



ARC Centre of Excellence in Population Ageing Research

Working Paper 2016/02

Retirement Income Adequacy: Concepts and Measurement

Rafal Chomik¹ and John Piggott²

¹Rafal Chomik is a senior Research Fellow at the ARC Centre of Excellence in Population Ageing Research, UNSW Business School, UNSW Australia. Email: r.chomik@unsw.edu.au

²Professor John Piggott is Director of the ARC Centre of Excellence in Population Ageing Research, UNSW Business School, UNSW Australia. Email: j.piggott@unsw.edu.au

This paper has been prepared for the CSRI Roundtable, April 2016. It can be downloaded without charge from the ARC Centre of Excellence in Population Ageing Research Working Paper Series available at www.cepar.edu.au

Retirement Income Adequacy: Concepts and Measurement

Abstract

This paper offers a discussion of adequacy of retirement benefits. We have the Australian context in mind, but introduce extensive international comparisons to provide perspective. We cover possible benchmarks against which to set benefits, how these might change depending on household structure, the actual levels at which different countries set basic and minimum pension levels, related taxation policy, and the policies and rationale for benefit indexation. We focus primarily on adequacy in the context of poverty alleviation, but also investigate the idea of defining the adequacy of income replacement. This includes a discussion of design features that increase the likelihood that the retirement system will provide adequate income replacement and the measures that can guide our assessment of the outcomes.

Key words: Population Ageing; Social Policy; Pensions

JEL codes: D63, I38, J1

RETIREMENT INCOME ADEQUACY: CONCEPTS AND MEASUREMENT

Introduction

This paper offers a discussion of adequacy of retirement benefits. We have the Australian context in mind, but introduce extensive international comparisons to provide perspective. We cover possible benchmarks against which to set benefits, how these might change depending on household structure, the actual levels at which different countries set basic and minimum pension levels, related taxation policy, and the policies and the rationale for benefit indexation. We focus primarily on adequacy in the context of poverty alleviation. This focus is consistent with the Australian approach to social policy generally, which focuses on needs rather than rights. It is also consistent with the use of the term in the literature more generally, in which ‘adequacy’ is thought of in the context of poverty alleviation (including for example in the OECD’s regular publication, *Pensions at a Glance*). Given the interest in Australia’s superannuation structure and its possible reform, however, we also offer a brief discussion on what might be thought of as adequate income replacement.

At the outset it is worth emphasising that where retirement income is provided or subsidised by the public sector, the level of benefit will be dictated by the budget available for the given pension programme. There is an obvious trade-off between adequacy and affordability: higher levels of public pension will cost more. This is especially important in the context of an ageing demographic, because promises made today will likely affect the labour and saving behaviour of working cohorts, and thus need to be sustainable for the future. Having made this important point, the paper does not further address the affordability side of the equation.

The paper has three broad parts. Part I makes up the bulk of the paper and covers adequacy with respect to poverty alleviation. We begin with a discussion of poverty benchmarks. We examine this first for a single individual, and then discuss the impact of household composition. Indexation is then discussed. Part II briefly discusses adequacy with respect to income replacement. Part III includes short sections focused more specifically on the Australian context, offering comments and conclusions on adequate poverty alleviation and adequate income replacement.

PART I: ADEQUACY WITH RESPECT TO POVERTY ALLEVIATION

1.1 Defining poverty benchmarks

Poverty is a subjective concept. It relates to the notion that someone has inadequate resources to meet their basic needs. Such needs can be determined relative to prevailing community attitudes and standards. So it is these agreed standards that can then be translated to a poverty line, which in turn allows poverty measurement by looking at the number or proportion of people or households that fall below that line, and by how much (i.e., the depth of poverty or ‘poverty gap’).

A common approach to measuring basic need, and thereby to measuring poverty, in developing countries is based on the level of adequate nutrition, possibly in reference to what is consumed by people considered poor in a given region; plus cost of other essentials such as clothing and shelter (often estimated as a proportion on top of the food basket), also with reference to consumption levels of people considered poor in a given region. It is the basis of the \$1-2 a day poverty line.

Rarely is such an absolute measure used in developed countries. In the United States, the cost of basic needs for different types of households was established in the 1960s and has been inflated with prices ever since. Inflating the line only by price is a form of absolute poverty measurement. It allows one to track the evolution of poverty over time, and is also useful when evaluating the effects of policies and programs on the incidence of poverty. In general terms, the absolute poverty line is consistent with the 'subsistence level'.

In most developed countries, the concept of poverty has been extended to include: (1) popular subjective judgments of what is the adequate basket of goods and services; (2) relative measures that change with community living standards; and (3) broadening the measure of standards of living away from purely financial measures.

Minimum Budget Standards are a relative poverty measure and represent a way to capture prevailing attitudes to poverty. These can be produced by regularly surveying the population for their views on what items constitute a socially acceptable basic quality of life and then costing the resulting basket. These may be developed for different types of households, including those consisting of the elderly (Hartfree et al., 2013). In Australia, the Association of Superannuation Funds of Australia uses this method to determine a 'modest' and 'comfortable' level of income for retired single and couple households (ASFA 2015). The modest level approximately corresponds to the level of the Australian Age Pension (including supplements).

A relative poverty line can be drawn by taking a proportion of the national median income or of the minimum wage. The regular review of the basket or the use of the contemporary median reflects the evolution of social consensus about what constitutes poverty. The absolute and relative poverty concepts can be combined: an absolute poverty line can be established by taking a relative measure at a point in time, and then indexing it to prices over time.

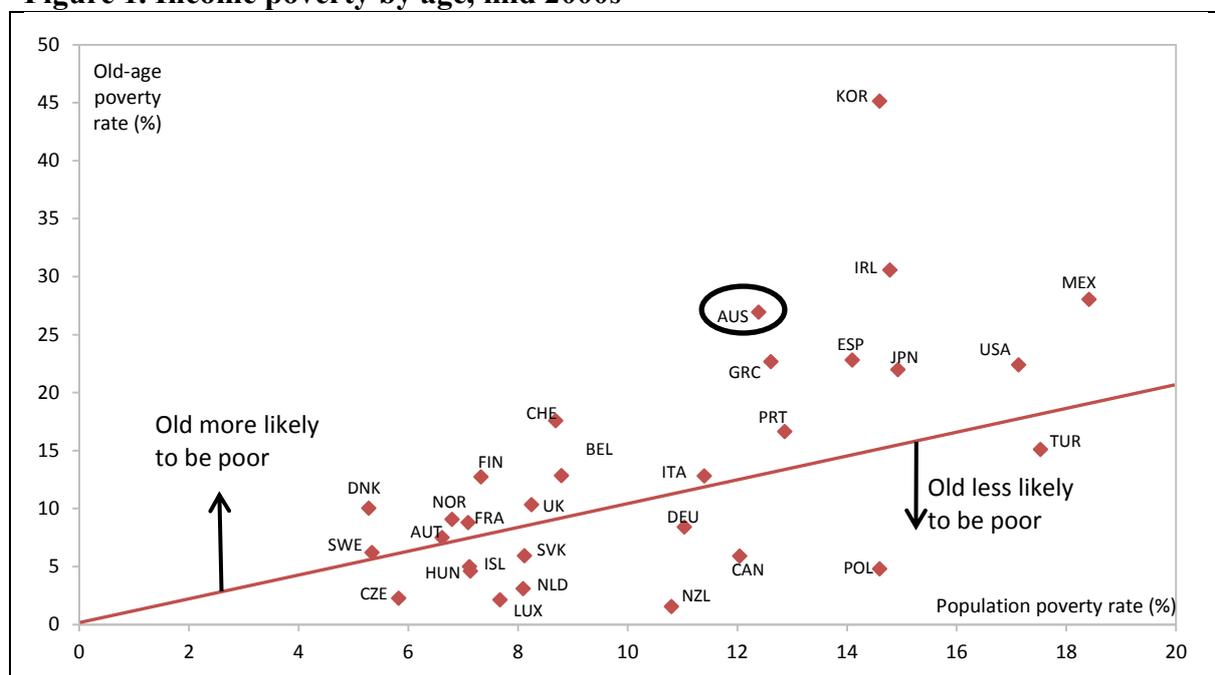
The unit of measurement is often income, which is a proxy for standards of living achieved by different groups. However, there are many other factors that can affect living standards, such as wealth, physical health, actual level of consumption, and public services. For example, a low-income household with above-average wealth may be better off than a medium-income household with no wealth.

For this reason, many countries consider consumption levels, which may also include the consumption of services. For example, France has made a concerted effort to measure the standard of living by including consumption, capital, and different dimensions of material living standards, including political engagement, following the Report of the Stiglitz Commission (Stiglitz et al., 2009; this report was also the motivation for the OECD's 'Better Life Index').

In various European countries, material deprivation indices have been developed to gauge the less tangible effects of poverty. Until recent reforms, the UK government used four key measures of

poverty which take account of income in relative and absolute poverty comparisons, non-income forms of poverty, and persistence of poverty. The official measures consisted of: (1) relative low income: proportion of pensioners living in households where income is less than 60 percent of median household income after housing costs; (2) absolute low income: proportion of pensioners living in households where income is less than 60 percent of median household income after housing costs in the base year adjusted for prices (base year was previously 1997, recently changed to 2010); (3) low income and material deprivation: proportion of pensioners who experience material deprivation (measured as the absence of access to social activities and goods and services) *and* live in households where income is less than 70 percent of median household income after housing costs; and (4) Persistent poverty - proportion of pensioners living in households where income is less than 60 percent of median household income after housing costs in at least 3 out of the previous 4 years.

Figure 1. Income poverty by age, mid 2000s



Source: OECD (2011)

Benefit levels in the UK may be influenced by, but are not directly set according to, poverty lines or material deprivation outcomes. In fact, many countries do not target poverty explicitly by way of benefit transfers. At the European level, the Europe 2020 strategy aims to reduce the total level of poverty or social exclusion through the Open Method of Coordination – a form of peer review, where actual targets and strategies are set at member level. The measures that are used to define poverty and social exclusion consist of living in households with (1) low work intensity (less than 20 percent of potential, taking account of age and disability); (2) before housing cost income below 60 percent of member country median; or (3) material deprivation (measured by lack of access to a set of social activities, or goods and services). To construct and monitor these measures, the EU uses a detailed annual household survey known as EU-SILC that also includes a longitudinal component.

For international comparisons, the OECD treats poverty as a ‘relative concept’, defining the poverty line as 50 percent of contemporary country median equivalised household disposable income (Figure 1). Such an analysis is helpful in gauging whether some countries’ pension benefit packages are adequate. If the elderly are not more disadvantaged than other segments of the population, it may be that general social assistance may be a more appropriate use of limited government transfers unless programs already exist for other groups.

1.2 Household composition and benefit level

In setting income and poverty benchmarks, it is important to consider how income is shared between individuals in a household and to what extent the incomes of households with different structures can be compared. When measuring levels of poverty and the standard of living, it is standard practice to ‘equivalise’ household income. This is based on the idea that individuals gain from economies of scale in sharing household costs. A family of four may require more money than a family of one, but not four times as much.

