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Stefan Graf
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Financial Planning and Risk-return Profiles

Stefan Graf, Alexander Kling, Jochen Ruß

Agenda

Motivation

“Assessing” products’ risk-return profiles – existing methodologies

Risk-return profiles by means of stochastic modeling

Conclusion

Motivation

Government-run pay-as-you-go systems suffer from demographic changes

→ demand for private old age provision increases

How to choose “optimal” products?

- Vast body of literature on determining optimal (often dynamic) asset allocations mostly using expected utility approaches
- Really practicable for “typical” client?

Motivation

Contribution

- Introduce methodology on how to derive risk-return profiles and compare them to existing approaches
- Quantitative analyses of common products with and without investment guarantees

Products under consideration

Products without embedded guarantees

- Investment in equity and balanced fund

Products with “money back guarantee”

- Static option-based product (“underlying + put”)
- (Dynamic) CPPI strategy on a client individual basis (iCPPI)

Products with “savings premium guarantee”

- (Dynamic) CPPI strategy implemented in a mutual fund and thus managed on a “collective” basis (CPPI high watermark fund)

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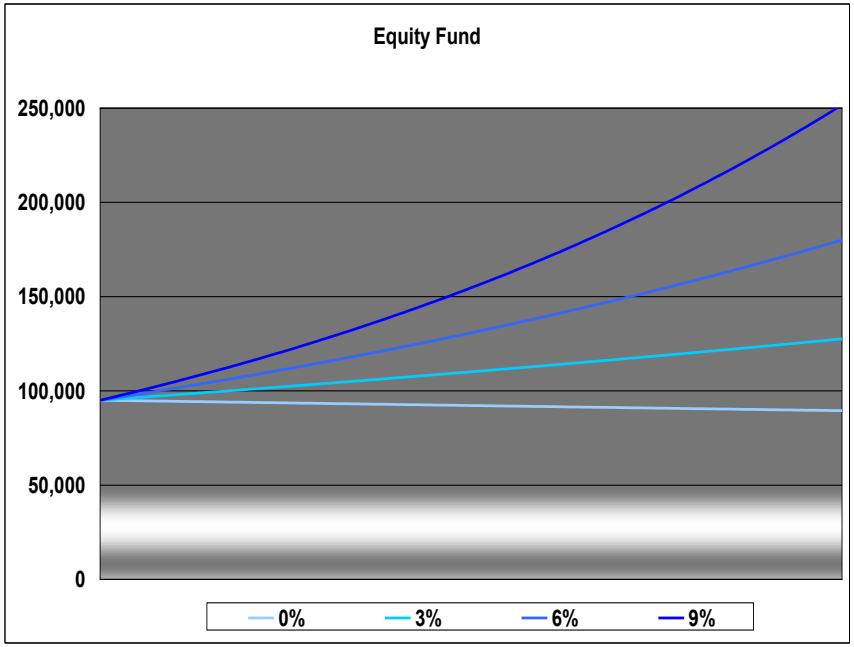
“Assessing” the risk-return profile

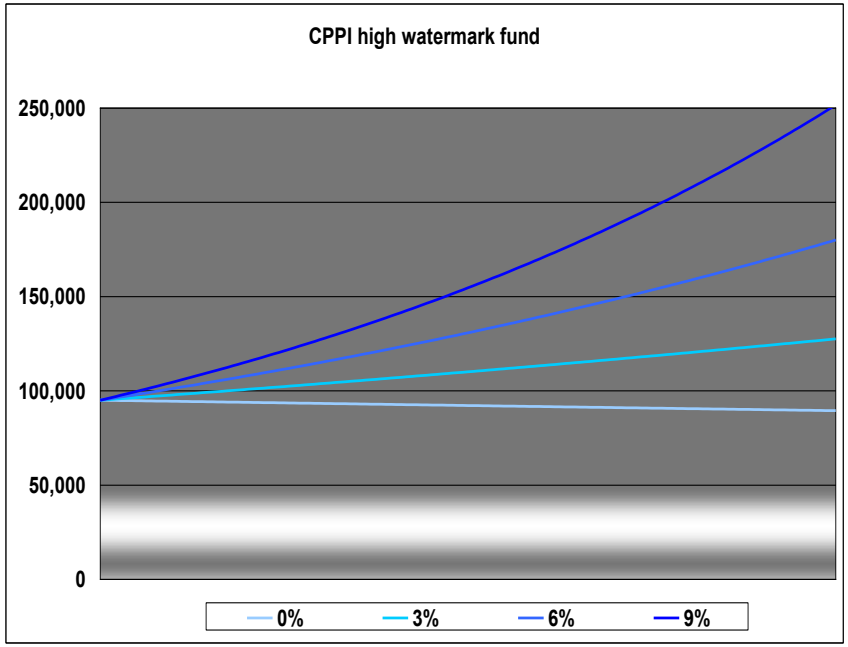
Sample illustration

- Underlying investment vehicle is projected assuming some (constant) deterministic performance
- Product’s maturity benefit is then calculated accordingly

