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Longevity: A Reinsurer's Perspective

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Longevity: A Reinsurer's Perspective

ABSTRACT

Purpose of your paper: To provide a picture of the longevity space as seen through the eyes of a product manufacturer, focusing on some key questions around the current state of the Australian Market and with particular emphasis on deferred life annuities which are the subject of impending tax changes in 2014.

Key words: longevity, annuities, post retirement, mortality trends, global, deferred life annuities

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CONTENTS

1. Executive summary	4
2. Australian market	5
2.1 Current size – a high level snapshot	5
2.2 Tax changes affecting retirement products - April 2013	6
2.3 Post retirement key income sources	7
2.3.1 Australian Government Age Pension	7
2.3.2 Retirement Products – without Longevity Protection	8
2.3.3 Retirement products with longevity protection	10
3. Deferred Life Annuities	14
3.1 Background	14
3.1.1 What is a deferred life annuity	14
3.1.2 Stakeholder need and marketing	15
3.2 Regulatory status update	18
3.3 Risk structuring	18
3.4 Lessons from other countries	20
3.5 Some pricing considerations	21
3.6 Conclusion	24
4. Comparison of the different product options	26
References	27

1. Executive summary

There are some exciting times ahead in the post retirement insurance market. In particular, a recent proposed change to the taxation of deferred annuities has raised the awareness and debate around how to service this segment of the market.

This paper seeks to further extend the body of research in this area, providing some 'Longevity 101' background to the current post retirement Australian Insurance segment along with exploring a few key questions around the introduction of deferred annuities, from a risk carrier point of view. The authors intend for this paper to be regularly updated over time as the market develops more clarity and we increase our understanding.

Key messages

- There is a clear trend towards growth in available funds at retirement in Australia. The insurance industry is well placed to take advantage of this shift and could play a far larger role than currently in this sector.
- At present, insurance that offers a true longevity hedge plays a limited role in servicing these consumers. Guaranteed Retirement Income Products (GRIPs) and Immediate Lifetime Annuities remain the two key product sets in this sector.
- Recent proposed tax changes should lead to the creation of a new product set around deferred annuities.
- These products have significant marketing appeal (linked to the benefit of mortality credits available at older ages).
- However, there remain some key impediments to the development of an efficient market. In particular, some clarity around the regulatory setting is needed. In addition, providers need to consider how to structure the risk where we are limited in the supply of available hedging asset classes along with an increase in the tail of the liabilities.
- The authors have highlighted some countries where these products have been tried along with some key mortality considerations in the development of the liability cashflows.

Overall, the increased focus on how the insurance industry can develop post retirement solutions is a key goal of this report and we look forward to future discussions arising.

2. Australian market

Before digging into some detail on Deferred Life Annuities, we need to set out some basic background to the current longevity space. As an addition to the body of research and policy papers already written on this subject, in this section the authors have sought to understand a handful of key questions with regard to the current longevity space. In particular, this first section will focus on the following key themes:

- Current market size – what’s being written at the moment?
- Recent tax changes – why care now?
- Post retirement key income sources – what’s available now in Australia for the men and women on the street?

2.1 Current size – a high level snapshot

There is no doubt that the number of retirees and the proportion of Australians aged over 65 are both increasing. Some recent statistics are:

- There were 4.2 million Australians aged over 60 according to the 2011 Census. Of these, 4.2 million people, 2.8 million were aged between 60 and 75.
- Australia will see a move from 20% of the population aged over 60 to 29%, based on forecast population growth to 2050. This move includes a doubling in the number of people aged over 60.
- It is estimated that 900,000 retirees are earning above \$800 per week. ASFA's Retirement Standard advises an income of \$780 per week is required for a single person to live comfortably. The full aged pension for a single person is \$386 per week.

The total single premium invested in retirement income stream products over the past five calendar years is shown in Table 1. This doesn't cover money withdrawn from the Super system (e.g. lump sum withdrawals). The first two products are growing steadily, although there is no longevity protection provided to retirees.

Table 1: Total Retirement Products - New Single Premiums (\$ bill)

DEXX&R December 2012

Product	Dec-08	Dec-09	Dec-10	Dec-11	Dec-12
Allocated Annuities	9.07	9.24	9.98	10.23	11.78
Term Certain Annuities	2.21	1.20	1.78	2.71	2.46
Lifetime Annuities	0.01*	0.01	0.01*	0.03*	0.14*
Total	11.29*	10.44	11.77*	12.96*	14.38*

Longevity: A Reinsurer's Perspective

Table 2 shows the three Life Insurers offering immediate lifetime annuities and their sales over the past 5 years.

Table 2: Total Lifetime Annuities - New Single Premiums (\$ mill)

Source: Challenger

Insurer	Dec-08	Dec-09	Dec-10	Dec-11	Dec-12
Challenger	0	0	0.8	22.1	133.1
AMP	3.2	0.1	0	0	0
CommInsure	8.6	5.8	9.4	5.2	1.9
Total	11.8	5.9	10.2	27.3	135.0

*Adjusted by Swiss Re to reflect Challenger figures

2.2 Tax changes affecting retirement products - April 2013

On 5th April 2013, the Federal Government announced changes to the taxation of retirement products. Currently, earnings on Superannuation assets supporting retirement income streams are tax exempt. However, from 1 July 2014, the first \$100,000 of earnings will continue to be tax exempt and additional earnings will be taxed at 15%. The income stream payments to the retiree will continue to be exempt from tax. The government's announcement also included the following clarifications:

- Similar tax treatment will apply for defined benefit (DB) schemes. Members receiving income streams from DB schemes will need to have their notional investment earnings calculated, based on their actuarial reserve.
- Products held by pensioners that were issued before 1 January 2015 will be grandfathered indefinitely and will continue to be assessed under existing rules for the life of the product.
- Deferred Life Annuities (DLA) will receive the same concessional tax treatment as Superannuation assets supporting income streams. This means the first \$100,000 of investment earnings on DLA assets will be tax exempt and the additional earnings will be taxed at 15%. Currently, all investment earnings on DLA assets during the deferral period are taxed at 15%. This is an important change and creates an opportunity for the DLA market to expand which we discuss in this paper. The change is effective on 1 July 2014.
- Deeming rules will apply to Superannuation account-based income streams for the purposes of the age pension income test. This ensures that income on all financial investments is assessed fairly.

2.3 Post retirement key income sources

In this section we will explore the key options for retirees in Australia at present.