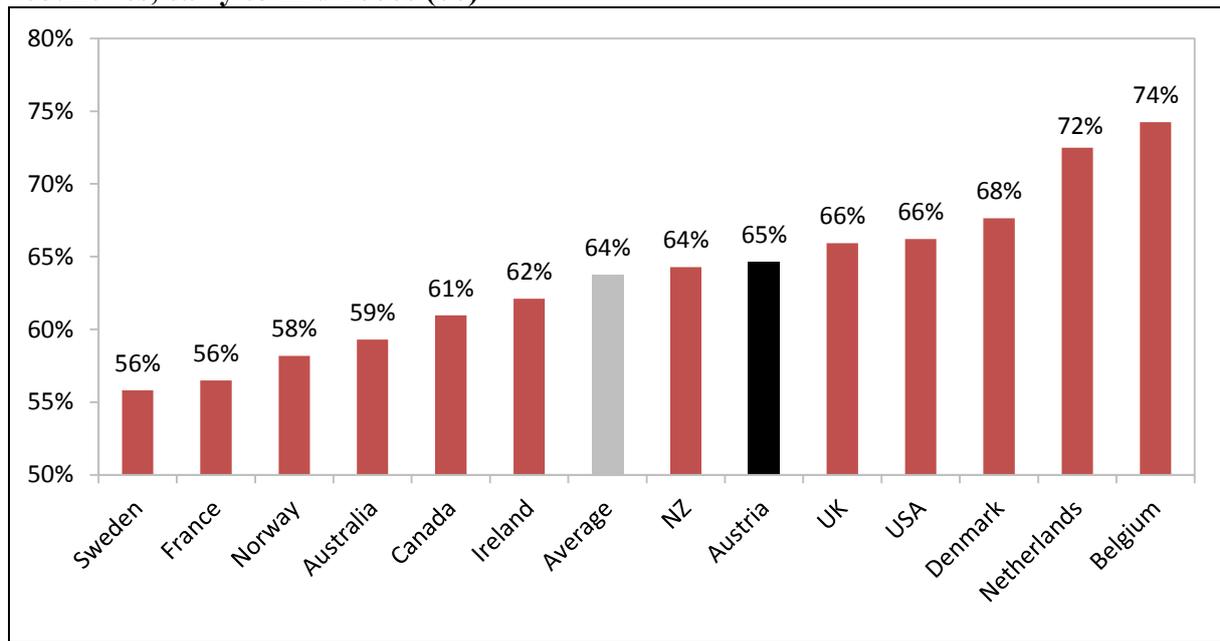
Different equivalence scales are employed in different countries. The OECD uses the square root of household size as its equivalence elasticity, which implies that the needs of a household composed of four people are twice as great as those of a single person (1.4 and 1.7 times those of a single person in the case of a childless couple and of a couple with one child). That selection involves assumptions about the economies of scale available to different households.

The choice of equivalence scale can dramatically alter the measure of poverty. For example, Lanjouw et al. (1998), looking at data from seven countries in Eastern Europe and the former Soviet Union, found that a change in equivalence rules can reverse the average poverty ranking of households with elderly adults versus households with two or more children. It suggests that even though there is no one correct answer to the specification of equivalence scales, it is necessary to take economies of scale within households into account in assessing poverty.

Pension benefit levels are often set based on the concept that couples can share costs – a pensioner couple does not always receive double the level of a single pensioner. There are several approaches to determine the relativity between couple and single benefit levels. A policymaker could consider the statistical relationship between spending on necessities, the level of income, and household composition to define how these factors relate to each other for different households. An alternative approach might be to match households on the basis of outcome (e.g. financial stress). That method would involve finding the ratio of incomes for different households with the same level of outcome.

In the OECD, all countries except Austria, Germany, Italy, Luxembourg, Spain, and Turkey provide pensions with higher overall gross replacement rates for one-earner couples compared to a single earner (OECD, 2011). Much of this is to do with benefit levels within basic pension schemes. Figure 2 presents this relativity for non-contributory payments for selected OECD countries where data was available. On average, a single pensioner receives approximately 64 percent of the benefit received by pensioners living in a couple. Outside of the OECD, it is more unusual to have different amounts for couples and singles.

Figure 2. Payment to single pensioner relative to combined couple, selected OECD countries, early to mid 2000s (%)



Source: Harmer (2009). Note: Relates mostly to social assistance payments to elderly; Data is prior to change in relativity in Australia that increased the rate of pension for single pensioners.

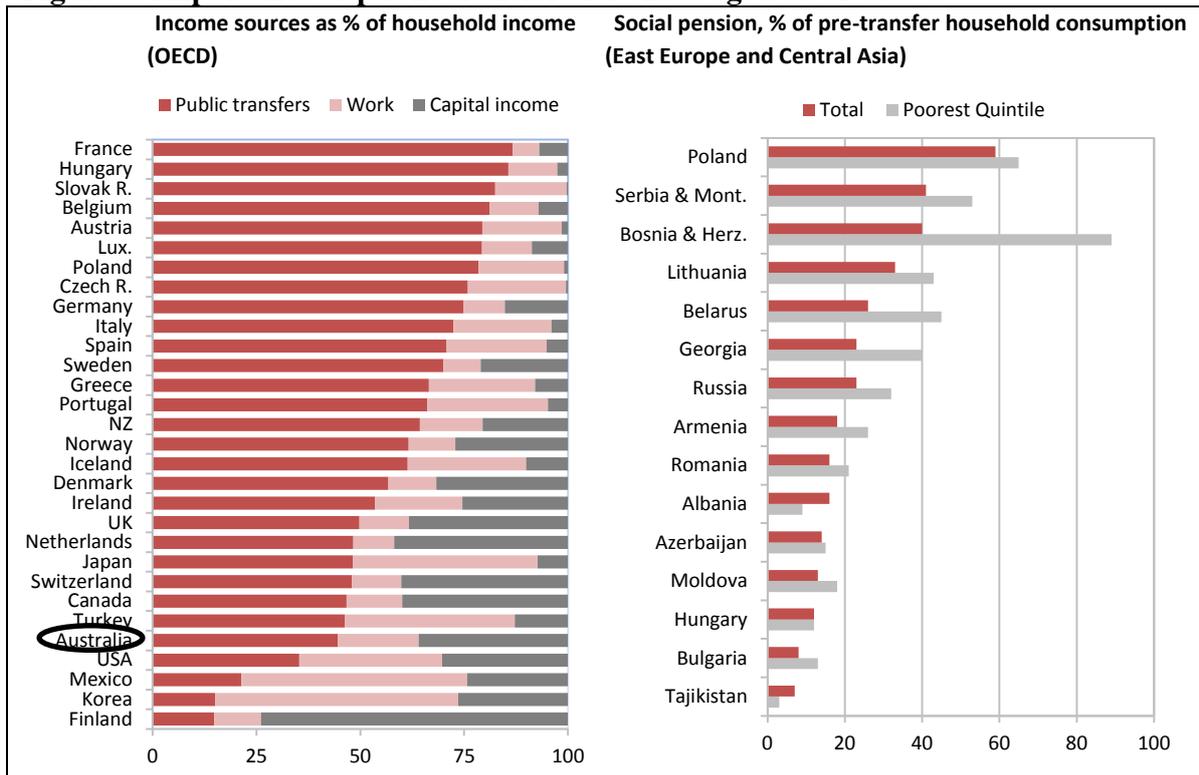
1.3 Relationship between poverty and benefit level

So what are the implications for the benefit level and pension systems overall? Any diagnostic of vulnerability and poverty levels of the elderly population should include the overall resources at their disposal. In some countries the elderly can rely on a well-developed private pension system or on labour market earnings, either by way of working longer or cohabitation with younger workers, and as a result social pensions and other transfers make up only a proportion of income and pre-transfer consumption (see Figure 3).

In setting benefit levels, policy makers should be mindful of not setting benefit levels too low, so that they have little impact on poverty, or too high and adversely affecting incentives. Higher benefits in the non-contributory pension may reduce incentives to participate in the contributory system. For example, SSA (2013) reports that in 2011, the contributory minimum pension in Uruguay, available at age 65, was worth a monthly 3,400 pesos, while the means-tested non-contributory pension available at 70, was much higher, at nearly 4,800 pesos – a situation that does not encourage high levels of contributions.

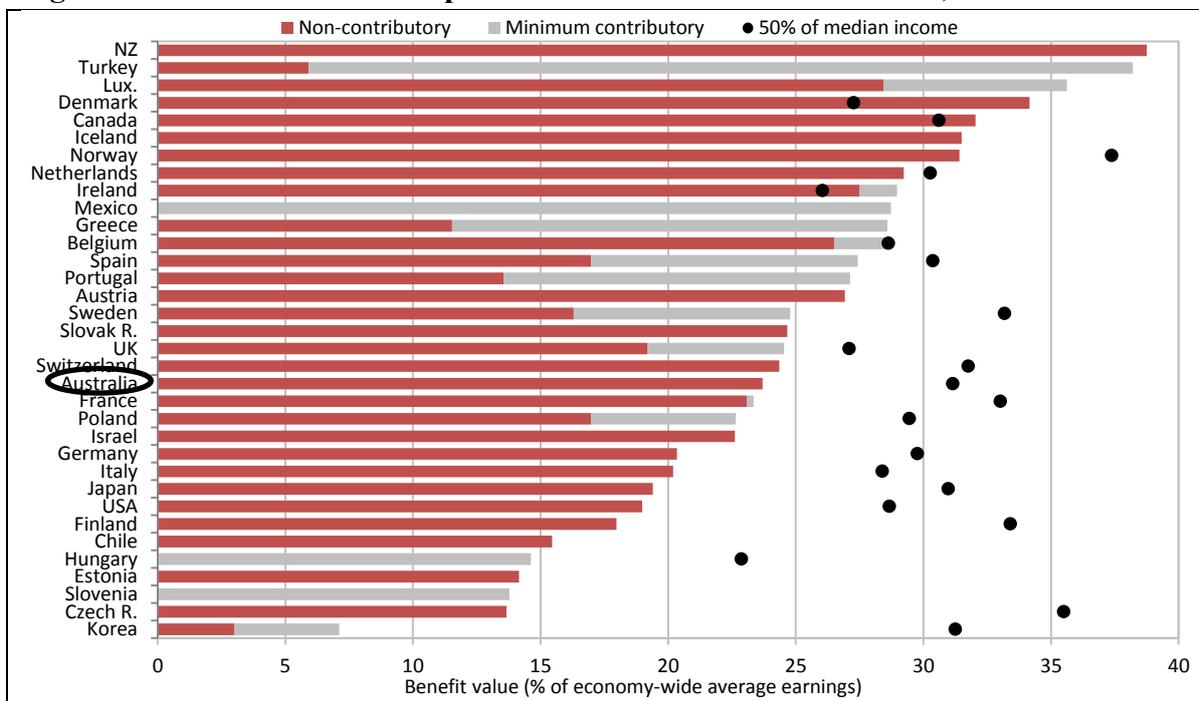
Figure 4 shows the levels of benefit of non-contributory and minimum pensions in OECD countries. It also gives an indication of the relative position of a poverty line if it were drawn at 50 percent of median income. The numbers shown in Figure 4 are complicated by the fact that many countries have multiple programs that may be additive or substitutive. The non-contributory benefit level represents the absolute minimum, assuming residency requirements are met. The minimum contributory level is based on maximum entitlement assuming a full contribution history on low earnings.

