New approaches to managing long-term product guarantees

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Current challenges for insurers selling guarantee products

Variety of current challenges

**Low interest rates**
- Current capital market environment with rather low interest rates putting pressure on interest rate guarantees of traditional products
- Long term guarantees

**Solvency II**
- In many countries „year to year“ cliquet guarantees
- Market consistent evaluation of insurance liabilities shows the significant value of long term guarantees

**Decreasing technical rates**
- Decreasing attractiveness of guarantees for clients
- Especially for short terms to maturity, i.e. insured of higher age
- At the same time: guarantees are highly demanded in this segment

**Consumer protection**
- Several Examples of misunderstood consumer protection
- E.g. gender directive
- E.g. guaranteed surrender values

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oversimplified general assessments

- cf. example from Morgan Stanley/Oliver Wyman 2010

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1 Total resource requirements = technical provisions + solvency capital requirement

Our experience shows that general assessments for a whole product category are impossible.

- Product design has a big impact on capital efficiency of products.
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De-risking traditional participating products

Traditional participating products – Product design

• The guaranteed interest rate is usually fixed for the whole term of the contract (sometimes this means accumulation + annuity phase).
• Guarantees are often not adequately hedged.
• Guarantees are potentially high risk for insurance companies in times of a low interest rate environment.
• Level of the guaranteed rates is high in comparison to market rates.
• On top of this interest rate guarantee an annual bonus is provided.

Recent developments

• Still, traditional (non linked) business constitutes a big portion of new business in many markets.
• This holds in particular for recent years, where insurance companies provided higher interest rates than banks and attracted large volumes of single premium business.

Challenges in the current environment

• Low nominal interest rates combined with rather high long-term interest rate guarantees granted to contracts that have been sold when interest rates were higher.
• de-facto guarantee of surrender values
• Market-based valuation of insurance liabilities leads to high volatilities of the company’s P&L.
• Solvency-II approach exposes some of the inherent risk of traditional products that has previously not been considered.
Risk-management by product design – examples and case studies
De-risking traditional participating products

Traditional products are to be re-designed.
- potential changes
  - Guarantees are provided for limited durations.
  - renewable guarantees
  - no more nominal guarantees
  - etc.
- in many markets: Changes in regulation might be necessary.
  - However: First modified traditional products have come to the market.
    - e.g. Allianz Perspektive in Germany
    - e.g. one product in the Swiss market (cf. the case study on the following slides)
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Modified traditional products

Policyholder view
- Offer the same guaranteed maturity benefit as your current traditional product.
- Calculated applying some technical rate on the premiums.
- Offer the same guaranteed surrender values as your current traditional product.
- Offer the same sample calculation (expected maturity benefit) as your current product.
- Only in very bad scenarios credited rates below the technical rate are possible.

Insurer view
- Separation of year-to-year guarantee, maturity guarantee and technical rate for calculation of reserves.
- In most scenarios the minimum annual guaranteed rate of interest is given by 0%.
- Significant reduction of solvency capital requirements.
- First product implemented in Switzerland.
- Seems to be possible in several other markets as well.
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Case study: probability distribution of shareholder cash flows for an “old” traditional product (red) and a modified traditional product (blue)
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Variable Annuities – Product design

- unit-linked product: funds without guarantee + guarantee by insurer
- Guarantees and corresponding risks are managed by internal hedging (or outsourced).
- transparent guarantee charges, typically a fix percentage of NAV p.a.
- different types of guarantees: GMDB, GMAB, GMIB, GMWB (temporary), GLWB (lifelong)

Recent developments

- Products have been very successful in the USA and in Asia.
- different success stories in Europe
  - not very successful e.g. in the German market
- re-pricing guarantees and fees (de-risking of products in general)
- Increasing interest rates might be a great chance for Variable Annuities.

Challenges in the current environment

- reduced attractiveness of products in new business
- losses with existing products due to inefficient hedging programs
- Policyholder behavior has become an issue.
Risk-management by product design – examples and case studies
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Client Options within Variable Annuities

- Variable annuities contain a variety of client options.

Risk Management & Hedging

- thorough analysis of client options and guarantees necessary

We have developed a model framework within which all GMB guarantees can be analyzed consistently and simultaneously.

- very detailed model for guarantees and client behavior
- rather simple capital market model

reduction of risk by product design possible

- Examples follow.
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**fund choice**
- limiting the fund universe to funds that are highly correlated to standard indices
  - reduction of basis risk
- use of funds with rather low volatilities
- Insurer reserves the right to change the policyholder’s asset allocation, e.g. when volatilities rise.

**premium payment options for ongoing premium business**
- Reduce premium payment options where possible.
  - Resumption of indexation options can be prohibited.
  - Define maximum premium amounts and maximum indexation rates.
- Reduce the guarantees if policyholders deviate from their scheduled premium pattern.
  - This needs to be transparently communicated in the general terms and conditions.
  - Policyholders need to understand how guarantees are adapted in order to reduce legal risks.
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surrender and partial surrender

- If possible, include rather high surrender charges during the first years in order to avoid early surrender in the case of increasing stock markets.

- In these scenarios, the value of the hedge portfolio tends to be negative and high surrender rates would lead to high losses for the insurer.

- Note, that surrender charges may be limited by a country’s insurance contract law, e.g. in Germany no significant surrender charges are allowed at all.

- (Partially) charge guarantee fees upfront.

- This reduces the risk of the hedge portfolio becoming negative.

