



WORLD BANK GROUP

Payout Options for Developing Countries

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Pension Core Course

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All outcomes – from coverage, adequacy and sustainability to efficiency and security are affected by the payout phase. You cannot evaluate a **pension** system unless you look at payouts

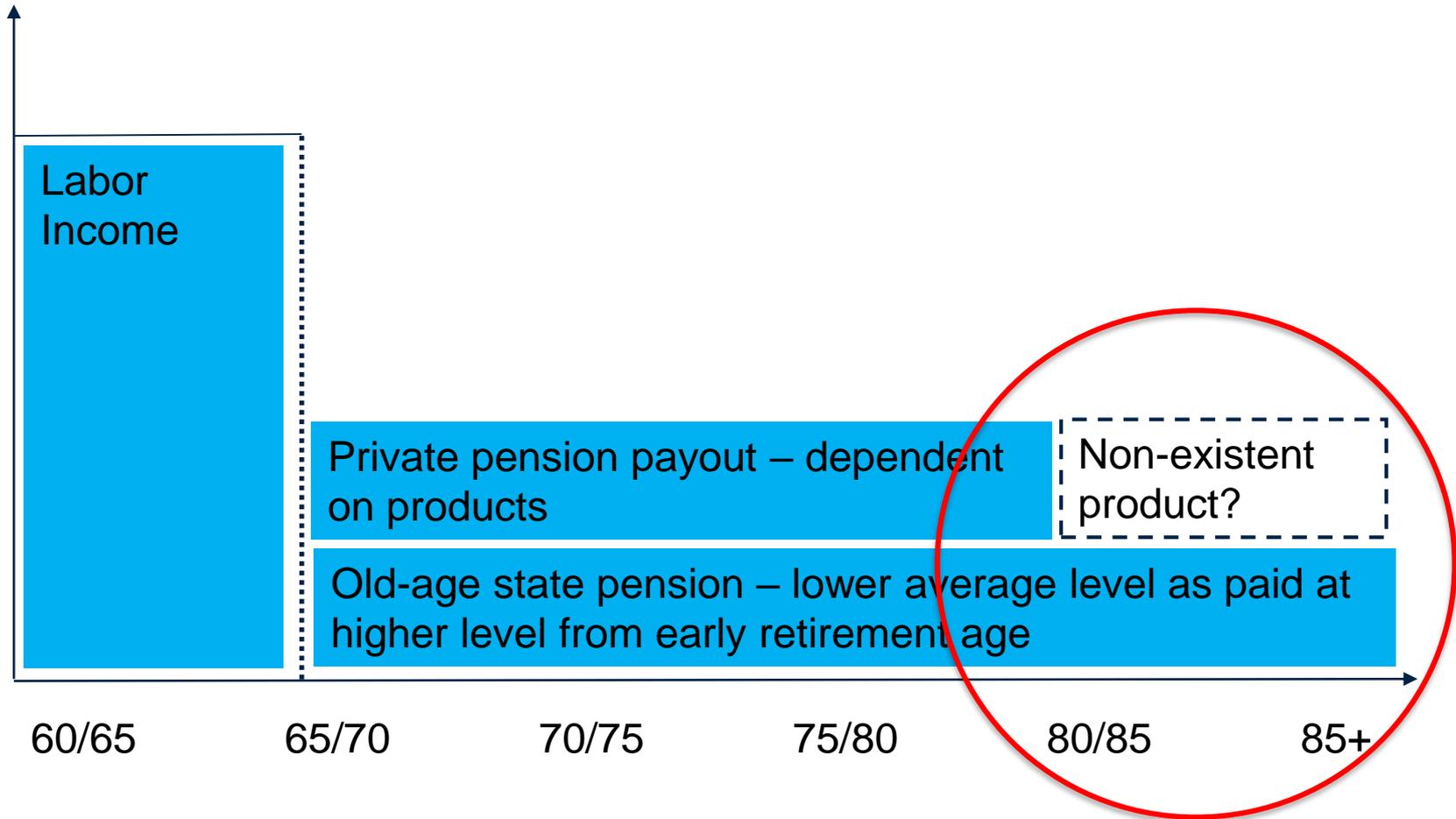
- Good **coverage** at the contribution stage if matched with lump sum payouts can lead to poor coverage of income in retirement (Malaysia)
- **Sustainability** depends critically on rules for increases or indexation in pensions – mandating at least price inflation (UK) compared to nominal anchors (Netherlands) makes a big difference to funding levels
- **Adequacy** is often specified as a share of pre-retirement income or relative to a poverty line – but usually in terms of the initial pension level – few analyses provide adequacy figures for both 65 and 80 years
- Very **efficient accumulation phases** with scale providers providing well-designed default funds for members can be followed by inefficient payouts – where individuals are left to make all the decisions again
- The **security** outcome - including supervisory elements - depends on how the payout phase will be delivered – by insurance companies, within the pension fund accumulating the assets, as individual products or pooled across individuals and sharing longevity risk?

