



Institute of Actuaries of Australia

## **Next Generation Retirement Income Streams**

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## **1. Introduction**

The funding of retirement incomes is an issue attracting global attention due to increasing life expectancies and aging populations, along with the joint forces of higher living standards and higher levels of household debt. The issue is relevant to individuals accumulating assets to fund their own retirement, to companies funding defined benefit pensions of employees, and to governments funding both public sector superannuation funds and social security benefit systems.

Planning to provide an adequate level of income for retirement requires an understanding of a number of relatively complex variables and their interactions. Some of these may be certain or controllable, such as retirement age, superannuation contribution rates or investment strategy. Others are uncertain and not directly controllable including lifespan, level of health and actual investment returns.

There is a general awareness and understanding of investment risk by individuals, corporations and governments (or their respective advisors) leading to adoption of investment strategies to achieve desired risk and expected return outcomes. However, longevity risk is less well understood, and appropriate strategies to mitigate or manage this risk less obvious. Given the general trend from defined benefit to defined contribution superannuation arrangements, these risks largely fall to the individual to manage.

A growing recognition of the need for product solutions that enable individuals to manage this risk has driven product development activity in many markets, including Australia. In this paper we provide an overview of some of these developments both in Australia and overseas, leading us to conclude that there is still significant progress to be made to raise consumer awareness of the issues and provide appropriate product solutions.

## **2. The Opportunity**

The compulsory superannuation regime in Australia has led to substantial growth in the funds management industry and a reasonable level of public awareness of retirement funding issues.

Outside of the public sector, Australian superannuation is dominated by defined contribution arrangements, with the majority of superannuation assets currently residing in the accumulation products of pre-retirees. Funds under management (FUM) in retirement income stream products are substantial and growing. At 31 March 2007, total FUM in retirement income stream products was \$80bn, with sales in the preceding twelve months of \$16bn.

Allocated income stream products account for approximately 85% of fund in retirement income stream products, with the balance in annuity products including term certain and lifetime. Allocated income stream products account for 91% of new business for the 12 months to 31 March 2007, with the

balance in annuities. Subdividing further, lifetime annuities represented only 0.2% of new business sales.

The obvious implication of this market profile is that a significant proportion of the working population will be funding their retirement through defined contribution superannuation arrangements and, where eligible, the age pension, and are therefore exposed to both investment risk and longevity risk.

At the macroeconomic level, there is the question of whether current levels of superannuation saving provide adequate funding for retirement benefits. A number of studies have been undertaken to assess the adequacy of the current level of retirement savings of the Australian working population. Research conducted by Rice-Warner Actuaries on behalf of IFSA, estimated a retirement savings gap of \$452 billion in 2003. This amount represents the expected shortfall in superannuation savings for the working population aged between 25 and 65, earning between 0.75 and 2 times the average wage.

At the micro level, the question is whether individuals have adequate advice and available products and strategies to manage an unknown liability given they are unable to predict with certainty either their lifespan or future costs of living. This raises the question of why lifetime annuities are not more popular. The relatively small market for guaranteed products is likely to be due to a combination of factors including:

- the unwillingness of individuals to pay for guarantees, possibly because they do not recognise the nature of the risk they are taking
- a desire by many individuals to retain investment choice
- reluctance by product issuers to offer guaranteed products due to the risk assumed and associated capital requirements.

It is our view that a gap exists in the market for hybrid products that help individuals manage their longevity risk without having to pay for an absolute income guarantee. These products would share the risks between the provider and the individual, resulting in lower capital and guarantee costs than arise in respect of lifetime annuities, whilst providing some degree of risk transfer away from the retiree.

### **3. Managing the Risk of Retirement Funding**

Individuals currently have a choice of strategies to manage longevity risk:

#### **3.1 Maintain a Savings Buffer Just in Case**

Probably the simplest strategy to manage one's own longevity risk is to maintain a safety margin in retirement savings. If an individual plans for a long life expectancy then they are less likely to exhaust their savings.

