## Jens Thomsen: Ultra long-term financial instruments

Speech by Mr Jens Thomsen, Member of the Board of Governors of the National Bank of Denmark, at the OECD Seminar: "The pension payout phase: Annuities and implications for financial markets", Paris, 12 November 2008.

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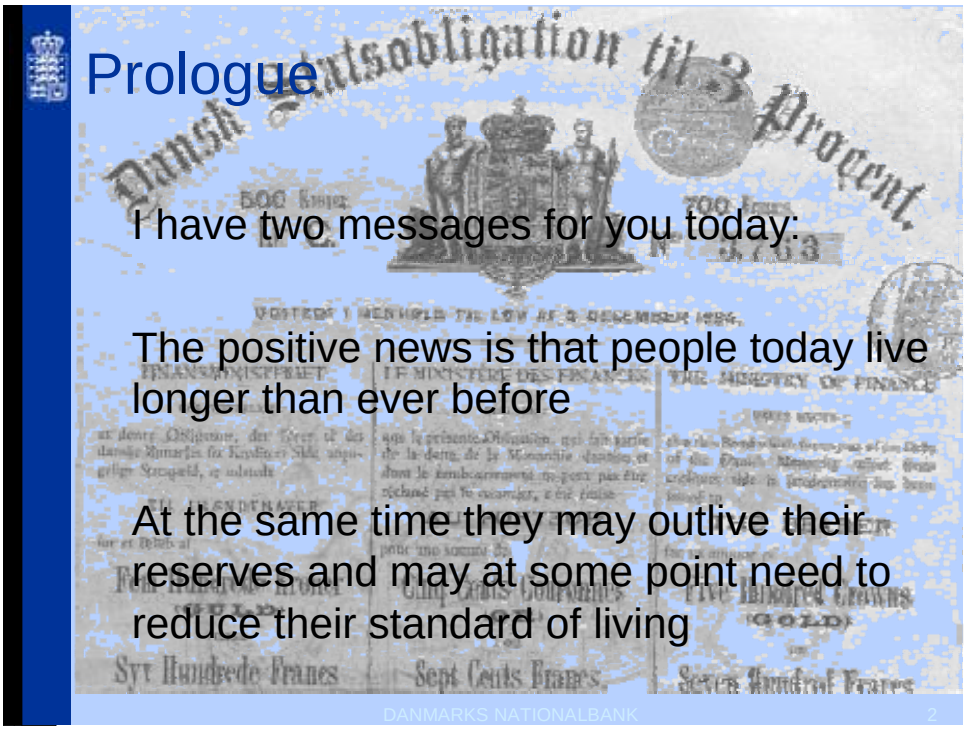
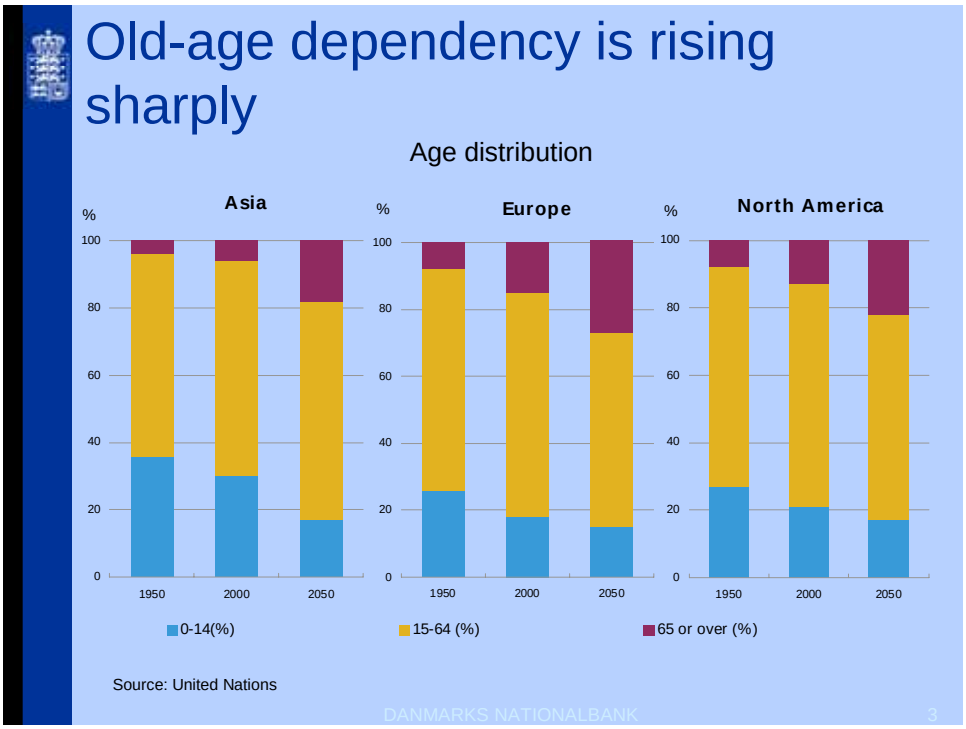
### Prologue

Today I have two messages for you: The positive news is that people today live longer than ever before. However, this implies that if people are not working longer, they may outlive their financial reserves and may at some point need to reduce their standard of living, cf. Slide 2.

