2014 EAAC IN TAIPEI TAIWAN

18TH EAST ASIAN ACTUARIAL CONFERENCE

12-15 October 2014

Taipei International Convention Center in Taipei Taiwan

Drivers of Pension Reforms in Asia

The Changing Retirement Landscape in Asia

Increasing Longevity
Combined DB DC solution

Danny Quant, FIA

Principal & Consulting Actuary

Milliman Inc.

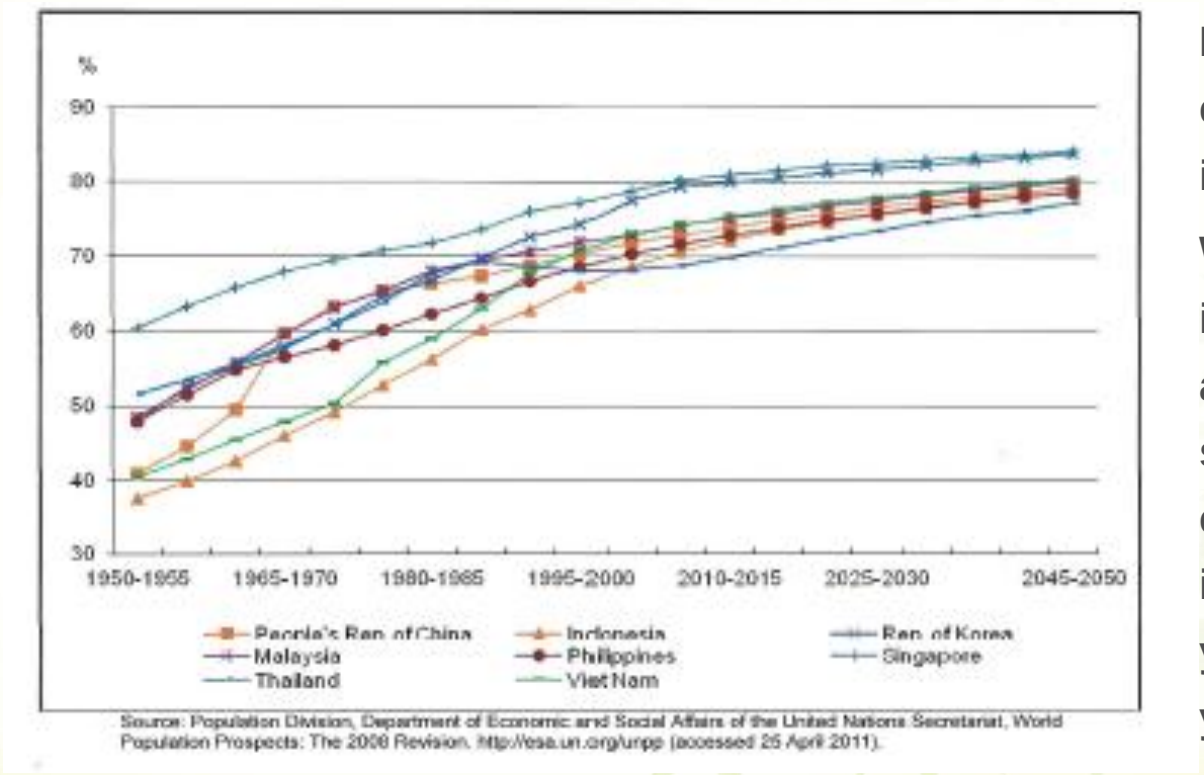
October 2014

EAAC

Agenda

- The facts: Increasing longevity
- Difficulties in funding DB promises
  - Pre retirement
  - Post retirement
- Short-comings of DC structures
  - Pre-retirement
  - Post retirement
- The best of both worlds