The obvious flaw in this strategy is the requirement that the individual has sufficient assets to maintain this margin. The research on the savings gap suggests that for many retirees this is unlikely to be the case. Even where an individual may be able to set aside funding, it may be at the expense of a reduced standard of living in the earlier years of retirement to protect against an uncertain future risk. This may not be an acceptable trade-off and in any event the buffer may not be sufficient.

#### **3.2 Purchase Certainty – Lifetime Annuities**

The second strategy is to purchase a guaranteed income stream. Lifetime annuities meet this requirement offering a certain income stream irrespective of investment and longevity outcomes. However, as noted, these products make up a very small proportion of the retirement income market and do not appear to meet the requirements of the majority of retirees. The cost of the absolute guarantee provided appears to be considered too expensive by most retirees.

#### **3.3 Rely on the Age Pension**

A third strategy may be to rely on the social security safety net. The age pension is available to all Australians, subject to an asset and income test. However, the amount of the age pension is currently \$22,900 for couples and \$13,700 for singles. In comparison, a 2004 ASFA survey determined a comfortable retirement income level to be \$46,297 for couples and \$34,563 for singles, significantly above the age pension income.

While it is not unreasonable to rely on the age pension to contribute towards retirement income, there is a significant risk that sole reliance on the age pension when other funding is exhausted may lead to an unacceptable drop in standard of living.

#### **3.4 Reverse Mortgages**

Reverse mortgages are gaining in popularity, possibly providing some support to the argument that there exists a retirement funding gap. However, these products are typically viewed by retirees as a last resort strategy, with most feeling somewhat uncomfortable about cashing in the family home leaving no buffer of funds for future unforeseen circumstances or bequests.

### 3.5 Defined Benefit Superannuation

For those fortunate enough to be a member of one, defined benefit pension schemes are an example of risk pooling across a member population on behalf of the funding organisation. Unfortunately for retirees, funders of defined benefit superannuation funds have, like annuity writers, begun to realise the true cost of providing such guarantees, resulting in these funds all but disappearing as retirement funding options.

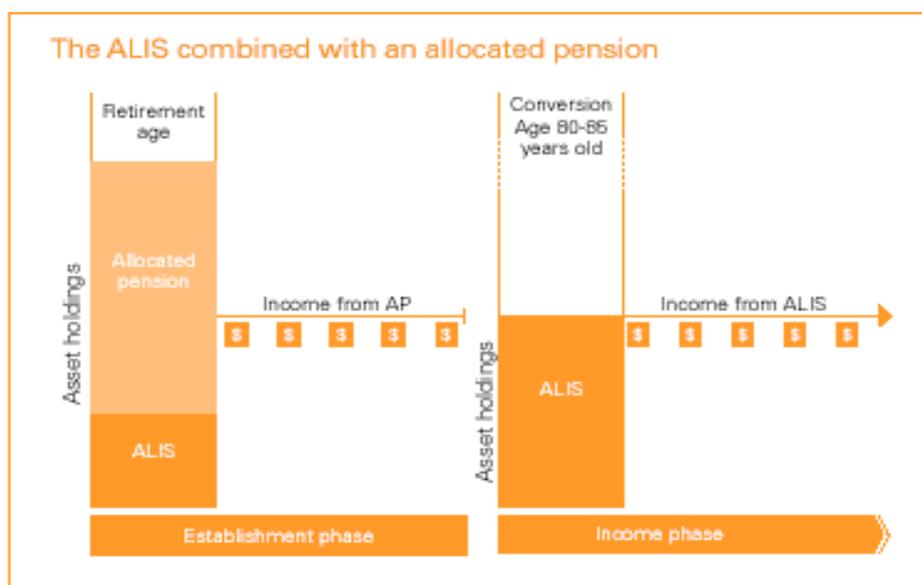
## 4. Recent Australian Product Innovation – The Asteron Longevity Income Stream (ALIS)

### 4.1 Product Overview

What is apparent from our review of the above strategies, is that some form of insurance has a role to play in managing longevity risk, whether it is the individual self-insuring by holding excess assets in ‘reserve’ or through a pooling mechanism. In recent years there have been global moves towards product development activity aimed at providing a tool to better manage longevity risk.

