

Retirement solutions in Singapore

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Introduction

Three facts

- The size of the United Kingdom retirement income product market

GBP13bn

- The amount by which the crude mortality rate for Singapore males aged 65-69 has reduced since 1980

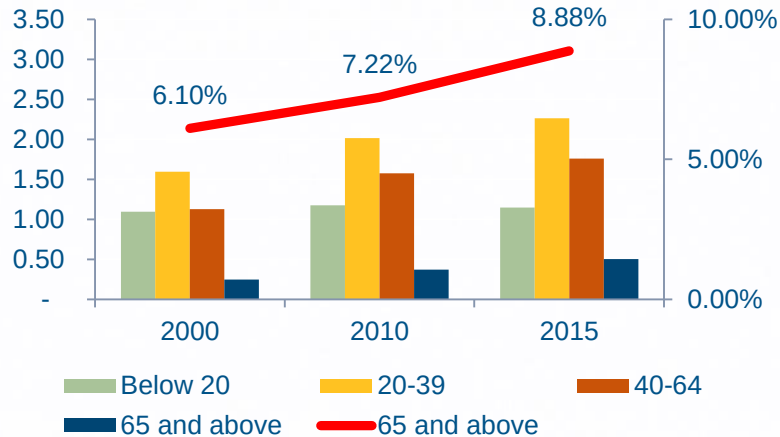
60%

- The number of Singaporeans who have no financial plan in place for retirement

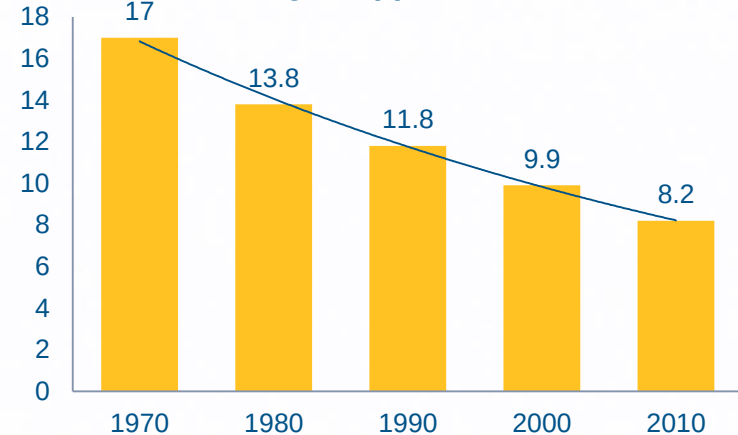
28%

Key Demographics

Population by Age Groups (millions)



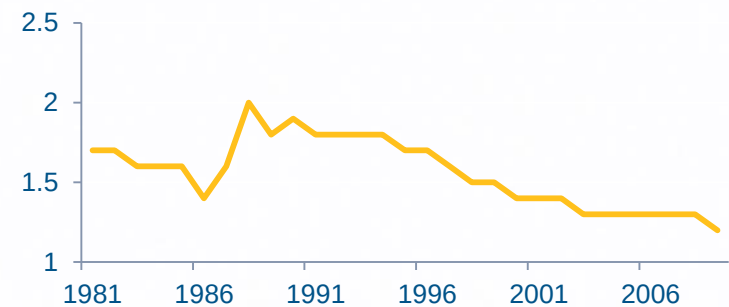
Old-Age Support Ratio



Life Expectancy at Age 65



Singapore Fertility Rates*

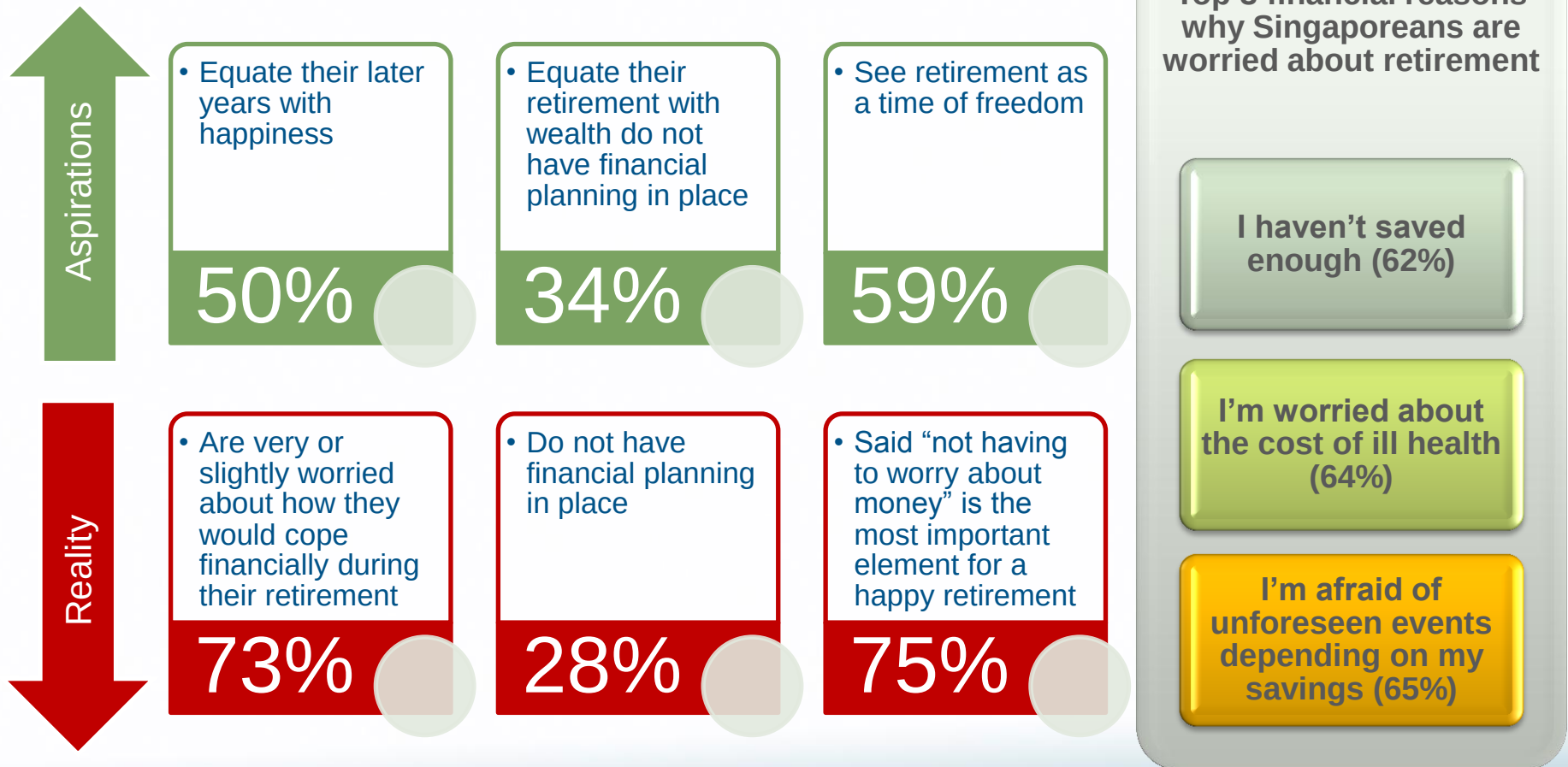


With low fertility and increasing life expectancy, Singapore's population is ageing quickly

