PENSION BENEFIT DESIGN AND THE INTEGRATION OF INSURANCE BENEFITS OVER THE LIFE CYCLE

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ABSTRACT

It is suggested that South African retirement schemes ought to be designed around the financial lifecycle, and the risks faced by families at various stages of the cycle. This paper reviews what we know about the life cycle and the non-investment risks: principally death, disability, dismissal and divorce. Providing for death and disability within schemes would allow for an offset of these costs against that of retirement, for less in the way of underwriting and for economies of scope. It would also allow for the elimination of those statutory and private schemes that give partial cover for accidental causes of death and disability. The paper also criticises insurance arrangements that conflate the heterogeneous causes of disability. It then considers arguments for making scheme membership and various elements of design a legislative requirement. Against the common view, it is suggested that a relatively low level of saving should be required, but that life and disability cover ought to be compulsory as should annuitization at retirement.

KEY WORDS

Policy; Pension funds; collective action; life insurance; annuitization; disability; retirement; social policy.

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1 INTRODUCTION

1.1 Investment risks aside, retirement schemes can significantly aid their members navigate pre-retirement risks: death, disability, dismissal and divorce, as well as post-retirement longevity risks. This paper discusses the possibilities - and the imperatives - in the context of the South African retirement fund industry. It is written particularly to evaluate the relevant recommendations of the Taylor Committee (Taylor *et al*, 2002), on which the author served.

1.2 Providing retirement, death and disability benefits within a single scheme allows the charges for each to be offset against each other, creating direct cost savings and allowing for less underwriting, and therefore wider coverage. The reason for the offset is that members of groups subject to higher mortality and disability risks will need less retirement income. Integrating payments made from retirement funds during periods of voluntary and involuntary unemployment can reduce the moral hazards associated with unemployment insurance. The value of savings for retirement can also provide alternative funding for periods of involuntary unemployment, which can later be made up by delaying retirement. Divorce is probably not insurable, but retirement schemes should not provide perverse incentives and could be made more flexible to deal with a greater variety of life histories.

1.3 This paper places these risks in the context of what we know about the financial lifecycle, identifying strands of research that provide insight into the stages and the risks. Section two of the paper describes the lifecycle; section three the associated risks. These sections expand material from Asher (2003). Some effort is also expended in attempting to understand the underlying reasons for the reduction in retirement age experienced over the past century.

1.4 Section four then discusses how retirement funds can provide for non-investment risks before retirement. Defined benefit (DB) funds do offer some of the integration required, but are now recognised as too opaque, unfair and often excessively risky for employers. The challenge is therefore to adapt the design of defined contribution (DC) retirement funds to provide the necessary integration. Some of the suggested changes would be easier after tax and other regulatory reform.

1.5 Section five then proposes a regulatory structure for private pension funds - in particular the questions of compulsory membership and minimum requisite benefits. It is concluded that all benefits should be paid as pensions. South Africa law does not currently require compulsory contributions to retirement funds, but the idea is frequently discussed and was recommended by the Taylor Committee. This section evaluates the justice of regulations requiring compulsion and minimum benefits using also the theory of collective action.

1.6 Section six concludes that there is much work ahead in developing pension funds that efficiently meet the needs of all their members.

2 THE LIFECYCLE

2.1 The financial life cycle provides a framework for considering the financial security needs of the middle class members of retirement funds and their immediate families. In outline, it divides a person's adult life into two main stages: of accumulation while in employment, and de-cumulation in retirement. Within the first stage, there is normally a period before children, a period with children in the household and a final period when they have left.

2.2 Financial security is defined here as a level of certainty that the members of the middle class family can maintain their accustomed standard of living in the face of idiosyncratic risks. (These are risks that affect only some households, not those that would lead to a general decline in standards of living.) The effects go beyond the financial: continuity in housing and leisure consumption are required for people to continue to interact easily with their family and friends.

2.3 The financial lifecycle does not really apply to casual workers and subsistence farmers who cannot save and so are obliged to work while they are able, and rely on *ex gratia* state or family support when they are not. Those who inherit wealth that they pass on to their children may also display less of a change of financial circumstance over their life course, and have limited needs for insurance or retirement funds.

2.1 ECONOMIC RESEARCH

2.1.1 The interest of economic research in the financial life cycle is spelt out in Modigliani's (1986) Nobel lecture. Deaton (2005) places it in wider perspective, which includes principally the determinants of savings. The idea is hardly novel: the need for the young to accumulate wealth, and of the old to be supported, are present in the three thousand year old account of Jacob's youthful accumulation of wives and herds under Laban, and reliance on his sons in his later years[1]. Urbanization, and its attended mobility, has however made it necessary to develop new institutions to replace the extended family and rural community as a source of financial support[2]. Beginning with Germany, a number of countries introduced national pension arrangements that clearly recognised the lifecycle. Rowntree (1901) provided an early systematic evaluation of the variations of poverty over the life cycle: affecting families with young children and the elderly particularly.

2.1.2 In spite of its macro economic origins, and appropriately because the etymology of economics derives from the management of a household, the elements of the cycle as the affect individuals have also been intensively investigated in the economics literature. Polachek and Siebert (1993) provide an excellent reference for the factors affecting income, which is used in the following sections, as is Hadjimatheou's (1987) useful treatment of consumption and savings questions. In the actuarial literature, Cooper (2002) also describes the results of a model of savings and consumption over the working life.

2.1.3 More recent research is particularly sophisticated. Gourinchas and Parker (2002) calibrate a model that incorporates utility of consumption over the lifetime, and stochastic investment returns, with US household savings data. They show the precautionary motive supplements lifecycle savings. Gomes and Michaelides (2005a,b) return to Modigliani's original problem by showing how the savings pattern generated by the life-cycle can be calibrated to the equity premium and the level of interest rates for countries with different demographic structures.

2.2 INCOME

2.2.1 We know that average full time incomes generally rise initially - until at least the early thirties - with people's increasing skills and commitment to the workforce. The process has been explained by "human capital theory", of which Becker (1983) is the originator. Human capital incorporates knowledge and skills that arise from education, training and practice. Murphy and Welch (2002) model the relationship with US wages over a 30 year period.

2.2.2 Human capital depreciates over time, more rapidly in an environment of rapid technical and institutional change. The rate of depreciation is however difficult to determine, with Groot (1998) finding rates of 15% per annum, and

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[1] Jacob's adult life is covered in Genesis 29 to 48.

[2] The Canadian Museum of Civilization website has a useful summary of an extensive literature review of the economic history of the late nineteenth and earl twentieth centuries. (civilization.ca/hist/pensions/1867-1914_e.pdf) for the summary and (civilization.ca/hist/pensions/cpp-biblio_e.html) for the bibliography.

Arrazola and De Hevia (2004) finding them much lower. The capacity to work also eventually declines with age – beginning at an earlier age for manual workers. Once people begin to think of retirement, they are also likely to reduce their investment in their human capital because it will be of use for a shorter period of time. Incomes tend to decline from this point on.

2.2.3 Noonan (2005) reports on difficulties experienced by some older workers in keeping their jobs. Stock and Beegle (2004) find that this can arise from discrimination against older workers and retirement rules and incentives that encourage earlier retirement. These both appear to contribute to the observed fall in average incomes as retirement approaches.

2.2.1 Education

2.2.1.1 The rise in incomes is quicker and less protracted for those with less education, who are more likely to rely on physical strength. Increasing education delays entry into the workforce, but income growth often persists into the fifties. Income growth perseveres for longer in larger organizations as a result of promotions to senior positions. This might be interpreted as returns to firm-specific capital, but Neal (1995) however finds evidence only of industry-specific returns to experience. The high income of senior people in large organizations therefore requires other explanations.

2.2.1.2 There is considerable data on the investment returns to education. Psacharopoulos (1994) summarises his review of the literature:

> "...primary education continues to be the number one investment priority in developing countries; the returns decline by the level of schooling and the country's per capita income; investment in women's education is in general more profitable than that for men; returns in the private competitive sector of the economy are higher than among those working in the public sector; and that the public financing of higher education is regressive."

2.2.1.3 The advent of computerization appeared to have had the effect of increasing the wages of those able to use them, but Allen (2001) finds that it has not reduced the wages of older workers relative to younger ones.

2.2.2 Sex

2.2.2.1 The pattern of income by age and sex is likely to differ in different societies, but the research is largely limited to developed countries, and heavily weighted to the USA. The observed patterns do however have intuitive appeal:

- Single women's salaries are similar to those single men's salaries by age.
- Married women's income drops at the birth of the first child, and they seldom catch up. Kristen and Malone (2005) explain a large portion of the loss by the additional housework associated with children, which reduces the opportunity to earn.
- Married men have the highest average income. On the one hand, they have partners who take a disproportionate share of domestic chores so enabling them

to invest more in their earning power, and on the other they are expected to meet more of the family's financial demands.

2.2.2.2 Discrimination, most often on grounds of race, sex and age can create deviations from these generalizations. Hellerstein *et al* (1996) in a study of 60,000 US plants finds evidence that older males are relatively overpaid, while less qualified women are underpaid relative to productivity. Such statistics are obviously situation specific, but are consistent with general impression of relative social power. The discrimination against older workers reported in 2.2.3 above relates to the ability to obtain a job, so is consistent with older males earning higher wages on average.

2.2.2.3 Waldfogel (1998) finds evidence that more generous maternity leave reduces the differences between women with and without children, suggesting that the cost of re-establishing oneself in the workforce (rather than the efforts spent on housework or discrimination) explains some of the lower wages earned by married women.

2.2.2.4 The previous two paragraphs are significant for people deciding to retire: a return to work at a later age may well be at a lower income level, which means that the decision cannot be taken lightly, and that it represents a loss of future wage earning power.

2.3 EXPENSES

2.3.1 It is particularly difficult to measure the costs of living precisely, given the vast number of potential purchases and the ability to substitute when prices change. Nelson (1988) discusses the difficulties in measuring economies of scale, and Deaton (1998) provides an overview of some of the difficulties in measuring prices over time and quality changes.

2.3.2 Expenses do however have a different trajectory to income over the lifecycle:

– Setting up house - and buying cars - is expensive. To obtain an idea of the costs, one can use the websites of general insurance companies to calculate the value of household contents, and it can amount to years of income. This obviously has significance for those who need to set up another household after a divorce.

– The cost of children generally rises with their age and drops when they leave home. A range of methods have been used to adjust household income for the number of adults and children. There must be some overhead costs, and marginal costs are likely to reduce as the number of people increase: more expenses can be shared, bulk purchases can reduce unit costs, and there will be more opportunities to provide goods and services for other members of the household. It is doubtful whether any households reach the size where diseconomies of scale arise from the need to achieve co-ordination.

