



Annuity Provider Capital and Solvency II

4th Contractual Savings Conference: Supervisory and Regulatory Issues in Private Pensions and Life Insurance
World Bank, Washington D.C.

Philip Long
4 April 2008

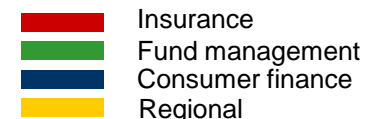
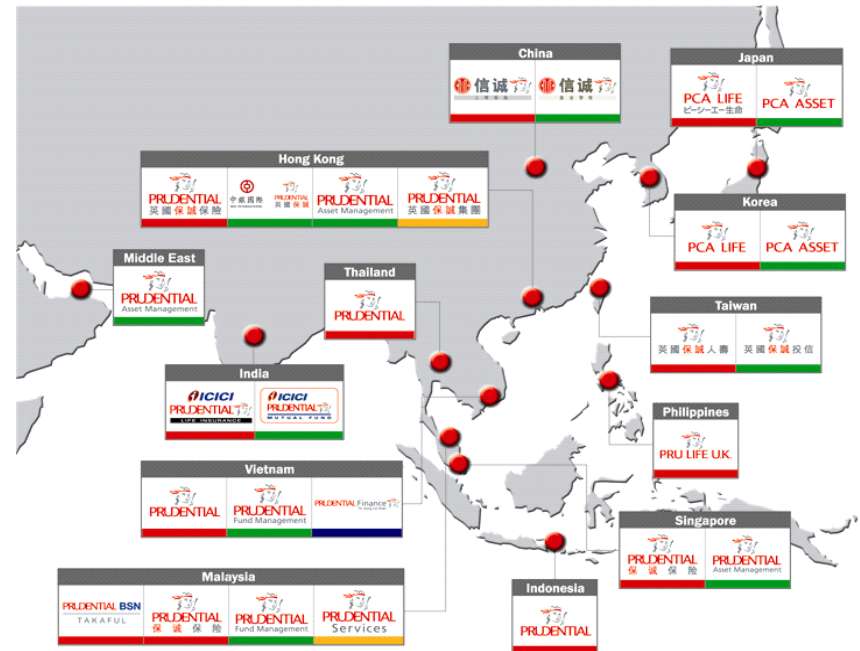
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Prudential plc



Of which Asia...(and Middle East)



- Last year Prudential made \$4.2 billion of payments on 1.5 million annuity policies in the UK



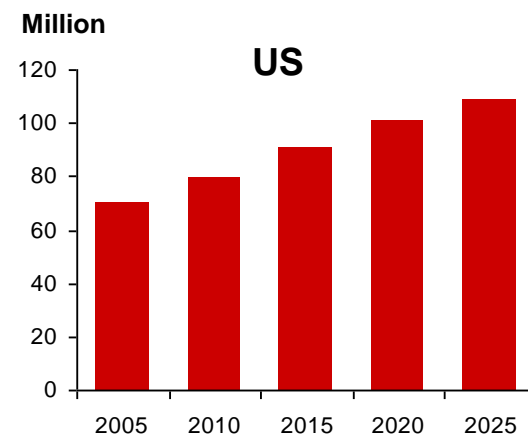
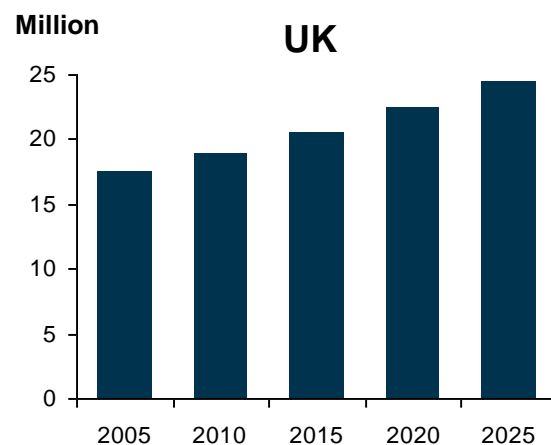
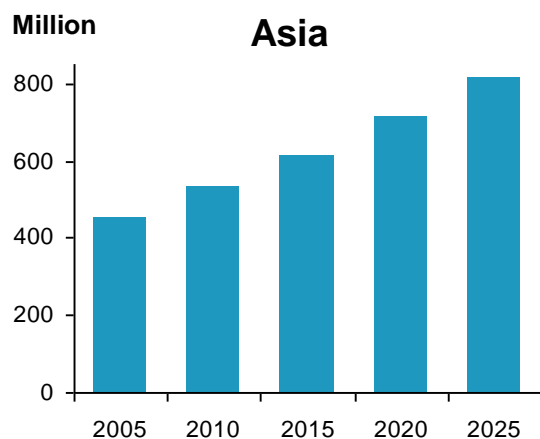
Agenda

- The retirement time bomb
- An objective and transparent approach to valuation and capital
- Developing annuity markets – how to make it work



Ageing populations...

Projection of population aged 55+

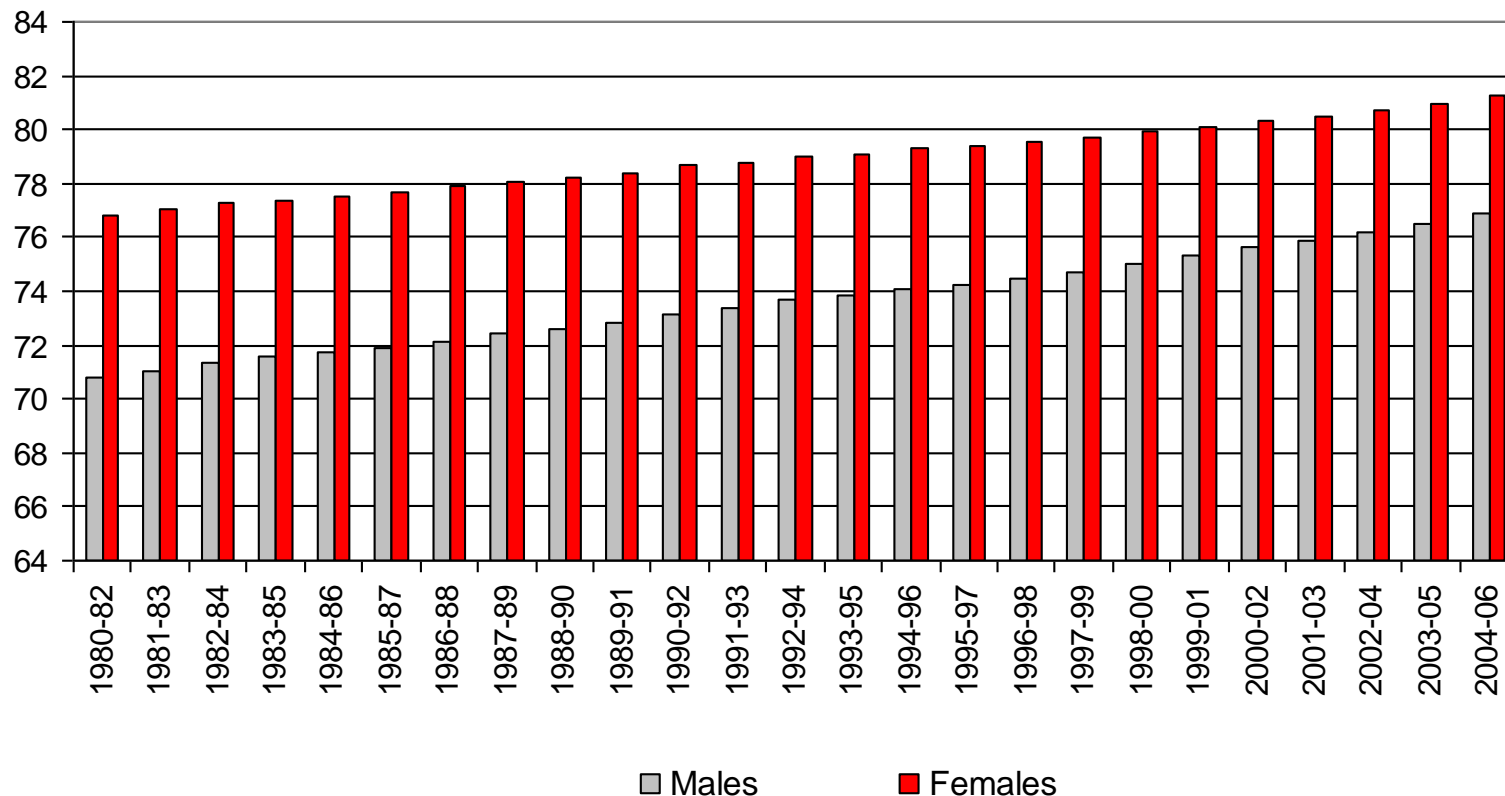


Source: Population projection: Global Demographics July 2007, Asia population data - estimates for Prudential's 12 markets



Increasing life expectancy...