Existing provision

Singaporeans and retirement

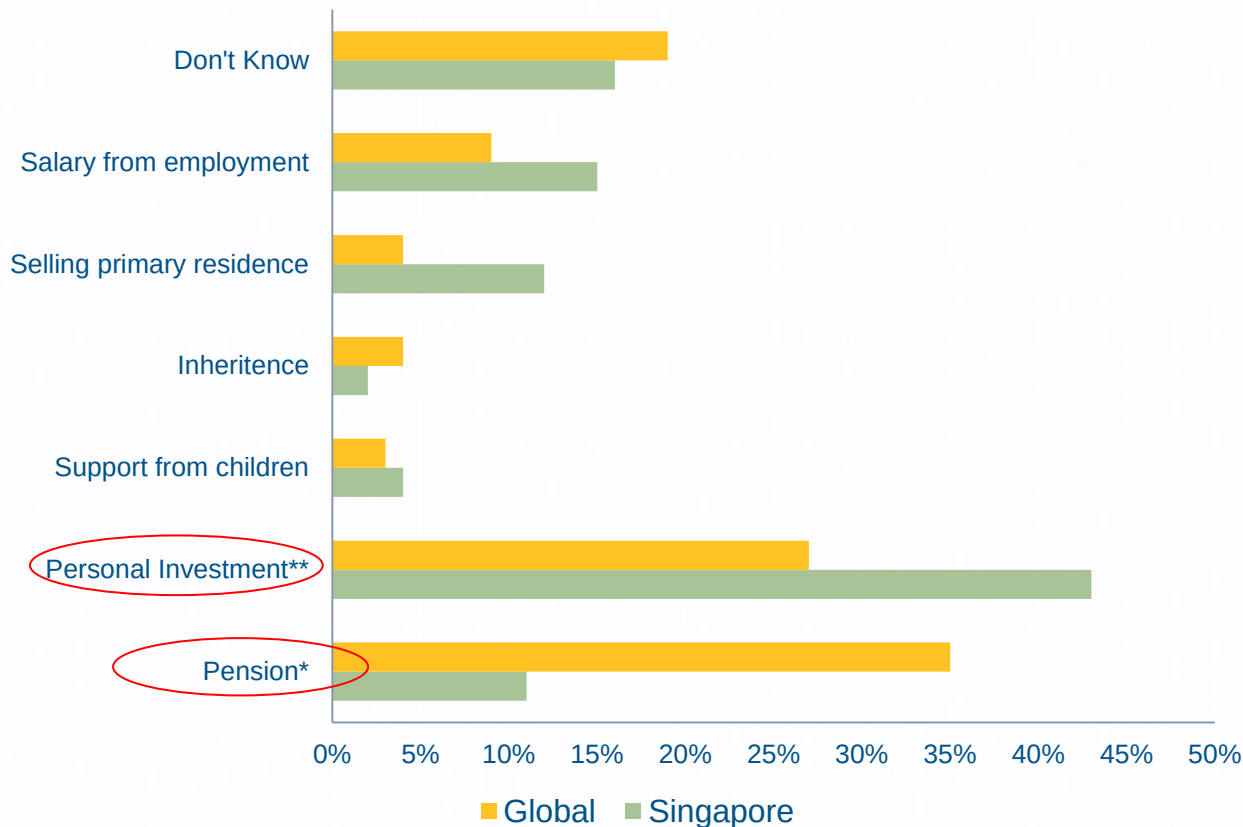
According to HSBC's The Future of Retirement report



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Singaporeans and retirement: Planned sources of income

Expected sources of retirement income

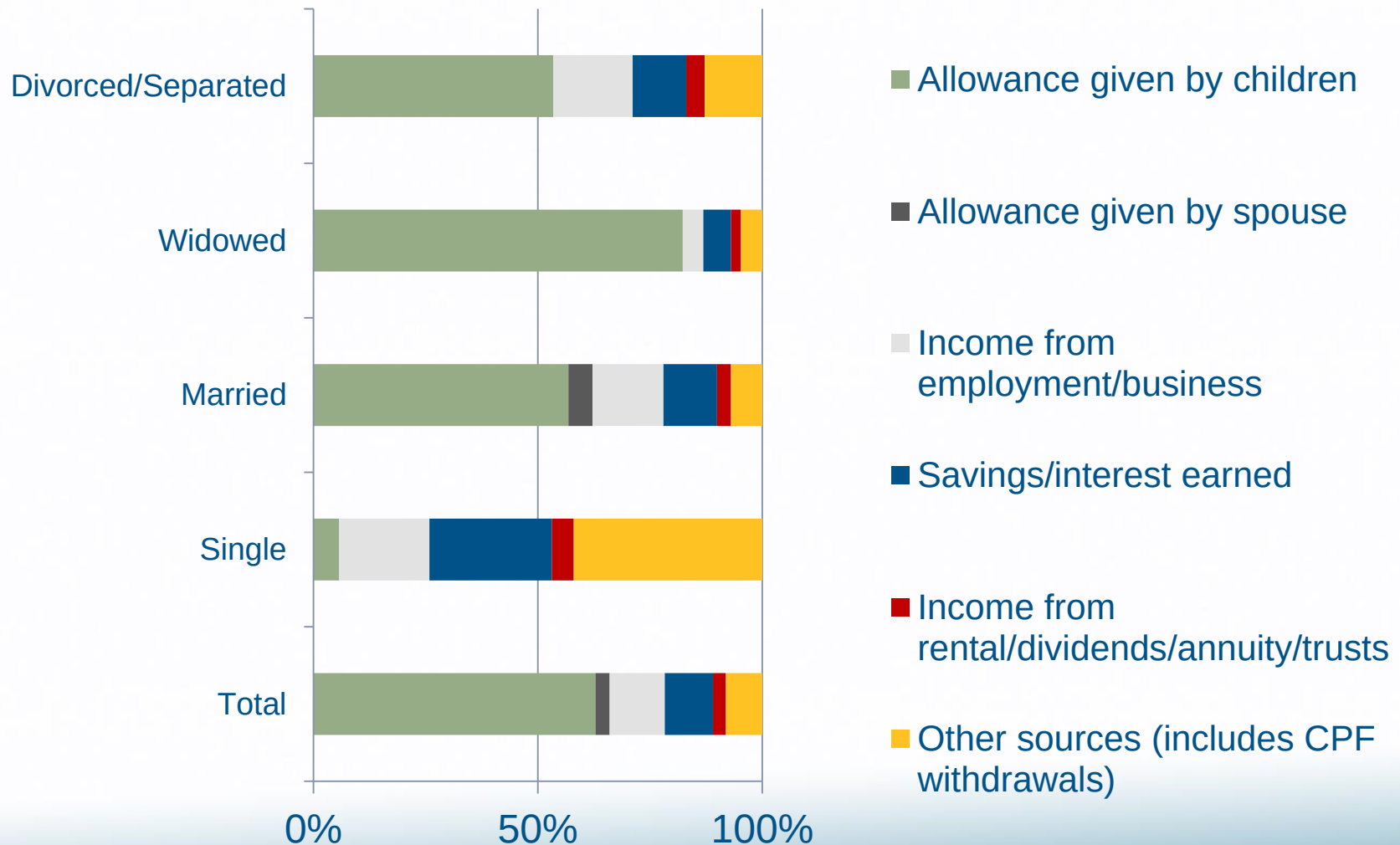


Compared to global experience, Singaporeans plan to depend more on personal investments rather than pensions for retirement

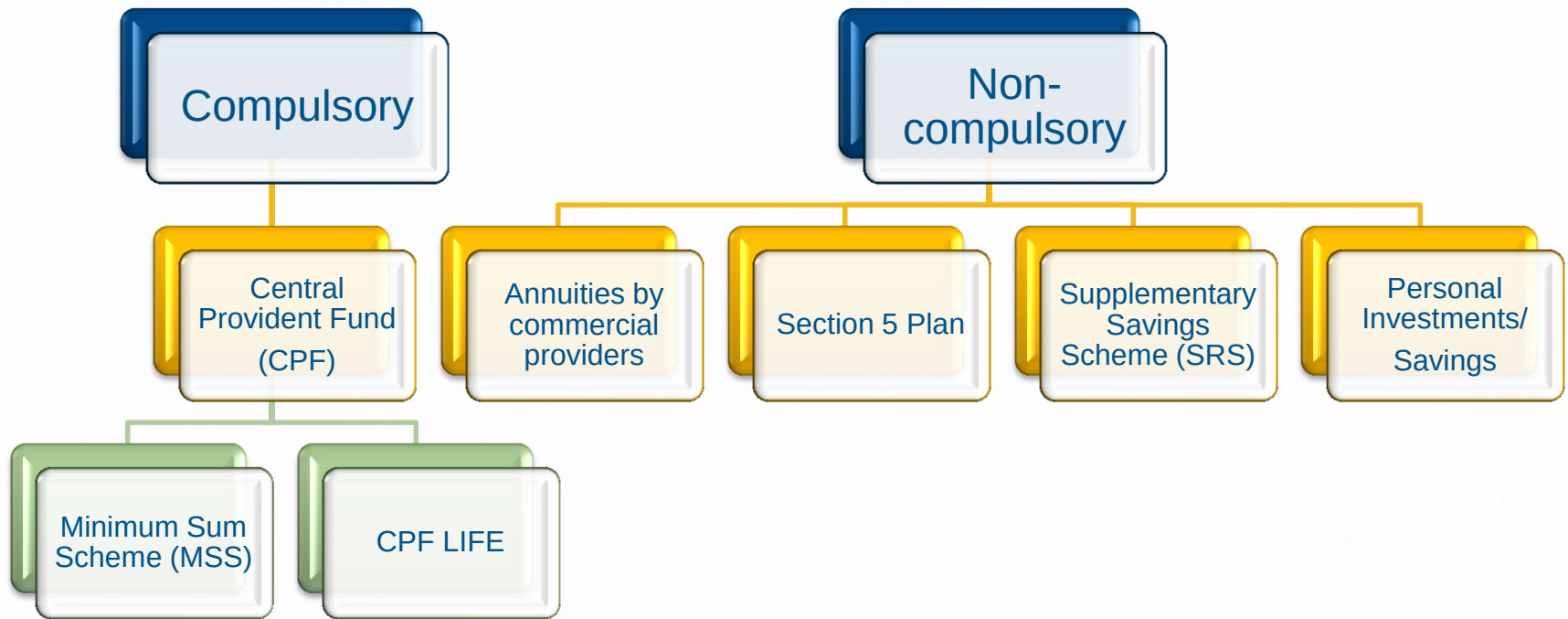
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*Pensions include state pensions, DB pension scheme, DC pension scheme.** Personal investment includes investment in stocks, rental income, selling investment property etc.