2.3.3 Family living allows for economies in expenses compared with living singly. The benefits of living together are not however only financial and continue into retirement. Brantervik *et al* (2005) report that Swedish aged living alone or with spouses in poor health are more likely to be malnourished. Ogg (2005) looks at

European data and describes the particular problems faced by the separated and divorced.

- Medical costs appear more or less proportional to the number of people in the household until retirement, after which they rise rapidly. Evidence however is that they (especially if they include the cost of care) are much heavier in the years preceding death rather than related to age *per se,* especially if one includes the cost of care. Van Weel and Michels (1997) suggest that medical costs in the last year of life account for 40% of lifetime costs.

- Other expenses reduce after retirement, more so as health deteriorates as found, for instance, by Banks *et al* (1998).

2.4 SAVINGS

2.4.1 Savings depend on the interaction of income and expenses. The following crude stages can be outlined:

- Twenties and increasingly early thirties: people start work, establish a separate household, marry and have children. They save for deposit on buying a home. Young people are likely to be "liquidity constrained" when they start work: consumption is constrained by an inability to borrow.

- Late twenties to late forties: most middle class families will borrow to buy a home. Paying off debt is prudent before saving for retirement can begin.

- Forties and fifties: at this stage, pension provision becomes important. Pension assets of at least fifteen times the required pension are probably necessary. This converts to perhaps 7 years of income or 30% of earnings over twenty years.

- Healthy over sixties: Depending on finances, inclination and opportunity, people can choose to work or enjoy the leisure of retirement. There is likely to be some withdrawal of savings for leisure activities.

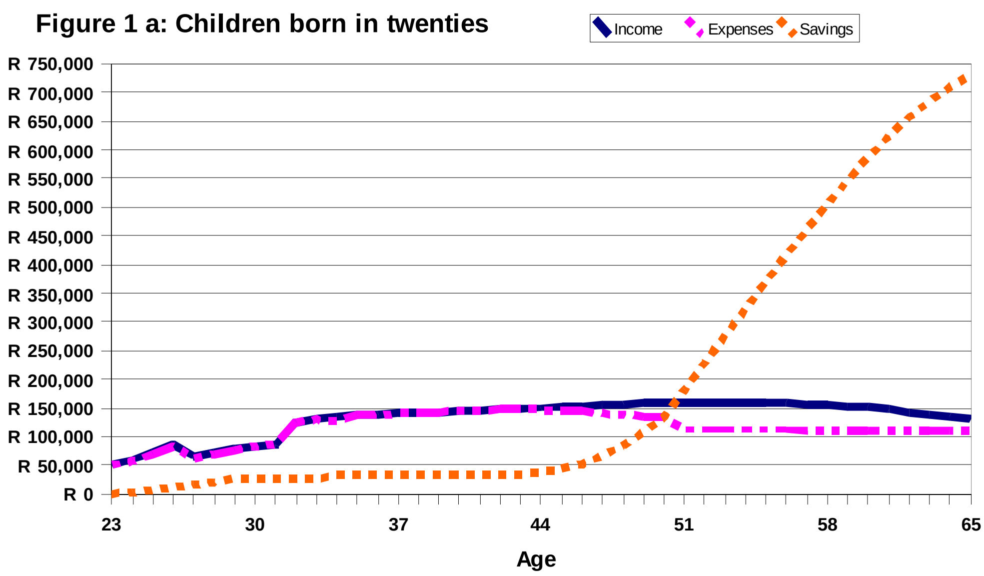
- Unhealthy over sixties: People are increasingly unable to work and in need of help in their activities of daily living. Significant dissaving may occur for medical expenses and formal care.

2.4.2 The cycle is effectively normative: deviations can be costly. Delaying children increases the risk of congenital defects and infertility. Too little saving may lead to financial hardship in old age; excessive savings may create an unnecessary reduction in consumption and more than enough assets later.

2.4.3 It is clear that there are many working people who think that they should save more. Many of those already retired also think that they should have saved more while they were working. Hurst (2003), analysing the Michigan Panel Study on Income Dynamics (PSID) data, finds that there are a significant number of families that fail to plan for retirement, and whose expenditure myopically follows changes to income. They predictably end up with less assets in retirement, although appear to have adequate pension benefits. Laibson *et al* (1998) provide a detailed analysis of motivation for saving, and document that a majority of their US survey are in favour of compulsory savings and limitations on pre-retirement withdrawal - seeing them as helpful restrictions on their own behaviour. This research helps explain the dispersion of wealth at retirement that Venti and Wise (1998) found to be less dependent on lifetime income than expected.

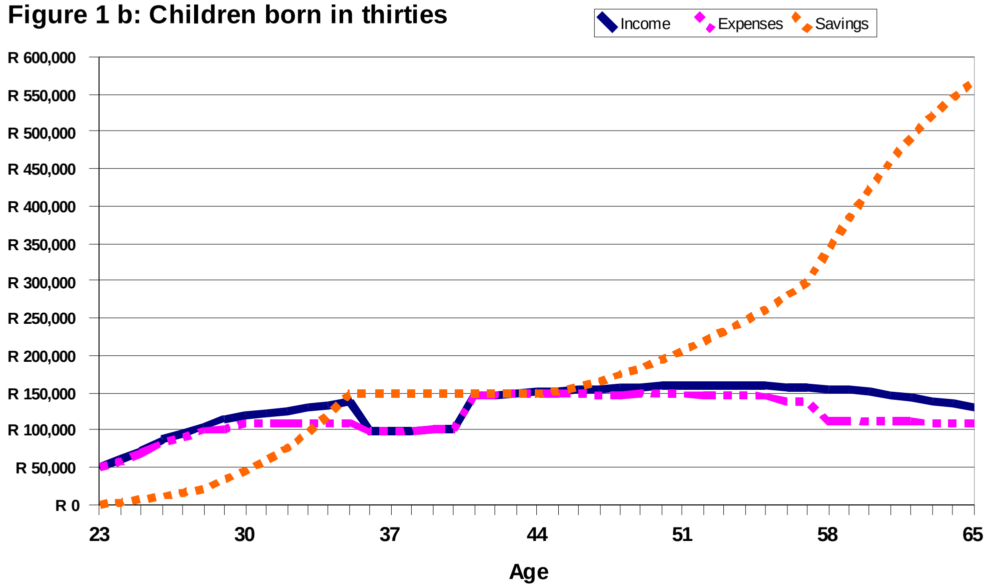
2.4.4 On the other hand, in an international survey[3], AXA finds that the majority of retirees in most countries regard their income as sufficient. As many report that their post-retirement living standards have increased as have reduced. It is not entirely clear therefore whether the view that people do not save enough arises from a clear picture of the life-cycle or from an un-informed, but established, myth that more saving for retirement is always good.

2.4.5 The models shown in figures 1a and 1b suggest that the popular view that one should save lots and save early is misguided. (The underlying data is given in the appendix.) The numbers are stylised and chosen to produce level consumption over the lifetime. They show that couples will usually be liquidity constrained when they are attempting both to buy a house and look after children. If they want to enjoy consumption over their lifetime that varies less, they should save less at that time. Only if children are delayed should savings become significant earlier in adult life.



[3] AXA (2006) AXA Equitable Retirement Scope: Retirement — a new life after work? Report axaonline.com/axa/pressroom/2006/2006_01_24_Retirement_Survey_International.pdf

Figure 1 b: Children born in thirties



2.5 NUCLEAR FAMILIES

The lifecycle is not only a middle class, but a nuclear family construct. It assumes that retired people are not supported by their children within an extended family, and – in the form described in figure 1 – assumes that parents support their young children. The lifecycle would be less pronounced and retirement funds less necessary in societies characterised by extended families living together.

2.6 RETIREMENT AS A SOCIAL PHENOMENON

2.6.1 As a middle class, nuclear family construct, the life-cycle as outlined above is largely of modern origin. Costa (1998) shows how retirement ages have declined in all the countries for which statistics are available for most of the twentieth century. People can work until older ages, but institutionalised retirement ages, public pensions funded out of both earmarked and general contributions, and tax concessions, have encouraged them to retire earlier. Buetler *et al* (2004) confirm, with individual data, that compulsory savings does create an incentive for earlier retirement.

2.6.2 Schulz (2002) writes of the emergence of retirement as an active phase in the middle class over the past century. He refers to “irrefutable evidence” that a major reason has been the need to ease unemployment at younger ages. While unemployment at younger ages has been high at times and may have been a contributing factor to lower retirement ages, table 1 shows that leisure is not currently distributed evenly over the life-cycle – if Australian data is representative. Earlier retirement has accompanied a significant increase in the employment of women, including the mothers of young children who work almost three times more hours than men in the last of the family phases shown. Jager *et al* (2003) confirm that this extra work creates stresses in their report on European countries. They suggest that while the Dutch and Swedes have similar views on the equality of the sexes, the Dutch approach of specialization within the household (women are more likely to work part-time) leads to lower levels of stress.

2.6.3 Erlich and Kim (2005) find a link between the generosity of national retirement benefits, family disruption and lower levels of fertility. They explain this by a reduced need to have children for support in old age, and the greater economic freedom enjoyed by women when they have their own pensions. Other explanations are possible. Generous pension arrangements are however characterised as much by higher contributions and earlier retirement, as higher pensions with less need for support from children. Higher contributions for younger people have themselves created a greater need for younger women to work, and earlier retirement has created a greater demand for their labour. These stresses would also cause family disruption and lower fertility.

2.6.4 This issue needs to be explored as it relates to the debate on compulsion that is discussed in section 5 below. The shifting of working hours from richer and older, but active, men to working mothers - as a result of institutional changes - suggests an intersection of class, patriarchy and gerontocracy power interests rather than needs. The idea of the gerontocracy is described by Mulligan and Sala-i-Martin (1999). They suggest that active pensioners make up a dominant political bloc in all democratic countries when it comes to the defence of social structures that benefit and build its constituency. Such structures would include discrimination against older workers that pressure them into an earlier retirement.

2.6.5 A Marxist analysis of this apparent distortion of the social structure would lead to a search for the “ideological superstructure” or “false consciousness” that would justify it. In South Africa and other Anglophone countries, where funded private retirement funds make up a core element of the financial system, there is a set of myths around the benefits to individuals and society of saving for retirement. For individual benefits, there is common misperception addressed in paragraph 2.4.5 above. On economics, there is the unsupported view that retirement saving contributes to investment and to economic growth discussed *inter alia* in Asher (2006b). There is also the commonly held view that a successful career involves hard work when one is young followed by an early retirement. These myths are institutionalised by compulsory pension fund membership with their consequential earlier retirement ages, subsidies for mothers to be in the workforce, and reinforced by an ideology of equality that leads younger mothers to accept fewer hours of leisure.