Figure 3. Importance of public transfers for those aged 65 or above



Source: OECD Income Distribution database; Grosh et al., 2008. Note: Income from work includes both earnings (employment income) and income from self-employment. Capital income includes private pensions as well as income from the returns on non-pension savings.

Figure 4. Benefit value of base pension schemes in OECD countries, late 2000s



Source: OECD (2011); <http://stats.oecd.org>; author's calculations. Note: Benefit values as well as equivalisation of median income are for a single person; in most cases figures are for 2008.

Overall, the average basic non-contributory benefit level represents 22 percent of average economy-wide earnings and the benefit level with contributory benefits is on average 25 percent. In most cases these are below the poverty line (i.e., 50 percent of equivalised household income)

and also below that attainable by someone working full-time on a minimum wage, which across the OECD is on average around 37 percent of a country's average wage.¹

This brief analysis suggests that the level may be set at different benchmarks – for example, by drawing an absolute or relative poverty line, taking a proportion of average wages or minimum wages, constructing a budget standard for pensioners, or even comparing to some proportion of the benefits available in the contributory system.

These all have advantages and disadvantages. For example, subsistence level may be too low, poverty lines can be arbitrary and sensitive to social benefit decisions affecting the median, budget standards are based on subjective judgments of 'focus groups', and using a proportion of minimum wage as a basis may distort decisions about minimum wages.²

Ultimately, since judgments about living standards are subjective, so too will be the decision on the appropriateness of the benchmark in setting pension benefit levels³. In most cases, these would be used only as a guide. An important step would be for policymakers to look at the benefit levels implied by each benchmark, side by side, as well as conducting simulations on the likely impact of different benefit levels on proportions of pensioners below and above different benchmarks.

The subjectivity can be observed in the assessment of adequacy in the Melbourne Mercer Global Pension Index, which gives full marks to pension systems with a minimum pension of 30 percent of average earnings and no zero for countries that offer less than 10 percent of earnings. These were set based on the distribution of minimum pension levels in OECD countries when the index was devised in 2009.

Australian policymakers have chosen to benchmark the maximum Age Pension to a given proportion of average wages, based on poverty studies (e.g., Harmer 2009). This translates to a benefit of approximately 27.7 percent and 41.76 percent of Male Total Average Weekly Earnings for singles and couples, respectively (an additional supplement for cost-of-living expenses, such as utilities, is also paid).

1.4 Indexation of benefit level

Indexation relates to the adjustment of parameters over time. As with benefit levels themselves, the indexation practices for pension parameters are a function of the arrangement and objectives of the pension system or pension scheme. The argument for indexing various parameters of the

¹ In some countries, the full benefit package, which may include other supplements, may bring those without any other income out of poverty, as defined in Figure 4. Also, it is worth noting that such comparisons are only indicative – they do not take account of differences in delivering state support in health, housing, and other services that affect the standards of living of pensioners. In some cases, supplemental payments relate to extra costs borne by pensioners such as fuel costs, disability, or health. An incidental point to this may be that responding to such heterogeneity by providing various cash supplements involves a trade-off between targeting and simplicity.

² That is, minimum wage decisions ought to be taken with labour market institutions in mind rather than the living standards of pensioners

³ Yet another way of arriving at the level is to start with surveys of self-assessed, subjective wellbeing or of adverse outcomes at a given level of benefit or income.

pension system is to maintain its structure and sustainability over time and to honour the intergenerational insurance contract (see Whitehouse et al., 2009, and Piggott and Sane 2009 for further discussion on indexation).

For pensioners themselves, indexation means the alleviation of inflation risk, which they, compared to the working-age population, are less able to bear. Unless protected by indexed pensions or annuities, benefit value erodes and pensioners' consumption and standards of living suffer. Indexation can be based on prices, wages, and combinations of the two.

Formalising indexation may also take sensitive benefit decisions out of the political arena and into the realm of the law. However, Whitehouse et al., present evidence across the EU and OECD that shows how values of benefits diverge from the ostensible policy, suggesting continued political intervention with the adjustment mechanism.

Indexation is important both before and after retirement, since a change in value of a benefit to pensioners today affects starting value for pensioners tomorrow. For example, the UK's Basic State Pension was linked to prices in 1981. It was then worth 24 percent of average earnings. Despite some discretionary increases since then, it dropped to 15 percent of average earnings by 2009.

In this way, how different elements are indexed has an impact on what importance these will have in the overall future of the pension system. For example, estimates of below-wage indexation of Poland's social pension floor show that this element will lose its redistributive power and practically disappear in the next decade (Choln-Dominczak and Strelecki 2013).

One strategy is to index the starting value with earnings, to ensure the structure of the system remains intact, while indexing pensions in receipt with prices to ensure pensioners maintain their purchasing power. Indexation should also apply to other parameters in the system, such as thresholds for targeting, otherwise the income or asset tests will increasingly affect people lower down in the income and asset distribution than the test was designed for.

Many countries have formal indexation policies. A summary of OECD and EU benefit indexation policy is presented in table 1 and the value of the main public base pension is shown discounted with wages for a selected set of countries in figure 5.

Price indexation tends to be the most common in high income countries. But many use hybrid indexation – a combination of price and wages, and may also include longevity-related adjustments. For example, the targeted pension in Norway is adjusted upward with wages but downwards based on cohort life expectancy increases.

The choice between prices and wages can be thought of as a trade-off. If wage growth exceeds price growth, for a given budget, smaller increases in pensions during retirement mean a higher starting point (i.e. higher replacement) and vice versa. There can be an infinite combination of initial award and subsequent adjustment. So it is important to think about what level of benefit people might want when, which is linked to whether 'marginal utility' of income falls or

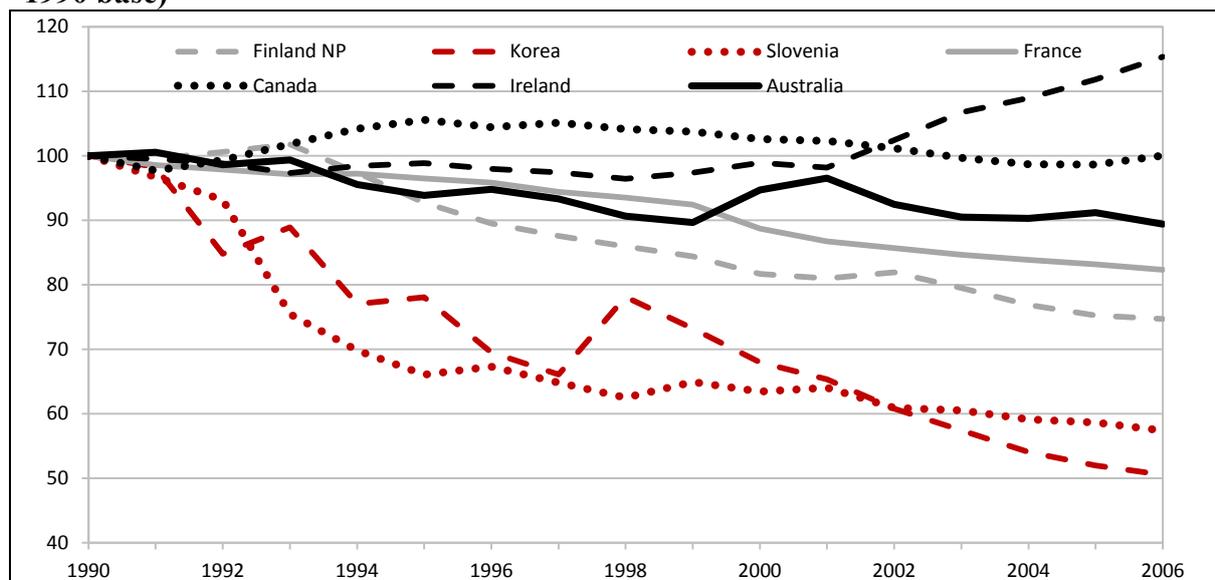
increases with age (e.g. lower consumption versus higher health costs). Economies with high levels of economic growth may want to use wage indexation to share the benefits of growing wages with older people. And there are other distributional consequences – people with lower incomes have a shorter life expectancy so may want more, earlier.

Table 1. Indexation policies for targeted, minimum and basic* pensions, OECD and EU countries, 2009

<i>Mostly discretionary indexation</i>				<i>Combination of wage and price indexation</i>			
	Targeted	Minimum	Basic		Targeted	Minimum	Basic
Bulgaria	D	D		Switzerland	WP		
Lithuania		D	D	Hungary		WP	
Germany		D		Poland		WP	
Austria	D			Cyprus		P	WP
Italy	D			Czech R.		P	WP
Estonia		D	WP	UK		P	WP
Greece	D	W		NZ			WP
Portugal	D	W					
<i>Mostly wage indexation</i>				<i>Price indexation</i>			
	Targeted	Minimum	Basic		Targeted	Minimum	Basic
France	W	P		Canada	P		P
Denmark	W		W	Belgium	P		
Iceland	W		W	Korea	P		
Ireland	W		W	Malta	P		
Norway	W		W	Sweden	P		
Australia	W		W	Turkey	P		
Luxembourg		W	W	USA	P		
Netherlands			W	Latvia		P	
				Mexico		P	
				Spain		P	
				Finland			P
				Japan			P

Source: Whitehouse et al. (2009). *Note: The definitions used here are based on OECD classification which defined basic schemes as flat-rate or depending on number of covered years. This is unlike the definition used in the rest of this paper, which labels pensions that depend on years of contribution as minimum schemes, and those schemes that are non-contributory and depend only on age and residency as universal.

Figure 5. Wage value of main targeted, minimum, or basic* pension over time (% , 1990 base)



Source: Whitehouse et al. (2009) and . *Note: See note in Table 1

For governments there are also macroeconomic considerations because pension increases can affect the budget. Germany implemented a fiscal sustainability mechanism in its pension

calculation, but when this meant lower increases for pensioners, the government overrode the mechanism for political and macroeconomic reasons. In Russia the social and notional defined part of the labour pension are both increased in line with wages, however explicit policy allows this to be overridden based on availability of revenue.

Another set of questions pertains to the use of an appropriate index. Most countries use a version of the consumer price index (CPI) to adjust pensions in payment, which has the strength of simplicity. But there is also an argument in favour of using an index that takes account of the prices of goods and services that older people generally consume. For example, older people spend proportionally more of their incomes on food and fuel. In the United Kingdom, for example, price inflation for pensioners in 2008 reached 7.4 percent compared with 5.4 percent for the population as a whole. In Australia, though wage benchmarking exists, the pension can also rise with a specially designed ‘Pensioner and Beneficiary Living Cost Index’.

Similar issues exist with wage indexation – for example, should the mean or median wage be used? Should it be average wages, or full-time wages? In Australia, the Harmer Review recommended replacing the Male Total Average Weekly Earnings benchmark with a measure of the net income of an employee on median full-time earnings, while the recent ‘National Commission of Audit’ suggested benchmarking to Average Weekly Earnings, which includes male and female workers.

There are also differences among pensioners. In one UK study, the inflation rate for the poorest, oldest pensioners was 9 percent compared with 6 percent for the youngest, richest retirees (Leicester, O’Dea and Oldfield, 2008). Longer-term studies in UK suggest there are year-on-year differences in the index based on pensioner consumption, but no long-term difference with the overall index. Some incorporate moral judgements: Belgium excludes tobacco, alcohol and petrol.

