<table>
<thead>
<tr>
<th>Annuities: a private solution to longevity risk</th>
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<tbody>
<tr>
<td>Product &amp; Knowledge Fair 2007</td>
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<tr>
<td>Rüschlikon</td>
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<td>30 March 2007</td>
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<tr>
<td>Thomas Hess</td>
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<tr>
<td>Head of Economic Research &amp; Consulting</td>
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<tr>
<td>Veronica Scotti</td>
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<tr>
<td>Client Solutions</td>
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</table>
Need for private solution is growing

Life expectancy at birth in different regions

Old-age dependency ratio* in selected countries


*Ratio of the population aged 65+ to the population aged 15-64
The role of the insurance sector

In the accumulation phase

- By helping individuals build up a desirable level of savings throughout their working years:
  - in a flexible way (in the amount and timing of their contributions to the capitalisation plan)
  - in an efficient way (via investment diversification, gradual adjustment of the risk/return profile based on age, tax advantages)

In the decumulation phase

- By allowing individuals to run their asset pool down smoothly while offering protection against longevity and inflation:
  - through various types of annuities
  - through health care and long-term care insurance
  - through wealth monetisation (eg reverse mortgage)
  - through wealth transfer in the case of early death
Size of annuity markets

<table>
<thead>
<tr>
<th>Country</th>
<th>Total assets (USD per capita, 2004 data)</th>
<th>Annuity assets (USD per capita, 2004 data)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switzerland</td>
<td>75'896</td>
<td>15'567</td>
<td>21%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>50'014</td>
<td>8'107</td>
<td>16%</td>
</tr>
<tr>
<td>United States</td>
<td>45'876</td>
<td>6'912</td>
<td>15%</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>41'336</td>
<td>21'141</td>
<td>51%</td>
</tr>
<tr>
<td>Australia</td>
<td>29'229</td>
<td>3'896</td>
<td>13%</td>
</tr>
<tr>
<td>Japan</td>
<td>17'596</td>
<td>250</td>
<td>1%</td>
</tr>
<tr>
<td>Germany</td>
<td>10'646</td>
<td>1'507</td>
<td>14%</td>
</tr>
<tr>
<td>Italy</td>
<td>6'392</td>
<td>83</td>
<td>1%</td>
</tr>
</tbody>
</table>

Source: OECD Global Pension Statistics; OECD Insurance Statistic Yearbook; insurance associations of represented countries
Total pension expenditure in % of GDP

Note: Data was not available for Ireland, New Zealand and Spain
Role of pension system:
Pension funds and life insurance assets penetration

- % of GDP
- Voluntary
- Mandatory (year of introduction)

Countries and years of introduction:
- Switzerland: 1985
- Iceland: 1986
- United States: 1992
- Denmark: 1985
- Australia: 1996/1985
- Ireland: 2000
- Canada: 1995/1985
- Sweden: 2000
- Finland: 2006
- Japan: 1956
- Belgium: 2005
- Norway: 2005
- Germany: 1998
- Austria: 1999
- Italy: 2005
- Portugal: 2005
- Slovakia: 2005
- Spain: 1999
- Korea: 1998
- Hungary: 1999
- Poland: 1999
- Czech: 1999
- Turkey: 1999
- Greece: 1999

Voluntary: Switzerland, Iceland, Netherlands, United States, Denmark, Australia, Ireland, Canada, Sweden, Finland, Japan, Belgium, Norway, Germany, Austria, Italy, Portugal, Slovakia, Spain, Korea, Hungary, Poland, Czech, Turkey, Greece


56.5%
Main risks and costs affecting annuity profitability

**Insurance risks**
- Longevity risk
- Persistency risk

**Financial-market risks**
- Interest-rate risk/
- Investment risk
- Unhedged inflation risk

**Costs**
- Administration costs
- Distribution costs
- Capital costs

**Underwriting activity**
- insured’s buying behavior
- risk management prowess

**Investment activity**
- scope for diversification
- hedging instruments use

**Operating activity**
- product structure
Longevity risk: Rectangularisation of the mortality curve

Source: UK GAD
Longevity risk: Uncertainty in demographic projections

Share of population > 65 years (%)

- North America
- Latin America
- Africa
- Southern Europe
- Western Europe
- South-East Asia
- China
- Japan
- World

Projection 1963  Actual 2000

Longevity risk: Projections errors grow with time span

Interest rate risk: Guaranteed rates vs. market yields

- LT Govt bond yield
- Guaranteed Rate
- DAX (rhs)
Managing longevity risk: The role of different players

- **State**
  - Insured longevity risk
    - Diversification
      - Insurers
      - Reinsurers
      - Capital Markets

- **State**
  - Diversification
    - Pricing/product design
    - Education/distribution
    - Risk absorption
  - Risk transfer
    - U/w support
    - Capital management
    - Hedging instruments