2.6.6 While issues of aging have been the subject of investigation in the sociological literature, the assumption is that discrimination based on age is due to stereotyping and prejudice that should be addressed by “information, contradiction and confrontation” (Bytheway, 2005). To the extent that social structures have advantages for particular groups and are embedded in the legal and institutional structure, however, there is the further need for political reform and institutional development.

TABLE 1: Time allocations* by household type (Table 5 in Apps and Rees (2003))

Household type	Lifecycle phase	Male hours of work			Female hours of work		
		Market	Domestic	Total	Market	Domestic	Total
I & II	1	2314	554	2972	1811	1014	2285
I	2	2359	1369	3775	15	4103	4118
	3	2394	1358	3859	111	3664	3762
	4	2415	1185	3600	355	3170	3525
	5	2362	817	3179	504	2393	2897
	6	2367	815	3182	670	1781	2451
	7	1862	1093	2955	0	2026	2026
II	2	2432	1464	3943	1378	2908	4286
	3	2478	1306	3784	1615	2679	4291
	4	2464	1095	3559	1915	2285	4200
	5	2527	856	3383	2120	1753	3873
	6	2369	958	3327	2217	1568	3785
	7	2062	1083	3145	1202	1458	2660
I & II	8	0	1458	1458	0	1750	1750

*Weighted data means, hours pa.

Type I	Traditional – female partner has minimal workforce participation
Type II	Non-traditional – female partner works long hours or full-time
Phase 1	No dependent children and a female partner under 40.
Phase 2	Children with an average age under 5.
Phase 3	At least one child aged 5 to 9 years.
Phase 4	Children are predominantly in the 12 to 14 year age group.
Phase 5	Older dependent children still living at home.
Phase 6	No children, female under 55 or male under 60; one working
Phase 7	Between phases 6 and 8
Phase 8	Both partners retired.

2.6.7 The existence of an ideological superstructure is not intended by this writer to suggest that its proponents are hypocritical, selfish or stupid. The economic arrangements that generate it and the theoretical constructs that support it are likely to emerge slowly as by-products of other developments. Recognising the ideology, and initiating the education, reforms and developments necessary to overcome its negative impacts are also likely to take time.

3 RISKS DURING THE LIFECYCLE

3.1 Much intriguing data on the volatility of income, expenses and savings has come from the PSID, and equivalents such as the British Household Panel Survey and the European Community Household Panel. Duncan (1988) reports from the PSID that relatively few US families remain persistently in poverty, but that a third or more of the population suffer significant drops in per capita household consumption at some point in a decade. The most important cause of the reduction is reduced wages (normally reduced overtime), or total unemployment. Changes to family composition (particularly leaving home and divorce) are also major contributors to financial instability. Also of interest is the spread and volatility of income progression in the light of changes to inflation and other economic variables.

3.2 This section considers the size and nature of these risks and the potential for retirement schemes to provide insurance cover.

3.1 DEATH

Death before retirement can create financial stress for remaining family members. This section describes the needs and the suggests how the benefits should be determined.

3.1.1 Orphans

3.1.1.1 The most obvious need is for the support of orphans. The presence of children in a household not only increases expenses but also diverts time from parents' opportunities to earn. Most poverty, worldwide, is felt by single parent families (most often headed by mothers) with young children. The problem is greatly exacerbated if both parents are dead, which is likely when AIDS was the cause.

3.1.1.2 It would appear highly desirable for all retirement funds to offer life cover for orphans. A problem arises if the funds do not know of the existence of the children of members. This can be avoided if the premiums are charged to all members, but this may be seen to be unfair. The reintroduction of a dependent's tax rebate would provide greater incentives for parents to report the existence of dependent children to their employers, and thus to their fund.

3.1.2 Spouses

3.1.2.1 To the extent that wives have sacrificed a significant portion of their earned income in order to look after their children, they will be more dependent on the earnings of their husbands, and will need cover in the event of his death. Cover for children's expenses may not compensate for this loss. Cover on the wife's life is not normally necessary as household arrangements usually appear to enhance the husband's earnings.

3.1.2.2 In those rare circumstance where husbands reduce investment in their own human capital to take up household duties, the needs will be reversed.

3.1.2.3 Offering cover to men but not women is likely to be seen as unfair discrimination, so spouses' benefits should be made optional in retirement funds. This allows the cover to be adapted to fit all circumstances.

3.1.2.4 Requirements for cover go beyond retirement. Society’s poorest members include elderly widows and divorcees - as described in Auerbach and Kotlikoff (1991). It appears that their husbands spend most of their retirement benefits on themselves.

3.1.3 Debt repayment

3.1.3.1 Banks and other moneylenders frequently require cover in order to ensure quick and easy repayment on death. The cover may well be necessary to protect the family, but there is frequently no attempt to determine the borrower’s total need for the insurance. Credit life cover for smaller loans particularly appears to be sold purely to earn additional commissions for the supplier.

3.1.3.2 If retirement funds offer life insurance, then additional cover may well represent over-insurance. There would therefore be an argument for laws governing retail loans to require moneylenders to accept the cover from retirement funds as security in the event of death. This in turn would require the funds to be able to pay some of the proceeds of life cover to the lenders, and to notify them before cover ceases.

3.1.3.3 The amounts recoverable would need to be limited to a portion of the cover in order to ensure that families were not impoverished in order to pay excessive debts. If benefits were only payable as pensions, this would be easier to ensure.

3.1.4 Funeral expenses

3.1.4.1 Funeral expenses are important for people where the cost of a culturally appropriate funeral is significant relative to income. This cover is widely offered by informal burial societies and a variety of group and individual life policies that normally cover the whole family. While not permitted in a retirement fund, over half the employers responding to the Sanlam Survey (2006) offer funeral benefits to the employees; most of these cover children.

3.1.4.2 South African law[4] limits the insurance that can be taken out on the life of children. The limits may be circumvented - mainly inadvertently - if people are members of a number of different groups offering funeral cover. This presents a

[4] Section 55 of the Long Term Insurance Act 1998 restricts the maximum cover that can be given for children to R10 000 for those under 6 and R30 000 for those under 14.

perverse incentive. Fisher and Young (1965) report that restrictions on the amount payable on the death of a child were introduced in 1875 in the UK for fear of encouraging infanticide. In 1948, this was taken further and life cover on children under 10 was prohibited altogether. While infanticide is seldom reported in South Africa, there are over 6 000 unnatural deaths[5] of children under 14 annually, which provide grounds for doubt. Given the ubiquity of funeral cover, it would appear undesirable to offer more.

3.1.5 Other death related expenses

Life insurance is also bought to provide a bequest to children, or if there are other assets, to pay the estate duty. This type of cover does not represent a need and should at most be optional in a retirement fund.

3.1.6 Determining the requirements

3.1.6.1 The amount of life cover required by the dependents of an individual in any future year can be derived as either:

a) net expected income in the year times the proportion not spent on oneself, or

b) one's contribution to household expenses and upkeep of others.

3.1.6.2 Lilly (2006) provides a detailed analysis as how the required cover might be determined by a financial advisor. His analysis is relatively complicated and includes relatively minor items such as specific provision for funerals. Given the difficulty of determining future income, needs and investment returns precisely, it would not seem that such detail can be justified. Rough calculations based on one of the two formulae suggested above are likely to be adequate.

3.1.6.3 The cover required for each year is likely to be relatively level, when expressed as a percentage of income. Allen (1970) reports common US benefit formula were for spouse's pensions of between 20% and 50% of income with orphans' pensions of between 5% and 15% each. The greater participation of women in the workforce since that time would suggest that proportions should be more heavily weighted toward orphans.

3.1.6.4 A formula for orphan's cover could be 15% of income for each child until they become financially independent, with maximum cover of 40% or 50% of income. These percentages would approximate a division of the income of a household into one part for each child and one for each adult.

3.1.6.5 The need is clearly for a monthly pension, but South African income tax rules on annuities make lump sum cover more tax efficient because the entire annuity and not just the interest portion is taxable. The same applies to spouse's

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[5] This number can be calculated from “Causes of death in South Africa 1997-2001: Advance release of recorded causes of death” (P0309.2) published by Statistics South Africa. Actual deaths are however believed to exceed reported deaths by a significant margin.

pensions. Antiquated tax rules of this type are designed to capture investment annuities, but have been amended to allow structured settlements in many other jurisdictions[6]. Tax regulations should also be amended in South Africa and extended to cover insurance based annuities. In the interim, even retirement funds that offer monthly cover should offer a commutation option that allows the beneficiary to purchase a tax efficient annuity with the commutation.

3.2 DISABILITY

3.2.1 Where disability leads to an unpreventable loss of income, there is a need for income replacement – whether the disability is temporary or permanent, total or partial. Disability also leads to additional costs of living and often of working. Zaida and Burchardt (2005) confirm this from their survey of a sample of disabled people in the UK.

3.2.2 It appears that insufficient attention is given to disability insurance in South Africa, where fewer people have private disability cover than life cover, although more people would have cause to claim during their working life. The position can be quite different if governments offer cover. In developed countries particularly, disability income payments can be very significant. An OECD report[7] shows a variation from 1.3% of GDP in Canada to 5.6% in Norway. This variation suggests that it is possible to make expensive errors in the design of a system of insurance, either denying needy claimants, or overpaying those who could be working.

3.2.3 This section attempts to outline a sensible and compassionate approach to the issues.

3.2.1 Rehabilitation

3.2.1.1 Disabled people need rehabilitation. Tate (1992) confirms that return to the workforce and "normal" life is often a possibility, and often the best cure. Rehabilitation may require special equipment and other provision, and needs special effort from family, employer and insurance provider. It is difficult, painful and sometimes humiliating for the disabled person. It is however superior from a human point of view and appears to be less costly. These points are illustrated by De Jong *et al* (2006) who find, in their Dutch study, that the cost of disability benefits can be significantly reduced by more rigorous management of the payment of benefits – without a consequential knock-on in higher unemployment benefits.