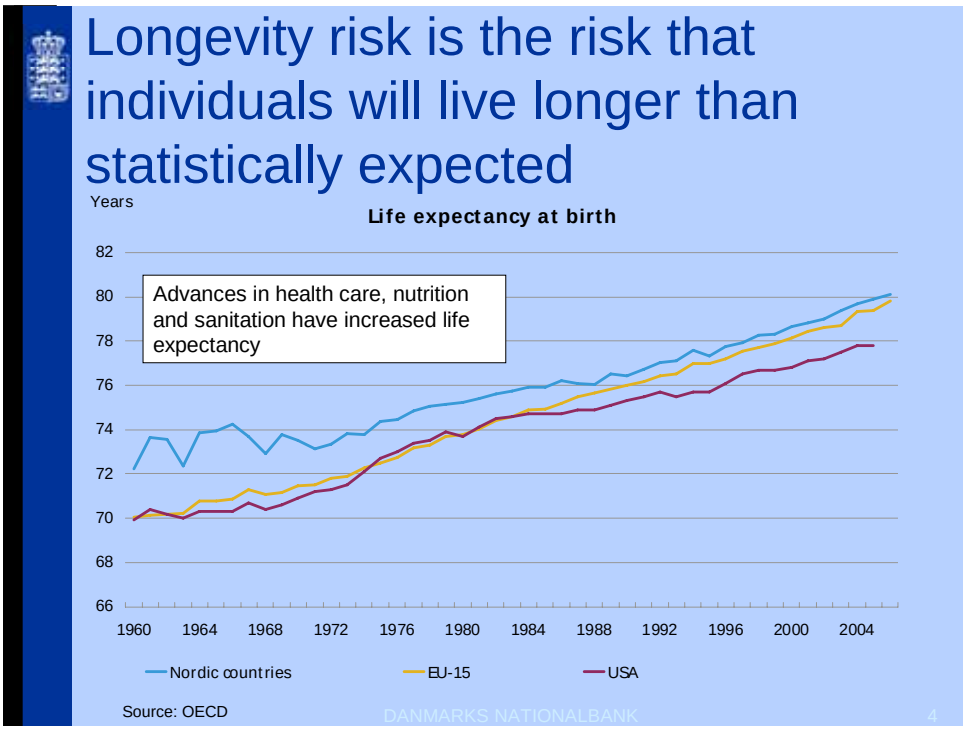



### Introduction

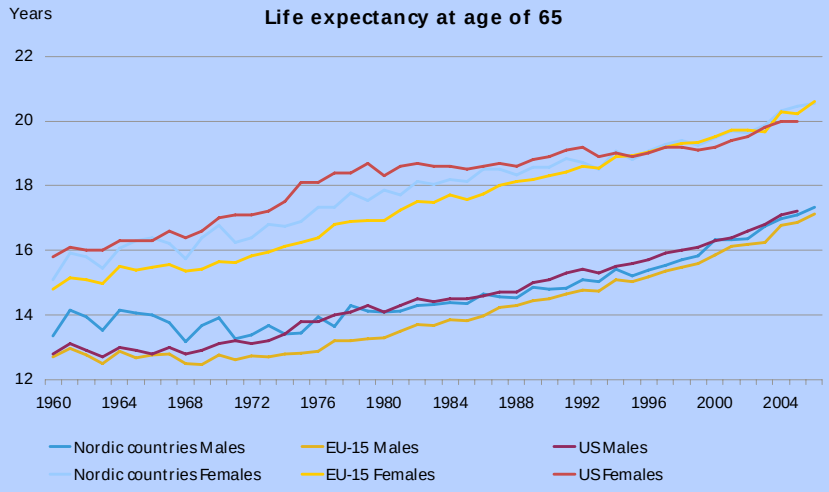
During the last half century the ageing of world population has increased rapidly. On one hand, the decrease in fertility rates in past decades and on the other the higher life expectancy at older age have caused a sharp increase in the current old age dependency. The trend of population ageing shows no sign of a turn, quite the opposite: The world population is expected to age at increasing speed, cf. Slide 3.




Living longer in good health is a fantastic accomplishment from the society to which improvements in health care, nutrition and sanitation have contributed, cf. Slide 4. On the other hand, the increasing life expectancy – in particular the increasing life expectancy at retirement age – poses challenges to individuals, governments, labour markets and life insurance and pension sector, cf. Slide 5.



## In particular, the increase in life expectancy at retirement age can be a challenge for carriers of longevity risk




Source: OECD

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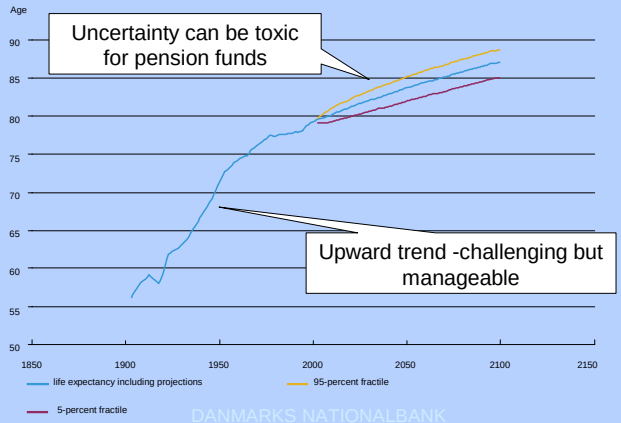
Demographic changes, such as increasing life expectancy, imply risks for the financial institutions. Longevity risk is the risk that individuals live longer than expected. The apparent upward trend in life expectancy is manageable but it is the speed and magnitude of the change in life expectancy that involves the risk: The life expectancy of the current generations may deviate substantially from the course projected today and that could imply problems to the pension sector depending on issued guarantees, cf. Slide 6.