- Include ratchets in order to avoid options being deeply out of the money (ideally such that surrender is never optimal from a client’s perspective).

- Incentivize late surrender if options are in the money by offering relatively attractive “alternative products”.
withdrawals

- for GMWB contracts: Often, an optimal pattern is to annually withdraw the guaranteed withdrawal amount and to surrender if the account value exceeds some high level.

- Provide incentives for policyholders to postpone withdrawals to some later stage.
  - Include market-based or deterministic step-ups into the product such that the optimal policyholder behavior still is to immediately start withdrawing.

- Make surrender less attractive, e.g. by including market-based step-ups.
  - high surrender rates if the options are way out-of-the-money correspond with negative hedge portfolios

- Incentivize rather high withdrawal amounts (partial surrenders) if the options are in-the-money in order to reduce longevity risk.
annuitization

- Annuitization in many European countries is incentivized by the government, e.g. in Germany via tax-privileges.

- Thus, rational annuitization behavior should be assumed for such markets.
  - 100% annuitization essentially is equivalent to rational policyholder behavior since the annuity chosen will be the higher of an annuitization of the account value at current rates and an annuitization of the guaranteed income base at guaranteed rates.

- Incentivize postponements of the annuitization decision by offering increasing lifelong annuities if the policyholders wait for another year.

- Product pricing needs to make sure that postponing this decision always leads to a less valuable guarantee.
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**mix calculation**

- fund mix
- age distribution
  - Offer different guarantees or different guarantee charges for different ages.
  - Providing the same conditions for all ages ...
    - ... either makes the product less attractive for the majority of the policyholders, or
    - ... significantly increases the risk of false estimation of the actual age distribution.
- premium payment
  - Charge different guarantee fees for different premium patterns, e.g. single premium and regular premium contracts.
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High watermark CPPI-funds

**Product design**
- family of guaranteed funds (different maturities) with monthly ratchet
- Monthly ratchet makes sure that all premiums paid into the fund are guaranteed at maturity.
- If maturity of the policy is after the maturity of the “longest” fund, client’s money is switched
  - either immediately when a new fund is offered (which requires the new fund to come with the previous fund’s guarantee) or when the old fund matures.

**Recent developments**
- initially extremely successful in several countries due to very simple marketing
  - 100% premium guarantee, 100% “highest value guarantee”, up to 100% equity exposure
- not seen as „state-of-the-art“ any more
- risk-return-profiles show the limit in upside-potential
- less new business in this product category

**Challenges in the current environment**
- Cash lock risk has become an issue.
  - High volatilities and low interest rates lead to decreasing stock ratios.
Select Products

**Product design**

- Client can choose every year if he wants his accrued account value to participate in the general assets (surplus participation) of the insurer or in some formula-based participation in some equity index.
- Client’s surplus is used to purchase option on this index participation.
- The client’s account value cannot fall within a year.

**Recent developments**

- Product has been developed by Allianz in the German market (Allianz IndexSelect).
- Awareness of other insurers about the success and capital efficiency.
- Recently: Several insurers “copied” the product in Germany, Switzerland and Austria.

**Challenges in the current environment**

- Very little exposure to market risk for the insurer.
- Impact only on the conditions of the index participation.
- Products proof to be rather “capital efficient”. 

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iCPPI – Dynamic Hybrid Products

**Dynamic Hybrid Products – Product Design**

- A dynamic hybrid product is an individual CPPI calculated for each client with the insurer’s general assets as riskless asset.
- However, most insurers can only perform the calculations (and hence trade) once a month. This significantly increases the gap-risk.
- Guarantee funds are usually used to cover for gap risk (monthly 80% guarantee reset).

**Recent developments**

- Introduced in 2006 by HDI Gerling in the German market. Within a few months, several providers followed.
- Currently: More than 20 providers in Germany. About 1 in 3 unit-linked policies sold in Germany is a DHP (source: Towers Watson).
- First products are offered (or being developed) in several other countries.
- Rather skewed distributions become an issue → product modifications that deal with that issue

**Challenges in the current environment**

- Low interest rates increase pressure on traditional part of the allocation.
- general assets as “safe haven” → Especially in times of high volatilities may have undesired effects for traditional business. → Product designs that reduce trading intensity and/or frequency are an issue (cf. following case study).
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Dynamic Hybrid Products – trading frequency and amount

- Dynamic Hybrid Products lead to transactions into and out of the insurer’s traditional assets.
- A fixed guaranteed rate of interest is applied on the money invested into the insurer’s traditional assets.
  ➔ Risk Management of trading frequency and trading amount needs to be part of the product development.

In what follows: example of two different product designs

- almost similar risk return profile from a client’s perspective
- Scenario analysis and stochastic simulation of trading frequency and amount show significant different risk for the insurer.
  ➔ See examples below.
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Dynamic Hybrid Products – sample path for a book of business – product design 1

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Dynamic Hybrid Products – sample path for a book of business – product design 2

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Dynamic Hybrid Products – trading frequency and amount, product design 1

- monthly trading amounts into the insurer’s general assets – scenario analysis
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Dynamic Hybrid Products – trading frequency and amount, product design 2
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current challenges for guarantee products

- low interest rates and high volatilities
- rather high and long term guarantees “in the money”

at the same time

- demand for high guarantees still existent

convergence of risk management and product development

- re-designing of traditional products
- de-Risking of Variable Annuities
- re-designing of CPPI structures including dynamic hybrid products

Many product developments of the upcoming years will be driven by risk management.
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