

Part II: What can the economics of insurance, pensions and annuities offer the policy debate?

7 The economics of pensions

7.1 Introduction

This thesis argues that full protection against the risks associated with longevity has not yet been achieved in New Zealand. The hypothesis is that there is an important, unexploited role for annuities in pension policy. A new annuity product is proposed in Part III of this thesis that fits the character of New Zealand's unique retirement income policy framework.

It is important to establish first whether New Zealand's policy mix is fundamentally sound, or whether there should be more radical reform of its public/private pension system. Should the World Bank's advice (see section 6.2) be heeded, with a move towards privatisation and individual accounts so that New Zealand has a proper second pillar? This is tantamount to asking if a fundamental reform is necessary to take us closer to meeting agreed objectives in pension policy.

In political circles it is often implicitly assumed that pension policy impacts significantly on macro-objectives and can bring about enhanced national saving as a means of alleviating the burden on future workers as the population ages. But changing retirement income policies (for example, PAYG to funded, defined benefit to defined contribution, introducing tax incentives, etc) is not a magic wand that can solve the resource allocation problems posed by an ageing population. The quantity and quality of real goods and services available to be shared is the important factor (Barr, 1998, 2000, 2001). Of course, in choosing pension design, it is important to not compromise other worthy often inter-related economic goals, such as growth and national saving. But there is little supporting evidence that a change in pension design in itself will favourably affect these macro-objectives. Thus while more saving by individuals for their retirement may be a good thing for them, and may be enhanced under one policy rather than another, the overall macro outcome for national saving may be little affected.

The demographics show that the output currently produced by every five people of working age must be shared with about one retired person. In thirty years however, the output of every five people of working age will have to be shared with just over two retired persons. The economic implications are clear, unless the pension policy itself causes a growth of the economic pie, the pain of the ultimate resource division between young and old remains unchanged. The source of claims on output, be it from private pensions, social security or past savings is not particularly important. Growth may help by making the absolute sacrifice of the working age population less painful, but if relative living standards are to be maintained, growth alone does not affect the necessary division into sevenths rather than sixths.

The argument is *not* that growth is unimportant. But in developed countries there is little empirical evidence that growth of the economic pie can be increased significantly by policy changes in pensions. For a beneficial impact to occur, first more national savings actually have to be generated. There is no point in increasing household saving if its price (tax incentives for instance) has an offsetting impact on government saving. Similarly subsidising one form of saving such as pension plans, may simply cause a shift of household saving into the preferred saving vehicle and may actually decrease household saving as the individual saving goal can now be reached with less effort.

Even if total saving arising from pension reform is higher, this increased saving does not guarantee growth. Nor does it guarantee either more or better investment. If investment opportunities are available it is not obvious that they require the prior act of saving in order for them to be exploited.¹²⁵

Yet despite these arguments, most official commentaries (for example, OECD, 1998; World Bank, 1994) stress the need to reduce the public component of retirement incomes and advocate various degrees of privatisation and prefunding. The implication is that this type of reform will resolve the extra pressure on resources implied by an ageing population. But as Barr points out, privatisation of an

¹²⁵ For an expansion of these ideas in the New Zealand context see St John and Ashton (1993). A recent commentary by the New Zealand Treasury on this theme has asserted that the concern about low national saving is misplaced. Growth requires investment but low national saving is not necessarily a constraint if these investments are to be made (Claus, Haugh, Scobie & Törnquist, 2001).

unsustainable public pension system does not change anything; the only gains will come from reducing the generosity of pensions. Suitable reforms to the public scheme, without privatisation, might also achieve this end. Perhaps privatisation is the vehicle for making such reductions more acceptable, but privatisation itself may present a raft of other problems for society including higher administration costs.

Pensions policy is fundamentally a mechanism to facilitate a sharing of current output among the economically active and the retired. Thus policy design must reflect the appropriate distributional goals to be achieved and the ultimate value judgements about equity behind these. Is individual equity to be prioritised, with the notion of fairness revolving around actuarial purity? Generational equity, as followers of this approach have dubbed it, implies that each generation should pay for itself and thus get its just deserts (Williamson, Watts-Roy & Kingson, 1999). If, on the other hand the goal is more equality between young and old, male and female, rich and poor, communitarian or collective objectives stressing interdependence and fairness at a point in time will be dominant. This approach is less encapsulated in a single catchword than is the case for the generational equitists. Following Williamson et al., (1999), terms that are likely to be used are ‘intragenerational equity’, and ‘generational interdependence’. The term *intergenerational equity* will also be used in this chapter to mean fairness in experiences and living standards between the old and the young.

The discourse around pension policy is likely to reflect the dominant cultural values of the particular country. Thus the proponents of privatisation of social security in the US who argue for generational equity are having success, precisely because they tap into deeply held American mores of self-help, thrift and self-reliance (Williamson et al., 1999). In New Zealand, on the other hand, while a moralistic streak can also be traced back to the 19th century (discussed in section 2.1), the emphasis for most of the 20th century has been on more communitarian and collective values. These values are reflected in a strong ‘generational interdependence’ endorsement of wider concepts of equity, including gender equity, poverty prevention rather than mere alleviation, and

the need to allow for ‘participation in and belonging to’ society rather than mere subsistence living.¹²⁶

In spite of the rise of Rogernomics from the mid-1980s which reactivated the older emphasis on self-reliance, thrift, choice and free markets, radical proposals to reform the state pension towards more ‘generational equity’ have failed abysmally. The first of these attacks on the basic values underpinning the New Zealand model for pensions came in 1991 as the newly elected right-wing government attempted to make the state pension a welfare benefit. The second attack came in the form of the 1997 referendum for an effective privatisation of the state pension defeated by an overwhelming majority (92.8 per cent) of voters (these issues were detailed respectively in section 2.4 and section 2.5).¹²⁷ It is therefore unlikely that the values that drive the US debate are as relevant to New Zealand.

7.2 Dependency models

Much of the policy literature concentrates on the impact of ageing and the so-called burden of dependency. Simple models look at how the cost of the economically inactive is borne by the economically active, while sophisticated variants tease out conceptual issues associated with measurement. For instance, what does it mean to be economically inactive? How does unemployment affect dependency? How will ageing affect the ‘burden’?

These models highlight the implicit distributional problem: the share of output enjoyed by the old is not available for the young. Manipulation of the parameters such as age of entitlement to a state pension, the level of pension and the indexation formula can, in theory, bring about a shift in the burden borne by the working age population. This may be deemed necessary in light of the ageing of the population, indeed many countries are adopting this approach.

¹²⁶ The Royal Commission on Social Security in New Zealand (1972) provided an important foundation to debates around equity by endorsing the concept that everyone should have enough income to be able to ‘participate in and belong to’ society.

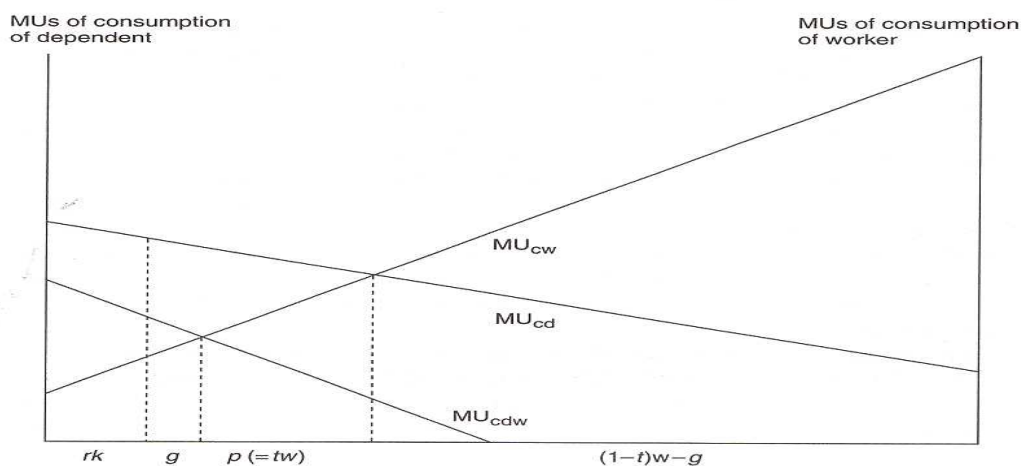
¹²⁷ The Retirement Saving Scheme (RSS) would have been a replacement for the state pension not a supplement to it (St John, 1999b).

The question remains: is there a distribution of output between the old and the young that is optimal? What are the criteria of an optimal distribution? Is the optimal outcome obtainable given real world political institutions? Any investigation into improved pension design has an overarching normative dimension; implying that there may be an optimal incidence of the burden of ageing. Clearly value judgments cannot be escaped when attempting to address these issues.

For instance, a utilitarian optimum distribution is one that has as its aim the maximisation of total utility. To make this operational, interpersonal comparisons of marginal utility (MU) of income are required, necessitating cardinal measures with all the associated problems such a methodology entails (Disney, 1996, p.20).

In the utilitarian model, each worker (of L workers) produces output w and each dependent (of D dependents) has assets k , giving rise to a claim on output rk , where r is the rate of return. The total income to be shared (Y) can then be expressed as $Y = Lw + Drk$. Workers and dependents each face diminishing MU from extra consumption but they may have different utility functions reflecting different marginal utilities at each level of income as shown below in Figure 7.1. To simplify the analysis, Figure 7.1 assumes that $L = D$, and the income to be shared between a representative worker and a dependent is therefore $w + rk$ (horizontal axis).

Figure 7.1: Optimal redistribution



Source: Disney (1996, p. 21)

This model requires that marginal utility of consumption for the worker as given by MU_{cw} and the marginal utility of the dependent, MU_{cd} are equated in each period. In a voluntary regime, presuming that workers care about the utility of retirees, the MU that the worker derives from the dependent's consumption can be illustrated by MU_{cdw} . The worker's utility is maximized where $MU_{cdw} = MU_{cw}$, implying gifts of value g will be transferred to the dependent. To maximise *social utility*, further transfers are required which may take the form of a pension p paid for by tax t on wages, that is $p = tw$. Hence the worker would have consumption claims of $(1-t)w-g$ and the dependent, claims of $kr+g+p$ as shown on the horizontal axis in Figure 7.1.

Even if, in theory, an optimal outcome can be found, it is far from clear that real world decision-making rules will produce the desired result. There is no benign omniscient mastermind that can guide decisions to achieve the 'Nirvana' of welfare maximising theory even if utility was capable of being measured cardinally. Moreover, there is a strong implication that for maximum welfare all real income should be equalised. Unfortunately, this has powerful effects on incentives and significant implications in terms of work and output.

Alternative value judgments about various income distributions may be based on Egalitarian or Rawlsian principles. In an egalitarian approach, redistribution may be judged desirable well beyond the point at which the economic pie starts to shrink as a result of the disincentives implied by such redistribution (Atkinson & Stiglitz, 1980, p.342). This is because a high weighting that the egalitarian approach assigns to the value of equality. On the other hand, a Rawlsian approach would emphasise the position of the least well-off, and only sanction distributions that maximise the welfare of that person (Stiglitz, 2000, p.102). In such an approach it is unlikely that universal pensions such as New Zealand Superannuation could be justified. There is no compelling reason as to why a universal payment to well-off over 65 year olds is necessary to enhance the position of poor families.¹²⁸

In light of the unsatisfactory resolution of many of these normative issues,¹²⁹ much of the literature instead concentrates on a dynamic concept in which interpersonal comparisons are not needed. Individuals have a lifetime budget constraint and are

¹²⁸ Except perhaps to spare the poor the stigma of the means test, and to save costs of administration.

¹²⁹ This thesis argues that the normative element must not be avoided.

assumed to choose outcomes that are preferred over time, and are hence optimal compared to other states. Unfortunately, achieving Pareto Optimality, even if real world decision-making allows this to occur,¹³⁰ does not answer the question of whether distribution between individuals and generations is in some sense ‘fair’. Disney (1996, p.14) notes:

...by eschewing interpersonal and intergenerational welfare comparisons, economists cannot provide clear answers as to what policies are ‘best’ for society.

7.2.1 The burden of dependency

There are numerous ways to conceptualise the dependency of older people but this so-called ‘burden’ is often misunderstood and oversimplified.¹³¹ Crudely, using the model discussed above illustrated by Figure 7.1, access to resources by the old is acquired by pensions, gifts and income from investment. Pensions of value p for each pensioner are paid for by the working age population’s taxes (at cost pD where D is the size of the dependent population). Direct gifts are of average value g and income earned on capital stock K is rK where r is the rate of return.

Following Disney (1996, p.22), with average wages w , working age population L , and assuming the capital stock K is held only by the dependent population and all income and transfers received by the old are spent on output, one measure of the burden B of retirees on current output is given by:

$$B = \frac{(p + g)D + rK}{rK + wL} \quad 7.1$$

If equation 7.1 represents a socially optimal distribution as well as the actual burden, the implication is that income from capital and gifts alone would not have sufficed.

¹³⁰ Disney (1996, p.285) also comments: “Although economists have tried to specify mechanisms (such as ‘policy rules’) that might sustain intertemporal optimising behaviour, no government has yet been prepared to relinquish the notional freedom associated with policy discretion and with the accommodation of interest groups”.

¹³¹As Disney (1996, p.23) says “Intertemporal and inter-country comparisons are often highly misleading”. Section 2.8 outlined some of the problems of international comparisons which exemplify this dilemma.

Disney hints that forced transfers, pD , may provoke intergenerational conflict. In practice, if workers are compelled to pay taxes to fund pensions, they will feel their utility is not maximised and may retaliate by cutting back on gifts. Not discussed by Disney is the possibility of bequests or transfers from the dependents to workers. If pensioners do not find their pensions and voluntary transfers from workers satisfactory, they are likely to draw down their past savings, at least to the extent that they have assets, and to the extent that mechanisms exist for them to realise those assets. The net result is one of lowered bequests and changes in asset prices, which effectively reduce the potential consumption of workers, regardless of whether they approve or not.

One of the conceptual problems therefore not incorporated into this simple model is the notion of expectations of rights to a certain level of consumption by the old. This expectation is likely to reflect each cohort's experience. It is not unlikely that the excessive expectations of the baby-boom cohorts may be particularly problematic.

The 'burden' of dependents is expressed as a share of total output in equation 7.1. But as Disney (1996) notes there are other possible representations of the 'burden', each with its own set of measurement issues.

The first measure is the public burden of pensions. This is the share of pensions in total income given by:

$$B_2 = \frac{pD}{rK + wL} \quad 7.2$$

The tax rate t on wages needed to finance the pension is given by:

$$t = \frac{pD}{wL} \quad 7.2a$$

The second measure is the replacement ratio R of the pension as a fraction of wages. The before tax ratio, p/w , becomes, $p/(1-t)w$, after taxes, t , needed to pay the pension, (assuming pensioners pay no tax).¹³²

$$B_2 = \frac{P}{(1-t)w} \quad 7.3$$

¹³² If, as in New Zealand and in most countries, pensioners pay expenditure taxes this equation needs modification (Disney, 1996, p.27).

A third measure looks at the burden of dependents on workers. The simple case of the total burden including voluntary gifts is given by:

$$B_3 = \frac{(p + g)D}{wL} \quad 7.4$$

Naturally equation 7.4 may also be considered in after tax terms. Thus the ‘burden of intergenerational transfers’ can be described and measured in a number of ways, but the literature around pension reform has largely focused on the tax burden on taxpayers or workers. Thus the replacement ratio, $R = p/w$, and the dependency ratio, D/L , are the critical variables with an ageing population. Rearranging equation 7.2a to reflect this emphasis:

$$t = R \frac{D}{L} \quad 7.5$$

However the dependency ratio is a crude measure, implying populations D and L , are discrete and separable. Modifications can improve the realism of the so-called ‘tax burden’ by identifying and including factors such as participation rates; sickness and unemployment rates.¹³³

One of the most important factors driving costs is the replacement ratio p/w with many countries increasing this ratio over time and extending coverage. The combination of a rising replacement ratio and a rising dependency ratio is at the heart of concerns about the cost of the burden of ageing. Changing the dependency ratio with policies to encourage later retirement can modify the burden, as may indexation changes to lower the replacement ratio (Disney, 1996, p.27).

If indexation of the pension is linked instead to post-tax wages, and R^* is the desired replacement rate, then:

$$R^* = \frac{P}{(1 - t - x)w} \quad 7.6$$

In equation 7.6, x is the tax rate needed to finance other government spending while, as before, t is the tax rate needed to finance pensions. The total cost of pensions for D pensioners pD , is paid for by twL . Thus, in equation 7.6, if p/w is replaced:

¹³³ Disney (1996, p.24) cites Falkingham in illustrating that demographic change is only one factor and does not necessarily drive dependency.

$$R^* = \frac{t}{(1-t-x)} \left(\frac{L}{D} \right) \quad 7.7$$

If pensioners spend all their income and pay a value added tax on expenditure of rate v , the value of t can be correspondingly lower:

$$R^* = \frac{(v+t)}{(1-t-x)} \left(\frac{L}{D} \right) \quad 7.8$$

Although this model is a significant development from the simple tax burden given in equation 7.5, this approach oversimplifies the reality of a world where a number of other factors are likely to operate. In the case of New Zealand, these considerations include:

- New Zealand Superannuation is paid for from general taxation not from a separate wage tax. New Zealand's income tax base is *all income*, not just wage income, and the Goods and Services Tax (GST) is levied on all expenditure, not just that paid out of wages and pensions.
- Income-earning assets are held by workers, as well as held by the retired.
- Tax rates are progressive, and the progression affects the tax paid by pensioners.
- The dependency ratio D/L is not immutable and is too crude. It is influenced amongst other things by retirement decisions and the availability of work for older workers.
- To the extent that retired people are living on their assets, they will be contributing more expenditure tax (also noted in Disney 1996, p.28).