Singaporeans and retirement: Actual sources of income



Existing Provisions



Central Provident Fund (CPF)

The Concept

- National retirement program for all citizens and PR
- Based on a Defined Contribution (DC) system
- Mandatory contributions from employer and employee

The Underlying Funds

- 3 types of accounts –
 - **Ordinary** – Balance can be used for home purchases, insurance premiums, education etc
 - **Medisave** – Balance can be used for medical care expenses, catastrophe illness insurance etc
 - **Special** – Balance cannot be withdrawn until retirement
- All fund balances earn interest rate. Special account earns higher interest rate.

Central Provident Fund (CPF)

A look at a similar retirement program in Australia:

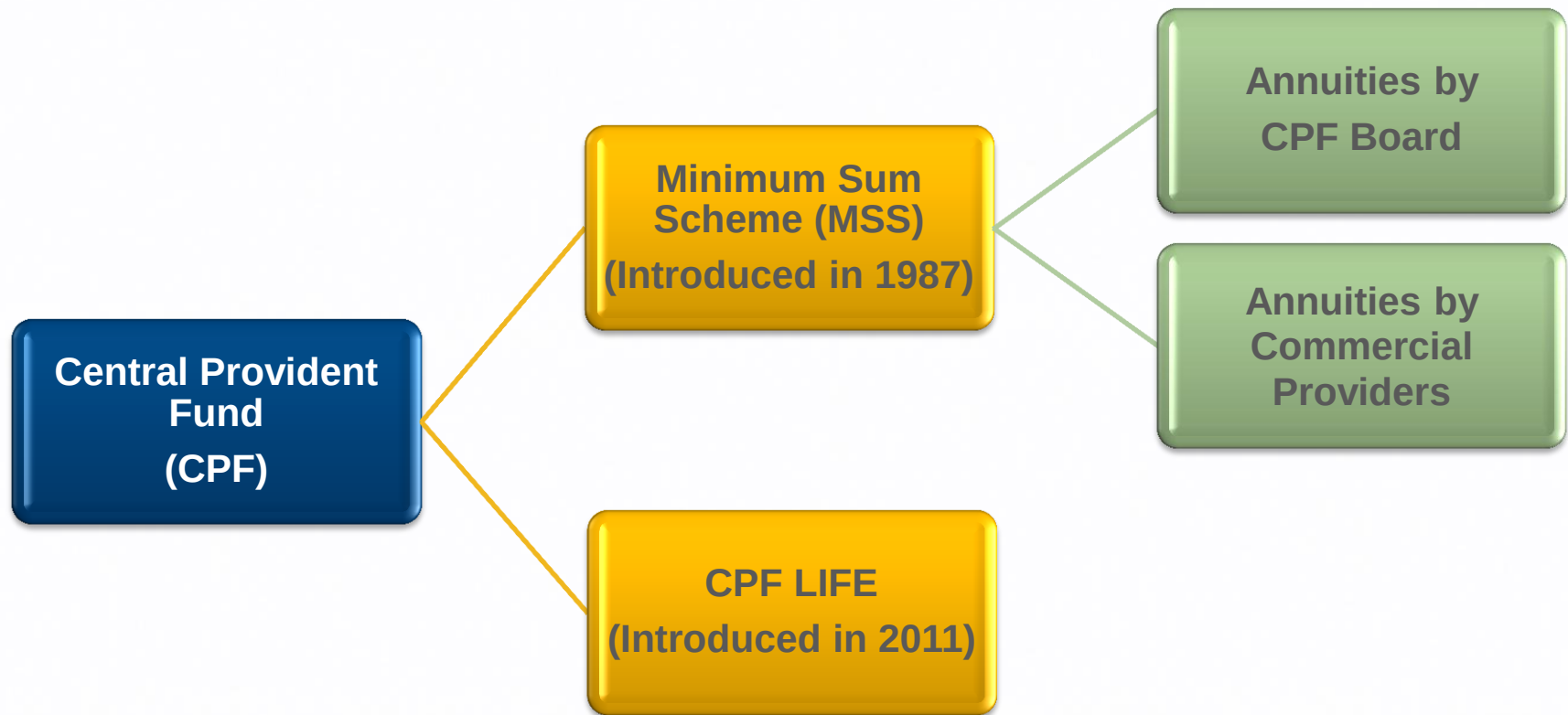
	Singapore's CPF	Australia's Superannuation
Contributions	<ul style="list-style-type: none"> ➤ Compulsory monthly contribution into the fund from working adults and their employers 	<ul style="list-style-type: none"> ➤ Compulsory contribution into the fund by employers
Access to funds	<ul style="list-style-type: none"> ➤ Before age 55, only for limited purposes including property investment, insurance premiums etc ➤ At age 55, a minimum sum has to be kept in the fund until drawdown age where annuitization/drawdown is allowed 	<ul style="list-style-type: none"> ➤ No access to fund before preservation age* except for special reasons (death, terminal illness etc) ➤ Not available for property purchases
Fund balance	<ul style="list-style-type: none"> ➤ A minimum sum is to be maintained at age 55. ➤ Property pledge is allowed to be use to make up the shortfall, if any 	<ul style="list-style-type: none"> ➤ No minimum sums ➤ No property pledge

Source: CPF Board, AustLII

*Preservation age refers to the age when the member becomes eligible for access to the benefits

Compulsory retirement provision

- What happens at age 55?



Option 1: CPF Minimum Sum Scheme (MSS)

Minimum Sum Scheme (MSS)

- A prescribed minimum amount of fund must be maintained in Special and Ordinary Accounts at age 55 and transferred to retirement account.
- This amount is calculated so that it will provide monthly payments for around 20 years starting from age 65.

Fund Shortfalls

- In the event that there is insufficient funds, members can
 - Top up the retirement account;
 - Pledge their properties previously bought using CPF monies (capped at 50%)

CPF Minimum Sum Scheme (MSS)

