INQUIRY INTO THE STRUCTURE AND OPERATION OF THE SUPERANNUATION INDUSTRY

THE BEST WAY TO CONVERT A LUMP SUM TO AN INCOME STREAM;

POLICY IMPLICATIONS FOR GOVERNMENT

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SUMMARY

Most Australian employees will emerge from the accumulation phase of superannuation with a retirement lump sum. The major problem confronting retirees with an adequate lump sum is how to maximize their retirement income stream with minimum risk.

There is unequivocally a 'best' way to do this

And the nature of the optimal strategy has implications for every participant in the Superannuation and managed funds industry as well as future government debt funding and superannuation infrastructure policy.

1.0 Introduction and executive summary

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 exemplified by the case study of Section 3. Technical details (proof of optimality) can be obtained by contacting the author roger.gay@buseco.monash.edu.au

However in a nutshell, the best conversion procedure is as follows:

- the lump sum is split into two parts
- one part is used to purchase an indexed annuity of term 10 to 12 years
- the remainder is invested in an ASX index fund over the years of guaranteed annuity income
- the expected accumulation in the index fund replaces the original total capital in real terms by the time the annuity expires.

It can be conclusively demonstrated that no lump sum conversion strategy is better than this in the sense that it provides the highest expected portfolio return for any given level of risk.

2.0 Implications for government superannuation policy

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 (territory, state and federal) 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 remain robust against the appalling legislative risk to which superannuation fund members and retirees are currently exposed

The case study below indicates how the Optimal Retirement Income Stream (ORIS) strategy can be applied.

3.0 Case study: Retiree income provision

The following example illustrates features of the ORIS scheme, in particular, the degree of investment and income control it offers retirees.

3.1 George's Retirement Income Problem

George (60) has a $600,000 retirement lump sum, an amount which he hopes will be adequate to provide for his pension. During the accumulation phase of his retirement income provision scheme George was happy to invest in a portfolio with a high proportion of growth assets. In the retirement phase he is less comfortable with this sort of portfolio if there are other options. He is aware that historical annual returns on his National ShareMarket Accumulation Index over the last 50 years are approximately normally and independently distributed with mean 13.3% and standard deviation 20.2%. He is aware also of the consequences for some of his acquaintance, of effects of consecutive years of negative sharemarket returns on the health of sharemarket balances when systematic drawdowns are made (for example, if an indexed pension were to be taken annually from the fund (such schemes of systematic drawdowns from an investment portfolio are sometimes called 'Allocated Pensions' - denoted by AP in the sequel). He expects inflation over the next decade to be realized at about 3% (even if the 3% target were met, this rate would halve the purchasing power of George's income in a little over 23 years). George owns his own home, has no significant outstanding debts, and would like an income stream commencing at $30,000 p.a. payable monthly, indexed at 3% at the start of each new year to last for the rest of his life. He would like there to be 'something over' if possible, on his death, to make a few bequests.

George's current life expectancy (using the Government Actuary's 2005 Male table) is about 22 years. However about 20% of 60-year-olds, live to age 90 or more.

A little investigation has revealed that for $600,000 one commercial provider (a life office) would offer George:

- a life annuity of $31,500 p.a. payable monthly, unindexed, with a 10-year guarantee period, or

- an indexed annuity with starting annual amount $20,742 payable monthly indexed at 3% p.a.

George has heard of the ORIS strategy and asked for further details.

3.2 George's retirement income strategy (one ORIS possibility)

George could:

(i) purchase a 12-year annuity payable monthly (13 times per year) indexed at 3% p.a.

(ii) invest the remainder of the lump sum in a National Stock Exchange (NSX) accumulation index fund for the term of this initial annuity.

Assumptions:

The 12-year indexed term certain annuity payable monthly can be purchased at a yield of 5% p.a. from a commercial provider,

The sharemarket fund yields a compound average of 9.5% net over the 12-year term of the annuity. No tax applies to dividends and realized capital gains on fund assets used to pay retirement pensions. In view of the 50-year average in excess of 13%, the 9.5% expected net return over the 12-year investment horizon is conservative.

