

Gesamtvorbund der Deutschen Versicherungsvereine e. V.

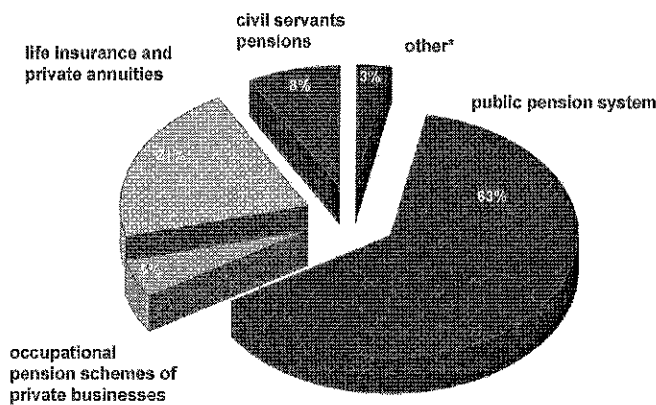
Traditional system of old age security in Germany

- dominance of first pillar: PAYG public pension system for workers and employees, special pension systems for civil servants and some other occupations, mostly unfunded
- funded systems (second and third pillar) had some importance, but were underdeveloped in an international comparison
- second pillar: long history of employer-financed occupational pensions
- third pillar: mainly in the form of life insurance savings / endowment insurance and proprietary dwellings
- fourth pillar: traditionally, some importance, but less so in the 1990ies (on the eve of pension reform very little employment of the elderly)



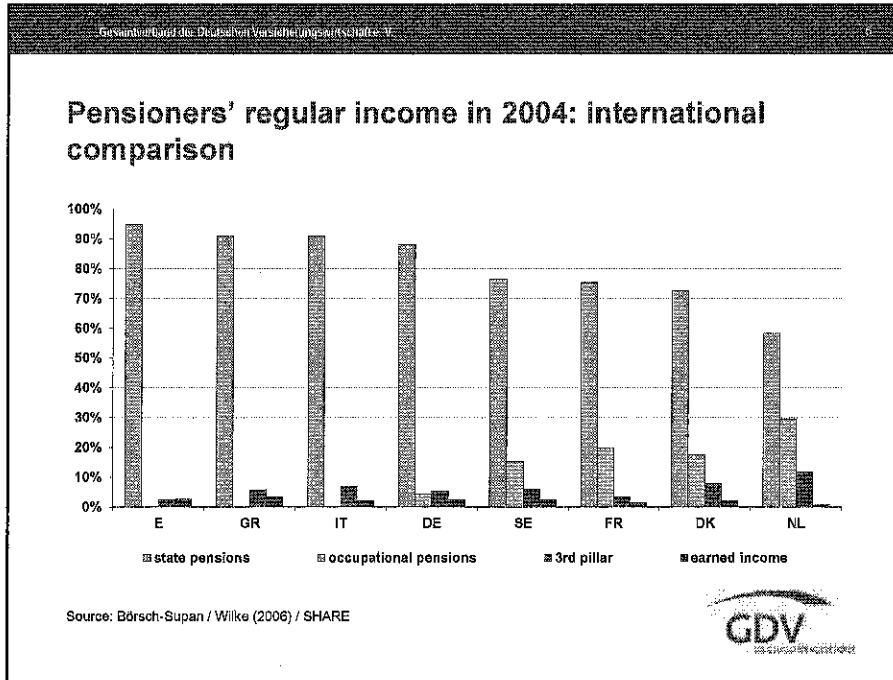
Gesamtvorbund der Deutschen Versicherungsvereine e. V.

Pre-reform breakdown of pensioners' benefits



* Including supplementary pensions for public sector workers
Source: Alterssicherungsbericht 2005, data for 2003





Gesamter Band der Deutschen Versicherungswirtschaft, V.

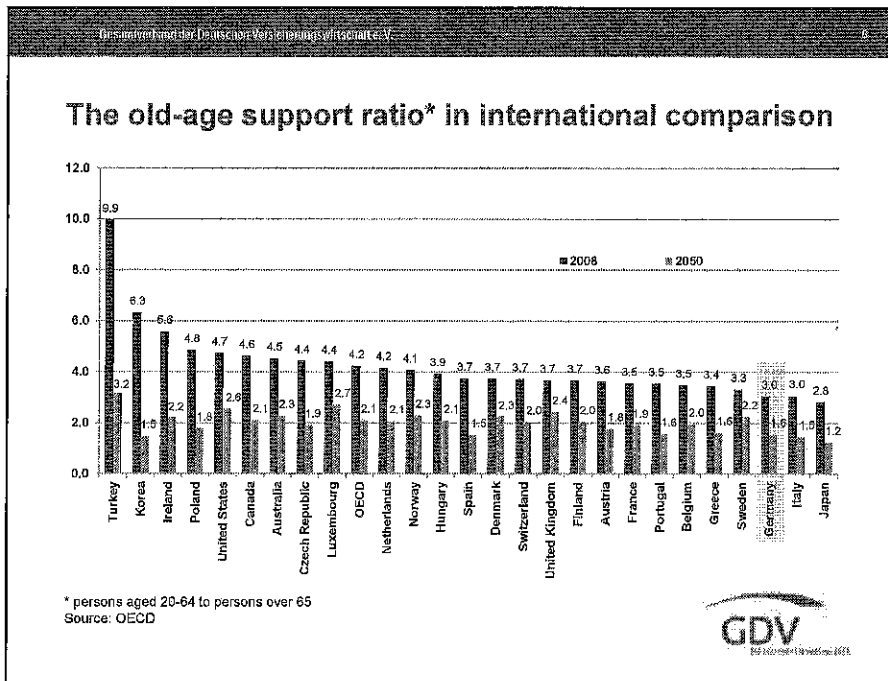
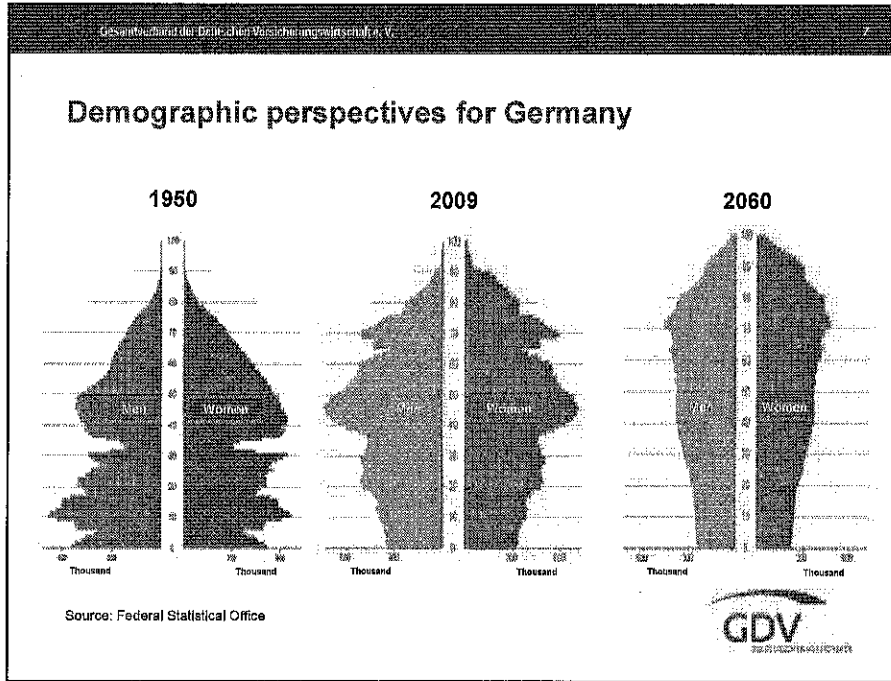
The need for reform: fundamental demographic and economic challenges

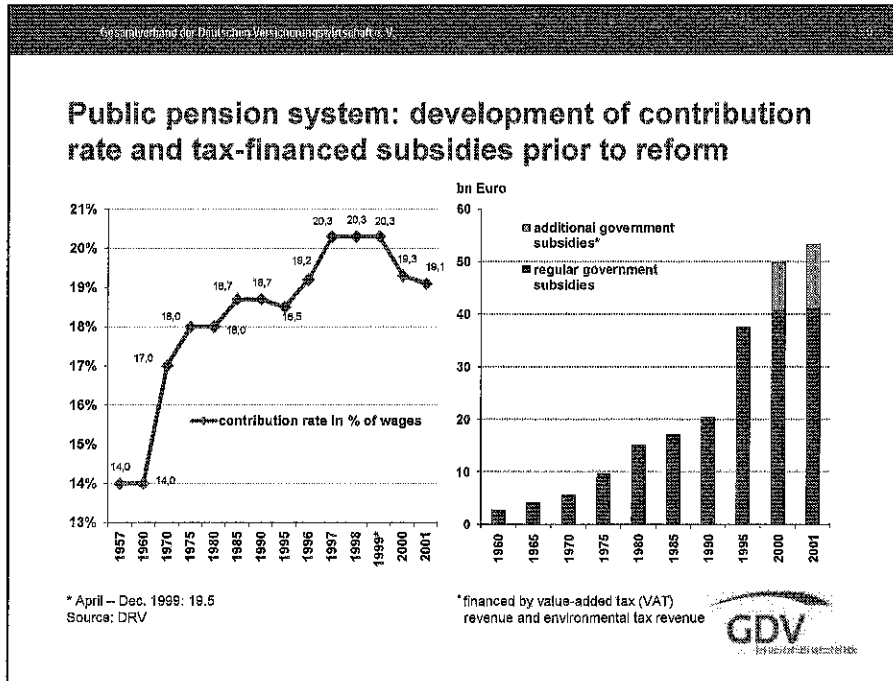
- demographic changes: fall in birth rate, longevity, ageing and shrinking of population
- globalisation, pension contributions a burden on labour markets
- deteriorating public finances
- limits of PAYG system, benefit increases of earlier years proved unsustainable in the middle and long term
- declining trend in occupational pension provision

⇒ **broad political consensus: major pension reforms inevitable**

GDV
DEUTSCHE VERSICHERUNGSWIRTSCHAFT

74





Gesellschaft für Diebstahlversicherungswirtschaft (GdV)

The Riester pension reform of 2001

- **new paradigm:** in order to maintain living standard in old age second and/or third pillar funded pensions are needed in addition to first pillar PAYG
- **PAYG public pension system:** reduction in pension levels with a view to stabilizing contribution rates, cutbacks in benefits (e.g. dependants' pensions)
- **promotion of funded pensions:**
 - **second pillar:** enhancement of employee-financed pension plans, right of enrolment, new tax incentives, introduction of new type of pension funds
 - **third pillar:** introduction of "**Riester pensions**" (with subsidies / tax-advantages and strict quality requirements (e.g. guaranteed minimum benefits))
- **reform objective:** increased (voluntary) private pension provision should compensate for reduction in public pensions

GDV
Gesellschaft für Diebstahlversicherungswirtschaft

Further reform measures to complement the Riester reform

2004:

- **further adjustments in public pension system:** introduction of "sustainability factor" into pension formula; transition to deferred taxation system
- **funded pensions:** higher taxes on insurance products with lump sum payments, preferential treatment for life-long annuity payments
- introduction of tax incentives for new funded private annuity product ("**Basisrente**"), characteristics similar to public pensions (targeted to the self-employed)

2007:

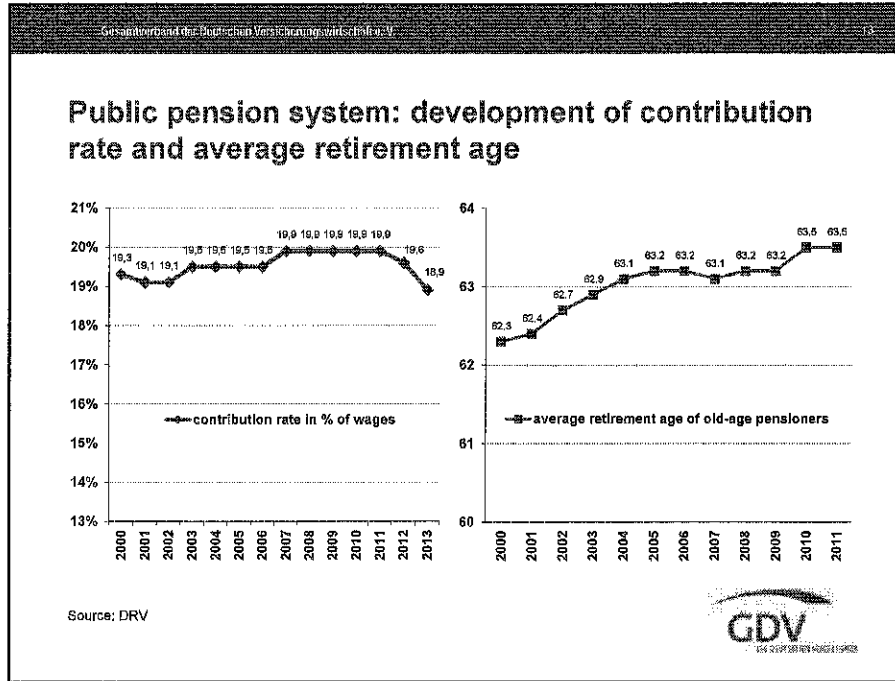
- regular retirement age to be increased from 65 to 67, phasing in until 2029



Impact of pension reforms so far (I): Impact on public pension system

- contribution rate stabilised, no further increase in tax-financed subsidies to PAYG system
- higher average retirement age due to various reform measures
- reduction of standard pension level
- however: several discretionary policy interventions with respect to annual pension adjustments, in particular: introduction of "pension guarantee" to prevent nominal pension cuts





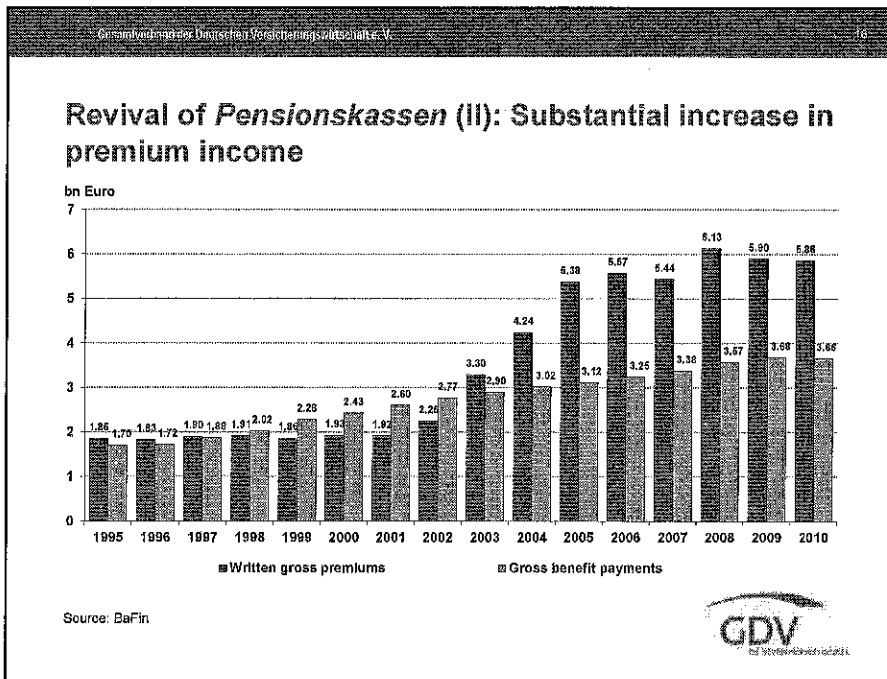
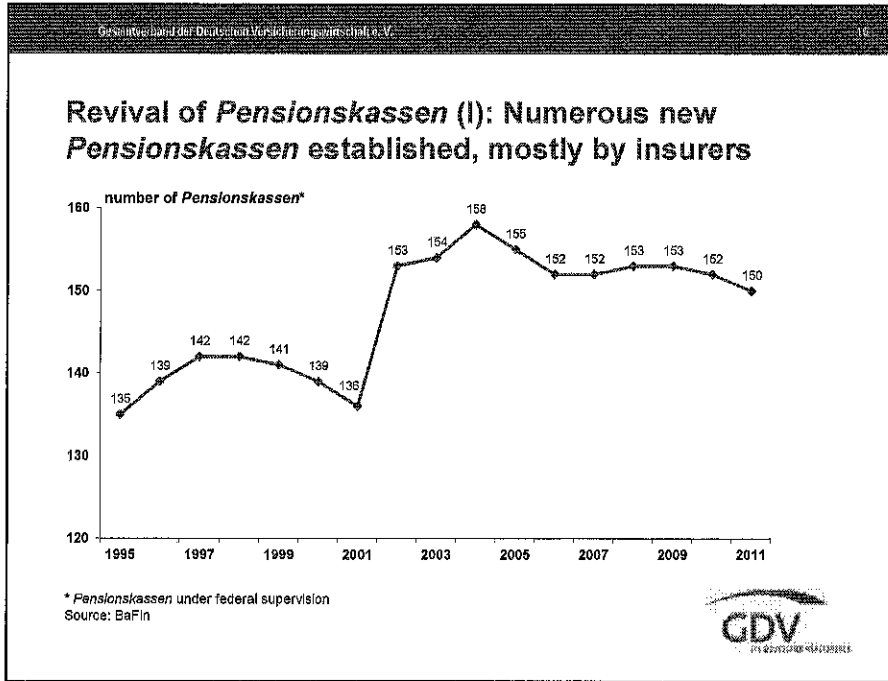
Gezetzgebungs- und Wirtschaftswissenschaften

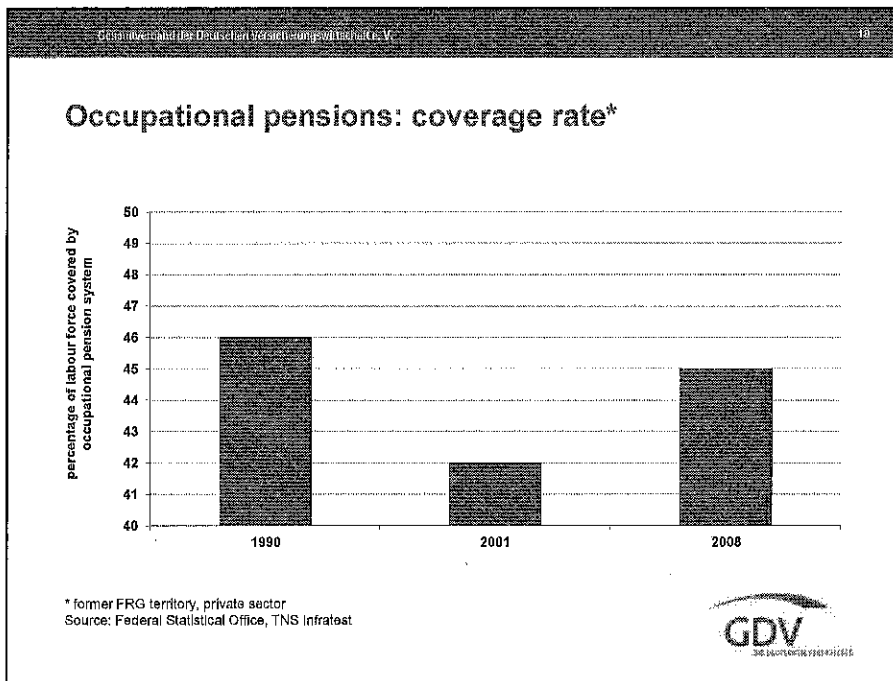
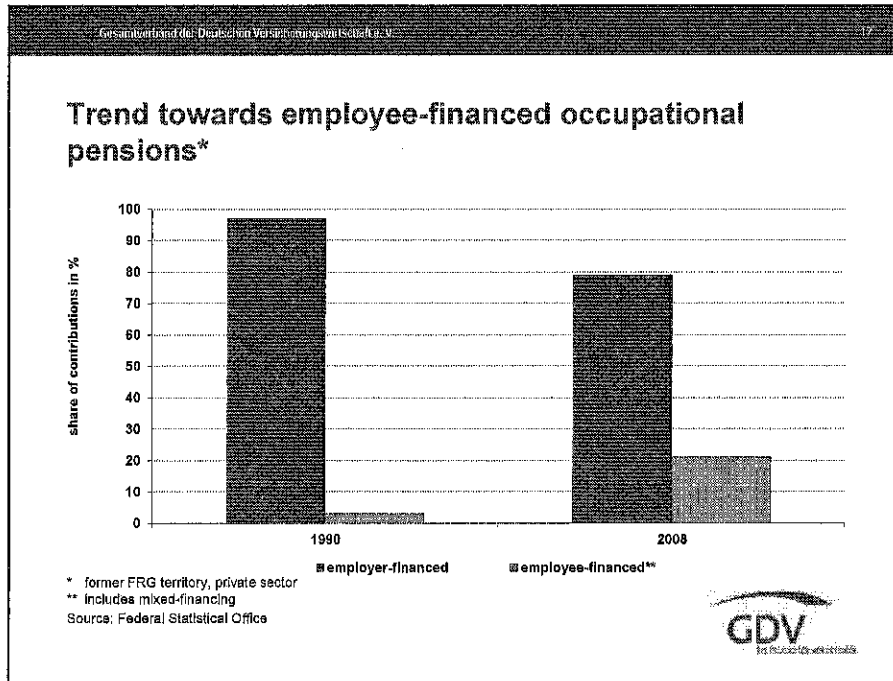
Impact of pension reforms so far (II): Impact on occupational pensions

revival of occupational pensions:

- many collective labour agreements refer to the new incentives for occupational pensions
- revival of *Pensionskassen* (traditional pension funds) as a vehicle of occupational pensions, number of future beneficiaries risen to 6.5 million (2010) from 2.4 million (2000)
- establishment of some 30 *Pensionsfonds* (new type of pension funds)
- increase in employee-financed occupational pensions compensates for decrease in employer-financed occupational pensions