Life expectancy at birth

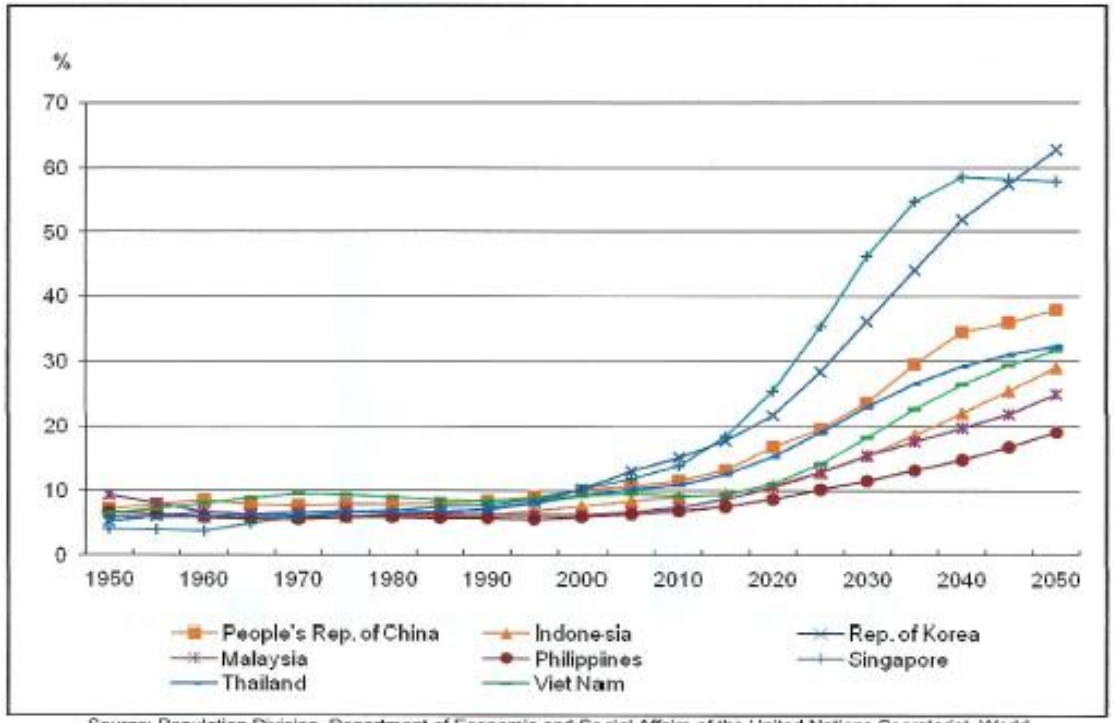


Source: Population Division, Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2008 Revision. http://esa.un.org/unpp (accessed 25 April 2011).

Life expectancy is expected to continue to improve

While much of the improvement has already occurred, it is still expected that life expectancy can improve by another 5 years in the next 40 years

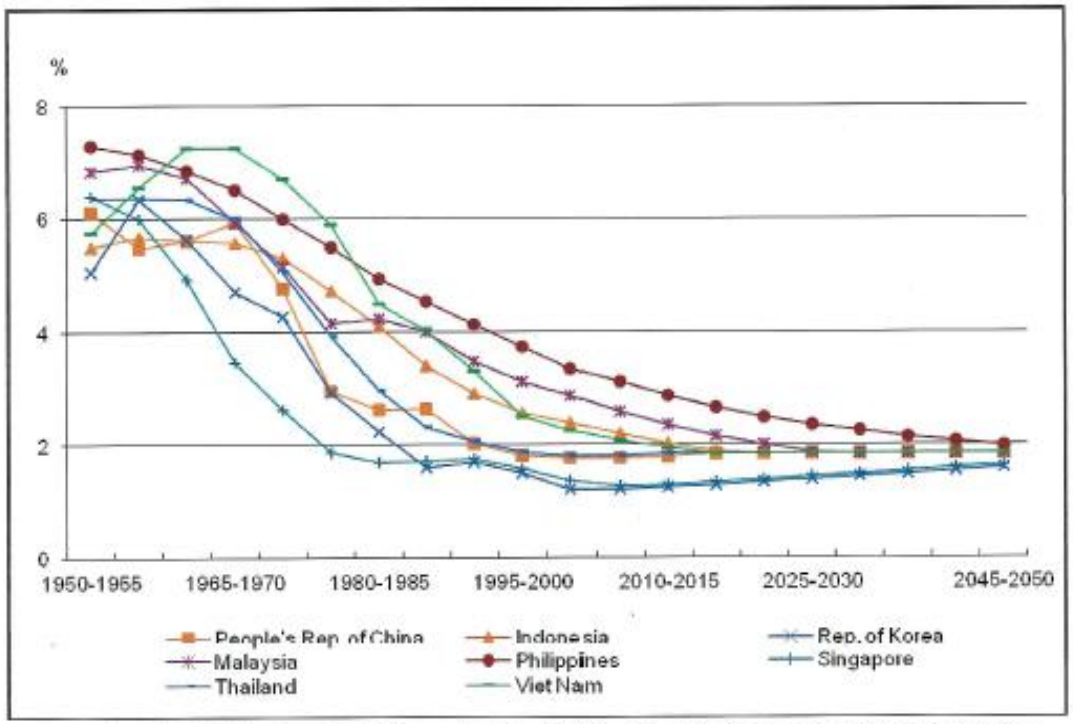
Ratio of population aged over 65 to population aged 15-64 - Asia