2.3.1 Australian Government Age Pension

Before we discuss the superannuation and insurance product suite available, it is important to understand the key government provision for retirees as background.

Many retirees in Australia will supplement the income from their own Superannuation and private assets with partial or full Age Pension payments.

To receive the pension, retirees need to satisfy eligibility criteria including aged 65 or over (this is transitioning to age 67), a resident of Australia, and satisfy the income and asset tests.

At September 2012, the full pension amount is \$772.60 per fortnight for singles and \$1,164.80 per fortnight for a couple – these payments include the supplement of \$60.00 for singles and \$91.40 for couples. This equates to \$20,100 p.a. for singles and \$30,300 p.a. for a couple.

The income and asset tests are performed and the lower result is used.

- Income test: adds all income plus 3% - 4.5% of all assets together. The full pension is paid if the income is below \$152 for singles (\$268 for couples) per fortnight. The pension reduces by about 50c per extra dollar, with no pension paid at fortnightly incomes of \$1,663 for singles (\$2,546 for couples).
- Assets test: this is based on the value of all assets, excluding the family home. The full pension is paid if assets are below \$192,500 for singles (\$273,000 for couples). The pension reduces by about \$1.50 per \$1,000 of assets, with no pension paid at assets of \$696,250 for singles (\$1,032,500 for couples).
- Different rules apply if the retiree is a non-homeowner. The full pension is paid if assets are below \$332,000 for singles (\$412,500 for couples). The pension reduces to zero if assets exceed \$835,750 for singles (\$1,172,000 for couples).

Retirees that are eligible to receive a partial or full pension receive other fringe benefits from the government, including Seniors cards, hardship allowances, carers cover, rent allowances. It is estimated that about 68% of people aged over 65 receive a part or full pension.

Note that for the purposes of this paper, we are not covering other sources of government support in the aged care space such as Community Care and Residential Care. Deloitte Access Economics' 2011 paper provides an overview of the various programs and scope.

2.3.2 Retirement Products – without Longevity Protection

The main privatised sources of income in Australia are Allocated Pensions or Term Certain Annuities. Neither option protects the retiree against longevity risk. These products are available from a range of providers.

Allocated Pensions have been a popular choice for retirees for nearly 20 years. As outlined above, the income stream withdrawals from the retiree's pension accounts are tax free and the first \$100,000 p.a. of investment earnings on the account balance are exempt from tax. The retiree has the flexibility to select the asset classes for his/her account and to take additional lump sum withdrawals. As noted, retirees take on their own longevity risk and also typically bear market and inflation risk.

The minimum withdrawals as a percentage of the account balance vary by the retiree's attained age, as shown in Table 3 below:

Table 3: Account Balance minimum percentages for annual withdrawal

Age on 1 July	Allocated Pension – minimum withdrawal	Minimum withdrawal with 2012/13 relief reduction
55 - 64	4%	3%
65 - 74	5%	3.75%
75 - 79	6%	4.5%
80 - 84	7%	5.25%
85 - 89	9%	6.75%
90 - 94	11%	8.25%
95+	14%	10.5%

Note that annuities only need to meet the minimum drawdown rules in the first year only if the annuity has a nil RCV.

Term Certain Annuities have a fixed term of between 1 year and 50 years. They pay a regular income to the retiree on a monthly, quarterly, half-yearly or annual basis. The income paid to the retiree is tax free if they are over age 60 and use superannuation assets to finance the product.

The product is structured in two alternate ways – income payments are effectively "interest only" and the principal is returned to the retiree at maturity; or the income payments include principal and interest so that there is no payment made at maturity. The retiree may also split their investment across both versions.

Reverse Mortgages have been popular with retirees. The normal design is for a bank to pay the retiree an initial capital amount and the bank will track the loan outstanding with interest. At death or earlier, the house is sold, the loan is repaid from the proceeds and the retiree receives the balance if positive. The bank will cover any deficit of loan outstanding compared to the sale price.

Integration of income streams from superannuation and the Aged Pension

The AustralianSuper Industry Fund provides information on its website for members about an integrated Allocated Pension and Age Pension. This Fund has over 1 million members and it is likely that members approaching retirement would rely on both their Superannuation savings and some or the entire Age Pension, hence our inclusion as a reference.

The following details are taken from the Fund's website with our paraphrasing:

How a pension account works:

- *You open an account. To be eligible you will need a minimum account balance of \$10,000 (for AustralianSuper's Pension account) and have reached the age of 55.*
- *You transfer money from your super account/s to your new pension account.*
- *You choose your pension payment amountand how often you want to receive these payments – weekly, fortnightly etc.*
- *Your pension payments are paid into your bank account and you can manage your account online.*
- *You can withdraw lump sum amounts when you want to (if you are retired).*
- *There is an age-based minimum amount that you must withdraw every year, which is set by the Government. The minimum amount is your account balance as at 1 July (or from the date you set up your new pension) multiplied by the pension factor for your age group as at 1 July (refer to the table in Allocated Pension section above)*
- *The income paid from your pension is treated favourably by Centrelink when assessing your Age Pension eligibility*
- *Your money isn't locked away for life. You can always make lump sum withdrawals for those one-off expenses that come up*
- *You don't need a large amount of super to make the most of an AustralianSuper Pension. In fact, when combined with the Government Age Pension, a \$50,000 super balance can make a difference to your weekly income in retirement*
- *You pay no tax on the investment earnings. If you're 60 or over, your pension payments and any lump-sums you withdraw are tax-free.*

Table 4: Examples of Age Pension combined with income taken from Super savings

Super Account Balance	Combined Monthly Payments from Super & Age Pension		Combined Monthly Income
	Super Account	Age Pension	
\$50,000	\$220	Single \$1,674 Couple \$2,524	Single \$1,894 Couple \$2,744
\$100,000	\$440	Single \$1,674 Couple \$2,524	Single \$2,114 Couple \$2,964
\$250,000	\$1,100	Single \$1,486 Couple \$2,524	Single \$2,586 Couple \$3,624
\$500,000	\$2,250	Single \$673 Couple \$1,786	Single \$2,923 Couple \$4,036

2.3.3 Retirement products with longevity protection

This section reviews the limited range of retirement products containing some form of guarantee that are currently available in Australia. We examine two categories:

- Guaranteed Retirement Income Products (GRIPs)
- Immediate Lifetime Annuities

These products differ from Allocated Pension products because allocated pensions do not provide any guarantees to investors on future income payments nor on their capital value.