In the New Zealand context, the rate of pension paid to everyone is 32.5 per cent of the net average wage (using the married rate of pension). Other benchmarks such as per capita GDP could also be used (St John & Willmore, 2001).¹³⁴ In this approach each pensioner is provided with a pension, py , where y is per capita income and p is the fraction of per capita income to be provided. The cost for L pensioners is pyL and must be met by taxes.

¹³⁴ The choice depends on which measure, wages or per capita GDP best reflects the relative living standards objective of policy.

If t is the tax rate as a fraction of national income Y then:

$$tY = pyL \quad 7.9$$

Dividing each side by total population where r is the proportion of pensioners in the total population, equation 7.9 becomes:

$$t = rp \quad 7.10$$

St John and Willmore (2001) show that for any desired universal pension for the retired, expressed as a fraction of per capita income, and a given proportion of retired people in the population, the tax rate t can be found. In the case of New Zealand, the pension rates as a proportion of per capita income are 0.315 for a married person and 0.41 for a single person.¹³⁵ The current proportion of those over 65 is 0.12 or 12 per cent. If the married person rate were paid to all, the tax rate as a percentage of GDP required would be found from:

$$\begin{aligned} t &= rp = 0.12 \times 0.315 \\ t &= 0.0378 \end{aligned}$$

This suggests that the current *net* tax required as a proportion of GDP is around 4 per cent and will rise to just over 8 per cent as the dependency ratio rises to 26 per cent by 2030. Within the simplifications made this model conforms to expected outcomes.¹³⁶

Using a basic dependency model, the Periodic Report Group (1997) projected the *gross* cost of pensions (tax rate, t) as a fraction of GDP under different parametric assumptions as shown in Table 7.1.¹³⁷ The 'no change' gross costs of New Zealand Superannuation parallels the results from the model illustrated above.

¹³⁵ The Periodic Report Group suggested there is little justification for a different rate for married and single persons. However a supplement to recognise the costs of living alone would still be needed if the single rate was aligned to the married rate (Periodic Report Group, 1997a, p.86).

¹³⁶ If the pension retains its relativity to per capita income, so long as per capita income is growing or stable, ageing need not impose additional burdens on workers (Willmore, 2001, pp.9-10).

¹³⁷ The current long-term model (Woods, 2000) is found on the New Zealand Treasury website, <http://www.treasury.govt.nz/>.

Table 7.1: Future gross cost of New Zealand Superannuation with parametric reforms

NZS per cent GDP	Year					
	2000	2010	2020	2030	2040	2050
No change	4.8	4.8	6.4	8.5	10.1	10.5
Increasing Age ¹	4.8	4.8	5.5	6.2	7.9	8.4
Semi wage index ²	4.8	4.8	6.2	7.6	7.4	8.0
Index to prices ³	4.8	4.3	4.9	5.6	5.8	5.1
Targeting ⁴	4.8	4.8	6.1	7.6	8.0	8.6
Scenario A	4.8	4.8	5.4	6.7	8.0	8.5
Age and targeting Scenario B	4.8	4.8	5.8	6.5	7.2	7.5
Semi-wage and targeting						

Source: derived from the Periodic Report Group (1997a)

Notes: 1. The age is raised from 65 to 68, beginning in 2015 and phased in over 12 years.

2. NZS is adjusted by the average of wages and prices in each year, until a floor for a couple of 50 per cent of net average earnings is triggered in 2050.

3. Adjustment only by prices.

4. Reductions achieved by targeting rise from 1 per cent in 2015 to 10 per cent in 2025, thereafter staying at 10 per cent of the gross costs.

The static dependency model takes the dependency and replacement ratios as given. In practice, growth of the population and/or of productivity will alter the dependency ratio over time. The economic burden of dependency as opposed to the demographically defined measure outlined by equation 7.5 depends on what is happening to rates of growth in the population and labour force participation. Naturally, positive rates in either rate will lower economic dependency over time (Disney (1996, p.30).

A dynamic model may be a more suitable framework for policy analysis of social security issues than the static model outlined in this section. The problem is that the growth rates are not independent and virtuous and vicious circles may arise. Thus falling population growth may enhance productivity or reduce productivity depending on the story you want to tell (Disney, 1996, p.41). For this reason the simpler model is more practical.

7.3 Overlapping-generations models

Overlapping-generations models are widely used and are based on Samuelson's seminal (1958) paper 'An exact consumption-loan model of interest with or without

the social contrivance of money'. The basic assumptions of Samuelson's model of the optimal allocation of consumption within and between periods are that:

- no goods can be stored: ie. capital accumulation is equal to zero;
- claims on consumption are discounted at a parametric interest rate (i);
- plans don't change and;
- each generation has the same preferences.

The standard model is set up so that each identical individual lives for three periods $j = 1,2,3$, working for the first two and retired in the third period. For simplification the length of the period is often taken to be the equivalent of a year in length and the realities of unpaid work and who bears the costs of reproduction are ignored. As one protagonist of the Samuelson model puts it 'Reproduction is exogenous and occurs through parthenogenesis' (Buiter, 1997, p.607).

The individual's utility is a function of total consumption in each period; $U = U(c_1, c_2, c_3)$, where lower case denotes per capita consumption. The model invokes the simplification that each individual must use the capital market to acquire a claim on resources in period three, hence:

$$s_1(i) + R s_2(i) + R^2 s_3(i) = 0 \quad 7.11$$

where $R = \frac{1}{1+i}$ and s is the level of savings.

Allocation of consumption among the three age groups at any point in time is given by:

$$C_1 + \frac{C_2}{(1+\eta)} + \frac{C_3}{(1+\eta)^2}$$

For total net (S) for all generations at any point in time to equal zero, with an interest rate i , and the rate of population increase η :

$$S_1(i) + \frac{S_2(i)}{(1+\eta)} + \frac{S_3(i)}{(1+\eta)^2} = 0 \quad 7.12$$

The individual's allocation of saving over three periods (equation 7.11) and the in-period requirement that net savings of all three generations alive is zero (equation 7.12) can be reconciled if the interest rate is equal to the rate of population increase,

that is: $i = \eta$. Thus equilibrium implies that the rate of interest is equal to the rate of population growth.

The critical insight provided by Samuelson is that a ‘social contract’ between generations, whereby present workers finance the pensions of retirees in the belief that the social security system will treat them similarly on retirement, may achieve the desired equilibrium as long as the interest rate equals the population growth rate.

The contract however is threatened if the rate of population growth is falling or stagnant. In such a case some generations will have to accept a lower, even negative rate of return on their contributions or may force unsustainable pension commitments. Public choice theory suggests that each generation will always try to pass excess commitments on to the next generation. Indeed the evidence suggests that this has happened in PAYG social security systems as populations have aged, giving rise to the view that such schemes are in essence ‘Ponzi’ schemes.

Much of the literature since Samuelson has attempted to address the limitations of the standard overlapping-generations model. The legacy of assumptions inherited from Samuelson of consistent lifetime preferences (no myopia); no changes in output (constant productivity) and no storable output (zero capital stock) are discussed in Disney (1996, pp.41-50).

Aaron (1966) extends the model to incorporate the possibility of real wage growth ω , rewriting equation 7.12 as:

$$S_1(i) + \frac{S_2(i)}{(1+\eta)(1+\omega)} + \frac{S_3(i)}{(1+\eta)^2(1+\omega)^2} = 0 \quad 7.13$$

Thus, ignoring cross products, equilibrium then implies that $i = \eta + \omega$. Aaron builds on Samuelson’s observations and concludes that “...social insurance can increase the welfare of each person if the sum of the rates of growth of population and real wages exceeds the rate of interest” (Aaron 1966 cited in Disney, 1996, p.43). However as Disney notes (p.43), there is an apparent paradox in claiming that:

... if a person saves in a funded scheme the present value of his pension (benefits net of contributions) will be lower than if he belonged to a PAYG scheme at any given rate of interest.

The reason is that the PAYG scheme pays the pensions to the current smaller retired generation, while the funded scheme is to pay for the identical pensions of the larger

current generation. The social contract works for PAYG so long as each generation is larger than the preceding one. Thus workers are better off with unfunded PAYG schemes rather than a fully funded scheme “...so long as the return on social security is at least equal to the sum of population growth and real productivity growth rates” (Disney, 1996, p.50).

The conclusion drawn from this relatively simple model is that only if the real rate of interest exceeds the sum of the population and wage growth, will a full pre-funded pension system be preferable to a PAYG one (see section 7.4.3). Critically however even this ignores the transitional costs of a change to a pre-funded scheme.

7.4 World Bank model

Based on the Samuelson model, it appears that PAYG financing is relatively more costly than funded, defined benefit approaches under certain assumptions about interest rate and wage increases. Following this approach, the World Bank (1994) have strongly suggested that countries review their generous PAYG public sector schemes and adopt a three pillar approach, with a second pillar of mandatory saving managed by the private sector as described in section 6.2. Developing countries, after establishing a minimum Pillar I to meet the poverty objective, should also be looking to mandate a private saving scheme for Pillar II.

The model set out briefly below is found in *Averting the Old Age Crisis* (World Bank 1994, pp. 297-302). In the PAYG scheme a worker is provided with a proportion of final gross salary indexed to average wage rises. Again for the PAYG scheme:

$$t = B \frac{D}{L} \tag{7.14}$$

Where the replacement ratio, $B = \frac{P}{w}$, is fixed, w equals the average wage, and t is the contribution rate necessary to achieve the pension outcome.¹³⁸ In contrast to this simple exposition, if a worker funds his/her own pension he/she must contribute tW in the first year, where W is the starting wage. Wages and contributions grow at the rate of $(1+g)$ each year and the capital accumulates at $(1+r)$ each year of a working life of

¹³⁸ The World Bank use $C = WD$ where C is the contribution rate and D the dependency ratio. This section uses common symbols for continuity with the rest of the chapter.

n years. The period in retirement is an average of m years. The years of retirement/years of working, m/n constitutes the passivity ratio.

Making the simplification that r equals g , the lifetime capital accumulation on retirement must equate to the present value of pension payouts over m retirement years. Assuming r , g , n , and m are constant over time the value of the accumulated capital, $tW(1+g)^n n$ must be equal to the present value of pensions $BW(1+g)^n m$. The required contribution rate can therefore be expressed:

$$t = B\left(\frac{m}{n}\right) \quad 7.15$$

If $r < g$ then t must be higher than $B(m/n)$. If $r > g$ then t will be lower. Intuitively it is clear that if interest rates are lower than wage rate growth, then a high contribution will be required. Lowering the passivity ratio, m/n , though say raising the retirement age will lower the required contribution rate. The World Bank rather bluntly concluded that:

- When the dependency ratio is the same as the passivity ratio and $r = g$ then there is no difference between PAYG and funding.
- If the rate of interest exceeds the growth rate g then funding is better than PAYG.
- If the dependency ratio is less than the passivity ratio, assuming $r = w$ m/n , as in a rapidly growing population, then PAYG is better than full funding.

The problem is that the dependency ratio can be higher than the passivity ratio with an ageing population. In an economy that is dynamically efficient, r should be greater than or equal to growth of GDP (which in turn reflects the increase in wages and population growth). Thus the World Bank (1994, p. 299) claims that full funding will be at least as cost efficient as PAYG and possibly more. They conclude:

Full funding costs less than pay-as-you-go (or yields a higher rate of return) if the interest rate is higher than the rate of wage growth plus the rate of population growth. If the interest rate is lower than wage growth plus population growth, the cost advantage lies with pay-as-you-go.

While empirical evidence on wage growth and interest rates can be amassed, the case for fully funding pensions is far from convincing. PAYG, according to the World Bank, has an advantage early when the dependency ratio is smaller than the passivity

ratio. The World Bank (1994, p.304) claims that as the dependency ratio approaches the passivity ratio, the influence of the higher return to capital reflecting its productivity, should dominate:

In sum, a cost advantage that pay-as-you-go plans might have had in the past was the result of demographic factors that no longer hold in many countries. In the future, if interest rates and earning growth maintain their relative positions and especially if pension funds are able to benefit from equity investments, capital mobility and international diversification, a fully funded system will require lower contributions rates than a pay-as-you-go system to achieve the same pension benefits.

Martin Feldstein, another influential voice in the call to privatise pensions, stresses the efficiency or deadweight costs of the extra tax burden implied by ageing under the US PAYG social security scheme (Feldstein & Liebman, 2001). He reviews the impact on national saving and concludes reforms are likely to have a positive impact. But the issue is controversial and the literature far from conclusive. The World Bank's analysis of PAYG versus fully funded pensions finishes with the throw away line: "and the winner is..." (p.302). There is little analysis of macro impacts and no mention of the inevitable transition costs in a shift from PAYG to a pre-funded pension scheme.

7.4.1 Critiques of the World Bank model

The framework and the conclusions the World Bank reached in the 1994 study are vulnerable on several other grounds, especially if relevance is sought in the context of the New Zealand pensions system. Internationally, the World Bank prescription has provoked a number of critical reviews (for example Heller, 1998; P. Orszag & Stiglitz, 2001).

PAYG and pre-funded schemes are doing two different things. One cannot replace the other, or be taken out of context, unless the argument is about what should have been the case a long time ago when pension systems were first introduced. A PAYG scheme improves the utility of existing retirees at the time of its introduction, while a pre-funded scheme does not. There may be social equity and justice reasons, as there were in the 1970s in New Zealand, for improving the incomes of the retired at that time. Clearly the issue of whether this was a good thing or not is highly normative.

Orszag and Stiglitz (2001) identify ten myths surrounding the common interpretations of the World Bank's preferred approach. The macroeconomic myths surrounding the mandatory private saving second pillar are:

- individual accounts raise national saving;
- rates of return are higher under individual accounts;
- declining rates of return on PAYG schemes reflect fundamental problems and;
- investment of public trust funds in equities has no macroeconomic effects.

They caution against thinking that there is one single answer for all countries and conclude, after examining these and the other myths that:

...the debate over pension reform would benefit substantially from a more expansive view of the optimal second pillar, which should incorporate well-designed, funded, public defined benefit plans. Such a more expansive perspective would allow policy-makers to weigh appropriately all the trade-offs they face, including private versus public systems; prefunding versus not prefunding; diversifying versus not diversifying and defined contribution versus defined benefit pensions plans. (P. Orszag & Stiglitz, 2001, abstract)

Barr (2000) explodes similar 'myths' in the pension debate (see section 6.6). In particular he writes of the primacy of the need for good governance and that "...from an economic perspective the difference between PAYG and funding is second order, and the range of potential choice over pension design is wide" (Barr, 2000, p1).

7.4.2 Impact on saving

Many arguments for preferring pre-funded schemes come from presumptions about the impact on various savings measures (Orszag & Stiglitz, 2001). While the theoretical case can be made for funding increasing national saving, the empirical evidence is far less obvious. Hemming (1998) provides a useful overview of the vast literature on this issue. He claims that the case for a switch to funded schemes is far from convincing, and refutes the claim that funded schemes are superior in handling demographic and economic risk. Eddy and Gower (2000, p.22) provide some evidence for Australia, where the introduction of the Superannuation Guarantee (SG) scheme might have been expected to increase private and national saving. They note that the expansion of compulsory superannuation in the last fifteen years of the 20th century did not result in a discernible lift in aggregate private saving, due at least in part to displacement of other kinds of saving. They query whether the SG will deliver

the rise in national saving that has been projected for the next 20 years of 4 per cent of GDP. They suggest that many of these offsets may prove larger than has been assumed.

It is often claimed that the introduction of PAYG schemes reduced national saving. Despite the logic of the argument, the empirical evidence is far from convincing (World Bank, 1994, pp.301-310). The reasons why the facts don't fit the theory include the desire of the older generation to leave larger bequests (maybe in recognition of the higher taxes that the young are paying or will have to pay in the future); offsetting changes in transfers from children to their parents; and that higher earners may not have faith they will get pensions and save anyway.

The World Bank does argue, however, that the introduction of full funding is likely to have a beneficial effect on saving. Among the explanations is the 'recognition effect' whereby the compulsory scheme raises the awareness of the importance of saving. The theory in this case is somewhat supported by empirical evidence (World Bank, 1994, p.209). Nevertheless, the World Bank (p.309) wisely concludes:

...if the policy goal is to increase saving, pension policy needs to be accompanied by other measures - for example, keeping inflation under control, increasing the availability of safe instruments for saving, discouraging consumer borrowing, and possibly providing tax incentives to long-term savings such as taxing real rather than nominal returns.

The transition from PAYG to full funding, a painful one for the current working generation, is largely ignored in the 1994 World Bank report. As Orszag and Stiglitz (2001) claim, ignoring the administrative and transition costs makes simple rate of return comparisons misleading. Transfers will still need to be made to the existing retired population (for example for social equity and justice reasons), and this could be interpreted to mean that the current generation of workers must 'pay twice', as they are forced to fund their own pensions as well. Interestingly though, in the case of the Chilean experience, the dissaving required by the state to pay off the old social security debt did not significantly offset the rise in private saving from the compulsory scheme.¹³⁹

¹³⁹ Other factors were also at work and the economy was growing rapidly in any case.

In the case of the compulsory Retirement Saving Scheme (RSS) proposed for New Zealand in 1997 (see St John, 1999b, 2001c), offsetting tax changes were required so that workers could afford to pay their contributions. These tax reductions would have meant higher taxes elsewhere, lower government spending or lower total public saving. In this New Zealand experience, the conclusion that introducing a pre-funded scheme averts an increase in required contribution rates arises only in the absence of macroeconomic considerations in the analysis.¹⁴⁰

Once the baby-boom generation draw down their funds in retirement, the saving deficit will still need to be filled by either increased contributions or more saving. This could mean either higher contributions paid by workers to reduce consumption or higher public surpluses. Either way the burden on the current workers is not alleviated.