Source: Population Division, Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2008 Revision. http://esa.un.org/unpp (accessed 25 April 2011).

Everywhere there will be many more over aged 60 relying on the working population placing enormous strains on PAYG systems

Fertility rates



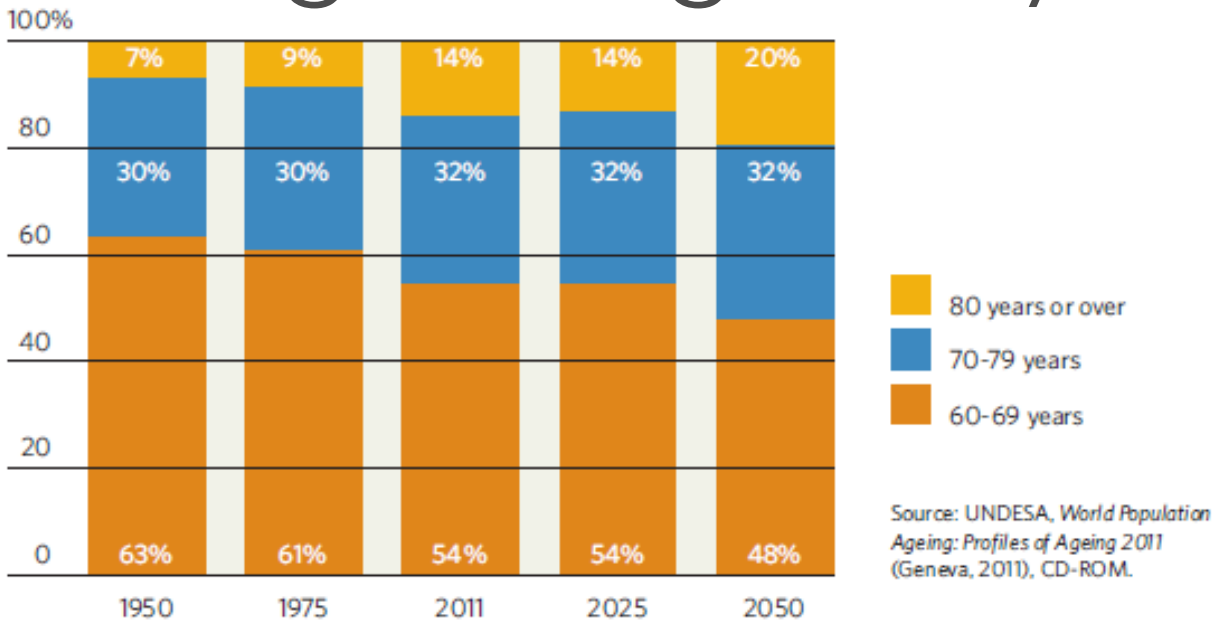
Source: Population Division, Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2008 Revision. http://esa.un.org/unpp (accessed 25 April 2011).

Medical improvements and safer working conditions help lengthen life

Alongside is a reduction in births per mother.

