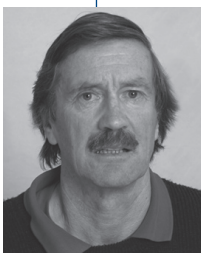
Lump sum retirement and government policy

The major problem confronting retirees with an adequate lump sum is how to maximise their retirement income stream with minimum risk. But this strategy has implications for future government debt funding and superannuation infrastructure policy, says **ROGER GAY**.



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Under the Keating Government's 1992 Superannuation Guarantee Scheme Australian employees are obliged to contribute a fixed proportion (currently 9%) of gross income to provide for their retirement. A small fraction of superannuants will be in receipt of a defined benefit pension in the form of an indexed life annuity, usually reversionary to a spouse. The remainder will be faced with the problem of converting a retirement lump sum – eligible termination payment (ETP) – into a retirement income stream (RIS).

Classic portfolio theory provides an optimal solution to the conversion problem which is described overleaf. The strategy depends partly on the availability of medium-term indexed annuities provided at a fixed rate of interest. Commercial providers exist, but generally the annuities are expensive and cannot be commuted.

Australian governments (federal, state and territory) have a unique opportunity to facilitate Australia's ageing population retirement funding, reduce inefficiencies in the commercial annuity market and fund long-term projects by issuing future debt in the form of annuity bonds – credit foncier bonds – rather than traditional coupon or bullet bonds, or as indexed annuity bonds. Governments have issued such bonds in the past (ACT currently has 20-year CPI indexed bonds payable quarterly on issue).

The availability of annuity bonds would enable retirees to purchase annuities at market rates from high credit-ranking providers, with the opportunity if necessary to commute the annuity at any time in the marketplace. Their establishment would constitute a logical and significant development of superannuation infrastructure.

The optimal funding strategy is so basic that is likely to remain robust against the appalling legislative risk to which superannuation fund members and retirees are currently exposed.

RETIREMENT INCOME STREAMS

Australia's rapidly growing $944 billion plus (Jones, 2006) superannuation industry driving Australia's managed funds industry has been the subject of a number of studies, generally in relation to fund performance.

An early paper by Bird, Chin and McCrae (1982) published in *JASSA* reported that superannuation fund managers' returns were inferior to those from a simple benchmark. Gallagher (2001) found no significant capacity of Australian pooled superannuation trust managers either to time markets or select outperforming securities. Drew and Stanford (2003) investigated performance of equity funds in the light of their (2001) scrutiny of asset allocation/stock selection, recommending use of index funds by superannuation trustees in fulfilment of legislative guidelines.

More recently, Bilson, Frino and Heaney (2004) investigated retail

superannuation funds, finding no evidence of outperformance of benchmarks with the possible exception of small or growth funds. While these results have some implications for retirees generally, few studies apparently deal with superannuation from the perspective of the individual.

The central problem confronting all retirees with an ETP is how to convert this into a retirement income stream likely to last for their residual life.

Generally this will entail purchase of an RIS product from a commercial provider, i.e. from a retail fund manager or from an industry superannuation fund.

The main income stream products which can be purchased are:

- Fixed term annuities
- Life annuities
- Allocated pensions (AP)
- Term allocated pensions (TAP).

Various add-ons are available at extra cost for these basic income streams. Fixed term and life annuities can be indexed at a fixed annual percentage or at CPI, and are payable as frequently as fortnightly. Fixed term annuities may have as much as 100% residual capital value. Life annuities can be equipped with guarantee periods, and can be made reversionary to a spouse. Fixed term annuities, APs and TAPs can be reversionary or may pass to the deceased estate of the annuitant(s).

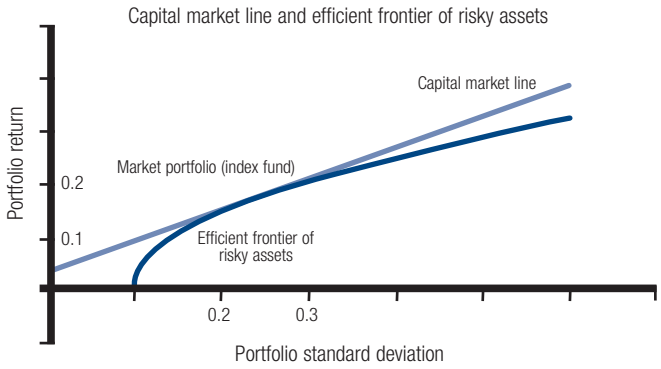
APs and TAPs are RIS products which were designed in part to procure 15% tax rebates and 'return of capital' tax reductions for pensioners under pension taxation rules currently in force. The April 2006 Federal budget proposed that there will be no tax on income streams for retirees of age 60 and over from July 2007.

