The Future of Life Insurance: Major Challenges and Strategic Options

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Agenda

1. Introduction
2. Major challenges
3. Customer preferences and willingness to pay
4. Capital efficiency and capital allocation
5. Strategic options
6. Conclusions
1. Introduction

- **Private old age provision should be a booming market**
  - Demography, low interest rates, low trust in state-run pensions (in particular with respect to pay-as-you-go systems)
  - Still positive income and wealth situation in many EU countries

- **Private insurance companies with equity capital are the best vehicle for old age provisions**
  - Insurance companies possess structural advantages compared to pension schemes and the banking system
  - They cover policyholders’ mortality risk and offer long-term investment guarantees (as opposed to mutual funds)
  - There are many scientific studies covering these aspects
1. Introduction

- **Major “clouds in the sky”**

- Capital market conditions (low interest rate environment / possible investment bubbles (stock market, real estate, alternative markets))

- Current monetary policy stimulates consumption (via debt), the incentives for saving money are low

- Long-term investment guarantees
  - Currently very expensive / hard to provide for insurance companies
  - Added value to the customer not generally obvious (especially given the costs)

- (Capital-)Regulation: difficult to achieve risk-adequate returns on the equity capital

- Black swans
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5. Strategic options

6. Conclusions
2. Major challenges

- Problematic process:
  - Low interest rates and high volatility in the asset markets increase c.p. the guarantee costs
  - Interest rate guarantee cannot be achieved via risk free investments
  - Solvency capital is required for risky investments
  - Risk-adequate return on the invested equity capital is hard to accomplish
  - Result: traditional business model comes into difficulties
2. Major challenges

- What is the influence of the interest rate guarantee level on the asset allocation of the insurer if …
  - a solvency restriction is applied and
  - the equity capital must achieve a risk-adequate return?

- Result: if \((\text{riskless rate of return} - \text{guaranteed interest rate}) \to 0\)
  - Theory: no investment in risky assets possible
  - Real terms: Is the asset allocation indeed risk-free? Or rather undiversified?
  - However, investment guarantee and participation are rather worthless under these conditions/direct investment in a AAA-Bond-ETF may be the better choice

- Only theory? Cf. Stock investment portions in the life insurance industry

- What if guaranteed interest rate > riskless rate of return? (current situation)
2. Major challenges

- Will the low interest rate environment persist?

- General consensus is a clear “Yes”

- Consequences:
  - Possible market bubbles
  - Incentives to consume even more and incur debt (both at a state and personal level)
2. Major challenges

- **Old model, new industry**

  - Liabilities ceded by US life insurers to shadow reinsurers (i.e., affiliated and less regulated, off-balance-sheet entities) grew from 11 billion USD (2002) to 364 billion USD (2012)

  - Life insurers using shadow insurance capture half of the US market share

    - Thereby, 25 cents of every USD were transferred to shadow reinsurers in 2012, up from 2 cents in 2002

    - Adjustment for shadow insurance provided by Koijen and Yogo (2015 / 2016) reduces risk-based capital by 53 percentage points (or 3 rating notches) and raises default probabilities by a factor of 3.5

- Reason: price war in the US annuity market

- Instrument: avoidance of US capital standards

Source: Koijen / Yogo (Econometrica 2015)
2. Major challenges

- Competition from non-insurance companies

- However, regulatory requirements act as entry barriers
2. Major challenges

- Customer experience relies on a complex journey
2. Major challenges

- New technology for risk analysis: Does this go in the right direction?

- Risk classification per se causes no problems with respect to the merits of pooling claims.

- But: If claims become non stochastic, the insurance business model will not survive.
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3. Customer preferences and willingness to pay (study 1)

- Endowment policies (clique-style guarantee / participation): Which interest rate guarantee level \( g \) is optimal?
  
  - Assumption of the study (German market)
  
  - Maximum guarantee level \( g \) under solvency restrictions and financing conditions (December 2015): 1.25 %

- Example:

<table>
<thead>
<tr>
<th>Contract Duration</th>
<th>30 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Premium</td>
<td>EUR 1,000</td>
</tr>
<tr>
<td>Guarantee Level (per year)</td>
<td>( g ) %</td>
</tr>
<tr>
<td>Surplus Participation (per year)</td>
<td>90 %</td>
</tr>
</tbody>
</table>
3. Customer preferences and willingness to pay (study 1)

- Results for the savings part (average mortality and surrender rates are taken into account)