Finally, frequency of benefit adjustment is important. This will largely depend on the volatility of the index used. For example, in periods of rapid inflation, pensioner’s purchasing power may need to be adjusted more regularly. In countries with mixed price and wage indexation, the adjustment with prices may take place more regularly than the adjustment with wages, which has a more medium-term purpose.

PART II: ADEQUACY WITH RESPECT TO INCOME REPLACEMENT

2.1 Design features to ensure adequate income replacement

Alongside poverty alleviation, income replacement is a key objective of any retirement income system. Income replacement relies on additional pillars of the retirement income system on top of any minimum and social pensions. Some design features of these additional pillars can improve the likelihood that the system provides adequate retirement benefits.

For example, in constructing the Melbourne Mercer Global Pension Index, assessment is made of several categories of features that affect a pension system’s scoring on ‘adequacy’ in addition to

attracting scores for the levels of minimum pension and hypothetical median worker pension.⁴ These features are generally consistent with a well-functioning *funded* pension system. They include: whether third pillar, voluntary contributions are treated favourably by the tax system; whether a minimum access age and withdrawal restrictions limit the amount of ‘leakage’ of funds before retirement; the level of mobility and vesting of pension rights, including maintenance of the real value of funds over time; whether income streams are mandated and allow for conversion of lump sum accumulations into income over the course of retirement; and whether contributions to a funded pension are maintained during temporary absence from work.

The lattermost feature, about contributions during time away from work, would be important for women who tend to take time off to care for children or people with a disability. In some countries, caring responsibility results in credits or top-ups in the pension system, potentially linked to parental leave periods. In Australia there has been limited policy development with respect to offsetting superannuation shortfalls for informal carers. The Human Rights Commission, among others, has made some recent recommendations in this regard.⁵ Still, it is unclear if such compensation should be channelled through the mandatory savings pillar or the safety net, redistributive pillar.

With respect to mandating an income stream, the Melbourne Mercer Index ascribes a maximum score to countries where between 60 and 80 percent of the benefit is mandated to be converted into an income stream. This is an area of particular interest in Australia, with a recent report from (Financial System Inquiry 2014) raising it as an issue for income replacement in retirement.

Other features that enhance the role of the pension system to transfer funds from work to retirement, such as administrative efficiency and appropriate investment, are also relevant. This is an area that has attracted attention in Australia, both in the Super System Review (2010) and the Financial System Inquiry.

2.2 Replacement rates as benchmark for adequate income replacement

Replacement rates calculate the proportion of working age income that is provided in retirement. These act as the primary rule of thumb to evaluate the adequacy of income replacement. The concept seeks to capture the extent to which individuals’ standard of living in working life will be matched in retirement.

There are a number of reasons why people could maintain their standard of living with a replacement rate below 100 percent, including that: income taxes, social contributions, and mandatory savings, are lower or absent for retirees; housing costs are lower since the majority own their own houses; there are often fewer costs related to dependents; and other savings are often made by not working and having more time for home production (e.g. food preparation). Because of differences in taxes, net replacement rates tend to be better indicators.

⁴ Adequacy is one of the three sub-indices that comprise the Melbourne Mercer Global Pension Index. The other sub-indices are ‘sustainability’ and ‘integrity’.

⁵ <https://www.humanrights.gov.au/publications/gender-gap-retirement-savings>

Another conceptual issue is the period over which working age and retirement income is compared. Should the denominator be based on final year or average lifetime earnings (revalued with earnings growth)? And should the numerator rely on pension income in the first year of retirement or should assumptions be made about use of funds throughout retirement (e.g. OECD calculations assume an annuitised income stream for all countries).

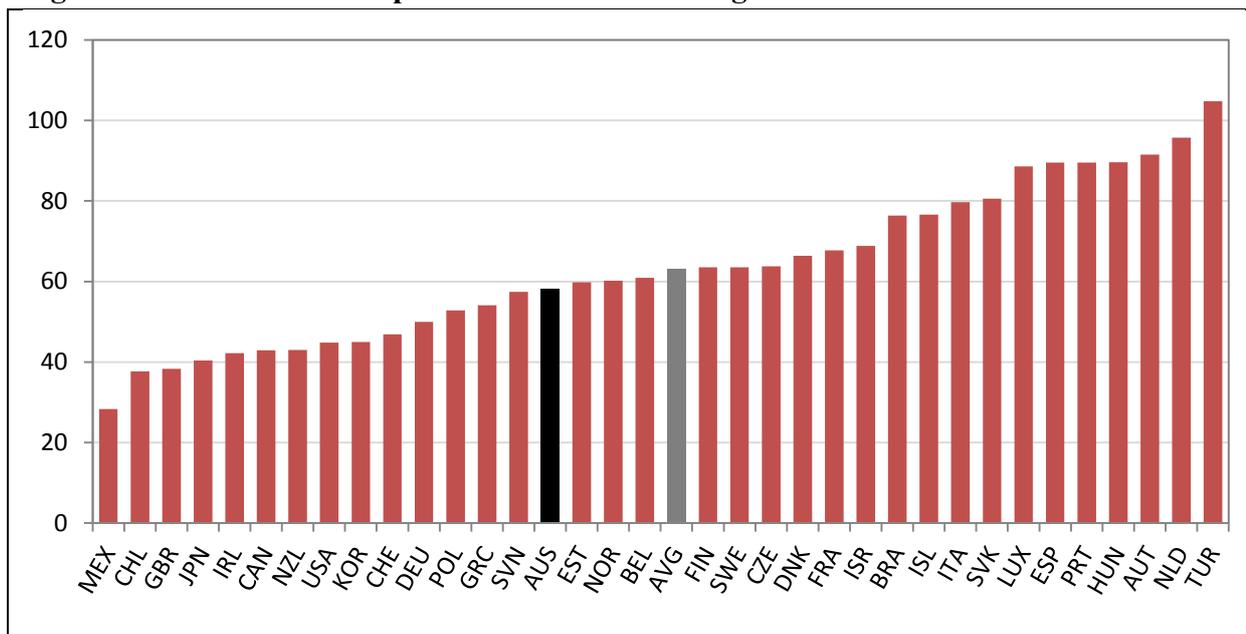
It also matters at which point of the income distribution we measure replacement rates. The redistributive nature of retirement income systems, which also reflects social norms, implies that those with low incomes will see much higher replacement rates than middle earners. But the gradient might not be constant as incomes increase since those at the top of the income distribution are more likely to have access to voluntary savings vehicles beyond the retirement income system compared to those in the middle. When looking at replacement rates in a retirement income system, it is standard practice to consider mandatory part of the system and calculate these for middle income earners.

Though rarely acknowledged, replacement rates don't differentiate by relationship / cohabitation status. They are calculated for individuals only despite the fact that less income is needed for those who are part of a couple (see section 1.3, above).

While policymakers in some countries set targets or design their pension systems with a target in mind (e.g. in setting contribution levels), those in countries with Defined Contribution schemes do not tend to mandate a set level. The World Bank (1994) noted a guideline target replacement rate for middle income earners in mandatory schemes that can be expressed as either 78 percent of net average lifetime earnings; 60 percent of gross average lifetime earnings; 53 percent of the net final year earnings; or 42 percent of the gross final year earnings.

Within the Melbourne Mercer Index, retirement income systems that provide median workers with a net replacement rate of between 70 and 100 percent of median lifetime earnings (revalued with earnings growth) score the highest marks for that component of the adequacy sub-index. Replacement rates below 20 percent score zero, while those with replacement rates above 100 percent incur a reduction in their score due the system's potential inflexibility to individual circumstances and overprovision.

The OECD routinely calculates theoretical net replacement rates that a full career worker newly entering the labour force could expect at retirement under reasonable circumstances. The latest figures are presented in Figure 6. For average earners, the net replacement rate in mandatory schemes across the OECD averages 63 percent. The rate in Australia is below the OECD average, at 58 percent. Australian replacement rates are above average for low earners. A full career Australian worker on half of average earnings can expect a net replacement rate of 87 percent, compared to an OECD average of 75 percent. Note that calculations rely on older parameters – Australian replacement rates are expected to increase as the mandatory savings rate increases from the 9.25 percent modelled by the OECD to 12% in 2025.

Figure 6. Net theoretical replacement rate for average worker

Source: OECD (2015). Note: Assumes Defined Contribution funds are annuitised according to male life tables (i.e. women's rates can be lower)

PART III: ADDITIONAL AUSTRALIAN CONTEXT AND CONCLUSIONS

3.1 Adequacy in the Australian first pillar

The most recent comprehensive analysis of Age Pension adequacy was undertaken in 2009 in the Harmer Review (Harmer 2009). The review's approach stemmed from the idea that adequacy relates to providing 'a basic acceptable standard of living, accounting for prevailing community standards' (page 23). This recognises the role of the pension in providing basic and ongoing income support to Australians who may need this support for an extended period.

But the Review report recognised that defining adequacy in this way did not provide a cut-and-dried answer to the level of benefit. A given benefit will lead to different outcomes in terms of well-being for different individuals, even if they are in similar circumstances, depending on different skills, capacities, priorities and aspirations. What is adequate for one person may well not be adequate for another. Where people's circumstances vary (health, household composition, housing tenure), more diverse outcomes will occur.

The Review's findings should be front and centre in the current debate over retirement incomes. We reproduce (in some cases abbreviating or paraphrasing) the most important in considering adequacy here:

Finding 1: The Review finds that the Age Pension, Disability Support Pension and Carer Payment should be paid at the same basic rate.

Finding 2: The Review finds that the specific costs associated with health and disability are best responded to by targeted services rather than generalised differences in base rates of payments or financial supplements.

Finding 5: The Review finds that a relativity (of singles to couples) in the range of 64 to 67 per cent across the package of support would be more appropriate than the current relativity. Adopting a relativity towards the upper end of this scale would appear to be reasonable if a three-tier approach were to be adopted. Under a two-tier approach, where the same relativity would be applied to single pensioners living alone and those living with others, a relativity at the lower end of this scale would more adequately reflect the average needs across both groups.

Finding 7: The Review finds that there is strong evidence that many pensioners in private rental housing face particularly high costs and have poor outcomes. Rent Assistance and social housing have complementary roles to play in addressing the financial security of these pensioners.

3.2 Adequacy and Australia's second pillar

The Harmer Review took the conventional position on adequacy that we have adopted generally adopted in this paper: that adequacy is independent of the standard of living an individual may have enjoyed through their working life, and is related to poverty alleviation.

Dealing with income replacement in retirement adds a new dimension of discretion and subjectivity to defining adequacy. As noted above, the standard approach to whether income replacement is adequate is to calculate replacement rates. In the context of a mandatory DC plan such as Australia's, there are three essential components to adequate accumulation of retirement savings that provide income over and above the Age pension: net contribution rate, contribution duration, and net return. Converting this accumulation to income requires good financial products in retirement. All these are affected by a series of design features discussed above.

Contribution rates are obviously crucial in this. If it is accepted that the price of labour is equal to total compensation, then it follows that increased contribution rates mean less income and liquidity through working life. Low income workers may be adversely affected by contribution rates set too high. Relatedly, the contribution rate itself has to be carefully defined. A 10 percent contribution rate into the pension accumulation account may be the same as a 12 percent rate before costs, or an even higher rate if the contribution itself is taxed, as in Australia. Careless comparisons with international practice can therefore be very misleading.

