The Impact of Inflation Risk on Financial Planning and Risk-return Profiles

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Agenda

Motivation

Nominal and inflation-adjusted risk-return profiles

Ideas on inflation-linked products

Conclusion

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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?
  - Graf et al. (2012) introduce risk-return profiles of old age provision products by means of stochastic modelling, focussing on nominal returns

**But: Purchasing power of benefits much more relevant than nominal returns.**
Contribution

- Extend the model of Graf et al. (2012) by including stochastic modelling of inflation.

- Quantitative analysis of real, i.e. inflation-adjusted returns, especially focussing on (existing) products equipped with nominal investment guarantees

- Proposal of product modifications taking inflation risk into account

(Nominal) risk-return profiles, e.g. following Graf et al. (2012)
Risk-return profiles

Methodology

- Enhance the capital market model applied in Graf et al. (2012) by modelling inflation
  - Inflation: Vasiçek O. (1977)
- Quantitative analyses of nominal and inflation-adjusted returns of different old age provision products applying Monte-Carlo simulation.
  - Sample capital markets
  - Model different asset classes: equity, bonds, funds, ...
  - Model asset allocation within the old age provision products taking into account charges, payment pattern, potential guarantees, etc.
  - Estimation of the probability distribution of nominal/real returns
Risk-return profiles
Products under consideration

„Standard“ products
- Products without nominal investment guarantees
  - Investment in equity fund
  - Investment in fixed income (modelled as zero-coupon bond)
- Different products with nominal guarantee
  - OBPI: Option based portfolio insurance
  - CPPI: Constant proportion portfolio insurance
    - with different multipliers

„Modified“ (inflation-linked) products
- „Fixed income“
  - Inflation-linked bond
- Modified versions of CPPI
  - Adjustment of floor based on realized inflation
  - Market based adjustment of floor
  - Inflation-linked bond as a safe asset
Especially products that are considered as particularly “safe” by the clients bear a significant inflation risk.
Inflation risk is significantly reduced when „nominal“ risk-free assets are applied. Inflation risk can be eliminated when inflation-linked risk-free assets are applied.
Conclusion and further research

Conclusion

- Inflation risk has significant impact on existing old age provision products, in particular products that are perceived as safe due to nominal guarantees.
- Proposed product modifications reduce inflation risk significantly.
- We constructed different modified products for clients with different risk aversion.

Further research

- measure and manage inflation risk in the payout phase of different types of annuities
- derive policy implications and educate governments, regulators, financial advisors and clients about inflation risk.

E.g. the German case:

- Government provides certain tax benefits only for products with nominal guarantees
- Further, legal obligation to show nominal risk return profiles
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