3.2.1.2 Goodman and Stapleton (2006) describe what they call a "new paradigm" of attempting to re-integrate the disabled in society. Their point is that

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[6] For a discussion see Chapter 22 of the report of the Road Accident Commission Report 2002 (Satchwell J) http://www.parliament.gov.za/pls/portal30/docs/FOLDER/PARLIAMENTARY_INFORMATION/PUBLICATIONS/ROAD/s10-22.pdf

[7] From Marin B & Prinz C (2003) *Facts and Figures on Disability Welfare: A Pictorial Portrait of an OECD Report* Vienna: European Centre for Social Welfare Policy and Research, 36 quoted in Social Security Administration (2006)

current US government expenditures are not appropriately geared to this objective. It is suggested here that this new paradigm can be overplayed. It is not new, having been, *inter alia*, the inspiration for the phasing out of hospitals for those with mental illnesses in many countries. This Tucker (1990) reports the consequences in the growth of the homeless: over a third of those in American cities had been patients at institutions for the mentally handicapped. Rehabilitation is not easily achieved.

3.2.2 Heterogeneity

It was clear from representations to the Taylor Committee that there is a wide range of differing needs, and that the disabled were not uniformly represented. It seems to this author that four main groups can be identified. If there is to be a new paradigm for the disabled, it is suggested that it should be based on recognition of the heterogeneity of disabilities, which this classification attempts to capture in some way.

3.2.3 Physical disabilities needing rehabilitation

3.2.3.1 In this category are those who are intellectually able but blind, deaf or have lost the use of their limbs, as well as many with epilepsy, multiple sclerosis and similar diseases. It is characterised largely by people who want to return to work, although they may need encouragement at times. The category has, practically, to be divided between those who would otherwise be capable only of unskilled work, and those with the ability to perform skilled work. Tate (1992) confirms the former find more obstacles in returning to work – even in his US study, where unemployment is less of a problem than South Africa.

3.2.3.2 Representations to the Committee from people in this category[8] confirmed that they want to participate as fully as possible in society. To the extent that they need help, they would like training and equipment that gives access to jobs. With help, they expect to be able to make a full economic contribution. It was argued by some that the disabled should not be paid income replacement benefits at all, as the benefits would tend to marginalize them.

3.2.3.3 For disabilities with these characteristics, it does seem appropriate that insurance pays the costs of rehabilitation rather than income replacement. Given the demography and high unemployment rates of the unskilled in South Africa, and the absence of unemployment benefits, some income replacement benefit would however appear to be necessary for those with fewer skills.

3.2.4 Backache and depression

3.2.4.1 This group includes people suffering from non-specific backache and some types of depression: painful conditions that make many aspects of life and work more difficult, but do not prevent working. Claims in this category fluctuate dramatically with economic and social change, and can represent more than half of all

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[8] The Committee received representation from the SA Federal Council on Disabilities, the National Council for Persons with Physical Disabilities in SA, the SA National Council for the Blind, the Deaf Federation of SA and the SA National Epilepsy League

disability expenditures[9]. The Taylor Committee however received no representations from organizations representing people in this category.

3.2.4.2 There is evidence that insurance cover for these conditions is largely misconceived. That on backache is strongest. Nachemson (1999) records that backache alone accounts for one third of claims in North America and in 1987 accounted for claims made by 8% of the Swedish workforce. His review of the medical research shows that the diagnosis rather than the condition is the cause of most claims, and that “compensation prolongs symptoms and disability”. He continues: “In our efforts to be kind to people, politicians and physicians perhaps have been doing the wrong thing. We are perhaps making people sicker by some insurance schemes.” He is particularly scathing of some workers' compensation arrangements where there is a lax management of claims. He reports on widespread success in reducing claims for backache by reducing the benefit payable, and limiting claims for work related injuries to the 6 weeks it takes for physical healing to occur.

3.2.4.3 Many claims for depression may fall into the same category, but medical research does not appear to have investigated this in sufficient depth to be sure. In a recent in-depth study of 19 individuals, Millward *et al* (2005) however report on “the unwitting role that can be played by the health care system in reinforcing the ‘sick role’ and in so doing providing a continued justification for an ‘off-work’ identity.”

3.2.4.4 There is evidence that modern medicine can cure many forms of depression cost effectively[10], which should suggest that the number of claims should be falling rather than increasing as is the case in many countries.

3.2.4.5 It would seem from a financial and social perspective that benefit payments for these conditions should be circumscribed by strict claims management and, where necessary, reduced benefits. As an alternative to paying a fixed lower benefit for backache and depression, the total benefits available for this category might be limited to a stated pool of money, which would be shared among those claiming at a particular time. The benefit would therefore be self-adjusting, its size declining as more people were claiming in this category. By reducing claims and making them more stable, it would significantly reduce the premiums for disability insurance so making it more attractive for those that really need it.

3.2.5 Intellectual and mental conditions

3.2.5.1 This grouping includes people of working age with intellectual shortcomings, the severely mentally-ill, and some people addicted to drugs and alcohol. The Committee received submission from organizations serving rather than

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[9] As reported in Berkowitz M (2002) Designing an Early Intervention Demonstration to Return Applicants for Social Security Disability Benefits to Work www.dri.uiuc.edu/research/p01-01c/final_report_p01-01c.doc and by Conti et al (2006)

[10] The US National Alliance on Mental Health claims $7 saved for every $1 spent. www.nami.org/Content/NavigationMenu/Inform_Yourself/About_Public_Policy/Policy_Research_Institute/Policymakers_Toolkit/Facts_for_Policymakers_Treatable_Causes_of_Disability_-_Major_Depression.htm

representing people in this category[11]; the focus was on sheltered employment and hospital services.

3.2.5.2 Noble (1998) confirms that there are people, with these conditions, who will not be able to participate in workplace without ongoing expert, or at least informed, assistance, which sometimes should be delivered in an institutional setting. Their families are often not able to cope on their own. The idea that such people should be looked after in the community is meaningless unless there are appropriate social structures to embody the concept. If structured care is not forthcoming, people in this category can be disruptive: occupying and defacing public spaces, and possibly being a physical danger. The US National Association of Mental Illness (NAMI) report[12] that 16% of the US jail population suffers from serious mental illness, while 30% of those in public psychiatric hospitals are forensic patients.

3.2.5.3 NAMI is an active lobbyist for more appropriate spending on the mentally ill, believing that it could save money in the USA in the relatively short run. They are advocates of supportive housing (within communities), adapting jobs to be more suitable and earlier and more specialised treatment.[13] Some of these ideas are likely to be applicable to South Africa.

3.2.5.4 If permanent rehabilitation is not possible and income replacement monies likely to be wasted, benefits for people in this category need to include structured support that perhaps be deducted from compensation for lost income. Benefits should in many of these cases be paid to third parties and subject to appropriate controls. Retirement funds and insurers should investigate collaboration with organizations supporting such people.

3.2.6 Other conditions

3.2.6.1 Those in this category require income replacement. Included are people who are bedridden or housebound. The Committee received a number of representations from organizations representing people living with HIV/AIDS, but all from organizations concerned with state support for orphans rather than for adults who had previously been members of pension funds.

3.2.6.2 If people have a condition that is temporary they need support until they are able to return to work. If the condition is not temporary, they will need income support until death. One concern is that people in this category may leave employment because they have exhausted their sick leave, and then lose their life insurance. This is a particular problem where there is no disability cover or if it ceases after a fixed period.

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[11] Cheshire Homes and the Department of Health

[12] See www.nami.org/update/unitedcriminal.html

[13] See the fact sheets at www.nami.org/Template.cfm?Section=policy_research_institute&Template=/ContentManagement/ContentDisplay.cfm&ContentID=14596

3.2.7 Long term care

3.2.7.1 Broe (2005), arguing against the "traditional 'age structure' that homogenises the old", uses three age related categories for the retired. He describes the middle group between approximately 75 and 85 as "generally mobile independent and cognitively together, but in 50% brain function is at risk if stressed and then they need some assistance – and 16% have a dementia." For the very old over 85, "70% have difficulties with cognition, executive tasks and/or with balance, gait, mobility and activities of daily living." Broe is concerned with the need for medical care for the older and oldest old, and also with preventing declining brain function. Tilse *et al* (2005) reviews the literature on ageing individuals and the help they need in managing their finances, and report on a survey that finds that almost one in three Australians has given help to an aged or disabled person in the previous year. It can be noted that most of the assistance is informal and appears to be inadequately monitored.

3.2.7.2 Institutional long term or frail care is likely to be required for those in Broe's older old categories. In an Australian context, which is similar to that of middle class South Africans, Madge (2000) considers the costs to the Australian state, which amount to some 1% of GDP for care and 2% for medical costs. The costs born by government are dependent on family and social conditions; women in some age categories are three times more likely to need institutional care than men, not least because couples are likely to care for each other and men are more likely to pre-decease their wives.

3.2.7.3 Provision for frail care might be incorporated into retirement fund benefits. As an insurance benefit, however, it would be subject to moral hazard: family members will be given less incentive to provide the necessary care. The incentives would be better aligned if there were a savings component that allowed for some money to be left over for bequests. The amount required would however be large, particularly when compared to smaller pensions. It is difficult to envisage retirement funds withholding such amounts from relatively poor pensioners for what may be decades between retirement and entry into frail care. The current method of state-provided means-tested care may well therefore be the most appropriate funding method. Means tests in this context represent relatively little additional intrusion into the lives of the people concerned, and are efficient in providing incentive to family members to limit state-subsidised care. This is in contrast to the means tests for the age pension which are intrusive and inefficient - as described in Asher (2006b). Both types of means tests do fall more heavily on those with relatively modest incomes, but the former have at least some merits.

3.3 UNEMPLOYMENT

3.3.1 It is often difficult to disentangle periods of unemployment caused by a disability from those caused by a lack of jobs for which an individual is qualified. Those rendered unemployed by economic and technological change can in some ways be described as disabled. Such unemployment may be insurable to the extent that it arises as a result of retrenchment. Benefits could be paid for the period required to retrain but would be subject to increasing moral hazards if claimants were not sufficiently motivated to return to work.

3.3.2 As with disability, the payment of unemployment benefits should also be accompanied with active retraining and pressure to return to work. Recent OECD[14] summaries of the international research confirm this. They describe the policies needed to successfully combat unemployment. Three are relevant to this section:

- "make it more attractive for people to work than to stay on welfare benefits;
- "make sure that benefit recipients receive high-quality services, particularly in relation to their quest for jobs, and that this is monitored closely, backed up by the threat of benefit sanctions;
- "provide people of working age with the education and training opportunities that they need to get jobs and raise their incomes."

3.3.3 The South African position before recent changes to the South African Unemployment Insurance Fund (UIF) rules was that individuals were allowed to resign, claim on the UIF and simultaneously spend their retirement fund withdrawal benefits – so making significant additional money available to them if they were previously liquidity constrained, and providing a perverse incentive to claim. UIF benefits are no longer available to those that resign, but claimants can still access their retirement fund withdrawal benefit while still receiving UIF benefits. This is a problem that ought to be addressed.