7.4.3 Rate of return arguments

Inescapably, the ultimate selection of a theoretical approach involves value judgements about equity objectives as previously discussed. Pensions have a range of possible objectives, one is fairness based on actuarial purity, another is redistribution to allow for participation and belonging or poverty prevention, another is income smoothing over time, yet another is to increase national savings and improve growth. A critical preoccupation of the literature has been with how PAYG schemes redistribute across generations. The traditional way to determine net redistribution is to look at the expected present value of benefits less the present value of contributions for each generation and from that work out a rate of return. Negative redistribution is implied by a rate of return less than the market rate of interest. This is often accompanied by the implication that alternative investments would make the investor better off. Usually net rates of return are calculated for groups of people, cohorts, males, females, etc., and show the first generations under a PAYG scheme are

¹⁴⁰ Similarly the push to introduce individual accounts in the social security trust fund in the US is based on a misunderstanding of the overall macroeconomic impact as opposed to how the accounting looks. The key point is that there is no free lunch (P. Orszag, 2001).

advantaged compared to subsequent ones, with little redistribution from rich to poor within generations.¹⁴¹

Rates of return discussions are frequently obscure with few writers spelling out clearly exactly what they mean. Settergren & Mikula (2001) provide a welcome exception. They attempt to remedy what they have seen as a deficiency in the literature.

The aim of this paper is to present a method to calculate the rate of return and the internal rate of Pay-as-you-go systems. After that is done it may still be claimed that the growth in the contributions base is a good approximation of the rate of return. We would largely agree with that view. However in this case for once in the social sciences - being more meticulous makes the understanding and analysis of the studied system not only more correct but also easier. (Settergren & Mikula, 2001, p. 2)

Drawing on the overlapping-generations literature, they model a mature system in which each identical individual is expected to live for three periods (years), working in the first two and retired in the third when a pension of 50 per cent of the average wage is paid. The rate of return, if growth is zero, is also zero, as it is with the Samuelson model.

If a population growth rate of 100 per cent is assumed, the population structure is 4:2:1 with six people of working age paying the pensions of one old person. There are six people of working age for every one retired person so that to provide a pension for that one retired person of $0.5w$ the workers must each contribute $0.833w$. The pension each individual receives on retirement of $0.5w$ is the total return on the contributions made in periods one and two, where r is the rate of return on those contributions. Settergren & Mikula show that the total return is 200 per cent, and the annual rate is 100 per cent as is found by solving the quadratic equation:¹⁴²

$$0.5 = (0.833)(1 + r)^2 + 0.833(1 + r) \text{ ie.}$$

¹⁴¹ The better-off enter the workforce later, and pay contributions later. They may gain from the ceiling on contributions and they live longer in retirement and enjoy earnings-related pensions longer. Also there is very often a significant redistribution to women at home in the social security formula for pensions. There is a 50 per cent bonus on pension for a spouse with a wife who was not in the paid labour force. Most often, the spouse of a poor person must work outside the home so that it is the wealthy who can afford stay-at-home wives are rewarded in the public pension system.

¹⁴² The root of negative 4 is taken to be irrelevant.

$$r^2 + 3r + 4 = 0$$

By taking this very simple approach, Settergren & Mikula (2001) show that the rate of return on contributions in a PAYG scheme is not always the same as the growth in the contributions base, but depends on the way in which wages are apportioned between cohorts one and two, and on mortality patterns.

Following Settergren and Mikula, Table 7.2 sets up a simple overlapping-generations model in which the average wage, w , is assumed to grow at ω per annum, in a steady state population. There are assumed to be three identical individuals alive who each live three periods of equal length, working in two of these and retired in the third, when they each get $0.5w$. The PAYG scheme is funded by a 0.25 payroll tax.

Table 7.2: Rates of return with wage growth

Period	Payment to the PAYG scheme	Payment to the PAYG scheme	Pension received
1	Individual 9 $0.25w_1$	Individual 10 $0.25w_1$	Individual 11 $0.5w_1$
2	Individual 8 $0.25w_2$	Individual 9 $0.25w_2$	Individual 10 $0.5w_2$
3	Individual 7 $0.25w_3$	Individual 8 $0.25w_3$	Individual 9 $0.5w_3$

Source: based on Settergren and Mikula (2001)

Thus $w_2 = w_1(1 + \omega)$ and $w_3 = w_1(1 + \omega)^2$ and ω is the rate of wage growth. The rate of return to individual 9 is given by the solution to:

$$0.5(1 + \omega)^2 = (0.25)(1 + r)^2 + 0.25(1 + \omega)(1 + r)$$

It can be seen that if ω is 10 per cent then r , the rate of return is also 10 per cent. Consequently it is tempting to conclude that the rate of return on social security is equal to the rate of wage growth in a static population. And, if the population growth rate is η , then the rate of return will be given by $\eta + \omega$.¹⁴³

However this overlooks the fact that the model is highly simplistic. Just how rates of return are to be measured in a world of non-equal individuals, whose longevity is changing and whose individual experience with the labour market is so different, is hard to see. Settergren & Mikula examine rates of return when wages are not earned

¹⁴³ Ignoring cross products.

evenly in the two work periods, and show that rates of return can differ from the growth in the wage base.

The simple model set up in Table 7.3, assumes that there is a one-off improvement in longevity in period four, while the pension rates stay the same. The rate of return of individual 10 improves dramatically. Not until we reach period 7 do the rates of return stabilise. Individual 10's rate of return is found from solving

$$0.5(1 + \omega)^2 + 0.5(1 + \omega)^3 = 0.25(1 + r)^3 + 0.25(1 + \omega)(1 + r)^2$$

Table 7.3: Rates of return with improved longevity

Period	Payment to the PAYG scheme	Payment to the PAYG scheme	Pension received	Pension received
1	Individual 10 0.25w ₁	Individual 11 0.25w ₁	Individual 12 0.5w ₁	
2	Individual 9 0.25w ₂	Individual 10 0.25w ₂	Individual 11 0.5w ₂	
3	Individual 8 0.25w ₃	Individual 9 0.25w ₃	Individual 10 0.5w ₃	
4	Individual 7 0.5w ₄	Individual 8 0.5w ₄	Individual 9 0.5w ₄	Individual 10 0.5w ₄
5	Individual 6 0.5w ₅	Individual 7 0.5w ₅	Individual 8 0.5w ₅	Individual 9 0.5w ₅
6	Individual 5 0.5w ₆	Individual 6 0.5w ₆	Individual 7 0.5w ₆	Individual 8 0.5w ₆
7	Individual 4 0.5w ₇	Individual 5 0.5w ₇	Individual 6 0.5w ₇	Individual 7 0.5w ₇

Source: based on ideas of Settergren and Mikula (2001)

But what is the reality of individual 10's apparent high rate of return?¹⁴⁴ He has had to live an extra period and his average discounted living standard in retirement does not improve. He may have money in the second period of retirement, but he is no better off than he was in the first period of retirement, he has just lived longer. The unrecognised issue in the traditional rates of return literature is that it is *relative living standards that are important, not rates of return*.

In period 4, individuals 7 and 8 pay an extra 0.25 per cent payroll tax. They have gained from wage growth compared to individuals 9 and 10, but that gain is overtaken by the impost of the extra 0.25 per cent tax.

Living standards of workers in period three are based on $0.75 w_I (1 + \omega)^2$. In period four, workers' living standards fall to $0.5 w_I (1 + \omega)^3$. If there is no growth at all, $\omega = 0$

¹⁴⁴ If $\omega = 10$ per cent, the rate of return in this example is approximately 40 per cent.

then this is a fall in living standards of 33 per cent. To compensate, the rate of increase in wage ω needs to be 50 per cent.

This extreme example is instructive in showing that a one-off increase in the period spent in retirement of 100 per cent requires a 50 per cent annual rise in wages to maintain living standards in the model. If longevity is improving more slowly than wage increases or productivity then living standards may be maintained for workers as well as the retired and may even rise.

It is important to look beyond the confines of an over-simplistic model however. It might be concluded that individuals 7 and 8, faced with the prospect of living longer should save for themselves. If new payroll taxes of 0.25 per cent are put aside in private accounts, not only will this not be enough compounded at $r = \omega$ (because individuals 7 and 8 now also live a longer time in retirement), but somehow additional taxes will have to be raised to pay for individual 10 in his second year of retirement, if he is to be supported at all. In period 5, individual 9 will also require a pension for the additional year.

7.4.4 Discussion

While these models are helpful in understanding where some of the statements in the literature come from we do not live in a world where any of the assumptions hold.

Notably:

- Individuals are not identical.¹⁴⁵ Workers have a spread of earnings around the average wage and hours of work and years employed vary significantly.
- Many working age women are employed in the work of reproduction which is invisible and uncounted.
- Individuals do not all live the same period of time in retirement but have a distribution of probability of death around the average.
- Living standards matter, not rates of return.

¹⁴⁵ The use of the masculine pronoun is appropriate as these models are somewhat irrelevant for women. They take no account of the work of reproduction or caregiving or the separate needs of women in retirement including their greater average longevity.

Clearly we need to take into account a greater spectrum of experience than may be possible while keeping the model tractable. For example, a more accurate picture can be drawn by distinguishing four distinct classes, i.e. those with:

- low average earnings while in periods one and two, low longevity (many lower socio economic men and women);
- low average earnings while in periods one and two, high longevity (many women);
- high average earnings while in periods one and two, low longevity (bad luck);
- high average earnings while in periods one and two, high longevity (many men);

In contrast rates of return studies generalise for all ‘workers’ and mask what is really going on. The World Bank study, for example, reports rates of return were higher than 15 per cent for workers retiring in the 1950s and 1960s, 8 per cent for those retiring in the 1970s but only about 2 per cent for workers retiring after 2000. Significantly, the inference is that these rates were less than these workers could have got from other investments (World Bank, 1994, p.134).

There is a strong sense of a lack of actuarial fairness:

In the Netherlands, Sweden and the United States, workers retiring in the first thirty years of the public pension scheme received large positive lifetime transfers, whereas many workers retiring in the future will get less than they would from other investments and will suffer negative lifetime transfers. (World Bank, 1994, p.2)

The observed fall in rates of return largely arise from three sources:

- The high rates to the first generations reflect their less than full contributions.
- The change in demographics.
- Policy changes which diminish generosity, such as raising the age of eligibility and changes to the indexation formulae.

The particular formula used to determine the final pension under different PAYG social security schemes determines the rates of return for each of the different groups identified above. Those with high average earnings while in periods one and two, and high longevity will generally do much better than those with low earnings and low

longevity. The favoured group will be largely high-earner, long-lived men and their spouses. Ironically it is this group with the most to gain from privatisation of the PAYG system, while the losers will be those who live a long time and have a low lifetime earnings history (a group in which women are disproportionately represented).

Rates of return studies, in turn, paved the way for the development of generational accounts as discussed below in section 7.5. These accounts attempt to quantify the benefits and costs for each generation (for example Auerbach, Ghokale & Kotlikoff, 1994; Kotlikoff, 1992). A question addressed in this thesis is whether a generational accounting approach to fairness is useful, or whether the static concepts of fairness at a point in time, between the young and the old, male and female, are more relevant.

In the case of New Zealand the rates of return analysis is not readily applicable as discussed below in section 7.7.1. The source of revenue for financing New Zealand Superannuation is not only tax on wages, but includes taxes on investments earnings and taxes on expenditure including those paid by the retired themselves. The basis for entitlement to the flat-rate pension in New Zealand is not contributions, as in social insurance PAYG schemes, but the simple one of residency. Therefore relating tax contributions to pensions paid is not just difficult, but conceptually meaningless especially for those who have never worked or even paid tax.

In the case of New Zealand, the first generation of retirees that received National Superannuation (see section 2.3.2) certainly received a boost in their living standards. Looking back, the portion of taxes paid by many recipients for social security would have been relatively miniscule. Yet, they can be viewed as being compensated for the sacrifices and taxes that they paid to build New Zealand's infrastructure and bring her successfully through the depression and war years. In accepting the validity of such arguments, this thesis argues an equity-based approach is the appropriate one as elaborated below in section 7.5.

7.4.5 The costs of pre-funded pensions

The World Bank and other similar models, in concluding that the shift to full pre-funded arrangements is optimal, specifically assume that actuarial pensions will be paid once private funds have been accumulated, thus failing to account for real world market failure problems in private annuity markets as discussed in chapter 8. The

pensions paid from pre-funded private schemes compared to pensions from a New Zealand style public PAYG scheme will always be at a disadvantage:

- They will incur much higher administration costs and overheads including the need to generate a profit.
- If there is unanticipated wage growth, or inflation, or risky investments that collapse, pre-funded schemes will find it difficult or impossible to meet expectations (for example of wage-related, real pensions).
- The macro implications of the transitional period may require offsetting policy changes, such as offsetting tax cuts to pay for increased contributions as in the 1997 Retirement Saving Scheme, (RSS).¹⁴⁶
- There is likely to be pressure for all or part of the private pension to be inherited on death, reducing the ability of the scheme to spread the risks from those who live a short time in retirement to those who live the longest, (see, for example, the debate over the RSS in New Zealand, St John, 1999b, 2001c).
- The distributional implications are in the direction of more, not less inequality as there is a close link between contributions and benefits. This link may or may not lead to less tax evasion than under a PAYG scheme.
- The recognition of unpaid work is impossible without a government contribution (unpaid work recognition is implicit and fundamental to the existing New Zealand public pension system).

The assumption therefore of a costless annuitisation process that could approximate the pensions from a PAYG scheme is not justified. If the aim is to save costs by reducing total pensioner claims, then privatisation may be a way to do it, but the same

¹⁴⁶ A shift to personal accounts does not diminish the burden on workers as they will have to honour the unfunded commitments to existing and future retirees. The argument that the issuance of special recognition bonds etc overcomes this problem as outlined by Feldstein & Liebman (2001) is fallacious (Mitchell, 2001, p.4).

ends might be more simply and less expensively achieved by parametric changes to the PAYG system itself.

7.4.6 Protection from demographic risk

The argument that a PAYG pension backed by a social contract is less secure than a pension scheme with asset-backing is a seductive one and underpins much popular anxiety about the need for pre-funded pensions. Thus it is thought that while a future generation might refuse to pay social security contributions under the social contract, pensioners' assets in a funded scheme would be inviolate. But the reality, as discussed in the introduction to this chapter, is that the cost of pensions and the burden on workers is determined by the pensions that have to be paid out and not by the way in which they are financed. Under the ageing scenario, a smaller working age population must reduce its consumption if a larger retired population is to consume more. Under PAYG the per capita demands of the retired can be reduced if workers refuse to pay higher taxes or contributions. But under a funded scheme a similar effect is possible. Workers may force employers to pay them higher wages, reducing profits and dividends. If the proportionately fewer workers can only be persuaded to purchase assets from the 'Fund' if prices are lowered, pensioners' expectations from the pre-funded scheme will not be met. The perception of what is happening, might in this latter case be less clear:

...both PAYG and funding are exposed to demographic risk, and in both cases this risk will ultimately be born by pensioners. However the extent that this burden is more explicit with PAYG - and there is an obvious sense in which this is so - then the potential for intergenerational conflict may be greater than with funding. (Hemming, 1998, p.12)

7.5 Generational equity and generational accounts

In light of the inconclusive resolution of the macroeconomics of the funding versus PAYG dilemma, attention has focused on issues of generational equity in PAYG schemes. This is reflected in an extensive literature on generational accounts (for example, Auerbach et al., 1994; Gokhale & Kotlikoff, 1999; Kotlikoff, 1992).

The idea of generational accounts is based on two strong premises. The first is that there should be some kind of fairness across generations, where fairness or *generational equity* specifically means each generation pays for itself without

imposing costs on other generations.¹⁴⁷ The second is that the government's fiscal accounts as they are commonly structured are not a good guide to the impact of current policy on the burden bequeathed to future generations. Kotlikoff (1992), for example, claims that government accounts are in fact meaningless.

Generational accounting is supposed to remedy the deficiencies of conventional budgets by taking a comprehensive view of income, assets and liabilities. The fundamental relationship is that the government's net financial liabilities plus its future consumption must be covered by the sum of the generational accounts of all existing and future generations. The net present value of taxes paid and transfers received by different generations over their remaining lifetime is calculated, using various assumptions about the discount rate and productivity growth.

Generational accounts have recently been composed for most OECD countries including New Zealand (Auerbach et al., 1997). In essence, the main point of comparison is between today's newborns and all newborns of future generations. Given changes in policy will affect the accounts of different generations differently; generational accounts allow the winners and losers to be identified. These accounts are based on the life cycle consumption model and income smoothing over time, and assume that the government has an 'intertemporal budget constraint' (Auerbach et al., 1997). Thus, future generations must pay for the fiscal excesses of today's generations.

As observed above, generational accounts have been compiled for New Zealand, but their use appears to be in abeyance. The original study by Auerbach et al., (1997), commissioned in 1995, found that, in marked contrast with other countries for which accounts have been compiled, New Zealand alone was not imposing a fiscal burden (taxes paid less benefits received) on future generations. The study assumed the prevailing fiscal policy and the requirements imposed by the Fiscal Responsibility Act would be maintained. These assumptions thus implied that the budget would remain

¹⁴⁷ The term 'intergenerational equity' is reserved in this thesis to mean fairness between generations at a point in time.

in balance and, if necessary, taxes would rise to achieve this, while the surcharge on New Zealand Superannuation would remain in place.¹⁴⁸

As the New Zealand Treasury was at pains to point out, the finding could *not* be interpreted to mean that “New Zealand’s current superannuation system, is sustainable into the indefinite future”, or to imply that “...the higher tax burden on future generations is bearable in an absolute sense” (Treasury, 1997, p.2).

In some quarters, for instance, Banks & Emmerson (2000, p.8), there has been effusive praise for generational accounting:

There is no doubt that it is the right way to think about the aggregate implications of government pension policy and the potential effects of reforms.

Yet, while generational accounts may indeed be useful where there are gross imbalances, such as was found to be the case in the early studies on the US, there are numerous caveats that make them difficult to interpret. A note of caution is sounded by Barr (2001, p.109) for example, who points out that seeking the goal of generational equity in the sense that net tax burdens should be equalised across generations entails a strong value judgement:

...a range of exogenous inequities - wars, natural disasters, major epidemics, the Great Depression, the collapse of communism - have generation specific effects: it is by no means clear that equalizing tax burdens is the equitable solution.