Often less than the ideal 2.1 replacement level

Distribution of population over age 60 - globally



- **The number of over 60's versus the working population will become a secondary issue**
- **The proportion of over 80's will be a huge toll**

The fundamental equation to solve retirement needs

Contributions *plus* **Investment Income**

equals

Benefits *plus* **Expenses**

Perspectives

- Defined benefit (final salary structures)

Contributions

equals

$\text{Benefits} + \text{Expenses}_{DB} - \text{Income}_{DB} + \text{Risk}(\sigma)$

- Defined contribution (accumulation structures)

Benefits

equals

$\text{Contributions} + \text{Income}_{DC} - \text{Expenses}_{DC} - \text{Risk}(\delta)$

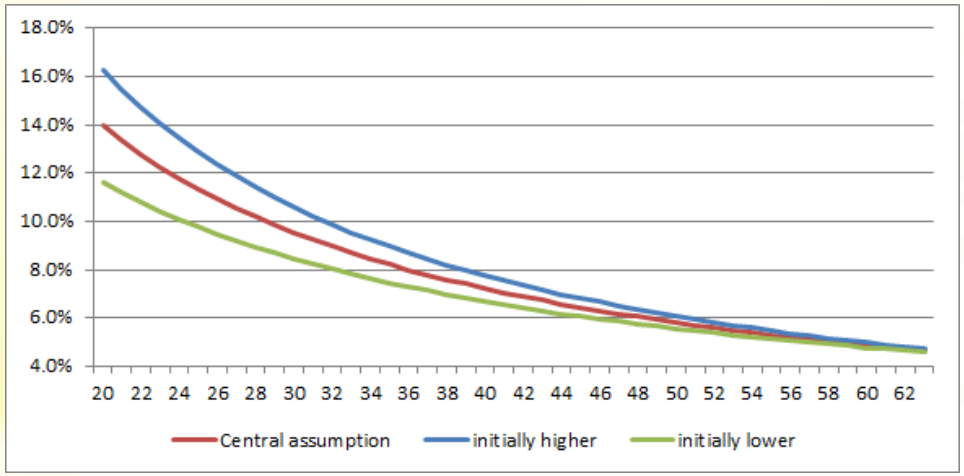
Major factors for the σ and the δ

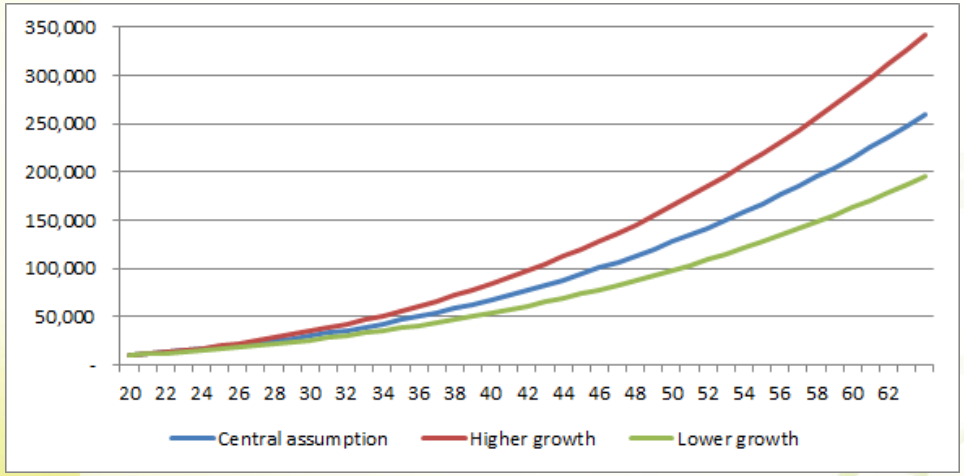
- **Income**
  - **Attitude to risk**
  - **Strategic asset allocation (market return: β)**
  - **Tactical asset allocation (manager returns over benchmarks: α)**
  - **Total expense ratio**
- **Expenses**
  - **Retail**
  - **Institutional**
  - **Economies of scale**
  - **Influence (related to other services within asset manager's group)**

Major factors for the σ and the δ

- **Salary inflation**
  - **Young v old**
  - **Juniors v seniors**
  - **Inflation + Promotional scales**
- **Mortality**
  - **Young v old**
  - **Gender**
  - **Occupation/industry**