The Asteron Longevity Income Stream (ALIS) product launched in September 2006 was an attempt to address some of these issues in the Australian market. ALIS is a single premium retirement income product that runs over two phases, the establishment phase and the income phase. The product is designed to complement an allocated pension, by commencing lifetime annuity payments at an advanced age, when an individual’s allocated pension balance may be running out. This is illustrated in Figure 1.

**FIGURE 1**  
**The Asteron Longevity Income Stream**



The establishment phase lasts from entry into the product through to a nominated conversion age between 80 and 85. During this phase the members' contributions are invested in a choice of investment pools. The balance accrues investment income and the redistribution of funds from deceased members.

At conversion age, the member enters the income phase of the product and receives a regular income stream for their remaining lifetime. The starting amount of the income stream is determined at conversion age based on prevailing mortality and interest rates rather than being guaranteed at outset.

The amount of the annuity payments in the income phase of ALIS will vary with the mortality and investment experience of the pool of annuitants, subject to a partial guarantee that provides an underpin to the payments, ensuring that ongoing income does not drop below 80% of the income level in the first year after conversion age. The cost of providing this guarantee is much lower than providing an absolute guarantee from age 65 and therefore provides a higher level of expected income from the date of conversion. Other than if the guarantee bites, deviations from the conversion age mortality and investment assumptions (both positive and negative) are reflected through an adjustment to the ongoing income stream.

The core principle of the ALIS policy is the pooling of longevity risk rather than the provision of an absolute guarantee. Members surviving to conversion age receive an income that is partially funded by the members who do not survive. The product therefore falls between the existing retirement income products as shown in the following table.

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**Table 1**  
**Allocation of Risk – Retirement Income Products**

	Lifetime Annuity	Allocated Pension	ALIS
Individual Longevity Risk	Life Insurer	Member	Pooled
Population (Mean) Longevity Risk	Life Insurer	Member	Pooled
Investment Risk	Life Insurer	Member	Member

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The impact of this pooling may be explained by considering the two sources of longevity risk for members:

- Variability in individual lifespans – the risk of an individual living longer or shorter than their average life expectancy on entering the pool is diversified across all members of the pool. The members surviving to conversion age receive an income that is topped up by the funds committed to the pool by the deceased members.
- Changes in mean life expectancy – members as a group retain the risk that, on average, all members live longer or shorter than their assumed