<u>Further details</u>

(i) For a yield of 5% on the purchase price considered as an investment, the cost of the 12-year pension is $10.53986 per annual dollar of starting pension payable monthly, or for $30,000 a $316,196 total.

(ii) The remaining $283,804 from the $600,000 lump sum has expected 12-year accumulation $843,312 at 9.5% p.a. compound. This is slightly less than the value of the initial lump sum ($600,000) indexed at 3% p.a. for 12 years which is $855,456.

(iii) Over the initial 12-year term, George need not concern himself with the sharemarket performance to regulate his year-on-year income needs as would be the case with systematic drawdowns, i.e. using an AP.

(iv) Market data comparison with AP. While for calculation of expected yield a conservative 12-year expected mean yield of 9.5% has been assumed for the market. Figure 1 depicts 100 simulations which use *historical* market returns (i.e. annual returns are independently and normally distributed with mean 13.3% and standard deviation 20.2%). George's ORIS end-of term accumulation is compared with the end-of-term accumulation for systematic drawdowns. For the drawdown strategy (AP), it is assumed that the indexed pension is taken each year from a fund invested entirely in the NSX index fund. The graph compares account balances after each 12 year term using the two strategies over 100 simulations. Evidently ORIS end-of-term accumulations are far less risky than AP end-of-term accumulations.

Evidence supporting ORIS is adduced from more extensive investigation. The mean accumulations from one million simulations using the market assumptions that annual returns are independently and normally distributed with mean 13.3% and standard deviation 20.2% were $1.29m. for AP and $1.27m. for ORIS. However the standard deviation for AP was $1.21m. whereas for ORIS it was only $0.85m.

The AP end-of-term accumulation failed to redeem the original capital ($600,000) in 34.8% of cases. For ORIS, the figure was 19.5%.

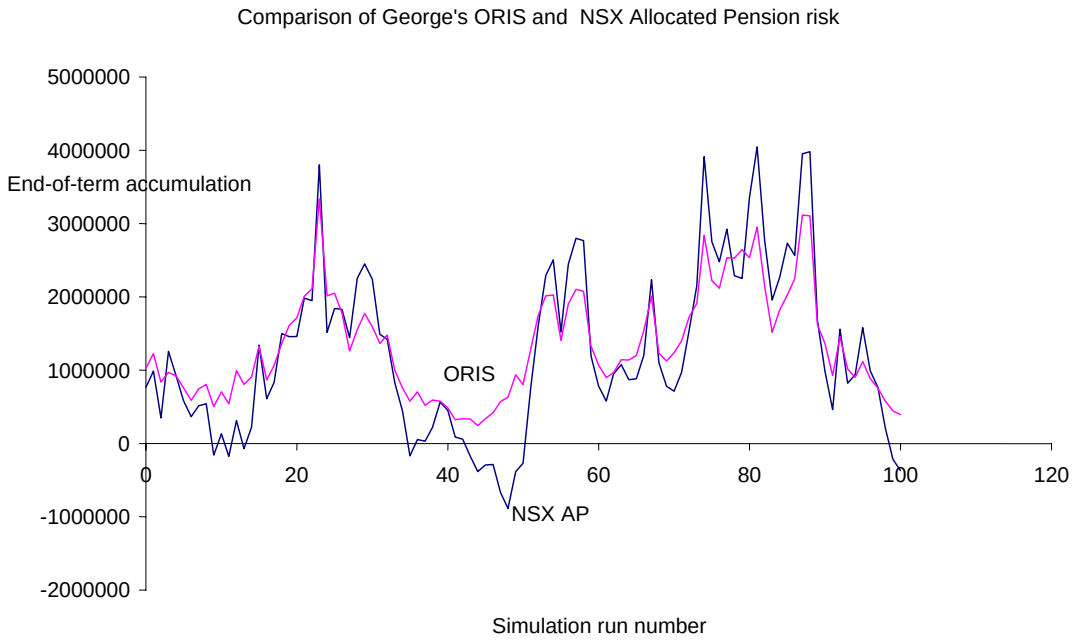

Figure 1 One hundred simulations of George's end-of-term accumulation under ORIS compared with the corresponding systematic NSX drawdown end-of-term accumulations.