Guaranteed Retirement Income Products (GRIPs)

GRIPs provide various guarantees on investors' capital or annual income streams when the product is issued.

The guarantee may apply to the initial capital invested, protecting it against a loss, or instead a fixed annual income is guaranteed for a number of years or life. The guarantee may apply to the entire portfolio or just to the growth assets of the portfolio. The protection cost is funded by an annual asset fee.

Investors are able to invest in growth assets and hedge potential losses. The total annual asset fees can be significant for these products as investors will incur administration and investment management fees as well as the annual fees for the protection (guarantee) of the account balance or income stream. The protection fees vary with the level of risk or volatility in the assets, due to the hedging costs.

GRIPs currently available in Australia are provided by:

- AXA (now AMP): launched the North product in 2007 and now has over \$6 bn in funds;
- MLC: launched MasterKey Investment Protection in September 2012;
- Macquarie Life: released Macquarie Lifetime Income Guarantee;
- MetLife: launched a form of GRIP in January 2013 for members of the MTAA Industry Super Fund.

The three product variations of GRIPs are:

(i) Protected Growth or Protected Capital

In this product, the value of the initial capital invested is guaranteed for a term of 10 or 20 years, with the guarantee also applying to increases in value of the initial capital as at each policy anniversary. Partial protection is applied if the investor cashes in the policy before the 10 or 20 year term and the capital has dropped in value.

Longevity: A Reinsurer's Perspective

(ii) Protected Investment

This product is outside Superannuation and has shorter term guarantees, for example 5 to 10 years and no adjustment for increases in value of the initial capital invested.

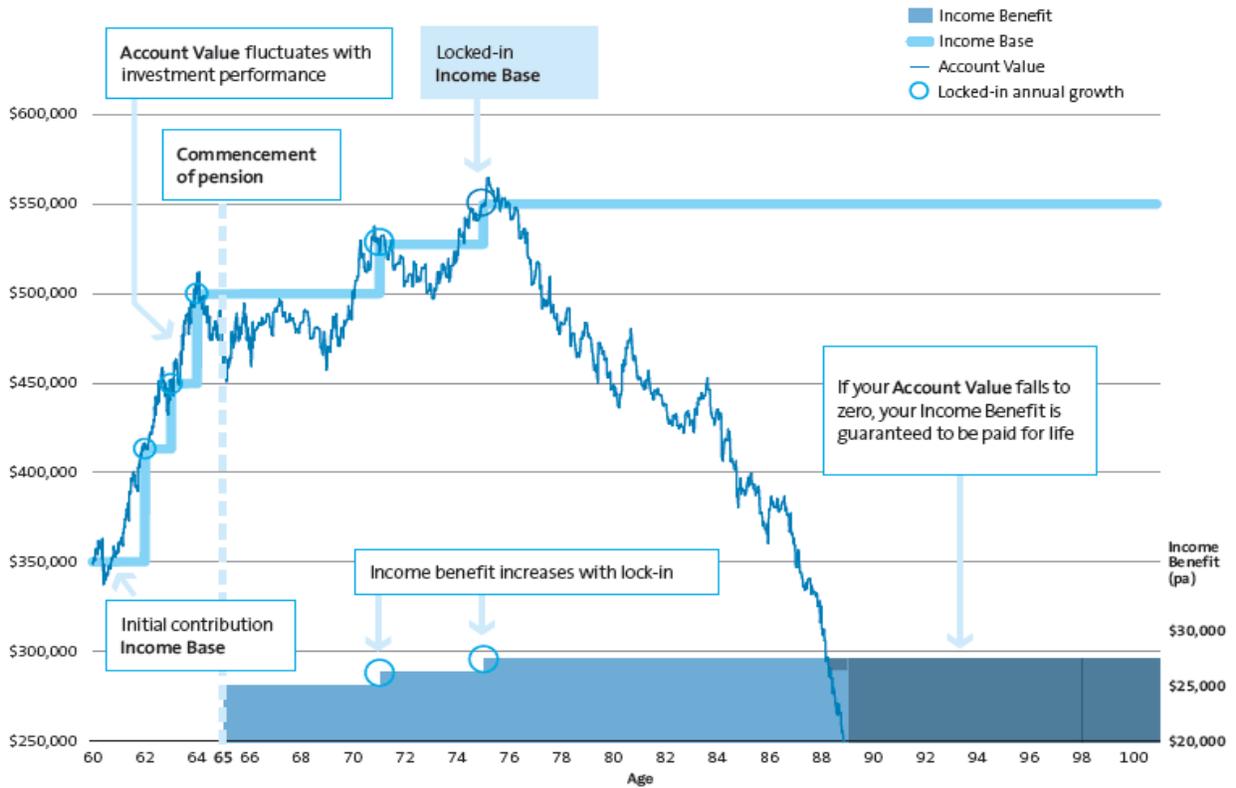
(iii) Protected Retirement or Protected Income

This product is also called Variable Annuities. It provides a guaranteed fixed level of income for terms of 10 years 20 years or for life. The guaranteed annual incomes are generally 10% p.a. of the initial account value for a 10 year term, 5% p.a. for a 20 year term and 4% - 5% for lifetime. Similarly to (i), increases in the value of the account value at each policy anniversary lead to an increase in the guaranteed annual income, known as "ratcheting up".

The remainder of this section examines Australian protected retirement income products with a guarantee for life. These products include the following general features:

- The guaranteed annual income stream is around 4% of the initial account value for commencement ages below 65 and 5% at ages 65 or higher. One provider has factors of 3.5% and 4% at ages 60 and 65 respectively but adds a 2% p.a. bonus for the first five years.
- Under the ratcheting process, at each policy anniversary, the future annual income stream is increased if the account value has grown since the previous ratcheting event. Depending on the product provider, the ratcheting increase may be guaranteed for the remaining duration of the policy or may be withdrawn if subsequent reductions in asset values lead to a reversal of previous ratcheting increases. Figure 1 illustrates an example of the ratcheting process where the account value has been exhausted.
- Investors can make partial or full withdrawals of their account balance at any time and the guaranteed income streams are reduced accordingly.
- Some providers pay the remaining account balance, if positive, on death of the investor.
- The asset fees charged for the guaranteed income, on top of the annual administration and investment management fees, from lowest to highest are 1.1% p.a., 1.25% p.a., 1.55% - 1.95% p.a. and 1.3% - 2.0% p.a. for the four product providers.