GDV
100 Jahre Sozialversicherung




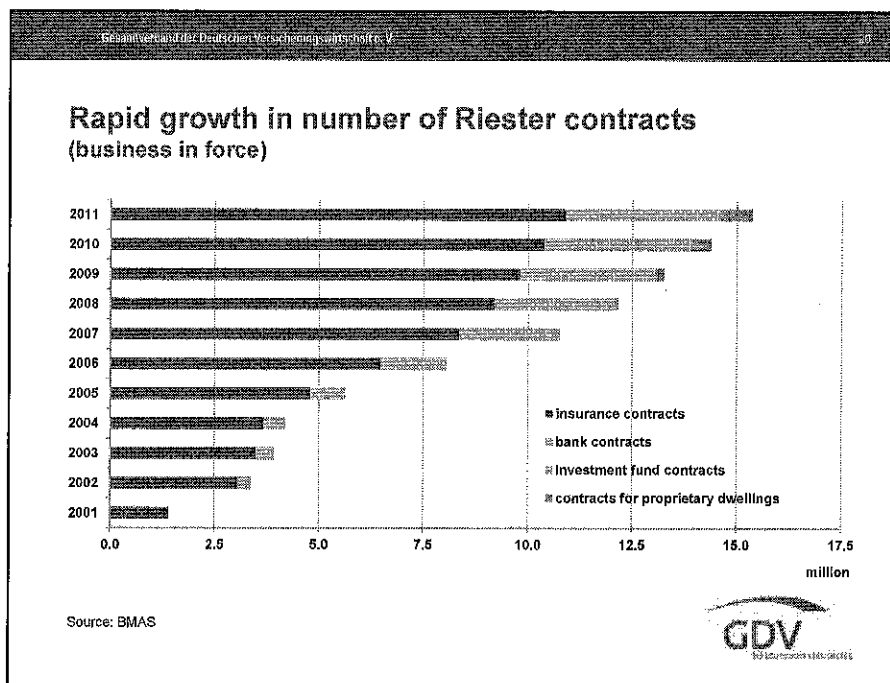


85

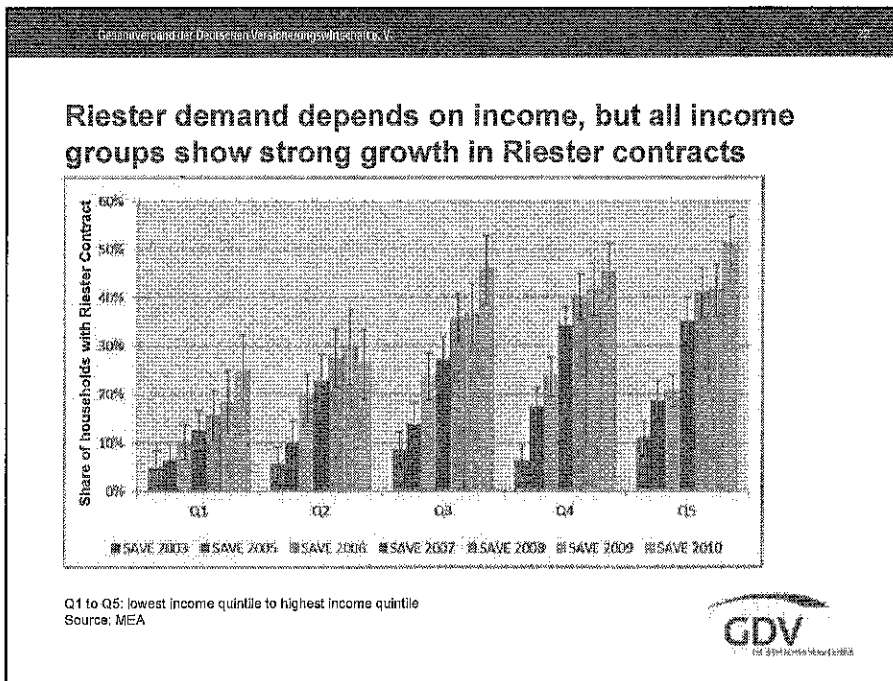
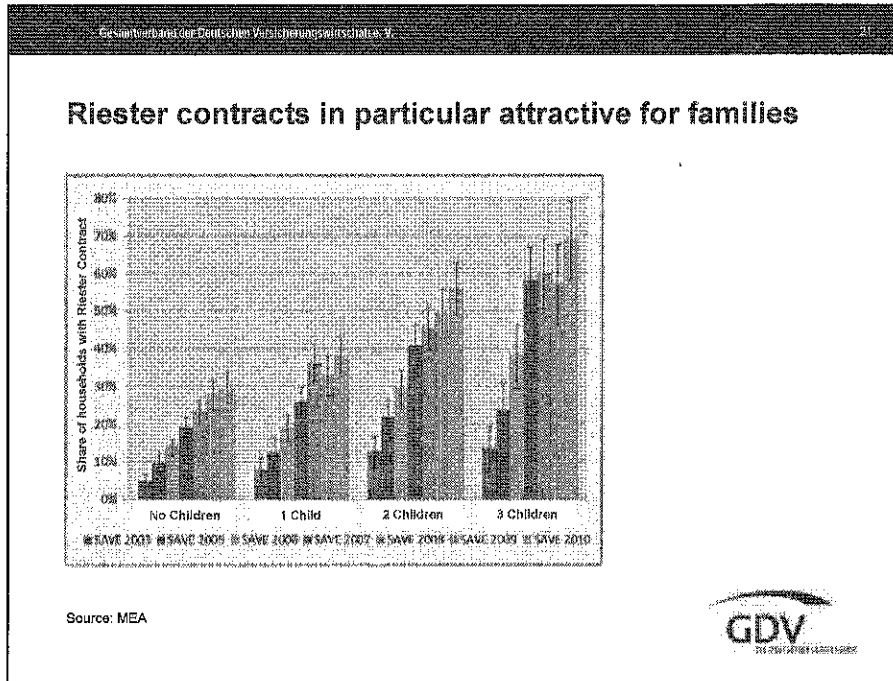
Gesamtvorstand der Deutschen Versicherungswirtschaft e.V. 48

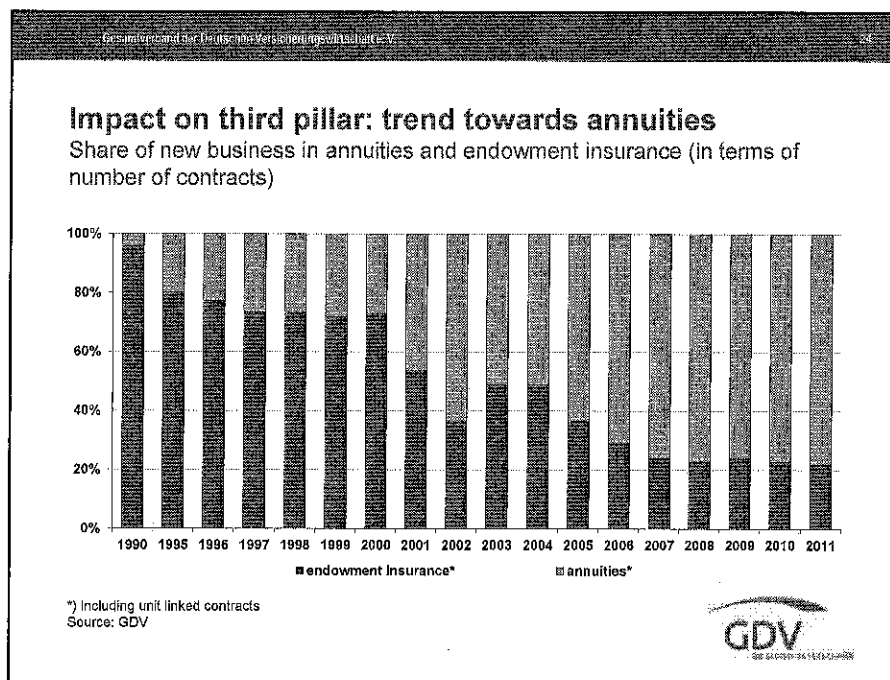
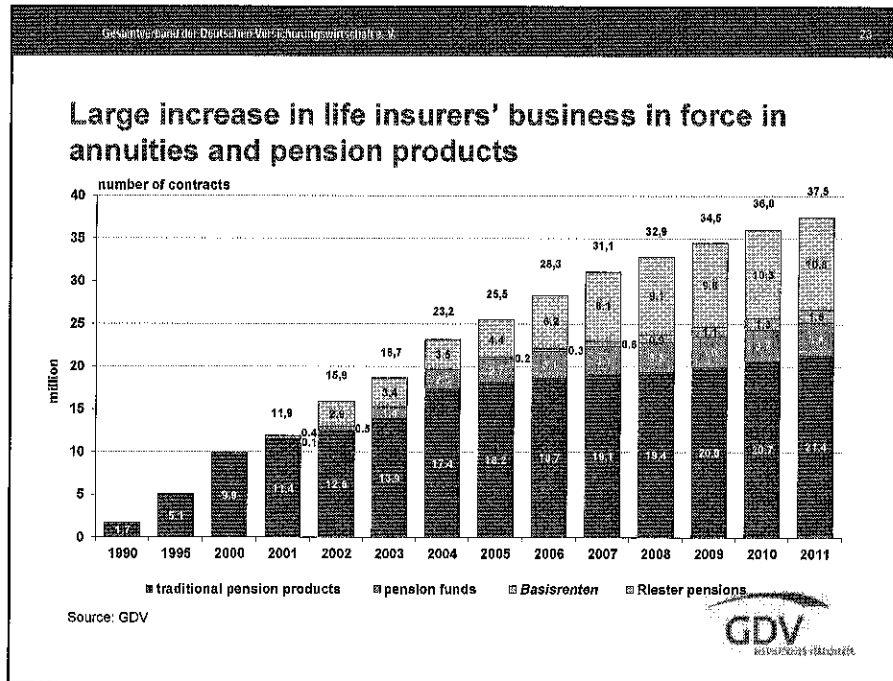
Impact of pension reforms so far (III): Impact on third pillar pensions

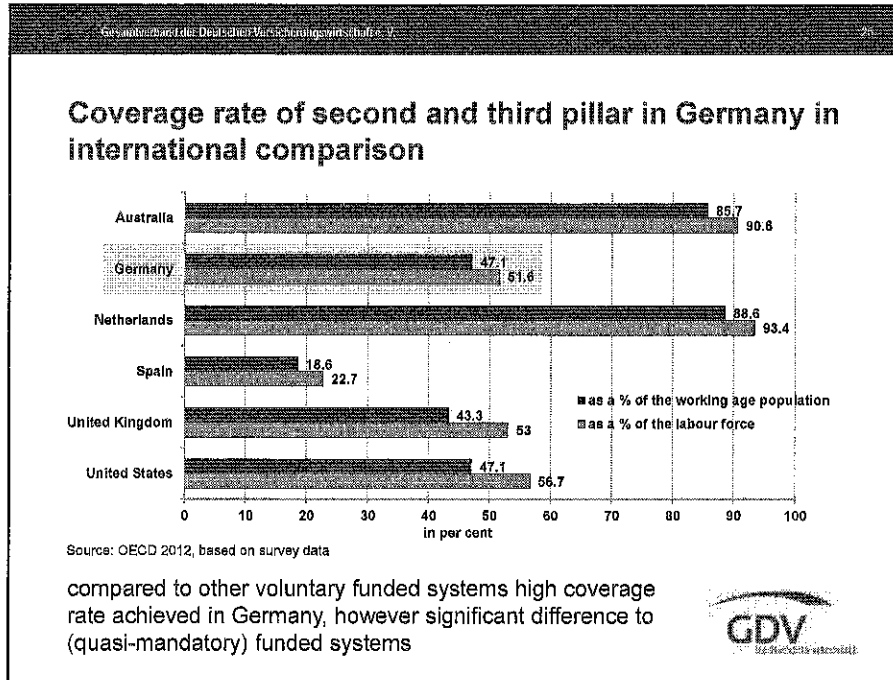
- rapid growth in number of Riester contracts
- Riester contracts in particular attractive for families
- Riester demand depends on income, but all income groups show strong growth in Riester contracts
- large increase in annuities and pensions business of life insurers
- trend towards annuities, new business in endowment insurance decreasing

91








Gesamverband der Deutschen Versicherungsverbände e.V.

Summary: The impact of pension reforms so far

- comprehensive pension reform successfully implemented, change in old age security system is on track
- however: not all the objectives could be achieved
 - decrease in PAYG benefits / higher regular retirement age difficult to sustain
 - coverage rate: roughly some 30 - 40 per cent of the entitled population do hold a Riester contract, new criticism of Riester pensions has negative impact on new business
 - average Riester premium relatively small (Riester insurance contracts: average annual premium of 620 EUR in 2011)
 - coverage rate in occupational pension plans and overall coverage rate in funded systems limited compared to earlier expectations



Current policy issues (I): New criticism of funded systems

- extensive ongoing discussion on suitability of Riester pensions / funded pensions in general:
 - coverage rate and level of funded pensions (in particular low income households)
 - justification of Riester subsidy as a measure of social policy targeted mainly to families and low income households
 - financial crisis / dependency of funded pensions on capital markets (expected rate of return, financial risk for pensioners)
 - acquisition costs and charges
 - transparency of products / financial literacy
 - increase in old-age poverty risk

⇒ pension reform again a major topic in Germany, all political parties promise some readjustment in retirement provision in the context of the 2013 general election



Current policy issues (II): Reform plans of the government


- prevention of poverty in old age
 - new minimum benefits for long-term insured in the public pension system under certain conditions
 - mandatory old age provision for all self-employed
- adjustments to Riester contracts: more transparency, restrictions in some charges, some improvements in product design
- introduction of voluntary employer-financed contributions to public pension system as a substitute for occupational pensions

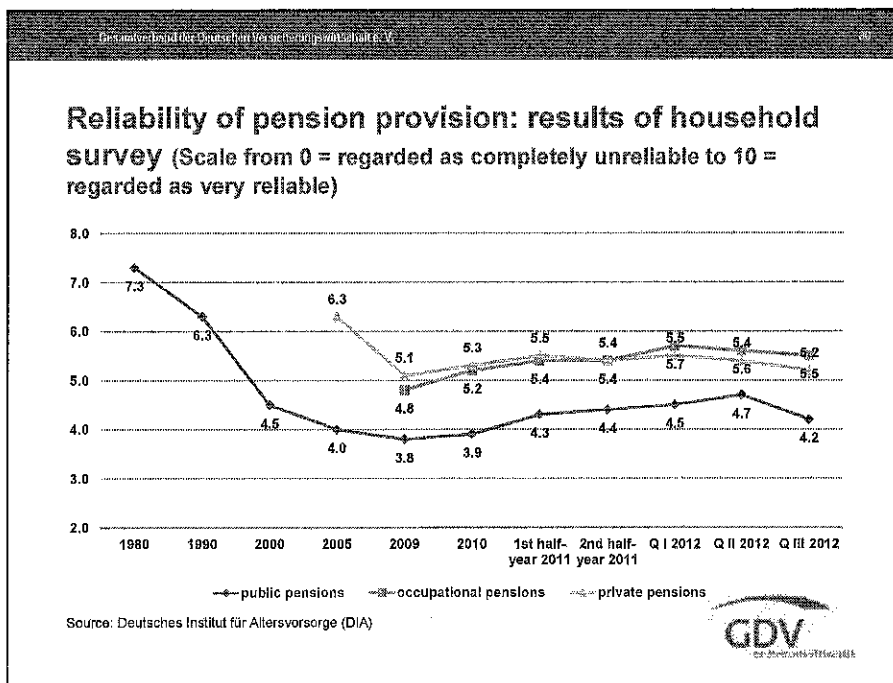


Gesamtwahl der Deutschen Versicherungswirtschaft e. V.

Current policy issues (III): further reform proposals

- suspension of phasing in of increase in regular retirement age until employment situation of the elderly is further improved
- increase in coverage of funded pensions by mandatory system or at least "opting out model" (e.g. in field of occupational pensions)
- further improvements in benefit level in public pension system at least for certain groups of pensioners
- in some extreme cases: abolishment of subsidy / tax advantage for Riester contracts
- reinstating pre-reform benefit level in public pension system





86

Conclusions and lessons to be learnt (I)

- reforms in old age security system with respect to demographic changes remain work in progress, periodic readjustments in pension system probably inevitable, need to convince ever again of virtues of funded systems
- tendency of the political system in favour of PAYG? At least: antagonism between economic necessities and propensity of politicians to provide population with short-term benefits
- world-wide economic and financial crisis has prompted new criticism with respect to funded retirement systems
- media tend to be critical towards rather than supportive of funded systems, focus on weaknesses, need to interact with media in order to advocate funded retirement systems
- need to live with cycles and swings in public and political opinion



Conclusions and lessons to be learnt (II)

- "old" arguments against funded pensions still around and revived by financial crisis (e.g. vulnerability to capital markets, high cost levels)
- major political question to be discussed regarding funded pensions: voluntary or (quasi-) mandatory system?
- high importance of financial literacy (in particular for voluntary systems)
- ongoing communication efforts by insurance industry vital
- but: insurance industry can only offer its services and engage in public discussion, ultimately pension system subject to political decisions

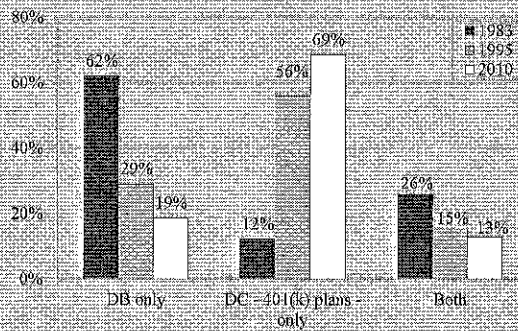


Using Participant Data to Improve Defined Contribution Default Portfolio Allocations

Anthony Webb and Zhenyu Li

In the U.S. and elsewhere, DC pensions have displaced DB pensions as the second pillar.

Workers with Pension Coverage by Type of Plan, 1983, 1995, and 2010



Source: Alicia H. Munnell, 2012, "2010 SCF Suggests Even Greater Retirement Risks," *Issue in Brief* 12-15, Chestnut Hill, MA: Center for Retirement Research at Boston College.

CENTER for RETIREMENT RESEARCH at BOSTON COLLEGE

In DC pension plans, the asset allocation decision is often left to the participant.

- Economic theory suggests households should rebalance from stocks to bonds as they age.
- Optimal portfolio allocation at any age will depend on preferences and characteristics.
- Financial planners can gauge willingness and capacity to bear risk.
- But few households employ financial advisors and households exhibit high levels of financial illiteracy.

CENTER for
RETIREMENT
RESEARCH
at BOSTON COLLEGE

2

One solution -- a life-cycle or target-date fund

- Household invests in a single fund that rebalances from stocks to bonds as the household approaches retirement.
- Will be optimal for some, but not optimal for all.
 - Contrast employee who works for a public utility with one who works for an investment bank.
 - Contrast high- with low-earner.

CENTER for
RETIREMENT
RESEARCH
at BOSTON COLLEGE

3

59

Can we improve on the “one-size-fits-all” approach?

- Obviously we can – if we provide personalized financial advice.
 - But this is costly, and many households are reluctant to participate.
 - Can we improve on the “one-size-fits-all” plan by making use of information known to the employer – creating a “semi-customized” plan?

What the employer does and doesn't know

- | | |
|---|---|
| <ul style="list-style-type: none"> • The employer knows: <ul style="list-style-type: none"> ◦ Age ◦ Income ◦ Degree of labor income uncertainty ◦ Gender ◦ Marital status ◦ 401(k) plan balance | <ul style="list-style-type: none"> • The employer doesn't know: <ul style="list-style-type: none"> ◦ Non-401(k) household financial assets ◦ Spousal earnings ◦ Risk preferences ◦ Other household characteristics that might affect portfolio allocation |
|---|---|
- But a “one-size-fits-all” plan only uses age.

90

We compare the “one-size-fits-all” and “semi-customized” plan with the typical and optimal portfolios.

- Calculate the percent increase in salary that would leave the household indifferent between the “one-size-fits-all”/“semi-customized” plan/typical portfolio allocation and the optimal.
- A larger increase in salary indicates that the plan is more sub-optimal.

Methodology – we assume:

- Household goal is to maximize expected utility.
$$\sum_{t=22}^T \sum_{m=1}^{m-1} B^{t-22} \rho_{m,t} E U(C_{t,m})$$

- CRRA
$$U_m(C_t^m, C_t^f) = \frac{(C_t^m + \lambda C_t^f)^{1-\gamma}}{1-\gamma}, U_f(C_t^f, C_t^m) = \frac{(C_t^f + \lambda C_t^m)^{1-\gamma}}{1-\gamma}$$

- AR(1) earnings process
$$\log e_j = \alpha' + \beta_1 AGE_j + \beta_2 AGE_j^2 + u_j$$

$$u_j = \rho u_{j-1} + \varepsilon_j$$

Assumptions:

- Base case is typical college-educated two-earner couple.
- Consider low- and high-earners with half and twice the above earnings, respectively.
- Carefully model relevant features of the Social Security system.
- Typical portfolio allocations are estimated using *Survey of Consumer Finances*.

CENTER for
RETIREMENT
RESEARCH
at BOSTON COLLEGE

8

Results show that the typical portfolio allocation is highly sub-optimal.

Compensation Required for Adopting Typical Portfolio Allocation

	Income		
	Low	Average	High
CRRA = 2			
Percent of salary	2.65	3.95	6.15
Dollars at age 65	100,000	300,000	934,000
CRRA = 5			
Percent of salary	0.83	0.79	0.80
Dollars at age 65	31,000	60,000	122,000

Note: All dollar amounts are in 2011 dollars.
Source: Authors' calculations.

CENTER for
RETIREMENT
RESEARCH
at BOSTON COLLEGE

9

92

The “one-size-fits-all” portfolio is substantially closer to optimal.

Compensation Required for Adopting “One-Size-Fits-All” Portfolio Allocation

	Income		
	Low	Average	High
CRRA = 2			
Percent of salary	0.10	0.15	0.21
Dollars at age 65	4,000	11,000	32,000
CRRA = 5			
Percent of salary	0.45	0.50	0.59
Dollars at age 65	17,000	38,000	76,000

Note: All dollar amounts are in 2011 dollars.
Source: Authors' calculations.

CENTER for
RETIREMENT
RESEARCH
at BOSTON COLLEGE

10

The “semi-customized” portfolio is even closer to optimal, but not perfect because it ignores spousal earnings.

Compensation Required for Adopting “Semi-Customized” Portfolio Allocation

	Income		
	Low	Average	High
CRRA = 2			
Percent of salary	0.11	0.15	0.11
Dollars at age 65	4,000	11,000	17,000
CRRA = 5			
Percent of salary	0.38	0.50	0.38
Dollars at age 65	14,000	38,000	53,000

Note: All dollar amounts are in 2011 dollars.
Source: Authors' calculations.

CENTER for
RETIREMENT
RESEARCH
at BOSTON COLLEGE

11

Challenge: how to further improve the “semi-customized” portfolio

- Solution – use *Survey of Consumer Finances* data to predict:
 - whether spouse is working; and
 - spousal earnings, conditional on working.

CENTER for
RETIREMENT
RESEARCH
at BOSTON COLLEGE

12

What if we mis-estimate risk tolerance?