3.3.4 Retirement schemes cannot help cover youth unemployment that occurs before people have had the opportunity to become members. Stiglitz and Yun (2002) suggest that national schemes could be designed to allow people with little or no retirement savings to borrow against future contributions. The suggestion should perhaps be explored in the context of the funding of tertiary education and training, but is not taken further in this paper because of the moral hazards.

3.4 DIVORCE

3.4.1 Divorce frequently involves financial distress as a separate household has to be formed and run. A drop in consumption is almost inevitable. The causes of the other stresses that arise from divorce are controversial. Amato (2000) surveys the literature and characterises the debate as polemical:

> "Some scholars see the two-parent family as the fundamental institution of society—the setting in which adults achieve a sense of meaning, stability, and security and the setting in which children develop into healthy, competent, and productive citizens. According to this view, the spread of single-parent families contributes to many social problems, including poverty, crime, substance abuse, declining academic standards, and the erosion of neighbourhoods and communities.... In contrast, other scholars argue that adults find fulfilment, and children develop successfully, in a variety of family structures. According to this view, divorce, although temporarily stressful, represents a second chance for happiness for adults and an escape from a dysfunctional home environment for children."

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[14] From the summary of the "Employment Outlook and OECD Jobs Strategy" found at: http://www.oecd.org/document/31/0,2340,en_2649_34731_36899679_1_1_1_1,00.html

3.4.2 This rather balanced conclusion seems to stand in contrast to the findings of his survey, which overwhelmingly confirms the negative impact of divorce on living standards and all aspects of well-being of both parents and children, with women suffering the economic effects more. While the studies do not find that divorce is always a destructive experience, they do find that divorce, apart from any pre-existing characteristics, is itself a cause of misery.

3.4.3 More recent research confirms all of these findings. Sigle-Rushton (2005) examines the hypothesis that early fatherhood, like early motherhood, disrupts the lifecycle accumulation of human capital, and thus leads to ongoing financial disadvantage. Avellar and Smock (2005) look at co-habiting couples who break up their relationship and find, as with married couples, that the brunt of the loss of household economies of scale are born by the women, with the presence of children leading to a higher probability of descent into poverty.

3.4.4 Particularly relevant to South Africa are the clear results of Sampson and Groves (1989) that family breakdown is associated with crime. More specifically, but not as widely investigated, Comanor and Phillips (2002) show that the absence of the father is itself a major contributor to crime. Available data[15] show that 20% of South African children do not live with their natural mothers, while fewer than 50% live with their natural fathers.

3.4.5 It is thus important that retirement funds do not create perverse incentives and aggravate destructive behaviour, while on the other hand attempt to provide flexibility to ease the financial distresses of divorce.

3.5 RETIREMENT

Retirement itself can be stressful.

3.5.1 Reduced expenditure for some

Banks *et al* (1998) look at the consumption of UK households at retirement and try to explain a small decline. They conclude that at least some arises from negative information that becomes available at retirement, which they interpret to mean that many pensioners have saved insufficiently. This would tend to be confirmed by Hurst's (2003) results. Other possible reasons would be the loss of human capital arising from the act of retirement itself, or the reduction in prices arising from pensioner discounts. Hurd and Rohwedder (2006) in perhaps a more careful consideration, find that the decline in spending is volitional: more time is spent on inexpensive pleasures.

3.5.2 Difficult transitions

Larson and Pedersen (2005) look at a Danish sample of pathways to early retirement. They identify 3 major paths: direct; after a period of drawing unemployment or disability benefits; and other paths that incorporate a variety of transitions including a long period of unemployment without a benefit. In their

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15 1995 October Household Survey, reported in Case et al. p14

sample, more than one worker in five appears to have been driven to retirement by unemployment; even more appear to retire for health reasons. These difficult transitions are more likely to affect lower income people. Hayward *et al* (1989) find that better educated and paid people have lower rates of ill-health retirement and disability.

3.5.3 Other disadvantages

Even those who retire voluntarily appear to decline in health. Dave *et al* (2006) carefully analyse a rich US panel data set, and find evidence that reduced opportunities for socialising, and a lower requirement to exercise sufficiently, appear to cause lower levels of health. This appears to be true even for those who found retirement removed them from a stressful job.

4. BENEFIT DESIGN

This section discusses how retirement fund benefits can be adapted to meet the contingencies discussed in section 2. Stiglitz and Yun (2002) make the formal arguments for such integration and mention the Provident Funds of Singapore and Malaysia as exemplars. While these national funds[16] do provide a degree of integration, it is mainly administrative. They provide what large South African companies provide as employee benefits to Provident Fund members: a choice of partial insurance schemes and mainly lump sum benefits[17]. The more complete integration suggested in this section would offer greater benefits.

4.1 CROSS-SUBSIDIES IN A TYPICAL DB SCHEME

4.1.1 DB schemes typically included both risk and retirement benefits: widow's and orphan's benefits and early retirement on grounds of disability. The payment of a joint pension after retirement also offered more protection to divorced spouses and widows.

4.1.2 The reasons for the switch from DB to DC benefits were normally not related to risk benefits. Fore and Hammond (2005) list some of the reasons in the USA as: “higher worker mobility; the maturing of DB plans in older and highly competitive manufacturing sectors with few new entrants, workers’ desire to control their own saving and the high costs of DB plan management, along (in more recent times) with unexpectedly poor stock market performance and low interest rates.” They suggest that the main reason has been the “unintended consequence of the risk-management mechanisms adopted to reduce risk, correct agency problems, and address pension administrative concerns.”

4.1.3 Kerrigan (1991) describes the South African reasons. The trade unions were particularly supportive of the need for change because they obtained fairer

[16] See Asher M G (2000) *Social security reform imperatives: the southeast Asian case* http://www.outlookmoney.com/scripts/IIH021C1.asp?sectionid=6&categoryid=33&articleid=1610&NoCache=5%2F1%2F2006+2%3A05%3A15+PM

[17] See the Sanlam Survey (2006) for more detail.

withdrawal benefits, lump-sums on retirement, greater influence on investment policy and the power to elect trustees. The DC funds did away with the complicated cross-subsidies of DB, and the lump sums offered greater ease in avoiding the means test that, at that time, reduced the state pension by 100 percent of other income. Employers encouraged the shift to DC benefits. First, they were reluctant to permit newly elected trustees to make decisions that could lead to investment losses. Second, they were not averse to reducing the investment risks inherent in DB design, and toward the end of the 1980s, they saw that AIDS threatened a significant increase in the cost of risk benefits.

4.1.4 Many of these disadvantages can be addressed, but it is suggested that DB schemes will not again find favour because of the unfair cross-subsidies intrinsic to their design. Actuarially fair pension benefits are such that the present value of the contributions is equal to the present value of the benefits: every member gets what they deserve. Actuarial fairness can be determined *ex ante*: making reasonable assumptions about the future and locking people into predetermined benefit formulae, or *ex post*, using actual experience to determine benefits.

4.1.5 Pure DC funds are actuarially fair *ex post*. This is one of their main attractions. DB funds could be made fair *ex ante*, but they normally pay higher benefits to older entrants and the married, and often to those with children. Those where the benefit is based on final average salary give better benefits to those whose salaries increase the most in their last years of work. Skilled people are paid faster growing incomes than manual workers, and so the poor and unlucky subsidize the rich and lucky.

4.1.6 The cross-subsidies can be significant. Consider the effect of an increase in salary on the value of the expected pension. The effect grows larger as retirement approaches and is proportional to years of service. Ignoring survival factors, and assuming a real rate of interest of 2%, the effect will be more than twice as much for a 64 year old as a 24 year old. If the older person has 40 years of service and the other just one, the effect on the older person's pension will be almost 100 times greater.

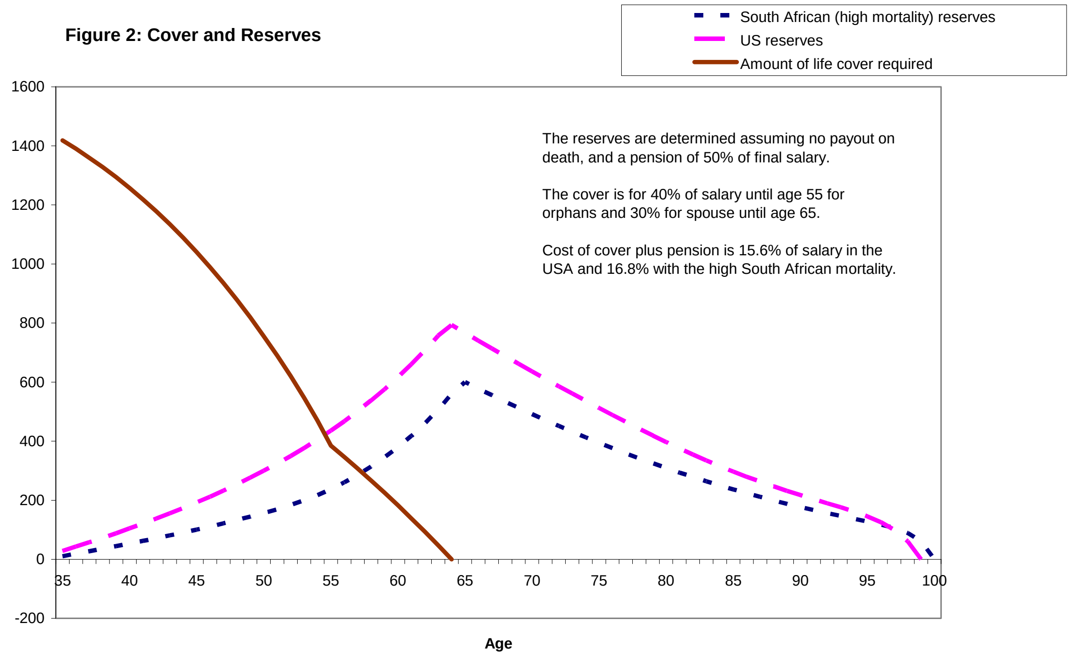
4.1.7 The problem arises because a lower than expected salary increase gives rise to a reduction in the value of the pension. The 64 year old with 40 years service may well have a pension worth ten times annual income. A salary increase 5% less than expected (not impossible in times of high inflation when the person is only a year from retirement) will mean that the pension declines in value by an amount equal to 50% of annual income. The reverse applies to those with increases higher than expected. Such dramatic side effects of small salary increase differentials are impossible to justify.