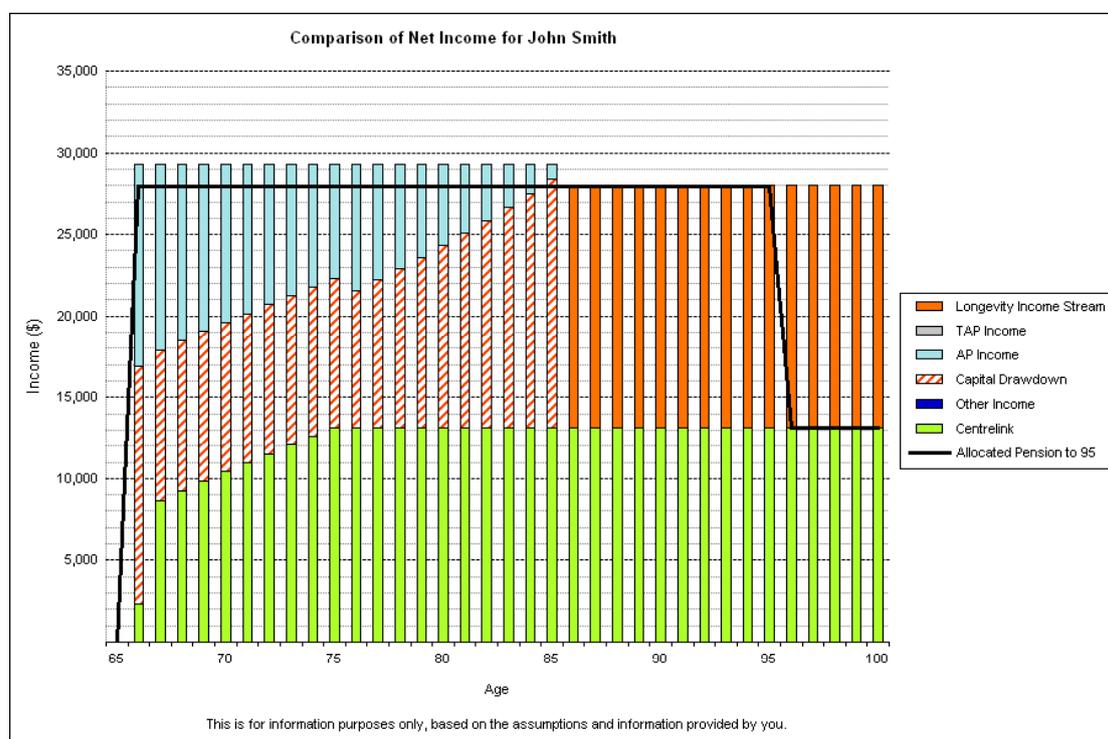
life expectancy at policy commencement. Membership of the product does act to partly diversify this risk, as an individual will still derive some benefit from membership of the product if some members do not survive to their life expectancy on entry.

The ALIS product does not attempt to provide guaranteed investment returns. A choice of investment pools is offered and members may switch between pools at any time during the establishment phase. Investment choice is therefore at the discretion of the member, and their future income is directly impacted by their investment returns.

The product provides individual members with a mechanism to diversify part of their own longevity risk, in the same way that they may diversify investment risk, without paying the cost of an absolute guarantee. The cost of this diversification to the member is that part of their ALIS premium is lost if they die before reaching conversion age.

As already noted, the ALIS product is not intended to be a replacement for an allocated pension, rather it may be considered an additional investment option into which the individual may place part of their retirement funds, or alternatively an insurance premium. The following diagram illustrates an example of a retirement income funded by a combination of ALIS, an allocated pension and the age pension.

**FIGURE 2**  
**Example Projected Income – Single Male**



The chart illustrates how a higher long term income can be achieved through a combination of the ALIS product and an allocated pension for a single male.

The stacked bars show the combined income from a combination of ALIS, an allocated pension and the age pension. The black line shows the equivalent income from an allocated pension and age pension. The longer the member lives the larger the benefit of ALIS. The “cost” of this income benefit is a lower estate on death.

## **4.2 Actuarial Management of ALIS**

The ALIS product is a hybrid of an investment and insurance product. It may be considered a form of insurance where the relationship between premium and benefits is not guaranteed (as is the case for a yearly renewable term contract without guaranteed premiums). Alternatively, it may be considered an investment pool with an additional, uncorrelated, source of return through the redistribution of funds from deceased members.

While there may be debate around the exact classification of the product, the actuarial assumptions and analysis required to price the product, determine estimated income projections and manage an equitable allocation of the pool to the surviving members at conversion age, are no different from those applied to price traditional risk and investment products. Indeed, the pooling concepts are not dissimilar from older participating products.

At commencement, a member is provided with an estimated income stream to be paid on survival to conversion age. This estimate is updated throughout the establishment phase of the product based on emerging experience and current assumptions. The requirement for realistic assumptions in respect of both current mortality rates and future rates of mortality improvements is therefore key to providing reasonable income projections to members both at inception and throughout the contract term.

As with other risk products, management of potential anti-selection risk is a significant element of the product design. The difference to a standard risk product is that if anti-selection occurs, the cost will always be borne by the remaining members of the pool. The risk pooling concept will fail if members can withdraw their funds if their health deteriorates. The product must therefore impose limits on voluntary withdrawals and include eligibility conditions on the entitlement to longevity benefit enhancements.