- Above calculations assume that the designers of the “one-size-fits-all” and “semi-customized” portfolios know the household’s risk preferences.
- What if they don’t? Specifically, what if they misclassify CRRA = 2 people as CRRA = 5, or CRRA = 5 people as CRRA = 2?
- “One-size-fits-all” still greatly outperforms typical portfolio, and “semi-customized” about as good as “one-size-fits-all.”

CENTER for
RETIREMENT
RESEARCH
at BOSTON COLLEGE

13

What if we mis-estimate risk tolerance?

Compensation Required for Adopting a "One-Size-Fits-All" or "Semi-Personalized" Portfolio Allocation Based on Incorrect Risk Preferences

	Low	Average	High
Typical portfolio allocation			
CRRA = 2			
Percent of salary	0.65	0.94	0.15
Dollars at age 65	100,000	300,000	934,000
CRRA = 5			
Percent of salary	0.85	0.75	0.80
Dollars at age 65	31,000	60,000	122,000
"One-size-fits-all" portfolio			
CRRA assumed to be 5, but really 2			
Percent of salary	0.34	0.33	0.34
Dollars at age 65	13,000	25,000	52,000
CRRA assumed to be 2, but really 5			
Percent of salary	0.48	0.51	0.55
Dollars at age 65	18,000	39,000	84,000
"Semi-personalized" portfolio			
CRRA assumed to be 5, but really 2			
Percent of salary	0.25	0.38	0.46
Dollars at age 65	9,000	25,000	70,000
CRRA assumed to be 2, but really 5			
Percent of salary	0.49	0.51	0.54
Dollars at age 65	19,000	39,000	82,000

CENTER for RETIREMENT RESEARCH at BOSTON COLLEGE
Source: Author calculations

14

The role of earnings volatility

- Primary justification for life-cycle funds is that low-risk human capital substitutes for bonds in the optimal portfolio. (Jagannathan and Koehlerlakota 1996)
- If human capital is risky, optimal portfolio should contain fewer equities and more bonds.
- Households with risky labor market earnings suffer substantial costs if they are put in life-cycle funds that are optimal for households with the average degree of labor market risk.
- Employers know the level of their employees' labor market risk and can tailor life-cycle fund portfolio allocations accordingly.

CENTER for RETIREMENT RESEARCH at BOSTON COLLEGE

15

The role of earnings volatility

Compensation Required for Adopting a "Semi-Personalized" Portfolio
Based on Household Income, by Earnings and Degree of Earnings Uncertainty

	Income		
	Low	Average	High
Low volatility			
CRRR = 2			
Percent of salary	0.03	0.05	0.05
Dollars at age 65	1,000	4,000	8,000
CRRR = 5			
Percent of salary	0.04	0.07	0.07
Dollars at age 65	1,000	1,000	2,000
Average volatility			
CRRR = 2			
Percent of salary	0.00	0.00	0.00
Dollars at age 65	0	0	0
CRRR = 5			
Percent of salary	0.00	0.00	0.00
Dollars at age 65	0	0	0
High volatility			
CRRR = 2			
Percent of salary	0.55	0.51	0.49
Dollars at age 65	21,000	39,000	74,000
CRRR = 5			
Percent of salary	2.12	2.35	2.13
Dollars at age 65	78,000	179,000	327,000

Note: The standard deviation of the earnings shocks of the low-volatility household is assumed to be zero, and that of the high-volatility household is twice the average.
Source: Authors' calculations.

CENTER for
RETIREMENT
RESEARCH
at BOSTON COLLEGE

16

Conclusions

- A completely customized portfolio is the ideal.
- Assumes that financial advice can be delivered at low cost, that employees will engage in the planning process, and know and can articulate their preferences.
- If these conditions do not hold, a "semi-customized" portfolio is a worthwhile improvement on a "one-size-fits-all" portfolio.

CENTER for
RETIREMENT
RESEARCH
at BOSTON COLLEGE

17

96



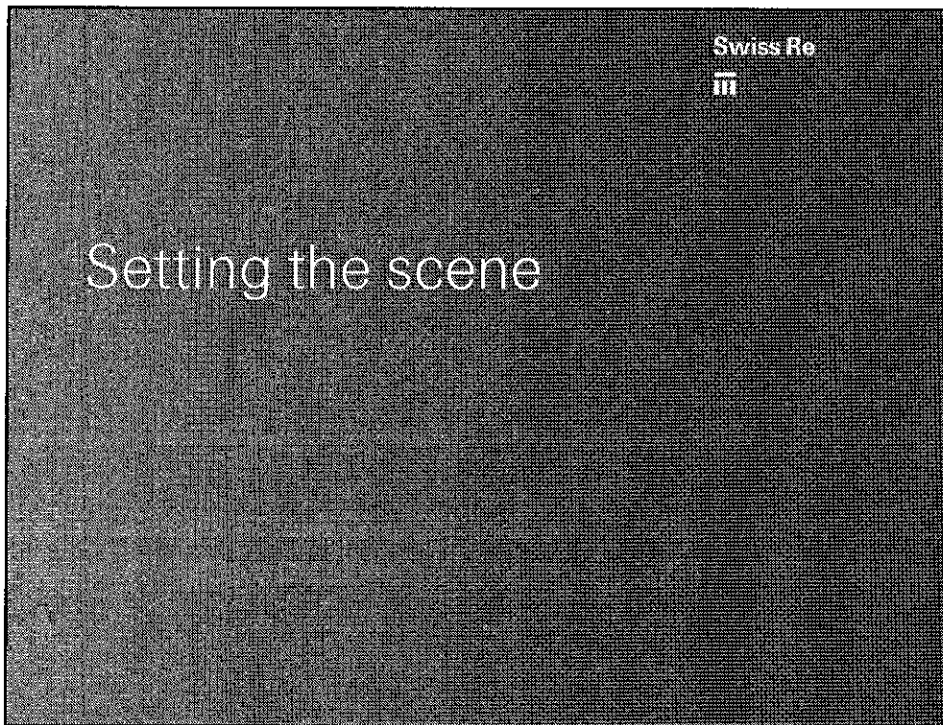
Managing Longevity Risk

Torben Thomsen

Swiss Re
III

Agenda

- Setting the scene
- Understanding and managing longevity risk
- Creating a longevity risk market
- Conclusions



Setting the scene

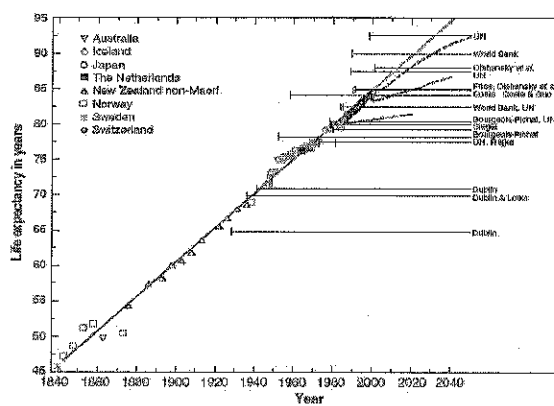
Swiss Re

Longest-lived life expectancy increases at 3 months per year for the last 150 years

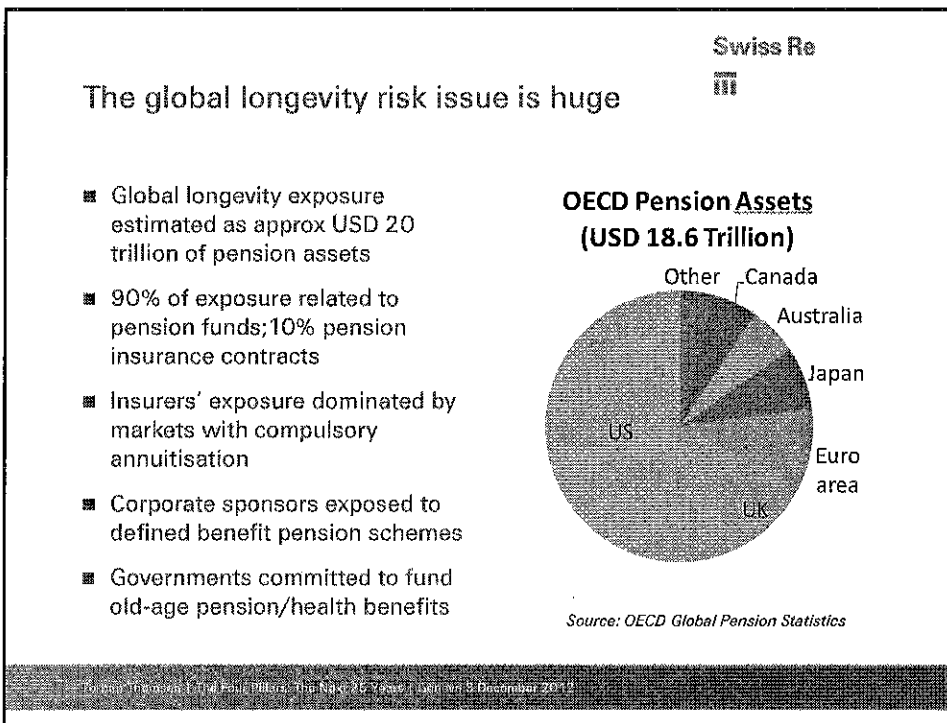
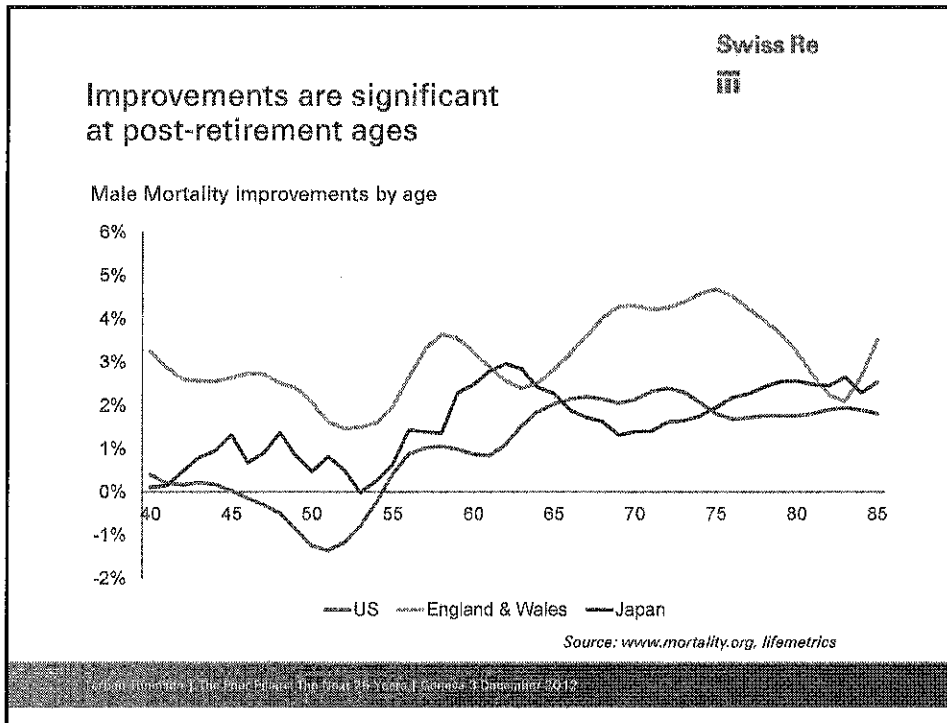
Record female life expectancy from 1840 to present

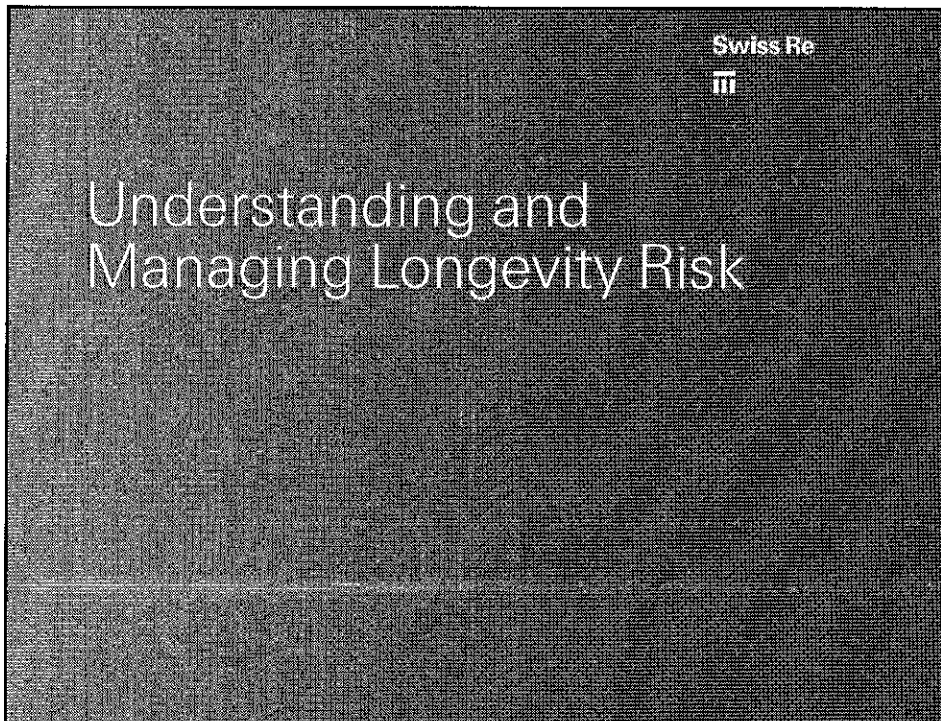
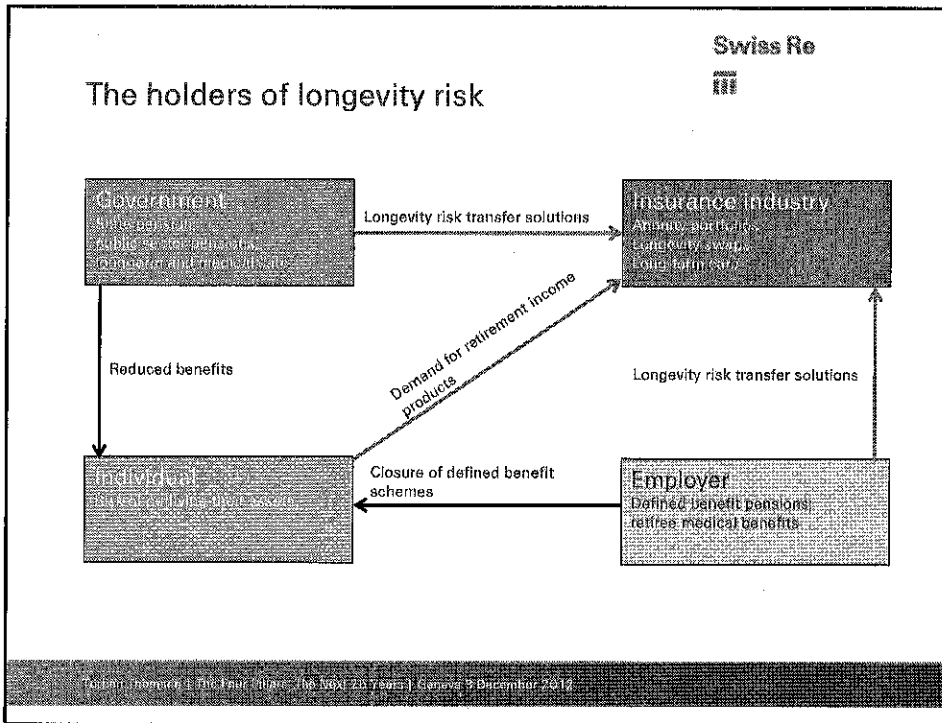
Horizontal black lines show asserted ceilings on life expectancy, with a short vertical line indicating the year of publication

Dashed red lines denote projections of female life expectancy in Japan published by the United Nations in 1986, 1999, and 2001

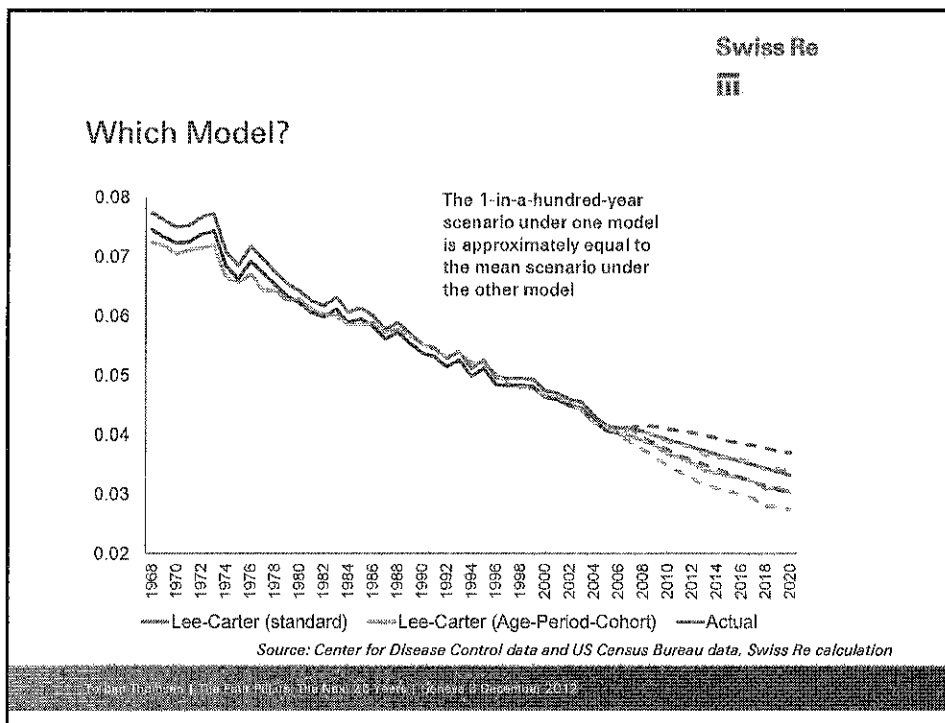
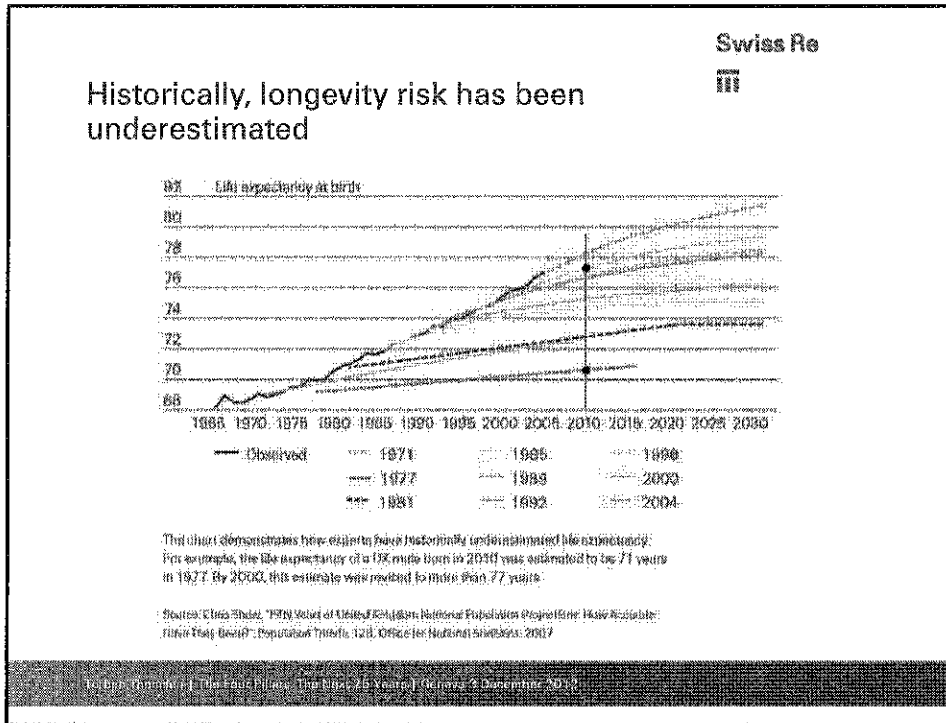


Source: Oeppen & Vaupel, broken bounds to life expectancy, Science 2000

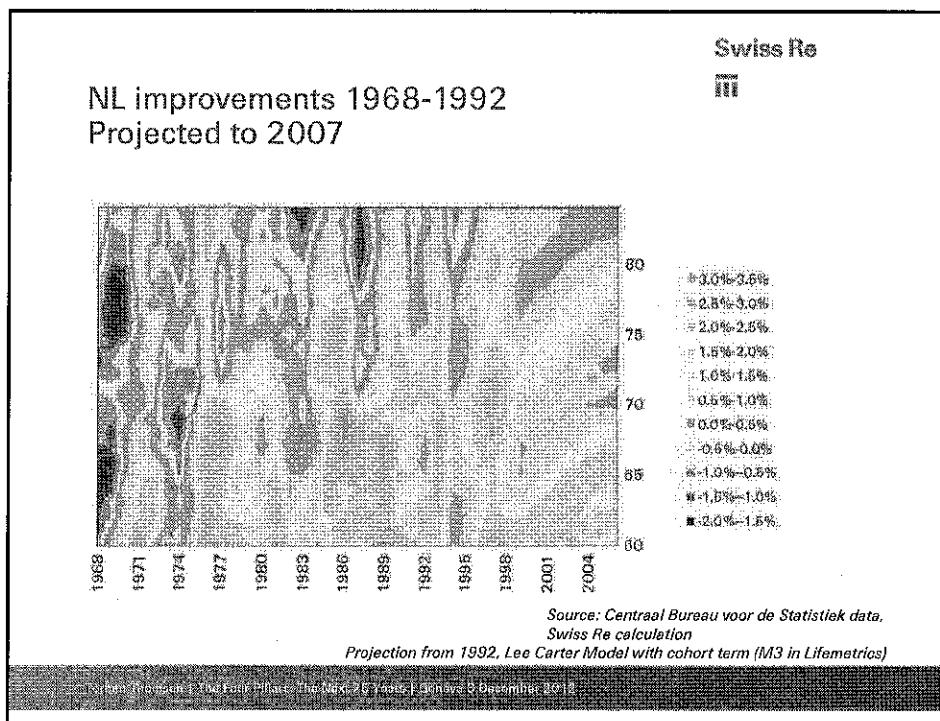
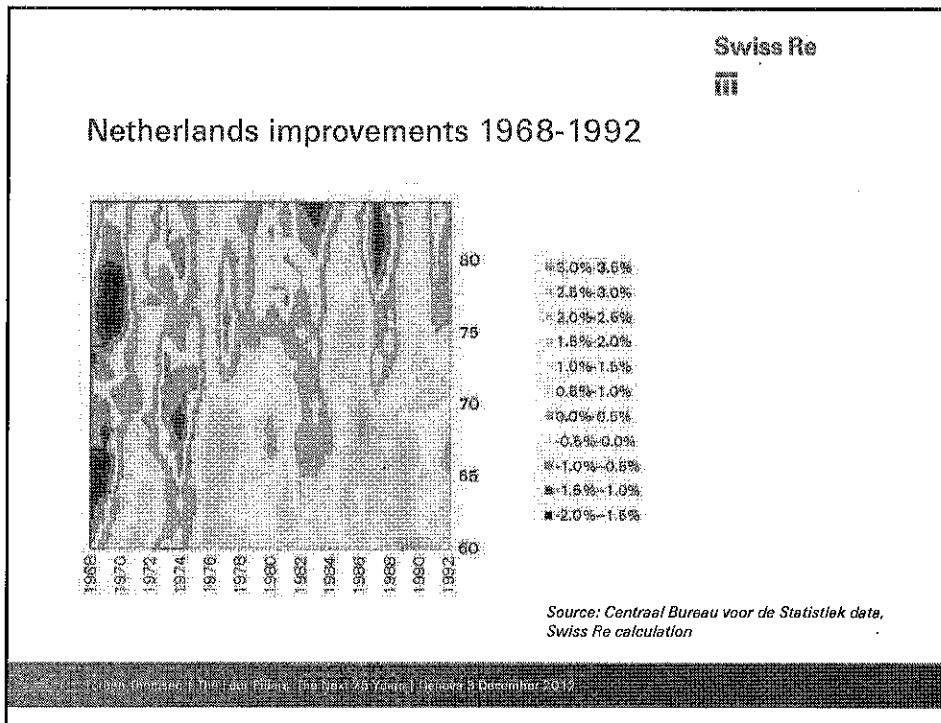