4.1.8 Career average DB designs do not suffer from this problem, and can be made fair if income is revalued to adjust for inflation. A revalued career average scheme is very similar to a DC fund with the crediting rate having the same effect as the rate of revaluation. The difference is that a career average scheme with a uniform rate of pension accrual requires increasing contributions with age[18]. There would not appear to be much to choose between such a DB fund and a DC fund with investment guarantees.

4.2 INTEGRATING DEATH BENEFITS BEFORE RETIREMENT

4.2.1 Thompson (1998; chapter 10) points out that the pension payable can be enhanced if the death benefit payable to survivors before retirement is limited to their real needs and does not include a return on contributions. The improvement is of some significance, depending on mortality rates. Allowing for no payment on death before retirement, the savings for 30 years of level contributions might vary from some 10% to 40% - the former based on US social security mortality[19] and the latter on Dorrington's (1989) estimate of black mortality in South Africa.

4.2.2 Figure 2 shows how a pension fund would accumulate and de-cumulate reserves for members experiencing these mortality rates. It also shows the life cover that might be required for a family with three children where there was also a need for a spouse's pension (40% of salary for the children and 30% for the spouse). While the cost of this cover would be 1.9% and 10.7% of salary respectively, the total cost of both retirement and mortality benefits is 15.6% and 16.8% - not greatly different for vastly different mortality rates.



4.2.3 The mortality difference between members of most retirement funds is likely to be much smaller than these extremes. A good case can be made for charging the same rate for this package of benefits on the grounds of equality, administrative simplicity and the elimination of underwriting. In contemporary South Africa, it

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18 An accrual rate of n% requires a contribution of n% $v^{65-x} a_{65}$ - perhaps with an adjustment for mortality. Discounting at a positive rate will mean that the contributions are increasing.

19 From www.ssa.gov/OACT/STATS/table4c6.html

would, in any event, be difficult to apply differentiation that disadvantaged any particular racial group.

4.2.4 In times before AIDS became a problem, being able to pass recruitment interviews would have been sufficient to qualify for life insurance cover. Given the recent improvement in AIDS treatments, it is quite possible that this position can be restored if the employer has a good record of ensuring treatment protocols are followed. If this is not possible in contemporary South Africa, one might be able to subsidise the cover of HIV positive members, or choose to exclude them from cover rather than to reduce or eliminate group insurance benefits for everyone.

4.2.5 The most obvious way of achieving this integration is to separately account to members for retirement and death benefits, with the former leading to a credit being added to the retirement account from the death release, and the latter leading to a charge. Members are already accustomed to the charge; the credit may well come as a pleasant surprise and will have the advantage of educating members about the benefits of annuitization. The credit will exceed the charge once the retirement account exceeds the death benefit. As can be seen from figure 2, the lines may cross some years before retirement.

4.3 INTEGRATING DISABILITY BENEFITS

Disability can be seen as analogous to retirement as both involve a withdrawal from the workforce. Indeed, the discussion of both retirement and disability above suggests that there are limited reasons for the state to provide encouragement for retirement of the able – except if it can be seen to reduce unemployment amongst the young. It is thus ironic that South African retirement funds are not permitted to provide for disability benefits. Allowing retirement funds to pay disability benefits would be administratively convenient, and allow for better integration of benefits. In the interim many employers offer group benefits through separate insurance schemes.

4.3.1 Offset with post-retirement mortality

4.3.1.1 Of particular importance is the offset - between disability and mortality impairment after retirement - that would be readily available to a largish retirement fund offering disability insurance and compulsory annuitization, but difficult and probably inappropriate for an individual.

4.3.1.2 The difficulty arises from the need to evaluate the degree of impairment before an impaired life annuity can be issued (by a fund or an insurer) where annuitization is not compulsory. In addition, even if the disabled member is unable to obtain an impaired life annuity, the providers of regular annuities will need to take anti-selection into account in the pricing of their annuities, which increases the price of annuities even further.

4.3.1.3 The likelihood that an impaired life annuity would be inappropriate arises from the wide variety of conditions that lead to disability and impaired mortality, as well as the fact that different rules will invariably be applied by different funds. A taskforce of the Institute of Actuaries of Australia[20] reported: “Analysis of total and permanent disablement statistics from an insurer indicates that two-thirds of those claiming total and permanent disablement benefits do not have a substantially reduced life expectancy.” On the other hand, it is clear that those taking early retirement can experience a significant reduction in life expectancy. The Continuous Mortality Investigation Reports[21] gives the additional mortality of UK life office early retirement pensioners in CMI 16. Table Pen1.2a provides a smooth additional mortality loading of some 30% under 70, 20% under 75 and 5% under 80. This produces annuity rates some 25% higher than normal – equivalent to an addition of 10 years at ages between 55 and 65, and more for younger ages.

4.3.1.4 These annuity enhancements would be significant relative to disability costs. Duggan *et al* (2005) calculate that the US decision in the early eighties to increase the age of full entitlement to an age pension from 65 to 67 will lead to an increase in disability claims equal to just 4% of the savings in pension payments.

4.3.2 Temporary disability

4.3.2.1 Disabling conditions can persist for some time without being obviously permanent. In many instances, there will be a possibility of recovery. For such cases and all disabilities at earlier ages, it is clear that people require insurance and retirement fund trustees should endeavour to ensure that they are offered as employee benefits outside the retirement fund – until it becomes possible to do so internally.

4.3.2.2 It is suggested that all disability cover should include provisions for rehabilitation benefits in addition to income replacement, and that the terms governing the payment of benefits should make the distinction suggested in section 3.2.2 above. Funds and insurers should be resolutely committed to restoring people to the workforce. Contracts should be drafted to that they allow for additional support for living expenses where necessary, and pay benefits to third parties if appropriate.

4.3.2.3 If regulation makes this difficult for a retirement or benefit (disability) fund, arrangements should be made with a medical aid to fill the gaps.

4.4 DEALING WITH DIVORCE

4.4.1 Divorced spouses and their children frequently have difficulty in accessing their fair share of retirement fund benefits. One obstacle is that the law on divorce[22] effectively includes only the withdrawal benefit from the retirement fund. Another is that lump sums paid on retirement are spent by the member on himself with the consequences of poverty for divorced spouses and widows recorded by Auerbach and Kotlikoff (1991).

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[20] http://www.actuaries.asn.au/IAA/upload/public/2006_0728_SuperTax_IAA_Sub5_Disability_final.pdf

[21] Published in the UK by the Institute and Faculty of Actuaries

[22] See discussion in the South African Law Commission discussion paper 77 at www.law.wits.ac.za/salc/discussn/dp77.wp

4.4.2 Ensuring that there are no financial incentives for one party to initiate divorce should clearly be an objective of law reform. In its absence, trustees of retirement funds should ensure that their funds do not contribute to such incentives. Given that men often have a financial incentive to initiate a divorce, this means that the benefits of wives and widows should be protected as much as is possible.

4.4.3 This could take two forms:

a) The payment of benefits as annuities that are likely to be shared with wives, or can be attached by Court orders if partners are separated.

b) Ensuring that lump sum payments are appropriately divided between spouses in terms of their marriage contractual arrangements. If, for instance, marriage is by South Africa's default accrual system, it would seem that lump sum benefits accruing during the marriage belong equally to both spouses – even if they are not separated. It seems that trustees not taking this into account when paying benefits may find themselves exposed to claims for negligence.

4.5 INTEGRATING UNEMPLOYMENT BENEFITS

The withdrawal benefits of retirement funds are available to fund periods of unemployment. This has the effect of reducing retirement funding, which at least in some cases, will lead to later retirement. Stiglitz and Yun (2002) show this is theoretically desirable, and Larson and Pedersen (2005) show that it appears to work well in Denmark where those who have not claimed from the unemployment fund are able to draw down the equivalent of a no claim bonus and go on early retirement. It is suggested however that retirement fund rules should withhold the withdrawal benefit until UIF benefits have been exhausted. It would also meet the need of unemployed members – and their spouses - if the withdrawal benefit was paid in monthly instalments until it is extinguished, or the member is re-employed. Such an arrangement might be made more palatable to members who fear unemployment if it were accompanied by an insurance benefit that extended the benefit paid by the UIF.

4.6 INAPPROPRIATE INSURANCE

4.6.1 Some of the insurance currently offered to South Africans resembles an unlucky dip. Benefits payable only because of accident are of particularly dubious value. If cover is required, then it is required regardless of the cause. The attraction of accidental benefits is that they apparently have a lower price, are easier to sell as no medical questions have to be asked, and they can be offered by short-term insurers as well as long-term assurers.

4.6.2 Disability contracts may also offer benefits on a fixed scale for loss of the use of various parts of the body. These bear no necessary relationship to the financial losses involved but may give the impression that they can replace disability insurance that offers more complete coverage.

4.6.3 The position is aggravated by legislated schemes that only provide cover for accidents. Workers' compensation regulations require employers to offer cover to employees injured while on duty. Accident cover is the cheapest way to do this. It is also offered by the Road Accident Fund (RAF) for death and disability if the driver can be shown to have caused the accident. Furthermore, the Assessment of Damages Act 1969 prevents the deduction of the victim's own life assurance benefits in assessing a claim for damages. This means that the victim who successfully claims may be over-insured. Disability benefits are likely to be reduced to ensure that members are not able to claim more than 75% of their income in benefits, but Nachemson's (1999) criticisms of workers' compensation arrangements mentioned in 3.2.4.2 above are likely to apply.

4.6.4 Also problematic are lump sum benefits, which are common but invariably inappropriate as disability cover.

a) The need for a monthly amount to pay expenses is the same as on retirement or bereavement. Disability, however, is likely to be more stressful, making it more difficult to manage a large lump sum especially if the condition involves intellectual dysfunction.

b) Lump sums are normally paid on total and permanent incapacity after a waiting period of at least six months. They cannot easily be adapted for temporary or partial disability. While they do fund costs of rehabilitation, the cover is at best belated.

c) If the amount of the lump sum is not reduced as the members' accumulated retirement savings increase, lump sum cover may also be excessive at ages close to retirement.

4.6.5 Trustees of retirement and benefit funds should obviously avoid inappropriate lump sum and accident covers. Given that statutory accident cover is likely to apply for some time, they could consider offering a benefit that was reduced in the case of the member receiving workers' or RAF compensation. While the amounts concerned may not appear significant, one by-product would be to make members conscious of their total need for cover. An alternative approach would be for the employer to offer full life cover and not merely accidental death cover as part of its workers' compensation obligations.

