

THE DEVELOPMENT OF A LIFE ANNUITY MARKET IN AUSTRALIA: AN ANALYSIS OF SUPPLIER RISKS AND THEIR MITIGATION

The significant accumulation of superannuation assets must be converted into income to finance the retirement needs of individuals. This paper considers the development of a life annuity market in Australia focusing on the risk management for potential suppliers of long-term guaranteed annuity products. It also examines the role of government in this market, particularly in hedging for the major risks involved.



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Australia has a three pillar retirement savings system with the first pillar being a means-tested government-provided annuity, and the second pillar being a mandated private employer contribution into individual defined contribution accounts, but with no provision for annuitisation. Voluntary savings form the third pillar.

While the need for retirement income products including life annuities is obvious, it remains unmet. There are two aspects to be considered when trying to understand the lack of demand and lack of supply of annuities: why consumers don't annuitise; and why providers don't create and market suitable products.

There are many reasons proposed as to why consumers may not annuitise including: constraint on supply; lack of consumer awareness of the risks of not annuitising;¹ and bequest motives when consumers decide whether to annuitise their retirement wealth.²

While we recognise that there may well be consumer reluctance to purchase long-term guaranteed annuities even if they were available, this paper does not consider these consumer issues but it looks at the potential suppliers in Australia, the reasons they may not be prepared to provide attractive long-term annuities, and potential solutions. The paper also considers the risks involved for suppliers and whether these long-term annuity products should be solely provided by the private sector, the government sector, or some combination of the two.

Risk management for long-term guaranteed annuity products

The major risks involved in the provision of lifetime annuities are:

- > investment return;
- > mortality of annuitants; and
- > expenses of operation.

Investment risk

The traditional life annuity transfers all the investment risk to the issuer since payments are guaranteed. With indexed annuities, both investment and inflation risk are also transferred to the issuer. These risks can be mitigated through product design with some or all of the risk being left with the annuitant.

Life annuities are traditionally matched with dedicated bond portfolios or, at least, the interest rate and inflation rate risks are minimised through hedging. The lack of hedging instruments has encouraged investment in corporate bonds and equity in order to

achieve higher returns. Variable products require complex hedging of equity and other investment classes to ensure guarantees are met.

Hedging equity assets requires the use of options or an asset swap whereby the insurer swaps the return on their portfolio to another party in return for a fixed return, or a lower volatility of return over the life of the annuity. Options to provide downside protection are available to a limited extent in the Australian market through the Australian Securities Exchange (ASX), and are available for individual equity shares or for underperformance of the market as a whole.

Longer term options are negotiated individually over the counter through an investment bank. An asset swap

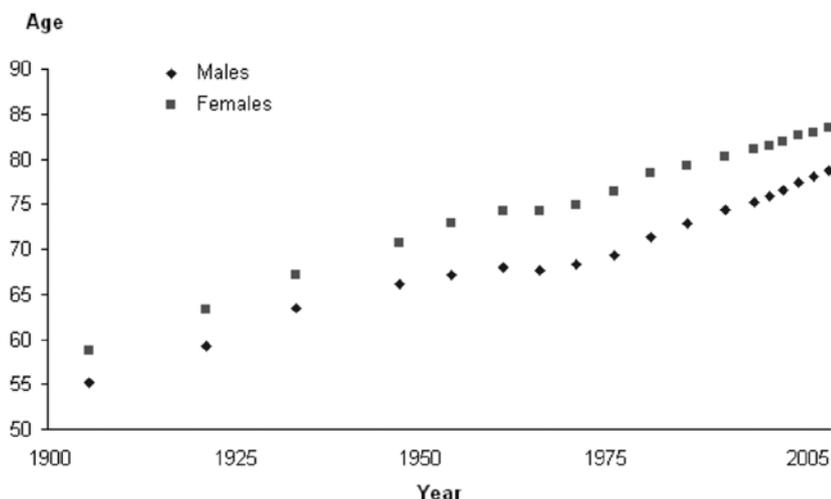
involves a counterparty taking on the investment risk of the insurer portfolio, as well as the risk of the average maturity of the annuity cash flows, and would need to be hedged by the swap counterparty.