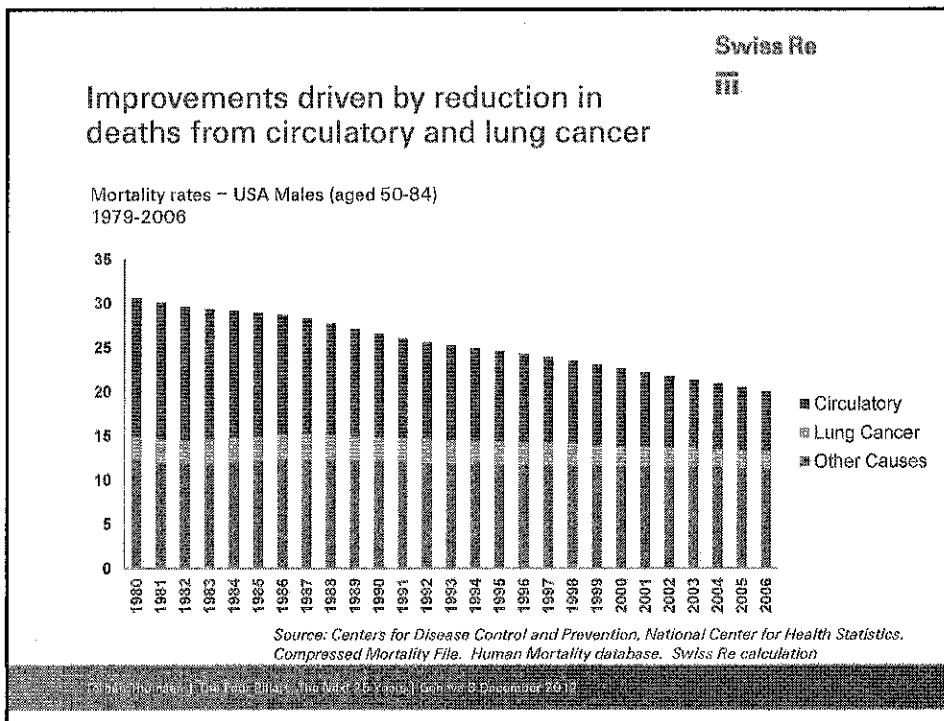
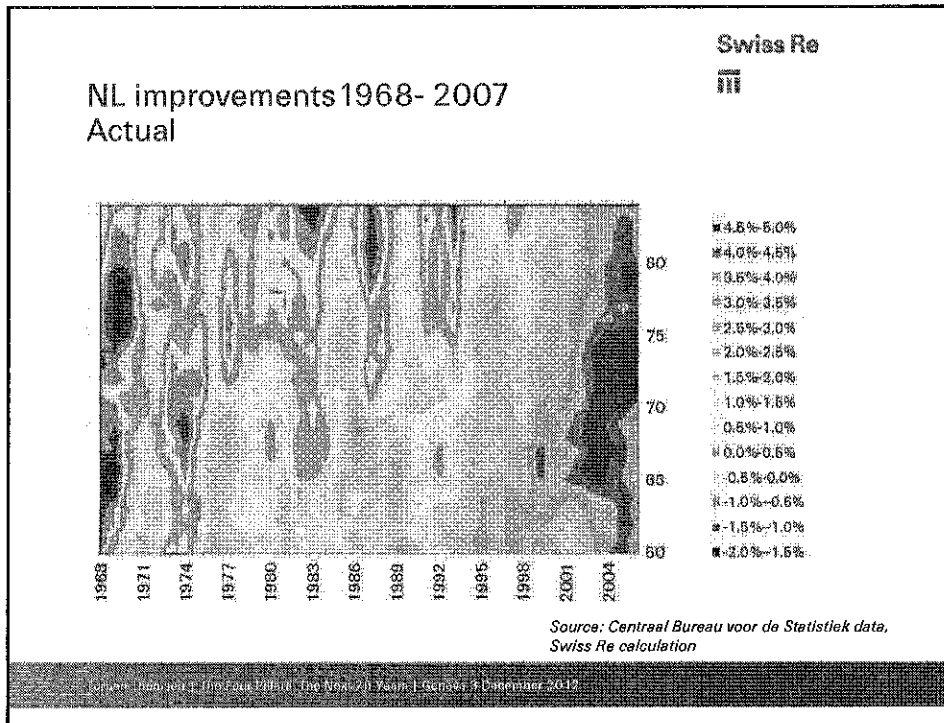
150



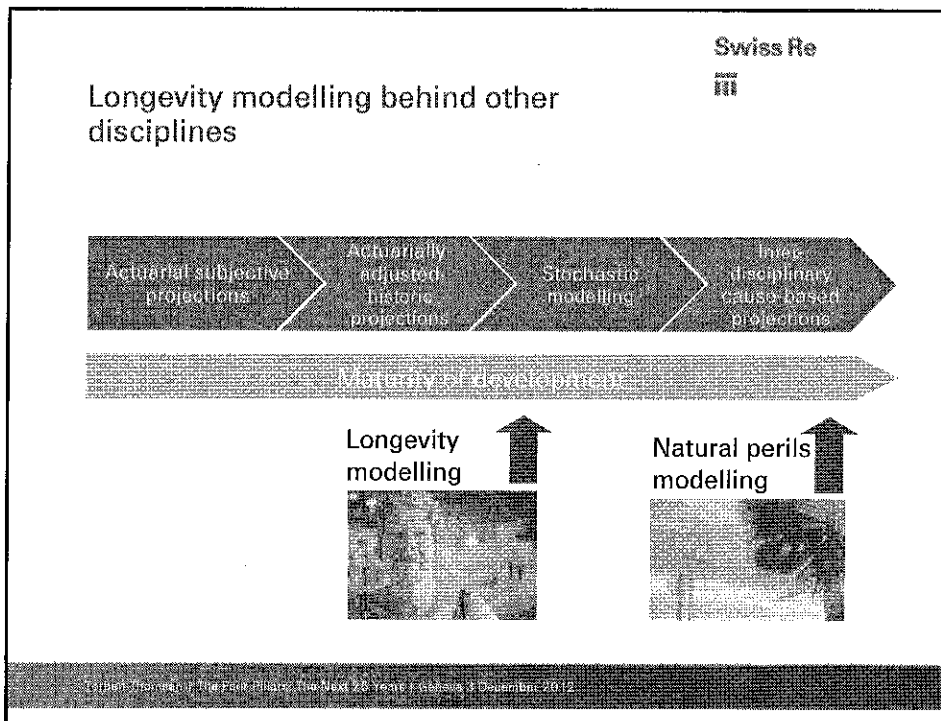
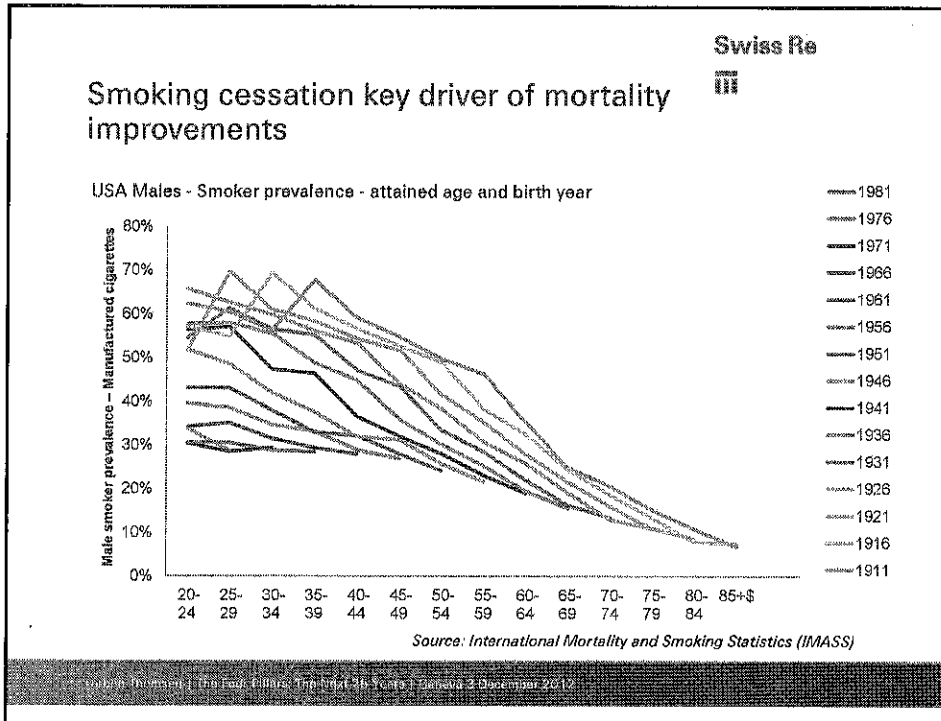
101



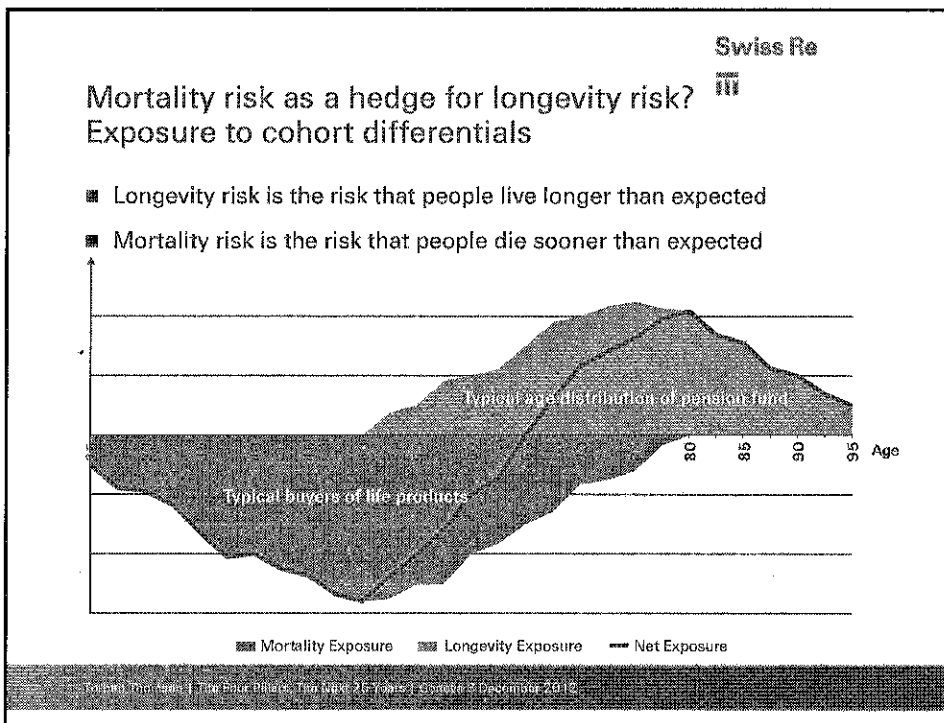
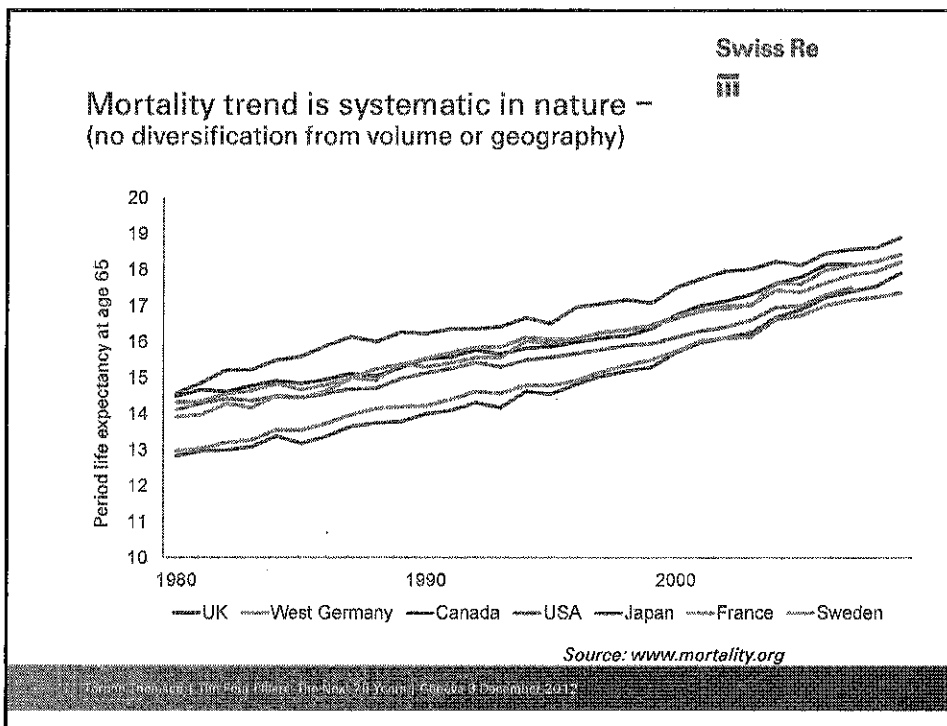
102



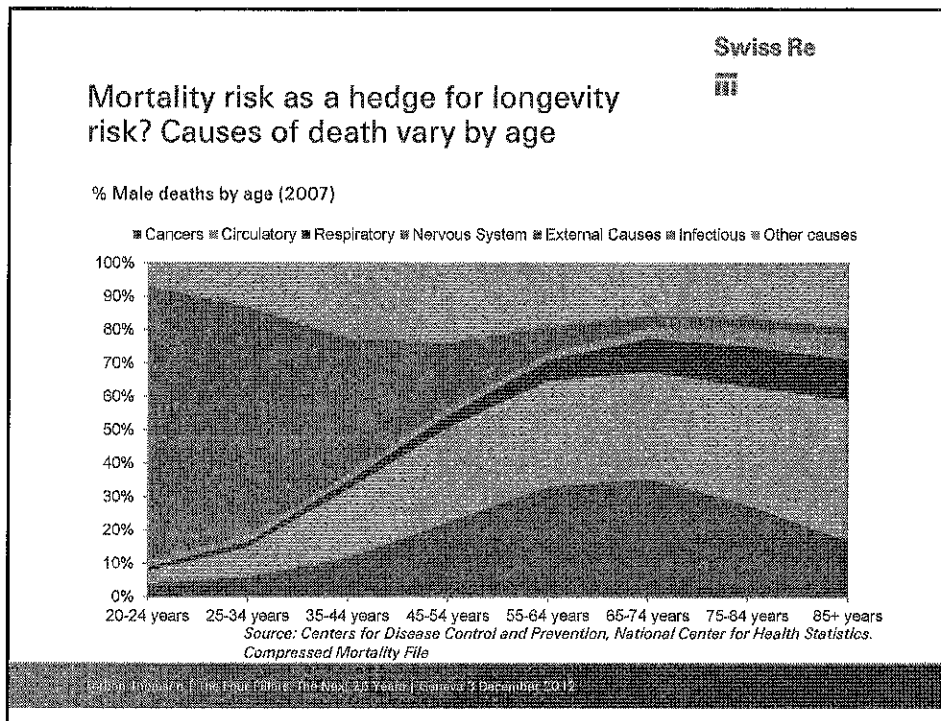
103



1044

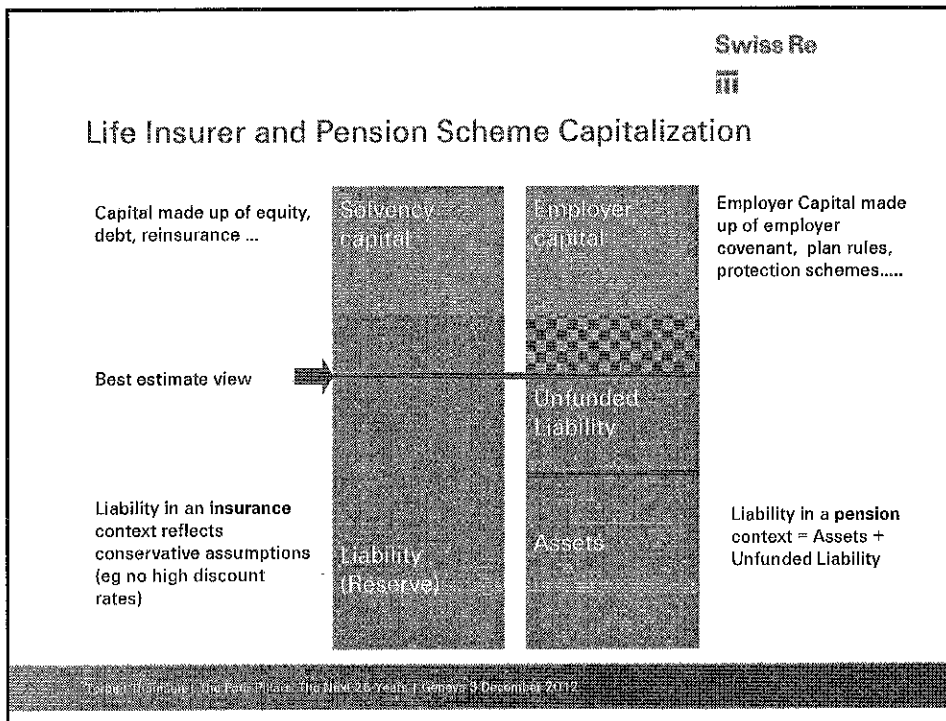
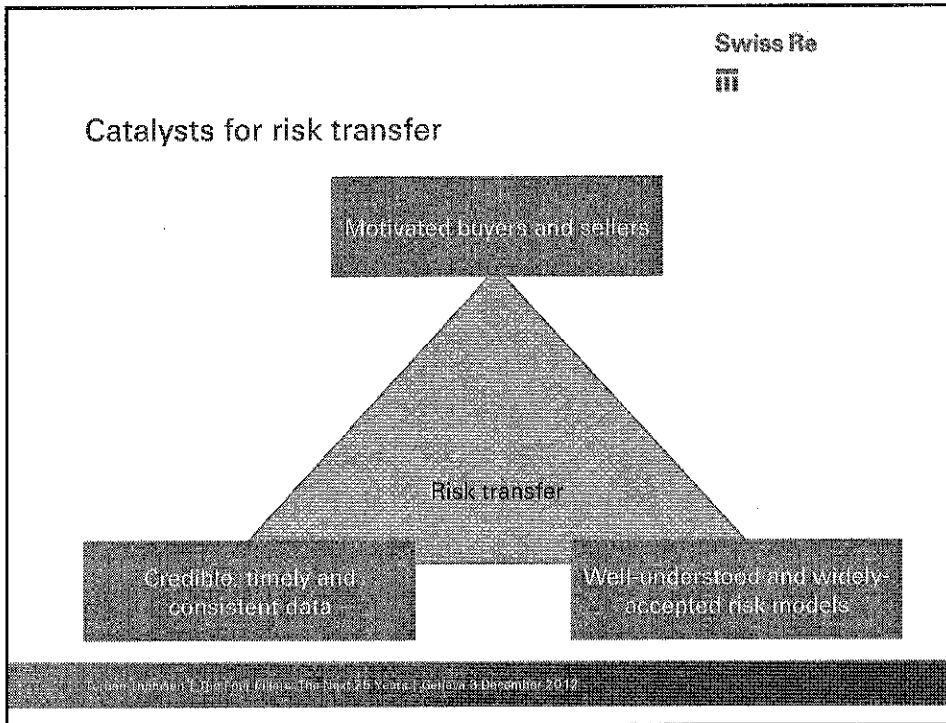