## The risk is the speed and magnitude of the change in life expectancy, not the direction

Expected and unexpected development in life expectancy for women in Denmark

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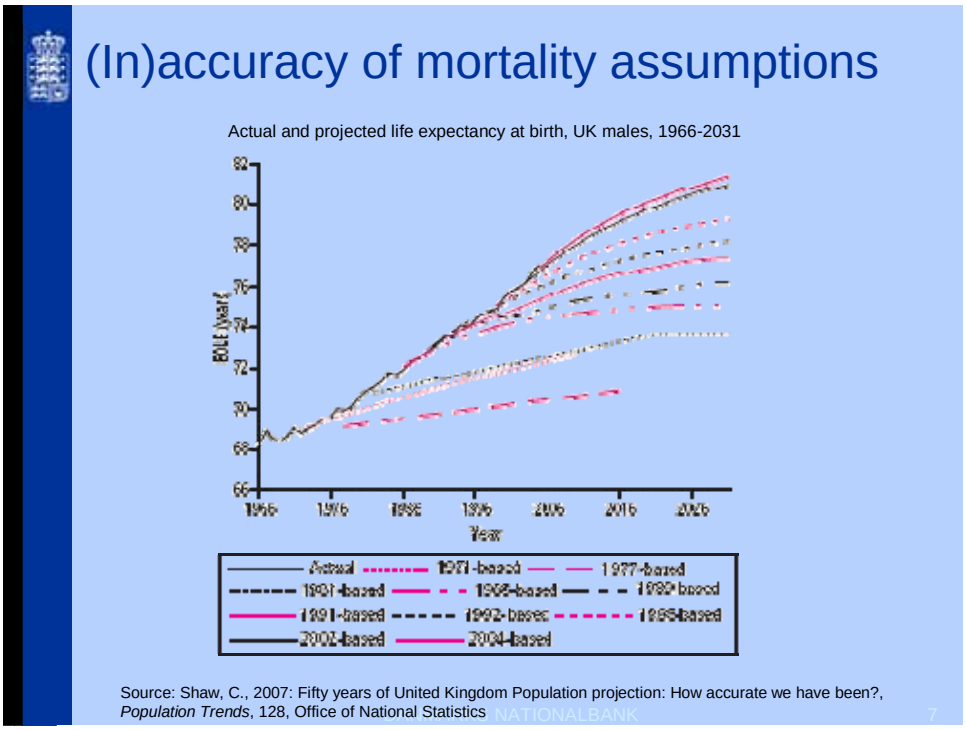
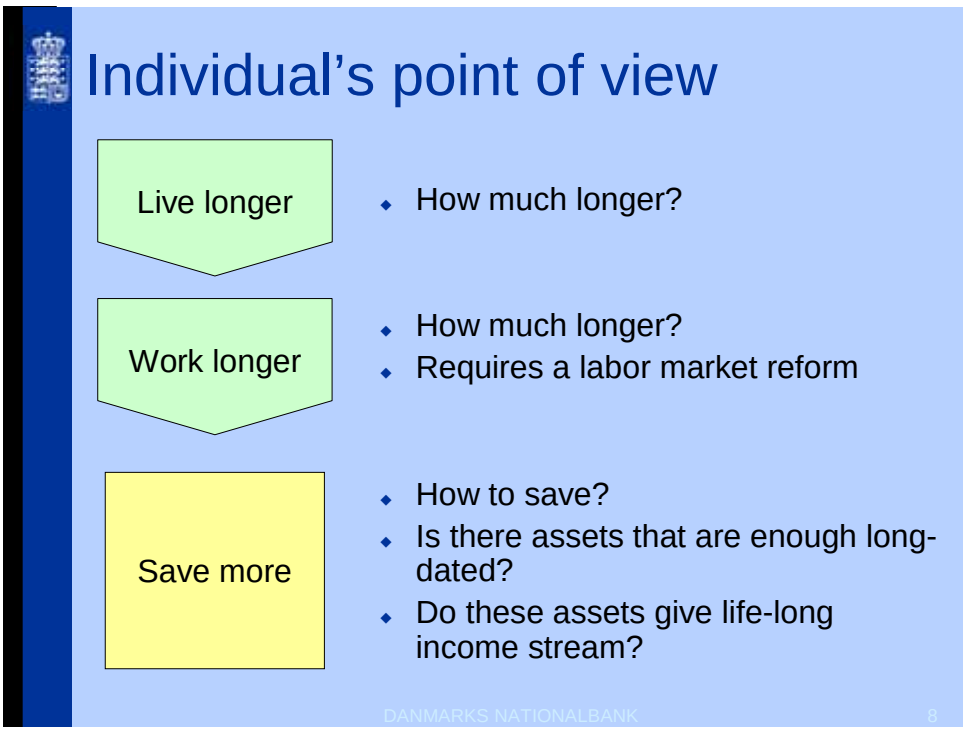
Thus far, the increases in life expectancy have been systematically under-estimated, which has lead to under-estimation of the number of elderly and old-age dependency. As a

consequence, pension scheme funding strategies have to some extent been inadequate, cf. Slide 7.