Longevity risk and pooling

As in most developed countries, longevity in Australia has been improving through the past century and at rates that have been largely unexpected and significantly underestimated. Figure 1 indicates how life expectancies at birth have been increasing over the past century in Australia.

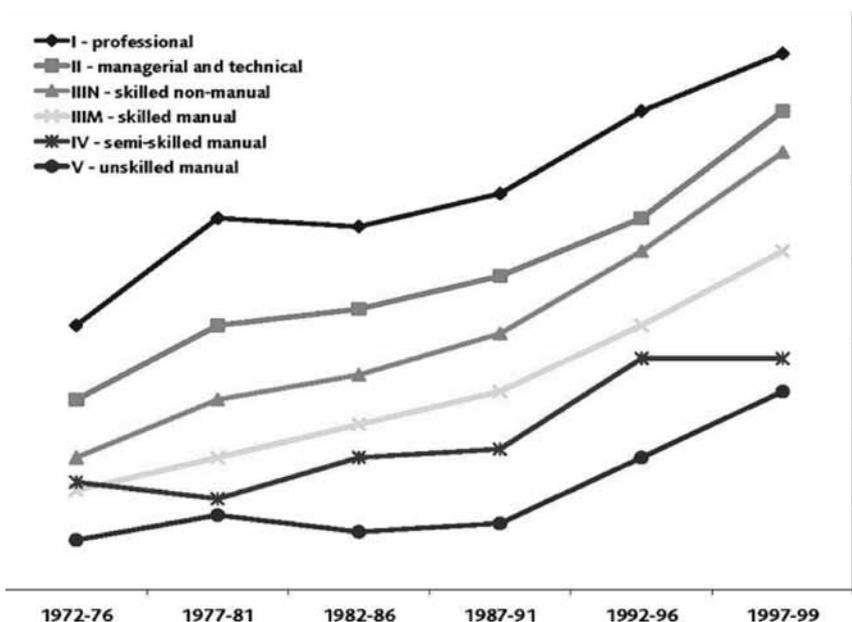
Socioeconomic group is a significant risk factor, as indicated by data from the United Kingdom in Figure 2.

FIGURE 1: Expected age of death, by sex, Australia, 1901–10 to 2004–06



Source: Australian Institute of Health and Welfare (ABS Cat. No. 3302.0; ABS Cat. No.

FIGURE 2: Male life expectancy at age 65 by socioeconomic group, United Kingdom



Source: ONS Longitudinal Survey.

A lack of natural investors to take on longevity risk results in demand and supply imbalance, and a lack of market development. The nature of longevity risk is new to financial markets and it does not have the normal properties of markets such as those for credit risks that have developed rapidly in recent years.

In a voluntary insurance market, insurers are faced with the risk of adverse selection. In a risk pool where there is substantial heterogeneity, this will result in those with a higher expected longevity purchasing life annuities and those with lower longevity not purchasing annuities. To avoid this, the insurer must undertake a risk assessment, to differentiate between those with different life expectancies, in order to charge fair premiums. This approach has led to impaired life annuities and postcode underwriting for life annuities in the United Kingdom.

Compulsory purchase of annuities avoids the problem of adverse selection but still leaves open the problem of fair pricing to reflect relative risks in a heterogeneous pool.

Mortality is traditionally assumed to be an independent risk that is managed by diversification of lives in large risk pools. The law of large numbers is relied on to reduce mortality variations to manageable levels and then capital is required to be held against the residual risk. Life annuities rely on the pooling of longevity risks to average the cost. They pool both systematic and non-systematic risks. Systematic risk arises from the uncertainty of the future survival probabilities because of common factors affecting mortality rates at future ages for a group of individuals. Systematic risks are those that affect all of the lives in the pool to a greater or lesser degree, resulting in dependence between the lives. Non-systematic risks are independent risks that have an impact on individual lives in an uncorrelated manner; this is referred to as idiosyncratic individual risk.