Another important issue raised by Barr (2001, p.109) is that even if each generation is in balance the issue of how individuals within specific generations fare is not:

...with generations of varying sizes, equal treatment of generations by definition means unequal treatment of individuals and vice versa.

Some critics are even more sceptical. Buitert (1997, p.606), for example observes disparagingly: “what prima facie they appear to tell us may be misleading and at worst quite incorrect”. Buitert identifies three major problems with the technique. First, it depends on the strict life cycle model of household consumption. Once a bequest motive is allowed, and the possibility of imperfect capital markets accepted,

¹⁴⁸ Since 1995, there have been major tax cuts, higher baseline spending and the surcharge has been removed.

generational accounts become far less easy to interpret. Thus transfers between generations can compensate for fiscal imbalances.

Second, even if the life-cycle model holds, the accounting framework is still not comprehensive enough to be meaningful. In particular, there is the intergenerational distribution of the benefits from the public provision of goods and services to consider and intergenerational externalities.

Intergenerational externalities are the external effects of the consumption, investment, R&D, production, resource extraction and human capital accumulation activities of current generations on the wealth and well-being of future generations (Buiter, 1997, p.623). Buiter's third, but most crucial criticism is the lack of allowance for general equilibrium repercussions of alternative budgetary policies. Thus all tax-incidence or shifting issues are ignored but these endogenous changes are likely to be highly significant over time.

It is not unreasonable to conclude that generational accountants have been mesmerised by their own techniques and overly optimistic that accounting devices can illuminate real and complex issues. The net present value calculations of taxes and transfers are particularly sensitive to the choice of an appropriate discount rate and assumptions about growth. The failure to account for the benefits of investment in human capital, the environment and infrastructure, or any other non-monetary considerations, make the interpretation of these accounts especially problematic. This point deserves emphasis. Among many possible illustrations, a parent's investment in their children's education is treated as parental consumption in this accounting framework, underestimating the benefits to the next generation and overestimating the generational imbalance.¹⁴⁹ The implicit assumption is that the money spent on education of children is for the parent's own pleasure. Similar arguments apply to taxes for building of infrastructure, parks, and nature reserves.

The main reason for New Zealand's relatively good showing at the time of the Auerbach et al., (1997) study, is that instead of building up public debt, debt incurred in the past was being repaid, freeing future generations from the obligation to do so

¹⁴⁹ I am indebted to Professor Larry Willmore, senior economic advisor to the United Nations for discussions on this point.

(Treasury, 1997). But where was the recognition that New Zealand *as a country* is seriously indebted and that repayment of foreign loans or repurchases of assets sold to foreigners requires the generation of current account surpluses? In other words, the model appears to only partially capture the New Zealand situation. If the government has an inter-temporal budget constraint, is there not also an inter-temporal country external budget constraint?

While generational accounts are an interesting idea, a proper balance sheet such as the New Zealand government has tried to develop under the GAAP rules, may have the potential to perform the same warning function as generational accounts. For instance the discounted contingent liabilities, which result from the interaction of pension promises and an ageing population, can be modelled with as much if not more instructive information to guide policy. The setting up of the New Zealand Superannuation Fund which was detailed in section 2.7 has reduced the potential for the New Zealand system to perform this warning function. While the logic of the Fund suggests that the discounted liabilities of future pensions should be on the balance sheet, this is not part of the legislation (see for a discussion of this point New Zealand Business Roundtable, 2001).

A common misconception is that generational accounts compare the fortunes of different generations where a generation is the cohort born in a given year. In fact the accounts show the remaining net taxes for each generation alive from the year in question to expected time of death. It does not look back at past taxes and benefits. It is therefore doing something quite different to the intergenerational equity approach taken by those who have compared the equity of lifetime positions of different cohorts. For example, Thomson (1991) in 'Selfish Generations' describes generations born in the 1920s, 1930s, and early 1940s as gaining vastly more from welfare state arrangements over their lifetime than their successors in subsequent generations will enjoy. He warns of the unpleasant possibility of "intensified social disintegration along age and generation lines" (p.2).

The so-called generational equity debate has the potential to become confusing. The concepts of generational, intragenerational and intergenerational equity are slippery and often used in different ways in different contexts. Williamson et al.,(1999) unscrambled some of the confusing elements and terminology and have provided a useful account of the historical evolution of the debate.

In brief, Williamson et al., (1999) explain that ‘generational equity’ is a concept held by the conservatives who emphasise the merits of individualism, and believe that each generation should pay for itself without imposing burdens on others. The conservative view, reflecting the shift to the political right, has sought to undermine public confidence in the US public scheme and pave the way for funding cuts. Liberals on the other hand have tended to minimise any so called generational inequity in order to avert cuts:

Of particular note was the efforts of conservatives to define the problem as a ‘crisis’ and for liberals to define it as a short-term funding problem. (Williamson et al., 1999, p.12)

Arguments against the continuance of the US social security scheme in the 1980s stressed that while retired people get far in excess of their contributions, workers are paying more than they will ever get back. Legislative changes in 1983 include an increase in contributions, a projected raising of the age of retirement and a reduction in the generosity of indexation provisions.

In the 1990s, advocates of generational equity focused on the need for partial or full privatisation of social security to avert ‘bankruptcy’. As discussed earlier, these concerns were driven by falling rates of return, which largely resulted from demographic change and a reduced generosity of future pensions.¹⁵⁰

The discussion of very low (and sometimes negative) rates of return for later generations reveals one of the major reasons for the head of steam that has built up behind proposals to fund pensions in many parts of the world. When the return being earned on contributions to the PAYG system is so low, this cannot be a great surprise. (Johnson, 1999, p.25)

Williamson et al., (1999, p.16) notes that the conservative rhetoric about the entitlement crisis afforded a convenient attack on a number of elements of the welfare state.

In short, the interpretative framework put forth by critics is that the purported entitlement “crisis” is a myth being advanced by conservatives seeking to reduce government spending on Social Security, Medicare and the American welfare state more generally.

¹⁵⁰ Thus, in the case of the UK, rates of return studies show a progressive fall for new retirees, until after 2020 when the rates of return become negative (Johnson, 1999).

7.6 Intragenerational and intergenerational equity

Williamson et al., argue that because the term ‘generational equity’ has become associated with the more conservative interpretation, it is less useful from the liberal perspective. In general, while there is less coherence and agreement among liberals, their concepts stress *intragenerational equity* and *generational interdependence*.

The concept of generational interdependence encompasses the view that the interests of the old and the young are intertwined. In the conservative view, the current elderly are often portrayed as getting a larger share at the expense of the young. Thus the falling fortunes of children are contrasted with the ‘greedy geezers’ and images of the old consuming the young (Williamson et al., 1999, p.14).

Liberals, on the other hand, see pensions for the old as also good for the young who benefit from their financial independence and are relieved of the obligation to support their parents. The policy conclusion is not that there should be means testing for the old so as pension benefits are paid only to the poor, or even affluence-testing which is also often advocated by the conservatives.¹⁵¹ While liberals advocate redistribution from rich to poor, they tend to be deeply suspicious of all means-testing. Critically, the liberals fear not just the possibility that over time the definition of the affluent may widen to include many of the middle class, but also that the contributory pension might become regarded as just a welfare benefit.¹⁵² They also believe that the concerns about middle class capture of universal or non-means-tested pensions is misplaced, and that public schemes perform an important insurance role for the middle class.¹⁵³

The concept of *intragenerational equity* is also important to the liberal position. This concept encompasses other forms of equity, such relating to age, gender, wealth, income and race but stresses the need for fairness among members of the same

¹⁵¹ The old age pension in Australia is a good example of how a means test can be designed as an affluence test to exclude only the better-off. The surcharge that operated between 1985 and 1998 in New Zealand is another example.

¹⁵² This thinking explains in part why the Labour government has been determined to keep the New Zealand Superannuation pension as a universal payment. The problem as discussed in this thesis for a liberal point of view on this one is that universal pensions sit oddly in a welfare state that is otherwise tightly targeted.

¹⁵³ For a comprehensive review of the literature on middle class capture and its relevance to the debates in New Zealand see Bertram (1988).

generation. In this thesis, the term *intergenerational equity* is taken to mean fairness between today's generations, namely the retired and the working age populations at a point in time. *Intragenerational sharing* of some of the risks of old age, such as increasing longevity and long-term care also improves *intergenerational equity* by lifting some of the burden off the working age population. More *intragenerational sharing* of the risks of old age underpins the suggested reforms to New Zealand retirement policies outlined in Part III of this thesis.

7.7 What is to be learned from the theoretical approaches?

The World Bank (1994, p. 317) argued that PAYG schemes go through a lifecycle:

- Stage one: Youth, accumulation, windfall benefits and low contributions rates;
- Stage two: Coverage, expansion and rising contribution rates;
- Stage three: System maturity and the collapse of the pyramid scheme.

But does this justify the radical reforms the World Bank has so strongly advocated? As discussed in this chapter and as Barr (2001) makes clear, privatisation of an unsustainable PAYG scheme must also involve changes that make outcomes less generous if there are to be any gains from privatisation. Rather than privatisation, PAYG schemes themselves can undergo parametric reform to make them sustainable as suggested, for example, by the summary for the New Zealand case in Table 7.1.

Nevertheless, the World Bank cautions newly developing countries to learn from the experiences of the older developed countries suggesting that the deterioration in the financial condition of PAYG schemes in developing countries is likely to be more rapid than for OECD countries. But the kind of PAYG scheme envisaged by the World Bank (1994, p 317) is clearly of the old social insurance type, rather than the New Zealand variant.

Starting with limited coverage and gradually expanding it delay the reckoning, but this solution is regressive under a pay-as-you-go scheme, because the first workers covered tend to be higher- income workers whose generous returns are paid for by the lower-income workers who enter late.

PAYG schemes do not have to be structured like this and the New Zealand model may be a good one for developing countries. New Zealand already satisfies the recommendation that large, positive contributions-related transfers to high-income

retirees should be avoided, and conforms to the advice from the World Bank (1994, p.327) that:

In general, transfers can be made more equitable by using a very progressive benefit and tax formula in public pension plans, imposing a floor but no ceiling on taxable earnings, switching to general revenue finance once coverage is widespread, and using privately managed funded plans that make benefits contingent on contributions, to provide higher pensions to higher-income groups.

It is true that one of the enduring themes of political questioning in New Zealand has been whether New Zealand should have a funded pension and whether there is a need for individual accounts. This debate is often confused, both as to objectives and as to just how different strands of policy are supposed to fit together. Thus, whether advocates of full pre-funding have Pillar I or a second supplementary Pillar II in their sights is often obscure.

In summary, the overlapping-generations models reviewed in this chapter are highly simplistic and based on restrictive assumptions. They are also inconclusive and while based on simplifying assumptions they quickly become too complex to be of much use for informing real world policy decisions. Furthermore, if they are to be calibrated to a real world economy there are daunting data requirements. The degree of implicit, but controversial, normative judgements in these models and their failure to incorporate gender analysis also render them less useful to real world policy-making. As Disney (1996, p.49) notes:

Whether such equilibria are attainable when, for example, capital investment is driven by other autonomous factors is open to doubt ... and the analysis of disequilibria and stability properties can get extremely complex.

One of the problems of changing to a funded scheme from PAYG is the double burden on the current generation. The simplistic recommendation to adopt full pre-funding of social security ignores this transitional cost. The size of the transitional cost, however, is real and must be offset against any discounted gains from such a shift. Once this is done, it is far from clear that recommendations to privatise social security can be justified.

Moreover, as discussed, the case for funding over PAYG on the grounds of improved national saving is far from clear on empirical evidence despite its theoretical appeal and advocacy by the World Bank.

If funding is a lower cost financing option than PAYG, if it results in more intergenerational fairness, if it can better handle demographic and economic risk, if it can more clearly signal future pension costs and if it is associated with high saving (or at least most of these things are true), then a case could be made for funding. However it is argued that funding does not have a clear advantage on these grounds, and the case for a shift from PAYG to funding is an uneasy one. (Hemming, 1998, p.5)

7.7.1 The influence of theory

It is clearly evident from the foregoing discussion that there is a vast literature on the economics of pensions. It is less clear that these theoretical and empirical studies have had any influence in actual pension reform decisions in many OECD countries.¹⁵⁴ For example, Banks & Emmerson, (2000, p.55) observe that this is particularly true for the UK, whereas in the US there is a lot of debate but little reform:

One striking feature of the evolution of the UK system over the last 20 years... is the number of reforms that have been introduced with little or no prior debate. All genuine economic analysis has been conducted after the reforms were implemented.

In the case of New Zealand, many reforms have been imposed with little warning let alone analysis. As discussed in chapter 2 of this thesis, many of these 'reforms' in turn have been reversed, for example, the New Zealand Superannuation scheme of 1974, the surcharge introduced in 1985, the change of the pension to a welfare benefit in 1991 and the reduction in the indexation formula in 1998. It is fair to say that academic debate and the influence of economic models of the type described in this chapter has also been muted if not non-existent in New Zealand.

The models presented in this section have, nevertheless, been used extensively in policy debates elsewhere and their influence may be increasing in New Zealand. But, at times, there has been an uncritical acceptance of the implications of these models for policy purposes. This is compounded when the objectives of policy are themselves often unclear, obscure or conflicting and the normative issues are neglected. The goal of a socially optimal distribution between generations at a point in time

¹⁵⁴ The World Bank model has, however, been particularly influential in pension reforms in less developed and Latin American countries.

(intergenerational equity) has been confused with returns to the individual (individual equity).¹⁵⁵

In the New Zealand context it is clear that it is difficult to fit a social insurance scheme such as New Zealand Superannuation into the context of the overlapping-generations model and the related discourse about rates of return. This does not, however prevent analysts from attempting to do so. At a one-day symposium on Retirement Income Policy (Wellington, July 13, 2001), Professor John Rust was invited to present the opening paper in which he stated:

Economic theory suggests PAYG social security systems result in a) lower savings, b) higher costs and distortions relative to fully funded systems since the implicit return of PAYG (the sum of real wage growth plus population growth, approximately 2 per cent for New Zealand) is less than the real interest rate (5-7 per cent).

The high real rate of interest in New Zealand is likely to be related to the risk premium needed to attract international capital to pay for an imbalance in the external accounts and a monetary policy focused on keeping inflation low. It does not necessarily reflect genuine growth opportunities, suggesting caution when drawing such conclusions.

Rust (2001) reported that the internal rate of return for average wage earners in the US from social security was only 2 per cent. He claimed it was even negative for high earners.¹⁵⁶ The clear inference was that people could do better investing on their own. Moreover in drawing conclusions for New Zealand he stated:

To the extent prefunding comes from increased tax contributions (as opposed to borrowing to prefund the pension liabilities) New Zealand will benefit from the higher compound returns on the trust fund portfolio as opposed to the less than 2 per cent rate of return on a PAYG system.

¹⁵⁵ This confusion has underpinned much of the debate about privatisation of social security, especially in the US. As discussed in this chapter, rates of return on social security contributions are supposedly low, maybe negative compared to sharemarket returns, and therefore individuals are presumed best to save for themselves.

¹⁵⁶ This is not true for single-earner couples in the US, due to the 50 per cent pensions bonus for the spouse. The widow also continues with her husband's pension.

But, as observed above, it makes little sense to talk about a rate of return in the New Zealand's PAYG scheme.¹⁵⁷ Naturally, pre-funding the state pension has an opportunity cost, such as repaying public debt or reducing taxes. If people kept their tax money and invested it, 'New Zealand' may benefit to a similar extent. If New Zealand does opt for individual accounts, the underlying objectives of NZS would need to be radically changed.

Rust (2001) argues that individual accounts would be legally the individual's own property making it difficult for government to renege on its promises. For a supplementary scheme that tops up the basic pension, individual accounts are critical. But one of the advantages of the New Zealand approach, apart from its simplicity, is that there is no residual value to be appropriated to an estate in the case of death, and there are no messy issues around spousal pensions and divorce. It is a highly cost-effective scheme if judged, not against the goal of actuarial purity, but of securing a reasonable standard of living for all older people.

7.8 Conclusion

While the extent of the international economics literature is impressive, the results from a policy perspective have proved largely inconclusive. Debates over funding versus PAYG, defined benefit versus defined contribution, private versus public delivery, have not delivered clear answers. As Banks and Emmerson (2000, p.55) suggest further academic research and model refinements are now showing 'diminishing returns to scale' and now the hard work of normative analysis is needed:

Ultimately, however, conditional on policy-makers' knowledge of pensions issues being at the frontier, many developed countries are at the point where value judgements need to be made in order to set the direction for policy on future public and private pensions.

It is the lack of appreciation of public choice issues, and the failure to grapple with equity issues between the young and the old at a given point in time, that has rendered most pension models, and predictions from them inconclusive.

¹⁵⁷ To reiterate, New Zealand Superannuation is highly redistributive, making the average rate of return an unhelpful concept. Those who pay no tax during their pre-retirement years can gain the equivalent in pension of several hundreds of thousands of dollars. The New Zealand system is not analogous to the US system.

What is striking to a reader of these studies is the difficulty of making any conclusive assessment of the redistributive consequences of a public pension scheme, given the multiple perspectives that one can have on how to evaluate any redistribution that may occur. (Heller, 1998, p.24)

Furthermore, an enquiry into welfare enhancing pension reform *cannot* avoid distributional value judgements. Heller (1998) suggests that redistributive issues must be considered at the outset in designing a public pension scheme. In the terminology used by the World Bank, attention to Pillar I is crucial. Yet, as Heller, argues, the emphasis to date on Pillar II has left many Asian countries with primary pillars that are incomplete or non-existent and many of their elderly unprotected.

