Impact of longevity risk to the pension system and mitigation

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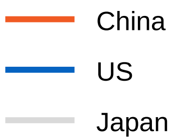
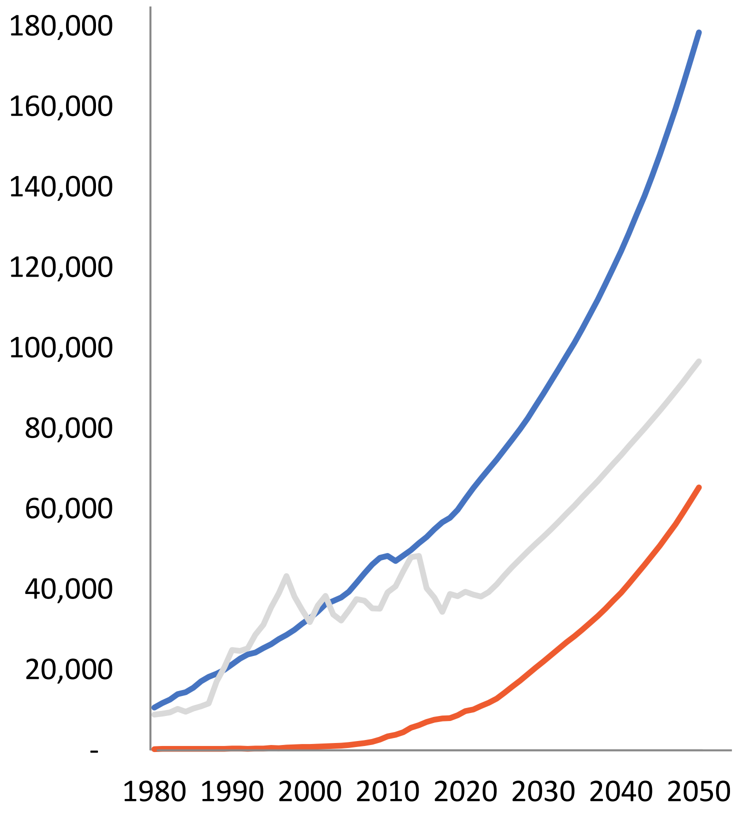
China faces the risk of high life expectancy and aging before the population becomes rich, which are key challenges to the pension system reform