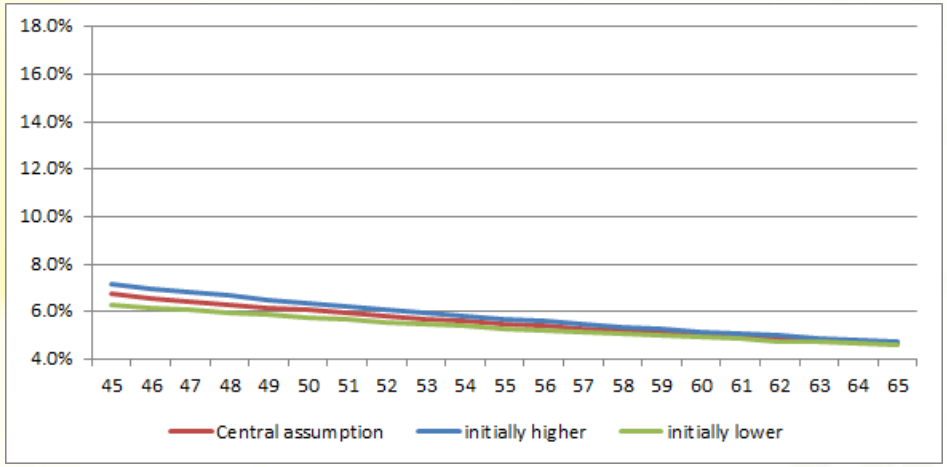
Salary growth is difficult to predict over long periods

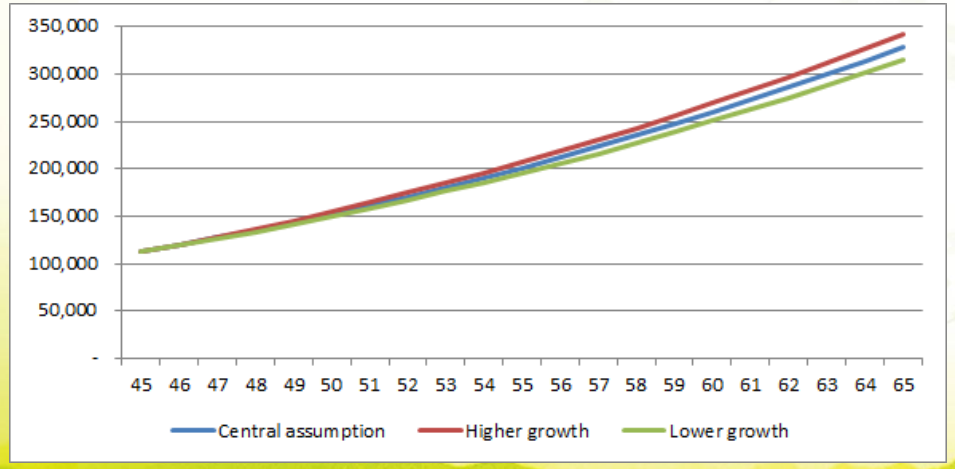




- Upper chart shows classic salary scales
- Starting with large increases during the accelerating promotion period.
- Initial growth depends on personal success. Perhaps +/- 2% p.a. each year at the start.
- Towards the end of the career increases are generally around inflation whatever grade you have reached.
- Lower chart shows range of salaries that would be achieved at retirement based on these salary scales.
- The final salary in this example could be 32% higher or 25% lower depending on the rate of acceleration early in the career.