If our interest is improving retirement policies, what conceptual model should be used? This chapter has suggested that the models that stress actuarial fairness for all generations, or those that are based on concepts of 'generational equity', are not useful as a guide to New Zealand policy development. The concepts of generational interdependence and intergenerational and intragenerational equity, as defined in this chapter are more appropriate. The aim of policy for the retired should be to facilitate a fair sharing of resources both between young and old and amongst the old themselves. The achievement of this goal should be empirically evaluated, suggesting the need for comprehensive data on distribution and living standards.

The case for New Zealand to fundamentally alter its retirement policies, by shifting to full pre-funding away from PAYG arrangements as proposed by the World Bank, cannot be sustained by rate of return arguments or by generational equity arguments. This leaves parametric changes to the state pension and reforms to private voluntary savings arrangements. The Periodic Report Group (1997b) set out a suitable political framework for policy development in New Zealand, while an earlier report outlines the necessary parametric changes (Periodic Report Group, 1997a). Reforms must meet agreed criteria, for example those of equity, efficiency and administrative simplicity. To be sustainable, they should also be flexible in the light of uncertainties surrounding migration flows and economic conditions.

Part III of this thesis discusses a range of suitable normative criteria that might be used to guide future reforms. The concepts of *intergenerational* and *intragenerational* equity are crucial to this discussion.

8 Insurance, annuities and long-term residential care

8.1 Introduction

The theoretical arguments advanced by the World Bank, as discussed in section 7.4 of this thesis, have encouraged the view that privately managed, funded schemes are superior to public, unfunded defined benefit schemes. With the increased advocacy of privatisation of social security and the individualisation of retirement provisions, more attention internationally is now focused on the practical aspects of annuities and how retirees will deal with the lump sums that are accumulated in their defined contribution schemes (see for example, J. Brown et al., 2001; James & Vittas, 2000b; Wadsworth et al., 2001; Wallister, 2000; Watson Wyatt, 2002).¹⁵⁸ The major risks in the absence of suitable annuitisation are that people will outlive their assets, and die in poverty, or restrict their living standards and die unduly asset-rich. In either of these two scenarios, unannuitised retirees may have high psychic costs of worry and uncertainty in what could be 30 to 40 years of retirement. From the perspective of society, the practical implications of under-annuitisation may be increased demands for public spending for healthcare and social services and a further widening of the wealth distribution.

It is interesting that the implicit assumption behind the kind of relatively simple mathematical model produced by the World Bank, is that the accumulated capital sum under a private funded scheme can be painlessly translated into an actuarially fair real pension (as well as one that is adjusted for wage growth). Once the difficulties and costs of private annuitisation are acknowledged, the case for the privatisation of social security schemes is seriously diminished.

Proposals to change the existing system need to deal with whether private markets will be able to offer protection against longevity risk during retirement similar to what Social Security offers. In particular, will retirees be able to convert their private account balances into annuities at fair prices? If not, some of the long-run gains attributed to pre-funding retirement consumption may be diminished. (Congressional Budget Office, 1998, p.2)

¹⁵⁸ See also for a comprehensive listing, www.worldbank.org/research/workingpapers

In most countries the annuities market is still small, although it may be underpinned by mandatory arrangements tied to subsidised pension plans as in the UK. Private annuity markets have tended to grow rapidly in those countries that have adopted the mandatory second pillar of the World Bank model (James & Vittas, 2000b; Wallister, 2000). The appendix to this chapter sets out some of the practical issues in the provision of annuities in Australia, the US, the UK and Chile. The focus of the discussion here is on the viability of private provision of annuities and long-term care insurance in voluntary private markets.

It is well recognised that private unregulated markets for insurance to protect against many of life's risks fail to achieve economically efficient outcomes (Barr, 1998, 2001). The risks that older people may seek to insure against include: living longer than expected; ill health and the need for long-term care; unanticipated inflation eroding income; falling relative living standards; investment risk including fraud and mismanagement of retirement assets. The traditional life annuity is designed to protect against the first risk, that of outliving one's capital. By doing this, if suitably designed, it may enable some protection against some of the other risks as well, as considered in section 8.6 below.

The life-cycle model of consumption implies that people ought to be interested in consumption smoothing over the life-cycle.¹⁵⁹ Various explanations have been proposed for the apparent lack of voluntary interest in annuitisation observed in practice, such as the bequest motive; the actuarially unfair pricing of annuities; fear of catastrophic illness; lack of indexation and rigid design of products, and poor marketing (see for example, Friedman & Warshawsky, 1990; Warshawsky et al., 2002). It is also suggested that poor utilisation of annuities may derive from the financial planning industry's under-rating of the mortality risk, and hence their offering of inadequate advice. The unattractive commission structure may be another explanation as to why annuitisation is not a popular option.

Some annuitants in countries with generous PAYG pensions are net savers suggesting that they may have preferred a lower rate of annuitisation of their total wealth (including social security). But even in countries where private occupational pensions

¹⁵⁹ Mitchell et al., (1999) use an expected utility optimisation framework to suggest individuals would forego 20-30 per cent of their net wealth (excluding social security) to obtain a life annuity.

are well developed, there is little evidence that people believe they are over-annuitised (Wallister, 2000). Such a belief might be evidenced in a demand for life insurance to offset over-annuitisation and compensate for early death by providing for bequests, but there is little evidence of this demand.

The private market for annuities in New Zealand may be undeveloped (see section 3.6) partly because annuities are perceived as a luxury good and their demand is income-related, and/or because bequests are important to older people. But market failure is a more likely primary explanation. This failure arises in the annuities market from several sources and explains why the market in New Zealand is almost non-existent and will be unlikely to develop in the absence of support by the state.

8.2 The private annuities market

An annuity is an income stream that continues for a fixed period (term certain annuity) or for life (life annuity). In its simplest representation, a capital sum, K , buys an actuarially determined term-certain annuity, y , depending on the time period for which it will be paid, n , and the rate of return r expected on investment. While the Present Value (PV) of any given annuity stream y for t periods at a rate of return r is given by K , companies supplying the annuity must also cover overheads and profits.¹⁶⁰

$$K = \sum_{t=1}^n \frac{y}{(1+r)^t} \quad 8.1$$

The actuarially fair fixed life annuity y payable from a given capital sum K is dependent on tp_x , the probability of survival t periods from age x , where x is the age of the annuitant at the outset of the annuity ($t=0$). The maximum life span is given by w and the risk-free rate of return is given by r . The discount factor may be calculated using a term structure of interest rates, but is taken as a given here for simplicity.

$$y = K / \sum_{t=1}^w \frac{tp_x}{(1+r)^t} \quad 8.2$$

¹⁶⁰ The time period t is generally expressed in terms of months paid in arrears, but for purposes of simplification annual periods are used here.

If the annuity is a real annuity, then r is a real rate of interest. In practice if the assumed real rate of return is not achieved it will be difficult to fully-index the annuity. If instead of an annuity linked to a price index, the nominal annuity may be priced to increase each year at a rate s of say, 2 per cent or 3 per cent:

$$y_t = K / \sum_{t=1}^w tp_x \frac{(1+s)^{t-1}}{(1+r)^t} \quad 8.3$$

8.2.1 Market failure

Classic failures of insurance markets revolve around the two phenomena: adverse selection and moral hazard. In the voluntary annuities market the key market failure arises from adverse selection. This may arise in cases where the individual better knows his/her longevity risk than the insurance company. Even if the company knows the risk, discrimination based on expected longevity is not usually feasible except in the case of gender. The result of adverse selection is that the pool of annuitants has a better longevity profile than the population at large. For this reason life insurance companies use their own annuitant mortality tables to price annuities, rather than whole of population life tables.

If an insurance company offers annuity payments based on the average mortality rates of the entire population, it would soon run into difficulties as those who expected to live longer than average would find annuities more attractive than those who might expect to have a shorter life span.¹⁶¹ Ex post, premiums would have to rise if the insurance company is to remain solvent. This subsequently decreases the attraction for those with a shorter life expectancy and demand by them drops further. Following the seminal work of Akerlof (1970) the company is left with the ‘lemons’ or bad risks. Eventually it may be no longer viable for the insurance company to stay in the market. The greater the adverse selection, the higher premium cost of a given annuity, and the lower the Money’s Worth Ratio (MWR), (see the discussion in section 3.6 of this thesis), and the greater the total welfare loss for society.¹⁶²

¹⁶¹ One factor balancing this conclusion is that women who have a longer life expectancy on average are also poorer and less likely to be able to afford annuities.

¹⁶² Overcoming adverse selection by making annuities compulsory, also runs the risk of welfare losses as those who are compelled to buy may find they are over-annuitised. While voluntary annuities are

Economic theory suggests that insurers with imperfect information can induce potential purchasers of annuities to reveal their longevity risk by allowing them to choose between contracts of different design (Rothschild & Stiglitz, 1976). In theory, this will improve the efficiency of the outcome. For example, large and expensive, or small and cheap options could be offered. A small monthly annuity payment with a low premium per dollar of payout might be best for those with an expected short-life span but the problem is that they will feel underinsured. The insurance company cannot prevent them purchasing a similar product from another company to compound the size of the annuity (Wallister, 2000). On the other hand, a large annuity payment with a high premium per dollar of payout might attract the long-lived, but they too could buy several of the cheaper annuities.¹⁶³

If an insurance company can offer better-priced annuities to those who are highly likely to have a lower life expectancy (long-term smokers for example) then they can attract those who otherwise might exit the market. Nevertheless, the creaming off of the good risks into separate risk categories, in the extreme case, could destroy the risk pooling advantage of insurance.¹⁶⁴

One obvious way to discriminate is by gender. The average life expectancy of women is higher than for men. In some countries, although not New Zealand, discrimination by gender may not be permitted, making the task of insurance more difficult. But even with gender discrimination, the wide variations within gender are possible sources of adverse selection.

Another way of segmenting the market is to offer policies that have different degrees of guarantee. A refund for early death would be appealing for those who expect to live less than the average, while longer-lived people might be expected to prefer no refund or guarantee period, which would just be a cost to them in terms of a lower annual payment. If people who face a high longevity risk are also more likely to need long-

unambiguously welfare-enhancing because they are voluntary, they fall short of the ideal to the extent they are not based on full information and adequate risk discrimination.

¹⁶³ Of course as the New Zealand data attests (see section 3.6), there are fixed costs that make smaller annuities more expensive and thus mitigate against this possibility (Finkelstein & Poterba, 1999).

¹⁶⁴ See, for example, the discussion of the impact of gene technology in Barr (2001). In the extreme case, all illness could become determinate rather than random.

term and other forms of intensive healthcare it may be possible to tie these two risks together (see section 8.6 and Part III).¹⁶⁵

Given knowledge of average life expectancy, an individual could plan to divide income and capital between the years that he or she is expecting to live after retirement and draw this amount down each year. ‘Allocated annuities’ such as available in Australia facilitate this as described in the appendix to this chapter. The risk is high however, as much as 50 per cent, that the individual will live longer than the allocated period and may spend the last years of life in penury. Thus it is doubtful whether the term ‘annuity’ should really apply to this product.

8.2.2 Measurement of adverse selection

The costs of adverse selection can be estimated from the expected present value of annuity payments based on the mortality of the overall population, compared to the premium using special annuitant mortality rates. These rates may also be further adjusted by individual Life Offices to reflect expected improvements in longevity. In practice, the market price reflects not only the special annuitant tables that may be used, but also the requirement of private enterprise to cover costs and profits.

An Australian study compared adverse selection in Singapore and Australia, and showed that the Money’s Worth Ratio appears to be lower in Australia because, in contrast to Singapore, Australia has a generous public pension as a safety net (Doyle et al., 2001). The precise formula in this study for the annuity’s MWR requires that the expected present discounted value (EPDV) is calculated and then expressed as ratio to the initial premium paid (K), where N is the guarantee period, x is the age at which the annuity is purchased, r is the riskless interest rate and w is the maximum life span. A is the monthly annuity at age of purchase; p_x is the probability that the individual will be alive after 12 months.

$$EPDV = \frac{\sum_{t=1}^{N \times 12} \frac{A_x}{(1+r)^t} + \sum_{t=(N \times 12)+1}^{(w-x) \times 12} \frac{A_x \times t p_x}{(1+r)^t}}{K} \quad 8.4$$

¹⁶⁵ Eddy and Gower (2000, p.28) cite Creedy’s estimates for Australia for 1990 which show health costs rise dramatically with age, to become a larger per capita cost to the state for those over 74 than the age pension.

The calculations are complex, requiring cohort mortality tables that reflect anticipated mortality experience rather than the current mortality of different ages. Australian MWR ratios for men aged 65 using population wide mortality data were calculated to be 89 per cent for men and 91.5 per cent for women. Comparing the average MWR using annuitant mortality and population mortality, the findings were that adverse selection accounts for about 6 percentage points in the MWR for Australian men aged 65, and 3.6 percentage points for Australian women. In contrast, the MWRs for Singapore exceed 100 percent and therefore the adverse selection effect is low or non-existent (Doyle et al., 2001). Clearly the entire institutional structure of pensions and the nature of state intervention is important in these conclusions.

Early studies in the US showed that private annuities were 15-25 per cent more expensive than the expected present discounted value of an annuity. About half of this is due to longer than average life spans of annuitants and one half to overheads (see for example Congressional Budget Office, 1998; Mitchell et al., 1999). Later empirical studies suggest that annuities are surprisingly good value for money with higher MWRs than might be expected (James & Vitas, 2000a). Nevertheless the complexity of these calculations must be borne in mind:

Apart from the numbers derived by these studies, perhaps one of their greatest lessons is the complexity of the calculations involved. While straightforward estimations of the expected present discounted value of annuity payouts are ostensibly involved, this requires highly complicated derivations of the discount and projected mortality rates, with sensitivity analysis given the uncertainty surrounding these rates. When calculations are so complex and nontransparent, it is difficult to argue that individuals have a clear notion of the value of annuities and the extent to which annuity prices may or may not be unfair. (James & Vitas, 2000b, p.21)

James and Vitas (2000b) summarised some of the complex studies on MWRs and concluded that:

- the competitiveness of annuity markets has improved over time (1985-1998).
- adverse selection accounts for 10-12 percentage points of the load factor.
- administrative costs account for 3-13 percentage points, depending on the discount factor.

The estimate of adverse selection of 10-12 percentage points of the load factor is the real utility loss for the average-lived person who does annuitise. If they choose not to annuitise, their utility loss must be less than 10-12 percentage points, and depends on their unobserved willingness to pay. There may be a large range of reasons why many are not willing to purchase annuities even at actuarially fair prices. Thus for that group the utility loss from not being able to do so is zero.¹⁶⁶ Thus, the utility loss stemming from the non-availability of annuities on terms that are actuarially fair to the average member of the population may be much less than these numbers imply (James & Vitas, 2000a, p.18).

Among the complex assumptions that must be made in MWR calculations, the choice of discount rate is crucial. Using the government bond rate and the annuitants' mortality tables James and Vitas (Table 1, p.26) determined a MWR for US men at age 65 in 1998 as high as 97 per cent. Because there are obvious expenses relating to marketing and reserve provisioning, there is a puzzle as to how insurance companies cover their administrative costs and earn their profits.

If people want a risk-free annuity and if these annuities are indeed risk-free, they have gotten a good deal paying virtually nothing for longevity and investment insurance. (James & Vitas, 2000a, p.11)

The insurance company may in fact invest in higher yielding assets and may be in a stronger position than the individual to do so as they can spread risk not only for the current annuitants, but for new cohorts of annuitants as well:

According to these numbers, 10 percentage points of cost recovery and profits come through risk transformation charging according to a risk-free rate but investing the premiums in riskier assets, and retaining the differential. Insurance companies may be in a good position to mediate risk because they aggregate resources, can therefore diversify, reinsure and pass the residual risk on to their stockholders who are willing to bear it. In this case, the utility frontier is expanded by this combination of longevity insurance and risk intermediation. (James & Vitas, 2000b, p.19).

If individuals themselves prefer to accept more risk, they may use a higher discount rate to gauge the MWR, and thus the administrative costs charged by the insurance company would look higher. For example, the above study showed that for 1998, the

¹⁶⁶ There may be “a high-income elasticity of demand for annuities combined with the positive correlation between income and longevity” (James & Vitas, 2000b, p.17).

MWR for 1998 fell to 87 per cent if the corporate bond rate was used instead of the government bond rate¹⁶⁷. Knox (2000) also argues this point, noting that Life Offices can be assumed to earn more than the risk-free rate of return. Thus using a corporate bond rate or a bond rate plus a margin to discount the annuity will result in a lower MWR and less attraction for those who believe they should expect more than a risk-free rate of return. Variable annuities, which permit a higher return may be preferred by such individuals, however they may not fully trust the insurance company with managing their large capital sum over the long term and may still prefer not to purchase annuities at all (James & Vitas, 2000b, p.19).

8.2.3 Moral hazard

Separating the annuities market into risk classes may be more difficult than in the life insurance market because the incentives of the insurer and the insured work in opposite directions. In the life insurance market, both the insurance company and the insured individual want the insured to live a long and healthy life. By contrast, an annuity insurer would like the insured to die early. To the extent that changes in lifestyle can affect longevity in the short-to-medium term, the annuitant might change his or her habits and live longer than previously expected by the insurer. Such a change in behaviour after the sale of the insurance policy is called moral hazard. Healthy annuity applicants seeking lower rates could also cheat by claiming they had unhealthy habits, such as smoking, to receive a better rate.

Annuity insurers also cannot provide any incentives that entice people to behave in the insurers' favour. Other insurance contracts, like health or fire insurance, require co-payments of the insured to avoid moral hazard. If a catastrophe occurs, the insurance company does not finance the full cost of the damage; instead, the insured are required to bear a certain percentage of the cost. Also, if the terms of the contract are violated, the insurer may withhold compensation altogether. Such arrangements increase the incentive of the insured to reduce the risk of damage. However, those kinds of incentives do not work for annuity insurance because the insurer cannot entice the insured to die early or live recklessly by means of a co-payment.

¹⁶⁷ This calculation is based on the annuitant life tables. If general population tables are used, the MWR falls to 77 per cent.