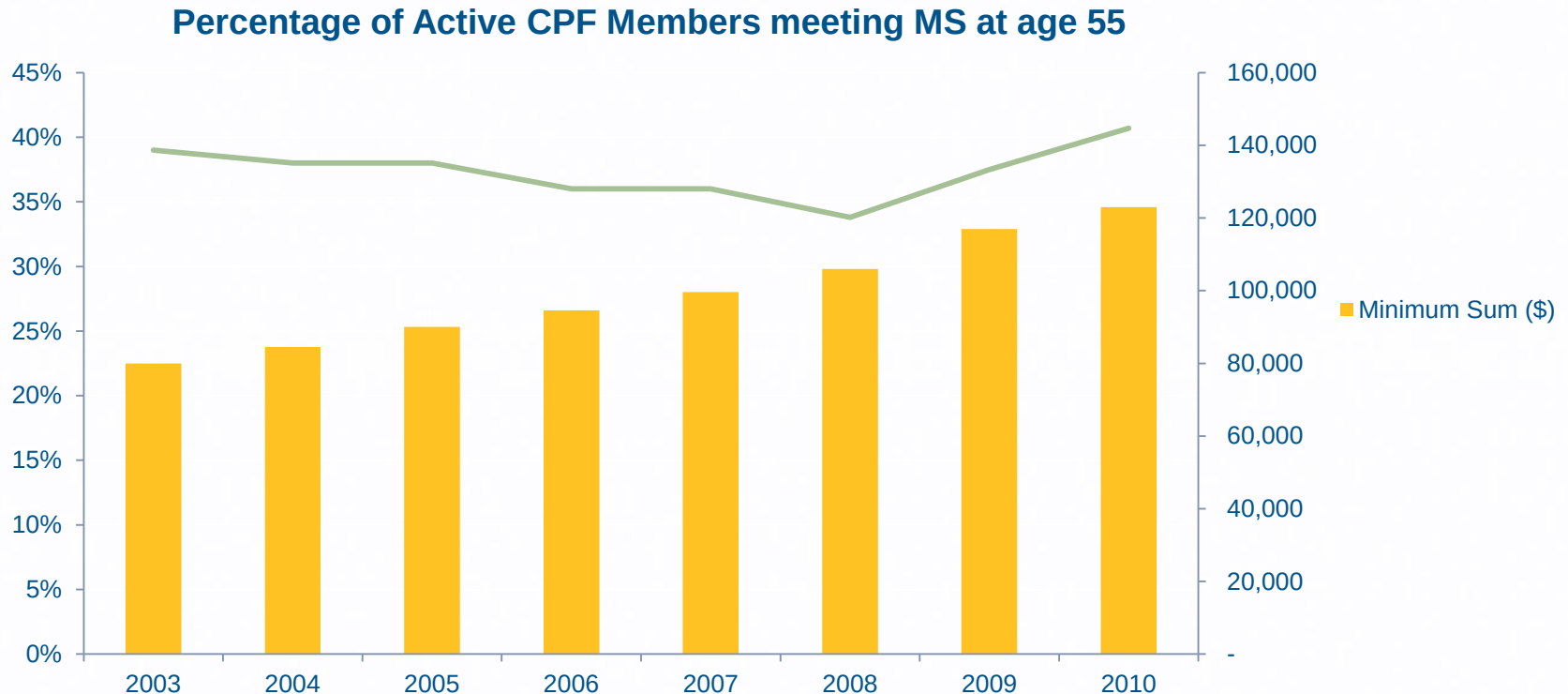
- Minimum Sum Amount

55 th Birthday on or after	Minimum Sum Amount
1 Jul 2003	80,000
1 Jul 2004	84,500
1 Jul 2005	90,000
1 Jul 2006	94,600
1 Jul 2007	99,600
1 Jul 2008	106,000
1 Jul 2009	117,000
1 Jul 2010	123,000
1 Jul 2011	131,000

Source: CPF Board

CPF Minimum Sum Scheme (MSS)

- Amount of members meeting MS at age 55



According to the CPF Board, only about 40% of the active members have managed to meet the minimum sum requirement at age 55.

CPF Minimum Sum Scheme (MSS)

Pros:

- ✓ Helps to ensure that there is stream of income available after retirement

Cons:

- ✗ Payments are only planned for approximately 20 years after age 65
- ✗ Other products might potentially be extremely expensive once the fund is exhausted
- ✗ Might get higher earning than 4% currently accrued elsewhere (in stocks etc)

Minimum Sum Scheme – Commercial provider

- The CPF also allows members to use their minimum sum in the RA account to purchase life annuities from commercial providers as well.
- Currently, NTUC Income is the only participating insurance company which members can opt for:

Companies	Immediate Annuity	Deferred Annuity
NTUC Income	➤ Guaranteed Life Annuity	➤ Guaranteed Life Annuity ➤ Classic Annuity

Option 2: CPF LIFE

The Concept

- Introduced to mitigate the increasing life expectancies of members.
- Monthly income payments starts at 65 for life
- Participation is compulsory for members born on or after 1958 if minimum fund balance is met (S\$40,000 at 55 and S\$65,000 at 65).
- Four options available (Life Income, Life Plus, Life Balance and Life Basic).

	Refundable Plans			Non-Refundable Plans
Monthly Payouts beginning	LIFE Plus	LIFE Balanced	LIFE Basic	LIFE Income
Remaining RA savings	N/A	From DDA until one month before turning age 80	From DDA until one month before turning age 90	N/A
Annuity	From DDA for life	From age 80 for life	From age 90 for life	From DDA for life
Premiums deducted	100%	30%	10%	100%

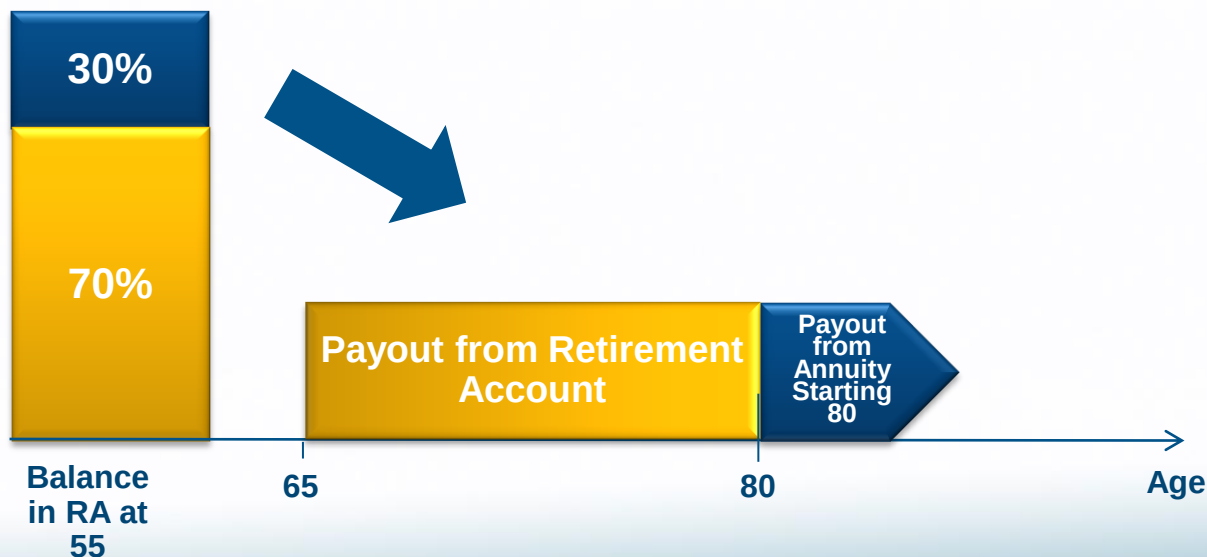
Source: CPF Board

* Property pledges are available for the Balanced and Basic plans, provided there is sufficient RA savings. They are not allowed for the Plus and Income Plans.

CPF LIFE

How it works

- The balance in the Retirement Accounts (a maximum amount equivalent to the prevailing Minimum Sum) will be applied to the LIFE Plan chosen. Based on the LIFE Plan chosen, an amount of premium will be deducted from the balance to purchase the life annuity and the remainder will be refunded to the CPF Member.
- Despite guaranteed for life, there is no minimum payment levels and they fluctuate according to the performance of the funds.



Example: LIFE Balanced Plan

In this plan, 30% of the balance in RA at 55 is deducted to pay the annuity premium with payments starting at age 80.

Source: CPF Board

CPF LIFE

Pros:

- ✓ Payments guaranteed for life
- ✓ Various plans catering to different target groups

Cons:

- ✗ Once a plan is chosen, it cannot be changed
- ✗ No guaranteed minimum payouts
- ✗ Not Inflation-protected