Average Period Expectation of Life in the UK

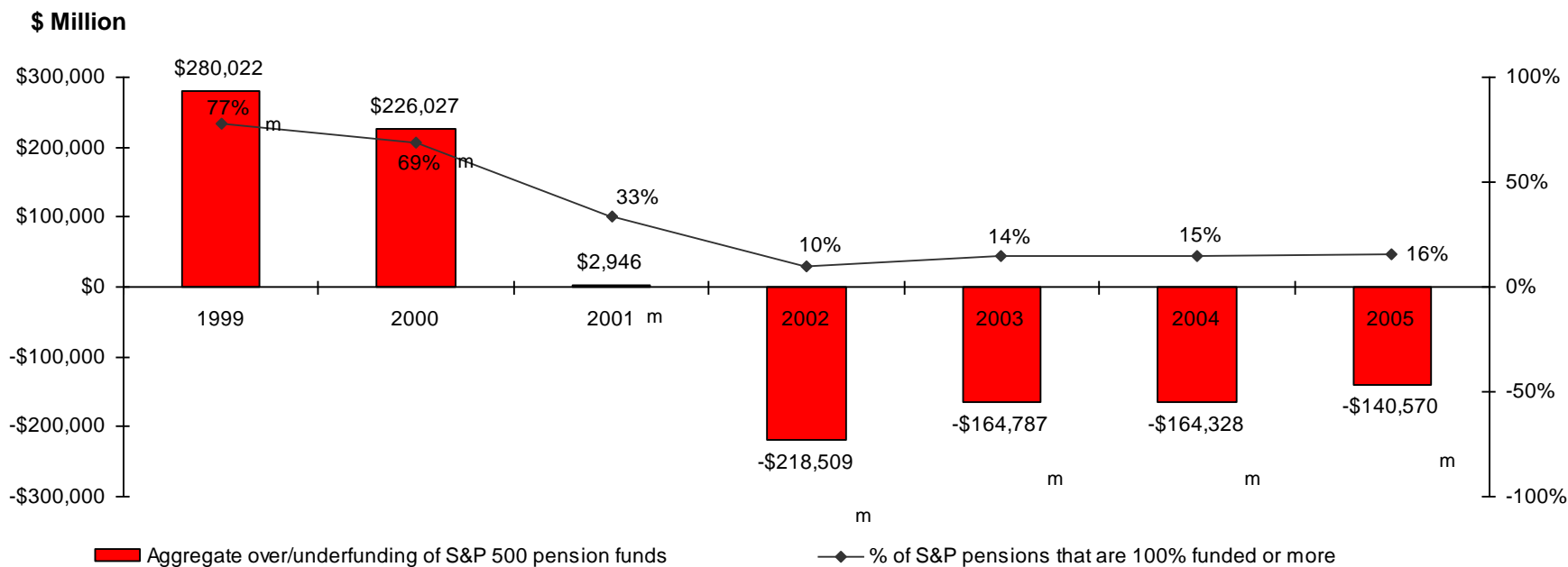


Source: *Interim Life Tables UK*, Office for National Statistics.



Underfunding of company-sponsored pensions schemes...

Aggregate funding of S&P 500 Defined Benefit Pension Schemes 1999-2005



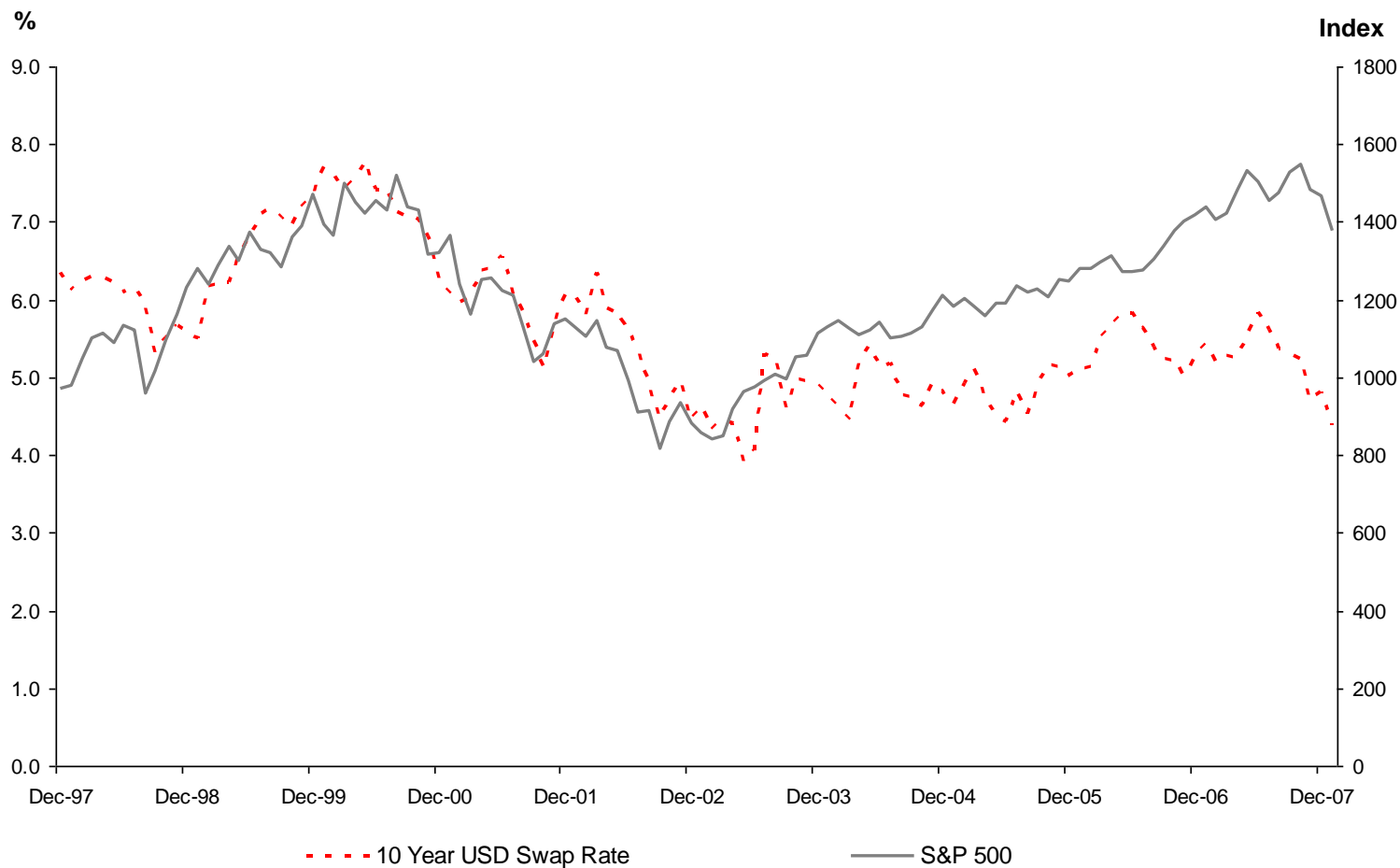
Sources: S&P 500, Cerulli Associates

....AND PRESSURE ON GOVERNMENT-SPONSORED PAY-AS-YOU-GO SCHEMES



Positive correlation between equities and interest rates...