The equitable allocation of the assets of the deceased members to the surviving members of the pool also requires the application of actuarial techniques such that the annual allocation to each member is equitable, reflecting their relative risk exposure for the year.

## 5. Product Design – Navigating the Rules and Regulations

Innovation in financial services products in Australia has tended to focus on development within existing product categories (eg. benefit enhancements on risk products, more exotic investment options on wealth platforms) with the introduction of new product categories being far less common.

Legislation is largely structured around existing product categories, leading to some issues when trying to fit a new product type to the regime. As a result, truly innovative new product development requires the successful balancing of a raft of interdependent rules and regulations that never contemplated these new types of products. These include:

- Tax – ensuring equivalent tax treatment to substitute products
- Life Act and APRA Prudential Standards – where products are issued as life insurance products, ensuring compliance with Life Act requirements and all APRA prudential standards, including in respect of contract classification, capital requirements and minimum surrender values
- Superannuation Industry Supervision Regulations (SIS) – ensuring compliance with SIS product definitions in respect of complying income streams
- Social Security – ensuring equivalent treatment to substitute products under the income and asset tests for the age pension

A number of these requirements have significant interdependencies and minor product changes to address the requirements in one area can often cause issues elsewhere.

The ALIS product development process required a number of iterations to ensure that a design was achieved that balanced all requirements and did not create any undesired risk or inefficiency for either policyholders or shareholders.

One of the key difficulties in achieving this aim was determining the treatment of a product that is neither defined by reference to an individual account balance nor a guaranteed income stream at policy commencement. Much of the existing legislation is framed around these two categories of existing products. In the best case, this can lead to significant difficulty in extending the application and interpretation of the legislation to new product types. In the worst case, it can act as a barrier to innovative design as a new product cannot be expected to succeed if the benefits (ie. longevity pooling) are largely offset by more penal tax or social security outcome than other retirement income products.

A clear example of this is the new superannuation legislation that, while simplifying previously complex rules in many areas, is still defined in terms of

existing products and does not directly contemplate a product with an income stream that is guaranteed for life, but not at a defined amount.

As more development activity occurs in this area and the range of products expands, it is likely that both interpretation and drafting of the legislation will evolve.

## **6. International Developments**

The issues of increasing longevity and the provision of retirement incomes are not unique to Australia. Most developed nations are facing the same problem of increasing numbers of retirees who are living longer and are being supported by a reducing working population. As a result, governments globally are encouraging innovation in retirement incomes, largely through tax incentives, and a variety of product solutions is emerging.

### **6.1 US Style Variable Annuities**

The best known development globally in the provision of retirement income streams has been the advent of variable annuities in the United States. Variable annuities have been available in the US since the 1950s, however, it was during the 1990s that the product really caught investors' attention and sales took off. This was most likely due to favourable tax changes and the introduction of guaranteed death benefits throughout the 1980s. With improvements in technology and hedging capabilities in the new millennium, a new range of guaranteed living benefits have been introduced to the product, fuelling continued interest and growth, such that by 2005 a total of US\$1.8 trillion was invested in variable annuities in the US.

Variable annuities in their most basic form operate similarly to allocated annuities sold in Australia. They are typically sold as deferred annuities with an account value that increases, or decreases in line with changes in the value of an underlying pool of assets and from which income payments can be drawn down. The product has 2 phases, an accumulation phase, during which the policyholder contributes to build up the account balance which will be converted into a source of income during the payout phase. Historically, many were cashed in at the end of the accumulation phase and not converted to an income.