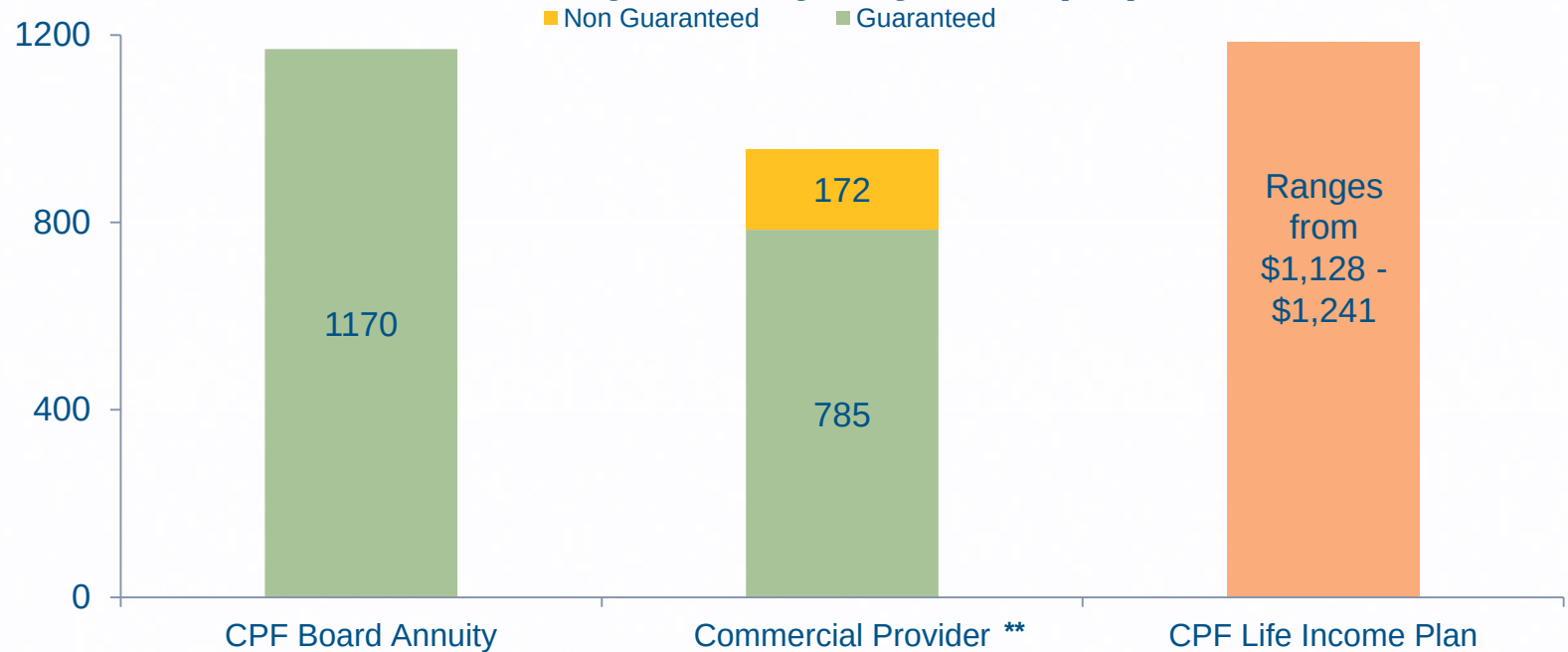
MSS vs CPF LIFE

	MSS	CPF LIFE
Eligibility	<ul style="list-style-type: none"> ➤ All members who has met the minimum sum amount are eligible 	<ul style="list-style-type: none"> ➤ Will be made compulsory to all members who have adequate account balances
Monthly Payments	<ul style="list-style-type: none"> ➤ Planned for around 20 years after drawdown age 	<ul style="list-style-type: none"> ➤ Guaranteed for life ➤ No guaranteed/minimum amounts, payments fluctuate according to the fund performance
Plans	<ul style="list-style-type: none"> ➤ Limited flexibility in choosing different drawdown/annuitization levels 	<ul style="list-style-type: none"> ➤ 4 types of plans to cater to different people with different needs ➤ However, once chosen, the plan cannot be changed thereafter
Insufficiencies of funds	<ul style="list-style-type: none"> ➤ Property pledge is allowed to make up the shortfall (up to 50%) of the minimum sum 	<ul style="list-style-type: none"> ➤ Property pledge is only allowed for the Balanced and Basic Plans

Comparison of benefits

Assuming RA balance at age 55 of \$131,000:

Monthly Annuity Payouts* (S\$)



Duration:

**Around
20 Years**

For Life

For Life

CPF Life monthly payments improved slightly and are guaranteed for life. But is it enough for the retirees?

Source: CPF Board

*For Males Only **Rates are taken from NTUC Income's Life Annuity

Global product offerings

Four common retirement solutions

Lifetime Annuities

Income Drawdown

Equity Release

Variable Annuities w/ GMxB

Lifetime annuities

Level Payment Lifetime Annuities

- Same amount of income is paid every year until a person dies
- Higher initial payouts compared to the escalating lifetime annuities
- Income is not inflation protected

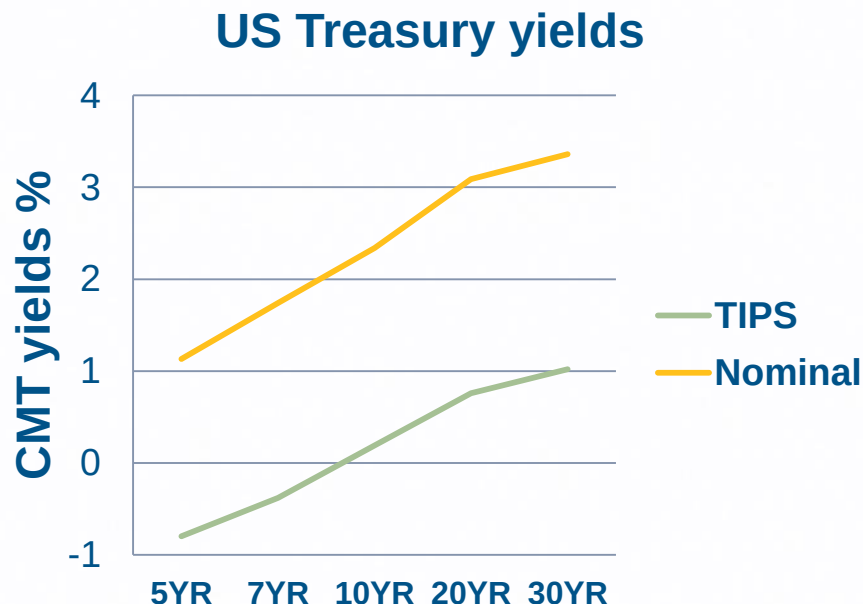
Fixed-Rate Escalating Annuities

- Payouts are increased each year based on a fixed percentage eg. 4% annual
- Income level might or might not be sufficient to cover the rising prices

CPI-Indexed Escalating Annuities

- Payouts are adjusted according to the movement of the Consumer Price Index (CPI)
- Guarantees a constant purchasing power throughout the whole life
- Initial payouts are lower than level payment

Lifetime annuities: Can we sell these products?



**Illustrative annual annuity rates for males with initial investment of SGD100,000
(Basis not suitable for pricing or reserving!)**

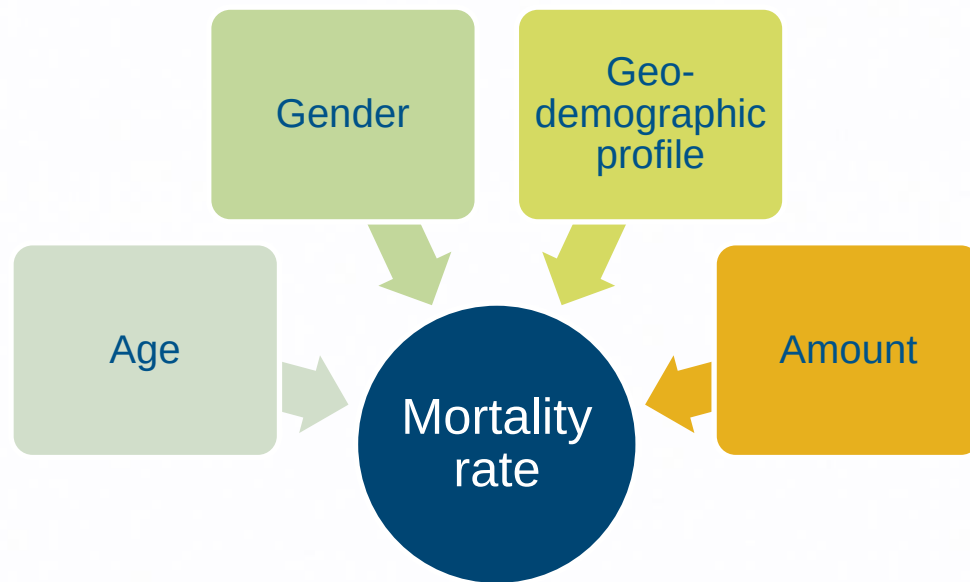
Age	1% yield	3% yield
65	6,190	7,579
70	7,776	9,219
75	10,209	11,746

Source: US Department of Treasury close 28 October 2011 prices

Mortality differentials (1)

- Baseline mortality models based on age and gender can be adjusted to allow providers to more accurately price for the expected mortality rates if they have adequate underlying data

$$\begin{aligned}\mu_x &= \alpha + \beta \left(\frac{x - u}{v} \right) && \text{Age law} \\ &+ \sum_i \text{indicator}_i \cdot \gamma_i && \text{Indicators} \\ &+ \delta(t - k) && \text{Trend component}\end{aligned}$$

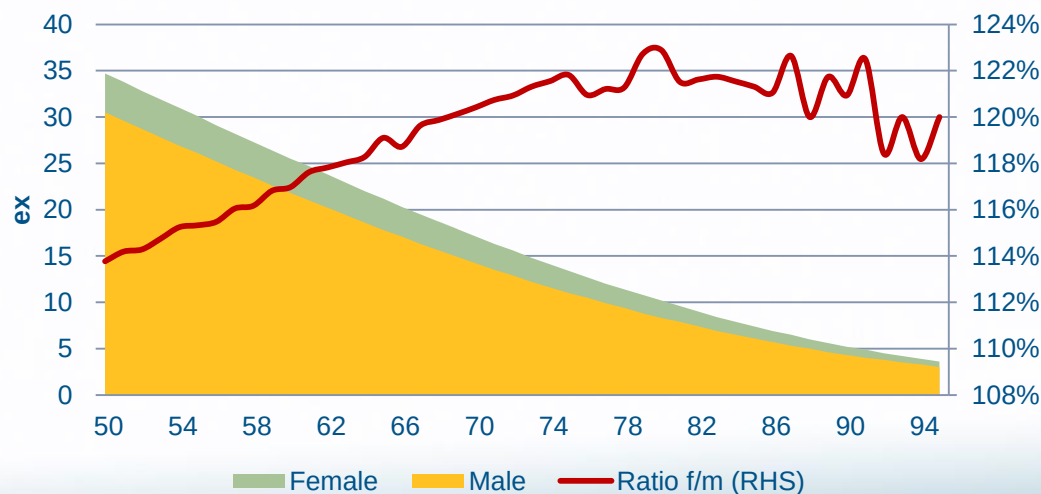


- Where will we get the data from in Singapore?