There are (too) many ways in which pension assets are paid – with different implications for benefits, risks and complexity

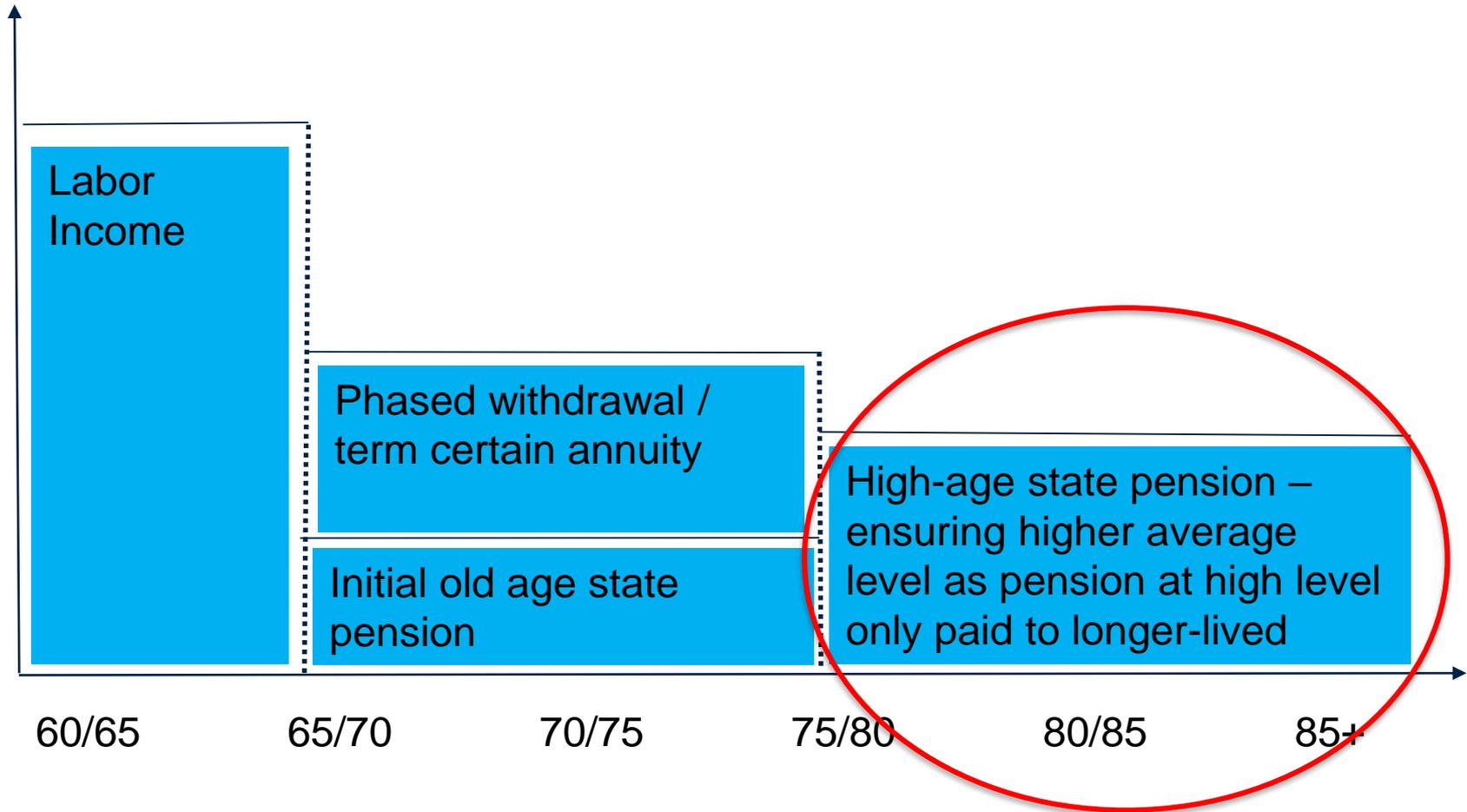
<i>Retirement product</i>	<i>Protection offered</i>			<i>Benefits provided</i>	
	<i>Longevity risk</i>	<i>Investment risk</i>	<i>Inflation risk</i>	<i>Bequest</i>	<i>Liquidity</i>
Fixed real life annuities	Yes	Yes	Yes	Limited	No
Fixed nominal life annuities	Yes	Yes	No	Limited	No
Escalating real life annuities	Yes	Yes	Yes Plus	Limited	No
Escalating nominal life annuities	Yes	Yes	Partial	Limited	No
Variable life annuities, guaranteed benefits	Yes	Yes	Possible	Limited	No
Variable life annuities, bonus payments	Shared	Shared	Shared	Limited	No
Variable life annuities, unit linked	Shared	No	No	Limited	No
Phased withdrawals	No	No	Possible	Yes	Possible
Lump sum	No	Possible	Possible	Yes	Yes
Self-annuitization	No	Possible	Possible	Yes	Yes