The second critical element in the accumulation is net return. Here, administration costs are critical. Over a lifetime of work, a one percentage point (of assets) difference in costs can translate into a 30 percent or more difference in accumulation value, depending on the gross rate of return assumed. So in Defined Contribution plans, lower costs and higher administrative efficiency can be important aspects of overall pension benefit. Complex regulation, time out of the workforce to have children, unemployment, and poor health all contribute to lower accumulations than might be expected with continuous employment.

When considering income replacement adequacy, therefore, it is important to bear in mind that life course circumstances, as well as circumstances in later life, have a major bearing on outcomes. Heterogeneity impacts both accumulations and needs in retirement. As noted above, replacement rate definition also needs to be considered - not just gross or net, but also the period considered for both earnings from employment and benefits. Comparisons of replacement rates that ignore these nuances can be problematic.

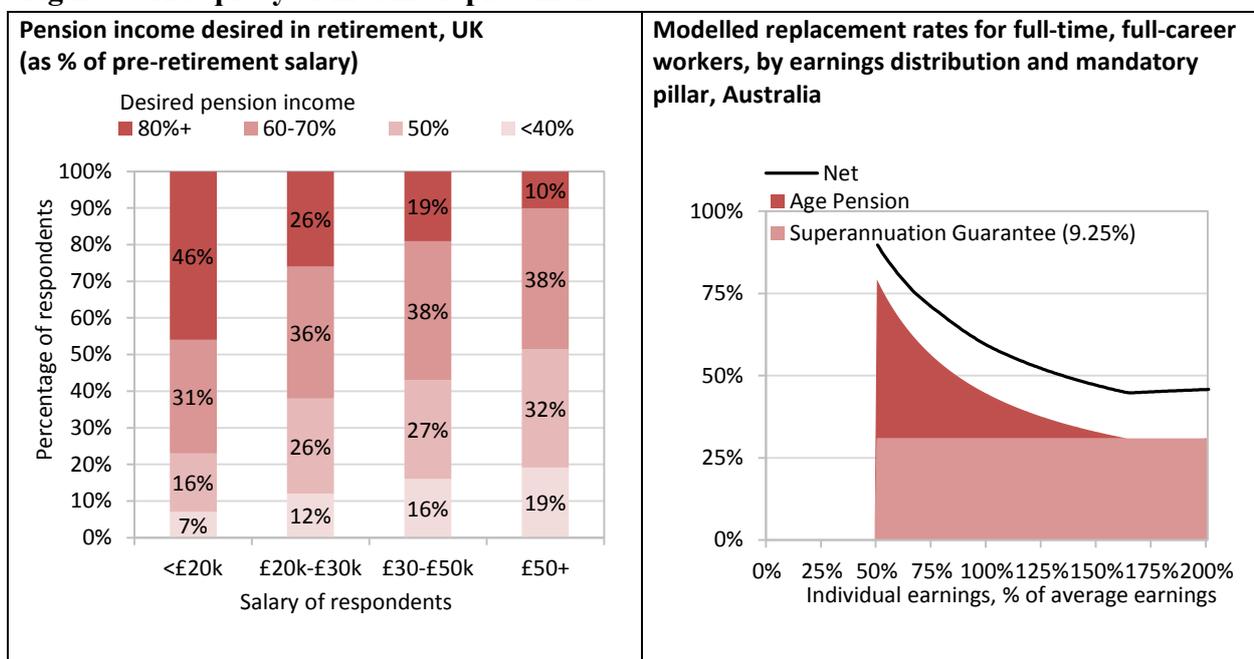
With these points in mind as a caveat, what net replacement rate do individuals themselves desire, or think of as "adequate"? Towers Watson (2010) report results of a survey undertaken in

the UK in 2008, in which people with different incomes were asked what they considered to be an adequate replacement in retirement. Results are reproduced in Figure 7, left-hand panel.

The important finding is that the lower the income from employment, the higher the replacement rate nominated. For example, 46 percent of workers earning less than £20,000 said they required a replacement rate of 80 percent or more, compared with only 10 percent of respondents in the £50,000-and-above bracket.

This pattern of replacement rates is what is expected to be delivered by Australia's overall retirement income policy. The OECD (2015) has calculated the expected replacement rates for people across the earnings distribution, generated by a combination of Age Pension benefits and the Superannuation Guarantee, annuitised. Results are reproduced in Figure 7, right-hand panel. The reported pattern of replacement rates echoes the desired pattern revealed by the UK study.

Figure 7. Adequacy of income replacement



Source: TowersWatson (2010); OECD (2015). Note: Australian mandated savings rate of 9.25% (modelled above), is now 9.5% and expected to reach 12% by 2025.

One way to evaluate what people find adequate from income replacement in Australia could be to look at what member of the public consider as a 'comfortable' standard of living in retirement (based on the ASFA retirement budget standards) as a proportion of average earnings. Such a calculation for a single pensioner shows that a 'comfortable' standard of living is equivalent to 53 percent of average full time adult total earnings. According to the OECD calculations, the Australian system's replacement rate achieves a net replacement rate above this level. This exercise does not however give us insight about the desired or expected levels of replacement rates across the earnings distribution.

3.3 Conclusion

In this paper, we have attempted to give substance to the notion of adequacy in the context of retirement income. The predominant idea of adequacy relates to poverty alleviation, and we develop this by reference to international literature and policy experience. We find that for developed countries at least, most measures of poverty are relative, requiring automatic or discretionary adjustment in line with changes in community standards of living.

Because, late in life, circumstances are very diverse, the notion of adequacy needs to be flexible. Here we discuss household composition in detail, but other circumstances, such as health status and home ownership, can also be critically important.

One reason why international organisations such as the OECD consistently rate Australia's elderly poverty rate as among the highest in the developed world is that housing, and particularly wealth held by the elderly in the form of housing, is inadequately recognized in OECD modelling. Australia has among the highest elderly owner-occupancy in the developed world, and among the highest outright ownership rates.

A second reason is that the maximum rates of Australia's Age Pension are set just below the OECD defined relative poverty threshold (50 percent of median equivalised household income). In fact, figures for average depth of poverty in Australia (distance from poverty threshold) are remarkably low (OECD 2013).

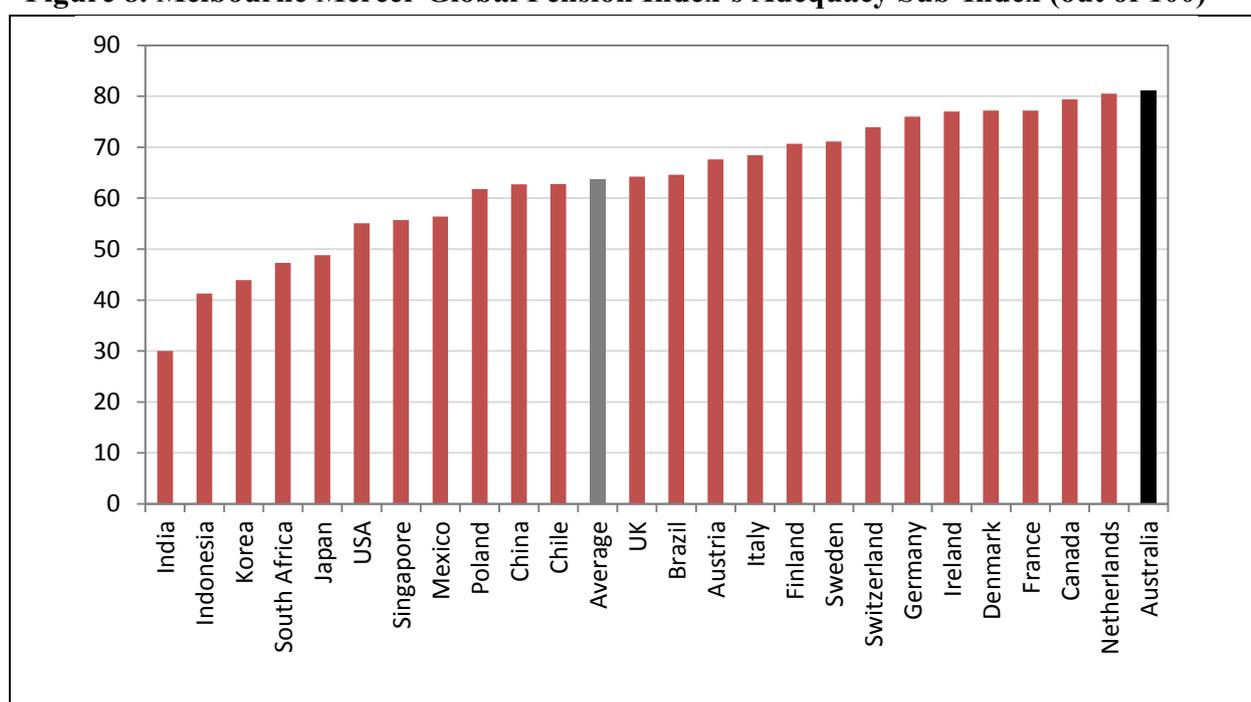
The paper also discussed the design features that can improve adequacy with respect to income replacement and the concepts and measurement methodology behind the replacement rate. Such a measure can act as a rule of thumb to evaluate income replacement. Generally, replacement rates are used as a guide rather than acting as a hard target.

We set some of the Australian context by discussing recent reviews, such as the Harmer Review, which focused on the adequacy of the Age Pension as well as the adequacy of benefits designed to alleviate poverty. We provided some evidence that the *pattern* of replacement rates across the labour income distribution generated by the overall Australian retirement policy structure is not too different from what people in these earnings brackets think of as adequate.

We have limited evidence on whether people think the actual levels of retirement income generated by the Australian policy are adequate. However, according to a back-of-the-envelope analysis of community-based budget standards and simulations of replacement rates, the Australian system delivers what is viewed as a 'comfortable' replacement rate. The Harmer review provides some evidence that the Age Pension, at least, should be classified as adequate with respect to poverty alleviation in conjunction with separate benefits that account for different costs such as rent.

Finally, it is worth drawing the reader's attention to the Melbourne Mercer's adequacy sub-index, which takes account of adequacy with respect to minimum, income replacement, and relevant design features. It is shown in Figure 8 and reveals Australia to score well on the 'adequacy' of its retirement income system. Still, such indices come with inherent limitations. For example, the selection and weighing of the index criteria are necessarily subjective – but perhaps not more so than the concept of adequacy itself.