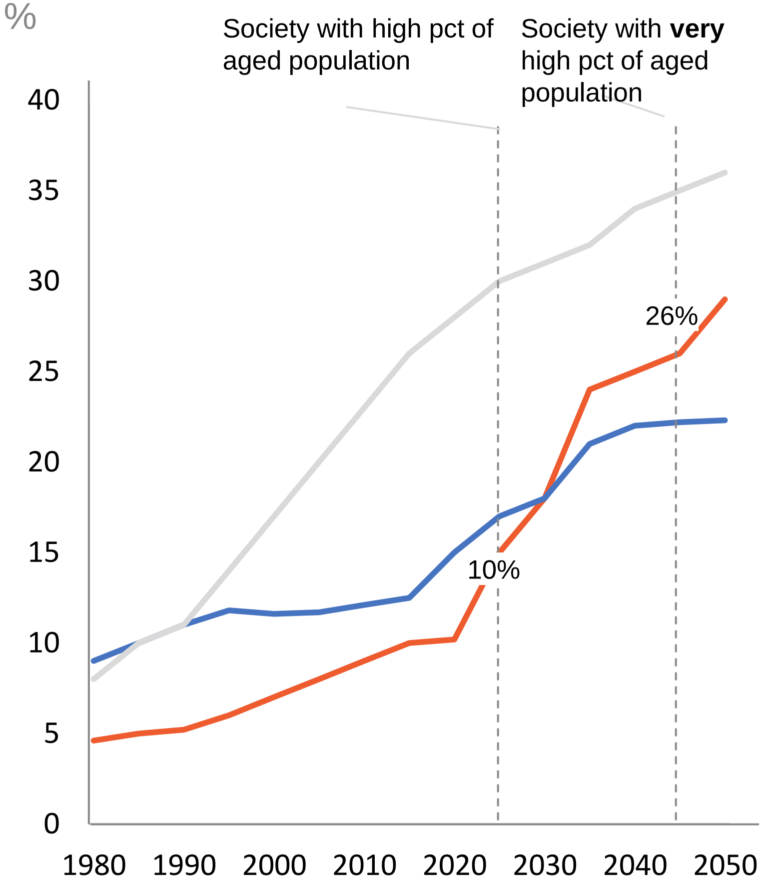
Poorer than developed nations

Per capita GDP
USD



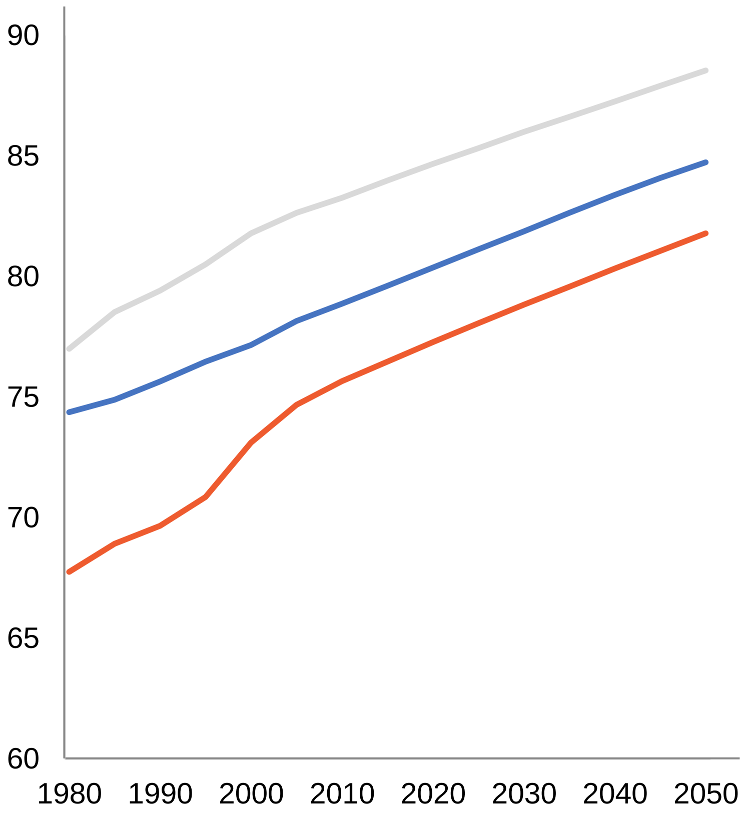
Fast aging population

% of citizens aged 65+ to total population
%



Longevity

Avg. lifespan by nation
years



SOURCE: UN; IHS

Over the past 5 years, the Chinese government introduced a series of pension policy reforms

Policy title | Policy content

- 2013.09 — Comments of State Council in Expediting Development of Elder Services Sector
- 2014.08 — Notice in Respect of Proper Government Procurement of Elder Services
- 2014.11 — Notice in Encouraging Foreign Investors to Participate in Elder Services
- 2015.02 — Implementation Guidelines in Respect of Encouraging Private Sector Capital to Invest in Elder Services Sector
- 2016.03 — Guidelines in Respect of Financial Support for Speeding up Growth of Elder Services Sector
- 2016.03 — Outline of 13th 5-Year Plan
  - "Improve on basic pension system and build a multi-tiered pension system"
- 2016.03 — Comments on Key Activities in the Deepening of Economic System Reform 2016
  - "Roll out personal tax-deferred pilot on commercial pension schemes"
- 2016.12 — Comments of General Office of State Council in Fully Opening up Elder Services to "Market"
- 2017.03 — Notice of State Council in Disseminating "13th five-year plan" for state's elder sector growth and system development
- 2017.02 — Smart Healthy Elder Industry Development Action Plan (2017-2020)
  - "Deepen commercial pension supply-side structural reform"
- 2018.04 — Notice in Respect of Piloting Personal Tax-Deferred Commercial Pensions
  - "Further enhance personal tax-deferred commercial pension schemes"
- 2018.07 — Notice of China Banking & Insurance Regulatory Commission in Expanding Scope of Reverse Mortgage-Based Pensions for Senior Citizens

Good practice in creating "longevity risk" trading market, product design, investment solutions and hedging in coping with longevity risk

Create "longevity risk" trading market	• Incubate an effective "longevity risk" trade market, partly as the effort to diverse & deepen China capital markets
Innovative product design	• Optimize the product design so that it contains less longevity risks
Optimize investment solutions	• Optimize investment to prevent and hedge against the risk of uncertain returns in the future
Hedging	• Transfer "longevity risks" to suitable counterparts via hedging