S&P 500 and 10 Year USD Swap Rate

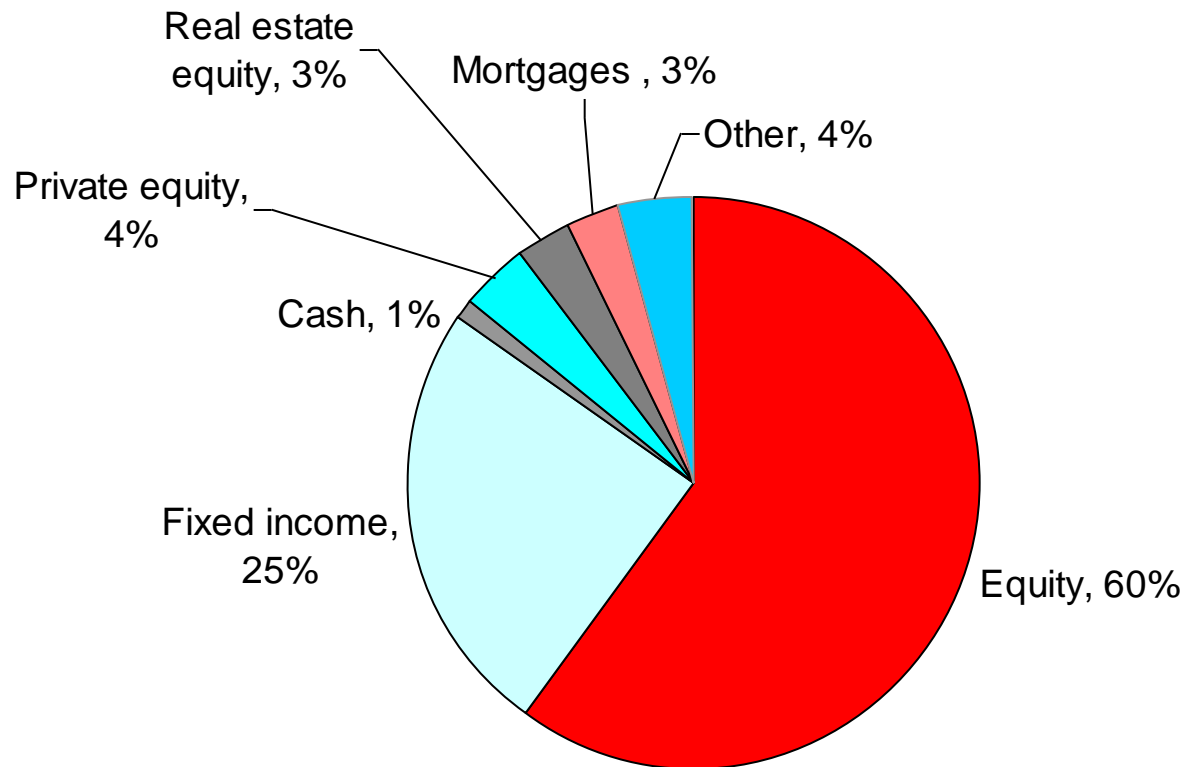


Source: Bloomberg



But greater risk taking with asset-liability mismatch “bets”..

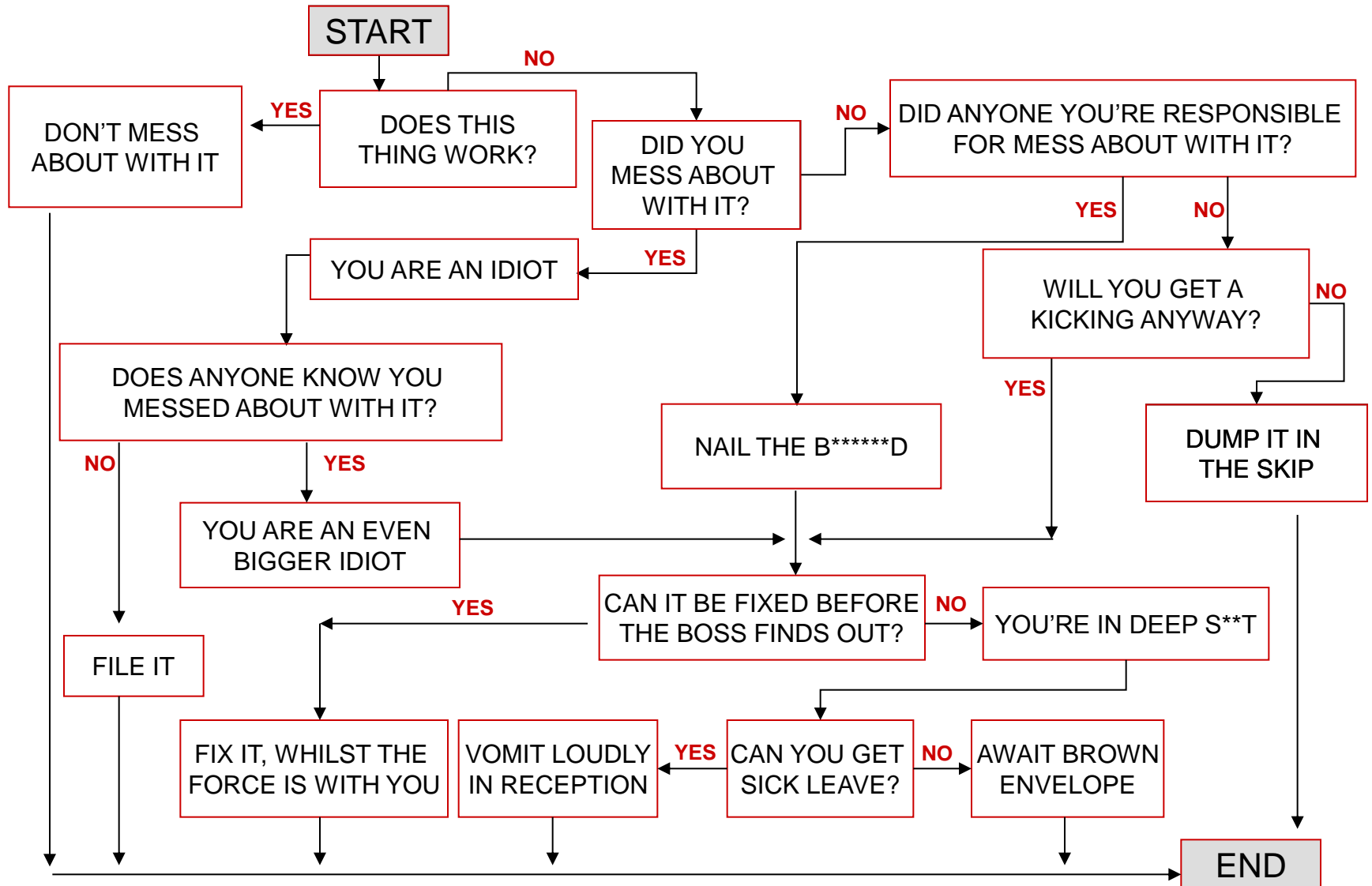
Private Defined Benefit Pension Schemes Asset Allocation 2005



Sources: *Pensions and Investments*, Cerulli Associates



One approach for decision-making and allocating responsibility...