105

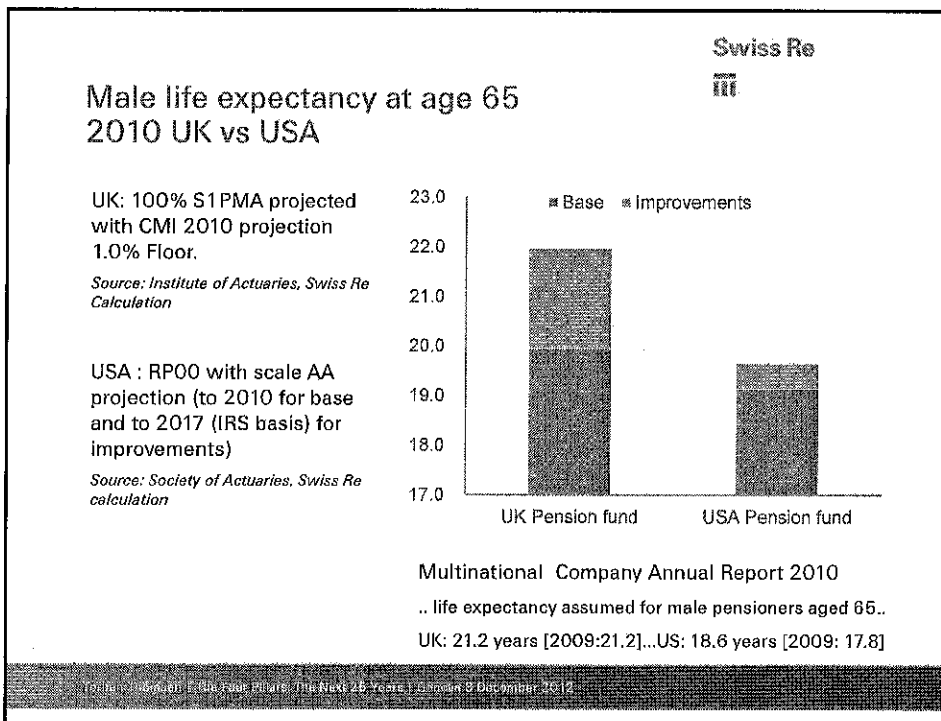
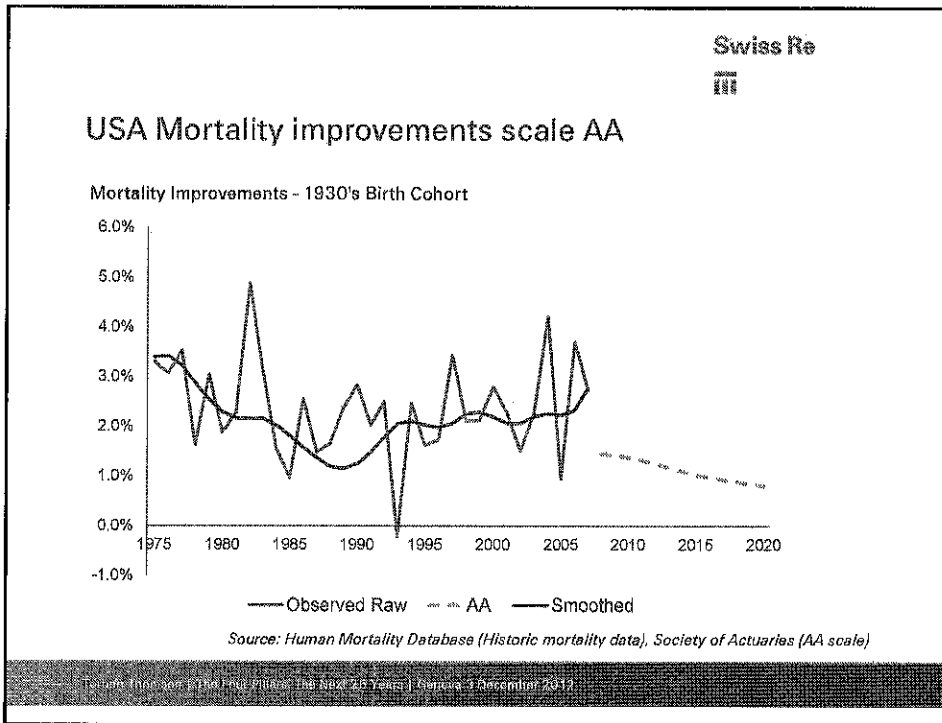



Swiss Re
III

Creating a Longevity Risk Market



107



Swiss Re


Finite capacity, disproportionate demand


UK corporate pension liabilities Over GBP 1 trillion	Proportion of UK corporate pension liabilities insured each year Under 1%pa	UK Life Companies Annuity reserves GBP 150bn
---	--	---

Although the bulk annuity market is growing, activity is still small in comparison to the total pensions market

- Over the last 5 years GBP 30 billion of pension liabilities has been transferred through bulk annuity and longevity hedging

There is insufficient capacity in the insurance market to absorb the future demand for longevity risk transfer from UK pension plans

© 2011 The Geneva Association. The Next 25 Years | Geneva 9 December 2012


Swiss Re


Longevity capacity is currently provided by reinsurers

UK	Aviva	£0.1 bn	Bank	Capital Markets
	Islands Life	£0.5 bn	Bank	Capital Markets
EUROPE	Allianz	£0.6 bn	Bank	Reinsurance & Capital Markets
	HSA	£1.9 bn	Bank	Reinsurance
	Bancock International	£1.2 bn	Bank	Reinsurance
	Royal Dutch of Belgium	£1.0 bn	Reinsurer	
ASIA	BMW	£3.0 bn	Bank	Reinsurance
	British Airways	£1.3 bn	Bank	Reinsurance
USA	Pall	£0.1 bn	Bank	Capital Markets
	TVV	£1.7 bn	Bank	Reinsurance
	Ethical Airways	£1.3 bn	Bank	Reinsurance
	Millington	£1.0 bn	Insurer	Reinsurance

© 2011 The Geneva Association. The Next 25 Years | Geneva 9 December 2012

109



Evolution of longevity market


Indemnity based

- "Named lives" – matches exposure of risk holder
- Extensive due diligence and disclosure requirements
- Bespoke, limited scope for liquid, secondary trading market
- Appeal to narrow range of investors, eg specialised Insurance Linked Securities funds

Index based

- Linked to publicised mortality index, eg general population
- Risk holder retains basis risk between own portfolio and index
- Standardised, scaleable, more suited for secondary trading
- Likely to appeal to wider investor base, eg money managers and multi-strategy hedge funds

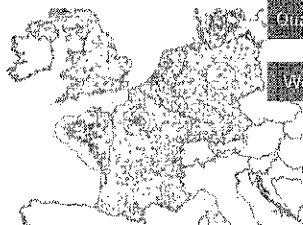
Source: European Longevity Index – The Next 40 Years | Geneva 3 December 2012



Capital markets favour credible, timely and frequent data

In terms of frequency and granularity there is scope for improvement

✓ Available in the UK	Available from death	Aggregate age-specific deaths	Aggregate individual age groups	Geographical breakdown	Cause of death breakdown
✗ Not available	Annually	✓	✓	✓	✓
	Quarterly	✓	✗	✗	✗
	Weekly	✓	✗	✗	✗




Timeliness
The recent move by the ONS to reporting deaths as they are registered reduces reporting lag

Governance
An independent agent with an explicit mandate to calculate and maintain indices is essential

Timeliness is key in data collection for parametric Eurowind bonds

Source: European Longevity Index – The Next 40 Years | Geneva 3 December 2012



Develop capital market investor base Kortis example

- Swiss Re has entered into a transaction with Kortis Capital Ltd. ("Kortis") to receive up to \$50m of payments in the event of a large increase in the differential in mortality improvements between male lives aged 75-85 in England & Wales and male lives aged 55-65 in the US
- First tradable rated security providing protection against longevity trend risk
- Trigger is based on a longevity divergence index measuring mortality improvements in England & Wales relative to mortality improvements in the US

Management Highlights


Swiss Re's longevity strategy focuses on providing the client with mortality protection, while highlighting the development of innovative capital markets solutions to be provided based on a source of life's longevity capacity.

Blair Gray, Chief Underwriting Officer, Swiss Re

The Kortis programme is a synthetic hedge of longevity protection against adverse deviation in mortality improvements of both Swiss Re's mortality and longevity portfolios, which allows it to hedge the non-parasitic nature of the Swiss Re.

Christina Buschmann, Head Life & Health, Swiss Re

© 2011 Swiss Re Ltd. All rights reserved. The Next 20 Years | Geneva 2 December 2010



Conclusion



Conclusion

- Understanding longevity risk continues to be a challenge for both buyers and sellers of risk
- Historic models have failed – need for forward looking cause based models
- Longevity risk is systematic – scale and portfolio diversification of limited use as risk mitigation tools
- Risk capital in the insurance industry can carry only a small proportion of longevity risk
- Reinsurers providing some new capacity
- Capital Markets solutions required to provide large enough pool of capital to carry the risk, however still early days

Urban, J. and S. J. The Longevity Risk: The Long 20 Years. Geneva 3 December 2012



Thank you

112

Swiss Re



Legal notice

©2012 Swiss Re. All rights reserved. You are not permitted to create any modifications or derivatives of this presentation or to use it for commercial or other public purposes without the prior written permission of Swiss Re.

Although all the information used was taken from reliable sources, Swiss Re does not accept any responsibility for the accuracy or comprehensiveness of the details given. All liability for the accuracy and completeness thereof or for any damage resulting from the use of the information contained in this presentation is expressly excluded. Under no circumstances shall Swiss Re or its Group companies be liable for any financial and/or consequential loss relating to this presentation.

Geneva 10 November 2012. The Geneva Association, 101, Rue de la Gare, CH-1201 Geneva 2, Switzerland 2012

Insurance Solutions for Pension Challenges

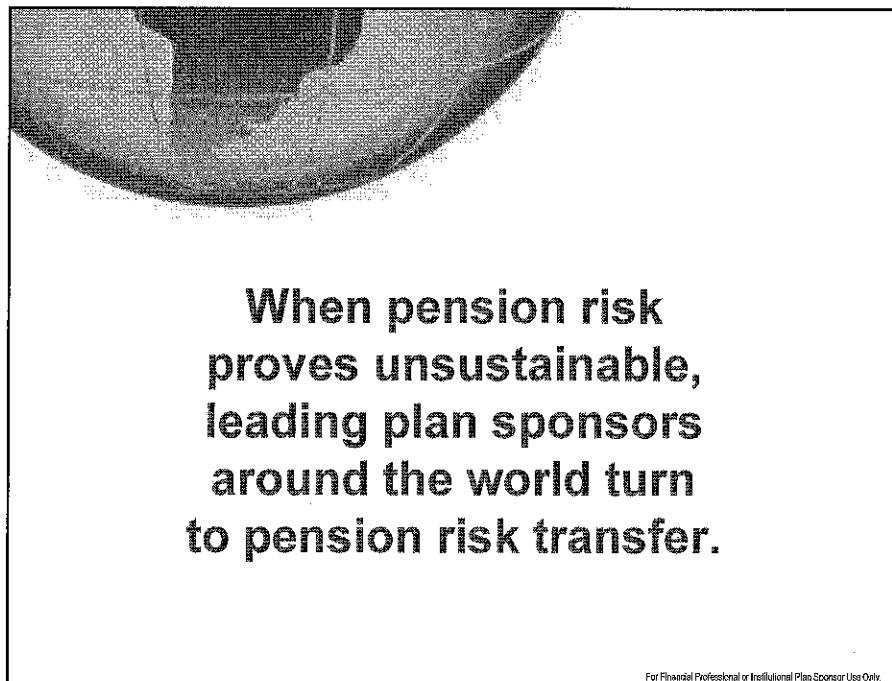
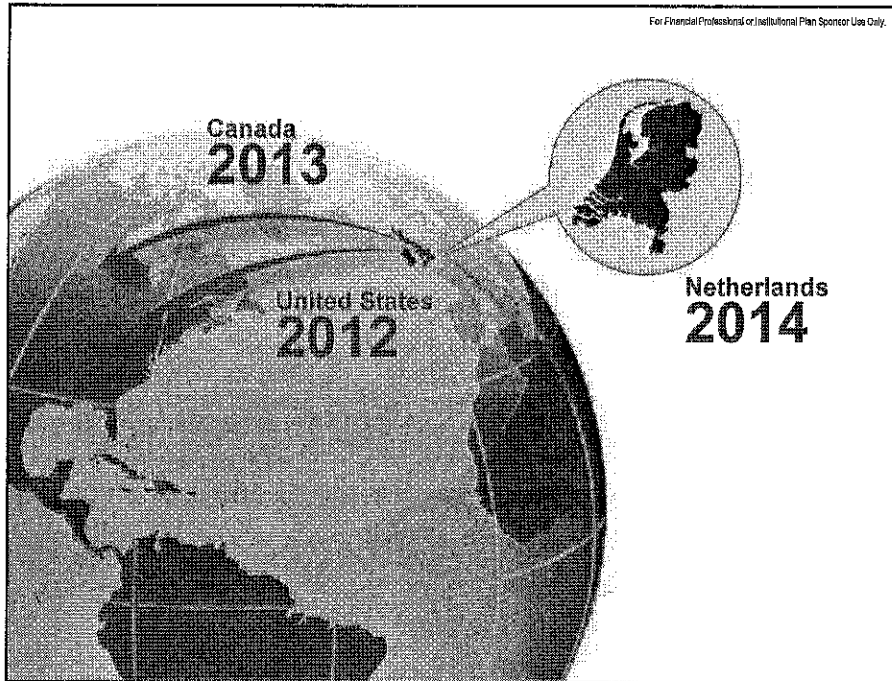
Amy Kessler

Pension Risk Transfer
IS **going**
GLOBAL

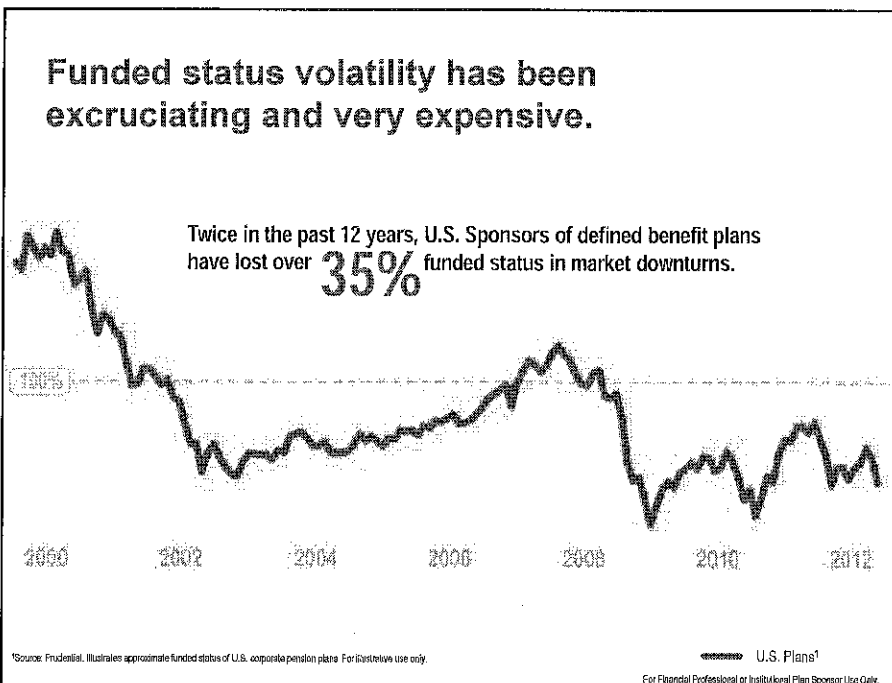
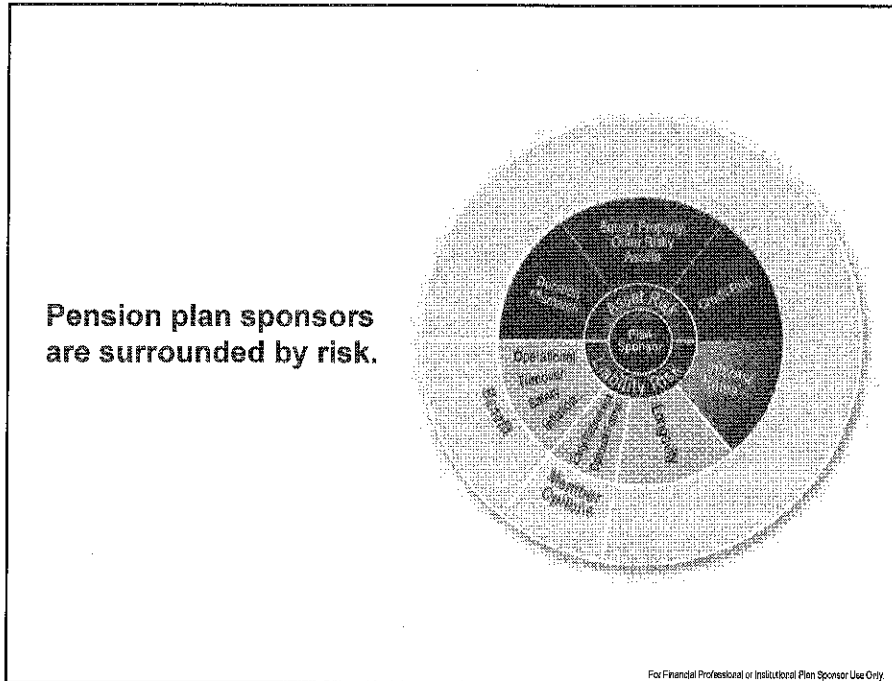


For Financial Professional or Institutional Plan Sponsor Use Only

114



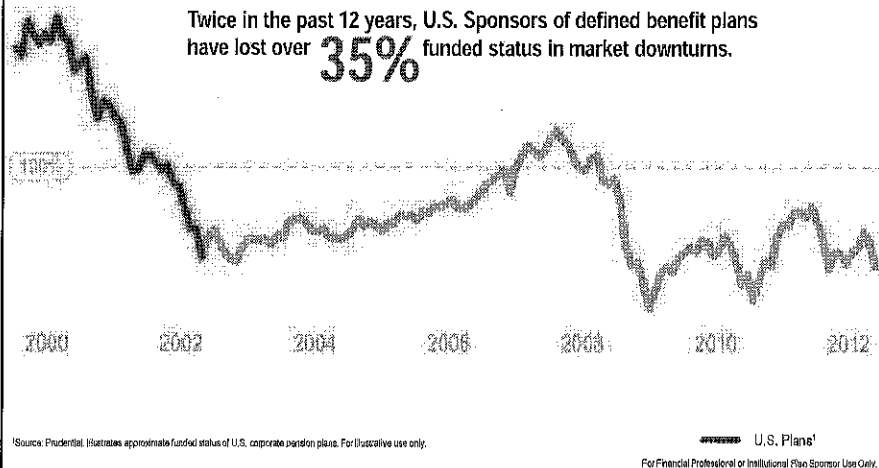
115



116

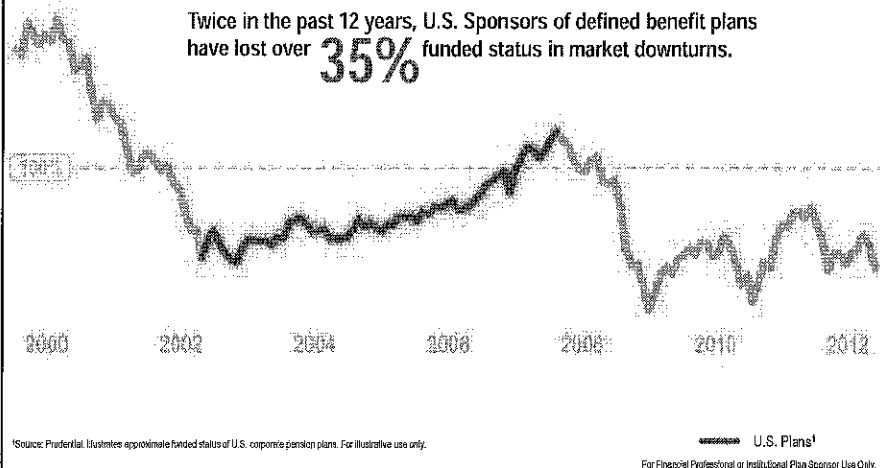
Funded status volatility has been excruciating and very expensive.

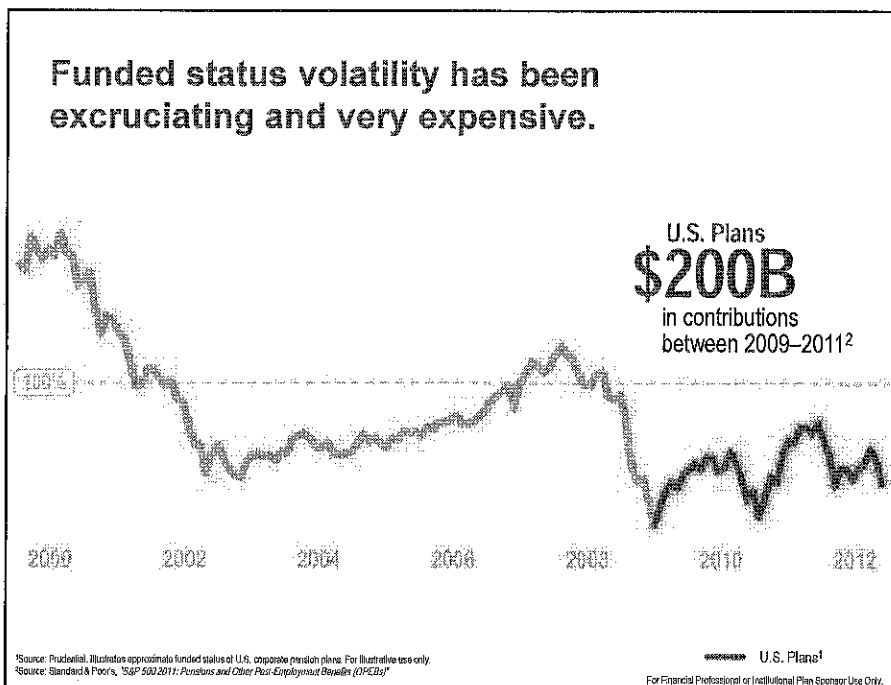
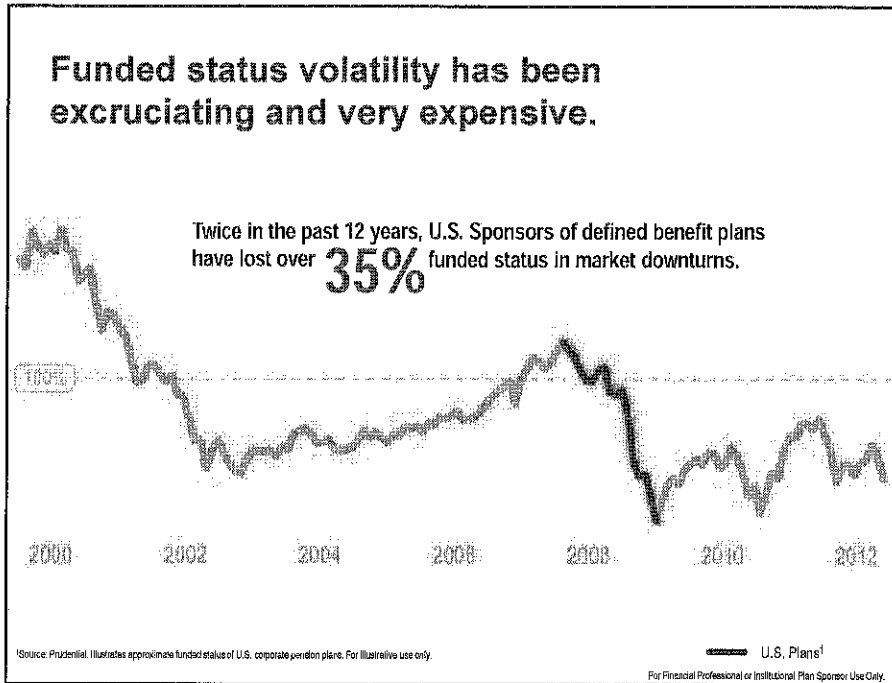
Twice in the past 12 years, U.S. Sponsors of defined benefit plans have lost over **35%** funded status in market downturns.