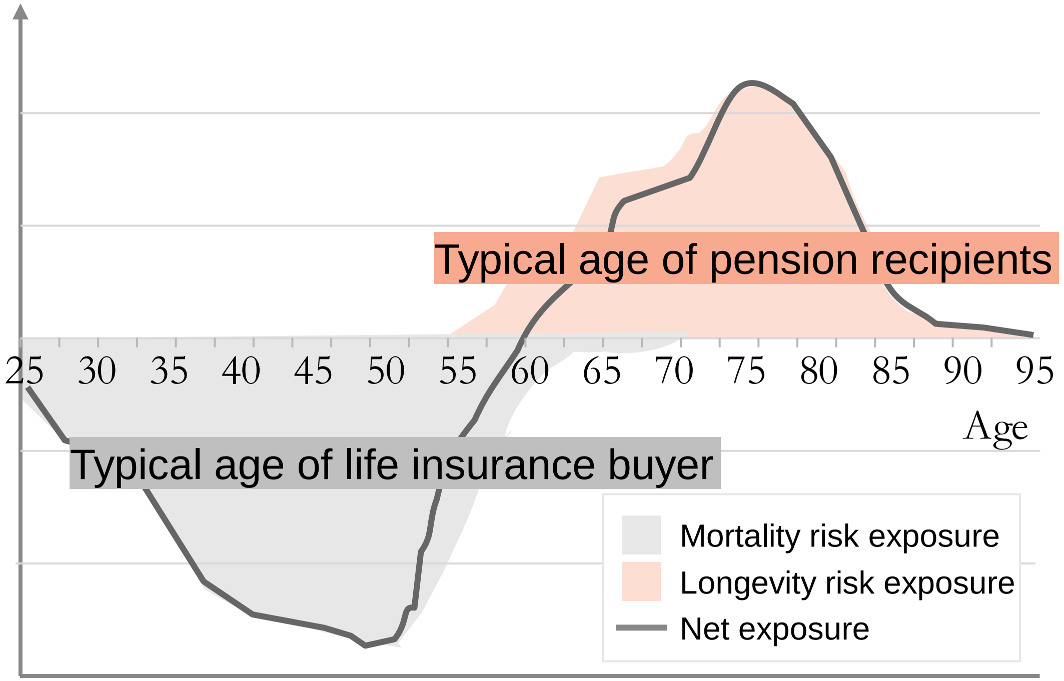
Longevity risk trading market: establish an effective risk trading market to hedge longevity risk

Coping with longevity risk

Longevity risk trading market	Innovative product design	Optimize investment solutions	Hedging

"Mortality risk[1]" is the most effective hedge against "longevity risk[2]"

- Longevity is a risk to annuity but earning to life insurance



Government shall actively establishe "longevity risk" trading market

- Some investors (life insurers) need to look for targets in "longevity risk" trading market as a hedge against longevity risk

Active risk "buyer" and "seller"

Longevity risk trading market

Reliable, timely and standard data

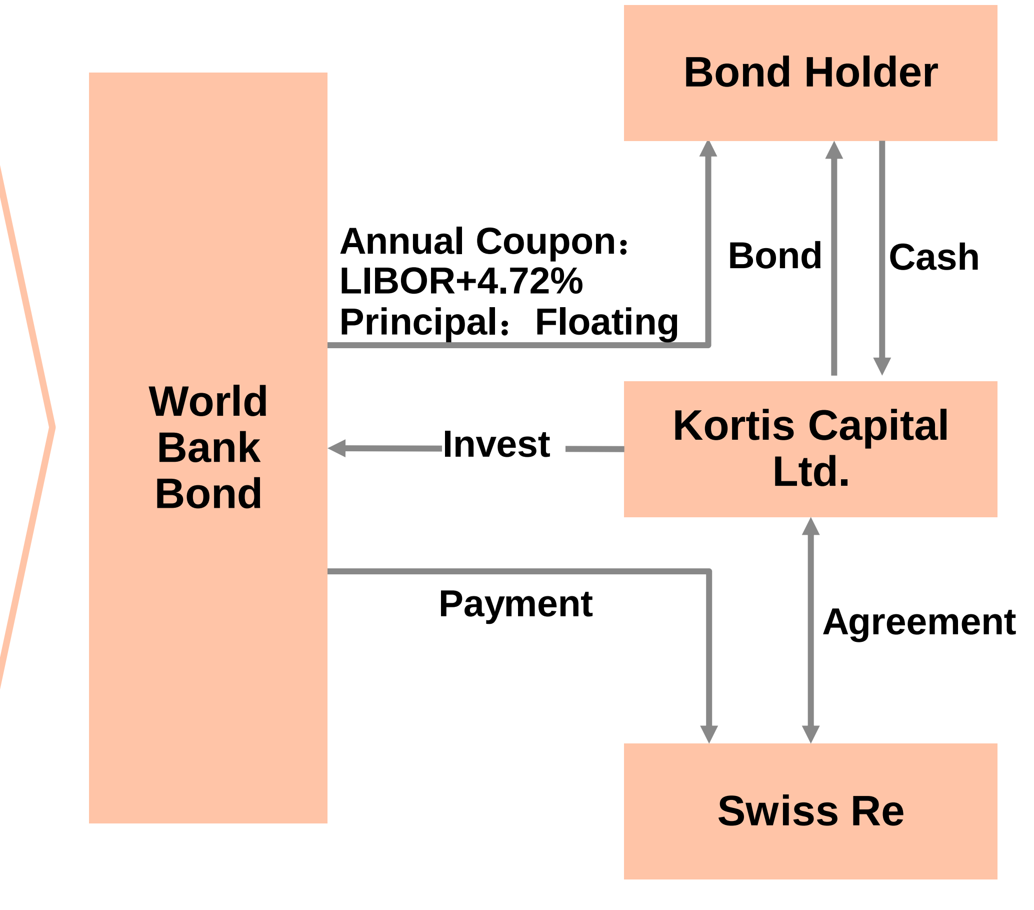
Easily comprehensible and acceptable risk (pricing) model