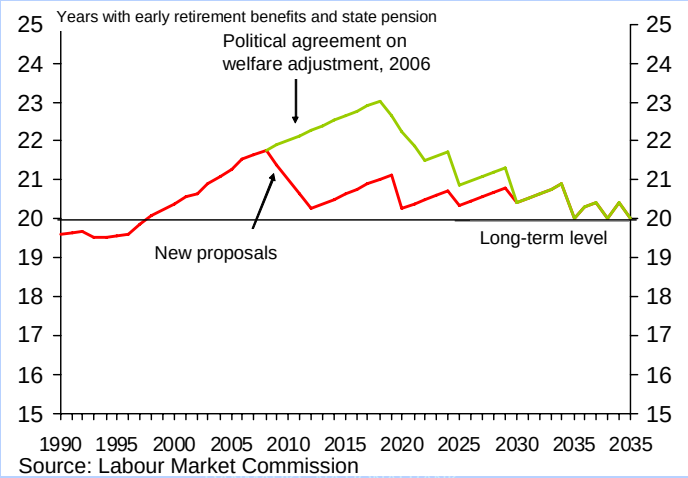

**Retirement saving**

From an individual's point of view longevity raises a financial question: Will there be enough resources to sustain an adequate life quality if life expectancy increases? The individuals that hold a pension plan where the retiree bears investment and longevity risk now have to become portfolio managers and decide upon the portfolio in an environment of uncertainty with no appropriate instruments for hedging the uncertainties, cf. Slide 8.



Some countries have increased general retirement age so that the dependency of retirement savings can decrease while retirement savings increase. In Denmark, for instance, the Labour Market Commission's new proposal is to start to extent retirement age by a half-a-year every year between 2009 and 2012. The previous political agreement on welfare adjustment from 2006 stated that the extension would begin in 2019, cf. Slide 9.

## DK: Expected number of years with early retirement benefits and state pension for a 60-year-old, 1990-2035

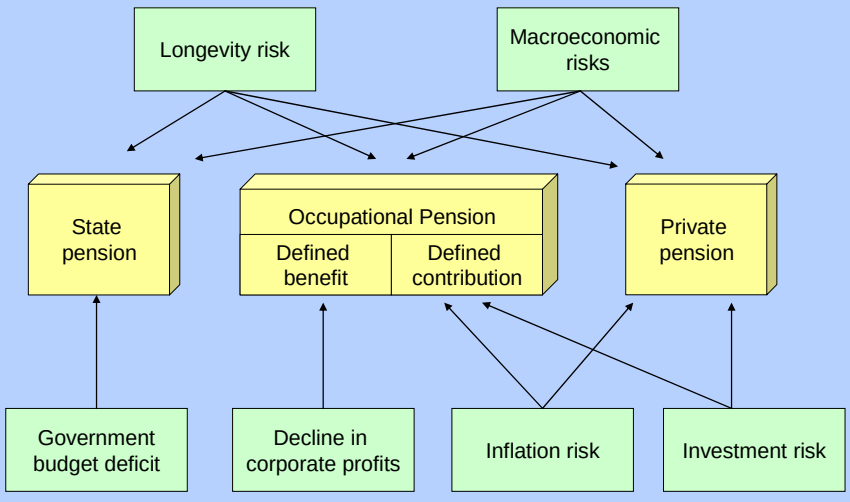



Source: Labour Market Commission

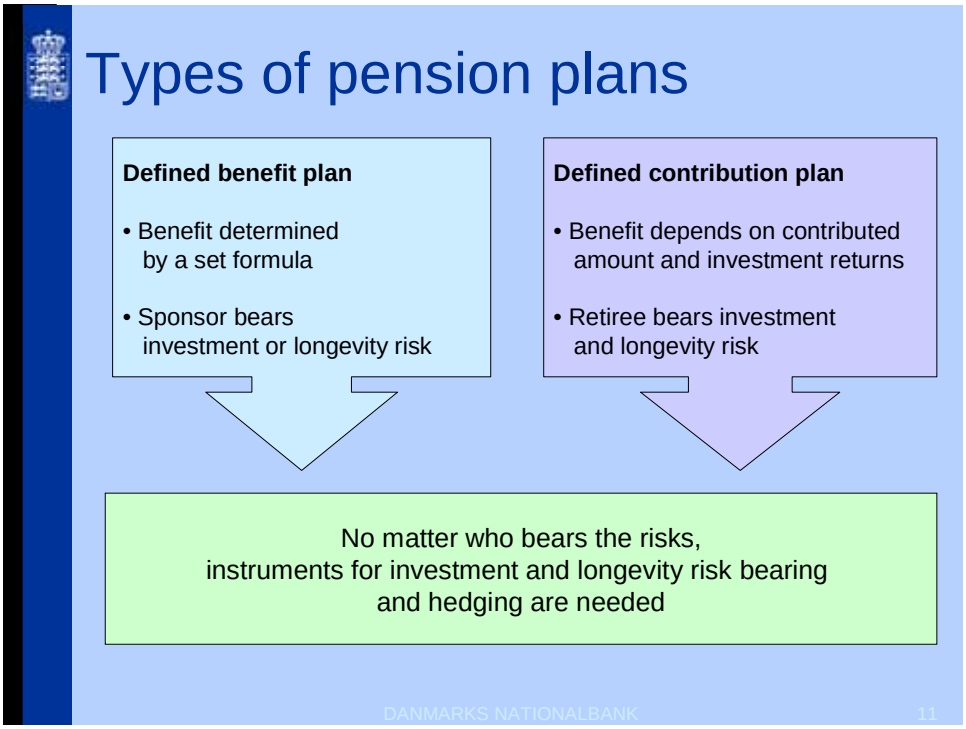
Retirement saving is exposed to a number of risks depending of the form of saving. However, longevity and macroeconomic risks affect all forms of retirement saving, cf. Slide 10.