Mortality differentials (2)

- There are alternative risk factors that are increasingly common also such as enhanced annuities for impaired lives?
- And let's not forget unisex annuities

**Singapore expectation of life
(complete life table 2009)**

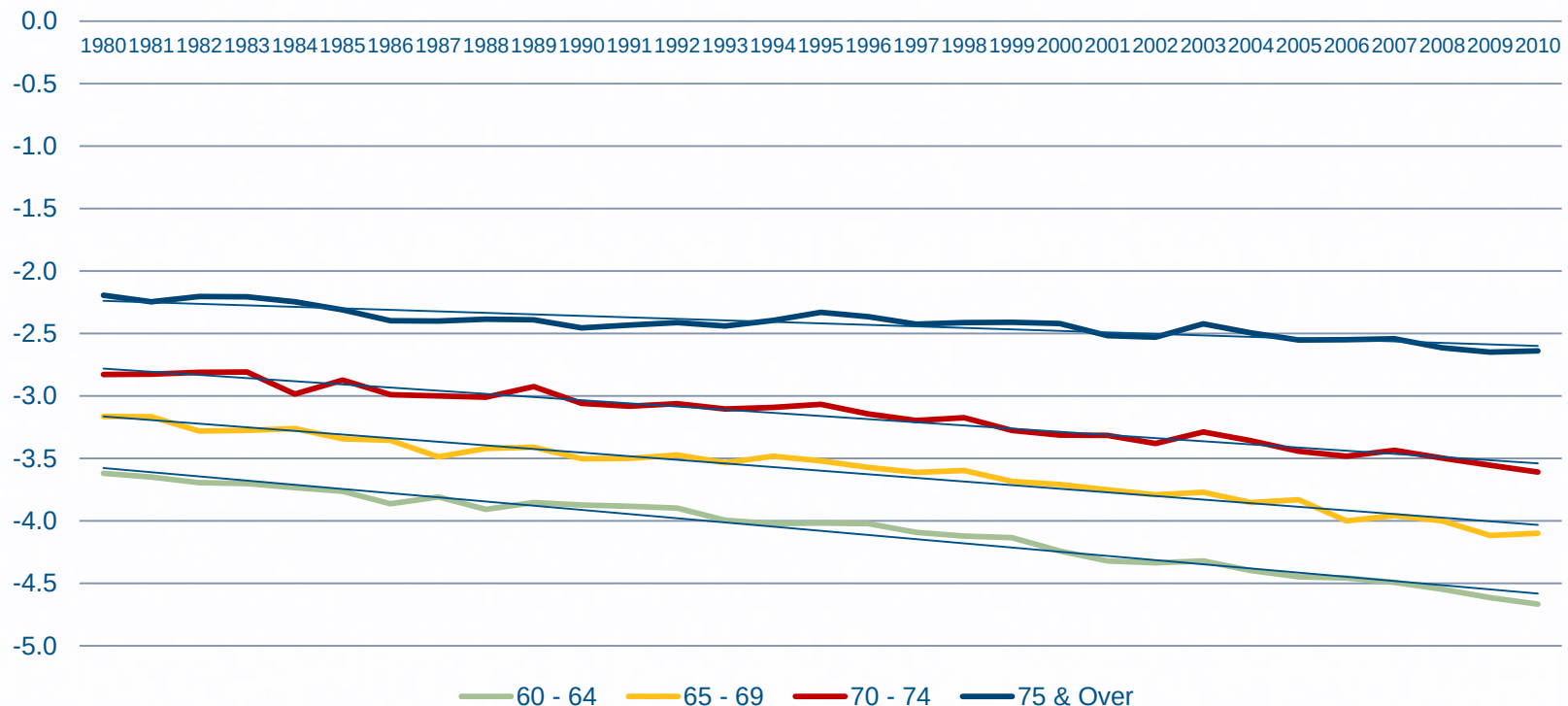


**“European Court of
Justice gender ban is
disappointing news for
UK insurance
customers says the
ABI”**

*“For annuities: men approaching retirement could see an eight per cent reduction in annuity rates while rates for women approaching retirement could rise by six per cent.”
(Source: ABI)*

Lifetime annuities: Should we sell these products?

Singapore log male mortality rates 1980 to present



Source: Singapore Department of Statistics

Income drawdown

Definition

- Allows the investor to draw an income from the pension fund at a regular period while keeping the remainder invested in stocks/bonds rather than buying an annuity
- Also known as unsecured pension

Pros

- Can withdraw any amount desired within the allowable range
- The pension value remaining in the fund will continue to be invested
- Can delay purchasing annuity until the rates become higher

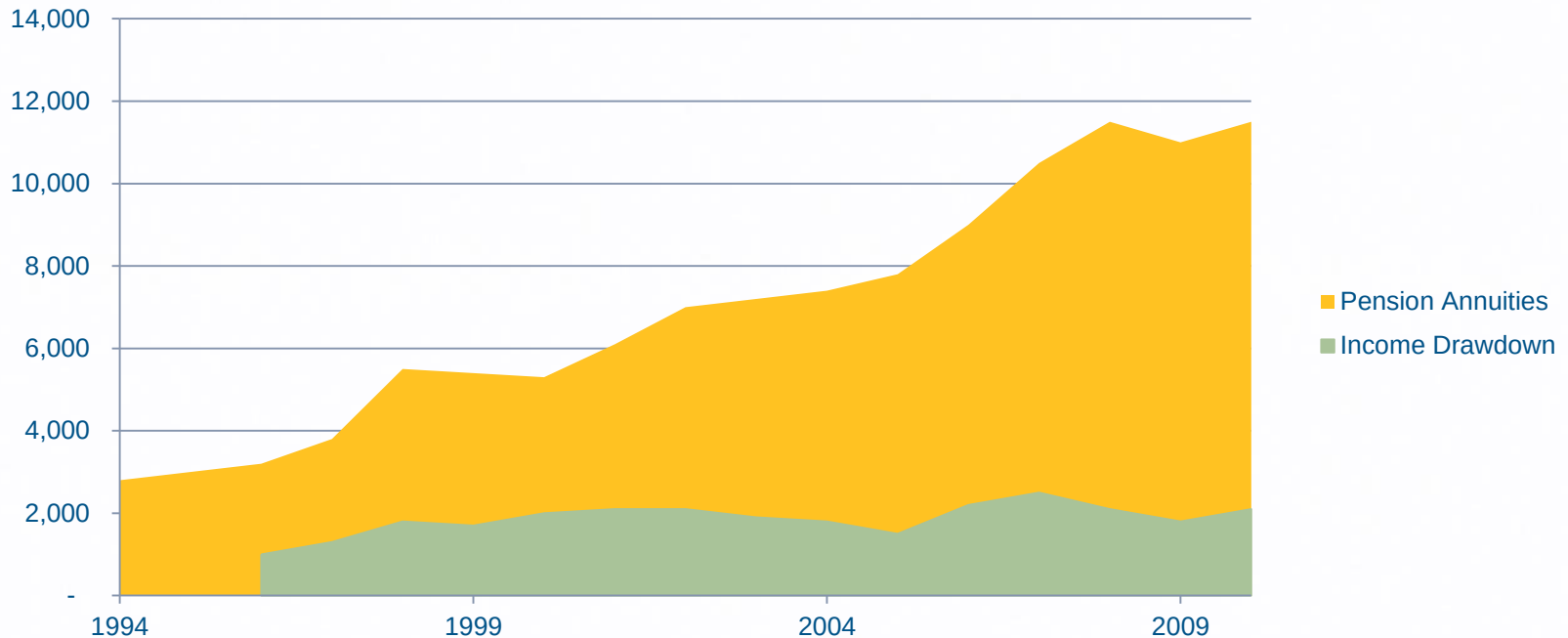
Cons

- Annuity rates might not improve in the future/immediate future
- Resulting fund balance might not be enough due to excessive withdrawal or low investment returns