Figure 1: AMP's Protected Retirement Guarantee



Immediate Lifetime Annuities

Immediate Lifetime Annuities (ILAs) are currently sold in Australia by only two providers: Challenger and Comminsure.

ILAs were popular during the late 1980s, with up to 10 insurers providing immediate annuity products in a high interest rate environment. These insurers now have legacy portfolios in run off.

Immediate lifetime annuities for super investors normally have the following features:

- Single life or Single life with a reversion to spouse after death;
- Monthly, quarterly, half-yearly or annual payments;
- Annual indexation of payments by change in CPI or flat annual payments;
- An option for a guaranteed minimum payment period e.g. 10 years. Upon death during the guarantee period, the beneficiary can opt to receive the remaining payments as they fall due or instead receive a commuted cash payment.

Comminsure's ILA product offers an extended minimum payment period, varying by age at policy commencement and gender, as shown in the Table 5. This feature provides the annuitant with more certainty about future cash flows but comes at a cost because the annuity instalments are less than those applicable if no minimum period applied.

Table 5: Commisure (PDS) lifetime annuity – maximum guarantee periods

Age at policy commencement	Maximum guarantee period - Males	Maximum guarantee period - Females
60	23 years	26 years
65	19 years	22 years
70	15 years	18 years

Challenger recently launched an innovative ILA product with the "guaranteed minimum term" replaced by a commutation option within the first 15 years of the policy. If this feature is not required, higher annual annuity instalments are paid although a death benefit is always offered regardless of choice of commutation.

The commutation feature is interesting and was added presumably to make the product more attractive to investors. The commutation feature gives the investor more flexibility, albeit at a cost.

The commutation values payable at duration 15 years are shown in Table 6.

Commutation values in years 1 – 14 are not guaranteed and subject to interest rate changes.

Table 6: Challenger lifetime annuity (PDS) – commuted values at duration 15

Age at policy commencement	Commutation Value Males single life	Commutation Value Females single life
60 - 65	85%	100%
66 -70	70%	90%
71 – 75	40%	50%
76 - 80	20%	30%
81+	10%	15%

3. Deferred Life Annuities

We now turn our attention to the new potential opportunity. There has been some recent excitement around Deferred Life Annuities, a new product set that is currently not sold in Australia. This has been particularly driven by a proposed change to the tax rules governing these products but along with some recent papers and reports that have advocated the need for these products. The authors seek to understand a handful of key questions which product providers need to understand:

- What do we mean by a Deferred Life Annuity - what are we actually talking about?
- Will these products appeal to consumers and advisors – can we really market the benefits?
- Market opportunity - what's the size of the prize?
- What are the regulatory challenges still remaining – is the market ready?
- How do we manage the liability – the tail is now even longer?
- How do we hedge the asset risk – what assets do we use to hedge?
- Has it been tried anywhere else – what are lessons learned?
- What are some of the key pricing considerations - mortality and improvements?

Although the above list is not an exhaustive set of questions, this section attempts to build on the existing body of research available, point readers to where further information can be gained, and add to the growing interest in the under-served post retirement sector of the market.

The recent changes to the Superannuation tax proposals may go some way towards moving this market forward. This paper attempts to look at some of the key issues from a product provider's perspective and some of the challenges that need to be overcome. We acknowledge the fundamental challenges with annuities in general in this market - the authors advocate some form of compulsion with part of retirees' savings, a default system or failing this, additional tax incentives perhaps during the pre-retirement phase to fund extreme old age income. Without this, the oft quoted benefit of the recent tax changes on price alone will not be sufficient to drive this market forward.

3.1 Background

3.1.1 What is a deferred life annuity

There are a number of different variations of an annuity that is deferred. Generally, a traditional deferred annuity provides an income that only starts once the policyholder survives beyond a certain age.

Typically the annuity income stream from that point on is guaranteed for life, with the provider of the annuity taking on any longevity risk (if mortality is different to expected) and market risk (if investment returns deviate from expected). Typically these annuities are paid as a single premium at outset.

For the purposes of this paper, we are focusing on the post retirement sector of these products.

3.1.2 Stakeholder need and marketing

The rationale for the customer purchase is linked being able to invest a small share of money now to create an income stream starting at some future point.

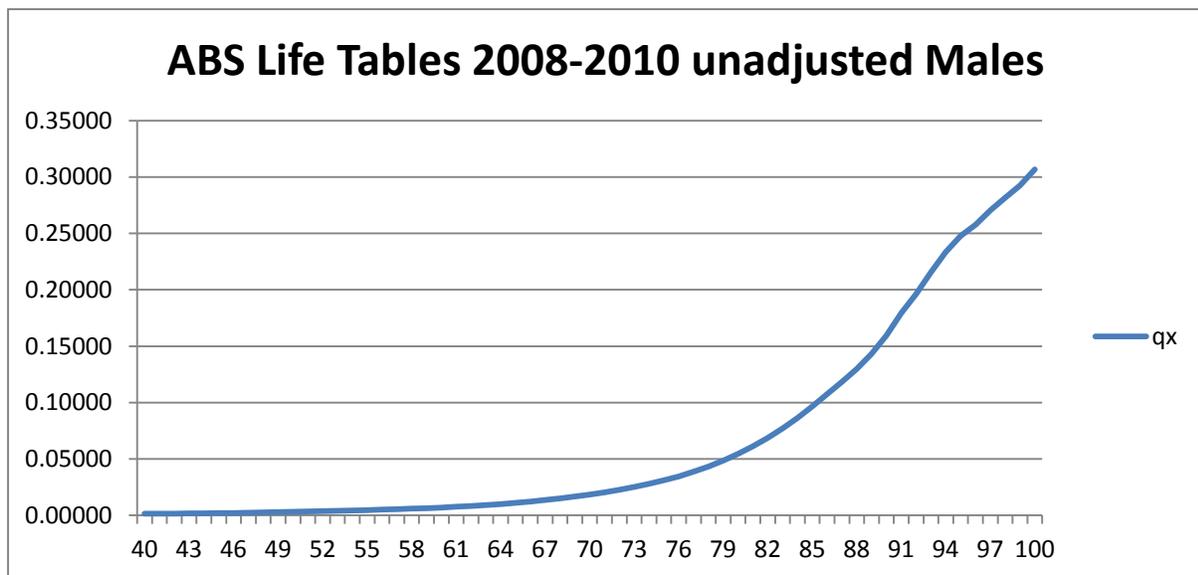
The key attraction to consumers of these products is that they offer a guaranteed income stream but at a significantly cheaper price than traditional immediate annuities in terms of outlay (price driven by the length of the deferral period), which is reflected in the upfront cost. You cannot run out of money and you arguably have capacity to increase your risk profile on the remainder of your investment portfolio (a feature for advisors to also add value).

