4.0 % or 1.75 %
- ▶ calculatory mortality tables: Heubeck 2005 G or DAV 2004 R

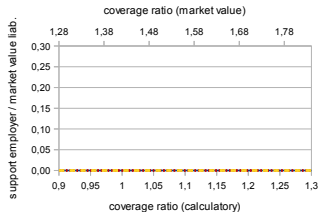
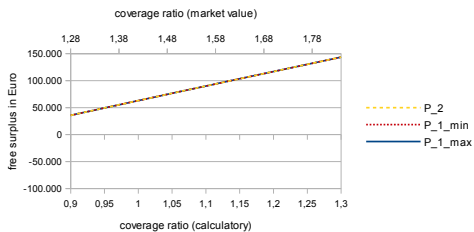
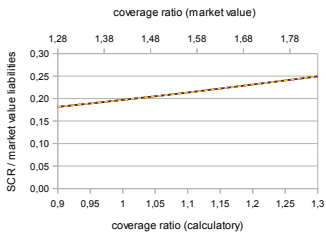
Employer bearing market risk (1)



Employer bearing market risk (2)

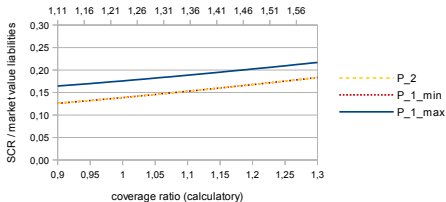


Insurance type

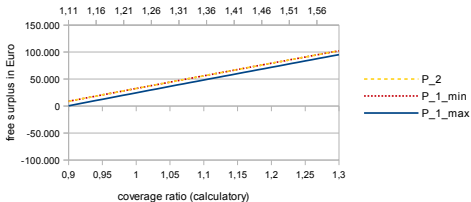


Employer bearing biometric risk

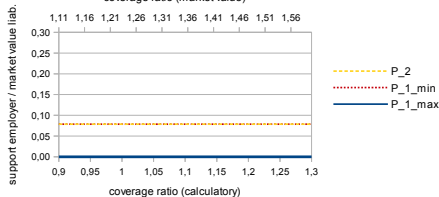
coverage ratio (market value)



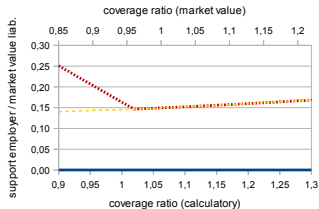
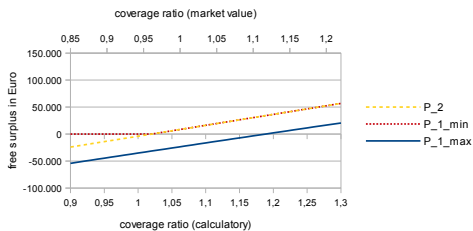
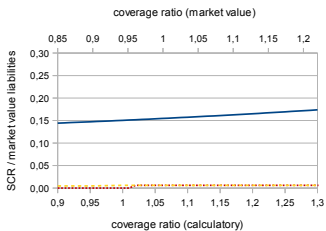
coverage ratio (market value)



coverage ratio (market value)



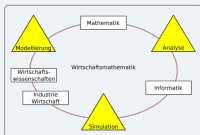
Employer bearing both market and biometric risk



Conclusions

- ▶ The answer to the question, which security mechanisms should be taken into account for the calculation of the SCR, depends on the supervisory objectives assumed.
- ▶ A general statement about which perspective delivers a higher SCR and therefore is the more stringent one, is not possible. The result strongly depends on the constellation of risk sharing, the coverage ratio and the limitation of additional support from security mechanisms.
- ▶ On the subject of systemic risk further research is needed.

Contact



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Thank you for your attention!

Literature I



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