From mid career until retirement salary growth is a little easier to predict

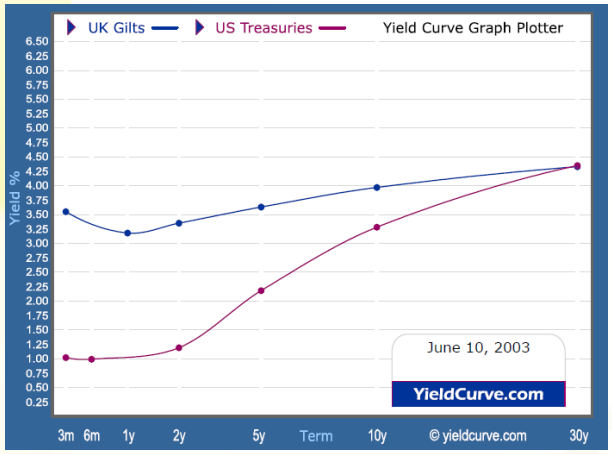


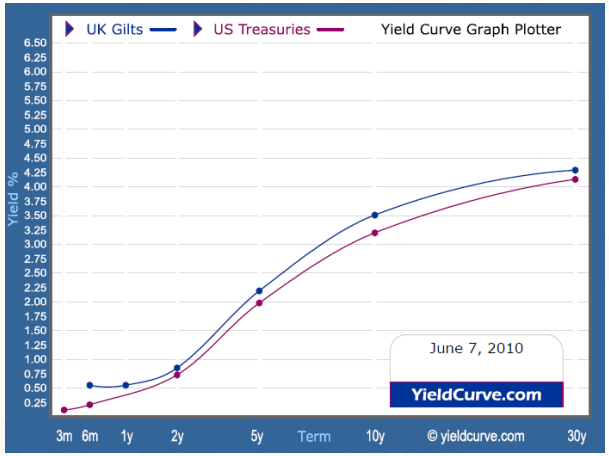


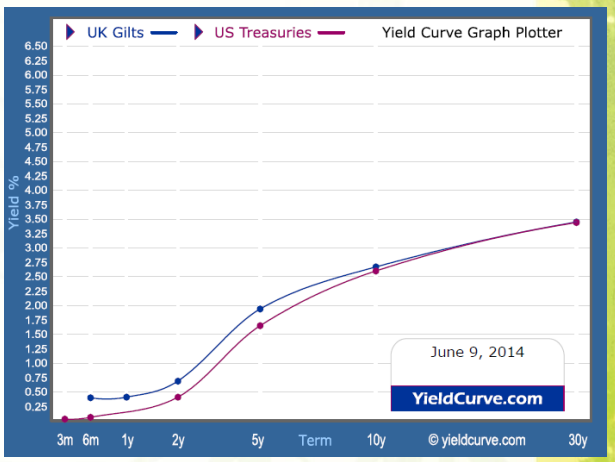
- Same vertical scales.
- The ranges of results are much narrower.
- The initial acceleration due to promotions and other advancements are already in the salary by mid career.
- From this point much of the growth is inflation driven and is constant at many levels for base salaries
- The difference in the level of salaries for the lower growth and upper growth ranges are both around 4% of the central assumption.
- This is convenient for planning the funding of final salary related benefits.