## Risks affecting retirement saving



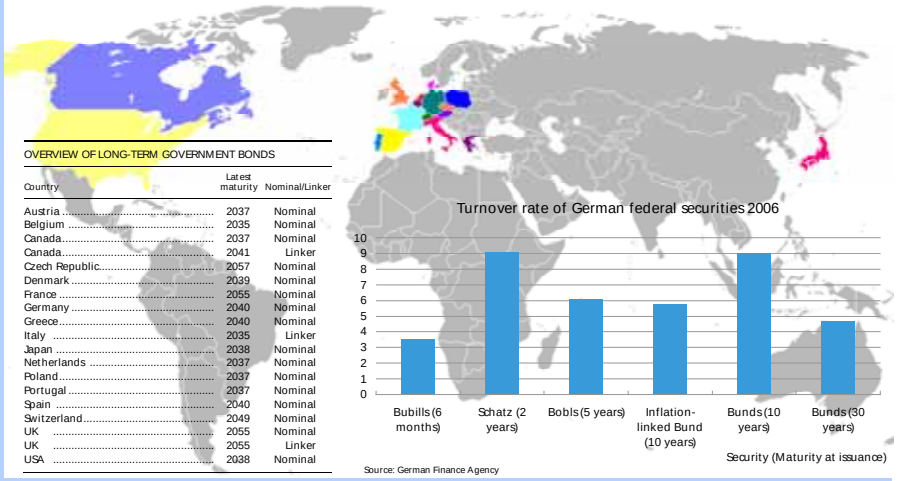
Depending on the type of pension plan, it is either the sponsor or the retiree that bears the longevity and investment risk. As the defined benefit retirement plans are being reduced in favour of defined contribution plans the risks are shifted from the sponsors to individuals. Some sponsors have attempted to renegotiate the agreed pension plans with the retirees within the scope of the pension contracts to take into account the longevity risk. Anyhow, appropriate risk management for interest rate, inflation and longevity risks are needed, cf. Slide 11.




**Long-term government bonds**

The ultra-long government bonds are not a recent invention. Perpetuals were used in war financing for example in United Kingdom that in 1919 issued two ultra-long bonds, 57-year "Victory Bond" and 71-year "Funding Loan". Today many governments have long-dated outstanding loans with maturities up to 50 years. The issued ultra-long bonds tend to end up in investors' buy-and-hold positions, which affects bond liquidity. In Germany, for instance, the turnover ratio of the 10-year Bund is almost the double compared to the 30-year Bund, cf. Slide 12.

# Government bonds with maturities over 30 years, OECD-countries



OVERVIEW OF LONG-TERM GOVERNMENT BONDS

| Country | Latest maturity | Nominal/Linker |
|---|---|---|
| Austria | 2037 | Nominal |
| Belgium | 2035 | Nominal |
| Canada | 2037 | Nominal |
| Canada | 2041 | Linker |
| Czech Republic | 2057 | Nominal |
| Denmark | 2039 | Nominal |
| France | 2055 | Nominal |
| Germany | 2040 | Nominal |
| Greece | 2040 | Nominal |
| Italy | 2035 | Linker |
| Japan | 2038 | Nominal |
| Netherlands | 2037 | Nominal |
| Poland | 2037 | Nominal |
| Portugal | 2037 | Nominal |
| Spain | 2040 | Nominal |
| Switzerland | 2049 | Nominal |
| UK | 2055 | Nominal |
| UK | 2055 | Linker |
| USA | 2038 | Nominal |

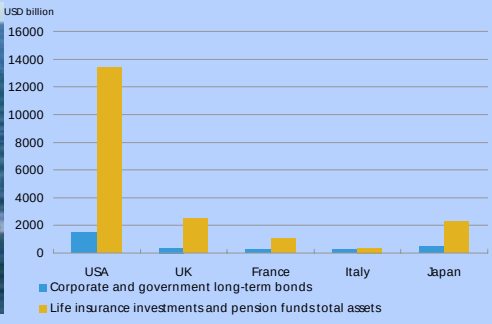



Source: German Finance Agency



Supply of ultra-long bonds is small compared to the size of pension fund and life insurance company portfolios. For instance in USA, the supply of government and corporate long-term bonds is only 10 per cent of the size of life insurance sector's investments and pension funds' assets, cf. Slide 13.