The key difference between these products and an Australian allocated annuity, is the range and prevalence of guarantee options that may be added to the base policy to provide additional financial security to the retiree. As discussed previously, Australian allocated annuity products leave all investment and longevity risk with the individual annuity holder. US Variable Annuities allow the retiree to purchase protection against these risks by offering a range of optional guarantees that may be added to the policy for an explicit annual charge. The most common of these guarantees are:

(i) *Guaranteed Minimum Death Benefit (GMDB)*

A basic variable annuity will pay to the policyholder's beneficiaries the accrued account balance if the policyholder dies during the accumulation phase, and may offer a limited death benefit if the policyholder dies while in the payout phase. By purchasing the optional GMDB, the policyholder can ensure that this benefit will not be less than his or her total contributions less withdrawals to the date of death.

(ii) *Guaranteed Minimum Income Benefit (GMIB)*

At the commencement of the payout phase, a policyholder may choose to annuitise his or her account balance at annuitisation rates then prevailing. GMIB options provide the policyholder with a degree of certainty regarding his or her income level in the payout phase by guaranteeing a minimum annuitisation rate and a minimum assumed account balance to which this will apply.

(iii) *Guaranteed Minimum Accumulation Benefit (GMAB)*

Purchasing a GMAB ensures that a policyholder's account balance will be at least equal to a specified minimum amount after an agreed number of years, regardless of the actual fund performance during that time. Typically the guarantee period will be 10 years.

(iv) *Guaranteed Minimum Withdrawal Benefit (GMWB)*

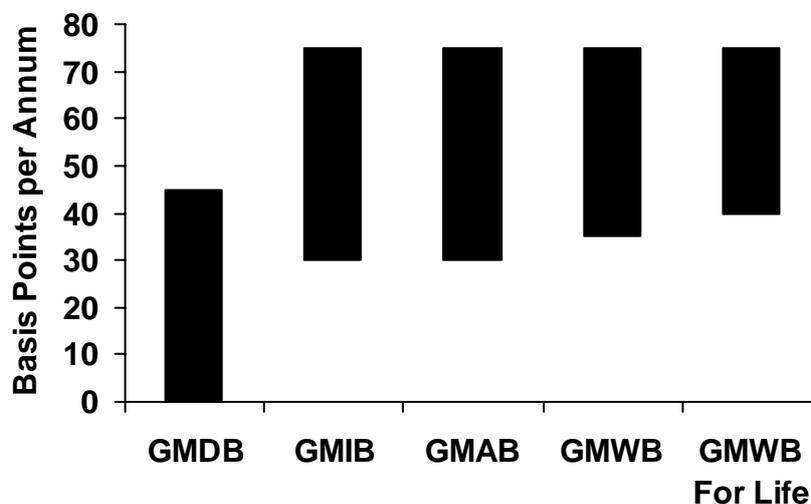
Standard GMWBs guarantee that a specified percentage (usually 5% - 7%) of a specified benefit base (frequently total contributions) may be withdrawn each year, for a maximum of  $x$  years, where  $x$  is equal to 1 divided by the guaranteed percentage. Recently, new style guaranteed-for-life GMWB's have been introduced, under which the policyholder is guaranteed to be able to withdraw the specified percentage every year for life. GMWB percentages under the guaranteed for life products are typically lower than standard GMWB rates, say 4% - 5%.

(v) *Ratchets*

For an additional fee, policyholders are able to purchase ratchets for most guaranteed benefits. Ratchets provide the policyholder with the option of resetting the minimum guarantee level, locking in investment performance up to the date of reset. Different levels of ratchet, at different fee levels, allow resetting to occur at specified points in time, or at any time during the term of the contract.

All guarantees are paid for by an explicit annual guarantee charge. Typical fee rates are shown in Figure 3.

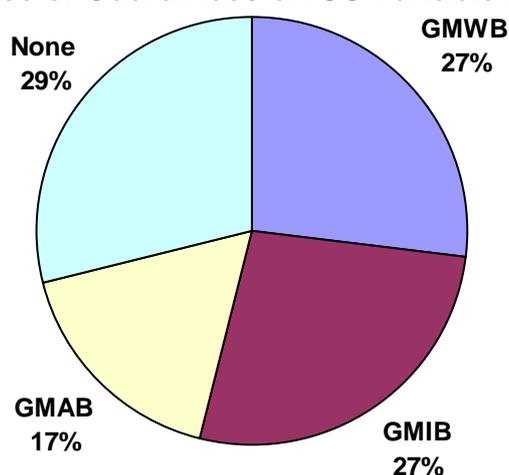
**FIGURE 3**  
**Typical Cost of Guarantees in US Variable Annuities**



Source: National Association for Variable Annuities, 2006 Annuity Fact Book

Optional guarantee benefits on variable annuities have proven to be very popular in the US. In 2005, 71% of all variable annuities included some form of living guarantee, as shown in Figure 4.