For advisors, the potential marketing message around the cost is compelling. Besides the standard marketing benefits such as long term longevity protection, guaranteed income streams and tax efficiency, they can compare the returns under this product to those achieved with other asset classes.

What this last point means is that deferred annuitants benefit from the fact that a number of lives will not survive to the end of the deferral period. This 'mortality credit' is an effective enhancement to the yield achieved for those surviving. This additional yield is further enhanced for older ages where the mortality curve is steep.

The Australian Bureau of Statistics mortality table for 2008-2010 unadjusted males (Figure 2) illustrates the shape of the mortality curve:

Figure 2: The Australian Bureau of Statistics mortality table for 2008-2010 unadjusted males



As can be seen, the yield curve steepens significantly at older ages. For policyholders purchasing an annuity with a deferral period running through this steepening, the effective mortality credit is quite significant.

Longevity: A Reinsurer's Perspective

Table 7 illustrates for a hypothetical set of claims cashflows, the enhanced yield on survival to the end of the deferred period:

Table 7 – Swiss Re calculation

Mortality credit - increase in return p.a. above risk free through survivorship			
Males	Deferred age		
Age at outset	65	75	85
55	5%	21%	53%
65		28%	72%
75			104%

For example, a 65 year old male purchasing a deferred annuity with a 10 year deferral period and surviving to age 75, has made an effective c28% increase in their risk free return on his initial investment. Another way of looking at it is that when you compare the single premium invested at time 0 with the present value of cashflows on survival to the end of the deferral period, the risk free return is enhanced by 28%.

Surviving the deferral period (and others dying) means that the effective pool of assets remaining can be spread amongst fewer survivors. This provides one compelling case for policyholders relative to other asset classes, particularly in a low interest rate environment. Note that the lower the risk free rate, the higher the relative increase.

Deferred annuities can also be considered differently depending on the stage of life of a consumer. Although not focused on in this paper, pre-retirement consumers can contribute through their working lives (via monthly contributions) to a savings pot that is used to purchase a defined income stream at retirement. At or post retirement, the need is slightly different where consumers here would use some of their accumulated lump sum savings to purchase a guaranteed income stream commencing at some future date. Whether the income stream starts at retirement, a short period post retirement (e.g. 10 years), or at an advanced age (e.g. 85), the theme remains the same – these annuities provide a guaranteed income that underpins any variability in a consumer's remaining income.

Advisors are also able to charge an upfront service fee under these life products that is commensurate with the level of advice and time required to sell the product. Challenger currently offers for traditional lifetime annuities an upfront commission of up to a maximum of 3.3% (including GST). It should be noted that the lower lump sum, relative to traditional annuities, might reduce interest in commission from advisors (see Chile example later).

From the provider's point of view, offering this product class offers expansion of the product range into a previously untapped segment. There is also the diversification benefit from a capital perspective under LAGIC along with opportunity to package up post retirement solutions as part of a complete product offering.

3.1.3 Potential size of opportunity

Longevity: A Reinsurer's Perspective

The Australian annuity market continues to suffer the absence of any compulsory requirements, default options or extended tax advantages to purchase an annuity. Despite this, the relative cost differential of a deferred annuity product against a lifetime annuity is expected to lead to an increased attraction for advisors and consumers.

There are a number of inputs into quantifying the potential size of this market. Coming up with a concrete set of projections for the potential size of this market is a bit theoretical. However, the following may offer value in determining the potential business case:

- In terms of total market pool in a voluntary setting, Deloitte Access Economics, in a research report commissioned in 2011, opined that the market share of lifetime annuities with complete removal of any impediments would only ever reach less than 10% of total assets. Currently total lifetime sales are approximately less than 0.5%.
- The US Health and Retirement Survey conducted over 1992 to 2002, found that only c4% of participants who left their jobs at age 55 or older annuitized their defined contribution balances. References in other journal articles suggest less than 2% according to the same data. This provides some indication of conversion rates in a voluntary annuitization setting with sufficient access to competition although there are a number of factors that would have contributed to this result (higher interest rates one example but this also incorporates variable annuity offerings).
- Perhaps one indication of the shape of the growth would be to consider the growth levels in the US of Deferred Income Annuities (discussed in this paper) which might represent the broad structure of how these products develop in Australia. The market effectively began for more traditional deferred annuities (called DIA's) in 2011. Up to December 2012 according to LIMRA, there were sales of \$1bn of DIA's (against a total annuity market of c\$50bn – so 2% of the total annuity market and a much smaller % against total Retiree assets). The number of providers offering this product is now in the double-digits and production levels by quarter are increasing relative to the earlier quarters.
- Finally, Deutsche Bank in its paper on DLA's – a game changer for CGF, references that DLA's have a potential market share of 40% of retirees (targeting retirees with asset balances of \$200-\$800k). They opine that with 40%-50% of these retirees seeking financial advice and a 20% take-up, implies 8% of retirees may purchase a DLA. Going one step further (although the amounts would have been factored into the reports cashflow projections), and assuming that DLA's would be around 20% of the cost of a full lifetime annuity, suggests about 1.5% of assets could be in DLA's at some point.
- On the basis of above, assuming all impediments are removed, reaching a level at some point in the future where total annuity sales (lifetime and deferred) are between 2%-4% of total Superannuation assets seems reasonable.

3.2 Regulatory status update

A number of Superannuation Industry (Supervision) Regulations 1994 (SIS regulations) may be seen as impediments or creating uncertainty in regard to the development of a deferred annuity.

In essence, in order to meet the requirements of the regulations and thereby receive the benefit of the investment income backing the annuity being tax free, an annuity must be paid at least annually throughout the life of the primary beneficiary or throughout the life of an eligible reversionary beneficiary. The regulation also limits the amount by which the annuity payment can vary from year to year.

There is also an APRA prudential standard on minimum surrender values of pension and annuity products. Applying standard minimum surrender values to such products would make them unattractive from the point of view of a provider, given that an individual might use the minimum surrender provisions if it becomes apparent to them that they are not likely to reach the age at which the deferred annuity or pension is payable. We understand that the new APRA surrender value standards do not mention these products but the status should be confirmed.