Moral hazard in pensions is often related to the incentive to change behaviour when there is a means-tested state payment, like the Australian age benefit, to consider. In a voluntary market this could affect the decision to annuitise at all, and the timing of annuitisation depending on the means-test rules. One of the possible arguments for compulsory earnings-related Pillar II pensions is the desire to limit the moral hazard that might reduce the incentive to save (Agulnik, 2000).

8.2.4 Inflation risk

So long as the provider achieves the assumed real rate of return, inflation adjustments to the annual payment are possible. It is not usually feasible for a provider to guarantee full indexation, however, as future real interest rates are uncertain.¹⁶⁸ In some countries, private annuity markets do provide indexed annuities but at high cost. If the government provides inflation-indexed long bonds, indexation of annuities becomes possible but, in this case, the government carries the cost of uncertainty.

The Money's Worth Ratio (MWR) is lower for indexed pensions, perhaps because the adverse selection problem is more severe. It is speculated that workers who purchase indexed annuities may have above average longevity and derive a greater benefit from inflation protection.¹⁶⁹ James and Vittas (2000a) show that real annuities have MWRs 7-9 per cent lower than nominal annuities, and that when a riskier corporate bond rate is used to discount annuity payments there is a further 7 per cent reduction. Even when indexed bonds are available, as in the UK, the market for indexed annuities is small (J. Brown, Mitchell, Poterba & Warshawsky, 1999; James & Vittas, 2000a).¹⁷⁰

The lack of instruments such as long-term indexed bonds makes inflation-adjusted annuities less likely (TIAA-CREF Institute, 2002). Inflation-indexed bonds, (IIB), were first available in New Zealand in the period 1977-1985. Wholesale IIBs were

¹⁶⁸ Barr distinguishes between risk, for which probabilities can be attached, and uncertainty, for which no statistically reliable estimates can be made. Many of life's contingencies especially in later life are of the uncertain kind rather than the risky.

¹⁶⁹ Another possibility is that insurance companies forego their profit from riskier investments to avoid being caught by the inflation risk. Further research at the World Bank should elucidate this issue (James & Vittas, 2000b, p.21)

¹⁷⁰ The UK has a well-developed indexed bond market comprising 15-20 per cent of government debt on issue (Watt & Reddell, 1997).

reintroduced by the Reserve Bank of New Zealand in 1995 with a coupon rate of 4.5 per cent and maturity in 2016. IIBs have been relatively illiquid, limited in application and have not been used to back insurance products (Watt & Reddell, 1997). Full inflation protection is not possible in any case as income tax is levied on the gross return (real plus inflation adjustment). Events of the late 1990s including a lesser need to borrow because of state-owned assets sales, saw the New Zealand government suspend issuance of these bonds (Gordon, 2002).

New Zealand Life Offices provide only nominal annuities. While these may be designed to increase a set amount each year, escalating annuities are likely to be unattractive in terms of the starting annuity value. Escalating annuities do not address the danger of unanticipated inflation. With no formal capital gains tax and high short-term interest rates, there are other avenues for hedges against inflation in New Zealand such as the residential property market or short term roll over deposits (Watt & Reddell, 1997). Nevertheless, there is some on-going discussion about the need for new, more favourably taxed retail inflation-linked bonds in light of government's concerns about increasing retirement saving (Gordon, 2002).

8.2.5 Investment risk

Typically, an annuity is priced on the day of purchase with reference to prevailing interest rates, thus locking in both purchaser and provider. Thus, while an annuity should protect the income position of the retired persons for as long as they live, they may also lock in a conservative investment strategy. Over time as living standards improve generally from economic growth, the nominal annuity falls relative to both prices and wages. More recently, as the competitiveness of annuities improves, there is a growing recognition that if the annuity is to keep pace with improving living standards, the investment policy should favour growth assets.¹⁷¹ In particular, 'Participating annuities' have been developed to allow annuitants to participate in the profits earned by insurance companies. These profits may arise from better investment results, more administrative efficiency, or changes in longevity that are favourable compared to assumptions.

¹⁷¹ That is, in countries other than New Zealand.

8.2.6 Mortality risk

If people begin to live longer on average than the mortality experience factored into annuity prices the insurance company could become insolvent. If insurance companies make allowance for probable improvements in longevity, their products are likely to be perceived as poor value by purchasers who may not understand the risk they face. In general, improvements in mortality are not predictable and represent more of an uncertainty than a risk. This makes pricing an annuity much harder. In the US a variable annuity called the College Retirement Equities Fund (CREF) annuity, passes on the aggregate mortality risk to annuitants by varying the annuity payouts with the mortality experience of the annuitant pool (Congressional Budget Office, 1998). Pooling of the longevity risk between companies is another option (James & Vitas, 2000a).

8.2.7 Thin markets

Adverse selection, investment, mortality and inflation risk are not the only explanations for an underdeveloped annuities market. The bequest motive may be another significant factor. An unfair annuity cost due to adverse selection and overheads can interact with an intentional bequest motive (Friedman & Warshawsky, 1990). It could be that the leaving of a bequest may bring utility rewards for its own sake, but there may be an expectation that a bequest may elicit the desired caring family behaviour towards the older person.

The expectation of expensive medical costs may be another reason for maintaining non-annuitised wealth, especially long-term care in the absence of social or private insurance (Wallister, 2000). Other reasons, previously discussed, include individual myopia; ignorance; mistrust of insurance companies; the 'luxury good' nature of annuities; tax policies that favour lump sums; public pensions that crowd out the need for private annuities (James & Vitas 2000a).

In a country the size of New Zealand, competing insurance markets have a small pool of annuitants and little reliable actuarial data on annuitants' mortality on which to base their pricing. Moreover in most countries, an inflation-adjusted pension provided from social insurance schemes removes the longevity risk at least for basic living standards. New Zealand's basic inflation and wage-adjusted NZS provides a relatively

generous flat-rate annuity and may be a substantial factor in the lack of interest in annuities.

8.2.8 Summary

The arguments presented above suggest that there is a range of explanations for the observed underdevelopment of the annuities market in New Zealand. The calculations in section 3.6 indicated that Money Worth Ratios from the perspective of the general population have been low and falling, although these results would be moderated by factoring in cohort longevity improvements.

Factors on the demand side include myopia, with people largely ignorant as to the probability of extended life expectancy; the desire to bequeath assets to children; suspicion about the financial standing and viability of the insurance provider over what could be a lengthy retirement; lack of protection from inflation and growth in living standards; lack of a tradition of private annuities in New Zealand and less involvement from employers; lack of competition in a thin market; inflexibility of products and their variability. Adverse selection is a large factor and may be getting worse in a thin market in which annuities become even less attractive to the ordinary population over time.

On the supply side annuities can be high risk especially in the light of expected improvements in longevity. Without suitable government indexed bonds, inflation protection is expensive to provide, and thin markets do not lend themselves to product flexibility and innovation.

Many of the factors above constitute a genuine market failure problem, where various forms of government intervention may be appropriate to improve social outcomes.

8.3 Government intervention

In every country where there is a significant annuities market, government plays a substantial role in mitigating market failure. Typically, adverse selection may be overcome by making annuities compulsory, although risk differentiation, such as between men and women, may still be permitted.¹⁷² The welfare losses from forcing

¹⁷² In the US sex and racial characteristics however are not permitted categories for employment-related pensions or life insurance.

some people into sub-optimal (for them) annuitised products needs to be balanced against the welfare gains for others from minimising adverse selection. There are also broader gains for society that are often overlooked. If people have income for as long as they live, they have some means of contributing to their costs of care in old age should they require it (this point is developed further in Part III). Annuity wealth cannot be gifted away or tied up in trusts, and it is possible to achieve much more intragenerational sharing than would be possible with individual saving. This is because, ignoring any defined period of guarantee, those who die young subsidise those who live longer.

A state pension itself provides the quintessential example of state intervention in the annuities market. The state pension overcomes: adverse selection by including everyone in the pool; the inflation risk by CPI indexing; the investment risk by linking to average wages; the mortality risk by general tax funding. It also has the cost advantage that the balance of the annuity does not go into the estate pool on the early death of the annuitant, as there is no guarantee period.

In considering the role of government, mandating additional provision for retirement over and above the mandatory Pillar I arrangements on the grounds that low aggregate savings will improve is controversial as the empirical evidence is by no means conclusive as was noted in 7.4.2 of this thesis, see also Hemming (1998). Paternalism based on the belief that people are myopic, and adverse selection are two more convincing rationales, but as James and Vittas (2000a) argue, once a sound Pillar I is in place, there is little evidence to suggest mandatory annuitisation is desirable for many people. Even if the MWR were 100 per cent it is not clear that the demand for annuities would greatly increase. Clearly, as argued by James & Vittas, (2000a, p21), compulsion is not the answer for low-income people.

Forcing them to buy (beyond the modest amount dictated by myopia and moral hazard) in order to obtain an actuarially fair price for those who want to buy is not only inefficient, it is unfair in terms of equity.

Compulsory annuity purchase is not the only possible approach and, in any case, may be irrelevant to the New Zealand situation (this assumption is adopted in Part III of this thesis). In the absence of compulsion there still remain a range of policy issues to consider. One controversial issue is whether insurance companies should be permitted to discriminate on grounds of gender. While women on average out-live men, people

are individuals, and experience death individually. Only a group of about 14 per cent comprising short-lived men and long-lived women, can be regarded as having a statistically determined different probability of dying than the total population of men and women (Campbell & Munnell, 2002). Hence if a voluntary annuities market is regulated to use unisex pricing, adverse selection may become even more of a problem. Life Offices may use an average expectancy to determine unisex pricing or may bias it towards long-lived women, in which case adverse selection is likely to be amplified (Campbell & Munnell, 2002).

Other policy questions concern how annuity providers are to be regulated with respect to charges and investment and how far annuities should be guaranteed to overcome the risk of company failure without engendering moral hazard. Other questions concern to what degree inflation-protection should be mandatory and what role the state should play in facilitating indexation of annuities.

The current body of literature largely concludes that the state must play a significant role in the future of the annuities market (for example Mitchell & McCarthy, 2002). In practice, a number of countries have adopted various interventions designed to facilitate a viable annuities market as briefly summarized for selected countries in the appendix. In Chile, for example, the annuities market is voluntary but Pillar I is sparse and the government subsidises the annuities market. All participants are guaranteed a minimum pension hence the government assumes a good portion of the longevity risk. Insolvency of pension providers is also underwritten by the state and pension funds are regulated as to returns and investments. Thus although Chile has a privatised scheme, the role for the state is both extensive and expensive. For example Smetters (2002) raises concerns with respect to the costs of the guarantee and argues that it may prove to be a lot more expensive than hitherto realised.

To date the use of life annuities in Australia has been limited as described in the appendix to this chapter, largely because government's role has also been limited. Importantly, the Pillar II compulsory superannuation is not regulated to require that the final payout be in the form of an annuity or pension. Including public sector employees, more than 80 per cent of superannuation benefits are received as lump sums. The problem with life annuities is seen to be the comparative loss of control, and the locking in of initial investment decisions or interest rates. The life annuitant risks falling behind general rises in living standards because savings are in a capital

guaranteed product. Nevertheless, the government is attempting to make life annuities and allocated annuities more attractive by assigning them more favourable tax treatment than pre-retirement superannuation (Knox, 2000). The investment earning for annuities is tax-free whereas for superannuation funds tax is levied at 15 per cent. (Other offsets apply to the tax on the final annuity, and interactions with the means test for the age pension as described in the appendix to this chapter).

The Australian insurance industry is increasingly drawing attention to the reality that life annuities do not protect from the investment risk, and allocated annuities do not protect for the longevity risk. In addressing the 2001 Superannuation Colloquium in Sydney, the Managing Director of AMP Financial Services, Andrew Mohl warned of the impending crisis. It was suggested that if the baby boomers shift into capital guarantee products to reduce the longevity risk there may be serious implications for the equities market. The management of lump sums by the baby boomers, some of whom are already beginning to retire under the Superannuation Guarantee at age 55, will be a potential problem for themselves and for the state:

My key message today is that there is a gap in the market place because you cannot buy a lifetime pension that is backed by growth assets. Such a product doesn't exist in Australia, although it could easily do so if the right regulatory and market conditions existed. (Mohl, 2001)

On the other hand, provision of suitable variable annuities may mean all kinds of better outcomes including an improved sharemarket, lower state age pension support; fewer unintended bequests; and increased industry activity.

...this is a policy issue that is too large and the future consequences on the Australian society too grave to shift back to government alone. We need collectively - and that includes the superannuation and funds management industry - to seriously rethink the tax and compliance regime that almost forces people into safe, low risk, low return products that do not suit their real needs. (Mohl, 2001)

The constraints imposed by regulation on the types of investment Life Office may make for life annuities is inhibiting the development of new more appropriate products. Australian academics and the industry are currently exploring policy options including the case for mandatory annuitisation with suitable regulations that might offer better protection for individuals and taxpayers alike (Doyle & Piggott, 1999).

The annuities market in the US is small but relatively well developed. With proposals to create individual accounts within social security, there has been a renewed interest

in the need for flexible annuity products. Annuitisation is seen as necessary for a range of reasons, including reducing moral hazard effects that arise from incentives to spend assets now and fall back on state assistance later, adverse selection, a lack of financial sophistication, and the trend away from life annuities in private pensions plans (Warshawsky, 2001). Mandatory annuitisation from individual accounts is seen as probably necessary to overcome the inherent disadvantages in the voluntary annuities market, but other policy approaches might stress such factors as tax incentives, education, advice, and the like (J. Brown et al., 2001; Mitchell & McCarthy, 2002).

A contrast is provided by the UK example where the purchase of annuities from pension plans is mandatory no later than age 75 with at least 75 per cent of the pensioner's fund assets. This is, however, raising concern about their design and appropriateness of the annuities on offer and actuarial interest is focusing on redesigning annuity products. Of relevance to this thesis, is the notion of more intragenerational sharing that is discussed further in Part III of this thesis.

Converting assets to income in an orderly fashion will become an increasingly important issue for the ageing populations and economies of many nations. Conventional annuities have many weaknesses, not least a diminishing supply of long bonds from governments. However, without a sharing of longevity risk the task of achieving a satisfactory income in old age will become impossible for many. Furthermore, it is likely that such sharing will have to become intra rather than intergenerational (as it is now) if it is to be workable in the future. (Wadsworth et al., 2001, p.3)

8.4 Health and long-term care insurance

For the standard reasons in the economics of insurance literature, health insurance left to unregulated private providers is likely to fail to deliver either efficient or equitable outcomes in health.¹⁷³ Barr (2001) concludes that to contain the two major problems of private healthcare funding and private production (cost explosion and poor coverage), some form of social insurance is inevitable. He identifies three imperfect choices, with the third one the most imperfect of all:

¹⁷³ These arguments are well-canvassed in many health economics and public economics texts (Barr, 1998, 2001; Stiglitz, 2000).

- Public funding and public production (for example, the UK, Scandinavia)¹⁷⁴
- Public funding and private production (for example, Canada, Germany)
- Private funding and public production (for example, the US)

Genetic screening intensifies the known problems of private insurance as it reduces the benefits of pooling and may create a larger number of uninsurable conditions. The problems can be overcome, in theory, with regulation and maybe forms of cost sharing of the risks among insurers. Thus insurers may be required to ignore the results of genetic testing in setting premiums, and the subsequent risks spread with reinsurance among all providers. The important conclusion is that no system is going to be perfect, and the conditions for private markets to work as a theoretical ideal simply do not exist.

Long-term residential care is not well covered by private insurance as would be predicted. Yet there would be gains from pooling risks, as otherwise huge costs can fall on the uninsured and/or the financially naïve.¹⁷⁵ If each person tries to save enough to pay for the maximum time they might need in care, given that the majority will not need such care, many people will die with their assets intact. The obvious welfare gains to be had from pooling risks are not well exploited by private providers because of the special difficulties of the insurance contract.

Private insurance works best for annually renewable contracts, such as car insurance. The problem is that the purchase of a long-term care policy may be as much as 30-40 years in advance of needing it. Annual renewable contracts are possible, but require a great deal of trust that the company will not only remain in business but also not increase premiums unfairly as time goes on to discourage old age, higher risk, participants (see discussion in section 4.2). From the company's perspective, a long-term care policy is much more difficult to price than an annual car insurance policy. The risks of getting it wrong in the face of multiple uncertainties are high and

¹⁷⁴ The US Medicare and Medicaid insurance programmes initially gave the poor and the old access to private medicine through an open-ended third party payment system albeit funded by the state. Diagnostic-related groups and managed care were public responses to contain costs in these programmes.

¹⁷⁵ As in the case where assets have not been protected and the state can take these in payment for care before providing any subsidy (see section 4.3.1).

significant loading charges are likely to make the insurance unduly expensive (Fenn, 1999).

Some of the difficult questions to be addressed, discussed in Barr (2001) are:

- How will the care be allocated? How much, what type and on what basis?
- How might costs and types of care be affected by new technological developments?
- Can premiums rise if the patient becomes more risky (older, or unwell)?
- Will there be a ceiling on reimbursement of the cost of care?
- Is there a maximum duration over which benefits are paid, if so what happens if the individual lives beyond this period?
- How will wage and price inflation affect the cost of care?
- How are disagreements/bankruptcy of the insurer to be dealt with?
- How much insurance is adequate, ie. should there be any minimum level?
- How integrated is it with existing public funding and/or provision for long-term residential care and what if policy changes?

In light of these difficulties, and others, it is clear that any all encompassing contract will be near impossible to draw up. On the insurer's side, problems arise because uncertainty, rather than risk, makes probabilities indeterminate. Moreover:

- There is no accurate data to predict the probability with which future cohorts of retired will require care.¹⁷⁶
- Insuring from a young age gives more insurance protection because of the wide pooling, but the costs of uncertainty are higher.
- The condition of independence of probabilities does not hold. Medical advances that prolong life may place everyone in a similar situation.

¹⁷⁶ It is not clear, for example, whether predicted future increased longevity will in turn increase the average period spent in long-term care.