Figure 8. Melbourne Mercer Global Pension Index's Adequacy Sub-Index (out of 100)



Source: Mercer (2015)

References

- ASFA [Association of Superannuation Funds of Australia] (2015) 'ASFA Retirement Standard', ASFA Research and Resource Centre, <http://www.superannuation.asn.au/resources/retirement-standard>
- Choln-Dominczak, A. and P. Strelecki (2013) 'The minimum pension as an instrument of poverty protection in the defined contribution pension system – an example of Poland
- Financial System Inquiry (2014) 'Financial System Inquiry: Final Report', Commonwealth of Australia
- Grosh, M., C. del Ninno, E. Tesliuc, A. Ouerghi, (2008) 'For Protection and Promotion : The Design and Implementation of Effective Safety Nets', World Bank Washington, DC
- Harmer, J. (2009) 'Pension Review Report', Commonwealth of Australia
- Hartfree, Y., D. Hirsch, L. Sutton (2013) 'Minimum Income Standards and Older Pensioner's Needs', January 2013 JRF Programme Paper

- Lanjouw, P., B. Milanovic, and S. Paternostro, (1998) 'Poverty and Economic Transition: How do Changes in Economies of Scale Affect Poverty Rates for Different Households?' Policy research working paper 2009, World Bank, Washington DC
- Mercer (2015), Melbourne Mercer Global Pension Index,
<http://www.globalpensionindex.com/wp-content/uploads/Melbourne-Mercer-Global-Pension-Index-2015-Report-Web.pdf>
- OECD (2011) 'Pensions at a Glance, 2011', OECD, Paris
- OECD (2011a) 'Pension at a Glance, Asia Pacific', OECD, Paris
- OECD (2013) 'Pensions at a Glance, 2013', OECD, Paris
- OECD (2015) 'Pensions at a Glance, 2015', OECD, Paris
- Piggott, J. and R. Sane (2009) 'Indexing Pensions'. SP Discussion Paper 0925, World Bank, December.
- SSA (2013) 'Social Security Programs Throughout the World'
<http://www.ssa.gov/policy/docs/progdesc/ssptw>
- Stiglitz., J, A. Sen, J. Fitoussi (2009) 'Report by the Commission on the Measurement of Economic Performance and Social Progress', Government of France
- Super System Review (2010) 'Super System Review: Final Report', Commonwealth of Australia
- Towers Watson (2010) 'Pension Adequacy: The Challenge for Defined Contribution Pension Plans'
- Whitehouse, E., A. D'Addio, R. Chomik, A. Reilly, J. Seisdedos (2009) 'What are the prospects for the standard of living of retirees? The indexation of pensions in European Union and OECD countries', ISSA technical seminar on pensions
<http://www.issa.int/Resources/Conference-Reports/What-are-the-prospects-for-the-standard-of-living-of-retirees>
- World Bank (1994) 'Averting the Old Age Crisis', Oxford University Press
- World Bank (2009) 'Social Transfers in Bosnia and Herzegovina: Moving Towards a More Sustainable and Better Targeted Safety Net', World Bank, Washington DC



CEPAR submission to the Financial System Inquiry

A number of CEPAR staff and affiliates contributed to this submission, including Rafal Chomik, Michael Sherris, Hazel Bateman, John Piggott, Ralph Stevens, and Diane Hosking, and the Chairman of the CEPAR Advisory Board, Marc de Cure

31 March 2014

About CEPAR

The ARC Centre of Excellence in Population Ageing Research (CEPAR) is a collaboration between academia, government and industry.

The Centre is based at the University of New South Wales with nodes at the Australian National University and the University of Sydney. It aims to establish Australia as a world leader in the field of population ageing research through a unique combination of high level, cross-disciplinary expertise drawn from Economics, Psychology, Sociology, Epidemiology, Actuarial Science, and Demography.

CEPAR is actively engaged with a range of influential government and industry partners to cooperatively deliver outcomes to meet the challenges of population ageing. It is building a new generation of researchers to global standard with an appreciation of the multidisciplinary nature of population ageing.

Mission

CEPAR's mission is to produce research of the highest quality to transform thinking about population ageing, inform product and service development and provision (private practice) and public policy, and improve people's wellbeing throughout their lives.

Introduction

The importance of households

This submission is mainly concerned with the interactions between the financial system and households, especially as they relate to long term contractual, or life cycle, financial savings. We take it as given that the financial system ultimately exists to serve households, both directly and indirectly, and its efficacy in this regard will be of paramount importance to the Financial System Inquiry (“the Inquiry”). These interactions are assuming ever greater importance, to system stability and individual welfare, as the population ages and Superannuation balances grow. Australia is unusual among developed nations in delivering earnings related retirement resources in a mandated pre-funded structure, privately administered and managed. This means that the financial system has a more prominent role in delivering retirement resources than is the case in most other OECD countries.

Terms of reference

The importance of superannuation assets in the Australian financial system is clear. The Terms of Reference include superannuation funds among the financial intermediaries listed under section 3.3. Also relevant to this submission is section 4.3, which refers to policy options that “meet the needs of users with appropriate financial products and services”, and 2.1 (consumer protection), 2.2 (financial risk allocation), 2.3 (financial regulation) and 2.4 (the role of Government). Furthermore, section 3.1 makes reference to the challenges of demographic change, which includes population ageing. An important subtext of this submission is that a long term focus which anticipates the financial implications of an ageing demographic is critical to the relevance of the Inquiry’s recommendations.

Focus on decumulation

The superannuation system can, with some risk of oversimplification, be conveniently divided into accumulation and drawdown functions. Many of our comments will apply equally to both, and some will focus on the interaction between the two functions. However, this submission will place particular emphasis on the drawdown, or decumulation, phase of superannuation. This is because:

1. it is the least developed and thought-out dimension of Australia’s retirement income system, whose efficient operation depends integrally on the financial system;
2. the population is ageing rapidly, with many of the baby boomers retiring in the present decade;
3. the absence of decumulation structures restricts the income options available to individuals who may as a result make uninformed choices and end up with lower incomes than expected. This may have fiscal implications for government if it is in future called upon to subsidise retirement incomes, and for the wider economy if inefficient allocation of resources and greater tax pressures result.

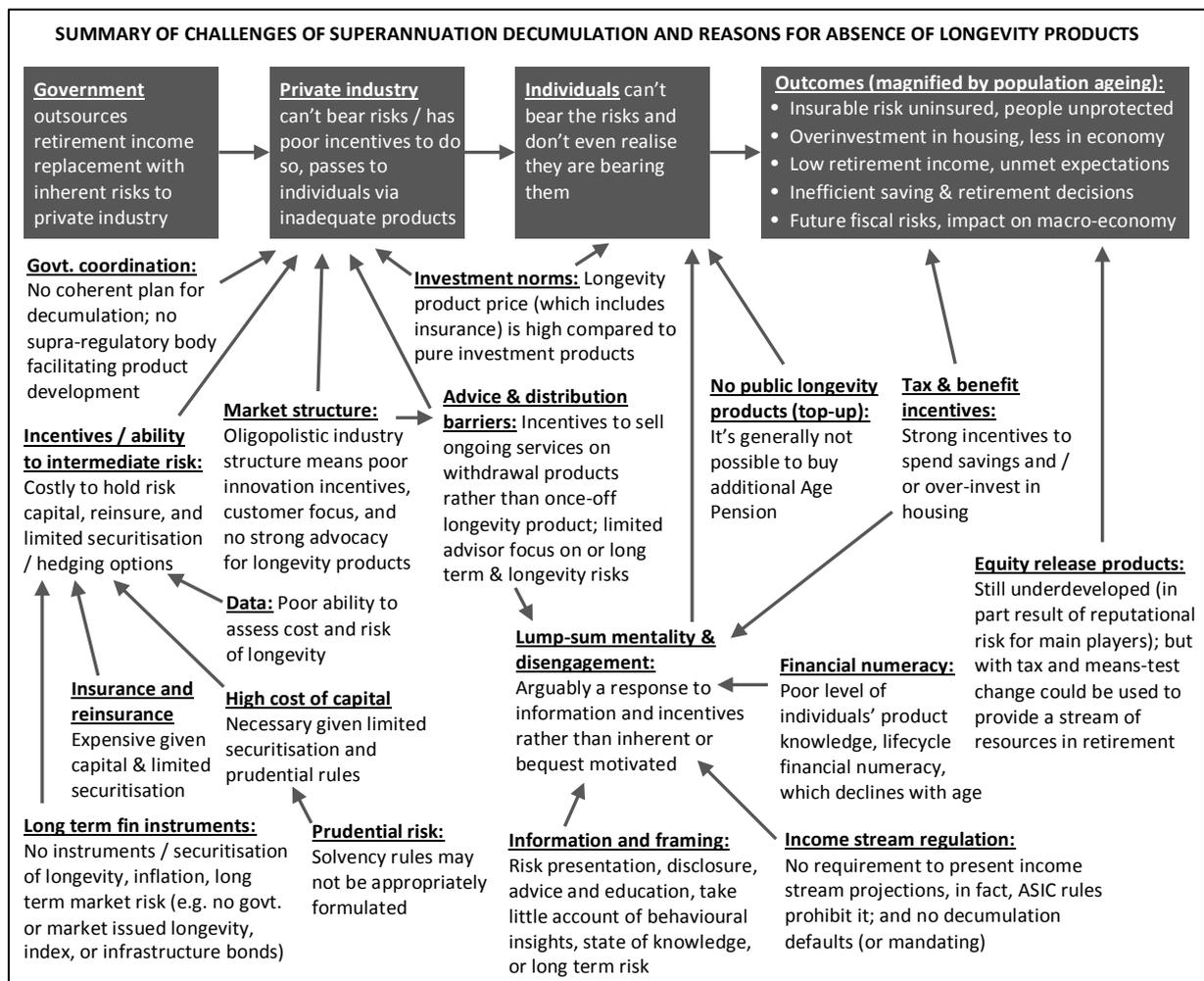
The various components of our submission are unified by the view that the purpose of superannuation is to provide a stream of resources in retirement that will ameliorate the risks inherent to households who have reached a life stage where human capital is depleted.

Summary of Recommendations

1. The purpose of and problems with Superannuation

Policy and practice directed towards superannuation should take as a point of departure that its purpose is to provide a stream of resources in retirement. The financial system in its current state is deficient in providing a decumulation structure to effectively turn assets into a stream of resources in retirement due to various supply, demand and regulatory issues. The private sector passes all long term and longevity risks onto individuals, who are least able to bear them. For individuals it will mean lower standards of living in retirement and sub-optimal saving and retirement decisions. For governments and the wider economy, it poses future fiscal risks and a misallocation of resources.

This submission focuses on three inter-related responses to the retirement income challenge. Firstly, consideration ought to be given to the private sector structures that determine what products are available, including structural and regulatory incentives and barriers to innovation, and the ability of the private sector to intermediate long term and longevity risks (section 2). Secondly, direct government intervention should be examined, including direct provision of products and/or financial instruments that support such products (section 3). Thirdly, consideration should be given to how people behave in deciding on appropriate levels of education, information, compulsion, defaults, nudging, and incentives that result in better decision making (section 4). These are summarised in the figure below, where interactions between different issues are emphasised.



Recommendation 1: Government should formulate and pursue a coherent plan that will allow superannuation to provide a stream of resources in retirement. This is an overarching recommendation from which other, specific recommendations and comments follow.

2. Products: Developing a menu of retirement income products

A range of retirement income products can provide a stream of resources in retirement, some of which are unavailable in Australia or operate in an inefficient market because of various barriers. These include products related to longevity risk insurance, long term care insurance, and equity release products. There are a number of issues with the private sector developing such products that the inquiry should consider. The related recommendations are as follows.

Recommendation 2: The Inquiry should weigh up the benefits of a stable and strong market structure against one that is more competitive and innovative. It should investigate ways to increase competition in retirement income product provision, including through greater use of low cost and customisable digital platforms, and with greater market supervision within elements of the value chain rather than across the industry as a whole.