Source: Based on Rocha and others 2011

A fundamental challenge for a pension system is how to translate assets into income in retirement – particularly for the ‘toxic tale’



Governments of course do this already in zero and first pillars, but this creates sustainability issues. But non-government sources of income till death can be challenging. One novel option is to split government payments into two parts for early old age and late old age – and focus private payouts on the ‘easier’ part



Most, but not all, traditional Defined Benefit plans paid out some form of annuity

- The ‘traditional’ DB plan often did not have any choice for the member of the nature of the payout
- Depending on plan rules the payout could be flat in nominal terms, rising with inflation, dependent on growth in plan assets or have other features
- Some DB plans e.g. in Egypt – actually payout a lump sum – so effectively ignore the payout phase
- The funding rules for Defined Benefit plans effectively play a similar role to the capital adequacy provisions for insurance companies, but there are very important differences and an insurance model should not be imported mindlessly
- Equally however, many DB plans that ‘promise’ an income for life only do so if the plan is adequately funded. If it is not then the plan can collapse to be a DC plan where only benefits matched by current assets are paid
- Members will likely never understand this – and custom and practice will have a huge impact on understanding – see Netherlands example.

Notional Defined Contribution plans (NDCs) have a retirement income based on an underlying formula which uses similar principles to an insurers annuity formula – but often ‘reprice’

Annuity Divisors for the Inkomstpension

The annuity divisors for the inkomstpension are used for recalculation of pension balances as annual disbursements and are a measure of life expectancy at retirement, with consideration given to the interest of 1.6 percent (advance interest) credited to pensions in advance.

$$D_i = \frac{1}{12L_i} \sum_{k=i}^r \sum_{X=0}^{11} \left(L_k + (L_{k+1} - L_k) \frac{X}{12} \right) (1,016)^{-(k-i)} (1,016)^{\frac{-X}{12}}, \quad i = 61, 62, \dots, r \quad (\text{A.8.1})$$

D_i annuity divisor for age group i

$k - i$ number of years of retirement ($k = i, i + 1, i + 2$, etc.)