(v) Further evidence in respect of the relative riskiness of ORIS end-of-term accumulations vis-à-vis AP end-of-term accumulations is available from the graphs of their empirical distributions (Figure 2) reinforcing the message of Figure 1.

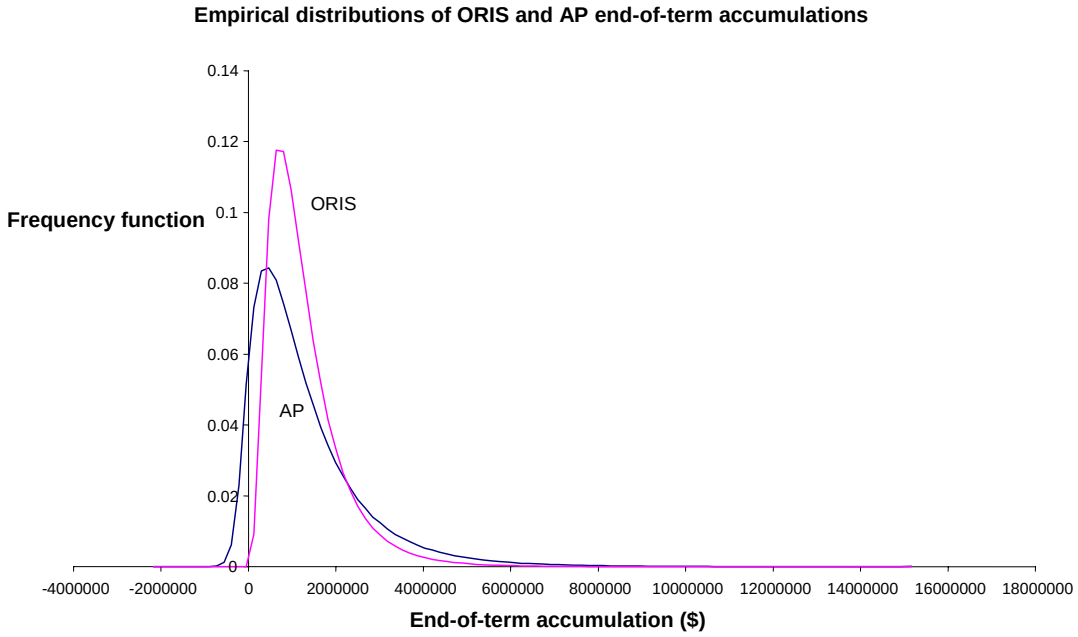

Figure 2 Empirical distributions from one million simulations of George's ORIS end-of-term accumulation compared with the AP end-of-term accumulation. The term is 12 years. ORIS end-of-term accumulations cannot be negative. The AP end-of-term accumulations have been allowed to 'go into debt' to illustrate the risk of insolvency. The probability of insolvency could be replaced by an 'atom' of probability at origin. But all the probability in the tail or the atom represents significant probability of exhausting the original capital over a 12 year term.

(vi) Use of an annuity certain of term 12 years allows for some discretion as to when to leave the sharemarket. If the NSX has performed well over the first say 10 years, the opportunity exists to transfer the accumulation to more defensive assets, with two years of the guaranteed annuity still to run.