# Markets for long-dated bonds are small relative to the size of pension fund and insurance company portfolios

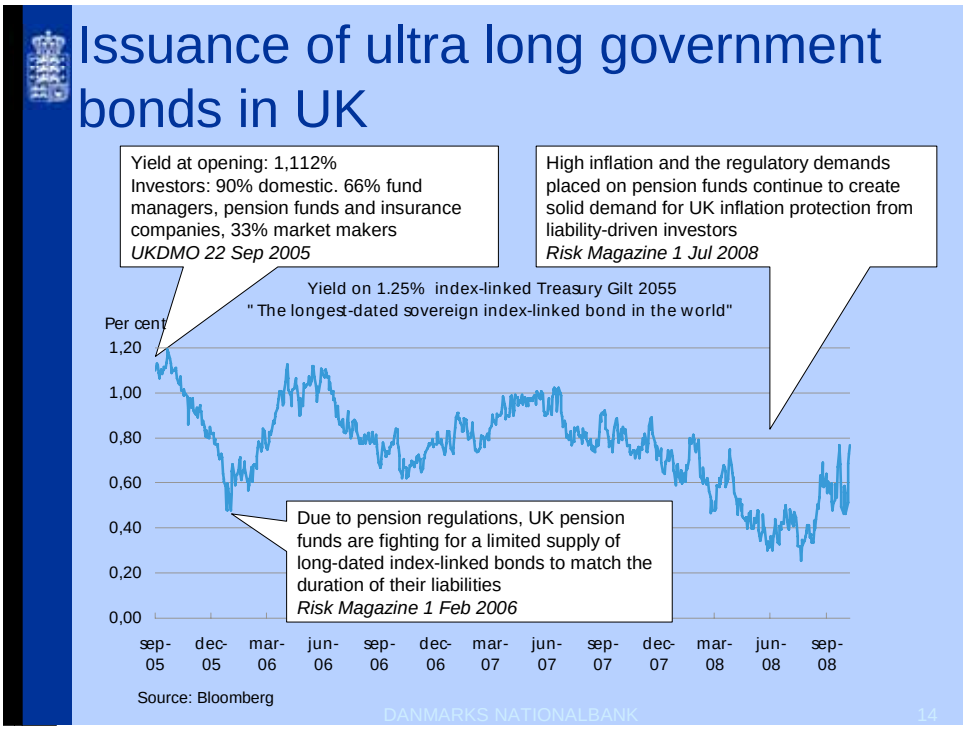



Source: Ageing and Pension System reform, Report to the G10 deputies, 2005, *Pension Markets in Focus*, OECD Newsletter, Dec 2005



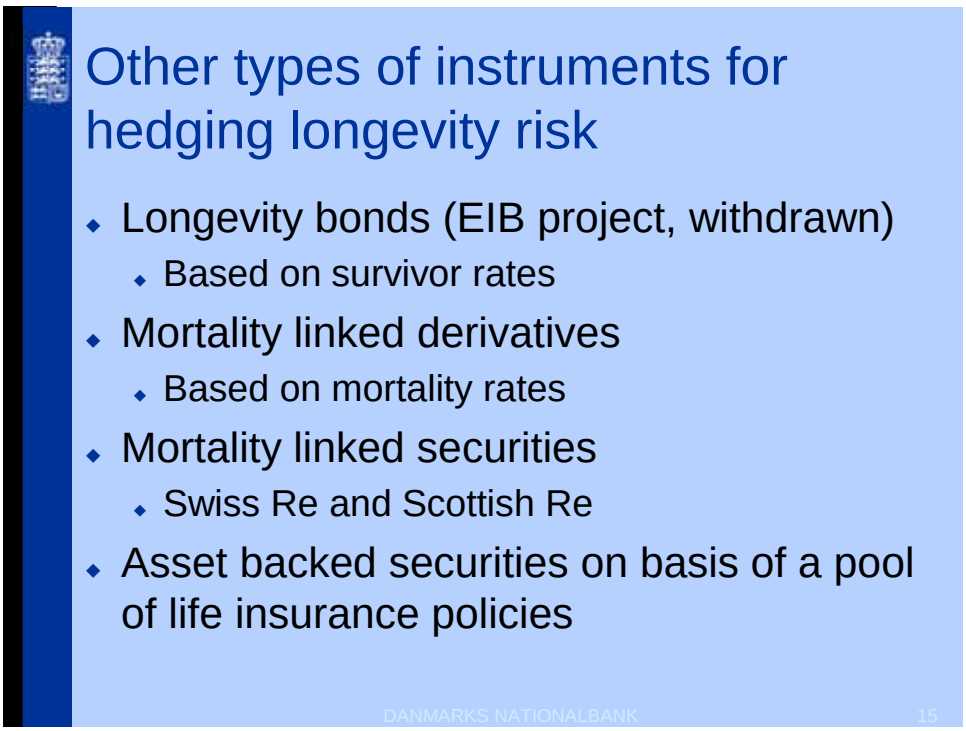
Moreover, many countries have lately introduced new pension regulations requiring pension fund managers to update their pension plan assumptions and apply mark-to-market approach in valuation of risks. As a result many companies have implemented asset liability risk management (ALM), which implies a closer linkage between pension fund assets and liabilities and an increased demand for long-term bonds, cf. Slide 14. Together with the limited supply of the long-term bonds this has lead to increasing use of derivative instruments

to match asset portfolio duration with pension liability duration and to hedge inflation and interest rate risks.