**FIGURE 4**  
**Prevalence of Guarantees on US Variable Annuities**



Source: Milliman

## **6.2 Popularity of Variable Annuities Outside the US**

### *6.2.1 Japan*

Variable annuities were introduced into the Japanese market by US multinationals in 2000. By September 2005, assets invested in variable annuities in Japan exceeded US\$70 billion.

The explosive success of variable annuities in the Japanese market appears to be due to a combination of favourable factors:

- The Japanese tax system provides significant advantages for investment in variable annuities, including enabling annuity payments of up to approximately A\$5,000 tax free, and concessional tax on payouts above this amount.
- A low interest rate environment, making it relatively more difficult for Japanese to make their retirement savings last throughout their lifetimes.
- A lack of viable alternative retirement savings products.
- A culture that values guarantees and certainty.
- Asset markets, particularly equity markets, that decrease as well as increase.

### *6.2.2 Canada*

In Canada a variant of the Variable Annuity products, known as Segregated Funds, are sold. The key difference between US Variable Annuities and Canadian Segregated Funds is that Segregated Fund products include guarantees to protect the investor's principal as an integral part of the product, rather than an optional extra. Typically segregated funds will guarantee between 75% and 100% of the investor's principal on maturity and death.

### *6.2.3 Europe*

US style Variable Annuity products have recently been introduced into some European countries, typically by multinationals with experience of the product in the US. In May this year ING launched a Variable Annuity product in Spain, which the company heralded as the start of a broader European roll-out. There are also a number of companies that have launched the product in the UK over the past year, including AIG, Hartford Life, MetLife, Lincoln and Aegon. Time will tell whether these products will enjoy the same success in Europe as they have across the Atlantic.

### **6.3 Innovations in Traditional Annuities**

In the UK, most retirees are encouraged via the taxation system to annuitise their pension benefits on retirement.

The requirement to purchase essentially lifetime annuities has driven retirement incomes innovation in a different direction from that in the US. Innovation is witnessed in the variety of different lifetime annuities available, this section outlines a selection of these.

#### *6.3.1 With-Profit Annuities*

With-profits annuities link retirees' annuity income payments to the performance of the company's with-profit (or participating business) fund. The level of annuity income typically starts quite low, and this amount is guaranteed as a minimum for life. Each subsequent year bonuses may be declared, based on the performance of the fund. Bonuses may be reversionary, which are guaranteed to be paid for the duration of the annuity, or special, which are only guaranteed for the year in respect of which they have been declared.

#### *6.3.2 Unit-Linked Annuities*

Annual income levels generated by unit-linked annuities are linked directly to the performance of the funds in which the annuitant has invested. Typically a range of funds with varying risk profiles will be available. The starting level of income is based on an assumed growth rate. If the fund earns more, then the retiree's income increases, if the fund earns less, income decreases. Most unit-linked annuities in the UK do not come with a minimum income guarantee.

#### *6.3.3 Impaired Life/Enhanced Annuities*

Probably the most significant innovation in recent times in the UK has been centred around making lifetime annuities accessible and meaningful for more of the population, particularly via the advent of impaired life and enhanced annuities.

Impaired life and enhanced annuities provide more attractive than standard annuitisation rates to individuals with reduced life expectancies. Impaired life annuities are sold in the UK to individuals with limited life expectancies due to illness and disease. More recently, companies have begun issuing enhanced annuities to individuals with lower than average life expectancies based on socio-economic or lifestyle factors, such as smoking status.