- The relative cost of care is likely to continue to rise over time (Baumol's cost disease), but the extent of this is uncertain.¹⁷⁷
- Adverse selection problems are high and may require intrusive questioning from the insurer.
- Moral hazard may arise from several sources. The obvious one is that the person concerned may be more likely to demand care, but there are also worries that family likewise may push older relatives into care if there is insurance.¹⁷⁸

The UK Royal Commission report on long-term care cited by Barr (2001, p.83) concluded that private insurance without state intervention was not ever likely to become significant in the UK. In the US as outlined in the appendix to this chapter, private long-term care contracts have severe short-comings as might be predicted. Social insurance, on the other hand, would have advantages of being adaptable to changing circumstances, as the contract need not be fully specified from the outset.

Just as for public pensions, prefunding is not necessary for social long-term care insurance. Some of the problems of private insurance that arise from third party payment are not however necessarily resolved by social insurance. The incentives to demand more care and better quality care must be contained if costs are to be kept in check, but may be more readily contained in social insurance than private insurance schemes (Barr, 2001, p.84).

8.5 Long-term care in practice

In practice few countries have grappled successfully with providing protection for the costs of long-term care, but increasingly attention is being focused on this issue. Japan

¹⁷⁷ The theory known as Baumol's cost disease, that costs would rise relatively faster in the public sector, because the nature of the output was labour intensive and not as amenable to productivity changes as private output was first outlined by William Baumol in "Macroeconomics of Unbalanced Growth," *American Economic Review*, 62 (1967): 415-426.

¹⁷⁸ Barr notes that it could be rational not to insure oneself so as not to be put in care against one's will (Barr, 2001, p.82). The moral hazard effect may reduce the welfare gains from insurance. For example, Zweifel and Struwe (1998) question the welfare gains that flow in theory from compulsory social insurance in Germany.

and Germany have most comprehensively addressed the issue with long-term care insurance.

The Japanese model is interesting in that it has adopted intragenerational sharing principles at the same time retaining some general tax funding. Long-term care insurance was introduced in 2000, covering both institutional and community-based care from age 65. Everyone aged 40 and over pays premiums, initially 0.9 per cent of income up to a ceiling shared with employers. Older people too share the costs by paying income-related premiums deducted from their public pensions and co-payments for care. The state subsidises fifty percent of the long-term care from general revenue.

There are no cash payments, but services are provided based on needs assessment in six categories. Benefits cover 90 per cent of services with a 10 per cent co-payment. The consumer has a choice of services and providers appropriate to the needs assessment, including community-based care where available. The premiums paid by those aged 40-64, are pooled nationally and distributed to the local government administrators using a formula based on income and demographics. The local municipality can provide more services and charge a higher premium depending on the wishes of local voters. Those aged 40-64 are also eligible for long-term care payments should they need care, providing a 'tangible payoff' for the premiums they are required to pay (Campbell & Ikegami, 2000).

Germany is also unusual in that it has explicit compulsory long-term care social insurance funded along with medical insurance through a payroll contribution. Contributions comprise 1.7 per cent levied on earnings up to a ceiling and shared between employee and employer. The rate of contribution is expected to rise to 2.4 per cent by 2040. Pensioners must also contribute with contributions equally shared between pensioner and the pension fund.

The system is credited with success in giving support to informal caregivers, increasing providers and choice, and expanding home-based care (Harding, Meredith & Wistow, 1996). The demographic change in the next two decades is, however, expected to place some strain on the system as the numbers of those over 80 years old predictably mushroom (Cuellar & Wiener, 2000).

Canada, the UK, and the US are in the process of discussing options for long-term care insurance. The New Zealand system of income and asset testing was outlined in section 4.4 but to date there have been no comprehensive plans to consider social insurance specifically for long-term care.¹⁷⁹

8.5.1 Australian long-term care

The bulk of retirees in Australia have access to highly subsidised healthcare as discussed in section 2.8. To a lesser extent this is also the case for long-term care. There are two institutional levels of care: hostels and nursing homes. Hostel level care is less intensive and while subsidies were not means-tested until 1997, there could be further charges for other services and amenities. For nursing homes the user contribution for long-term care was not linked to assets until 1997, only to the age pension.¹⁸⁰ In 1997 there was an attempt to increase user charges, including the introduction of accommodation bonds that proved highly unpopular and were later rejected. However there have been moves to separate the costs of care from accommodation costs, and to increase the use of community-based care (Howe, 2000).

The basic care fee has been 85 per cent of the age pension, covering around 15 per cent of the average cost of nursing home care. Since 1997 means-tested care fees were made applicable to both hostel and nursing home care. Care fees are capped at the reimbursable level and fees control applies with some exceptions. A means-tested accommodation charge to a maximum of A\$4000 per year also applies for Nursing homes with entry payments also applying to hostels. It appears there is little scope for increasing user pays charges in the current political climate. As most residents already qualify for a means-tested pension, there is not much scope to increase payments from their resources (Howe, 1999b).

It has been suggested that a special pre-funded social insurance scheme might be developed to supplement other sources of financing (Howe, 1999a). The idea is that Australians are used to paying separate levies and do not regard these as adversely as they would another tax. Table 8.1 explains the gaps that have been identified in the

¹⁷⁹ Other aspects of the New Zealand system are discussed in Ashton (2000).

¹⁸⁰ Which is itself asset tested.

Australian approach to long-term care in contrast with the other ‘pillars’ for healthcare and for retirement income. As shown, long-term care does not have the supporting pillar from a dedicated levy, and private insurance is non-existent.¹⁸¹

Table 8.1: Funding for old age provisions in Australia

	<u>I</u> Tax-funded	<u>II</u> Compulsory levy	<u>III</u> Private funding	<u>IV</u> User payment
Retirement income	Age pension	Superannuation Guarantee	Private saving	Continued earnings
Healthcare	Universal insurance	Medicare levy	Private insurance	Out of pocket
Long-term residential care	Benefits	--	--	Pension linked

Source: Howe (1999a)

8.5.2 The US

In the US, long-term care is the Cinderella of insurance, just as it is in New Zealand and in many other countries (Feder, Komisar & Niefeld, 2000). While Medicaid covers the needs of the poor, few middle-income people relish the thought of running their assets down to the level at which they would qualify for such assistance.

Private long-term care insurance is available, but is taken up by relatively minute numbers. Chen (2001a) estimates that in 2000, of the total formal paid long-term care expenditures, only 4 per cent were met by private insurance. Medicaid funded 35 per cent, Medicare 24 per cent, while 35 per cent came from personal savings and 2 per cent from other payers. Thus social insurance under the Medicare programme provides only a minority of the costs. Medicaid is best regarded as a safety net welfare programme rather than social insurance.

Medicaid is only payable after the bulk of the person’s assets have been exhausted, and as in New Zealand, the costs of long-term care fall unevenly and very harshly on the families involved. Moreover, as Chen notes, the pressures on the Medicaid budget are immense and future reliance on this source is unlikely to be sustainable.

Clearly some level of social insurance is required, as private insurance is unlikely to ever be a substantial part of the long-term care package but the question is who should pay (Chen, 1993, 1994, 2001a, 2003). Chen suggests that rather than a reliance on

¹⁸¹ Similar to the World Bank lexicon for pensions, ‘pillars’ or ‘legs’ are used to refer to the contribution to income support provided from public, mandatory and voluntary private support.

workers, old age care needs to be financed by intragenerational risk pooling. The major reason for this suggestion is demographic: the working age population growth is slowing, the availability of informal caregivers is falling, and the numbers of the retired are set to rise rapidly with the retirement of the baby-boom generation. More than 40 per cent of those aged 65 or older are expected to spend some time in a nursing home and one in ten will spend five or more years in one before they die. Over 50 per cent of those over 85 receive some form of long-term care service. While the chronic disability rate is falling, this effect is simply not fast enough to overcome the impact of vastly increased numbers at the older age groups (Chen, 2003).

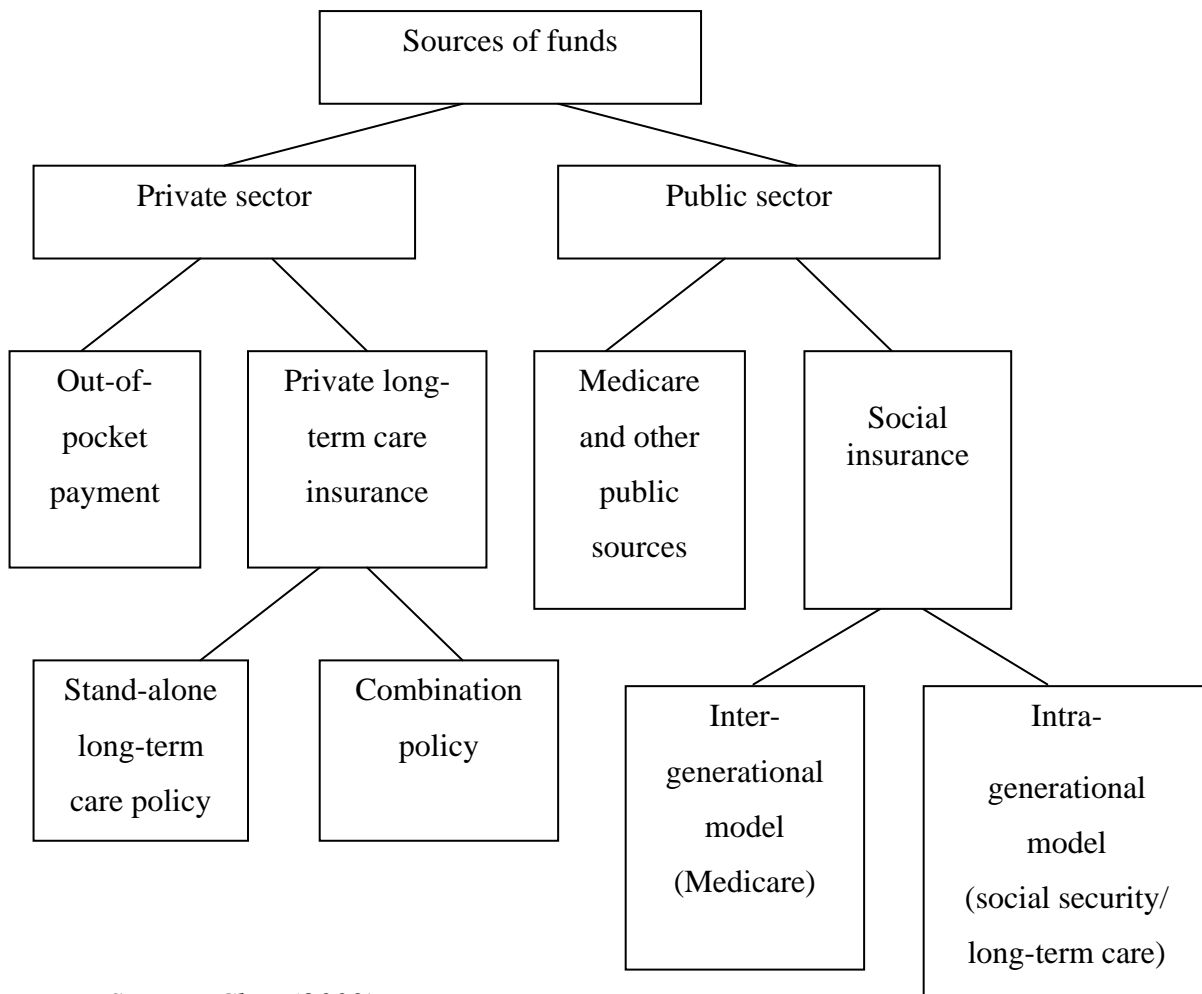
Chen's approach is interesting from the New Zealand perspective as it stresses intra rather than intergenerational social insurance. The basic social insurance is financed by a tradeoff where pensioners are required to pay 5 per cent of their social security benefits with exemptions for low-income people. Chen advocates a trust fund and a five year phase in which the contributions rise from 1 per cent to 5 per cent over this time. The fund would provide a buffer rather than adhere to the principles of full funding. This three-legged stool approach would see the basic tier of old age care provided by the social insurance. Supplementation with private long-term care insurance might also involve a link with occupational pensions and other savings vehicles.

...if out of pocket payments were unavailable for the supplemental private insurance, then, applying the same trade-off principle, it should be possible to link private insurance to occupational pensions and/or saving vehicles, such as Individual Retirement Accounts, Keogh plans and the like that are already in place (Chen, 1994, p.493)

One of the solutions discussed in the US is enlarged tax subsidies for private long-term care insurance. Whether this represents an equitable use of public resources when the tax incentives are unlikely to reach those who may be most in need of long-term care is debatable (Feder et al., 2000). Despite the availability of tax incentives, coverage to date under private insurance for long-term care has not been impressive.¹⁸²

¹⁸² A description of the nature of long-term care products actually sold in the US is found in the appendix to this chapter.

Figure 8.1: Funding long-term care in the US, a schematic approach



Source: Chen (2003)

8.6 Integrating annuities and insurance for old age care

New trade-offs are suggested linking life insurance and annuities to long-term care insurance, but as Chen (2003) notes only about 6-7 per cent are of this type in the US. Typically a policy would pay for long-term care up to the value of the death benefit, providing a trade-off between death benefit and long-term care. Surprisingly, there has been comparatively little literature to date devoted to exploring the potential of pooling risks of longevity (requiring lifetime annuities) with the risk of needing long-term care (long-term care insurance). Murtaugh, Spillman & Warshawsky (2001) propose a method for linking the two risks in a single product in a voluntary market that has the potential to be cheaper by reducing adverse selection, and provide cover for more people. This theme is developed in a recent contribution where it is argued that the combination of a life annuity and long-term care insurance "...has the

potential to make them available to a broader range of the population, with minimal underwriting and at lower cost” (Warshawsky, Spillman & Murtaugh, 2002, p.198).

Chapter 10 of this thesis will explore further the notion that the longevity risk and the risk of needing old age care could be insured with a single product in the form of a life annuity, the level of which increases once long-term care becomes necessary. The purchase would be at age 65 or 70 and the insurance policy would not require annual premiums as the cost is built into the level of the annuity. In contrast, most health insurance premiums are annual, providing opportunities for providers to reassess the risk with the outcome of diminishing the security of retirees. For example, as outlined in section 3.6 the major insurer in New Zealand has recently adopted an age-related premium, which has made health insurance far less attractive and less affordable to older age persons.

It is logical that a product that insures a large pool of people well before they can be expected to need long-term care, is likely to be cheaper to provide. The problem is that younger people find it hard to relate to a risk they might face so far into the future. There is merit in confining the purchase of insurance to older age groups when there is less reluctance to consider the problem, without leaving the purchase too late (Warshawsky et al., 2002, p.210). It is possible that a life annuity plus long-term care insurance purchased with a single premium at age 65 or 70 might capture a wide pool of annuitants even if it is non-mandatory. Those who die early and do not need care, along with those who live into old age but do not need long-term care (the vast majority of those who survive), subsidise the ones who do need care. The younger the age of purchasers, and the greater the numbers who purchase, the greater the pool for the sharing of risk. Those whose health status make them poor risks for long-term care insurance are good risks for life annuities, so that linking the two risks is likely to increase long-term care coverage of the population at the same time as reducing adverse selection in the annuities market.

There may be other attractions to a joint product. The coupling of the life annuity with insurance for long-term care may mitigate a perceived disadvantage that there may be a loss of inheritable wealth from the purchase of a life annuity (Warshawsky et al., 2002, p.210). Family members may feel that they have some protection against the erosion of the older person’s assets if viable long-term care insurance is in place.

There is some interest in this kind of product from some providers of annuities emerging world-wide, but Warshawsky et al., (2002) find no actual product has emerged to date. Nevertheless, preliminary estimates for the UK by Life Company Watson Wyatt show that worthwhile income increases could be paid once long-term care became necessary for modest reductions in the initial annuity. They see the demand for purchases for such annuities arising later in retirement, at above 70 years (Watson Wyatt, 2002).

There are several issues to consider in designing a life annuity with long-term care insurance.

- The age at which the policy is to be purchased, and the role of deferral of purchase.
- The nature of the costs to be covered, the policy may either indemnify the actual costs or pay a specified amount for an assessed condition. For the latter, once the highest level of dependency is diagnosed, the annuity increases by a given factor regardless of the nature of the care chosen.
- The size of policy and whether maximums should apply. This may be important if there are significant subsidies or government guarantees to this product.
- The kind of inflation adjustment that applies and who pays for it.
- The source of the purchase price. Can it include home equity and, if so, on what basis?

Part III explores some integrated solutions to the risks of longevity and long-term care in the context of the unique New Zealand retirement income system.

8.7 Summary

This chapter has outlined substantial market failure problems of both life annuity markets and the market for long-term care insurance. It has developed the case for government intervention, and discussed the forms this might take. Compulsory annuitisation helps overcome adverse selection and is an obvious way to strengthen the annuities market. Attention to the inflation risk, the investment risk, the long-term viability of insurers, the excess longevity risk require various responses from the state, including regulation.

While the provision of gender specific annuities is not an example of market failure, as risk discrimination is necessary if the market is to function without encouraging adverse selection, it does raise issues for many individual women who receive significantly lower annuities for the same capital sum, but who may not expect to live significantly longer than men of the same age. If this is a social issue to be addressed, then government will have to mandate gender-neutral annuities.

In some countries a less regulatory approach to investment of the Life Offices supplying life annuities may be required, especially if annuities are to participate in a general growth in living standards over time. Investment in growth assets will be required raising issues of how individuals are best protected from the impact of negative markets so that the annuity can fulfill its role in providing security and certainty. Public provision of suitable inflation indexed bonds to permit inflation-indexed annuities to be paid will also be required. Other regulations, such as for gender-neutral annuities may require reinsurance arrangements or state underwriting for those companies that end up with a pool of annuitants whose mortality experience is 'better' than the average

The observed lack of suitable, or often any, long-term care insurance products suggest that social insurance may be appropriate. In countries that have introduced an explicit social insurance scheme, such as Japan and Germany, there is an emphasis on intragenerational sharing of risk. In other countries these issues are also being discussed, although progress is slow. Some funding for long-term care is always likely to be needed from the working-age population, but there are attractions to funding more of this cost from the resources of the retired as a group.