FUNDING RETIREMENT INCOME: THE 'OPTIMAL SOLUTION' FROM CLASSIC FINANCE

In classic Markowitz Portfolio theory securities are ordered by reference to their expected return (μ) compared with returns volatility (σ). Returns volatility is measured by standard deviation of returns and constitutes one measure of portfolio risk. Over any specified investment horizon, optimal portfolios are those with maximum expected return for a given level of risk. Under fairly non-restrictive conditions the optimal Markowitz portfolios of risky assets form a parabolic Efficient Frontier, comprising all portfolios with maximum return μ for any specified σ. Investors choose an efficient portfolio to suit their level of risk tolerance. If a risk-free investment (e.g. a government bond) is also available the efficient frontier changes from a parabola in the (σ^2,μ) plane to a straight line in the (σ,μ) plane – the capital market line (CML). (See Figure 1.)

Optimal portfolios on the CML consist of a diversified portfolio of risky assets and some holdings of the risk-free asset. Any portfolio consisting of holdings of the risk-free asset and the tangent portfolio provides a higher return for any given level of risk (standard deviation) than corresponding portfolios on the curved efficient frontier of risky assets. Furthermore in 'equilibrium' (long-term) the tangent portfolio consists of holdings of risky assets in the proportions of their market capitalisation.

FIGURE 1 THE EFFICIENT FRONTIER IN THE PRESENCE OF A RISK-FREE ASSET (THE CAPITAL MARKET LINE)



It turns out that this result does not have much practical significance for securities market portfolio formation; estimation problems required to implement it are insurmountable. (Sharpe, Alexander and Bailey, 1995, Chapter 8.)

But remarkably, this simple notion of a capital split consisting of a low-yield risk-free investment held long-term in tandem with a higher-yielding (but more volatile) portfolio of risky assets translates into an optimal retirement income provision strategy for semi-conservative investors.

THE MARKOWITZ SOLUTION TO RETIREMENT INCOME PROVISION

Application of the CML capital split to RIS provision requires that the period considered is the investment term of a 'starting' annuity (typically about 10 to 12 years). Ideally this would be a fixed interest annuity purchaseable from a creditworthy provider such as a federal, state or territory government.

Because investors are concerned in economic terms with 'real cash outcomes' it would also ideally be indexed over its entire term.

This indexed medium-term fixed rate annuity represents 'holdings of the risk-free asset'.

Investment in the 'tangent portfolio' requires investment in 'the market portfolio'.

In the sharemarket this is, in practical terms, tantamount to long-term investment in a continuously rebalanced index fund. In the broader market it is equivalent to long-term investment in a benchmarked balanced fund.

EXAMPLE: Jane's retirement income stream strategy

Jane is a 60-year-old retiree with a $650,000 ETP. She is debt-free, owns her own home and has about $70,000 of 'lifestyle' assets (car, furniture, etc.). Jane was sensibly aware of the smoothing effect of time on portfolio expected returns and was happy during her working life to direct her super-annuation contributions into a portfolio of growth assets.

However, while Jane enjoys good health (she has a life expectancy of 25.44 years according to the Australian Government Actuary's Life Tables 2000–02) she is less comfortable about employing this sort of investment portfolio – i.e. one with considerable sharemarket and listed property market exposure – to generate year-on-year retirement income. She is thinking in terms perhaps of a life annuity.

Under the Australian Securities and Investments Commission (ASIC) Policy Statement PS146 a financial planner advising Jane must provide an RIS strategy which takes account of her circumstances, objectives and risk profile.

While an AP would provide a flexible income stream with a high long-term expected yield, it is ruled out by Jane's lowered risk tolerance, and her expressed aversion to it. A planner would fail in their fiduciary duty in recommending a plan against Jane's stated preference.

Commercially available life annuities while guaranteed are expensive compared with other options. For example, one life office will provide a lifetime annuity starting at $4,009.22 per $100,000 indexed at 2.5% and payable monthly i.e. 12 times per year. This annuity price can be derived approximately using the Australian Government Actuary's 2000–02 Mortality Table as follows:

(i) subtracting four years from the life of the annuitant to take account of annuitant selection against the office; and

(ii) using a yield of 4% p.a.

If Jane spent her entire ETP on this indexed annuity it would provide her with a starting annuity of $26,060 p.a. indexed annually at 2.5%, payable monthly. Importantly, Jane only realises around 4% on her $650,000 purchase price regarded as an investment.