“Assessing” the risk-return profile

Sample illustration*, e.g. equity fund vs. CPPI high watermark fund





*12 year-single premium investment

“Assessing” the risk-return profile

Sample illustration - pitfalls

- Asset allocation neglected
- Lack of volatility conceals path-dependant effects

→ e.g. reallocation of risky and riskless assets in CPPI products

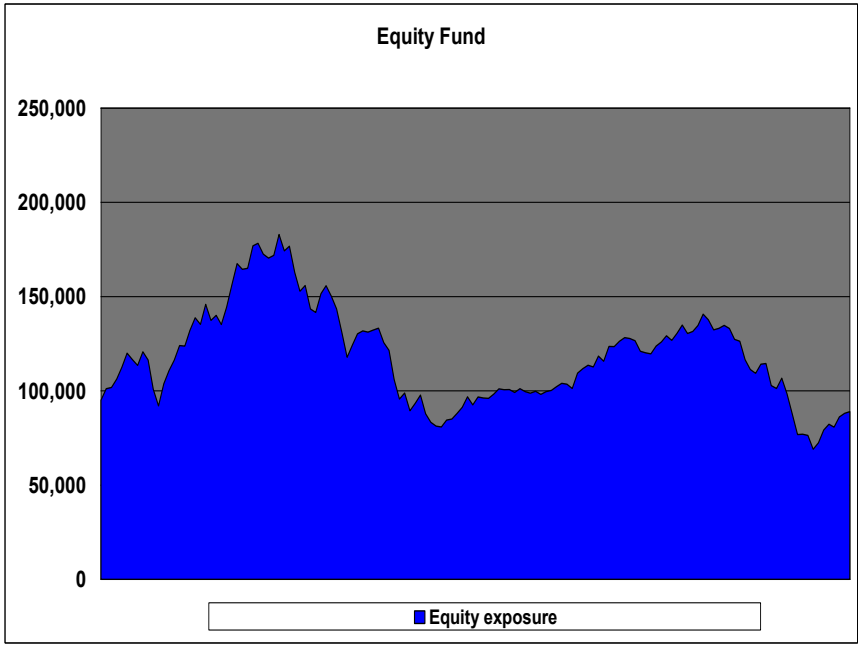
“Assessing” the risk-return profile

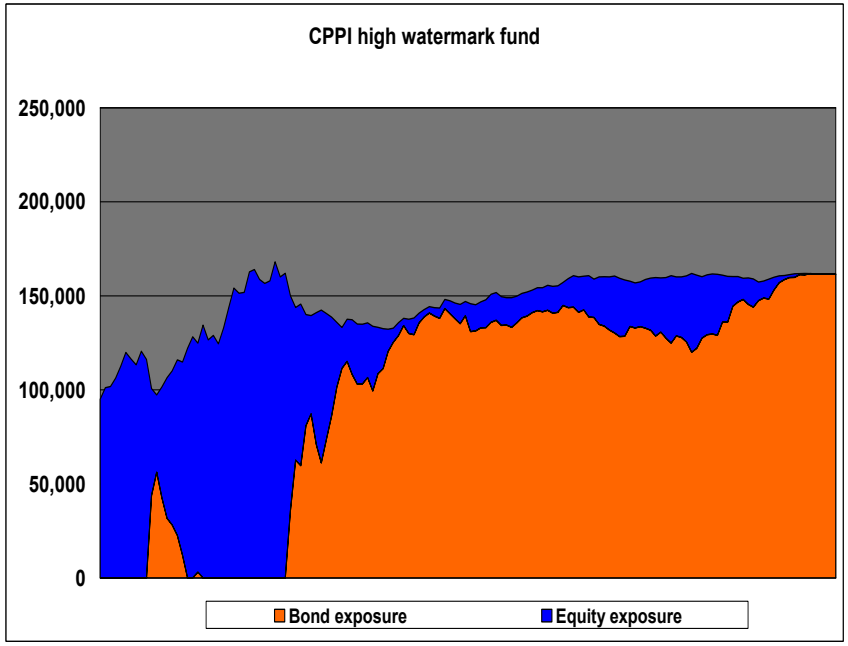
Backtesting

- Underlying investment vehicle is projected assuming it had been invested in the past (according to some time series)
- Product’s maturity benefit is then calculated accordingly

“Assessing” the risk-return profile

Backtesting*, e.g. equity fund vs. CPPI high watermark fund





*Single premium investment in MSCI World and German Government Bonds from 1998-2009