Interest rates – UK & USA

- **Levels have been historically low – UK v US Government bonds**



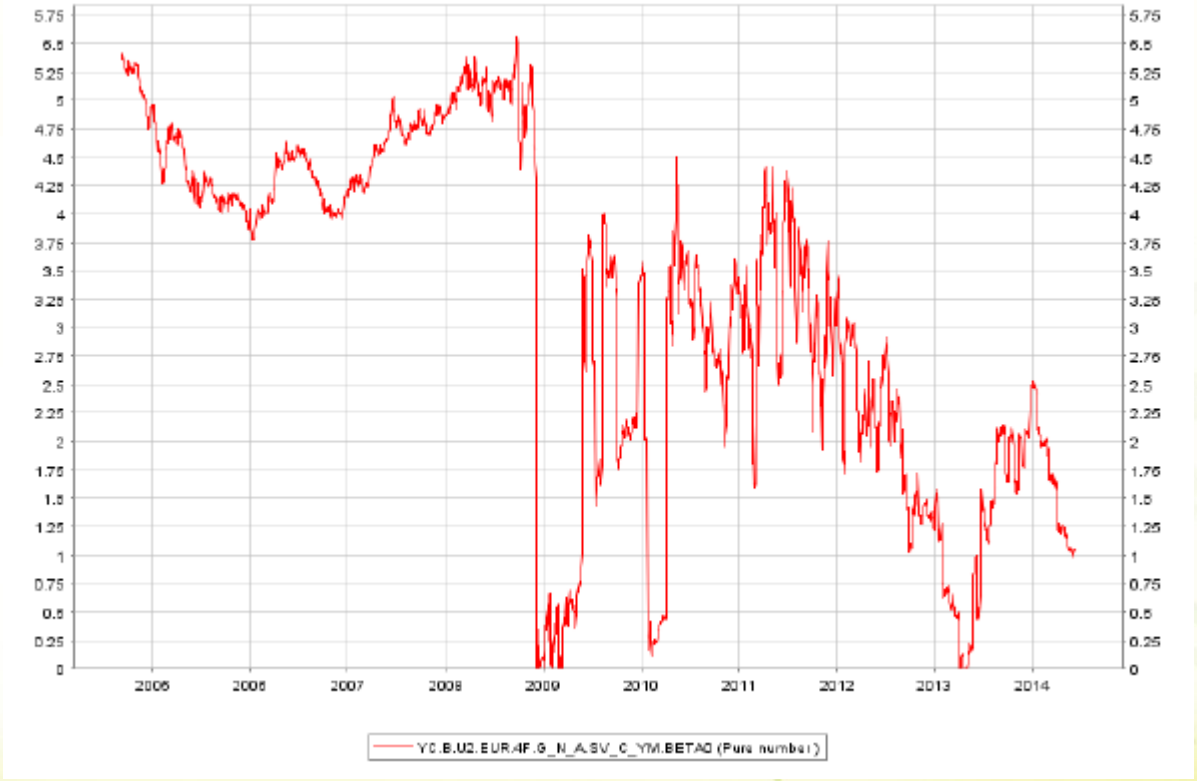




- **This has put enormous pressure on the annuity markets**
- **So much so that in the UK the Government are looking to enable retirees to take their DC pots in cash at retirement age rather than buy expensive annuities.**

Interest rates - Europe

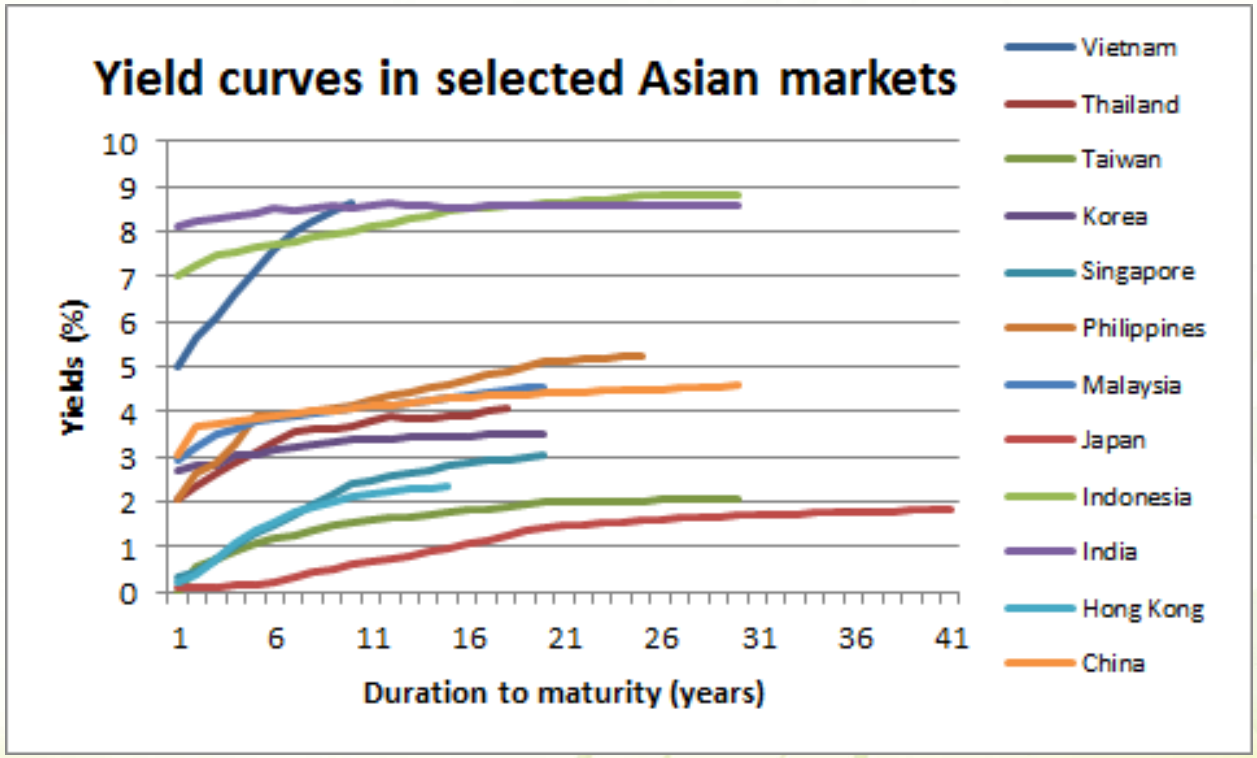
- **In Europe levels have been historically low or shockingly volatile**