5 THE PROPOSED POLICY FRAMEWORK

These considerations provide the basis for the design of pension funds that meet people's needs. Legislation however requires greater justification than this. Justice, the traditional criterion for evaluating policy recommendations, can be evaluated by determining whether the legislation is intended, in a procedurally just manner, to maximise the realization of five sometimes conflicting objectives: equality, liberty, efficiency and recognition of people's just deserts, as well as provision for their basic needs. The proposals developed below consider each of these objectives. This section looks first at the compulsory membership of funds, the minimum benefits that should be provided with a brief consideration of consistent charging and governance requirements.

5.1 COMPULSION

On the question of compulsion *per se*, perhaps the most common argument is that people are myopic. While bolstered by Hurst's (2003) findings reported in 2.4.3

that many people actually want to be compelled to save, justice would require there to be a careful balancing of the advantages of compulsion against the resultant loss of liberty. One cannot argue that a section of the population is myopic without wondering whether it is the putative experts that have missed something. The discussions in section 2.6, 3.2 and 3.5 certainly suggest that it is disability benefits that are really required, and that experts might be requiring people to save too much for retirement.

5.1.1 Retirement funds as common goods

5.1.1.1 A more satisfying argument can be developed if the group or national provision of retirement and risk benefits is considered as a common or public good. Olson (1965) writes about the "anarchistic fallacy", which is the "illusion that mutually useful relationships will spontaneously evolve in a free society". Assuming self interest only, individuals will not contribute to public goods - where personal costs exceed benefits. Group members must be persuaded that there will be limited free riding (other individuals not paying their fair share).

5.1.1.2 Pension funds (with the other benefits recommended here) provide a common good at two levels. At a community level, if people who are able to provide financial security for themselves fail to do so, they become free riders and they or their families a burden on others. At a national level, the amount spent on social welfare for those who could have looked after themselves is not great. Tax concessions for retirement funds exceed any savings in social pensions, as shown, for instance, in Asher (2006b). The free riding would be more likely to be felt in local communities, where people may feel obliged to support their relations and friends that have fallen on hard times – or feel guilty if they do not. Such support is likely to be unsatisfactory if entirely *ad hoc*; while as soon as thought is given to an appropriate structure, it becomes clear (in terms of just deserts) that people should make their own contributions.

5.1.1.3 At the employer level, more efficient group schemes might not come into existence because of the likelihood that members will free ride on the efforts of the few that might set up the scheme. Once schemes were in existence, without compulsion, the prevarication of some members would constitute free riding in that it would require the additional costs to sell benefits to each individual. Rusconi (2004) shows that these can more than double the costs. These benefits extend to the reduced need for underwriting for active members, and the ability to support disability benefits for older members if they are required to annuitize their retirement benefits.

5.1.1.4 There is a further advantage in that better informed members of a group can protect the more naïve. Campbell (2006) describes various research which suggests that a large proportion of financial service consumers (buyers of housing finance in his examples) fail to make obviously advantageous decisions. In group schemes, sophisticated members of the group will act as buyers for all, while communal pressure or regulatory intervention can prevent exploitation of the weak or naïve.

5.1.1.5 It is true that members of group retirement funds have to surrender some of their power to make individual choices. It is therefore consistent with maximising people's freedom that retirement funds should limit the benefits offered to a minimum level likely to be needed by all (or at least the overwhelming majority) of members. Members with additional requirements can make voluntary provision for these. Trustees may however provide for optional additional benefits to be offered by the retirement fund.

5.1.2 Contributions

5.1.2.1 Accepting the advantages for those who can afford to contribute, it does not follow that compulsory membership should be extended to those in the informal sector for whom contributions cannot be collected efficiently. Asher (2006a) argues that this represents an unwarranted interference and an inefficient tax on people struggling to make a living in this way. The current state pension provides an adequate base for retirement, and would be even more suitable if the means test was abolished as suggested in Asher (2006b).

5.1.2.3 It also does not follow that significant savings contributions are necessary early in the lifecycle. It can be seen from figure 1 in section 2.4 above that retirement saving should often not begin until the age of 40 or later. Before that time, people are better off repaying the mortgage on their homes. The costs of borrowing on a home loan and simultaneously investing through a retirement fund are significant. The margin of home loan rates over matching fixed interest investments are invariably more than 3% per annum in South Africa, to which must be added marginal retirement fund charges and the 9% tax on retirement fund income. If individuals invest in shares, the costs are balanced by the equity premium, but one would have to take an optimistic view of the latter to produce a positive expected benefit. Members are therefore unlikely to gain, except exposure to unnecessary risk.

5.1.2.4 This is the reason that the Taylor Committee recommended compulsion, but that those under 40 be permitted to redirect the contributions into repaying their home loans. Forty is probably too early for compulsory contributions, especially for those who have their children late or are re-establishing their household assets after a divorce. A provocative alternative would be to suggest 60 as the age after which compulsion would apply. Most people are capable of working until 70 and the annuity rate for a man of 70 is about 10 times the annual annuity. This means that a single male could live on 50% of his income for the rest of his life, if he contributed 50% for ten years from age 60. From the calculations in 4.3.1, this could probably include disability insurance if he were pre-committed to annuitization.

5.1.2.5 Compulsory contributions with possible withdrawals for the purchase of a first house (for both the first and subsequent families) and for periods of unemployment appear reasonable compromises. Both are currently permitted by the Pension Funds Act 1953.

5.1.3 Insurance cover

The Committee also recommended compulsory orphans' and disability cover. The arguments have been made above: those who do not pay for cover will leave orphans that are provided for by others – or themselves be provided with disability benefits. There is a greatly reduced need for underwriting, so allowing more people to obtain necessary cover at cheaper prices. Supporting the hypothesis that more sophisticated members protect the more naïve, members of group schemes would also appear to get less of the inappropriate lucky dip cover described in section 4.6 above than individual policyholders. In South Africa, they are more likely to have inflation protected pensions. It can be noted that there is already compulsory cover for work and some road accidents.

5.1.4 Annuitization

5.1.4.1 The Committee recommended that all retirement funds offer pensions on retirement, but did not recommend whether these should be compulsory or be a default option allowing for commutation.

5.1.4.2 If some people are myopic before retirement, Broe's (2005) findings about intellectual impairments increasing with age, suggest it is much more likely after retirement. This makes it surprising that when it comes to compulsory annuitization and compulsory contributions, most people appear to be persuaded of the need for the latter, but not of the former. One reason is the disincentive of the means test, but this does not apply to all. The papers in Fornero and Luciano (2004) suggest a number of reasons for the unpopularity of annuities: poor value of money, bequest motives, underestimation of life expectancy, crowding out by compulsory annuitization of state benefits, or that a sufficient level of wealth or family support makes longevity insurance unnecessary. Suggested by the sociological arguments of section 2.6 are the interests that have allowed lump sums to be spent by older men, who leave their ex-wives and widows in relative poverty. This latter suggestion also provides a possible explanation for the otherwise inexplicable tax advantages enjoyed by lump sums over annuities.

5.1.4.3 Weighing heavily in favour of some compulsion is the arguments made in 4.3.1 about funding ill-health retirement benefits by pre-commitment to annuitization. Another is the likelihood that people over 85 at least need assistance in managing their finances and that annuities provide the necessary budgeting and administrative services. The iterative argument is that because people cannot know whether they will become incapable of managing their finances next year, they should make provision at all times. If people should be compelled early in life to save for when they cannot look after themselves, and prevented late in life from withdrawing savings for similar reasons, permitting the proceeds to be spent between retirement and senescence appears to defeat both purposes.

5.1.5 Occupational or national arrangements?

5.1.5.1 Choice of retirement fund therefore undermines the protection offered by sophisticated buyers, economies of scale, universal insurance cover and annuitization. The fact that compulsory fund membership is almost universal suggests that the benefits from efficiency, extended coverage of needs and a closer match to people's desert are generally seen to outweigh the restrictions on people's freedom. This does not address the question of whether membership should be of a mandatory national scheme or the occupationally based schemes that cover most of the formally employed in South Africa.

5.1.5.2 The possible benefits of a national scheme would be for greater efficiencies, and greater equality in charging for risk benefits - as the well off could subsidise poorer members. There is no doubt that economies of scale are possible; Rusconi suggesting that larger funds can achieve cost savings of 50%. His statistics however suggest that there will be few further economies to be gained from funds over R1 billion in assets and perhaps over 1,000 members. The Taylor Committee suggested that ways should be found of rationalising small retirement funds to gain these advantages.

5.1.5.3 The calculations in section 4.2 suggest that over a lifetime, the difference in contribution between those with the lowest and those with the highest mortality would be some 2% of salary. The maximum redistributive impact would therefore be of the same order as a 1% increase in the top marginal rate of tax. This seems insignificant. Although this will be higher with AIDS, the potential for proper treatment suggests that this is a temporary feature around which it would be inappropriate to redesign a retirement system.

5.1.5.4 A national scheme can also offer investment guarantees. Investment risks and funding issues are not considered in this paper. They are however considered in Asher (2006c), where it is argued the state resources ought not be spent on guaranteeing the investments of the wealthier.

5.1.5.5 Employment based group schemes therefore appear to achieve almost all the advantages of a national scheme, but allow for greater freedom, more democratic control and may well foster efficiency and innovation through competition of service providers. State run schemes are also more subject to political pressures to create excessive benefits for some classes of members. If these advantages are not already captured by the concept of subsidiarity, it would seem an appropriate principle to apply to this question: government should be as close as practical to the people governed.

5.2 MINIMUM BENEFITS

This section sets out the minimum benefits that it appears would be required by almost all members. The pensions should, obviously, all be subject to mechanisms that would be expected to provide compensation for inflation.

5.2.1 Contributions

Contributions, whether expressed as employers or employees, should be at least sufficient to cover insurance benefits and administration costs and leave at least 7% for retirement savings. The minimum contribution rate is clearly debatable. This suggestion is based on what would be required for a pension of 50% of average earnings for a single male at 65, who contributes for 30 years and earns an average of 2.5% of income. The amount in the savings account should be available until the age of 45 to repay a loan on the member's house. Contributions should be payable to normal retirement age, which should not be less than 65.

5.2.2 Insurance benefits

5.2.1.1 The fund should provide pensions to orphans on death. Orphan's pensions should be at least 15% of taxable income each, with a maximum per family of at least 40%, payable until 18, or 23 if the beneficiary is in full time study, or life if the beneficiary is severely physically or intellectually disabled.

5.2.1.2 Spouses' pensions should be optional, but if they are offered they should be payable until normal retirement age, which should be defined as the current age for access to the state pension.