<table>
<thead>
<tr>
<th>Guarantee Level</th>
<th>Present Value Premiums</th>
<th>Expected Payoff</th>
<th>Expected Return (per year)</th>
<th>5% Quantile</th>
<th>95% Quantile</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.25%</td>
<td>15.370</td>
<td>25,930</td>
<td>1.76%</td>
<td>20,610</td>
<td>33,810</td>
</tr>
<tr>
<td>1.0%</td>
<td>15.370</td>
<td>26,250</td>
<td>1.80%</td>
<td>20,510</td>
<td>34,340</td>
</tr>
<tr>
<td>0.5%</td>
<td>15.370</td>
<td>26,840</td>
<td>1.88%</td>
<td>20,560</td>
<td>35,320</td>
</tr>
<tr>
<td>0.0%</td>
<td>15.370</td>
<td>27,380</td>
<td>1.94%</td>
<td>20,690</td>
<td>36,190</td>
</tr>
<tr>
<td>-0.5%</td>
<td>15.370</td>
<td>27,900</td>
<td>2.01%</td>
<td>20,850</td>
<td>37,060</td>
</tr>
<tr>
<td>-1.0%</td>
<td>15.370</td>
<td>28,400</td>
<td>2.07%</td>
<td>21,000</td>
<td>37,970</td>
</tr>
</tbody>
</table>

Source: Braun / Fischer / Schmeiser (Working Paper 2016)
3. Customer preferences and willingness to pay (study 1)

- Optimal level of g for customers of type A (low risk aversion (RA)), B (medium RA) and C (high RA)

![Graph showing customer utility in EUR T for different levels of the guarantee rate for customers A, B, and C.]

Customer segmentation is desirable

Less is more? What / how to explain to the customer?

Which type of customers possess sufficient willingness to pay for which kind of investment guarantee?

Source: Braun / Fischer / Schmeiser (Working Paper 2016)

Source: Gatzert / Huber / Schmeiser (Geneva Papers 2011)
3. Customer preferences and willingness to pay (study 2)

- In the current situation, investment guarantees are very expensive and hard to offer for insurance companies

- Cliquet-style options
  - Very expensive
  - Customers’ willingness to pay is too low under most normative and behavioral setups
  - «Double hurdle problem»

- Lookback guarantee
  - Very expensive and high parameter and model risk

- Point-to-point guarantee
  - Much more stable / additional value for risk averse policyholders

Source: Braun / Fischer / Schmeiser (Working Paper 2016)
Three theses regarding the life insurance market

Thesis 1: Compared to other industries, we do not know much about the customers’ willingness to pay for different product features

- Cf., e.g., different investment guarantees forms and levels

Thesis 2: Customers buy product features via bundling; however, their willingness to pay for different product features within the insurance product is not sufficient

Thesis 3: For those parts where the customers’ willingness to pay exceeds the costs, actuarial pricing («Cost +») is far from optimal

- Suboptimal price / demand combinations
3. Customer preferences and willingness to pay (study 3)

- **Approach:**
  - Intensified customer segmentation based on socio-demographic customer segmentation for different product features
  - Cf. a current study from Swiss Re / Institute of Insurance Economics I.VW (Focus: Term Life Insurance in Germany)

Source: Braun / Schmeiser / Schreiber (European Journal of Operational Research 2016)
3. Customer preferences and willingness to pay (study 3)

- Example based on four generic products

**Product A**
- Brand: non-insurance brand
- Sales channel: online
- CI rider: none
- Underwriting: 10 questions

**Product B**
- Brand: well-known insurer
- Sales channel: human sales person
- CI rider: none
- Underwriting: medical examination

**Product C**
- Brand: unknown insurer
- Sales channel: online
- CI rider: yes
- Underwriting: one-year survival

**Product D**
- Brand: well-known insurer
- Sales channel: human sales person
- CI rider: yes
- Underwriting: three questions

EUR 100,000 sum assured
15-year term
3. Customer preferences and willingness to pay (study 3)

- Average willingness to pay (premium per month) for products A, B, C and D

<table>
<thead>
<tr>
<th></th>
<th>Product A Budget</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>mean</td>
<td>17.6 €</td>
<td>21.3 €</td>
<td>24.8 €</td>
<td>34.8 €</td>
</tr>
</tbody>
</table>

- Willingness to pay for additional product features

<table>
<thead>
<tr>
<th></th>
<th>Product A Budget</th>
<th>Budget + CI</th>
<th>Budget + Personal</th>
<th>Budget + Well-known</th>
</tr>
</thead>
<tbody>
<tr>
<td>mean</td>
<td>17.6 €</td>
<td>24.4 €</td>
<td>18.8 €</td>
<td>22.6 €</td>
</tr>
<tr>
<td>HDI</td>
<td>0 – 89.2 €</td>
<td>0 – 111.0 €</td>
<td>0 – 92.0 €</td>
<td>0 – 104.2 €</td>
</tr>
<tr>
<td>WTP = 0</td>
<td>58.8 %</td>
<td>51.4 %</td>
<td>57.4 %</td>
<td>50.8 %</td>
</tr>
</tbody>
</table>