Funded status volatility has been excruciating and very expensive.

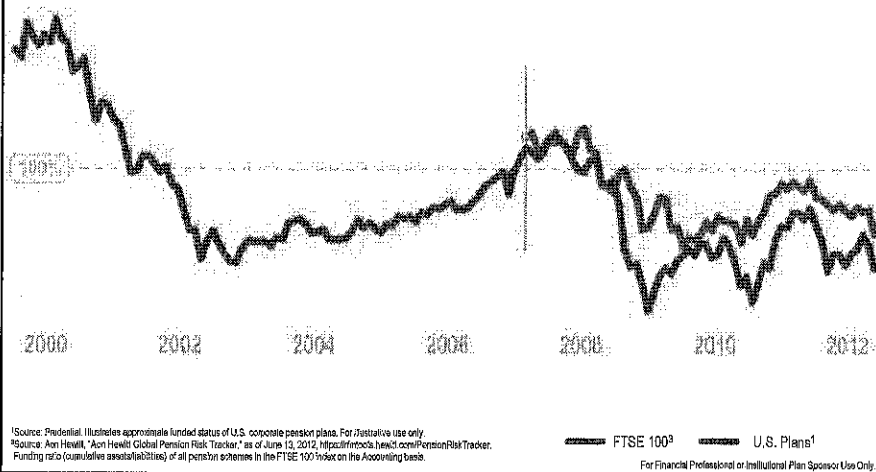
Twice in the past 12 years, U.S. Sponsors of defined benefit plans have lost over **35%** funded status in market downturns.





118

Funded status volatility has been excruciating and very expensive.



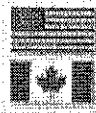
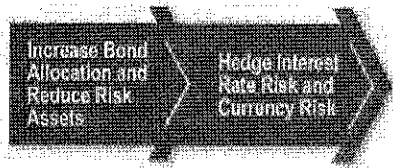
Pension Funds that Aim to Reduce Risk Are Following a Consistent Path

Increase Bond Allocation and Reduce Risk Assets

Most U.S. and Canadian plans are here

For Financial Professional or Institutional Plan Sponsor Use Only

Pension Funds that Aim to Reduce Risk Are Following a Consistent Path



Most U.S.
and Canadian
plans are here.

For Financial Professional or Institutional Plan Sponsor Use Only.

Pension Funds that Aim to Reduce Risk Are Following a Consistent Path



Most U.S.
and Canadian
plans are here.

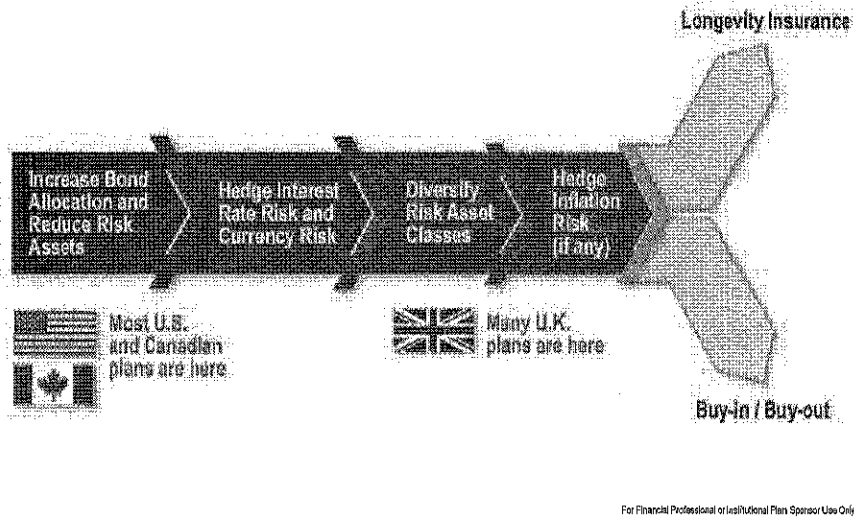


Many U.K.
plans are here.

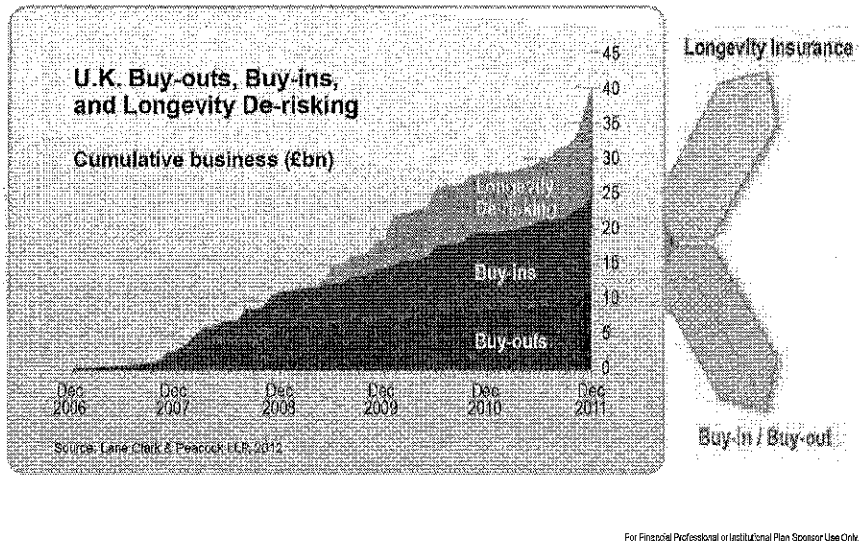
For Financial Professional or Institutional Plan Sponsor Use Only.

120

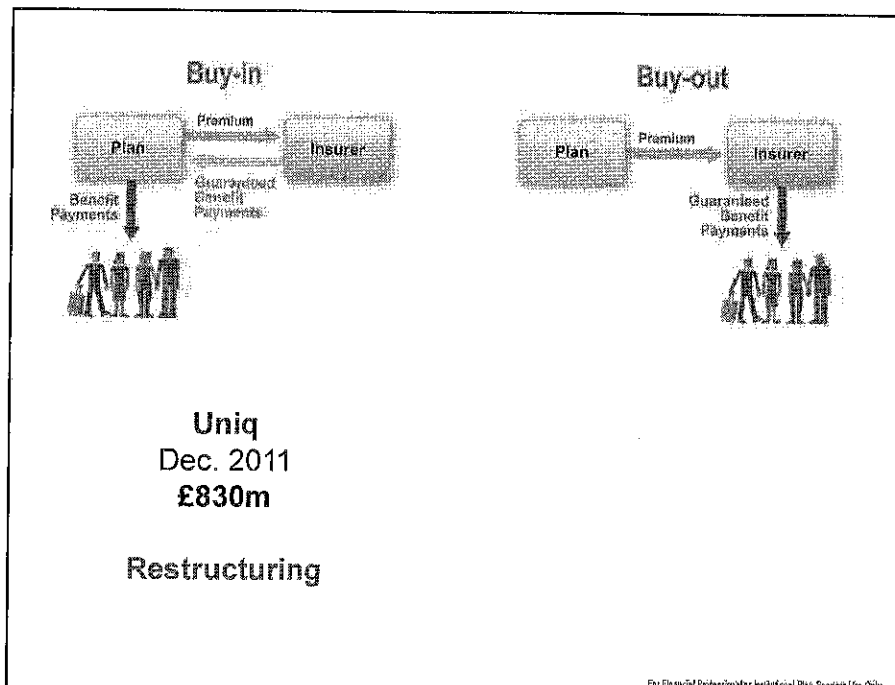
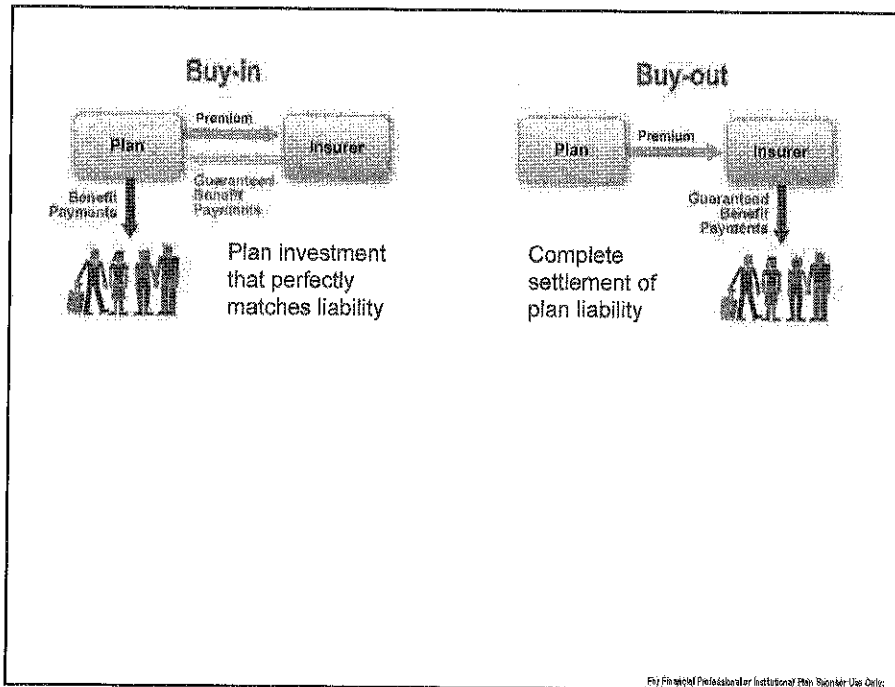
Pension Funds that Aim to Reduce Risk Are Following a Consistent Path

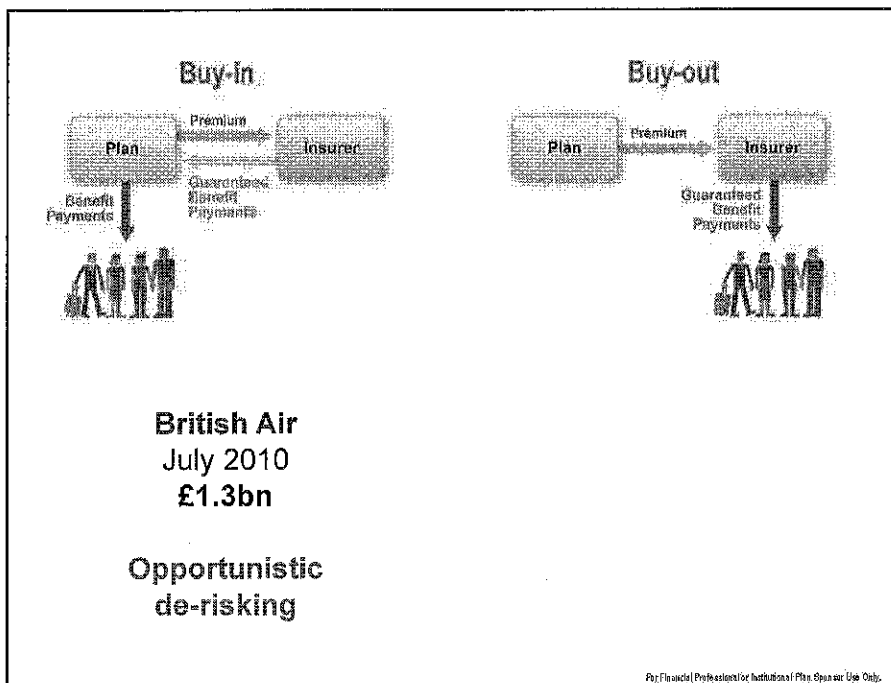
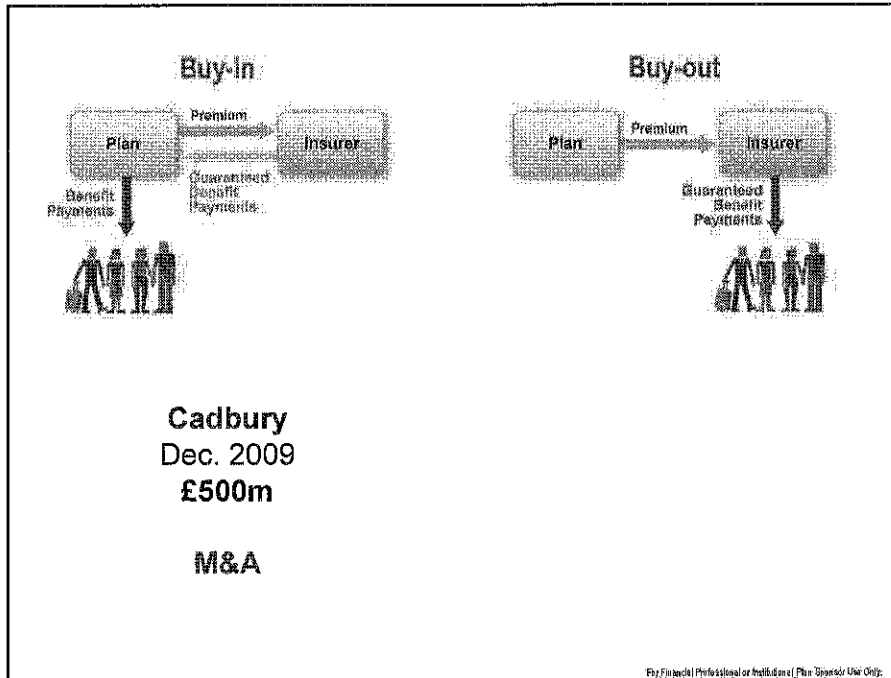


Pension Plans and Their Sponsors Choose a Solution Based on Their Needs

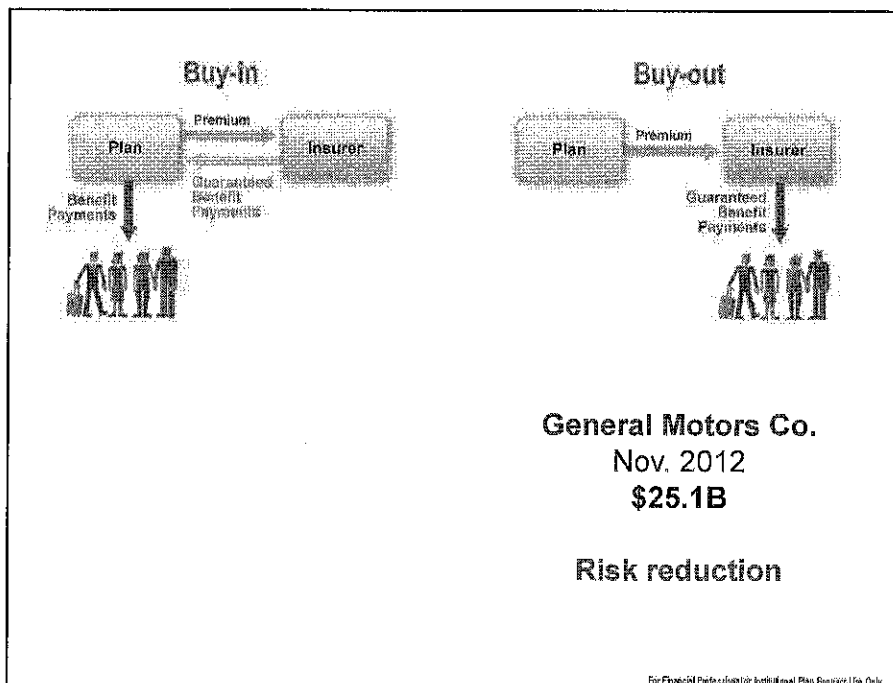
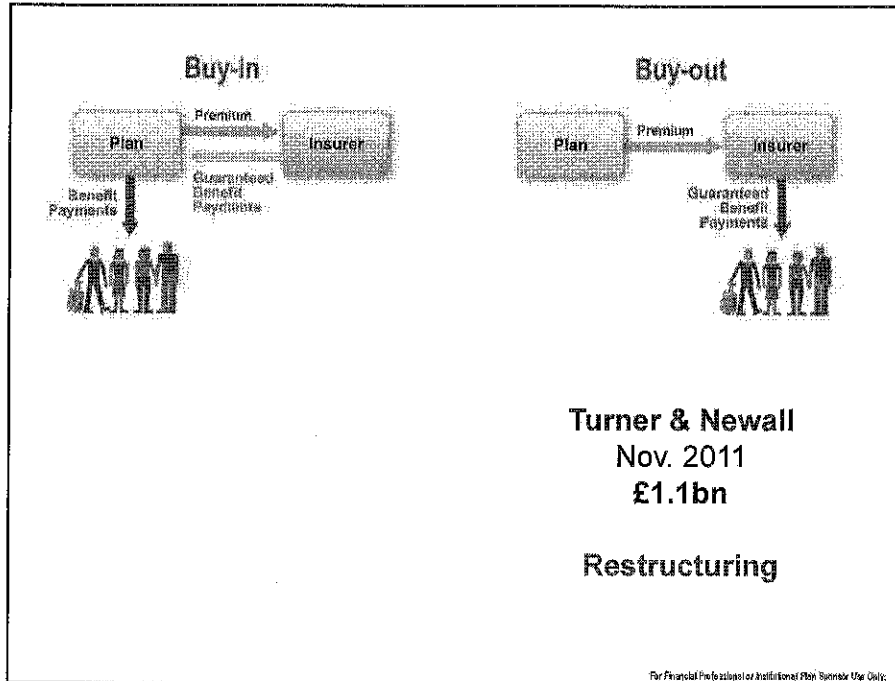


121

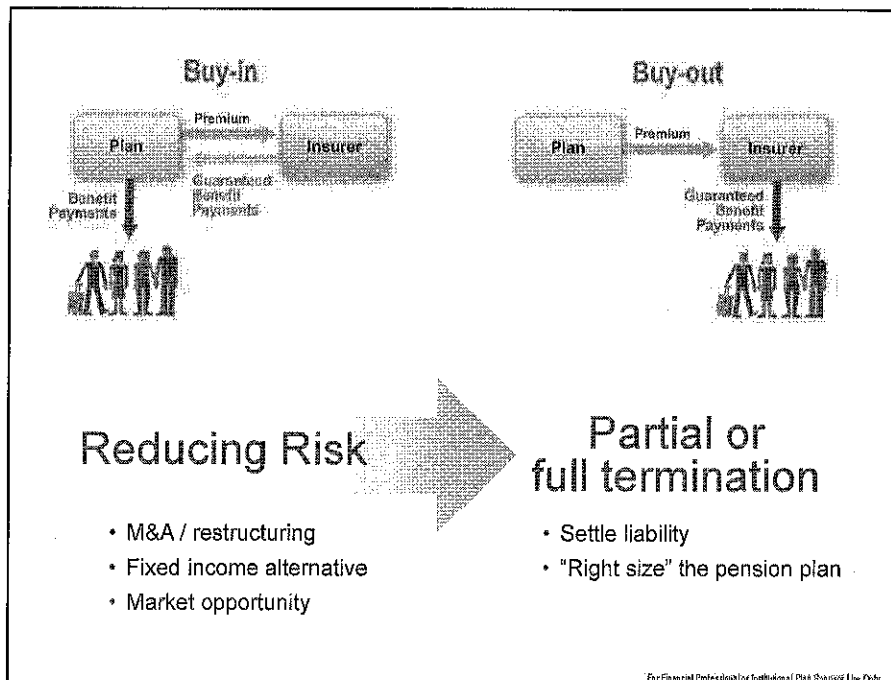
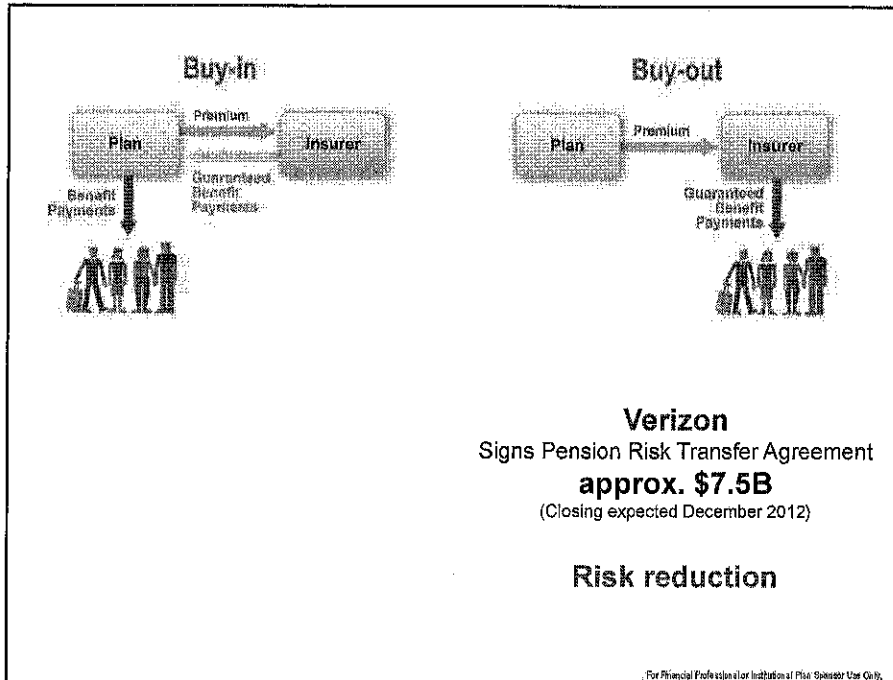




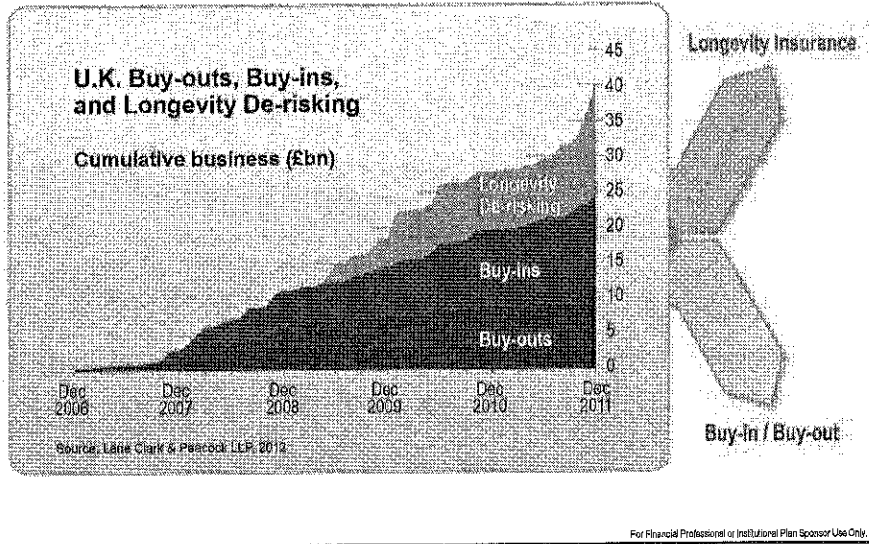
123



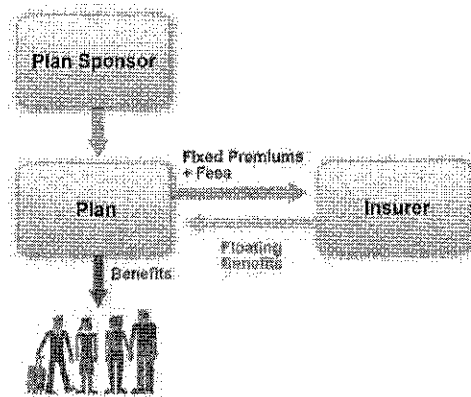
124



Pension Plans and Their Sponsors Choose a Solution Based on Their Needs



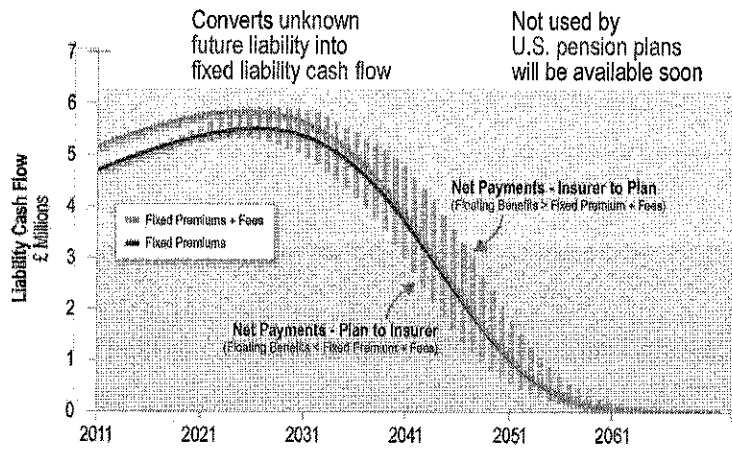
Longevity Insurance



For Financial Professional or Institutional Plan Sponsor Use Only.