Recommendation 3: The Inquiry should consider the extent to which the distribution and advice structure for retirement income products limits competition; whether advisers are knowledgeable about long term and longevity risks; whether their incentive structure discourages their recommending certain retirement income products, and whether their advice is always in the sole interest of customers.

Recommendation 4: The Inquiry should investigate how a menu of cost effective retirement income products that cover longevity risk could be made available to consumers to potentially form part of their retirement portfolio of assets. These may include standard life annuities, deferred annuities, and other forms of risk pooling product offering long term and longevity protection. The Inquiry should seek to remove any regulatory impediments to product innovation and provision.

Recommendation 5: The Inquiry should recommend establishing a supra-regulatory body or formal arrangement focused on facilitating retirement income product provision, allowing for a concerted effort, coordinated across responsible agencies, to prepare the financial and retirement income systems for population ageing.

Recommendation 6: Impediments to product innovation for longevity risk, as noted in earlier recommendations, should be reduced as far as possible while at the same time maintaining appropriate prudential requirements for products that provide substantial investment and longevity guarantees. Ideally, the arrangements would facilitate the efficient allocation of risk across government, business, and households.

Recommendation 7: Prudential regulation of insurers and reinsurers should be risk based but should also recognise the hedging benefits of financial market transactions in a manner that does not inhibit the efficient transfer of this risk.

Recommendation 8: Heterogeneity and its impact should be recognised in life annuity products and population level individual data should be used to better assess the cost and risks of longevity products.

Recommendation 9: Home equity release products, which can also be used to provide a stream of resources in retirement, should be included in the above recommendations when assessing the retirement income product market.

3. Government: Direct role in managing risk of retirement income products

A direct method to support the supply of retirement income products would be for government to participate in the market by issuing long term financial and longevity instruments, or alternatively for government to directly provide longevity insurance products to consumers. The apparent market failures around longevity products suggest that there is a rationale for this kind of intervention.

Recommendation 10: The inquiry should investigate the options for government to directly provide underlying financial instruments that would support the longevity insurance market, including long duration longevity, infrastructure, and inflation linked bonds.

Recommendation 11: The Inquiry should assess options for the government provision of longevity insurance products through existing distribution channels and payment systems (e.g. Centrelink or Australia Post) directly to consumers.

4. People: Facilitating choice

It is often observed that in Australia there is a “lump sum mentality” which disproportionately influences choices regarding retirement asset drawdowns. It is likely that this is a cultural attitude developed as much from historical tax-benefit incentives towards lump sum withdrawal and information framing as from any inherent and immutable “mentality”. By facilitating product availability and choosing appropriate policy and regulatory settings that affect decision making, an “income” mentality could be engendered which would better serve the core purpose of superannuation.

Recommendation 12: The development and delivery of appropriate financial literacy education (broadly defined to include superannuation system and product knowledge), specific to stage-of-life and across different media and settings, should be considered.

Recommendation 13: Attempts by regulators, policy makers and the financial services industry to simplify information to assist people to make superannuation (and other complex financial) decisions should be comprehensively consumer tested on the basis of *how* people use the information to make decisions.

Recommendation 14: Superannuation account information (such as annual member statements) should be presented as projected retirement incomes rather than ‘current’ accumulations, taking account of anticipated Age Pension payments and with projections for different retirement ages.

Recommendation 15: The Inquiry should assess how regulations can protect ageing consumers of Superannuation products, including those using SMSFs, in the event that they experience cognitive decline.

Recommendations

1. The purpose of and problems with Superannuation

Policy and practice directed towards superannuation should take as a point of departure that its purpose is to provide a stream of resources in retirement, rather than merely an accumulated asset for individuals or a source of funding for business. The financial system is central to achieving the implied objective: to ensure that Australia's retirement income system is fit for purpose as the population ages.

Unlike in many other countries, the income replacement pillar of Australia's retirement income system has been outsourced to the private sector. The financial system in its current state provides a Superannuation decumulation structure that is deficient. Long term risks related to inflation, investment and longevity are passed onto individuals, with the publicly provided Age Pension acting as a minimum income guarantee. Self-insurance through lump sum withdrawals invested in the family home or phased withdrawal products are the main vehicles individuals have to access resources in retirement since the life annuity market is relatively small (Bateman and Piggott, 2010).

Better risk intermediation in the financial system is not impossible. Other countries with similar mandatory accumulation arrangements deal much more effectively with decumulation. Switzerland and the Netherlands are the major developed countries with mandatory accumulation structures as the major source of earnings related retirement resources, and in both, income drawdowns are the norm (figures 1A and 1B; see also Rocha et al., 2011).

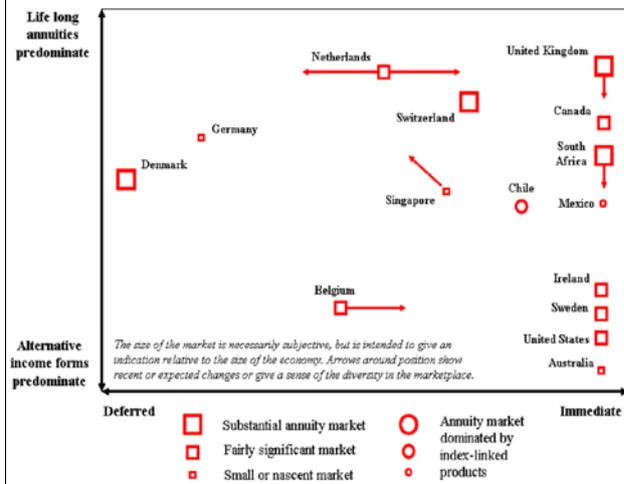
The Netherlands, for example, has a similar scale of superannuation wealth to Australia; it is a good example of a small mature annuity market existing alongside a large defined-benefit public and occupational pension system. The money's worth calculations (the ratio of an actuarially fair value to the price) suggest that Dutch annuities are fairly priced (Cannon et al. 2013).

In Australia however, there is a high proportion of retirement savings being taken as lump sums. On one reading of APRA data, benefits are increasingly being taken as income streams rather than as lump sums (figure 2A). However, this reflects the accumulation of current and prior-year's non-lump-sum payment streams. As such, the data misrepresents the implied reduced reliance on lump sum payments.

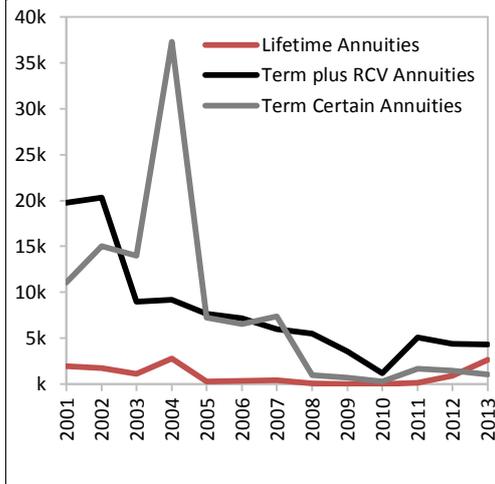
A comparison of lump sums as a proportion of retirement cohort assets shows that lump sums are not necessarily losing their importance (figure 2B). The lack of adequately collected administrative data that would identify the year-to-year changes in preferences between lump-sums and income stream is symptomatic of a lack of interest in the topic of decumulation. This lack of data is an impediment to undertaking research and to government policy determination.

An increase in reliance on phased withdrawals would be consistent with the 2007 superannuation tax reforms which made superannuation benefits tax-free after the age of 60 as long as they are behind the superannuation veil, rather than taken as a lump sum. However, the tax and benefit system, primarily through the Age Pension means test incentivises individuals to take and spend their lump sums, often in housing. This in turn contributes to Australians' overinvestment in housing wealth and lower levels of investment in other parts of the economy.

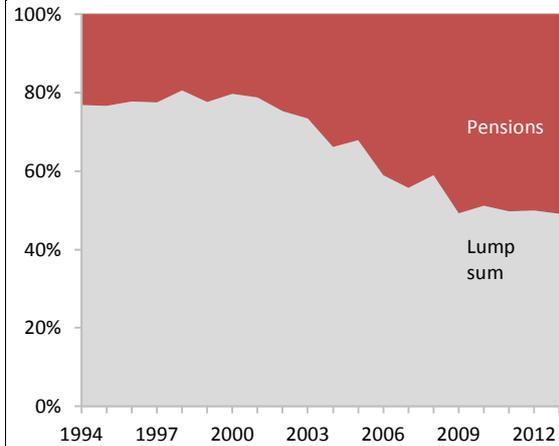
1A Representation of world annuity markets



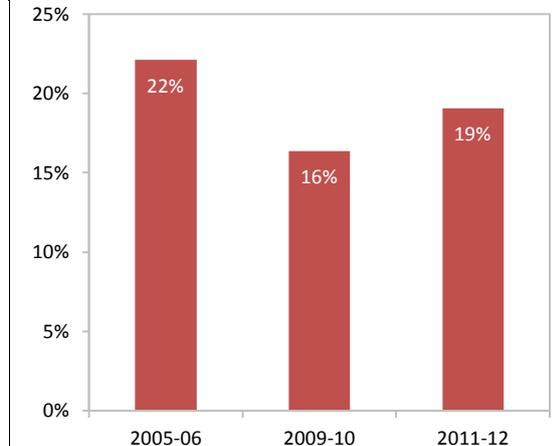
1B No. of annuities sold in Australia



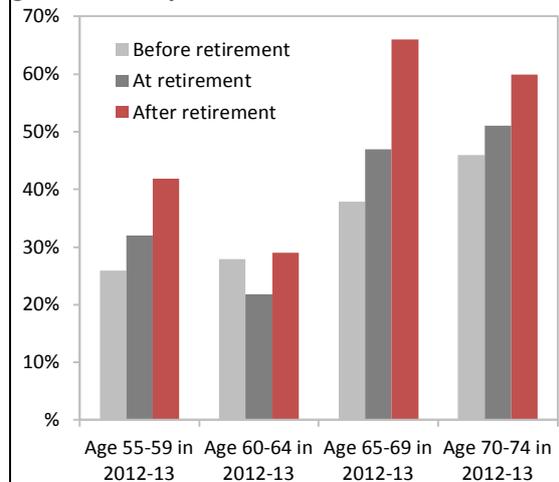
2A Proportion of annual benefits paid as pensions and lump sums, 1994-2013



2B Lump sums as a proportion of super assets of 60-64-year-olds, by year



3A Expectations and outcomes: % of those who retired in within last 8 years relying on government pension as main income source



3B Worrying: % of people aged 50+ who worry about outliving their saving



Source: Rusconi (2008), Plan for Life (unpublished); Authors' calculations based on APRA (2005, 2014), Clare (2008, 2011, 2014), ABS (2013b). ABS (2013a), National Seniors Australia (2013). Note: Figures 2A and 2B should be interpreted with caution. See text regarding figure 2A. Figure 2B should be interpreted only for trend since it includes five years' worth of assets in the denominator and one years' worth benefits in the nominator.

Yet, Australians want and expect to retire with more than just the Age Pension. A recent ABS (2013a) survey suggests that around half of people aged 45 years and over expect to rely on superannuation as their main source of income after retiring from the labour force. For many, this is unlikely to be the reality (figure 3A) and, perhaps unsurprisingly, many worry about outliving their savings (figure 3B).