Impaired life and enhanced annuities, like traditional lifetime annuities, leave all of the investment and mortality risk with the issuing company, and do not share any of this with the annuitant. For this reason they create the same capital and management issues for companies as standard lifetime annuities.

## 6.4 Longevity Insurance

Globally there have been only a few limited attempts to launch pure longevity insurance products. Despite the widespread support for these products among researchers and retirement incomes experts, products of this nature have struggled to achieve commercial success.

The first attempt we are aware of was a product launched in the late 1980s by the IDS Life Insurance Company in the US. This product was funded by a single premium, paid 30 or 40 years prior to the commencement of benefits at the age of 80. The product included a participating structure in which surviving members benefited from the mortality profits arising from those who did not live to the benefit age. This is conceptually similar to the ALIS product, but was implemented via a relatively complicated schedule of mortality credits. Despite the benefits of this product in responsible retirement planning, sales failed to materialise as expected and the product was withdrawn from the market.

In 2004, Moshe A Milevsky wrote a paper entitled "Real Longevity Insurance with a Deductible: Introduction to Advanced-Life Delayed Annuities (ALDA)". In this paper, the author describes a concept product, called an Advanced-Life Delayed Annuity (ALDA), which is paid for by instalments over the working life of the purchaser, and then commences annuity payouts at an advanced age, say 80, 85 or 90. The author argues that this product has significant advantage for annuitants, by removing the risk that they will outlive their assets, however, he concludes that *"Quite likely a costly and prolonged marketing effort – undertaken by the industry as a whole as opposed to a particular company - will be required to make this concept a commercial success."*

We are aware of at least 3 providers that have launched longevity insurance products in the US. MetLife launched the Retirement Income Insurance product in September 2004; New York Life has a Longevity Benefit Variable Annuity; and The Hartford offers a product called Income Security. Outside the US, the ALIS is the only other example of longevity insurance of which we are aware.

We understand that sales of all longevity insurance products have been slower than expected. The most likely drivers of this are a lack of understanding amongst retirees of the costs associated with longevity, coupled with the unusually strong performance of investment markets over recent years. Many pre-retirees appear to believe that should they live to a very advanced age, they will not require very much income as they will not be doing a great deal. However, this does not take account of the costs of the level of daily care that will most likely be required. In our view, these products are likely to continue to struggle to meet sales targets until we experience a global downturn in financial markets and/or the first generation of retirees living off variable or allocated annuities begin to reach advanced ages. Unfortunately this may be many years away, by which time the cost of purchasing such insurance will have become prohibitive for those retiring today.

## **7. The Future**

The global retirement income stream market is a growing market with a clear consumer need that does not appear to be being fully satisfied by the current range of available products. In recent years there has been encouraging product development in this market, but more is required as the problems associated with aging populations intensify.

In our opinion, more needs to be done to provide options for retirees to reduce their exposure to longevity risk, in a manner that is reasonably capital efficient and thus affordable. Additionally, if such options do not emerge, the risk of mortality improving faster than currently anticipated will continue to be borne by retirees and governments.

The current obstacles to such products appear to be consumer understanding and regulation. The consumer education process is likely to take a number of years, even longer if markets continue their apparently monotonic increase. It is therefore essential that governments do all they can to simplify the process of product innovation and ensure that regulatory frameworks do not impede innovation in this area. In particular in Australia, reducing the complexity and inconsistency in definitions and requirements of the social security, tax and superannuation legislations would facilitate greater product innovation.

Throughout this journey there is a clear role for the actuarial profession to play in guiding the debate; proposing solutions and designing products; and assisting with consumer education. The traditional actuarial skill sets of mortality risk management, pooling, and ensuring policyholder equity naturally underpin optimal retirement incomes strategies. As a profession and as individuals we need to actively step up to this challenge, or we will let it pass us by and the problem will be solved by others; leaving us to question the ongoing relevance of the profession in the management of mortality related issues.

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