X number of months (0,1,...,11)

L_i number of survivors in age group i per 100,000 born, according to the life span statistics of Statistics Sweden. These statistics are for the five-year period immediately preceding the year when the insured reached age 60 in the case of pension withdrawal before age 65, and age 64 in the case of withdrawal thereafter.

The NDC balance is divided by this complicated formula to give an annual income. The income generated at age 61 is lower for later cohorts because they will live longer. Income for older people is higher as they have less years

Confirmed Annuity Divisors for the Inkomstpension *

	61	62	63	64	65	66	67	68	69	70
1938	17.87	17.29	16.71	16.13	15.56	14.99	14.42	13.84	13.27	12.71
1939	17.94	17.36	16.78	16.19	15.62	15.04	14.47	13.89	13.32	12.76
1940	18.02	17.44	16.86	16.27	15.69	15.11	14.54	13.96	13.39	12.82
1941	18.14	17.56	16.98	16.39	15.81	15.23	14.65	14.08	13.50	12.94
1942	18.23	17.65	17.06	16.48	15.89	15.31	14.74	14.16	13.59	13.02
1943	18.33	17.75	17.16	16.58	15.99	15.41	14.84	14.26	13.68	13.11
1944	18.44	17.86	17.28	16.70	16.11	15.54	14.96	14.38	13.80	13.23
1945	18.55	17.96	17.38	16.80	16.22	15.64	15.07	14.48	13.91	13.33
1946	18.64	18.05	17.47	16.89	16.31	15.73	15.16	14.57	13.99	13.41
1947	18.73	18.15	17.56	16.98	16.40	15.83	15.24	14.66	14.07	13.49
1948	18.83	18.24	17.66	17.07	16.49	15.91	15.33	14.74	14.16	13.58
1949	18.89	18.31	17.72	17.13	16.55	15.97	15.38	14.79	14.21	13.63
1950	18.98	18.39	17.80	17.21	16.63	16.05	15.46	14.87	14.28	13.70
1951	19.06	18.48	17.89	17.30	16.71	16.13	15.54	14.95	14.37	13.78

* Annuity divisors are confirmed each year up to age 80, but the table shows only the divisors up to age 70.

Annuity pricing is complicated but important to understand at a high level. This example from Swedish is used in a variable annuity model that has many attractions. Singapore has introduced something similar recently – although without publishing the formula

$$D(x) = \int_0^{\infty} e^{-\delta t} \frac{l(x+t)}{l(x)} dt$$

$$\delta = \ln(1+r) - \epsilon$$

$$l(x) = \int_0^{\infty} e^{-\int_0^x \mu(t) dt}$$

$$\mu(x) = \begin{cases} a + be^{cx} & \text{for } x \leq 97 \\ \mu(97) + (x - 97) \cdot 0.001 & \text{for } x > 97 \end{cases}$$

Only annuities guarantee income to death. The Swedish use a different annuity divisor in their Defined Contribution pillar – but the principles and outputs are clearly similar to the NDC

Age of beneficiaries, Annuity Division (AD) and annual payments	AD 61	Annual payment for 100,000 assets	AD 65	Annual payment for 100,000 assets	AD 70	Annual payment for 100,000 assets
Without Survivor	17.19	5,817	15.18	6,588	12.99	7,698
Benefit of taking income at 65 compared to 61			+13% a year	Benefit of taking income at 65 compared to 61		+17% a year
With survivor benefit						
Co-insured 60	20.15	4,963	19.38	5,160	18.75	5,333
Benefit of taking income at 65 compared to 61			+4%	Benefit of taking income at 70 compared to 65		3%
Note that the benefit of delaying retirement with the survivor benefit looks smaller in the example because at each age the survivor is assumed to be 60 so even though the main beneficiary is older the relatively young survivor offsets some of the gains to higher income seen for the single life.						