Of more immediate promise, and the driver for this section of the paper, is that the tax treatment of earnings on assets during the deferral period has been placed on an equal footing with other risk products. Previously, a deferred annuity was subject to 15% tax on investment earnings on Superannuation assets during the deferral period, despite no actual income being paid to the policyholder. This has been proposed to be removed from July 2014 and seems supported by both major political parties.

The Treasury also requires minimum drawdown rules in the first year. This remains a major impediment for deferred annuities and needs to change to ensure that the market can develop.

Lastly, there are other broader impediments that might remain at a policy level:

- Different treatment of insurance companies and Superannuation providers who cannot offer annuity products – the Henry Review recommended that given the nature of these products, they should only be provided by prudentially regulated entities.
- Potential asset test requirements during the deferral period, again despite the annuity income not being received. As set out by the Actuaries Institute in the pre-budget submission of 27 Jan 2012, this may also lead to unfavourable treatment under aged care and Centrelink rules.

3.3 Risk structuring

There are two fundamental constraints, different to other traditional annuities that providers need to consider. The deferral period in particular creates two complex problems:

Longevity: A Reinsurer's Perspective

- the even bigger shortage of long dated assets to hedge the liability, and
- length of the liability cashflow stream is further shifted out relative to a traditional annuity.

Hence, in an ALM context, we really don't have the A and we really don't know the L. Therefore, risk providers will need to look for innovative solutions.

On the asset side, there is no doubt that offering of long dated government bonds would be an ideal solution (government debt in Australia is issued to 2030, but in small amounts). Failing this, the following could be considered as part of the asset management strategy (theoretically):

- duration matching in longer duration asset classes e.g. infrastructure, property
- longer duration OTC swaps (swaps can last as long as 30 years)
- strategies around swapping market risk for modelling risk (there are a variety of possible strategies here around constructing a long end model using available bonds – all of which may lead to reinvestment and modelling risk).

One possible source of how to approach the asset side is to look to the strategies employed by some of the Scandinavian insurers. They use the Euro swap market to hedge the local currency liabilities, holding the risk of EUR/Scandi rates diverging. However, the use of Euro in Denmark/Sweden is that central banks aim for stability with respect to the Euro. Denmark, in particular, is part of the ERM-II mechanism – its currency must be within 2.25% of the Euro. Finding an equivalent proxy Australian rate market is therefore more problematic. Correlated Asian markets have similar liquidity in longer dated rates as per the local market.

Ultimately all of these asset hedging strategies leave some form of residual risk (be it market, modelling or basis). This potentially requires sufficient buffers (additional capital) to cater for these risks until a more efficient class (longer dated bonds) is introduced. Alternatively, and until the asset side has sufficiently developed, we could consider some form of participating structure around investment earnings i.e. guarantee of a minimum level of return which ratchets up or some form of with profit bonus declaration. However, any reviewability in the product would impact on the marketability of these products to consumers.

In terms of the liability side, our view is that the following should be considered to mitigate some of the tail risk:

- Only written as part of a package of longevity risk (immediate and deferred blocks). This allows some level of cross subsidisation around an overall reduced duration.
- Introduce a cap on the maximum length of the payment stream once the annuity commences e.g. to age 105 or
- Only offering for deferral durations of 10 years or less
- No optionality for consumers around withdrawal during the deferral period (to avoid any anti selection)

The other material risk to consider on the liability side is around anti-selection. In a voluntary setting, this risk needs to be carefully considered (relative to other compulsory

Longevity: A Reinsurer's Perspective

systems). This suggests that mortality assumptions for deferred annuities need to consider the adjustment factors required. At a broader structural level to mitigate this risk, we would advocate the setting up of an industry pooling arrangement akin to the health fund industry where we could consider pooling the risk through an industry run scheme that shares in the profits and losses as actual longevity emerges.

In the absence of a broader structural reforms, the voluntary option (which introduces anti-selection) in Australia needs to be managed and priced for to mitigate the risk.

As with the asset side, we could consider further some deconstruction of the risk and passing some to policyholders while leaving the rest with the provider.

There are also administration considerations that may necessitate certain design features. Examples here are limiting the product to single premiums only (reducing administration complexity and reinvestment risk).

3.4 Lessons from other countries

There are a number of different markets that offer or have offered some form of post retirement deferred annuities.

Milevsky (2006) refers to a product sold in the 1980s by IDS Life Company that offered many of the features of a traditional post retirement deferred annuity commencing at age 80. The paper references that sales of this product were not commercially successful.

Rusconi (2008) sets out some of the different systems. Countries such as UK, Germany, Denmark and Belgium offer deferred annuities these are typically developed pre-retirement (policyholders saving through their working lives with some form of guaranteed conversion at retirement). For the purposes of this paper, we will not explore further the pre-retirement guarantees options.

Chile provides an interesting market to investigate. A World Bank report titled 'Developing Annuities Markets – the experience of Chile' by Rocha and Thorburn explores the market in Chile. In particular, although small, it highlights from a small sample that 30% of annuities in 2005 offered some form of deferment but only 3% had a deferment period longer than 3 years. The size of the upfront premiums (lower broker commissions) was cited as one reason driving the shorter deferred periods.

A further potential comparable market that we can look at is the US. The US market for deferred annuities (called Deferred Income Annuities) started in July 2011 with New York Life. They are one of the annuity market leaders, a Mutual, and sales of these products largely through their own salesforce (which is a big driver anecdotally for the success). Anecdotally again, these products took off by surprise with sales around \$1bn in 2012 according to LIMRA (note that 4th quarter sales were up 150% on the first quarter of 2012).

Longevity: A Reinsurer's Perspective

The number of providers appears to be in the low teens and the market appears to be geared towards a lower average deferral period (c10 years) although providers can offer deferrals of up to 40 years. The target market is consumers aged 50-60. Also of interest is that most DIA's anecdotally offer some kind of death benefit and/or a return of cash during the deferral period which partly erodes the mortality credit value of these products use to consumers.