If Jane did not insist on indexation, the same issuer would offer a flat life annuity of $36,582 payable monthly.

Jane could do the following (we outline a strategy over the term of her current life expectancy):

Using $365,418 of her capital Jane could purchase an immediate annuity of term 12 years, indexed annually, payable fortnightly.

Jane can then use a $365,418/$284,582 split to secure her income needs, which she determines to be a starting annuity of $37,000 p.a. payable fortnightly and indexed at 2.5% p.a. but this will vary between retirees. This level of starting annuity income required by the retiree completely determines the capital split (Appendix, Note 1).

Jane can obtain this indexed annuity for a yield of 5.75% from a commercial provider. That is, Jane will get a return of 5.75% on the purchase price paid for the annuity, regarded as an investment. This rate is quoted for such annuities issued by life offices. The remainder of Jane's lump sum ($284,582) she invests in a low-fee ASX index fund such as Vanguard.

While ASX market returns are unpredictable in the short term, over 12 years Jane should expect an annual after-fees return in the range 10% to 12%. The 36-year average return on ASX with dividends reinvested is 13.3% (www.vanguard.com.au/vnl/mc/ac0506/index.html). A more conservative return of 9.5% is assumed here for illustrative purposes.

JANE'S RETIREMENT INCOME

In the first year of retirement, Jane will receive her chosen annual guaranteed amount of $37,000 payable fortnightly ($1,423 per fortnight). This annual income is indexed at 2.5% starting at the beginning of each year, increasing at the commencement of the 12th year to $48,547 ($1,867 per fortnight).

Over the 12-year term of the annuity, Jane's sharemarket expected accumulation is $845,623 from the starting $284,582 assuming a 9.5% net compound yield. Jane has received her guaranteed indexed income for 12 years. Her sharemarket investment, volatile in the short term, had a 12-year horizon, reducing the standard deviation of year-on-year returns by a factor of $1/\sqrt{12} \approx 0.29$

After 12 years when Jane is aged 72, she may wish to reassess her income needs. Having survived the last 12 years, her life expectancy at age 72 is then 15.53 years. She may invest again using a different split of her capital.

If, however, she chose to invest in another 12-year indexed annuity to provide her with a starting annual income of about $49,761 (representing a smooth transition from her original annuity indexed at 2.5% annually, payable fortnightly) she could do this by investing $491,447 of her sharemarket accumulation. The chance of Jane surviving from age 72 to 84 are, according to the Australian Government Actuary's 2000–02 Female mortality table, about 67%.

The next 12-year ASX index expected accumulation deriving from the remainder of the $845,623 after annuity purchase (i.e. $354,176) would be about $1.05 million using the same annuity market and sharemarket returns assumptions (respectively 5.75% and 9.5%).

By comparison, if Jane had purchased the life office's indexed life annuity, it would after 12 years be providing an annual income of $35,048 payable monthly, indexed at 2.5% p.a. compared with her annual $49,761 payable fortnightly, indexed at 2.5% p.a.