In particular, this chapter suggests that the new literature linking the risks of longevity with the risks of needing long-term care is worthy of exploration. A joint product is likely to appeal to a wider range of people than would buy either product singly. By including those who may not expect to live a long time, but are likely to require care, long-lived annuitants will find the life annuity portion better priced. The linking of long-term care insurance to annuity provision may mean that many of those who would be excluded under a single policy for long-term care can be covered. As to be further discussed in Part III of this thesis, the availability of such a product may reduce the demand to set up inappropriate family trusts.

Appendix Chapter 8

A. Private long-term care insurance plans

To understand the types of policies that are feasible it is necessary to go to a country where they are well established, like the US. Information is available on products and the regulations on the Teachers Insurance and Annuity Association (TIAA-CREF) website: <http://www.tiaa-cref.org/ltc/>

Long-term care insurance policies are generally paid for with an annual premium. The premium varies according to the amount and type of care needed and the setting in which it is provided. Coverage may be for nursing homes (average US \$38,000 per annum in 2002), or nursing care at home (three visits a week for two hours per visit about US \$8000-12,000 per annum).

Medicaid pays for nearly half of all nursing home care and some community-based services, but only after the resident's own assets have been spent down to a level that makes them eligible.

A typical premium for a long-term care policy taken at age 65 for reimbursement to a maximum daily rate of \$100 would cost around \$1260 initially. The annual policy may be adjusted for inflation if there is an increment added to the annual premium in coming years. Alternatively, a policy could have benefits that inflate 5 per cent a year. The additional cost of such a policy brings the annual premium to \$2660. At age 75, the premium for a 5 per cent adjusted policy is \$6706.

Long-term care insurance premiums can be included in medical expenses above 7.5 per cent of adjusted gross income on an age related basis for tax deduction purposes. Premiums can be increased, not for an individual but if increased for all people in the same class, so there is no guarantee of fixed costs. There are many dilemmas unresolved by private long-term care insurance:

- Many people find the premiums become unaffordable with cost the main deterrent to purchase.
- The younger the purchaser, the lower the premium, but the less the need is perceived and the longer time premiums may be paid.

- There is a deductible period. The longer the period, the lower premium, but the coverage is lower.
- If an indefinite period is chosen for the benefit period, and a high daily rate, the premium will be higher.
- Inflation protection is vital but expensive.
- Rates vary significantly from one company to another and according to geographical location.
- Exclusions can apply on application but renewal once the policy is granted is guaranteed.

The Royal Commission on long-term care in the UK assessed the potential of private long-term care insurance and concluded that without substantial state intervention policies would be too expensive for most people (UK Royal Commission, 1999).

B. Annuities in practice

Chile

In Chile there is a choice between an annuity or phased withdrawal over an expected lifetime. These payments must be indexed (World Bank, 1994). The annuities market is voluntary, but only 25 per cent of retirees in Chile take a lump sum. A life-time annuity is purchased by 44 per cent of pension beneficiaries, the rest use phased withdrawals. This high percentage reflects the government's role in subsidising the annuities market and the sparse nature of the first pillar. All participants are guaranteed a minimum pension, even those who choose a phased withdrawal (so government assumes a good portion of the longevity risk). Insolvency of pension providers is also insured by the state and pension funds are regulated as to returns and investments. Thus although a privatised scheme, the role for the state remains both extensive and expensive. The gross returns in Chilean pension schemes were high initially, but fell dramatically in the 1990s and the scheme is regarded as having higher administration costs than the PAYG schemes. There are marketing costs for example driven by competing private funds.

Problems have arisen from

- Lack of ability to compare options.

- High commissions.
- One time purchase exposes buyer to risk of poor expected returns.

Variable annuities which rise and fall in value with the interest rate can offer some protection but at the cost of not eliminating the investment risk for annuitants.

Australia

Australian Pillar II compulsory superannuation is not regulated to require that the final payout be in the form of an annuity or pension. Including the public sector employees, more than 80 per cent of superannuation benefits are received as lump sums.

Life annuities are not popular products, with Australians in general preferring to manage their own lump sums. Life annuities may be indexed or subject to a steady percentage increase over time and once in force cannot reduce in value. They may be payable for life or for the life expectancy of the retiree at purchase. No commutation is possible and no residual value is paid to an estate except to cover any fixed guarantee period. Over time they do not provide an income that keeps up with general growth in the economy. If they are fully indexed, the implied real rate of return is likely to be less than 1 per cent, making such annuities expensive and unattractive (Doyle & Piggott, 1999, p.12).

While the life annuities market is small, allocated pensions provided by superannuation funds, or allocated annuities from Life Offices are increasing in popularity. Allocated annuities are regular annual payments made within limits prescribed by government. The intent is to provide a maximum that will just exhaust the fund by age 80 and a minimum, which is the account balance divided by life expectancy in that year. A set of factors to determine the maximum and minimum withdrawals are produced for each age from age 60 (Knox, 2000, p.4).

Allocated annuities or pensions, referred to hereafter as allocated annuities, are perceived to be more flexible and offer better returns than life annuities. The investor can choose the investment strategy from a range of products and the value of the fund moves with the underlying investment. They do not however compensate for more than average longevity (Knox, 2000).

Table 8.2: Data in the Australian life insurance industry

Income product	Dec 1994 \$b	Dec 1995 \$b	Dec 1996 \$b	Dec 1997 \$b	Dec 1998 \$b
Allocated pensions and annuities	5.8	6.5	8.1	11.7	15.3
Term certain (or period certain annuities)	3.2	4.3	4.9	5.9	6.4
Life annuities	1.4	1.5	2.0	2.4	3.0
Total funds backing annuity products	10.3	12.3	15.0	20.1	24.7
Total superannuation assets	206.4	240.1	271.3	325.7	377.4
Asset backing as a % of super'n assets	5.0%	5.1%	5.5%	6.2%	6.5%
Life insurance companies	\$b	\$b	\$b	\$b	\$b
Total assets in life companies	100.3	107.8	116.6	151.8	160.0
Non superannuation assets	30.0	29.2	28.0	33.4	29.6

Source: Unpublished statistics from APRA quoted in Knox (2000)

Knox provides an example for a retiree age 65 with a balance of \$150,000. The next year aged 66, the retiree can draw down a minimum of \$9550 ($\$150,000/15.7$) or a maximum of \$18,520. At age 75 the fund less annuity payout has grown to \$125,000 and the minimum withdrawal is \$11,060 ($\$125,000/11.3$) and the maximum payment is \$29,070 ($\$125,000/4.3$).¹⁸³ Table 8.2 shows the relative importance of allocated annuities in the annuity products market, and the small amount of overall superannuation assets in annuities of any kind.

Another leverage that the Australian government uses to influence the purchase of annuities is tax. Thus annuities are favourably treated for tax purposes compared to the tax treatment of superannuation pre-retirement. The investment earning for annuities is tax-free where as for superannuation funds, tax is levied at 15 per cent. While the annuity itself is taxed along with an individual's other income there are offsets:

- Taxable income each year is reduced by the undeducted purchase price, (the member's contributions that have not received any taxation support) divided by the annuitant's life expectancy at the date of purchase. This measure is

¹⁸³ At age 66 life expectancy is 15.7 years and at age 75 is 11.3 years.

designed to avoid contributions from after-tax income being subject to taxation a second time.

- 15 per cent of the taxable amount of the pension is available as a rebate, primarily designed to offset the 15 per cent contributions tax on tax-deductible contributions paid into the superannuation fund prior to retirement. These rebates have improved the attractiveness of superannuation products, especially allocated pensions.

Further tax advantages introduced in the 2001 budget are likely to make allocated pensions even more important in the total picture. Using an allocated pension tax offset and the senior Australian tax offset, a couple can now receive a combined tax-free income of up to \$52,800 ignoring Medicare. The attractiveness of allocated pensions is further enhanced by flexible withdrawal arrangements and the zero tax on fund earnings.¹⁸⁴

The income stream from annuities is captured under the income test for the old age pension. However a deductible amount is allowed equal to total purchase price divided by the life expectancy at the date of purchase.¹⁸⁵

The unattractiveness of life annuities compared to allocated annuities is mitigated a little by the differing treatment under the asset test for the old age pension. Life annuities are usually exempt from the asset test, provided they cannot be commuted to a lump sum. Allocated annuities are different because the individual has more control over withdrawals and the balance of the fund on death goes to the retiree's estate (Knox, 2000).

The means-tests arrangements for the old age pension are very important making life annuities attractive. But allocated annuities are still more popular, even though the purchaser carries the longevity and investment risks. The problem with life annuities

¹⁸⁴ Solvency standards and capital adequacy ratios should be met (Knox, 2000, pp.10-11) and (Johnson, 1999, p.37).

¹⁸⁵ Knox gives the following example: If \$100,000 is used to purchase a level life annuity for a male aged 65 with an annual payment of \$8405 (typical), the amount of income that would be used in the income test equals: $\$8405 - 100,000/15.41 = \1916 , where 15.41 is the life expectancy for a male aged 65.

is the comparative loss of control, and the locking in of initial investment decisions or interest rates. The life annuitant risks falling behind general rises in living standards because savings are in a capital guaranteed product.

It has been possible to buy an allocated pension allowing considerable control over the draw-down for 15 years and a deferred annuity with partial or full inflation protection starting at age 80. The longevity protection provided by the deferred annuity costs about 10 per cent of the accumulation for a male at age 65 (Doyle & Piggott, 1999). The cheapness arises because the money is committed a long time in advance, the probability that death occurs before 80, the build up over 15 years offers some protection against inflation, the low life expectancy at age 80, and a lower initial payout.

Some commentators are very critical of the emphasis on allocated annuities. As Wakeling (2001) says, in past times society worried about life insurance for the breadwinners of young families. As that fear has receded, with the improvement in health and two-earner families being the norm its place is likely to be taken by the new fear of living too long. The fear is compounded by the expectation that the state pension will only provide a limited standard of living.

If today's retirees had a means of protecting themselves against their exposure to longevity risks they could better use their available income drawings for their genuine purpose- retirement living - thereby maximising retirement lifestyles and minimising the wastage of their tax advantaged saving. (Wakeling, 2001, p.10)

The industry is increasingly drawing attention to the reality that life annuities do not provide protection from the investment risk, and allocated annuities do not provide protection from the longevity risk.

Australian academics and the industry are currently exploring policy options including the case for mandatory annuitisation with suitable regulations that might offer better protection for individuals and taxpayers alike (for example Doyle & Piggott, 1999). The close relationship between Australia and New Zealand suggests that New Zealand should be paying attention to the design features of the Australian annuities market.

USA

Private pension coverage has traditionally seen annuities provided through group pension plans. Over time however there has been a marked shift into 401(k) plans, away from Defined Benefit plans (Munnell, Sunden & Lidstone, 2002). These 401(k) plans typically only pay out a lump sum and most plans do not even offer the possibility of a life annuity (J. Brown & Warshawsky, 2001). Retirees can then go to a life office to buy an annuity if they so wish. Participation in a 401(k) plan is voluntary and both employer and employee can make pretax contributions. The trend to 401(k) plans is expected to continue reflecting that defined benefit plans have diminished in number and importance.

In contrast to traditional defined benefit pension plans, 401(k) plans have advantages of greater portability (the individual can move accumulated funds from job to job) which is appealing to a young and mobile workforce. They have greater transparency, so contributors can see their funds growing and take responsibility for how to invest the assets. There is some ability to access funds before retirement giving more control. Employers like them because the investment risk is shifted to the individual and they are less costly to operate. 401(k) plans have risen to about 80 per cent of defined contribution plans as a whole, but overall coverage in pensions plans has remained virtually unchanged, reflecting the fall off in defined benefit plans (Munnell et al., 2002).

The annuities market in the US is small but relatively well developed. Both single premium individual annuities (SPIA) and flexible payment annuities are offered. In the latter, ongoing contributions, regular or irregular are permitted. Annuities may be fixed or variable. Fixed annuities have a fixed interest rate for a given period similar to term deposits. A new interest rate is set for the next period. There are no government guarantees, however, unlike the deposit insurance that applies for bank deposits. A 'participating' fixed annuity provides a guaranteed minimum payment and additional dividend payments that depend on the performance of the insurance company's investment portfolio.

Variable annuities have more features and hence higher fees than fixed annuities. They may or may not include a fixed component and usually offer a range of investment options eg., stocks, bonds and money market instruments so that the return

varies. Neither the principal nor return is guaranteed. This option should, in normal circumstances, allow the annuitant to benefit from growth in the economy and offer some degree of inflation protection. If there is a fixed account component to the annuity, money may be transferred from one account to the other, as circumstances dictate, without taxation.

Variable annuities are not common, with Singapore a notable exception. A factor may be the principal-agent problem with people unwilling to hand over a large amount of money irrevocably to an institution that may not act in the investor's best interests (James & Vitas, 2000a, p.18).

Deferred annuities provide a way to accumulate money in a tax deferred way for retirement. There are no taxes on earnings until money is withdrawn. But there are fees to pay, and the tax benefits can be less in total than these fees for some people in saving in this way. There is usually a 10 per cent tax penalty for withdrawal before age 59½. As well, surrender fees charged by the company may apply for early withdrawals. The deferred annuity can be taken as a lump sum or annuitised with tax payable on the earnings component. There is a degree of flexibility in design (Federal Consumer Information Centre).

The marketing costs of annuities may be substantial and are controlled by regulation:

The state of New York mandates that marketing costs including commissions not exceed 7 per cent of the annuity premium for licensed insurance companies (Congressional Budget Office, 1998)

When annuities are provided from private pension plans they come under federal labour law and are not permitted to use gender as the basis of risk discrimination. In 401(k) plans, lump sums are provided and individuals purchase their own annuities from Life Offices which come under State insurance law. In most states (except Montana), this law allows variation of premium rates and benefits by sex. Campbell and Munnell (2002) note how this is changing the relative price of annuities for men and women.

More recently with proposals to create individual accounts within social security, there has been a renewed interest in the need for flexible annuity products. Annuitisation is proposed as necessary to reduce moral hazard (ie. incentives to spend assets now and fall back on state assistance later), social responsibility, adverse selection, lack of financial sophistication, trend away from life annuities in private

pensions plans (Warshawsky, 2001). Mandatory annuitisation from individual accounts is seen as probably necessary to overcome the inherent disadvantages in the voluntary annuities market, but other approaches might stress tax incentives, education, advice, etc., (J. Brown et al., 2001; Mitchell & McCarthy, 2002).

UK

In the UK, where purchase of annuities from pension plans is mandatory, the debate is intense.¹⁸⁶ Regulations require annuitisation of defined contribution pension accumulations no later than age 75, with at least 75 per cent of the assets. This has increased demands for annuities and highlighted deficiencies in existing products (M. Orszag, 2000). Brown and Warshawsky (2001) note the intent of this requirement is to limit moral hazard.

The pension annuity business has grown through bulk-buyout business from the winding up of occupational pension schemes. Before age 75 draw-down products may be utilized and tend to be the prerogative of those with the most accumulated saving. The idea is that pension purchase can be deferred with the possibility of buying an annuity at a later date on better terms (Wadsworth et al., 2001, p.4). This period of draw-down however does not permit any sharing of the mortality risk.

Purchased life annuities (PLA) are only about 5 per cent of the premium volumes of pension annuities. PLAs have the attraction that they can be purchased from either a mortgage loan or equity release based on domestic property. In the UK, actuarial interest is increasing in redesigning annuity products. Of relevance to this thesis, is the notion of more intragenerational sharing (see Part III).

Converting assets to income in an orderly fashion will become an increasingly important issue for the ageing populations and economies of many nations. Conventional annuities have many weaknesses, not least a diminishing supply of long bonds from governments. However, without a sharing of longevity risk the task of achieving a satisfactory income in old age will become impossible for many. Furthermore, it is likely that such sharing will have to become intra rather than intergenerational (as it is now) if it is to be workable in the future. (Wadsworth et al., 2001, p.3)

¹⁸⁶ The requirement is unusual with most countries not mandating a pension from defined contribution plans. The World Bank model does not prescribe post retirement structures.

Conventional annuities are generally regarded as inflexible, and their price highly variable between companies and over time. The antipathy may also be due to the perception that they are not suitable investment products, although new innovations, such as with-profit, unit-linked annuities, are emerging. If a conservative investment path gets locked in on purchase, the annuitant has no scope to adopt a different asset allocation that might be more suited to the long time frame of retirement. Indexed or increasing annuities are available but require a lower starting annuity and are less popular especially with those whose life expectancy is below average. From the provider's perspective, uncertain improving life expectancy makes annuities risky products.

Mandatory purchase of annuities in an uncompetitive annuities market may encourage profit taking at the expense of annuitants. From the government's perspective, delayed annuitisation has a tax revenue cost, the taxation of annuities is one way to recoup some of the tax advantage of the pre-retirement phase. But the policy requires an annuity is purchased by age 75 which might be viewed negatively as capital is surrendered on death.

Wadsworth et al., (2001) identify a significant market gap for middle-income people who are not affluent enough to go for income draw-down until 75, and thus are locked into inflexible annuities from an early date. Within the existing UK framework, they propose a new product, called the 'annuitised fund', based on both equities and bonds. The initial annuity would be calculated on current investment and mortality data, but reviewed periodically to reflect changes, until at a higher age a guaranteed annuity would be locked in. At this point the asset backing would switch to 100 per cent bonds. It is argued that at the higher age the risk of wrongly predicting improved life expectancy is low because the remaining life expectancy is low. The annuitised fund utilises the concept of survivor credits in which the subsidy from those who die early to the longer lived is made explicit. This makes the product more transparent and less vulnerable to the criticism that the insurance company retains the funds on death.