1 Mortality risk refers to the risk of a person's life being shorter than "expected"
2 Longevity risk refers to the risk of a person's life being longer than "expected"

Longevity risk trading market example: Kortis "Longevity Bond" by Swiss Re

- **Background:**
  - In December 2010, Swiss Re issued longevity bond through Kortis Capital Ltd., and got initial success, transferring longevity risks to capital market investors
    - Value: 50 millon USD
    - Maturity: 8 years
- **Features:**
  - **Event triggered longevity divergence index bond,** can effectively diverse risks, and lowering the risks for investors
  - Rate BB+ by Standard & Poor's, proving a foundation for secondary market trading
  - **Relatively short maturity of 8 years,** meeting the needs of most capital market investors willing to take on longevity risks

Kortis Longevity Bond Structure



Source: McKinsey Research, Blake/Cairns/Dowd: Living with mortality; Longevity bonds and other mortality-linked securities, 2006; ILS development analysis

Innovative product design: adjust pricing strategy and coverage to lower risks

Coping with longevity risk

Longevity risk trading market	**Innovative product design**	Optimize investment solutions	Hedging

- **Strategy 1: more precise life chart**
  - Currently, industry life chart is updated every 10 years. Insurers can update it more frequently (every 5 years) and increase demographic segments (currently only male and female)
- **Strategy 2: adopt variable guarantee rate when pricing**
  - Currently pension products are priced with fixed pricing interest rates. Insurers can consider to adopt variable guarantee rate, thereby lowering overall risk
- **Strategy 3: life and annuity product combination**
  - Integrate the two types of products and sell as a combination, thereby minimizing the net risk resulting from longevity and death

Optimize investment solutions: diversify investment approaches/channels, enter into elder services sector to control the overall risk

- **Strategy 1: invest in long-term asset category**
  – Invest into long term asset category to match the long liability duration of annuity product to mitigate overall risk

- **Strategy 2: invest in “reverse risk” business to hedge risk**
  – Invest in industries that favor longevity, e.g., nursing homes, senior travels, bio-healthcare startups

- **Strategy 3: enter/operate “elder service” industry to lower costs**
  – Combine financial solution with elder service, e.g. enter/operate elder service industry to lower the cost of services procurement

Build risk hedge scheme: fully play out the functions of the “market” to shift risks

Coping with longevity risk

Longevity risk trading market	Innovative product design	Optimize investment solutions	**Hedging**

- **Strategy 1: longevity swap**
  - Locate the counterparties who naturally favor “longevity risk” (e.g., life insurers) for longevity swap
- **Strategy 2: IR swap, CPI swap**
  - leverage IR swap, CPI swap and other derivatives from the market to mitigate uncertainty risk
- **Strategy 3: cooperate with re-insurers**
  - Enhance involvement of reinsurers: insurers transfer the part of risk that insured’s life being shorter than “expected” to reinsurers

Thank you!

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