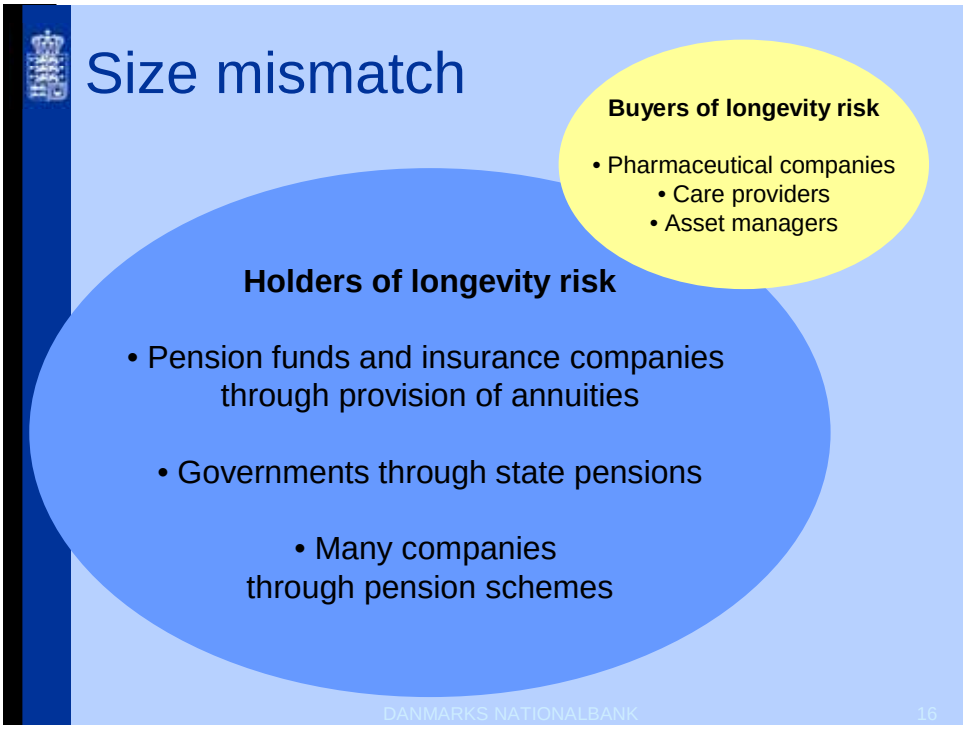



**Markets for longevity hedging**

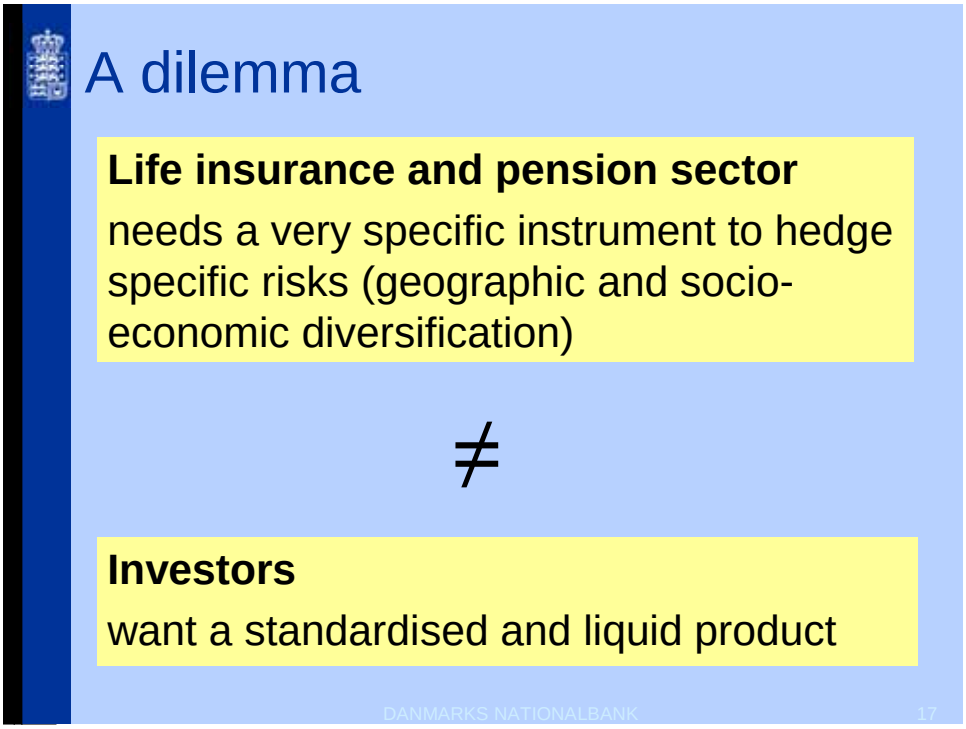
Against this background there is an increasing interest in new instruments that can be used to hedge longevity risk. The 2004 EIB announcement of longevity bond issuance generated a wide interest and a lot of attention. However, the issue was later withdrawn without being issued; According to anecdotal evidence, this was mainly because the pension industry found the price of coverage on longevity risk too high, cf. Slide 15.