A better approach: framework based on transparency and objectivity

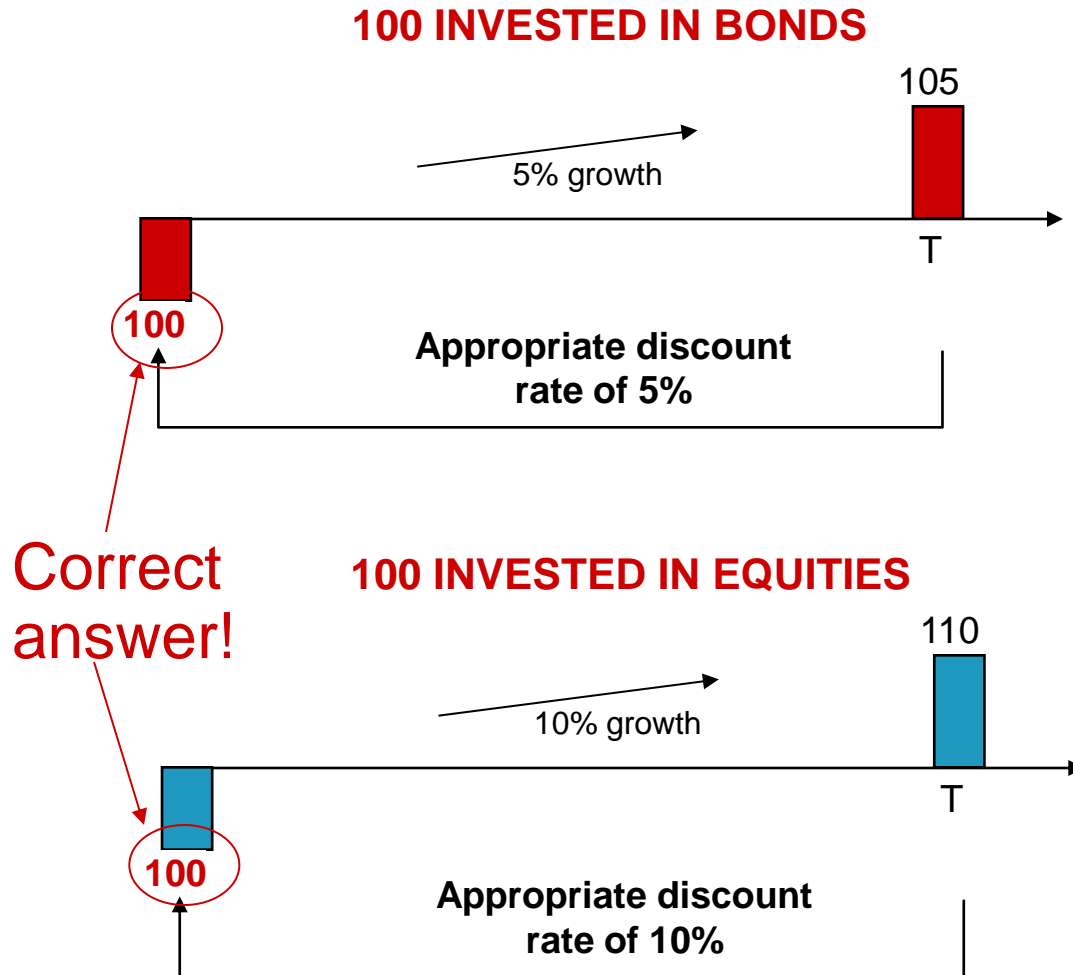
JUDGEMENT, OBJECTIVE
ANALYSIS AND
TRANSPARENT MODELLING



BLACK BOX: “JUST TRUST
ME, I’M CLEVER”

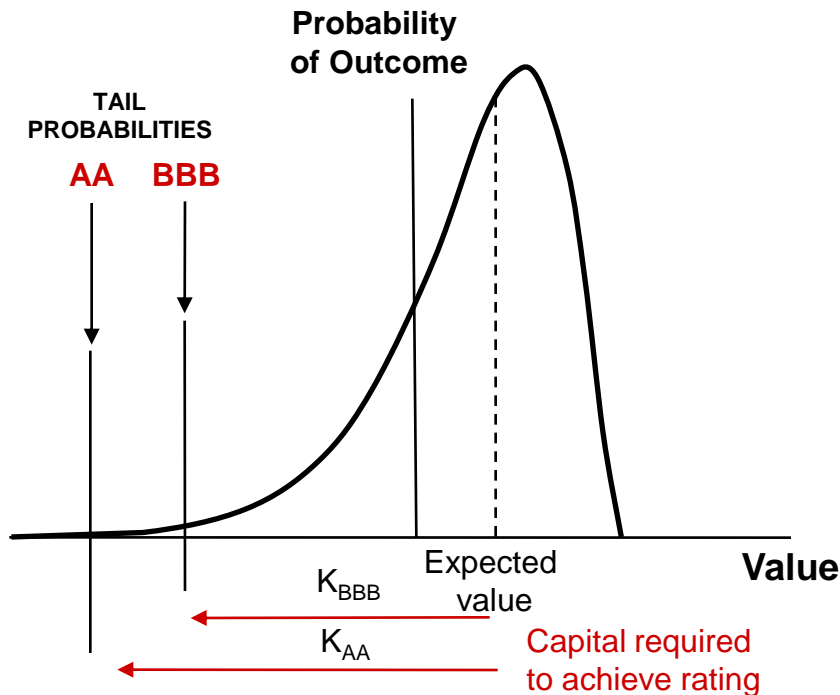


Market-consistent valuations take no credit upfront for investment returns not yet earned



Value at Risk (VaR) economic capital for 1 year time horizon is held

Value distribution



- Using internal models or standard models
- Solvency II standard set at 99.5% VaR ~ BBB

RISKS REQUIRING CAPITAL

NON-MARKET RISKS

Non-hedgeable

- **Mortality** level, trend and cat
- **Longevity** level, trend and discovery
- **Morbidity** level and trend
- **Persistency** (level shocks or changes to dynamic lapse curve)
- **Unit expense** increases