5.2.1.3 The funds should also provide disability pensions of at least 50% of income plus normal contributions to the pension fund. Cover should continue until normal retirement age. The cover should include income replacement and the costs of rehabilitation and permit partial benefits. The benefit should be payable until retirement. It should be permissible to reduce the cover for non-specific back injuries and untreatable depression, and to pay benefits to a third party if this appears to be in the interests of the member.

5.2.3 Unemployment

5.2.3.1 Members losing their jobs (for whatever reason) should be entitled to withdraw the savings element of their pension, subject to the following limitations:

- No money should be paid while the member is entitled to UIF benefits.
- All benefits should be paid as regular pensions unless a court determines that part of the pension should be made available as a lump sum in order to settle a debt or other obligation. Some part of the pension should be protected against debts unless the debt was incurred fraudulently. The regular payment should be no greater than the maximum monthly disability benefit.
- Provision should be made for divorced and estranged spouses to have part of the benefit transferred to their pension fund.
- Once re-employed, any remaining retirement account should be transferred to the fund of the new employer.

5.2.3.2 The fund should be permitted to take out unemployment insurance so that members do not draw down in their savings accounts.

5.2.4 Retirement

5.2.4.1 Early retirement should be covered by disability insurance if it is caused by ill-health or by the unemployment rules otherwise.

5.2.4.2 A lump sum commutation of part of the annuity could be permitted at retirement age. The simplest approach to this would be to retain the current limitation of 33%.

5.2.4.3 The balance of the benefits should be paid out in a lifetime annuity with a spouse's reversion of at least 50%. If no residual benefit is permitted, there is no need for a minimum withdrawal level. A maximum withdrawal limit could be set with reference to an appropriate joint annuity.

5.2.4.4 Trustees should be required to ensure that divorced and estranged spouses receive their fair share of both lump sums and annuities.

5.2.5 Discontinuities

5.2.5.1 This structure would not necessarily prevent financial distress, and might have to be supplemented by additional insurance or savings for any of the following.

- Insurance cover for orphans and spouses.
- Disability income.
- A shortfall in the retirement benefit when compared with the family's current standard of living whether funded by earnings or a disability or survivors' pensions.

5.2.5.2 Funds should provide members with appropriate inflation adjusted projections at normal retirement date to alert them to any further needs for savings. They might give their members the opportunity to pre-commit to a particular target at normal retirement date, and annually calculate the contributions necessary to meet it. This would be in the spirit of the observation by Mitchell and Utkus (2004) that people are found to be more ready to commit themselves to future savings.

5.3 CHARGING AND RESERVES

5.3.1 This benefit set would allow for cross-subsidies between members. The question arises as to the extent that they should be disclosed or prevented.

5.3.2 An important governance principle to apply would be that the fund should not build up reserves that are not allocated to particular individuals. Such reserves necessarily involve opaque cross-subsidies and usually depend on the discretion of the trustees, which creates uncertainty and the potential for conflicting interests and duties.

5.3.3 Because of the significant differences between people of different ages, it would be desirable for mortality and disability rates to be age dependent. Flat rates would mean that the costs of different funds would differ dramatically because of different age profiles – especially if the equality extended to pensioners, whose higher mortality releases would contribute significantly to reduced active life costs.

5.3.4 It does not seem necessary for any other distinctions to be made. Of the numerous possible categorizations, sex, income, habits (principally smoking and drinking), marital and health status are possibilities. To the extent that they are made, there will be cross-subsidies from those subject to lower mortality for insurance benefits and in the opposite direction when allocating annuitization releases. As illustrated in section 4.3.1, the impact over a lifetime is not that significant and may differ for different groups. Particularly sensitive cross-subsidies may arise if single people are required to pay for spouse's pensions and those without dependent children for orphans' benefits.

5.3.5 In order to avoid any legal uncertainty debate about potential discrimination, legislation should make it clear what types are acceptable and what not.

5.3.6 Simplest administratively would be to permit no discrimination other than for age for the compulsory package of benefits. This is also defensible in that it treats all members of the same age equally, and is likely to provide some subsidies to the less well off.

5.4 GOVERNANCE

5.4.1 There are a number of possible approaches to ensuring compulsory membership. South Africa is unique in choosing an approach that requires membership of funds to be compulsory to all employees of a single employer if the tax advantages are to be available. This, together with tripartite agreements covering a number of industries, would appear to have proved successful in obtaining a high coverage of the formally employed without legal enforcement. It has the particular advantage of not harassing smaller employers and the informally employed for which membership would appear to be a burden. The Taylor Committee's recommendation was that compulsory membership should be enforced by the same bodies as currently enforce workers' compensation insurance.

5.4.2 Another governance question relates to representation of members and the level of expertise of the governing bodies. There are some, such as Myners (2001) who suggests that funds should have some professionally trained members of their governing body. This has apparent advantages, but clearly weakens the position of the lay trustees in board meetings. If trustees want independent advice, they would be advised to contract for it rather than to surrender some of their powers. The Taylor Committee recommended that lay trustees continue to control South African retirement funds, as reflected its preference for democratic rather than technocratic governance.

6 CONCLUSION

6.1 Retirement funds, in South Africa, are the pivotal institution for the management of the middle class financial lifecycle and its attached risks: death, disability, dismissal and divorce. DC funds do not integrate these benefits in a way that DB funds were able, but there is no going back to the opaque cross-subsidies of DB funds.

6.2 This paper recommends that funds be based on a DC accumulation accounts but required to offer a minimum package of pension benefits including enhanced disability benefits. Recent research confirms that a more aggressive approach to rehabilitation and return to work can be justified – particularly in the case of backache and depression. Legislation should require compulsory:

- contributions, but only if withdrawal from the account is permitted for housing and unemployment;
- preservation except for unemployment, when monthly benefit payments should be permitted;

- annuitization of at least a portion of the proceeds at retirement;
- orphans' pensions;
- disability benefits.

6.4 Policy reform is also required in a number of areas that create over-insurance, which is both a waste and a moral hazard. There is the need to facilitate the match between life cover offered by retirement funds and that demanded by banks and other money lenders so that people are not required to over-insure themselves. The accident cover offered by workers' compensation arrangements and the Road Accident Fund is often over-insurance and should be abolished; people need cover for death and disability regardless of its cause. Funeral insurance for family members should also be discouraged in order to limit over-insurance that creates perverse incentives.

6.5 Reform should also facilitate life and disability cover being paid monthly: tax considerations discourage the former, restrictions on the benefits that can be paid by retirement funds the latter.

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APPENDIX

FOR FIGURE 1A: CHILDREN BORN IN TWENTIES

	Income				Expenses	Savings
23	50000	50000	0	0	50000	0
24	60000	60000	0	0	57000	3000
25	72000	72000	0	0	68400	6600
26	86400	86400	0	0	82080	10920
27	95040	66528	2500	0	61776	15672
28	104544	73181	2500	0	67954	20899
29	114998	80499	5000	0	74749	26649
30	118448	82914	6000	0	82914	26649
31	122002	85401	7000	37500	85401	26649
32	125662	125662	7000	36408	125662	26649
33	129432	129432	7000	35347	129432	26649
34	133315	133315	7000	34318	126649	33315
35	137314	137314	7000	33318	137314	33315
36	138687	138687	7000	32348	138687	33315
37	140074	140074	7000	31406	140074	33315
38	141475	141475	7000	30491	141475	33315
39	142890	142890	7000	29603	142890	33315
40	144319	144319	10000	28741	144319	33315
41	145762	145762	10000	27904	145762	33315
42	147219	147219	10000	27091	147219	33315
43	148691	148691	10000	26302	147171	34835
44	150178	150178	10000	25536	146554	38460
45	151680	151680	10000	24792	145960	44181
46	153197	153197	10000	24070	145390	51988
47	154729	154729	5000	23369	139842	66875
48	156276	156276	5000	22688	139316	83836
49	157839	157839	0	22027	133811	107864
50	159417	159417	0	21386	133327	133954
51	159417	159417	0	0	111942	181429
52	159417	159417	0	0	111942	228905
53	159417	159417	0	0	111942	276381
54	159417	159417	0	0	111942	323856
55	159417	159417		0	111942	371332
56	157823	157823		0	111782	417373
57	156245	156245		0	111625	461993
58	154683	154683		0	111468	505208
59	153136	153136		0	111314	547030
60	151604	151604		0	111160	587474
61	147056	147056		0	110706	623824
62	142645	142645		0	110264	656205
63	138365	138365		0	109837	684733
64	134214	134214		0	109421	709526
65	130188	130188		0	109019	730695

FOR FIGURE 1B: CHILDREN BORN IN THIRTIES

	Income				Expenses	Savings
23	50000	50000	0	0	50000	0
24	60000	60000	0	0	57000	3000
25	72000	72000	0	0	68400	6600
26	86400	86400	0	0	82080	10920
27	95040	95040	0	0	90288	15672
28	104544	104544	0	0	99317	20899
29	114998	114998	0	0	101750	34148
30	118448	118448	0	0	107845	44751
31	122002	122002	0	0	108200	58553
32	125662	125662	0	0	108566	75648
33	129432	129432	0	0	108943	96137
34	133315	133315	0	0	109331	120120
35	137314	137314	0	0	109731	147703
36	138687	97081	2500	0	97081	147703
37	140074	98052	2500	0	98052	147703
38	141475	99032	5000	37500	99032	147703
39	142890	100023	6000	36408	100023	147703
40	144319	101023	7000	35347	101023	147703
41	145762	145762	7000	34318	145762	147703
42	147219	147219	7000	33318	147219	147703
43	148691	148691	7000	32348	148691	147703
44	150178	150178	7000	31406	149424	148458
45	151680	151680	7000	30491	148659	151479
46	153197	153197	7000	29603	147923	156754
47	154729	154729	7000	28741	147214	164269
48	156276	156276	7000	27904	146531	174014
49	157839	157839	10000	27091	148875	182978
50	159417	159417	10000	26302	148243	194152
51	159417	159417	10000	25536	147477	206092
52	159417	159417	10000	24792	146734	218776
53	159417	159417	10000	24070	146012	232182
54	159417	159417	10000	23369	145311	246289
55	159417	159417	10000	22688	144630	261076
56	157823	157823	5000	22027	138810	280090
57	156245	156245	5000	21386	138010	298325
58	154683	154683	0	0	111468	341539
59	153136	153136	0	0	111314	383361
60	151604	151604	0	0	111160	423805
61	147056	147056	0	0	110706	460156
62	142645	142645	0	0	110264	492536
63	138365	138365	0	0	109837	521065
64	134214	134214		0	109421	545857
65	130188	130188		0	109019	567026