Other example products offered in the US are:

- American General Future Income Achiever
- Guardian SecureFuture Income Annuity
- MassMutual RetireEase Choice
- MetLife LIG (Longevity Income Guarantee)
- Northwestern Mutual Life *Select* Portfolio
- The Principal Deferred Income Annuity
- Prudential Defined Income
- Symetra Freedom Income Annuity

Singapore is another interesting case study to follow in this area. They launched CPF Life (Lifelong Income for the Elderly) which commences in full from this year. Broadly their solution which has been extended this year works as follows:

- At 55, individuals purchase a deferred annuity with some of their retirement savings. A second premium payment follows at age 65
- The annuity commences either from age 60 or 90 with the remainder of the retirement savings available for drawdown from age 65

The interesting part of this structure is that the longevity risk (and part of the investment risk) is pooled amongst the membership. If the pool experiences worse than assumed longevity, the members receive a lower level of income. This is akin to some of the European models being considered where the retirement age can be linked to experienced longevity.

From an Australian perspective, we should point out that our market is structurally different (for example, there is no age pension in Singapore, the scheme is compulsory and this new structure extends a previous arrangement whereby income drawdown was compulsory). However, the idea of a pooled industry scheme would alleviate some of the longevity liability concerns around avoiding anti-selection and allow the market to develop.

3.5 Some pricing considerations

In terms of offering a '101' set of pricing guidelines, pricing a deferred life annuity is a function of a number of standard cashflow components. In this section, although we highlight some of these items, we focus on the challenges with mortality assumptions rather than covering all.

Longevity: A Reinsurer's Perspective

Pricing a single premium deferred annuity, at the simple and broadest level, makes use of the following actuarial notation:

$$SP = (1 + L) (1 + r)^{-u} \bar{a}_{x+u} ({}_uP_x)$$

Where

SP = Single Premium to be charged at age x

L = Loading to cover expenses, distribution and cost of capital

u = Length of the deferral period

r = interest rate

\bar{a}_{x+u} = continuous discounted annuity factor

$({}_uP_x)$ = conditional probability that someone aged x will survive for u more years

For the purposes of this paper, we will not seek to address each of the underlying components of the claims cost. However, one area worth further exploration, and an area where reinsurers can offer assistance, relates to the calculation of the claims cost component (making up $\bar{a}_{x+u} ({}_uP_x)$) under the cashflow modeling approach. This includes:

- base mortality tables
- mortality improvement rates, possibly age and calendar based
- mortality improvement floor and age
- mortality base year and improvements adjustment
- mortality grading factors for males and females and by age
- assumed likelihood of annuitant survival after payments stopped
- extension of table age.

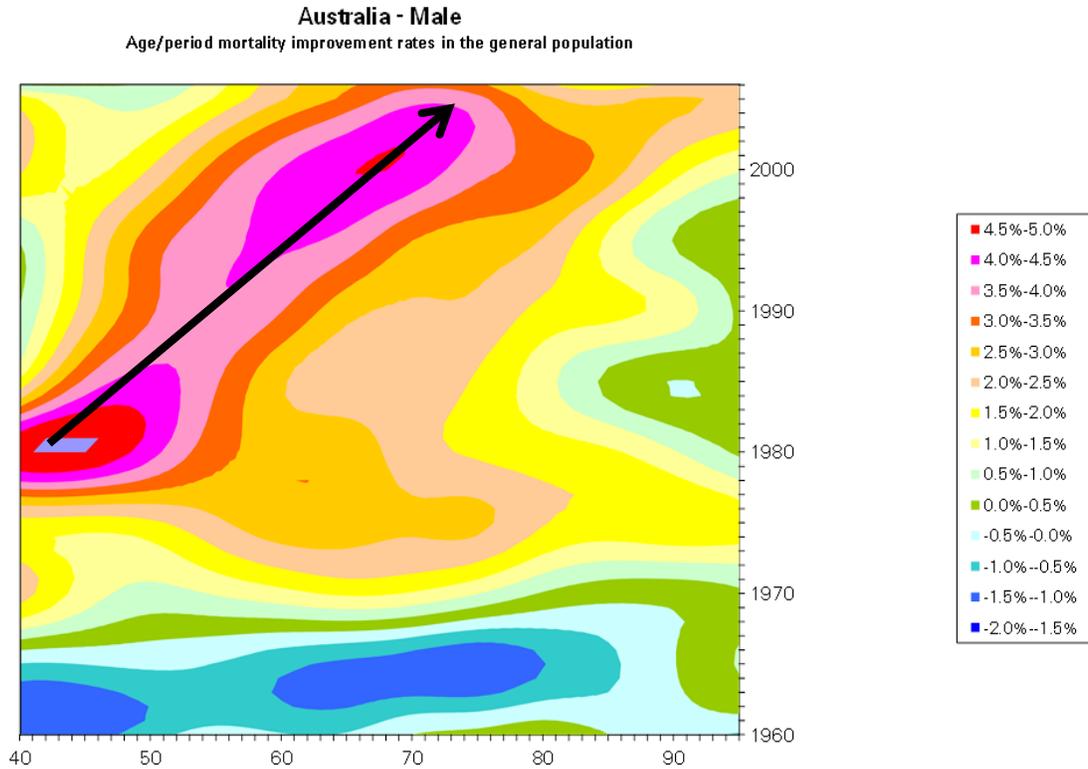
There are other annuity specific factors such as late notification of deaths that need to be factored in but have not been mentioned for simplicity.

To pick up on the first three of these assumptions, in terms of base tables, there are a number of published actuarial tables of population mortality shapes at older ages. One possible table for use is the ABS 2009-2011 population table. The grading factor to apply will be a function of judgment, insured annuitant experience (if available) and potentially some discussion with your reinsurance partner. Also factor in any grading for anti-selection and the shape as it runs down from purchase age (the UK population against UK insured annuitant/pensioners tables provides some benchmark of the shape for initial selection although how to apply to deferred annuities and in a non-compulsory setting is difficult).

One key area of contention relates to the choice of improvement factors. In terms of improvements, whilst a flat improvement factor can be applied (with age adjustments), these tend to ignore the historical shape of the improvements at a cohort level. One way to consider improvements is to view them in terms of a heat map, as follows:

Figure 3: Heat map showing Australian male mortality by year born and year of death

Longevity: A Reinsurer's Perspective



This table follows the Australian male population improvement levels for different cohorts. As an example, the bottom left hand corner of the table shows the improvement factors p.a. for a 40 year old in 1960 (i.e. born in 1920). Looking at the red section in the middle of the table, we can see that the cohort of lives aged 40-50 in 1980 exhibited historically the biggest improvement factors p.a. For interest, these were lives born broadly between the two world wars and during the great depression – their high levels of improvement have a number of theories around it but are attributed to factors such as:

- survival rates for young children during that period (only the healthier children surviving a tougher economic period)
- first cohort to stop smoking en masse
- cohort benefitting from the social security programs introduced (e.g. Medicare).