Hedgeable

- Relatively uncommon

MARKET RISKS

Non-hedgeable

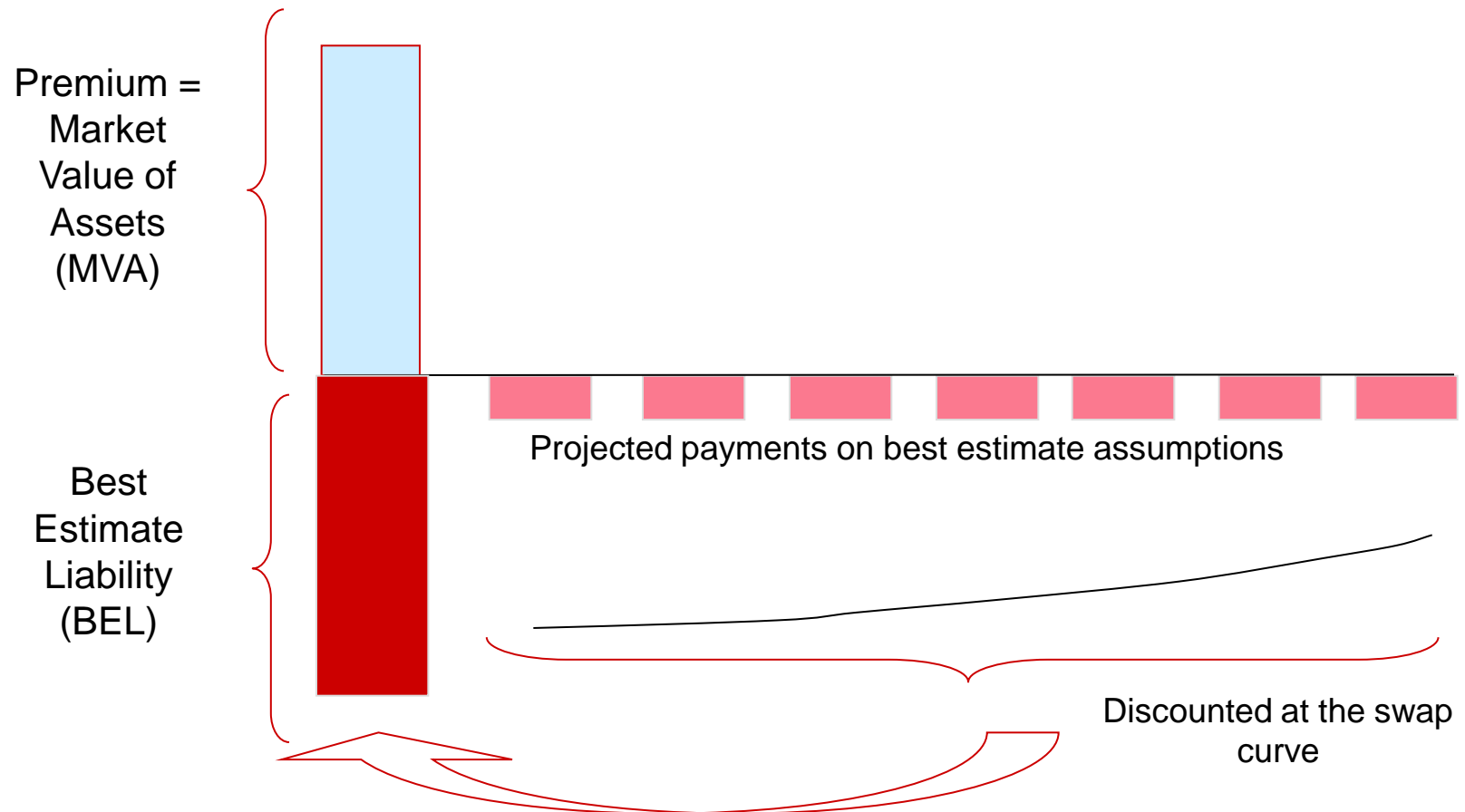
- **Unhedgeable interest rate risk** (shocks to long end of curve)

Hedgeable

- **Equity** or **property** values
- **Credit** risk
- **Market-related policyholder behaviour**



Market-consistent valuation for immediate annuity cashflows... similar to valuing a bond!

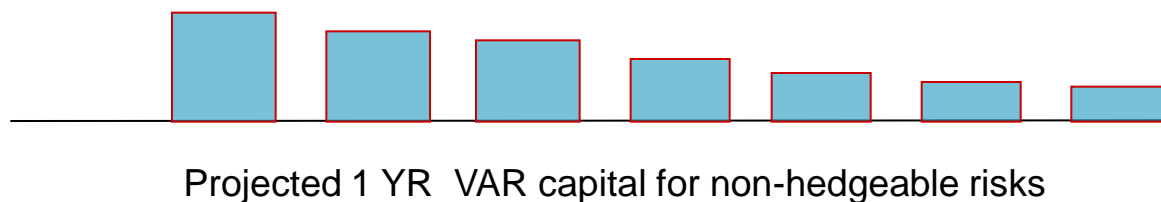


OPTIONS AND GUARANTEES EXPLICITLY MODELLED (E.G. USING STOCHASTIC MODELS) WHERE THEY EXIST



Market-consistent cost of VaR capital requirements: market value margin

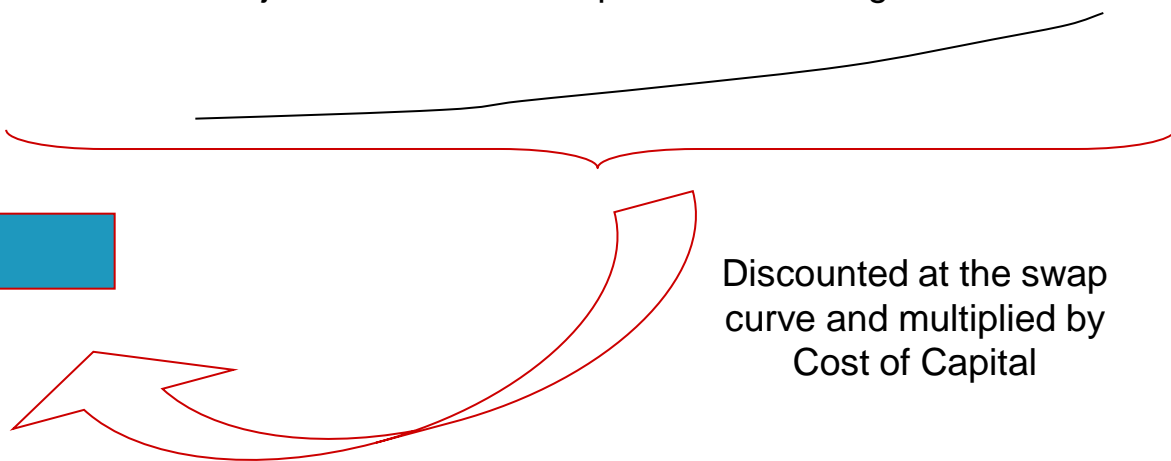
1 Year Value at Risk (VaR) Capital for Non-hedgeable risks



Market Value Margin (MVM)



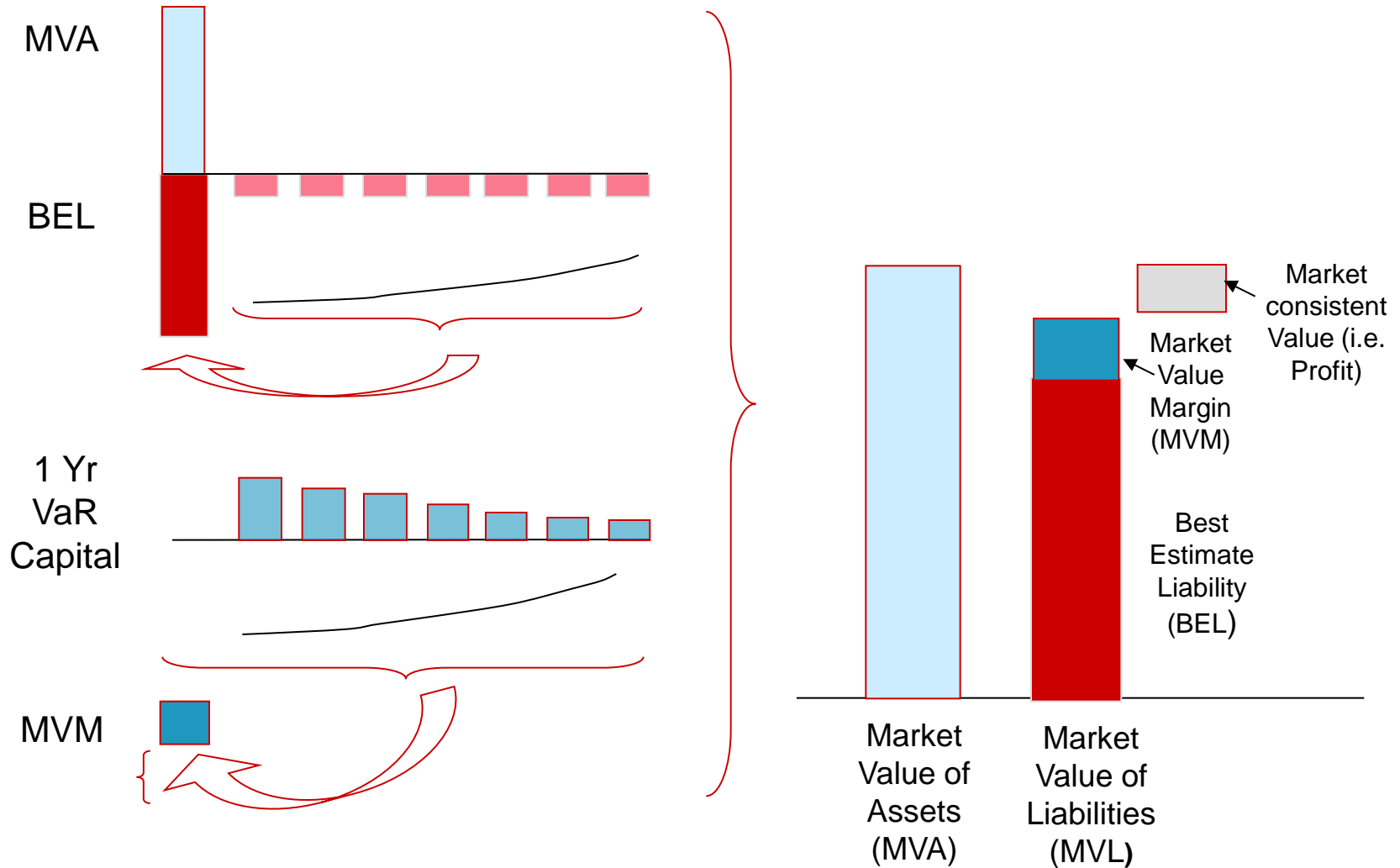
Discounted at the swap curve and multiplied by Cost of Capital