- Price sensitivity can be tested (in market shares) on this basis
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4. Capital efficiency and capital allocation

- Present value of payments from the policyholder should at least cover the present value of the payments to the customer

- Theory

\[ P_0 \]

\[ \text{Default free premium} = \text{PV}(L_1) \]

\[ \text{Premium with default risk} = \text{PV}(L_1) - \text{PV}(L_1-A_1,0)^+ \]

Capital costs depend on the risk of the company

Capital costs need to be financed out of the underwriting business

Capital costs exceed the return of the pure investment of \( EC \)
4. Capital efficiency and capital allocation

- Insurance practice: an example of Munich Re
4. Capital efficiency and capital allocation

- Insurance practice: Example RoRaC (Return on Risk Adjusted Capital)

\[
RoRAC = \frac{E(P)}{SCR} \geq r^* 
\]

r* denotes the capital costs ("hurdle rate")

- RoRAC of business units j (or contract level)

\[
RoRaC_j = \frac{E(P_j)}{SCR_j} \geq r^* 
\]

- Concept requires allocation of capital (here: SCR)
4. Capital efficiency and capital allocation

- Insurance practice: an example of Munich Re

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>Prop.-Casualty</td>
<td>5.7</td>
<td>6.3</td>
<td>0.6</td>
<td>6.2</td>
<td>0.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>P-C: Increase driven by reinsurance – FX and growth in special risks</td>
</tr>
<tr>
<td>Life/Health</td>
<td>4.8</td>
<td>4.7</td>
<td>-0.1</td>
<td>3.8</td>
<td>1.3</td>
<td>0.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market</td>
<td>8.8</td>
<td>8.7</td>
<td>-0.1</td>
<td>5.8</td>
<td>4.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Credit: De-risking of investment portfolio and full implementation of SII methodology</td>
</tr>
<tr>
<td>Credit</td>
<td>4.6</td>
<td>4.2</td>
<td>-0.5</td>
<td>2.7</td>
<td>1.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operational risk</td>
<td>1.0</td>
<td>1.0</td>
<td>-</td>
<td>0.8</td>
<td>0.4</td>
<td>0.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other a</td>
<td>0.2</td>
<td>0.1</td>
<td>-0.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simple sum</td>
<td>25.1</td>
<td>25.1</td>
<td>-</td>
<td>19.3</td>
<td>8.0</td>
<td>0.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diversification</td>
<td>-9.1</td>
<td>-9.3</td>
<td>-0.1</td>
<td>-7.4</td>
<td>-2.1</td>
<td>0.0</td>
<td></td>
<td></td>
<td></td>
<td>Diversification benefit: 37%</td>
</tr>
<tr>
<td>Tax</td>
<td>-2.2</td>
<td>-2.3</td>
<td>-0.2</td>
<td>-2.0</td>
<td>-0.7</td>
<td>-0.1</td>
<td></td>
<td></td>
<td></td>
<td>Loss-absorbing capacity of deferred taxes</td>
</tr>
<tr>
<td>Total SCR</td>
<td>13.8</td>
<td>13.5</td>
<td>-0.3</td>
<td>9.9</td>
<td>5.2</td>
<td>0.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

No major movement in SCR reflects unchanged risk profile of Munich Re (Group)

- Pitfall: Any form of allocation capital back to business units is to some extend arbitrary
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5. Strategic options

- Market segmentation as the basis for product innovations (not just «inside out»):
  - Measurement of the willingness to pay for product features leads to new products targeted at specific customer groups
  - Concept of «self-selection»

- Advantage for policyholder: Customer does not need to buy product features via bundling if the willingness to pay for specific product parts is not sufficient

- Advantage for insurance companies: Optimizing profits for product features that are highly appreciated by the customer

- However, this will lead to an increase in product forms and features (cf. the developments in the car industry)

- Sticking points of the industry: transactions costs (sales / ETF-based investments) and to some extent the image (customers / employees)
5. Strategic options

**Reduction of technical interest rate (2016)**

**Zurich reduces interest rate guarantees to 0 % (CH)**

**Allianz offers new products with temporary investment guarantees**

**Standard Life stops offering interest rate guarantees at all**
5. Strategic options

- “De”-risking strategies
  
  - Opt out of investment guarantees / only core underwriting business
  
  - Or: reducing guarantees for new contracts (below the technical rate)/provide new forms of guarantees
  
  - Or: point-to-point guarantees only
  
  - And / or: use risk rebalancing strategies in the products (or alternatively, hybrid forms, products with portfolio insurance)
  
  - Use of accounting rules and book values for risk reduction

- Adequate risk-return “communication” to the stakeholder
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