“Assessing” the risk-return profile

Backtesting - pitfalls

- “Each product can win” by choosing appropriate time-series and time-frame
- Incentives to design products that had been performing well in the immediate past

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Risk-return profiles

Stochastic modeling of

- Equity (modified (Heston, 1993))
- Interest rates (Cox et al., 1985)

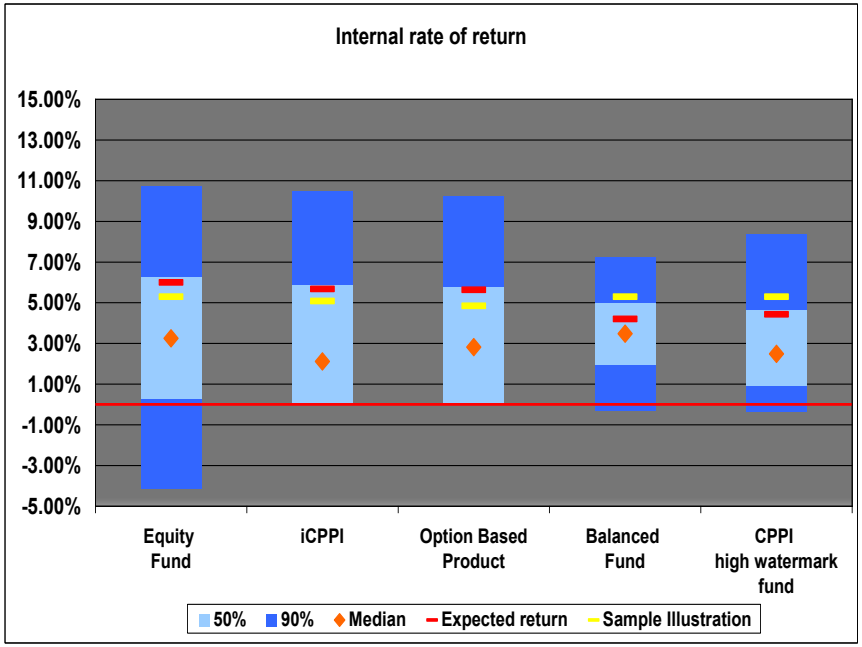
Derive maturity benefit by

- Generating equity and interest rate scenarios
- Modeling fund management decisions
- Modeling products investing in various funds

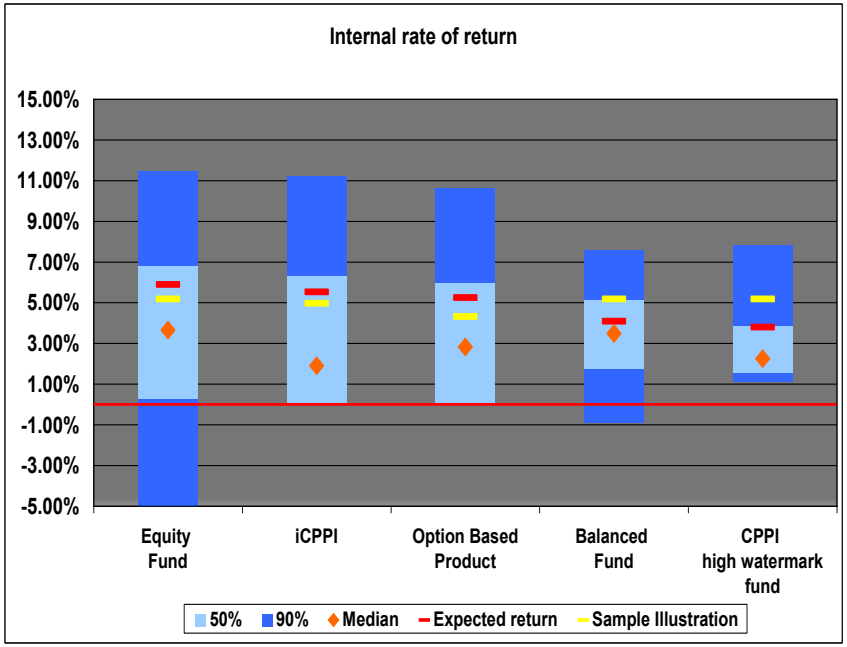
Assess product's risk-return profile by estimating the probability distribution of maturity benefits

Risk-return profiles

Quantitative results



Single premium



Regular premium

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Conclusion and further research

Conclusion

- Existing approaches provide insufficient information and may lead to misselling
- Introduced methodology provides appropriate assessment of product's risk-return profile

Further research

- Extension to retirement phase products?
- Model risk?
  - e.g. modeling of inflation, …
- How to communicate the information appropriately (to financial advisors and clients)?

Thanks for your attention

Contact details

Stefan Graf	s.graf@ifa-ulm.de
Alexander Kling	a.kling@ifa-ulm.de
Jochen Ruß	j.russ@ifa-ulm.de