The largest hinder for development of longevity risk market is that the market lacks interested buyers of the risk. The natural investors – who would benefit from unexpected rise in life expectancy – such as pharmaceutical companies and care providers are marginal in size compared to the longevity risk holders and may be hindered to enter into longevity risk transactions due to corporate governance reasons, cf. Slide 16.




Another obstacle for development of longevity risk market is that thus far the packaging of longevity risk has not appealed to both sellers and buyers of the risk, cf. Slide 17. Life insurance and pension sector needs to transfer very specific risks while the potential investors want a standardised product with high level of liquidity, cf. Slide 18.



# Hedging longevity

| Instrument \ Quality | Liquid | Hedge for basis risk* | Hedge for specific risk | Lack of correlation with other assets |
|---|---|---|---|---|
| Ultra long government bonds | (✓) | ✓ | | |
| Longevity bonds | | | ✓ | ✓ |
| Mortality linked derivatives and securities | | | (✓) | ✓ |
| Asset backed securities on basis of a pool of life insurance policies | | | | (✓) |

* i.e. imperfect hedging capacity



**The role of the private sector**

Pension funds and life insurance companies are experts in management of longevity risk. Yet they are heavily exposed to this risk category and therefore they have an interest in hedging some of the exposure. From the investor side longevity risk is very appealing due to its low correlation with the yield of other financial instruments. Nevertheless, the attractive contribution in asset managers' portfolios, the longevity instruments have failed to attract buyers, cf. Slide 19.

# Role of the private sector

**Advantages**

- Life insurance companies are experts in longevity risk
- Why wouldn't the natural hedgers for longevity risk issue longevity bonds?
- Lack of correlation between life expectancy and all other assets should appeal to a broad range of investors

**Barriers**

- Hard to find a package that appeals both sellers and buyers
- Pure longevity risk transfer is possible only when risk is fully priced

Until now the private sector has used other types of hedging tools in longevity hedging:

1. The pension sector has managed liabilities related to longevity risk without specific hedging instruments. Thus the exposure to longevity has been part of the pension sector's overall risk management.
2. Reinsurance companies have provided capital to the pension sector seeking hedging opportunities.
3. The pension sector has also transferred their pension contracts to external investors who have assumed the contractual obligations, cf. Slide 20.


**The role of governments**

Regarding the limited supply of instruments that could be used in longevity risk hedging, governments could issue ultra-long bonds in larger quantities to help in liability duration management. However, it should be stressed that in many countries this would need a change of mandate for the debt management office.

In addition, potential issuers of longevity instruments should keep in mind that the world financial markets are open and that there could be a considerable international investor interest to buy such a product. Hence, it is difficult to target the longevity instrument to the domestic pension sector.

Governments could produce a reliable and widely accepted longevity index that private sector longevity bond issuers could use as an unbiased benchmark to their bonds. Recently several private sector entities have launched longevity indices to be used as benchmark to various risk transfer instruments. Nevertheless, standardisation in this area has yet to emerge, cf. Slide 21.

# What could governments do?

- Issue ultra long government bonds (taking place today)
- Produce a reliable and widely accepted longevity index to be used as a benchmark
- Issue longevity bonds (more questionable)



Governments could issue longevity bonds, which would serve as benchmark similar to government yield curve and act as a catalyst in developing a private sector longevity bond market. However, the governments are heavily exposed to longevity risk through public pension systems and social security schemes, cf. Slide 22.

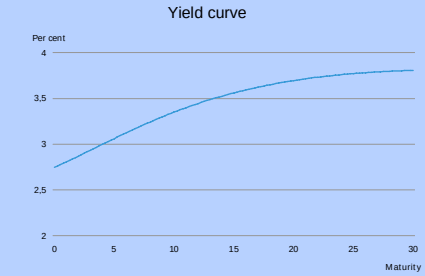
# Government issuance of longevity bonds

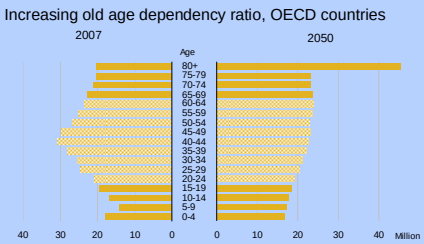
Pros:

- Could provide an unbiased benchmark similar to government yield curve
- Could be a catalyst in market development

Cons:

- Governments are heavily exposed to longevity risk






In the end, nothing is certain in life except death and taxes, cf. Slide 23. The need for development in market for longevity risk transfer is apparent. In view of the innovation seen in other financial areas, it is not impossible that a private market for longevity bonds will emerge, although not necessarily based on the product structures known today.

# The end

Nothing is certain in life except death and taxes.

Franklin, 1789

Thank you for your attention