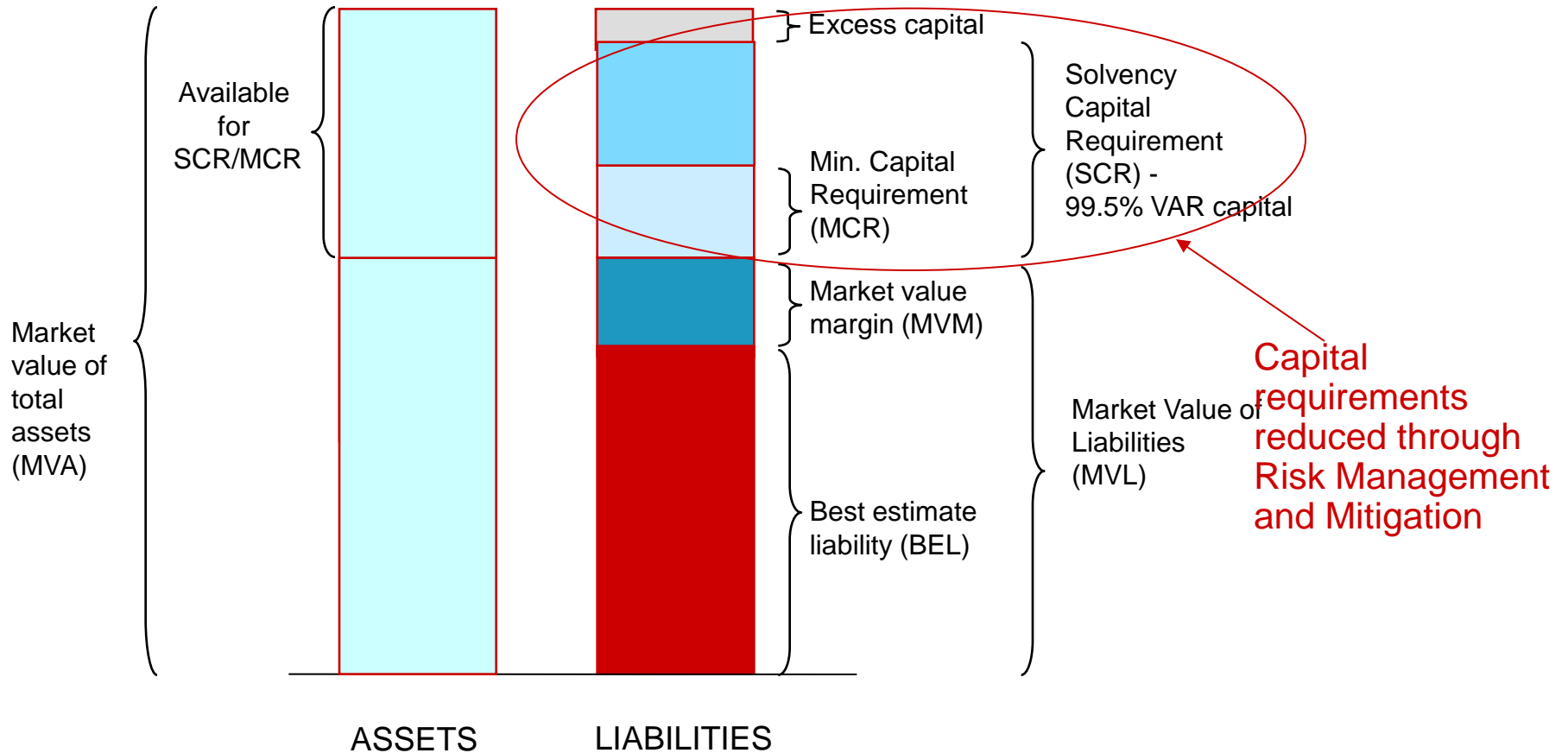
- NO OTHER “PRUDENT MARGINS” IN THE LIABILITY, AS THIS IS THE ROLE OF CAPITAL



The market-consistent value of an immediate annuity – assets, liability and profit



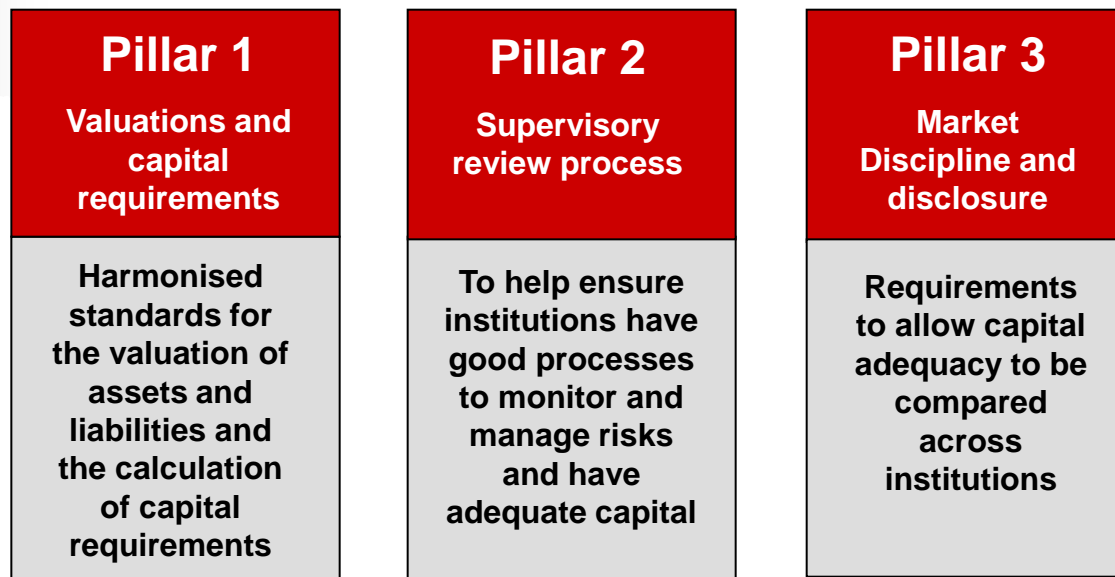
The market-consistent balance sheet



Source: CEA and CRO Forum joint submission: "Solutions to 5 Major Issues for Solvency II"



Solvency II proposals



PRINCIPLES

- Market consistent treatment of assets and liabilities (incl. embedded options)
- Risk-based capital requirements, including allowance for diversification (99.5% VaR over 1 year horizon)
- Reliance on internal models and risk management
- Ladder of supervisory intervention – MCR/SCR,
- Economic treatment of groups – group test, group support, diversification and capital mobility