126

Longevity Insurance



Source: Prudential

For Financial Professional or Institutional Plan Sponsor Use Only.

When is Longevity Insurance the Answer?

Longevity Insurance



Buy-in / Buy-out

Rolls-Royce
Nov. 2011
£3bn

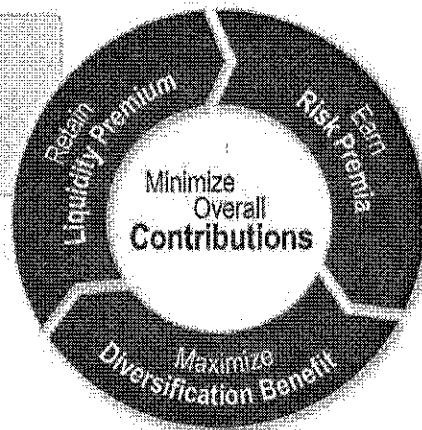
Berkshire County
Dec. 2009
£750m

For Financial Professional or Institutional Plan Sponsor Use Only.

Does Berkshire County Represent a Shift to a Sustainability Model for Pension Funds?

Endowment Approach

Risk budgeting is missing...
are the potential
losses affordable?

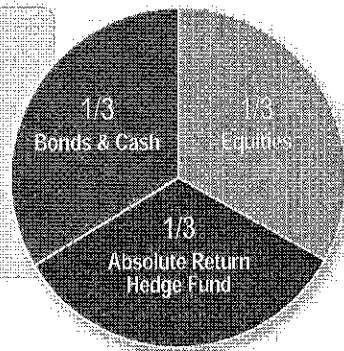


For Financial Professional or Institutional Plan Sponsor Use Only.

Does Berkshire County Represent a Shift to a Sustainability Model for Pension Funds?

Sustainability Model for an Open Plan

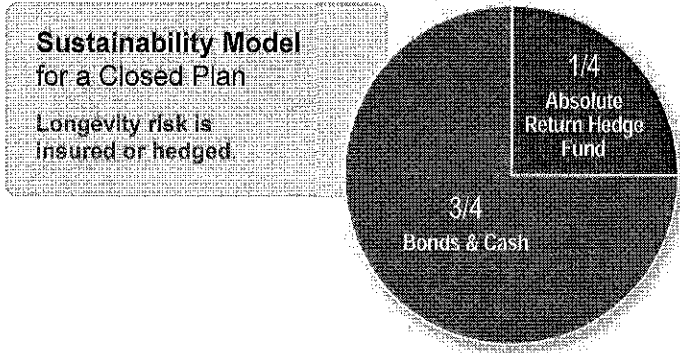
Risk budgeting is used to gauge whether potential losses are affordable – longevity risk is insured or hedged.



For Financial Professional or Institutional Plan Sponsor Use Only.

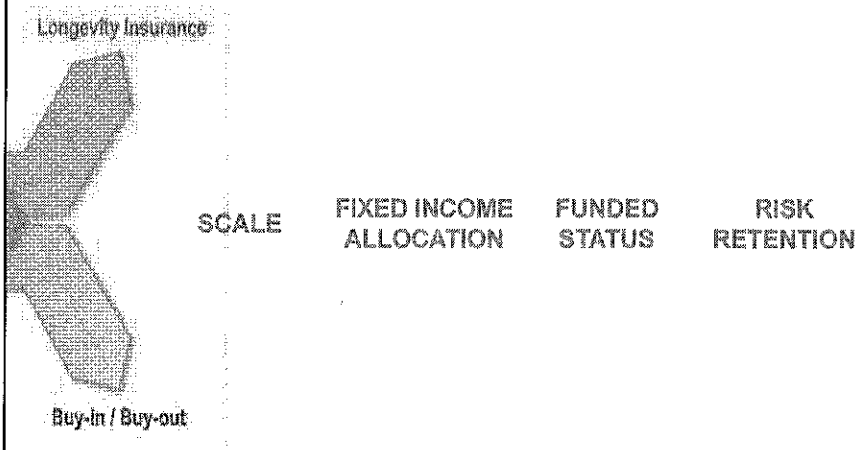
128

Does Berkshire County Represent a Shift to a Sustainability Model for Pension Funds?



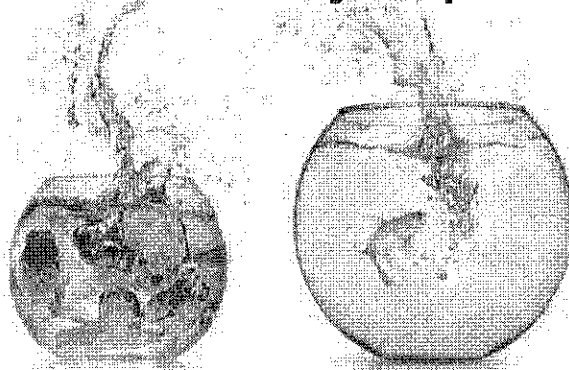
For Financial Professional or Institutional Plan Sponsor Use Only.

When is Longevity Insurance the Answer?



For Financial Professional or Institutional Plan Sponsor Use Only.

**What path will you take?
How can the insurance
community help?**



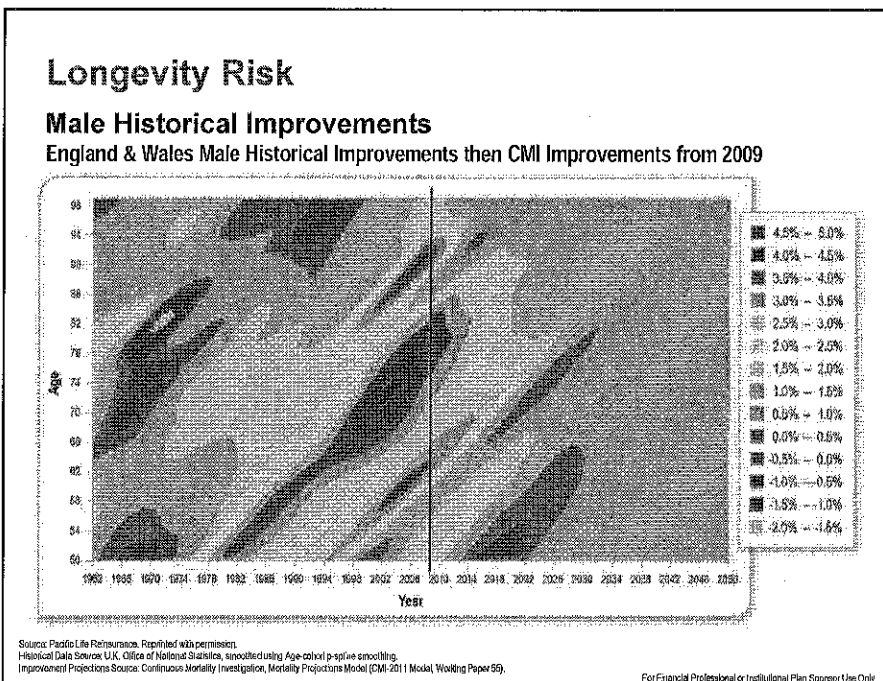
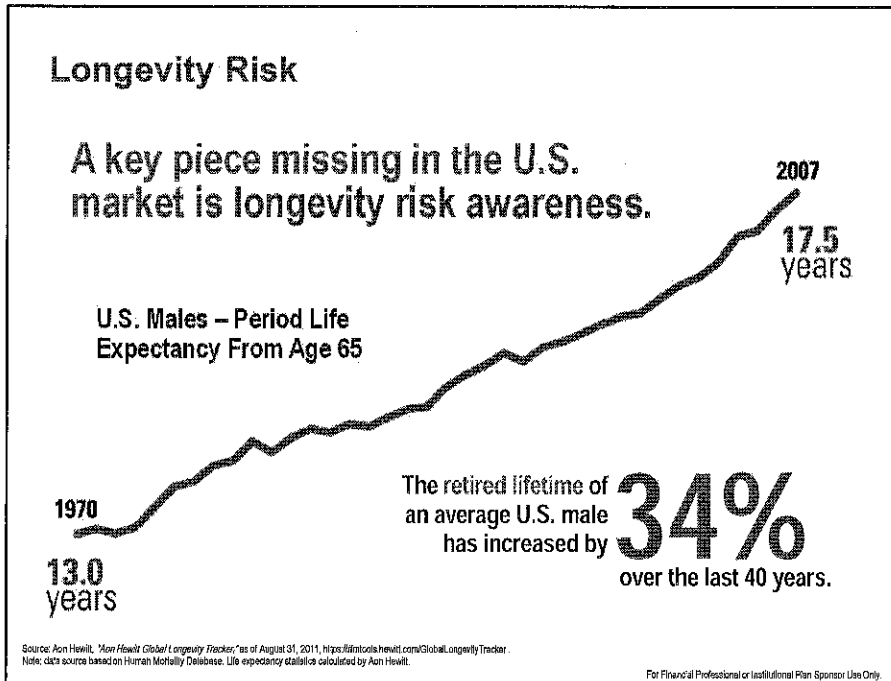
For Financial Professionals or Institutional Plan Sponsor Use Only.

Q&A

Amy Kessler
Senior Vice President
Head of Longevity Reinsurance
Prudential Retirement®

amy.kessler@prudential.com

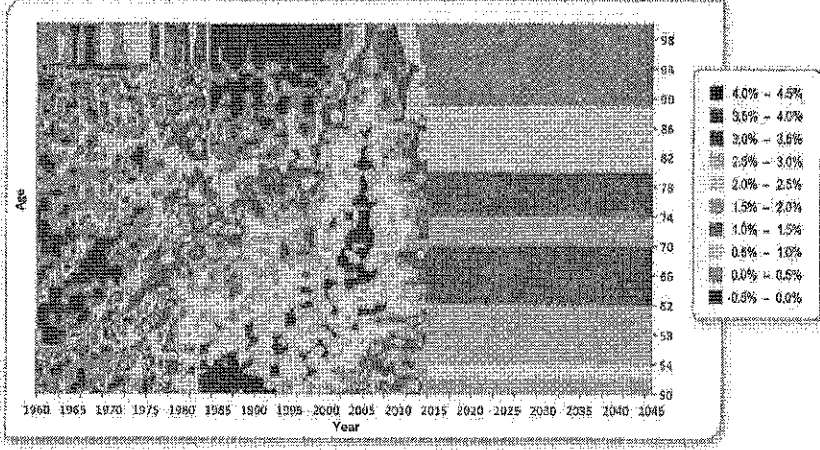
For Financial Professionals or Institutional Plan Sponsor Use Only.



Longevity Risk

Male Historical Improvements

Canadian Male Historical Improvements and then U.S. Scale AA Improvements



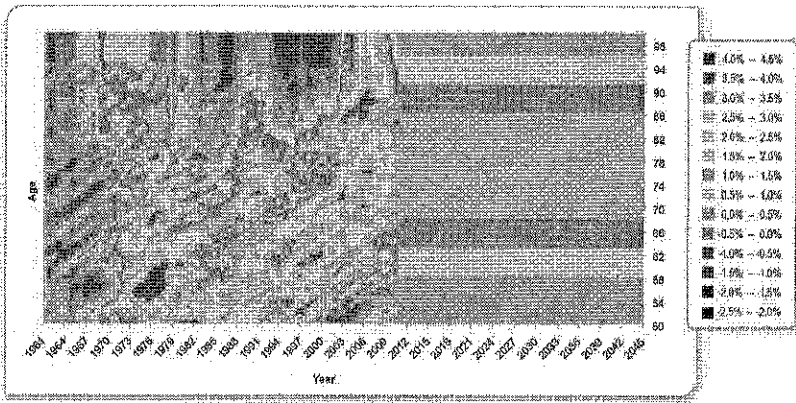
Source: Ernst & Young
 Historical Data Source: Human Mortality Database with simple data smoothing
 Improvement Projections Source: Scale AA improvement rates, Society of Actuaries, 1985 Volume 47.

For Financial Professional or Institutional Plan Sponsor Use Only.

Longevity Risk

Male Historical Improvements

U.S. Male Historical Improvements and then U.S. Scale BB Improvements



Source: Ernst & Young
 Historical Data Source: Human Mortality Database with simple data smoothing
 Improvement Projections Source: Scale BB improvement rates, Society of Actuaries.

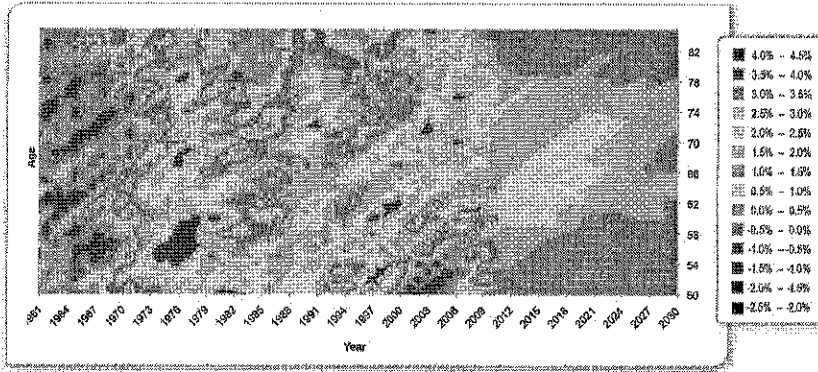
For Financial Professional or Institutional Plan Sponsor Use Only.

132

Longevity Risk

Male Historical Improvements

U.S. Male Historical Improvements and then Improvements according to CBD (2nd Gen)

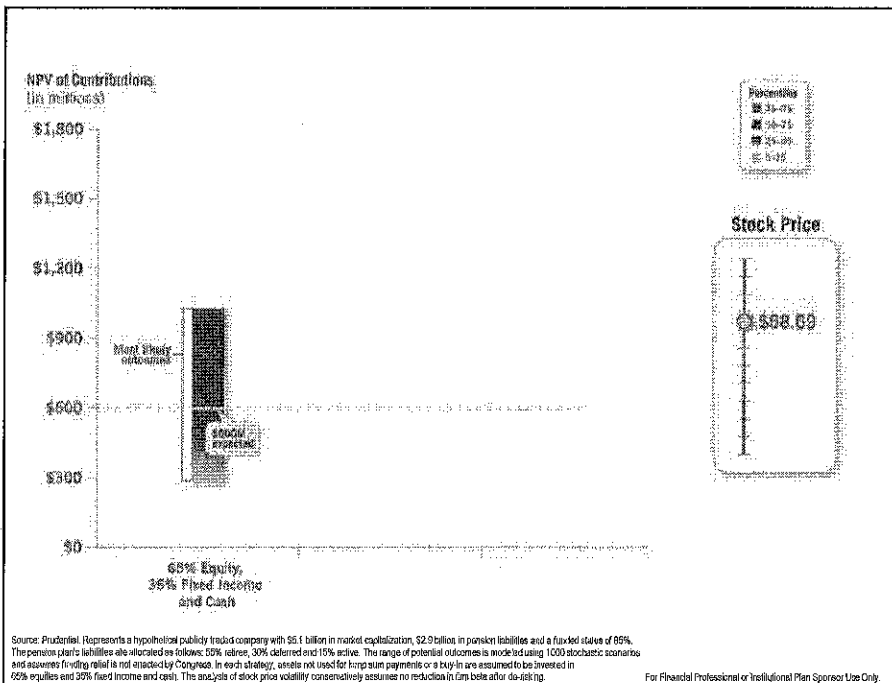
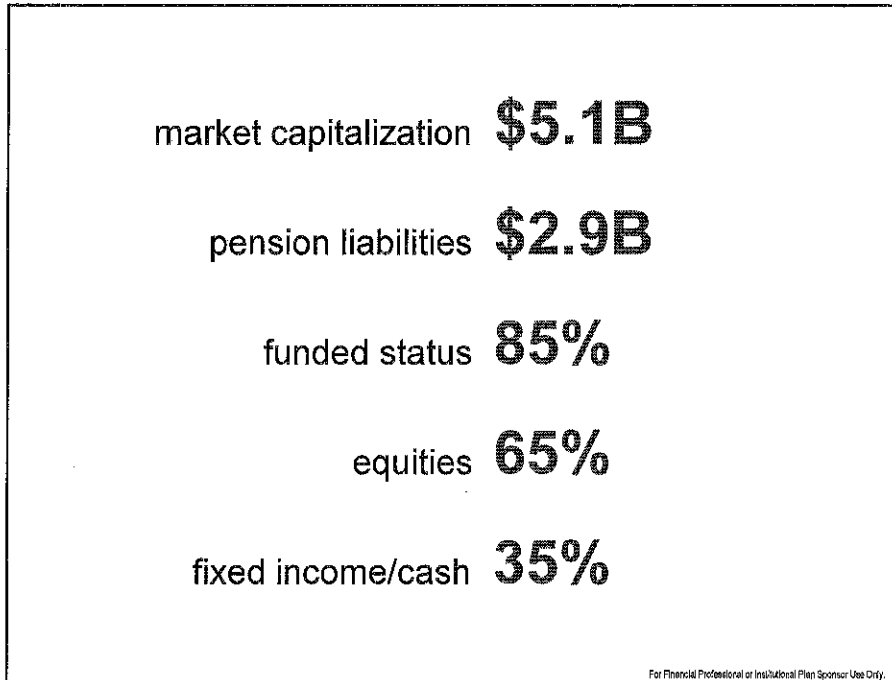


Source: Ernst & Young
 Historical Data Source: Human Mortality Database with simple data smoothing
 Improvement Projections Source: Projected by Ernst & Young using the 2nd generation Cairns-Blake-Dowd model with cohort effect.

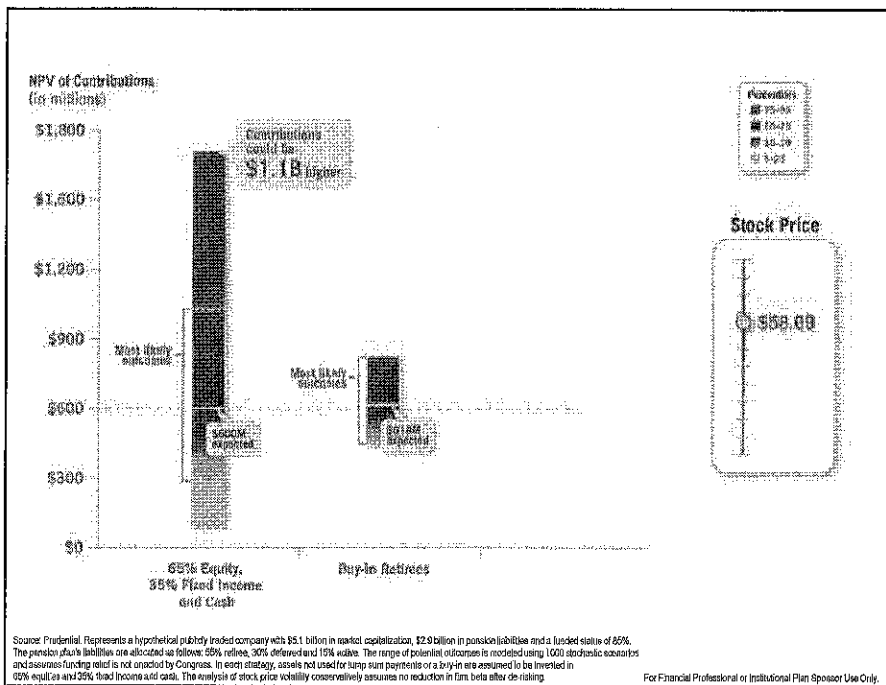
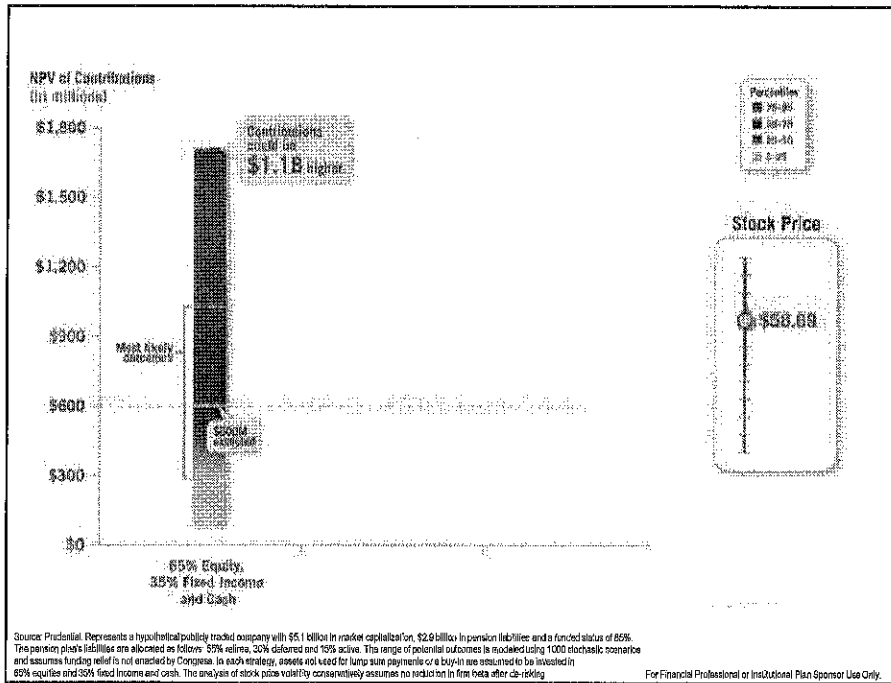
For Financial Professional or Institutional Plan Sponsor Use Only.