UK Statistics:

Lifetime annuities, income drawdown

Growth in UK Annuity NB Sales (£ millions)

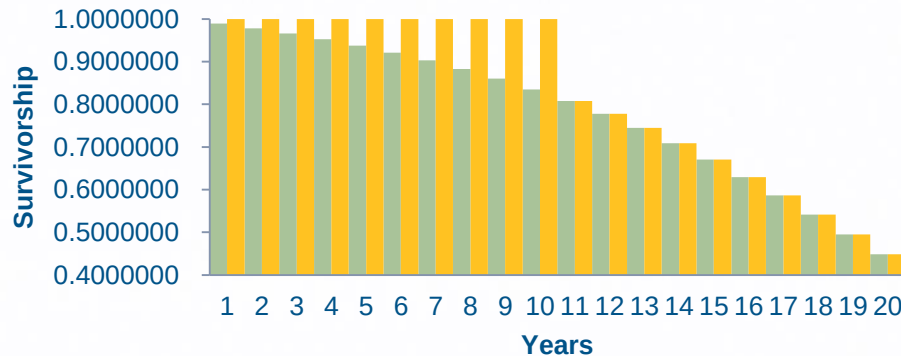


The fixed lifetime annuity market in the UK, which has the largest annuities market in the world, partly due to the regulation that requires a retiree to annuitise 75% of their pension wealth at retirement.

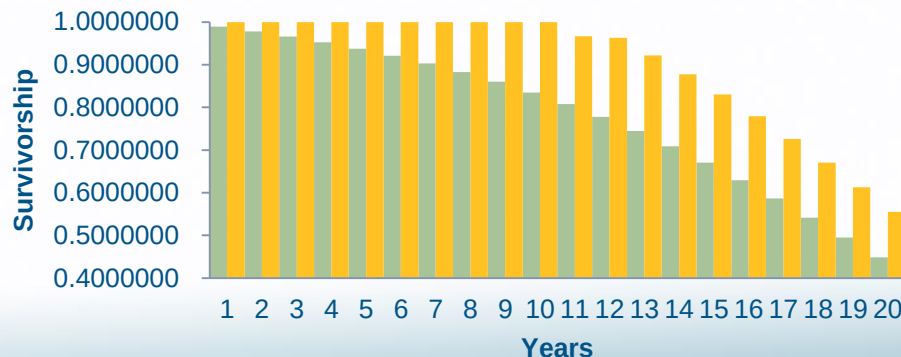
Source: Association of British Insurers

Income drawdown: Mortality drag

Loss of mortality cross-subsidy (10 year guarantee)



Loss of mortality cross-subsidy (10 year deferral)



Illustrative drag on yield for 65 year old male

Age	Additional yield
10 year guarantee	0.50%
10 year deferral	1.4%

Variable Annuities with Minimum Guarantees

Definition

- A form of annuities whose fund values are determined based on the performance of equity/stocks/bonds portfolio of the policyholder's choice
- Due to its volatility, most variable annuities (VA) are tagged with minimum guaranteed benefits such as GMDB, GMIB, GMAB, GMWB and GLWB.
- Provides the upside potential of higher earnings which then leads to higher income payments during retirement while being protected by the floor via the guaranteed benefit amounts.

Pros

- A large variety of choice of funds available
- Minimum guarantees provides protection from downside impact of markets
- Tax incentive available in some markets

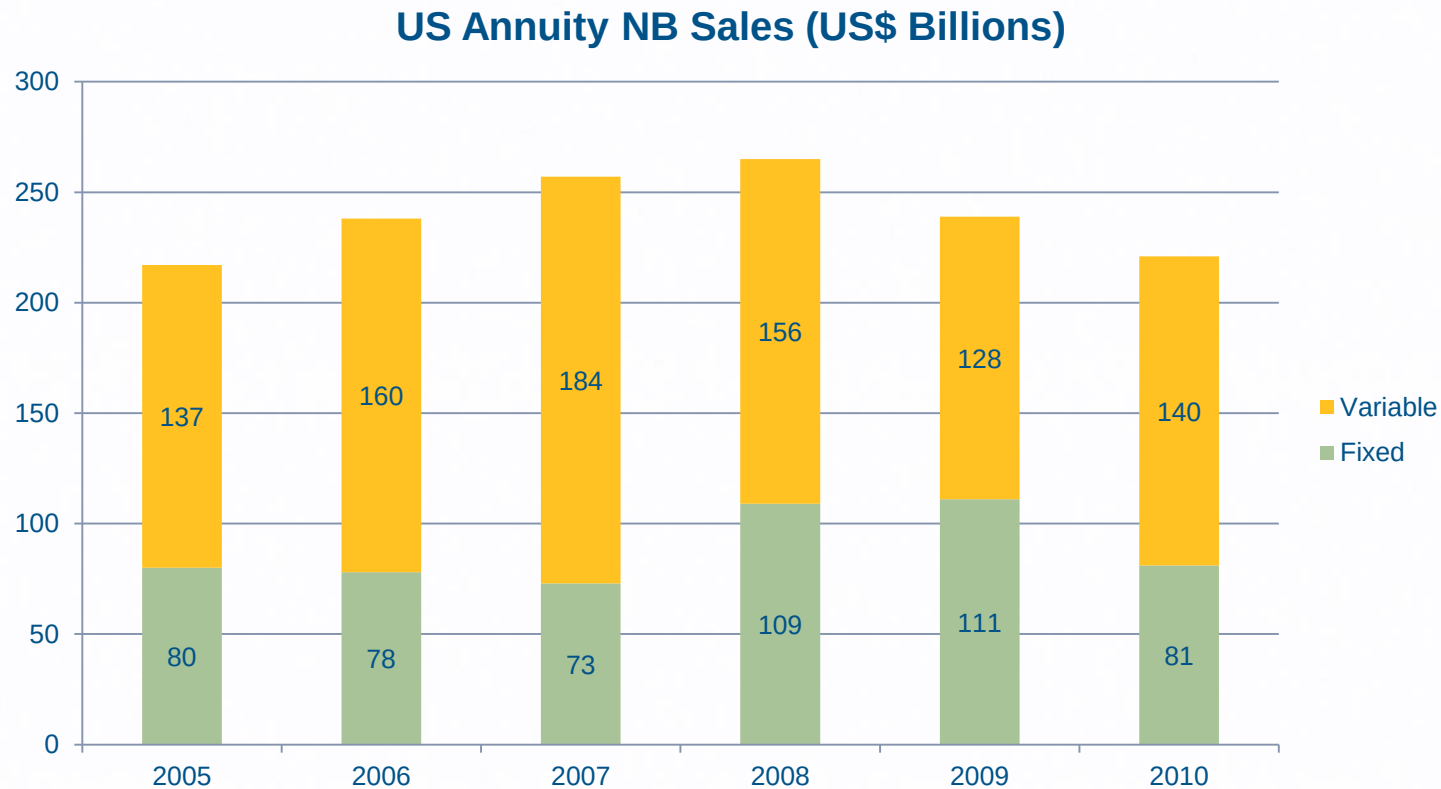
Cons

- With the variety of features also comes the fees and charges incurred
- Often tagged with steep surrender charges

*GMDB: Guaranteed Minimum Death Benefits, GMIB: Guaranteed Minimum Income Benefits, GMAB: Guaranteed Minimum Accumulation Benefits, GMWB: Guaranteed Minimum Withdrawal Benefits, GLWB: Guaranteed Living Withdrawal Benefits

US Statistics

- Variable Annuities with Minimum Guarantees



In the US market, we saw a shift away from the variable annuities to the fixed annuities market during GFC as people are more concerned about getting more stable income during the volatile economy. Variable annuities gained back some popularity in 2010.