Over the past 50 years, the impact of improvement in mortality has mostly resulted from systematic improvements in economic conditions, better health care and better awareness and treatment of diseases, improved road safety and other factors that influence the survival of all individuals to a greater or lesser extent. Improved longevity has not just been a 'chance' outcome with higher than expected numbers of independent individuals surviving to older ages. The volatility in the survivors of a group of annuitants initially aged 65 has a high level of uncertainty arising from the systematic stochastic mortality.³

This risk must be managed through risk transfer using capital market products, such as securitisation, through

reinsurance or having enough capital. Using such risk transfer methods for the systematic risk allows this risk to be diversified with other risks that are relatively independent of mortality risk. In the case of securitisation, hedge funds can pool risks such as capital market risks, insurance catastrophe risks and mortality/longevity risk to gain diversification of these risks at a portfolio level. Similarly for reinsurers, diversification of relatively uncorrelated life and non-life insurance risks can achieve risk reductions at the portfolio level.

The creditworthiness of the counterparty to any risk transfer is also an issue over such a long period of time. At the moment, the only protection available to issuers of lifetime annuities against adverse mortality risk is through reinsurance contracts where effectively part of the annuity is sold to the reinsurer. Attempts to create long-term longevity bonds in the alternative risk market that would protect issuers of annuities from adverse mortality have been attempted, but failed to find investors. Apart from being a complex bond structure, it is likely that the term of the bond is a deterrent as well, as most 'catastrophe bonds' that have been sold to the market have been around three years in duration.

As noted by the OECD,⁴ a lack of natural investors to take on longevity risk results in demand and supply imbalance, and a lack of market development. The nature of longevity risk is new to financial markets and it does not have the normal properties of markets such as those for credit risks that have developed rapidly in recent years.

Inflation risk

Mitigation of inflation risk arising from indexation or partial indexation of annuity payments is possible through product design by offering only fixed indexation rate life annuities, or by using a cap on the maximum level of indexation. If full indexation is adopted then life annuity providers will need to hedge long-term inflation-indexed cash flows for the maturity distribution of life annuity cash flows. This requires long-term inflation-indexed bonds or inflation-linked swaps.

Expense risk

To mitigate expense risk, ideally, an issuer of a lifetime annuity would need to hedge against adverse inflation of administrative and other costs, typically over a 30-year period. There is no capital market product available that offers protection against inflation of expenses. Product design for charging expense loadings can mitigate the risk, but even variable annuity products have to manage this risk. While inflation-linked capital market securities exist, they are relatively small in volume and could lead to reinvestment risk.

Role of private markets

The private market provision of longevity insurance products in Australia has been limited. This reflects the limited demand for life annuity products and the

significant costs faced by private markets in supplying reliable and efficient longevity risk products. There have been many proposals for private market products.⁵ Some of the products developed, such as variable annuities, although attractive to individuals, require complex risk management and can involve exotic option structures.⁶

In the absence of viable or affordable hedging instruments for longevity, interest rate and inflation risks, private life annuity providers must hold capital to absorb adverse developments in these risks. In the insurance industry, risk-based capital is determined by APRA's life insurance prudential standards and it is increasingly influenced by Solvency II, which is under development for insurers in Europe.

Capital can be costly to hold for insurers. Apart from the competitive return demanded by investors on capital, insurance companies have to price products to cover the risk costs of capital ranging from expected financial distress costs, additional transaction or taxation costs as well as potential agency costs arising from misalignment of the interests of policyholders and shareholders.

Solvency II includes requirements for holding capital to absorb the change in liabilities for a permanent 25 per cent decrease in mortality to cover longevity risk. This may understate the potential risk since there is a large degree of uncertainty around possible future mortality trends.

Capital is also required for other risks that cannot be hedged. These include inflation risks, where the life annuities are issued on a fully indexed basis, as well as interest rate risk, where Australia lacks a long-dated and actively traded government bond market and also has a thinly traded long-dated interest rate swaps market.