Source: Orange Report: Annual Report of the Swedish Pension System 2014 p102

Life annuities however have a demanding set of requirements to be delivered successfully

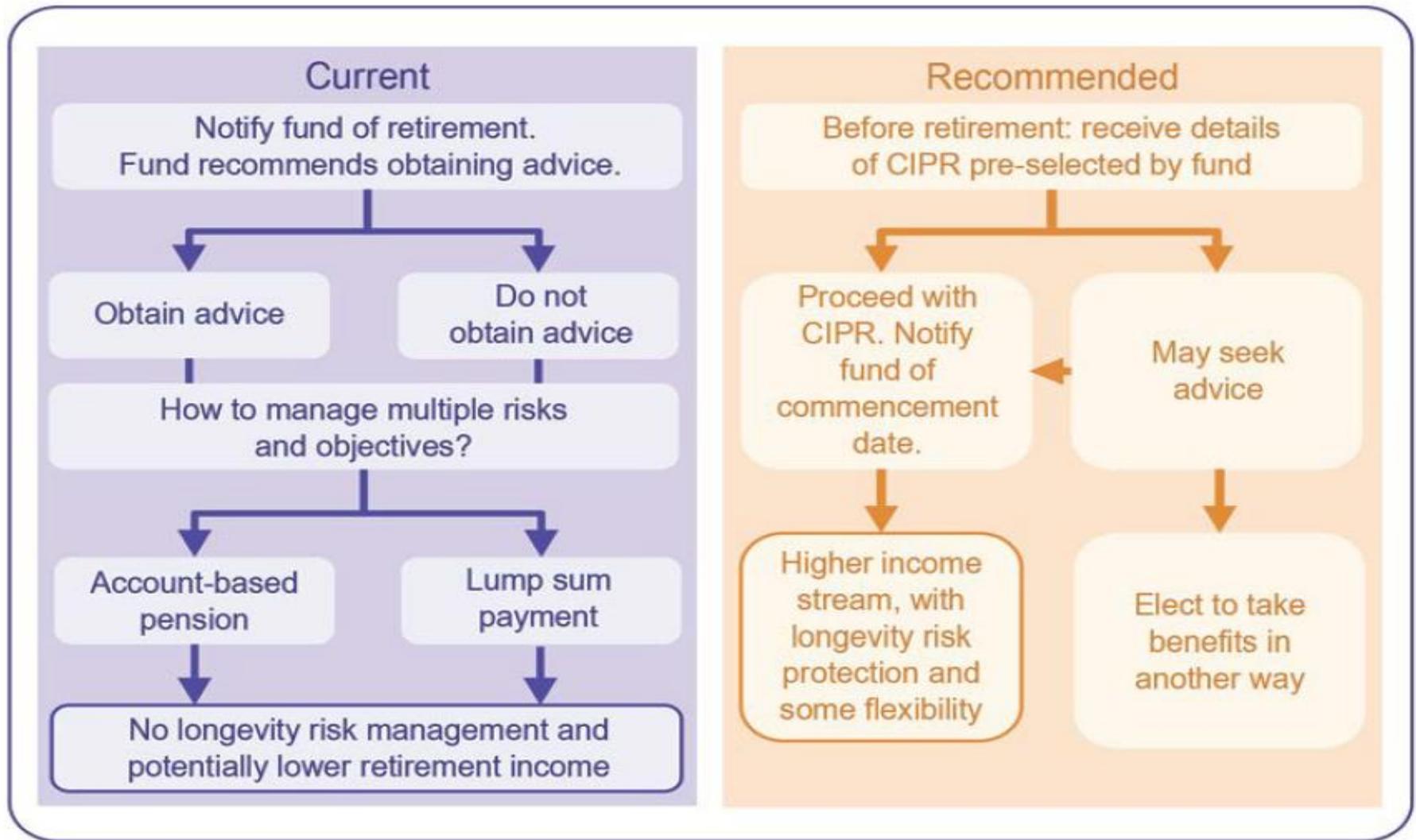
Life annuities that pay out an income guaranteed until death require at least the following to be delivered efficiently:

- Inflation linked bonds – assuming there is some increase in payments each year to match inflation in the country
- If not inflation linked bonds then long duration bonds to allow at least a regular increase – unless inflation is very low and a nominal income stream will be big enough
- Good quality mortality data – not just for the whole population, or even insurance annuitants but for the specific pensioner population
- Good quality supervision of the (insurance) company providing the annuity guarantee, along with well-designed capital adequacy rules
- A competitive market between insurance providers in theory
- A way in which consumers can get good value when they don't understand the different options

Phased or systematic withdrawals are becoming more popular for a range of good (and bad) reasons

- Phased withdrawals are simpler to implement than annuities
- If the status quo was lump sum then phased withdrawals are better
- They can be cheaper to provide (though see market structure later)
- But phased withdrawals do not give a guarantee of income until death – annuities are ‘expensive’ because they provide a valuable guarantee
- The right payout will depend on whether there is a generous public pension - one argument why in Australia lump sums were allowed
- But even in Australia there is dissatisfaction with whether the payout phase is actually delivering what is really needed from a pension pillar
- If phased withdrawals are used then decisions are needed on drawdown each year and investment strategy – and members will find those tough to understand – increasingly so as they get older
- Phased withdrawals can be ‘naïve’ e.g. paid out in full over 10 years, annuity-like – using an annuity formula linking payments to interest rates and life expectancy, or use a ‘rule of thumb’

The market structure that delivers any product is crucial. Many systems do not embed insights changing accumulation phases e.g. defaults, using scale, providing member-focused governance – including respected ones



Auctions as in Chile can add value and scale (and protect members) but there are other ways to use scale and governance to improve outcomes – for example bulk purchase of annuities by the accumulation vehicle