Source: U.S. Individual Annuities Sales Survey, LIMRA

Equity Release

Definition: Retaining the use of one's house but using the value of the house to fund for a steady stream of income or get a cash lump sum after retirement

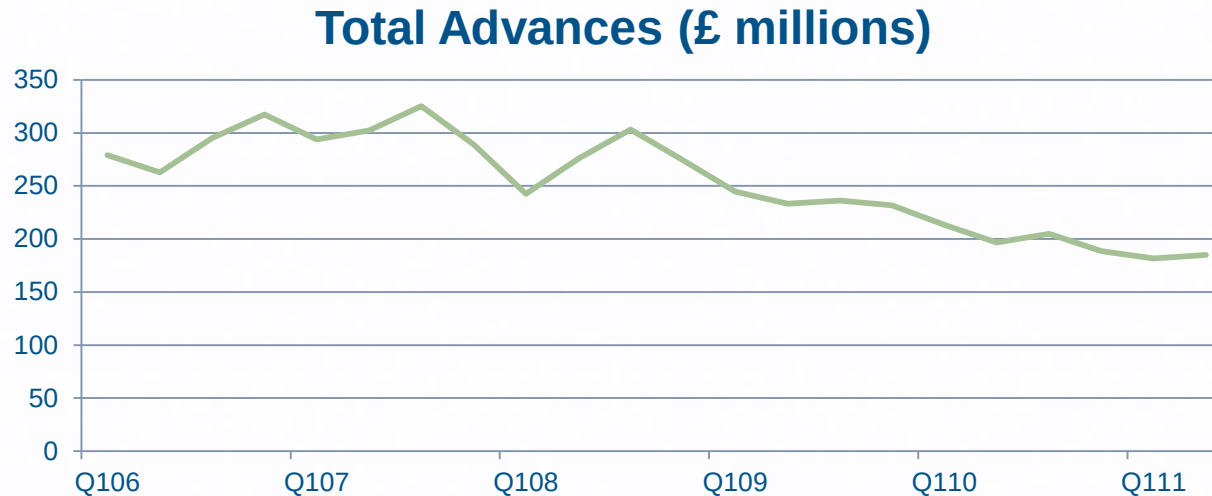
Home reversion

- House is sold to third party provider for a lump sum/ stream of income. Individual however retains the rights to stay in the house until death or admitting into long-term residential care.
- Equity release provider owns the house but cannot sell the house before that.
- This is not a loan, no interest/repayment

Lifetime Mortgage

- Loan is secured on individual's home. Loan is repaid by selling property when individual dies or moves into long-term residential care.
- Individual retains ownership of home.
- Types of products -
 - Roll up mortgages: No monthly repayments made during lifetime
 - Drawdown Mortgages: Similar to Roll-up but one is allowed to draw down the cash at any time, on which interest is charged
 - Interest only mortgages: Monthly repayments are paid each month covering the interest

UK Statistics - Equity Release



Equity Release Schemes have always been popular in the UK market, affected slightly recently by the volatile housing market.

Main providers in the market are Standard Life, Stonehaven, Bridgewater, LV= etc

“...many of those who are using equity release are drawing higher amounts than before – due in part to the use of enhanced products and increased confidence in the housing market”

Andrea Rozario, Director General of Safe Home Income Plans (SHIP)

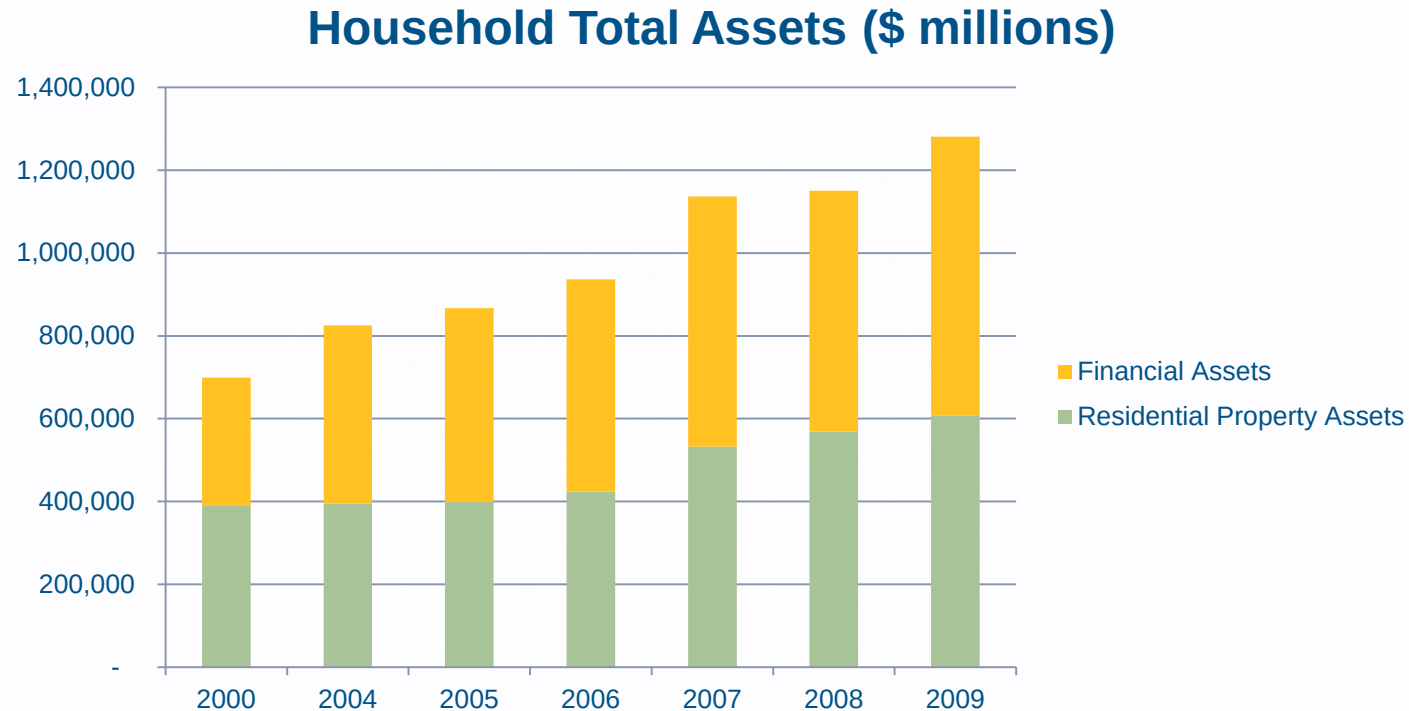
Historical experience



- The products have been offered by two major providers in Singapore:
 - NTUC Income offered reverse mortgages from 1994
 - OCBC Bank introduced reverse mortgages in 2006
- Sales processes were sensitive to the reputational risks associated with the sales process:
 - *Extensive measures have also been put in place by OCBC Bank to make certain that senior citizens clearly understand what the reverse mortgage entails before they sign up. These measures include thorough interviews with senior bank officers to assess if the scheme is suitable for them. In addition, **their next-of-kin will have to be present during the entire process** to ensure that the applicant's decision is made in consultation with his or her family members.*
Source: OCBC website
- Both products are understood to have met only modest success, possibly not helped by a celebrated case of litigation involving NTUC Income

Case Study: NNEG for no equity release

Is there a market for equity release in Singapore?



Almost half of the household assets are in the form of residential properties, both public and private housing.

Can NNEG be a possible solution?

No Negative Equity Guarantee (NNEG)

- Generally applied to roll-up mortgage.
- A No Negative Equity Guarantee (NNEG) prevents the amount of outstanding debt from going higher than the future value of the property.
- This further ensures that no debt will be passed on to the beneficiaries or that individual will have to be evacuated if house price falls below mortgage outstanding value.
- NNEG risks could come from
 - Longevity
 - House Prices Appreciation
 - Interest Rate levels

Pricing an NNEG (1)

Important reference: On Pricing and Hedging the No-Negative-Equity-Guarantee in Equity Release Mechanisms (Johnny Siu-Hang Li, Mary R. Hardy and Ken Seng Tan)

Impact of NNEG is similar to an European Put Option

Example:

Property value at 0 = S_0

Loan in advance = X

Interest Rate = i

Loan outstanding at future time t = $Y = Xe^{it}$

Property value at time t = ST

At time T ,

If $ST > Y$, Payoff = 0;

If $ST < Y$, Payoff = $Y - ST$

Value of Payoff = $\text{MAX}(Y - ST, 0)$

Payoff is similar to european put option with strike price Y and written on an underlying asset with time-zero value S_0 .

Pricing an NNEG (2)

Some key differences with standard European Put Options

Property market is infrequently traded

Time to maturity is random

House price returns are highly auto-correlated, with significant effects of leverage and heteroscedasticity

Pricing an NNEG (3)

- Li, Hardy and Tan examined UK data and concluded that an ARMA(1,3)-EGARCH(1,1) model best explained the data
- Geometric Brownian Motion formula can be used to give quick approximation to the value, however
- Example using GBM:
 - Male aged 65 borrowing 20% of estimated value of house
 - Interest rate 3.6%, fixed mortgage rate 5.6%, rental yield 2.6%, real estate volatility 10%
 - NNEG cost is 8.0% of the advanced loan

Summary

Challenges and opportunities

- The size of the United Kingdom retirement income product market

GBP13bn

- The amount by which the crude mortality rate for Singapore males aged 65-69 has reduced since 1980

60%

- The number of Singaporeans who have no financial plan in place for retirement

28%

- Singapore represents a large opportunity for the retirement solutions market, but there are challenges to overcome

Q&A



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