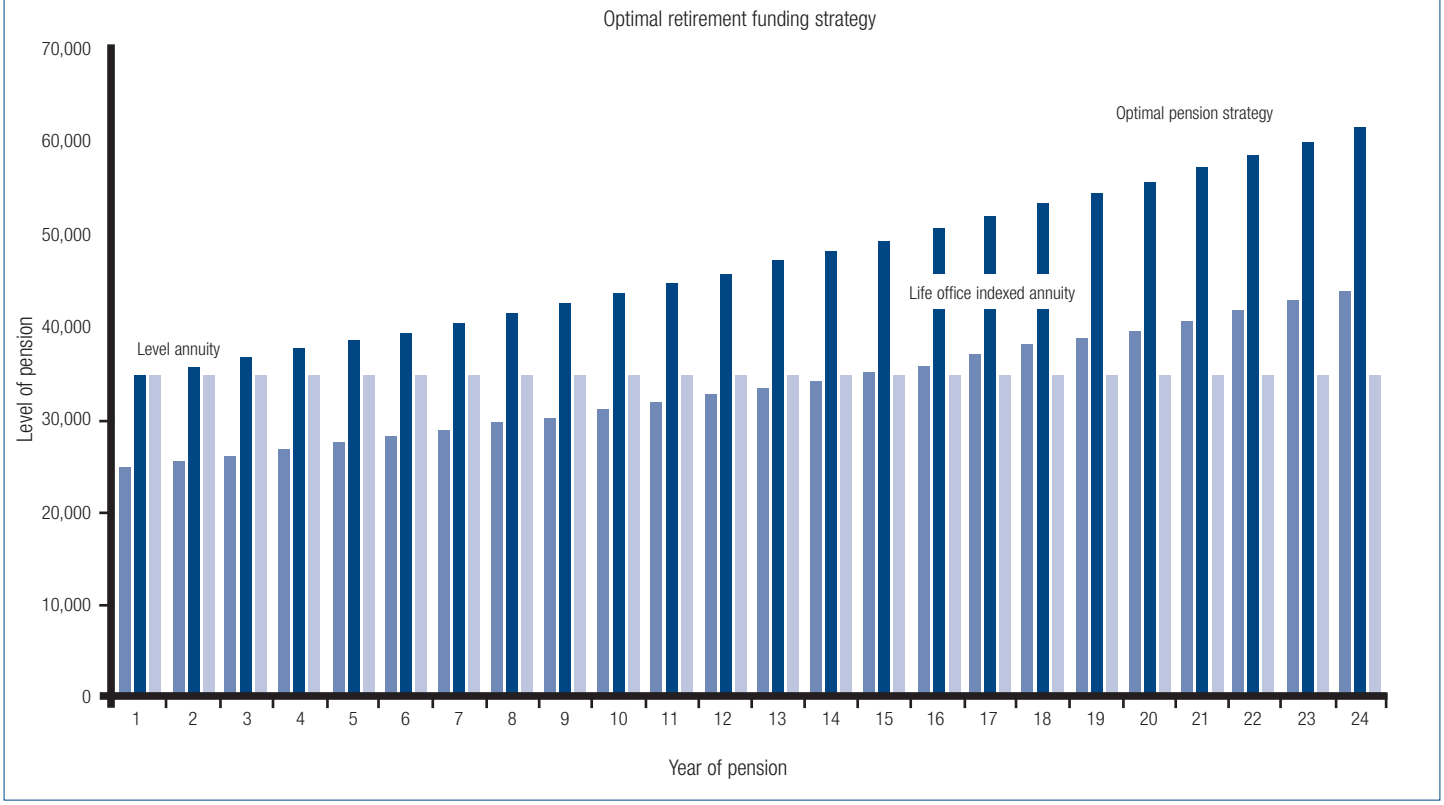
After 24 years of guaranteed indexed annuity payable fortnightly, Jane still has over a million dollars of expected sharemarket accumulation with which to provide for her residual life financial needs.

Use of a 12-year annuity rather than say a 10-year annuity provides Jane with additional flexibility in the matter of cashing in the sharemarket index portfolio. If the market has performed well over the first 10 years of the investment term, Jane will be able to assess whether or not to cash in the portfolio at that stage, and perhaps invest in less volatile short-term deposits over the remaining two years of her guaranteed annuity.

There is likely to be something left over! Jane's beneficiaries will receive on her death the remaining annuity payments together with the value of the sharemarket accumulation.

Had Jane purchased a lifetime annuity, not only are payments lower (level or indexed) but there would be nothing remaining for beneficiaries.

FIGURE 2 COMPARISON OF RETIREMENT INCOME FUNDING STRATEGIES OVER JANE'S LIFE EXPECTANCY.



Using the figures provided, the optimal strategy has enabled Jane to obtain an overall yield of about 7.7% p.a. effective compared with the 5.75% offered by the annuity issuer (Appendix, Note 2). It has provided her with a guaranteed income over 12 years, a 12-year smoothed sharemarket return and the opportunity to amend her income provision strategy after 10 to 12 years (See Figure 2).

ANNUITY BONDS

Life Offices offer Australian purchasers of fixed-term annuities low returns on their purchase price (generally less than 6% p.a. effective, and until very recently less than 5%). If an annuity issuer provides a 12-year 2.5% indexed annuity payable monthly at 5.75% and funds it by sharemarket investment which averages 9.5% p.a. compound effective over the 12 years, it can pocket about 17 cents of each dollar of the annuitant's purchase price.

Annuities are available at much lower cost in corporate interest rate markets, but most retirees would be a little hesitant at the thought of investing all their retirement money with corporate providers. Annuity bonds do, however, represent the path forward.

Listed on the sharemarket are certain annuity or credit-foncier bonds, notably the series issued by MarinerFunds (www.marinerfunds.com.au).

For example, the LSBHE bond series is a 20-year annuity bond which opened in September 2004, offering capital repayment and interest of $1,000 p.a. payable monthly. The issue price of the bond was $9,632 in September 2004. This offered investors in the initial issue a yield of about 8.79% p.a.