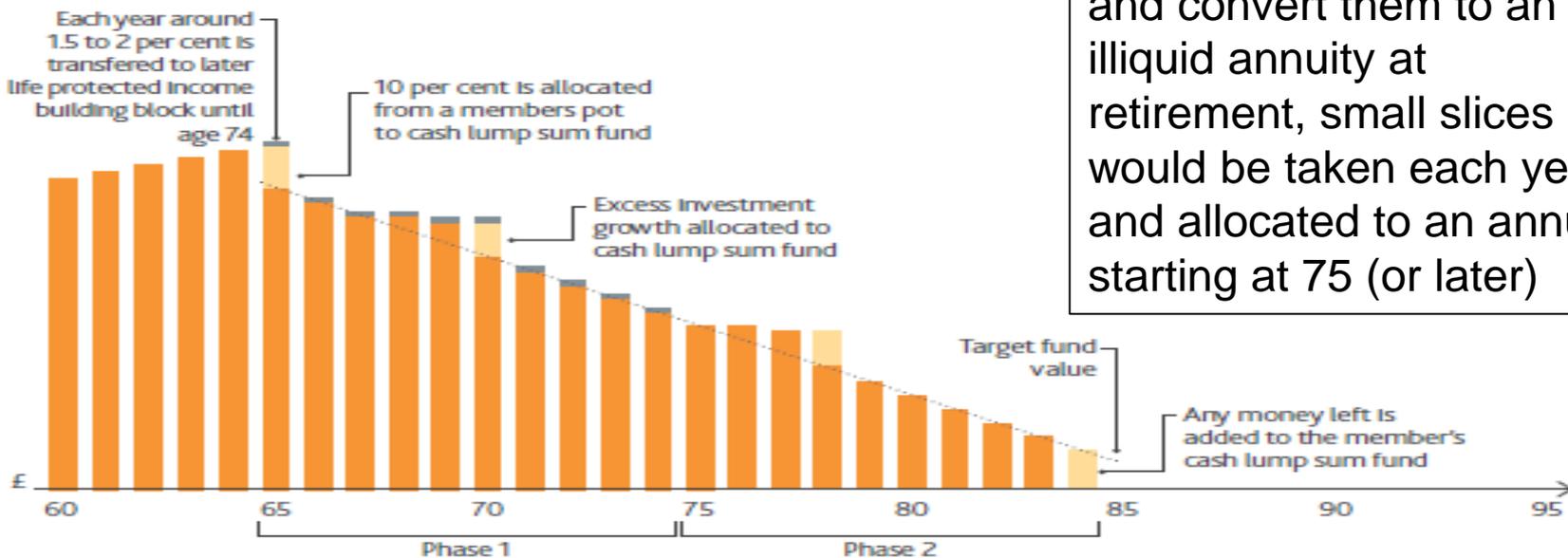


Source: LCP (2015)

Some innovative UK thinking aims to combine phased withdrawals with deferred annuities to make each part simpler to provide - innovation forced by the mistaken removal of requirements to translate assets into income

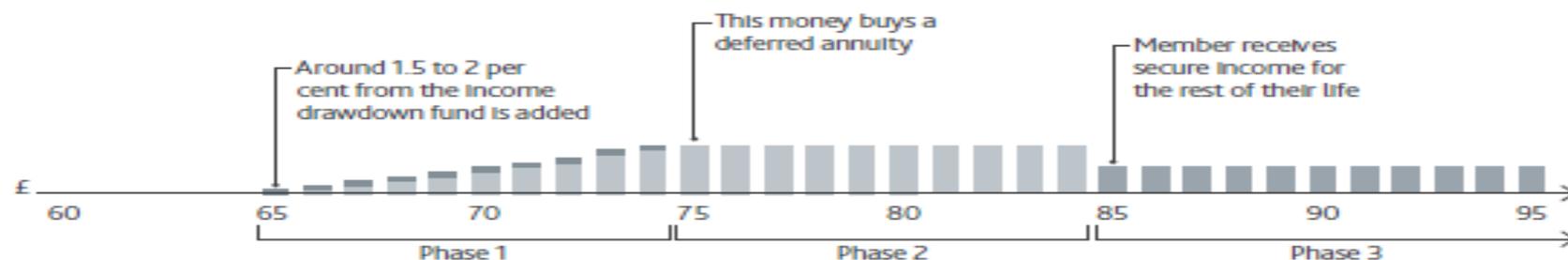
How their income is generated

Income drawdown fund



Rather than take all assets and convert them to an illiquid annuity at retirement, small slices would be taken each year and allocated to an annuity starting at 75 (or later)

Later-life protected income fund



Conclusions

1. You cannot evaluate a pension system without knowing its payouts
2. Governments typically already take a lot of longevity risk which creates sustainability issues and hence other sources are needed
3. Governments could reduce the costs of pensions by splitting old age into two phases and paying higher rates for the very old so markets fill the simpler slot
4. Annuities have a lot of advantages but are challenging to provide
5. The underlying pricing of an annuity is very useful to understand what is driving cost and how to share risks by 're-pricing' regularly – if you trust the 're-pricer'
6. Phased withdrawals are an obvious advance if the current default is lump-sums
7. They have many advantages but critically do not guarantee income until death
8. Whatever payout phase you choose, the benefits of scale, expertise and governance for members in accumulation are just as valuable
9. A promising area of development is to mix the different kinds of products – phased withdrawals for early old age and annuities for the final few years of life
10. Beware of reverse mortgages as solutions – there are few if any examples of them working well
11. However, access to housing is vital – and renting a room can deliver useful income – as can families – so be nice to your folks!

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