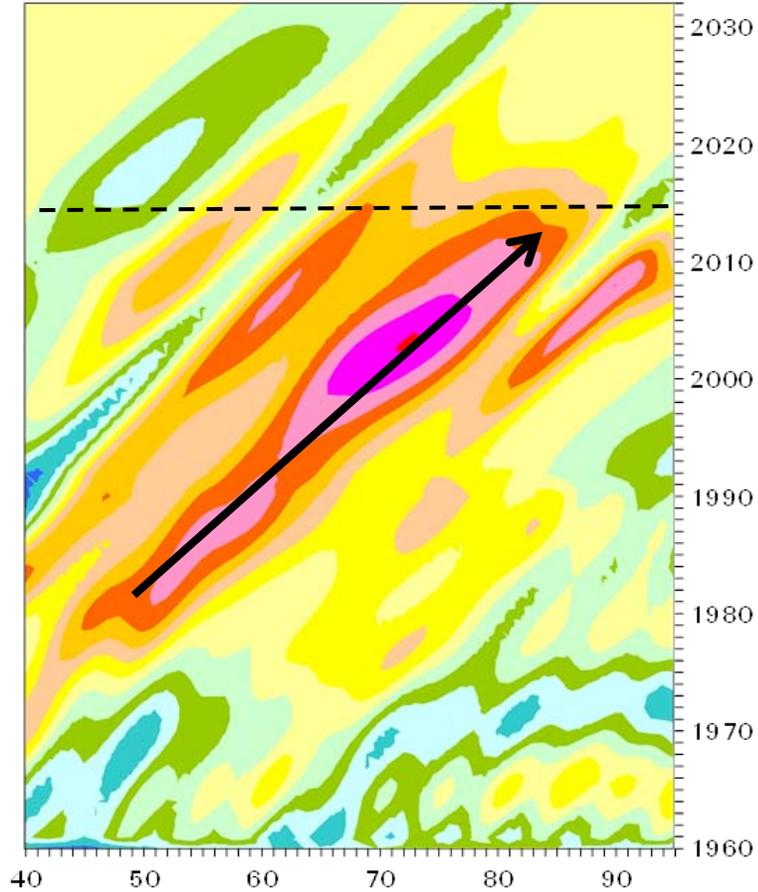
These cohort effects have been observed globally.

The reason for highlighting the cohort shape is that when setting improvement assumptions, care needs to be taken to track the development of the cohort groups by age and calendar year. In fact the UK have recently published industry tables (CMI Projections – see table 3) which offer an improvement table for annuity pricing which incorporates the different cohorts and shapes. These base tables can be considered for use in setting the shape of the improvement factors.

Figure 4: Heat map showing England & Wales male mortality by year born and year of death

England and Wales - Male

Age/period mortality improvement rates in the general population with UK CMI projection- male



A further consideration is whether to apply some kind of floor to the improvement levels. This should be considered both in terms of the level of floor and when to apply (ultimate).

3.6 Conclusion

At the simplest level, despite the recent tax changes affecting deferred annuities, we are still faced with the fundamental problem of how to get Australian consumers to annuitize their asset pots in a purely voluntary system. As advocated by the authors, key to the development of this annuity market relies on the introduction of some form of compulsory purchase requirements for consumers to annuitize. Failing this, at a minimum, extended tax incentives need to be created to ensure that setting up of guaranteed income streams is encouraged.

In terms of some questions we raised at the start of the section, let us return to some of the key questions that product development teams are looking at and our thoughts as discussed in this paper:

Question	Conclusion
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Longevity: A Reinsurer's Perspective

What are we actually talking about?	Single premiums Purchased at retirement Deferred start date Guaranteed for life
Can we really market the benefits?	Definitely Mortality credits offer a yield enhancement over other asset classes
What's the size of the prize?	2-4% of total Super assets for both lifetime and deferred annuities at some future point
Is the market ready?	Not entirely – it can be worked through but still some efficiencies to be gained
The tail is now even longer?	Write as part of a package, limit the maximum deferral period, introduce caps and ensure no optionality. Also price in the risks of anti-selection
What assets?	Residual risk will remain in the absence of long duration bonds. There are alternatives but additional capital is needed for the mismatch
Lessons learned?	Look to the US market for developments of DIA's (launched in 2011).
All comes down to mortality and improvements?	Follow the cohort in terms of improvements, consider a floor

4. Comparison of the different product options

Although a brief summary, in assessing and comparing the two current longevity product types, along with a potential DLA type, the following points are relevant:

GRIPs – those with a lifetime income option

The retiree can retain the same investment mix as existed pre-retirement, with high growth assets included in the portfolio.

The retiree can hedge the longevity risk, with a guaranteed annual income for life.

The retiree has flexibility and liquidity because partial or full withdrawals are permitted at any time.

The disadvantages of GRIPs are the investor is exposed to poor asset performance in the period soon after commencement and the total asset fees, including the annual guarantee asset fee, are higher than similar allocated pensions, which do not offer guarantees.

The fees for the lifetime guarantee are between 1.1% p.a. and 2% p.a. and the combined administration and investment management fees are between 1.0% p.a. and 1.3% p.a. for a balanced investment option. This means the total annual asset fee for a retirement income product ranges from 2.0% p.a. to 3.3% p.a. The total fees each year are therefore just below the starting income level paid to retirees and are an important consideration for retirees in evaluating their product selection.

ILAs

The retiree may perceive these as illiquid, inflexible and prone to loss of capital if the investor dies sooner than expected.

These criticisms are partly negated if the product has a minimum payment period or a commutation facility, similarly to those outlined in 2.3.3.

ILAs may be seen as unattractive if interest rates are at historically low rates or there is a lack of competition.

DLAs

The retiree can defer the purchase of a guaranteed income stream until survival to an older age, creating a cheaper source of hedging their longevity risk. This provides flexibility around their remaining asset pot and works even in a low interest rate environment due to the benefit of mortality credits.

The retiree, as with immediate annuities, may see this as inflexible and illiquid but the upfront cost would reduce their focus on the negatives.

Longevity: A Reinsurer's Perspective

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