Aegis independent research did not envisage Mariner having any trouble in making repayments on any of its annuity bond series, and indeed to date all payments on all series on issue have been duly honoured on schedule.

The market seems to agree with the Aegis assessment: On 25/6/06 (just after the June monthly installment) the bond (then with 18.25 years to run) had traded up in the market being at $10,351 at a yield of 7.14%. As ASX listed securities, the bonds enable annuitants to purchase a long-term annuity at a reasonable cost, with minimum transaction costs (brokerage only). Annuitants can redeem remaining capital in the annuity at any time, by sale of the bonds on the open market.

The main problem with these bonds is that the credit rating of the issuer is probably not as high as most annuitants would wish.

IMPLICATIONS FOR GOVERNMENT DEBT FUNDING POLICY

Recognised life office issuers with high credit ratings such as AMP, AXA, etc. are charging high prices for their annuities, and further hitting retiree clients through their Financial Planning networks (Kell, 2006).

Corporate issuers such as Mariner do not have sufficiently high credit ratings to entice most investors. The Commonwealth government has already moved to reduce the impact of inefficiencies in the financial planning industry through its simplification of the superannuation rules in the April 2006 Budget amendments.

Currently the federal government is unwinding its public borrowing (Commonwealth Government Bonds). As the highest credit-rated issuer in the country the federal government is unlikely to refrain from debt funding indefinitely. But in any event, state government treasury corporations should consider issuing annuity bonds or, more ideally, indexed annuity bonds for the ageing population.

Then annuitants would be able to purchase annuities at market rates confident of the credit rating of the issuer, and also sell them and redeem capital if need be at very low transaction costs. By such an initiative both components of the optimal strategy would be available to all retirees at market rates.

CONCLUSION

Classic portfolio theory provides an optimal RIS funding strategy.

The simplicity of the strategy provides some protection against the ridiculous legislative risk to which Australian superannuation fund members and retirees are exposed, and to which they have been exposed for a long time (with every likelihood that the same state of affairs is set to continue).

Due to inefficiencies in the Australian fixed term annuity market, it behoves Australian federal, state and territory governments to consider issuing debt in the form of annuity bonds. This would enable governments to help fund their projects at low cost, provide the burgeoning retiree population with annuities at market rates and bypass frictions in the fixed-term annuity market. It seems the next logical move in provision of retiree funding infrastructure.

Appendix

Note 1: Indexed annuity

If the ordinary annuity is payable *p*thly and indexed at a rate *g* (so that the *p*thly payments are $\$1/p$ over the first year, but $\$(1+g)/p$ over the second year, $\$(1+g)^2/p$ over the third and so on), the per dollar cost of the annuity is:

$$a^{(p)}_{n:r:g} = (r/r^{(p)}) \times (1-h^n)/(r-g)$$

where $h = (1+g)/(1+r)$, $i^{(p)} = p\{(1+p)^{1/p}-1\}$. When $r = 0.0575$, $p = 26$, $g = 0.025$, $n = 12$ the cost $a^{(p)}n:r:g$ is \$9.876162 and Jane's starting annuity of \$37,000 costs \$365,418 determining her capital split.

Note 2: Overall yield from optimal strategy

The annuity issuer provides the annuity payable *p*thly indexed at a rate *g* per annum at an effective rate *i* per annum to the client. The client consults income needs to determine the proportions into which the lump sum *L* is to be split.

Starting pension:

The starting annual pension is determined by finding fraction *f* such that the annual amount of starting pension *R* of the indexed annuity is adequate, i.e.

$$(1-f)L = Ra^{(p)}_{n:i:g}$$

By choosing $R = \$37{,}000$ when $i = 0.0575$, $p = 26$, $g = 0.025$, $n = 12$, Jane determines f as $284{,}582/650{,}000$.

For the same figures (and $j = 0.095$), Jane's overall yield r is given by the equation of value:

$$L = Ra^{(p)}_{n:r:g} + fL\{(1+j)/(1+r)\}^n$$

But since $Ra^{(p)}_{n:i:g} = L(1-f)$ this becomes:

$$L = L(1-f)a^{(p)}_{n:r:g}/a^{(p)}_{n:i:g} + fL\{(1+j)/(1+r)\}^n$$

So that

$$1 = (1-f)a^{(p)}_{n:r:g}/a^{(p)}_{n:i:g} + f\{(1+j)/(1+r)\}^n$$

In Jane's case the yield r is approximately 0.077.

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