The private sector annuity market must manage a large number of major risks in order for individuals to be provided with lowest cost annuities. In order to allow the most efficient use of risk-based capital, the major risks faced by annuitant providers need to be hedged in financial markets. Without this hedging, the risks faced by annuitant providers are significant and highly uncertain. The major risks for life annuitant providers are longevity risk as well as the inflation indexation risk for fully indexed life annuities. Variable annuities require much more sophisticated hedging and risk management than life annuities. Although the private market would normally have incentives to innovate and provide solutions, in the longevity risk case, this is yet to happen in Australia.

The role of government: private market support

There are strong arguments for government support for a longevity bond market including the issue by government of survivor or longevity bonds.⁷ By offering both long-term CPI-linked bonds that would deepen the existing market and longevity bonds, government can provide a viable market for hedging the long-term risks facing life

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annuity providers and reducing the costs of the annuities, hence making them more attractive to retiring individuals.

Longevity bonds pay future returns based on an index of population mortality. They allow purchasers to receive payments based on future mortality rates for the population, as mortality changes according to published mortality tables. They do not directly hedge a particular annuity provider's mortality risk but do so at the population level. Other financial contracts such as mortality swaps and other derivative-based and reinsurance-based contracts are required to manage the basis risk between the population mortality and individual provider's experience, but may not manage all of the basis risk unless specifically constructed to reflect the exact risks of the insurer.

The hedging of the credit risk of financial intermediaries — including those providing risk management instruments such as derivative and reinsurance contracts — is an important issue that is now well understood following the global credit crisis. Even in the securitisation market, there have been credit impacts especially where these arrangements relied on interest rate swaps or other hedging instruments. Those securitisation arrangements that have not been fully collateralised, such as synthetic CDOs, have resulted in substantial losses for major financial players as well as investors of individual savings including retirement savings. The government has the strongest credit rating and provides the assurance of contract performance that many private sector providers will not have.

The Australian Government has issued long-term inflation-indexed securities and has the market experience and knowledge to efficiently provide underlying securities for inflation risk. Providing loans structured as inflation-indexed annuity cash flows will provide even more demand for such securities in the event of the development of a more viable life annuity market in Australia. These securities also provide the basis for the development of other bespoke inflation hedging derivative instruments that can then be purpose designed for life annuity providers.

Similar comments apply to longevity-linked securities. Although the Australian Government may not be a natural supplier of such securities because of its exposure to longevity risk through the age pension, providing such instruments and creating a viable life annuity and longevity risk market will reduce the potential future call on government revenues from ageing Australians running out of their retirement savings.

Summary and conclusions

There are significant impediments to the development of a lifetime annuity market in Australia. This paper has reviewed those impediments including the major risks associated with the issuing of lifetime annuities and the lack of markets to hedge these risks.

The management of these risks is complex and the lack of developed risk transfer mechanisms is a concern that must be addressed.

To develop a sustainable annuity market for retirees on a cost-efficient basis, there are three broad solutions:

> *Private sector*: the private sector develops an annuity market for retirees, with government support to provide or organise hedging products for the major risks involved. If government support is not provided, it is difficult to see how the private sector can develop efficiently priced lifetime annuities that would be attractive to retirees.

> *Public sector*: a public sector solution would be potentially the most efficient, provided that annuitisation is compulsory.

> *Private/public sector partnership*: a private/public combination would be feasible with the private sector providing annuities for fixed terms, such as until age 85 or earlier death, and the public sector providing a deferred annuity from age 85 until death. The private/public solution would reduce the risks for the private sector and encourage an annuity market to develop, with the longevity risk being taken on by the public sector. This solution would work with both voluntary and compulsory annuitisation of retirement funds and is likely to be the most viable approach for future policy. ■

(This paper is based on commissioned research for Australia's Future Tax System.)⁸

Notes

1. Ganegoda and Bateman (2008).
2. Purcal and Piggott (2008).
3. Olivieri (2001).
4. OECD Monetary Review, 4th Quarter, 2007.
5. Ferro (2009).
6. Milevsky (2006).
7. Blake and Burrows (2001).
8. Evans and Sherris (2009).

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