(vii) About 85% of 60-year olds survive to age 72. Assuming George is one of them, George can reassess his income needs in the light of stockmarket performance and his end-of-term accumulation. His life expectancy at age 72 is about 13 years, but nearly a quarter of 72 year-old men survive to age 90.
If George decides to continue with his indexed annuity, he can purchase a further 12-year indexed annuity with starting annual income of $42,773 payable monthly (representing a smooth transition from the initial annuity). This will cost $450,821 of his $843,312 expected accumulation, leaving an expected residual $392,491 to reinvest in the market.

(viii) After 12 years, the new annuity ($42,773 p.a. payable monthly, indexed at 3% p.a.) compares with the Life Office's $31,500 p.a. payable monthly, unindexed (the guarantee period having expired) or $29,573 p.a. payable monthly indexed at 3% p.a.
The comparison is depicted in Figure V below over two twelve year ORIS cycles (just exceeding George's life expectancy at age 60).

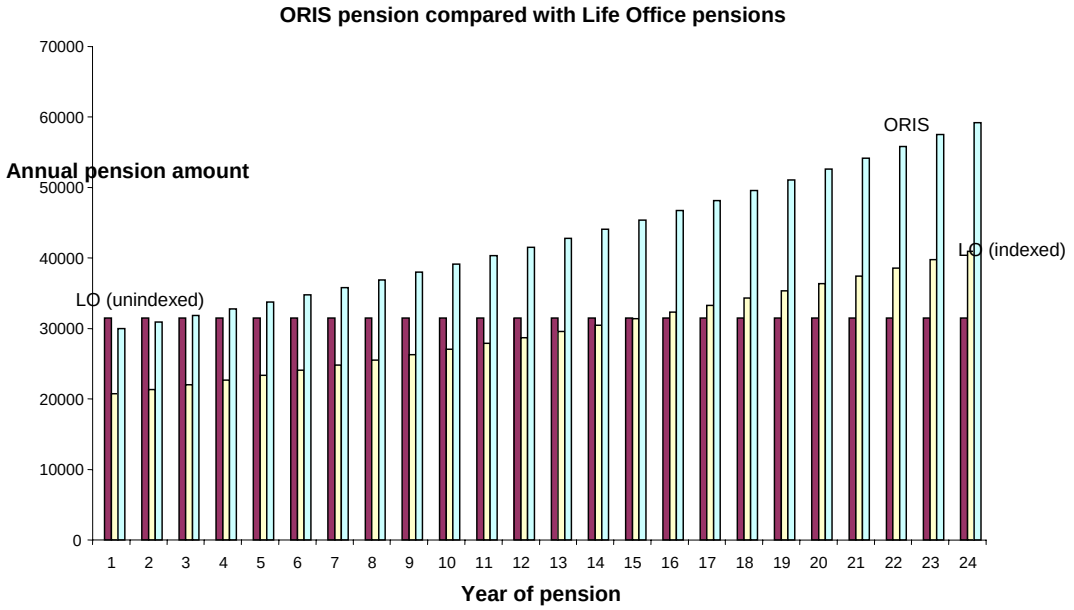

Figure 7 George's ORIS pension after two twelve year cycles, compared with pensions available from a Life Office (indexed) and unindexed.

(ix) The new expected end-of-term12 year accumulation from the $392,491 (expected residual from expected accumulation $843,312) is $1.16m. compared with the $1.2m. indexed value of the expected starting lump sum ($843,312).

(x) At all times, the ORIS strategy provides for a continuing source of reserve liquid capital (invested in the index portfolio) as well as the guaranteed income stream.

(xi) In the event of George's death, most of the original capital (in real terms) should be available for distribution to his beneficiaries, should George have a strong sense of bequest.

(xii) The yield on this particular ORIS strategy with $n = 12$, $g = 0.03$, $p = 13$ predicated on the values $i = 0.05$ and $j = 0.095$ is about 8.1%.

This sort of yield is very much what might be needed to provide retirees with an indexed life pension using the sorts of lump sums likely to obtain from nationally coordinated retirement income provision schemes.