http://www.ecb.europa.eu

Bond market - Asia

- **Tenures are too short for long term immunisation in some markets**
- **Rates are also very low in many markets**



http://www.investing.com/rates-bonds/asian-pacific-government-bonds

The impact of an error in mortality experience

Mortality experience - versus central assumptions*					
	Adjustment to central mortality assumptions	Expected age at death for female age:		Expected duration of annuity:	
		65	85	65	85
Central assumption	100%	84.4	91.0	19.4	6.0
Lighter mortality	90%	85.3	91.5	20.3	6.5
Heavier mortality	110%	83.7	90.6	18.7	5.6
Very light mortality	75%	86.7	92.5	21.7	7.5
Much heavier mortality	125%	82.8	90.1	17.8	5.1
Delta heavy/light		3.9	2.4	3.9	2.4
Delta relative to expected at age 65		4.6%	2.8%	20.2%	12.3%

* Based on 2000-2006 experience collected by 30 June 2007 from UK self-administered pension schemes, published in CMI Working papers 34 and 35, 2008.

- **Notice that the confidence in the cost of providing an annuity to an 85 year old is much higher than the cost of providing an annuity to a 65 year old**

Income and Expense

- **There are also risk elements in the income and expense components**
- **The expense component is controllable to some extent and should be small compared to the other components**
- **The investment risk remains and is for another session:**
  - **Note that it will be different for DB and DC plans**
  - **There are techniques to control the downside risk (although it may be at the cost of some of the upside)**

Suggestion for the future

- **Consider**
  - **A core DC benefit for all employees throughout their careers**
    - **Provides universal coverage and a predictable outlay for the employer**
    - **Driven by affordability, tax incentives and desired replacement ratios**
  - **A supplementary DB arrangement that is funded during the latter period of employment and is paid later in retirement**
    - **Higher confidence in the funding and payment phases**
    - **Driven by affordability and assumptions around the utilisation of DC pot**
  - **Retirees have a basic pension in their early retirement years without the worry of whether the defined contribution pot will last until they die**
  - **The defined benefit entitlement is security for those retirees who survive beyond their average life expectancy age.**

Implementation

- **Carry out demographic analysis to see**
  - **what is the sensible accumulation phase: from age 45?**
  - **what is the sensible late payment pension start age: at age 85?**
- **Convert existing defined benefit plans to DC plus Late Payment Pension Plans**
- **Establish DC plans in the knowledge that they are there for retirement but that the Late Payment Pension will become available at age 85**

- - END - -

Caveats

- The samples in this presentation are for illustration only and depend critically on the underlying assumptions
- The figures in this presentation are neither guarantees nor forecasts
- Milliman does not accept responsibility for investment decisions made based on the figures in this presentation
- No warranty is given for the accuracy or suitability of the figures in this presentation for any particular fund without appropriate due diligence carried out on the fund's circumstances

Danny L Quant, FIA
Principal and Consulting Actuary
Milliman Private Limited
#12-02 Keng Seck Tower
133 Cecil Street
069535 Singapore

+65 9658 7058

danny.quant@milliman.com