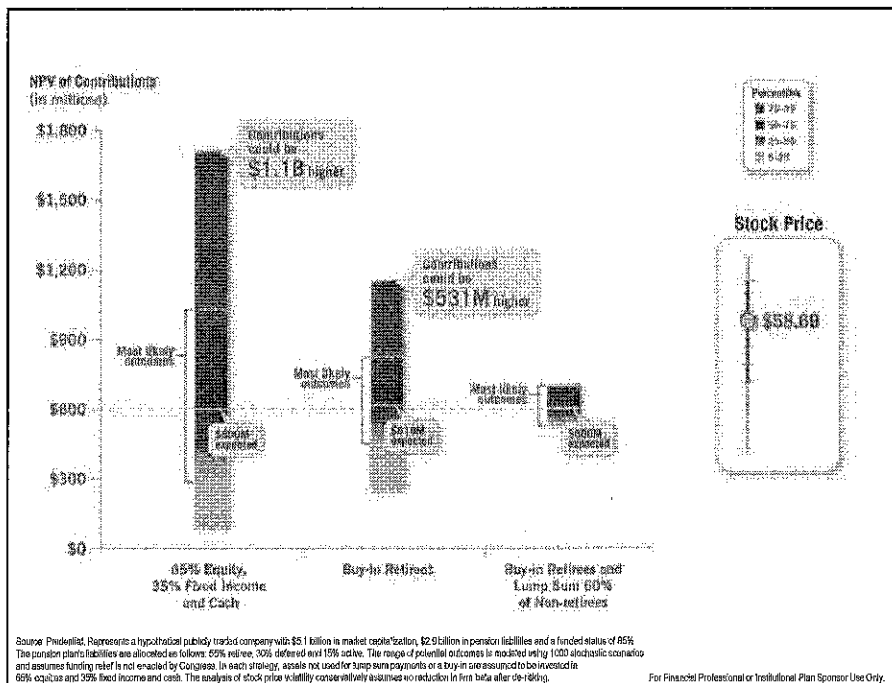
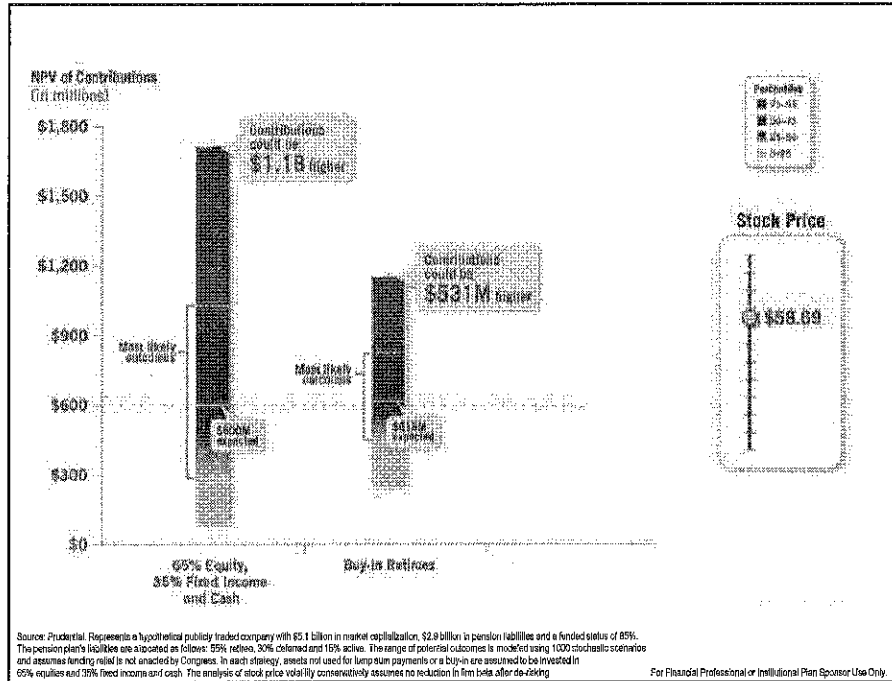
**De-risking
 has a real impact
 on corporate cash flow
 and stock price.**

For Financial Professional or Institutional Plan Sponsor Use Only.

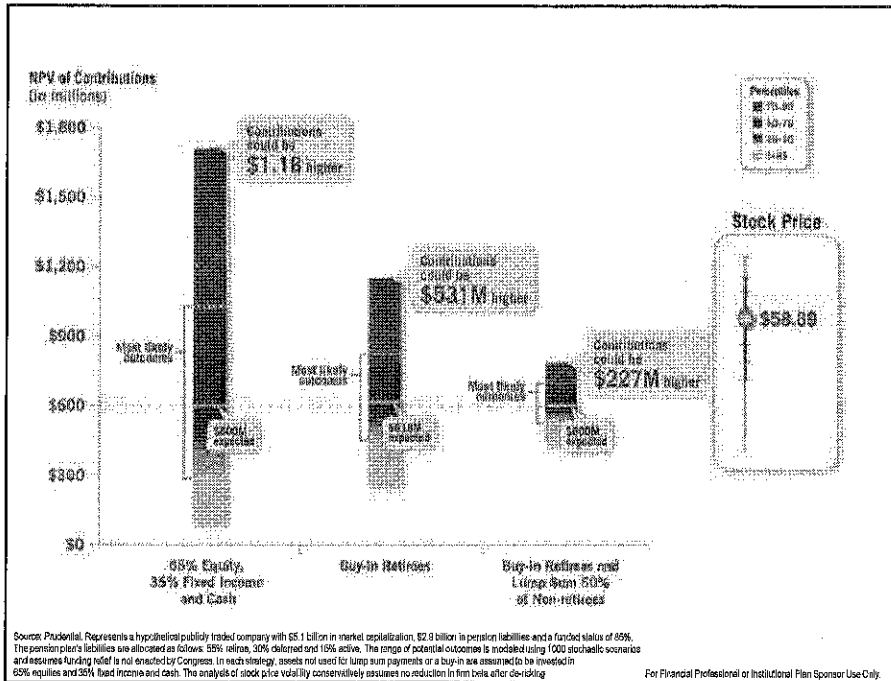


134



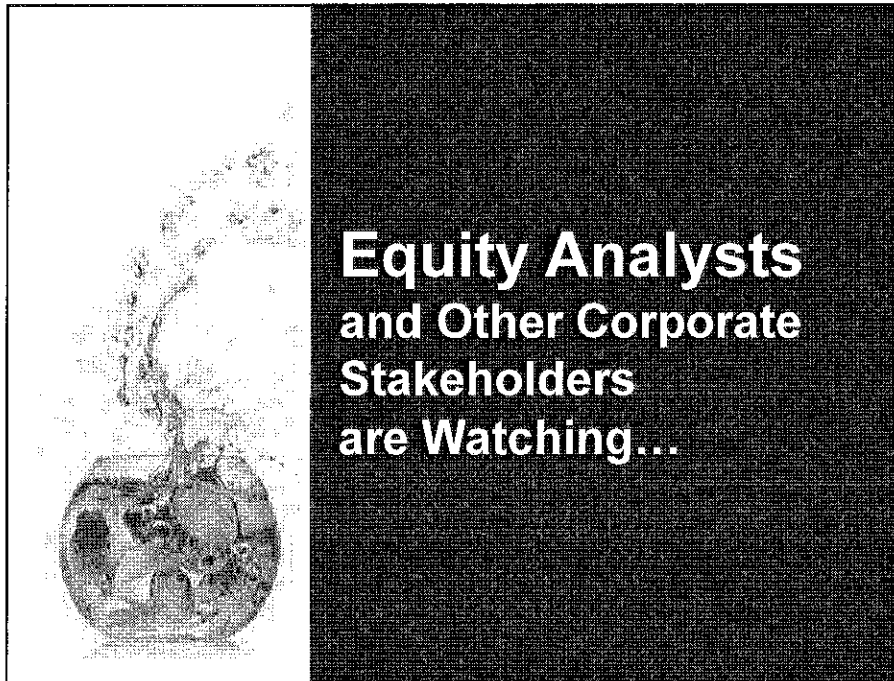


136



Companies that de-risk set themselves apart from their peers.

For Financial Professional or Institutional Plan Sponsor Use Only.



GM takes action to reduce its pension benefit obligation by approximately \$26B

... the move helps significantly reduce economic volatility, improves valuation transparency and enables GM to focus more on making cars rather than managing a pension fund.

— Morgan Stanley

Source: "General Motors Pension Down, Creditly, L.P." Morgan Stanley, June 1, 2012. Used with permission.

Financial Perspectives | Call Center | Plan Sponsor Use Only

As GM continues to fund and de-risk its pension, investors should develop increased confidence that incremental cash flows will accrue to them, and not the pension. As this happens, GM's multiple should expand.

— Credit Suisse

Source: "Doing the Right Thing - GM Further De-Risks Pension, Positive for Equity Holders," Credit Suisse, Equity Research, June 4, 2012. Used with permission.

For Financial Professionals or Institutional Plan Sponsor Use Only.

This discussion document describes product concepts that are not final. It has been prepared for discussion purposes only. It is not an offer to enter into any agreement. This document does not completely describe the terms of any potential transaction or final product design, and any transaction would be subject to applicable legal and regulatory requirements; internal, legal and regulatory approvals; and final legal documentation. Any indication of pricing provided in this document is for illustrative purposes only.

Prudential does not provide legal, regulatory or accounting advice. Therefore an institution and its advisors should seek legal, regulatory and accounting advice regarding the legal, regulatory or accounting implications of any insurance or reinsurance contract. This information is provided with the understanding that the recipient will discuss the subject matter with its own legal counsel, auditor and other advisors.

Insurance products are issued by either Prudential Retirement Insurance and Annuity Company (PRIAC), Hartford, CT, or The Prudential Insurance Company of America (PICA), Newark, NJ. Both are Prudential Financial companies. Each company is solely responsible for its financial condition and contractual obligations. PRIAC and PICA provide insurance products for U.S. pension plans but are not authorized to provide insurance products for U.K. pension plans. Neither PRIAC nor Prudential Retirement are authorized or regulated by the U.K. Financial Services Authority (FSA) nor any other regulatory bodies of European Economic Area (EEA). They do not offer insurance or reinsurance in the United Kingdom nor in the EEA. PRIAC does provide reinsurance in the United States to U.K. insurance companies that have acquired U.K. pension risks through transactions with U.K. plan sponsors. PRIAC is not authorized or regulated by the Office of Superintendent of Financial Institutions for Canada or by the Financial Services Commission of any Canadian province.

Prudential's Traditional Buy-out is a group annuity contract issued by PICA, Newark, NJ 07102. Amounts contributed are deposited in PICA's general account. Any payment obligations or guarantees are contingent on the claims paying ability of PICA.

Prudential's Portfolio Protected Buy-out is a group annuity contract issued by PICA, Newark, NJ 07102. Amounts contributed to the contract are deposited in a separate account established by PICA. Payment obligations specified in the group annuity contract are insurance claims supported by the assets in the separate account and, if such assets are not sufficient, by the full faith and credit of PICA.

Prudential's Portfolio Protected Buy-in is a group annuity contract issued by PICA, Newark, NJ 07102. Amounts contributed to the contract are deposited in a separate account established by PICA. Payment obligations specified in the group annuity contract are insurance claims supported by the assets in the separate account and, if such assets are not sufficient, by the full faith and credit of PICA.

Guarantees are based on the claims-paying ability of the insurance company and are subject to certain limitations, terms and conditions.

Products not available in all states.

© 2012 Prudential. The Prudential logo, the Rock symbol and Bring Your Challenges are service marks of Prudential Financial, Inc., and its related entities, registered in many jurisdictions worldwide.

0235407-00001-00

For Financial Professionals or Institutional Plan Sponsor Use Only.

Enhanced Annuities: How to Overcome the Hurdles of Private Annuitization

Klaus Miller

Consent to publication | EA development of EA market | HF understanding approach

Disclaimer

The information provided in this presentation does in no way whatsoever constitute legal, accounting, tax or other professional advice.

While Hannover Rückversicherung AG has endeavoured to include in this presentation information it believes to be reliable, complete and up-to-date, the company does not make any representation or warranty, express or implied, as to the accuracy, completeness or updated status of such information.

Therefore, in no case whatsoever will Hannover Rückversicherung AG and its affiliated companies or directors, officers or employees be liable to anyone for any decision made or action taken in conjunction with the information in this presentation or for any related damages.

© Hannover Rückversicherung AG. All rights reserved.
Hannover Re is the registered service mark of Hannover Rückversicherung AG.

140

Agenda somewhat
different

- 3 – 6 | Current pension environment worldwide
- 7 – 12 | UK development of enhanced annuity market
- 13 – 19 | Hannover Re's Underwriting Approach

hannover re®

Current pension environment | UK development of EA market | HR underwriting approach

Pension cover levels worldwide

- ▶ State pension not sufficient
- ▶ Additional income from defined benefit decreasing
- ▶ Private savings or defined contributions needed and in many markets supported by tax regulation
 - Funds available upon retirement
 - Upon retirement policyholders accept lump sum instead of annuity
- ▶ UK is the exception because annuitization was "obligatory" and additional rules are restricting drawdown

People are saving for retirement but do not buy an annuity

3 | Enhanced Annuities hannover re®

144

Current pension environment | UK development of EA market | HR underwriting approach

Rapid Mortality Improvements over the 20th Century United Kingdom

Year	Period life expectancy at birth - Males		Period life expectancy at birth - Females	
1901	46 ¹⁾		50 ¹⁾	
2009	78 ²⁾		82 ²⁾	

Year	q_0 Males	${}_{65}P_0$ Males	q_0 Females	${}_{65}P_0$ Females
1901	18% ¹⁾	36% ²⁾	13% ¹⁾	43% ²⁾
2009	<0.5% ³⁾	85% ²⁾	85% ³⁾	90% ²⁾

Sources: Office for National Statistics
 1) The health of adult Britain 1841-1994 (1997a)
 2) Statistical Bulletin: Older People's Day 2011
 3) UK Internal Life Tables 1980-82 to 2008-10 (2011)

Risk for annuitants choosing drawdown: outliving of annuity assets

4 | Enhanced Annuities hannover re[®]

Current pension environment | UK development of EA market | HR underwriting approach

Different life expectancies at age 65 in years

Profession	Life expectancy
Blue collar worker	24
Smoker	24
Doctor	30
Banker	30
Teacher	30
Poor ill worker	21

Individual annuity quote needed

6 | Enhanced Annuities hannover re[®]

142

Current pension environment | UK development of EA market | RR underwriting approach

UK pension system

State	Occupational	Private
Second State Pension (opt-out possible) Basic State Pension (flat)	Defined Benefit (Final Salary) Defined Contribution	Private Pensions

- ▶ Individual annuity quote already available for Defined Contribution and Private Pensions
- ▶ Individual underwriting for Defined Benefits developing

Shift to underwritten annuities

6 | Enhanced Annuities hannover re®

Current pension environment | UK development of EA market | RR underwriting approach

UK development

Product concepts since introduction until today

- Fully underwritten Impaired Life Annuities
 - ▶ Underwriting on detailed medical questionnaire and GPR
 - ▶ Individual consideration by skilled underwriters
- Smoker/Health Indicator Annuities
 - ▶ Simplified underwriting on a limited number of simple questions
 - ▶ Yes/no decision
- Select Annuities/Postcode Annuities
 - ▶ Based on lifestyle, occupation and/or postcode
 - ▶ Minor enhancement
- Level Concept Annuities
 - ▶ Automatically underwritten based on easy to answer medical questionnaire
 - ▶ Guaranteed enhancement level quoted

Increased competition requires individual assessment

7 | Enhanced Annuities hannover re®

Client/pension environment | **UK development of EA market** | IR underwriting approach

UK development

- ▶ Individual survival curves
- ▶ Efficient processing for IFAs
- ▶ Standard providers entering the market
- ▶ Open market option as default option
- ▶ Common quotation request form and portals increase comparability

Significant volume increase from 1995 until today

9 | Enhanced Annuities hannover re®

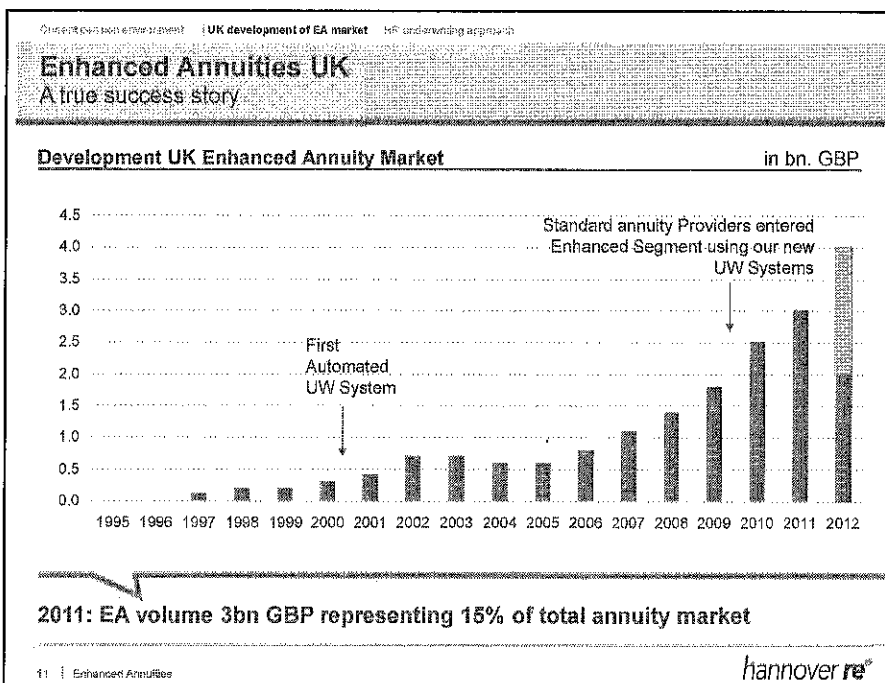
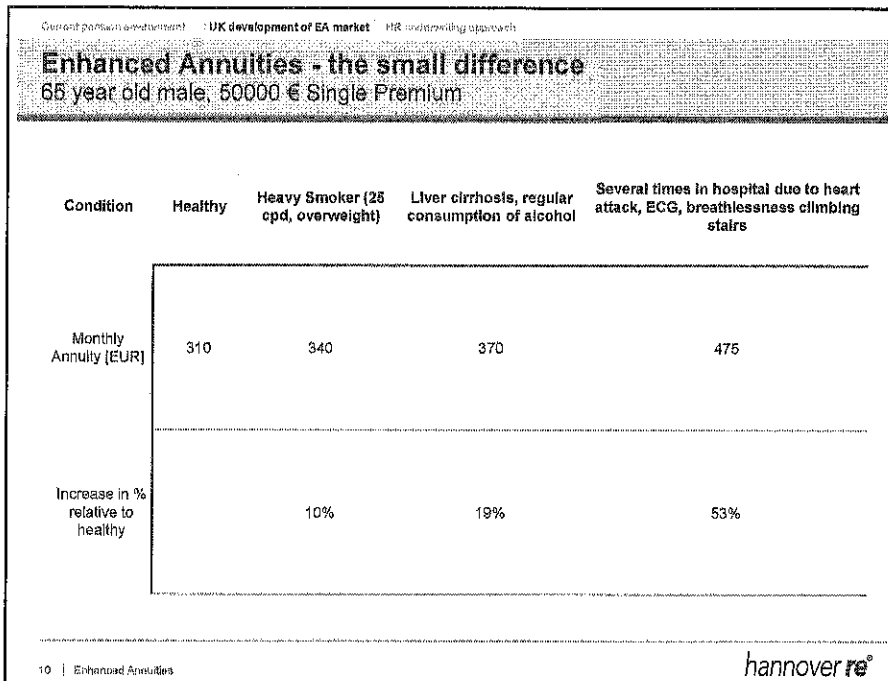
Client/pension environment | **UK development of EA market** | IR underwriting approach

UK development

1995	Today
▶ Differentiation between standard and impaired	▶ Trend to fully underwritten pensions
▶ Specialist providers	▶ Specialist and standard providers
▶ Provider offered products for special segments	▶ Provider offering full range from healthy, over slightly enhanced to severely impaired
▶ Providers use different underwriting approaches	▶ Common Quotation Request Form

9 | Enhanced Annuities hannover re®

Handwritten mark



Current pension environment | UK development of EA market | HR underwriting approach

UK Enhanced Annuities

- ▶ Standard providers entering Enhanced Annuity market
 - Simplified process for their vesting business or
 - Full integration for open market
- ▶ 40% to 60% qualify for an Enhanced Annuity
- ▶ Growth of total annuity market by ~11% p.a.
- ▶ Enhanced Annuity segment growing even faster: 22% from 2010 to 2011

All annuities will be underwritten in the not too distant future

12 | Enhanced Annuities hannover re®

Current pension environment | UK development of EA market | HR underwriting approach

Our experience

- ▶ Medical underwriting for annuities is very different from medical underwriting for life covers
- ▶ Underwriters need special training and have to think differently
- ▶ What is the standard concerning a 65 year old applicant?
- ▶ Common life underwriting manuals cannot be used for annuities
- ▶ Should the applicant be very ill, the annuity value for the customer increases

Annuity underwriting needs special knowledge

13 | Enhanced Annuities hannover re®

146

Current pension environment | UK development of EA market | HR underwriting approach

Our experience
Hannover Re Point of Sale System

- ▶ Underwriting at point of sale – allows immediate guaranteed quotes
- ▶ Simple questions, easy handling even by medical laymen
- ▶ All common diseases, all levels of impairment
- ▶ ~ 95% of conditions covered
- ▶ System underwriting provides consistency

Specialty designed to support smooth processing

14 | Enhanced Annuities hannover re®

Current pension environment | UK development of EA market | HR underwriting approach

Derivation of individual survival curve

ELE = Estimated Life Expectancy

MPLE = Maximum Probable Life Expectancy

Source: Hannover Re

ELE/MPLE is the best information medical doctors can provide

15 | Enhanced Annuities hannover re®