Polymakers and regulators need to help make it work

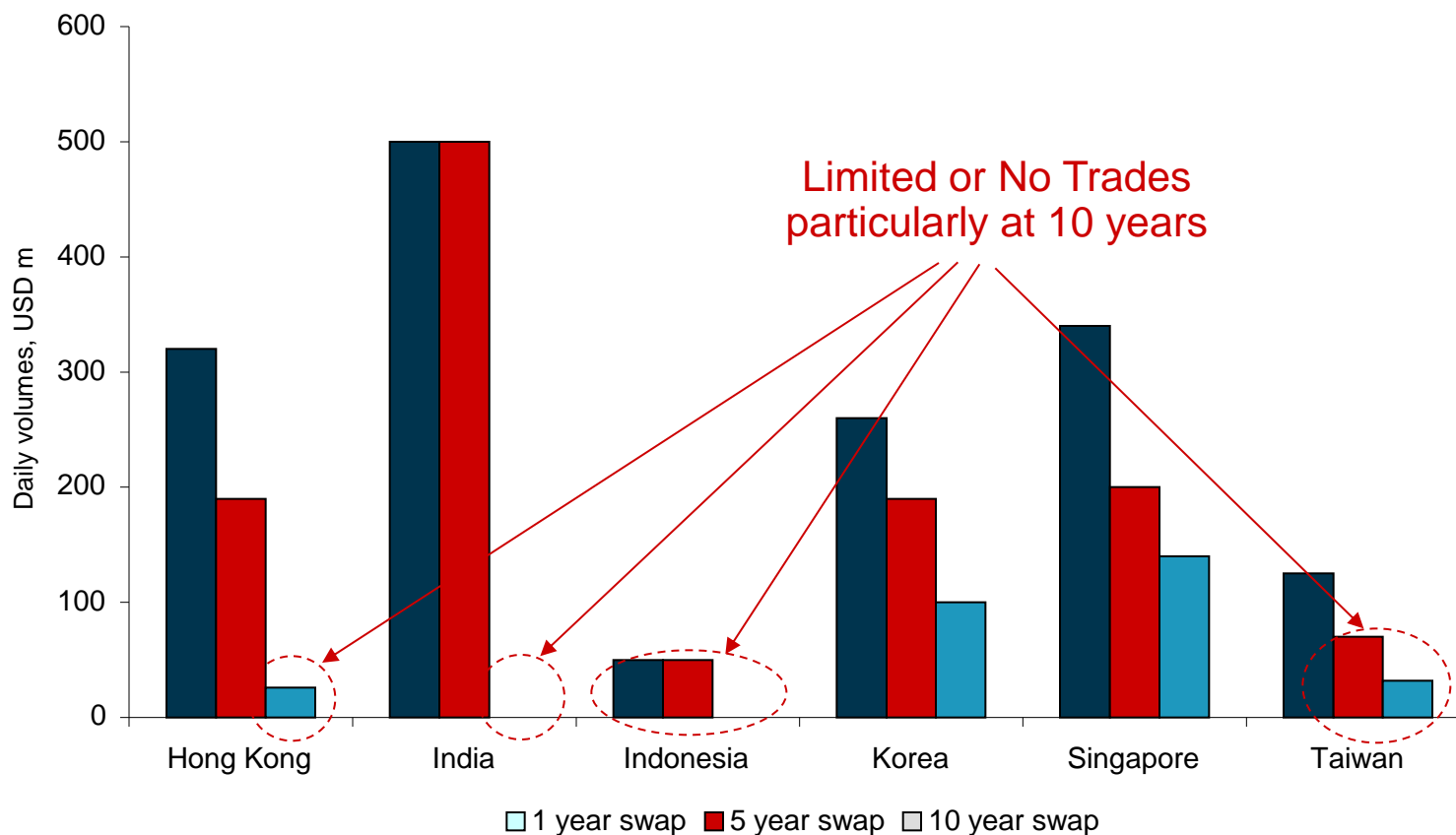
- Solvency II principles a good starting point ✓
- Regulators must have the necessary skills... and pay ✓
- National collection of data to build credible life mortality tables ✓
- Compulsory annuitisation to avoid moral hazard and introduce scale of provision ✓

- Resist (natural) tendency to gravitate to more and more regulatory rules ✗
- Resist arbitrary, non-economic regulatory add-ons or restrictions that can result in perverse incentives ✗
- Resist diluting regulatory intervention and enforcement powers and “too-big to fail mentality” that encourages moral hazard ✗



Need longer duration instruments in the capital markets

Daily trading volumes for 1, 5 and 10 year swaps in Asia

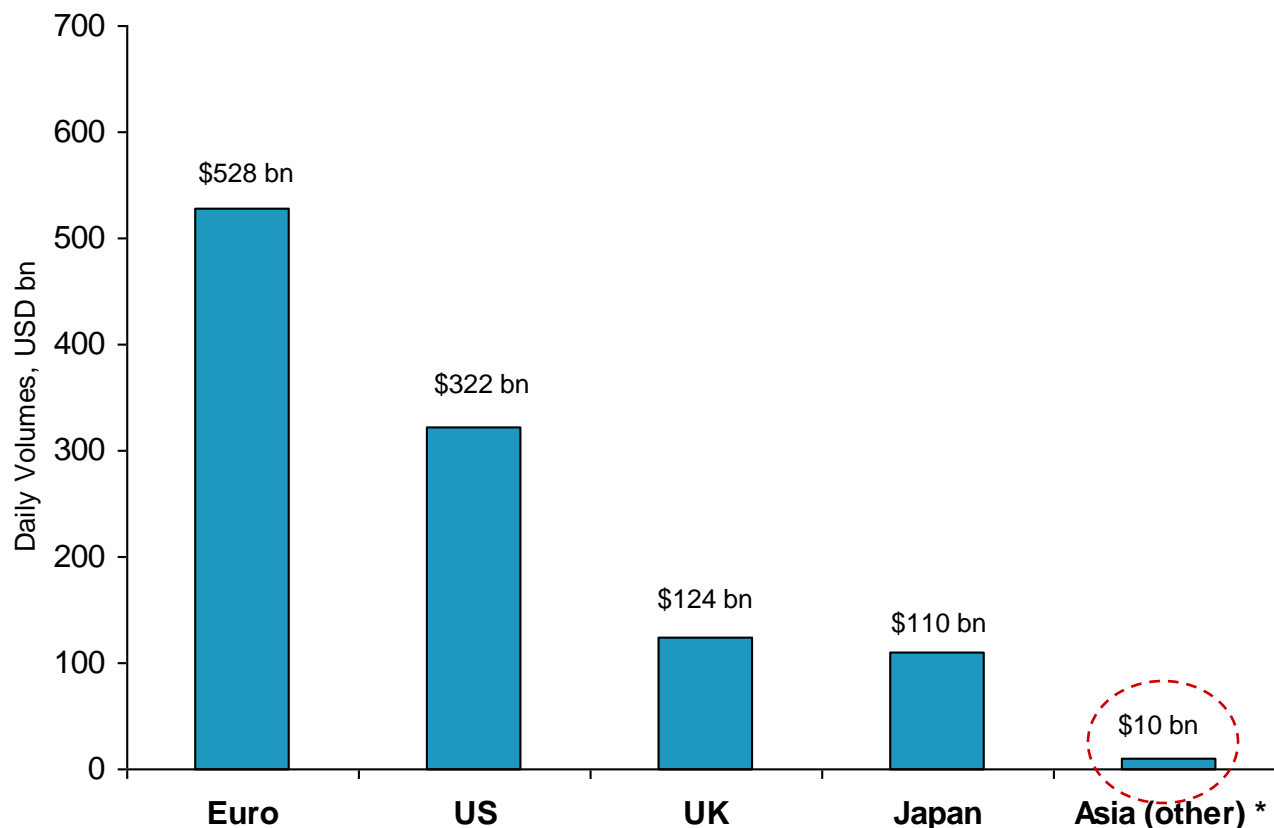


Source: JP Morgan Local Markets Guide, October 2007. According to the report, **China** and **Malaysia** have even smaller swap markets (total daily volumes USD 100m and USD 25m respectively)



Need greater liquidity in capital markets

Total daily trading volumes for swaps – Euro, US, UK, Japan, Asia



* Includes other 11 Asian markets where Prudential invests (estimated).

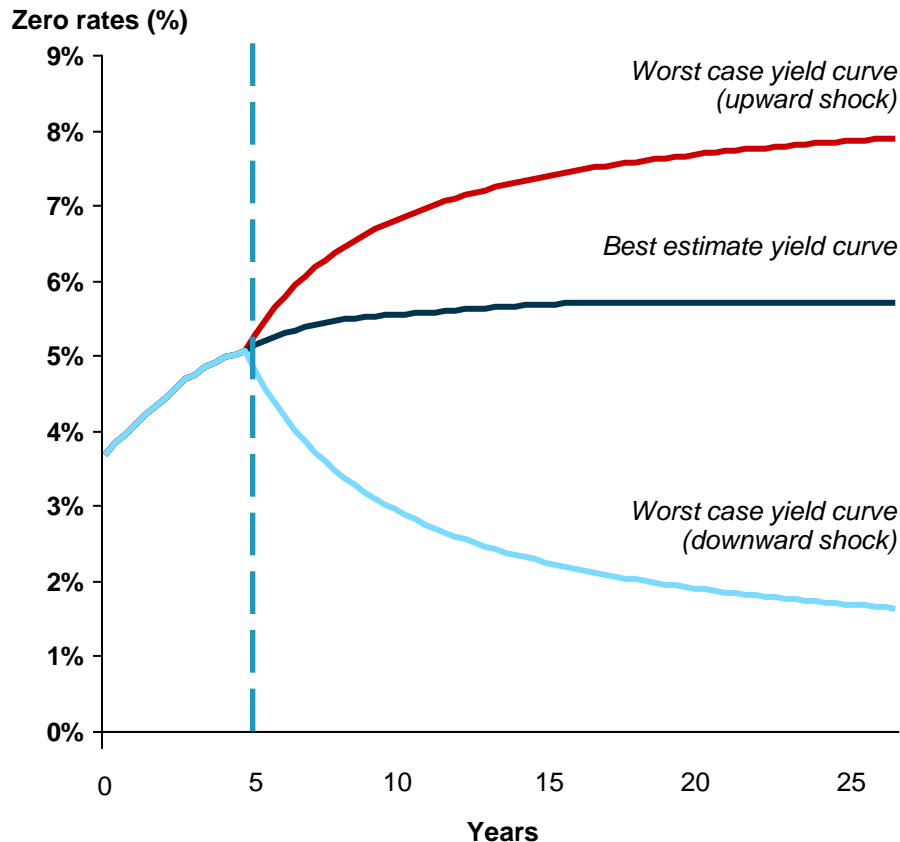
Source: JP Morgan Local Markets Guide, October 2007

Bank for International Settlements: Triennial Central Bank Survey of Foreign Exchange and Derivatives, April 2007



Significant VaR capital implications for non-developed capital markets

Shocked Yield Curves

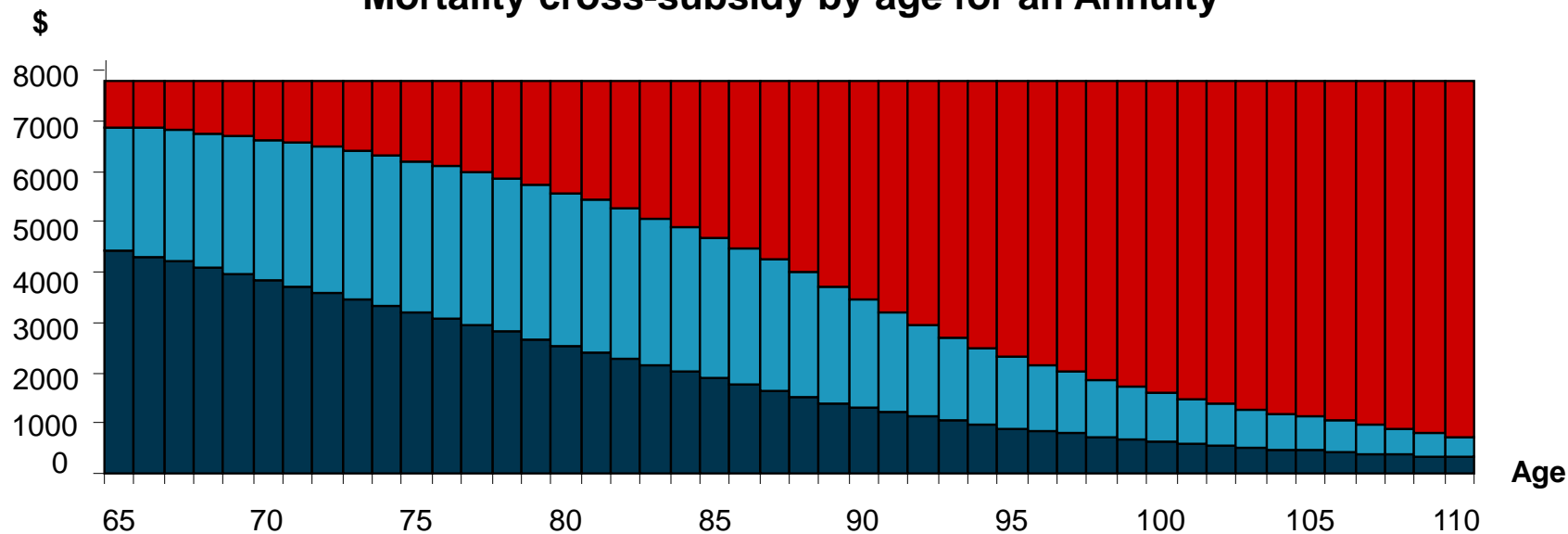


- With an incomplete yield curve, company is exposed to reinvestment risk after year 5
- Non-hedgeable VaR capital for incomplete capital markets determined by shocking the reinvestment assumptions after year 5 and recalculating the assets and liabilities on this basis
 - VaR capital is given as the difference between the best estimate and worst case
- The introduction of 10, 20 year etc instruments will reduce the reinvestment risk and therefore the non-hedgeable risk capital



Develop products addressing variation in mortality cross-subsidy

Mortality cross-subsidy by age for an Annuity



- Flexible retirement income account solutions giving income, investment and death benefit choice and flexibility
- Death benefit more valuable – so delay/phase full annuitisation

- (Compulsory) full annuitisation to secure guaranteed lifetime income
- Longevity risk absorbed by capital markets and insurers

- Further help with tail longevity risk from government

- Mortality cross-subsidy
- Capital (Single Premium)
- Growth less charges

Source: Prudential analysis using 100% PNMA00 medium cohort, 2007. Male aged 65 purchasing an annuity with no death benefit of \$7,773 per annum for \$100,000



Conclusion

Today's Retirement Time bomb

Framework for retirement provision and solvency

- Sbbbbbbbbbbbtick your head in the sand and hope for the best



Who bears the retirement risk?

- Corporations and governments



Impact on individuals

- Individuals delegate their retirement responsibility
- Open secret "My DB plans and/or social security won't pay for my retirement"

Our Vision... and how to make it work

- Transparent and objective approach to value, capital and risk
- Takes into account current state of capital markets but creates correct incentives for future development of such markets



- Individuals / insurers
- Purchase reliable security (longevity and income) at an appropriate price – compulsory and optional elements
- Governments can take extreme tail risk



- Enhances individual choice and responsibility towards risk and return
- Good Asset-Liability Management starts at home

MAKING EMPTY PROMISES WILL ULTIMATELY BE DETRIMENTAL TO SOCIAL BENEFIT