Policies and regulations that serve to clarify the link between an individual's superannuation assets and their standard of living over the course of their (increasingly longer) retirement will lead people to make more informed decisions about how much they save, when they retire and how they draw on those savings in retirement. Where policy settings in this context are required (e.g., access ages, options to take an income stream) they should be consistent with individual life cycle financial planning.

In a society facing population ageing it is important that individuals have access to appropriate retirement income products and make well informed choices. The alternative may be lower standards of living (e.g., greater reliance on the Age Pension), a misallocation of resources (where lump sums are spent primarily on immediate consumption or housing, which is tax- and means-test-advantaged), and future fiscal costs (via Age Pension, health and aged care). For example, the most common reported use of lump sum spending is for 'Paying off home/home improvements/buying a new home' (Challenger, 2012).

Recommendation 1: Government should formulate and pursue a coherent plan that will allow superannuation to provide a stream of resources in retirement. This is an overarching recommendation from which other, specific recommendations and comments follow.

There are three parts to pursuing the above. Firstly, consideration ought to be given to the private sector structures that determine what products are available, including structural and regulatory incentives and barriers to innovation and ability of the private sector to intermediate long term and longevity risks (section 2). Secondly, direct government intervention should be examined, including direct provision of products and/or financial instruments that support such products (section 3). Thirdly, consideration should be given to how people behave in deciding on appropriate levels of education, information, compulsion, defaults, nudging, and incentives that can level the playing field when it comes to decision making (section 4). Supply, demand and regulations need to be considered at the same time, since none can exist independently.

2. Products: Developing a menu of retirement income products

2.1 *Financial system market structure and innovation*

Australia's oligopolistic financial system structure, made up of the four large banks and one major wealth management group, typically results in high margins, and can make the main players slow to respond to customer needs. While this creates a good level of stability through lower risk taking it can stifle competition and innovation particularly as the main players have scale advantage, and are vertically integrated along the value chain and across major products e.g. banking, superannuation and wealth (de Cure, 2014).

Attempts to aggressively compete on price or commission have often been suboptimal (e.g. National Mutual Life Association when competing against AMP in the late 80s). Small players have been able to survive by operating 'below the radar' in less attractive or niche segments. If successful, they often get taken over by one of the bigger players (e.g., MLC by NAB, St George and BT by Westpac, and Colonial First by Commonwealth Bank) (de Cure, 2014).

This market structure can result in a lack of incentive to innovate when it comes to retirement income products. Since bearing long term and longevity risks is costly, it is more profitable for the main players to provide phased withdrawal products. This may change as: the population ages; margins decline; credit growth plateaus; the Superannuation system matures (i.e. when outflows will be more significant); individuals recognise the risks of outliving their savings; and the size of the wealth management sector increases (de Cure, 2014).

Recommendation 2: The Inquiry should weigh up the benefits of a stable and strong market structure against one that is more competitive and innovative. It should investigate ways to increase competition in retirement income product provision, including through greater use of low cost and customisable digital platforms, and with greater market supervision within elements of the value chain rather than across the industry as a whole.

2.2 Advice and distribution barriers

Distribution is a mixture of owned distribution (e.g., the large banks), aligned distribution (e.g. AMP), and genuine Independent Financial Advisers (IFA's). Direct distribution is important in converting Superannuation balances into retirement income products and the control of these distribution channels can act as a barrier to the development of appropriate new products.

Advisers may also have an incentive to sell ongoing services on withdrawal products, continuously advising on the management of investments and tax efficiency, rather than suggesting the sale of a once-off longevity product.

It may also be the case that advisers have limited appreciation of, or interest in, long term and longevity risks and little understanding of the insurance features of longevity products.

As discussed in section 4 individuals' decisions are affected by different types of framing including the context in which they are given advice. For example, Agnew et al. (2013d) find that some individuals rely on extraneous signals (such as the age and gender of the adviser) to judge advice quality and observe some persistence in adviser choice over time. The results also explain how some advisers can maintain trustworthy reputations despite giving bad advice.

Recommendation 3: The Inquiry should consider the extent to which the distribution and advice structure for retirement income products limits competition; whether advisers are knowledgeable about long term and longevity risks; whether their incentive structure discourages their recommending certain retirement income products, and whether their advice is always in the sole interest of customers.

2.3 Longevity risk, efficient allocation of this risk, and product innovation

Longevity risk has a large systematic component that arises from uncertain future improvements in mortality. The standard risk pooling approach used in insurance breaks down for such risks. This is similar in concept to flood insurance where large numbers of individuals can be adversely impacted at the same time making this coverage unaffordable for many.

Although systematic risk is held on the balance sheets of insurers and reinsurers, it is relatively uncorrelated with many other risks such as commodity risk, equity risk, and interest rate risk. If it were to be pooled through financial market transactions and vehicles such as hedge funds it could be more finely priced and the risk more broadly diversified. The general insurance

catastrophe risk derivatives are a good example of this risk diversification mechanism that is an attractive element of an investment portfolio. Many of these issues, and how longevity product provision could be encouraged, are discussed in Sherris and Wills (2008) as well as Evans and Sherris (2009).

Mutual risk sharing arrangements such as those in the form of Group Self Annuitization schemes (Piggott et al 2005 and Qiao and Sherris, 2013) hold some potential particularly for relatively homogenous groups of individuals in different industry funds.

Recommendation 4: The Inquiry should investigate how a menu of cost effective retirement income products that cover longevity risk could be made available to consumers to potentially form part of their retirement portfolio of assets. These may include standard life annuities, deferred annuities, and other forms of risk pooling product offering long term and longevity protection. The Inquiry should seek to remove any regulatory impediments to product innovation and provision.

A reason why decumulation structures are deficient in Australia is that among the different responsible agencies (DSS, APRA, ASIC, ATO etc.) there is no single agency with a mandate to deal with retirement income issues and/or promote their development. The result can be seen in regulations for deferred annuities, which have suffered in development because of conflicting and inhibiting regulations (e.g., tax, prudential, means tests).

Recommendation 5: The Inquiry should recommend establishing a supra-regulatory body or formal arrangement focused on assessment (to include data collection and analysis) and facilitation of retirement income product provision, allowing for a concerted effort, coordinated across responsible agencies, to prepare the financial and retirement income systems for population ageing.

It is important to recognise that full annuitisation of superannuation savings is not necessarily an optimal drawdown strategy for an individual (see Hanewald, Piggott and Sherris, 2013). In the presence of systematic longevity risk and with product loadings typical of life annuities, other methods of risk pooling have potential for more cost efficient provision of longevity insurance.

Some forms of product innovation can be less desirable if not carefully managed, such as the case with variable annuities with equity exposure and insurer guarantees. These types of guarantee are often difficult to price and the hedging of these risks difficult for such long dated contracts. These products also involve significant loadings and have had less than spectacular success in overseas markets except for very basic product structures. An alternative may be to leave the market risk with the individual via a phased withdrawal product and combine it with a deferred annuity product to cover longevity risk, as discussed in Bateman et al (2001), and facilitated elsewhere, for example through Germany's Riester pensions.

Recommendation 6: Impediments to product innovation for longevity risk, as noted in earlier recommendations, should be reduced as far as possible while at the same time maintaining appropriate prudential requirements for products that provide substantial investment and longevity guarantees. Ideally, the arrangements would facilitate the efficient allocation of risk across government, business, and households.

2.4 Insurance and reinsurance risk management and capital/solvency requirements

Insurers and reinsurers issuing longevity products take on long term guarantees. Financial market instruments do not provide longevity hedging capability for these insurers and the main form of risk management is through reinsurance (longevity swaps) or through holding capital under prudential requirements. Longevity swaps and the impact on capital requirements for an annuity provided are analysed in Blackburn et al (2014) that highlights the interactions between regulatory capital relief and the hedging of the systematic and idiosyncratic risks in a life insurer annuity pool. See also Ngai and Sherris (2011).

Solvency requirements under the European Solvency II requirements with a 1 year horizon have the potential to distort the relative costs and benefits of transferring these risks into the financial market. Meyricke and Sherris (2014) analyse these incentives and compare the financial market cost with the capital costs under risk based insurance regulations modelled on Solvency II. They show the incentive remains to hold the long term tail risk on the insurer balance sheets.

There is significant interest at an international level in developing a financial market product for the effective transfer of longevity risk to financial market. These transactions will compete with the reinsurance market. Alternatives include the collateralization and tranching structures used for credit risk. These are considered for longevity risk in Wills and Sherris (2010). Solvency requirements may be influenced by the availability of specific long term government issued financial instruments (see section 3).

Recommendation 7: Prudential regulation of insurers and reinsurers should be risk based but should also recognise the hedging benefits of financial market transactions in a manner that does not inhibit the efficient transfer of this risk.

2.5 Heterogeneity and longevity insurance market issues

In order for a private annuity market to provide coverage for as wide as possible a group of individuals it is necessary to take into account prospects of longevity for differing groups. Su and Sherris (2012) and Meyricke and Sherris (2013) develop models for quantifying the impact of mortality heterogeneity on annuity pricing using Australian population data and US HRS data respectively. The differences in life annuity premiums for these groups are significant and shows that insurers will need to recognise the expected survival prospects as well as the benefits of risk pooling.

Sherris and Zhou (2013) analyse the impact of heterogeneity and underwriting strategies of life annuity providers. They show how the relative profitability and the accumulation of tail risk significantly impacts the risk loadings for differing groups and underwriting strategy used for selecting lives that enter the annuity pool.

Heterogeneity creates significant issues for the effective operation of a private life annuity market. A significant issue to be addressed is the availability of data at an individual level for the population. Without the historical data to properly assess risk and ensure fair pricing this market will remain expensive and inaccessible to the majority of Australians who are not amongst the healthier and wealthier of individuals.

Recommendation 8: Heterogeneity and its impact should be recognised in life annuity products and population level individual data should be used to better assess the cost and risks of longevity products.

2.6 Long term care insurance and residential housing, including equity release products

Another product market that remains undeveloped that is associated with longevity risk is the long term care insurance market. The substantial wealth stored in owner occupied housing in Australia may provide resources to support long term care costs while allowing individuals to remain in their own home rather than move into residential care. This would be consistent with both individuals' preferences to receive care at home and the overall direction of Australia's aged care policy (Chomik and MacLennan, 2014).

One way to make this work more effectively is to have an equity release market that would allow individual to access their residential housing wealth without having to sell the house. Equity release products provide a valuable means for financing retirement needs (see Hanewald, Post and Sherris, 2013, for a theoretical analysis).

These products have significant potential for growth as the population ages especially since owner-occupier housing is such a significant proportion of individual wealth. These products combine various risks including longevity and interest rate. They are not a conventional housing loan because of the exposure to these risks. Alai et al (2013) assess these risks for a product provider considering both reverse mortgages and home reversions.

The private sector may have reservations about the provision of these products due to their potential risk to brand arising from potential disputes with beneficiaries (e.g. relating to alleged mis-selling and/or inappropriate charges). Tighter regulatory requirements that do not rely on disclosure alone may be required around this sort of product. This is important since such products are likely to be sold to older Australians with lower financial literacy and with potentially reduced cognitive capacity (de Cure, 2014).

Recommendation 9: Home equity release products, which can also be used to provide a stream of resources in retirement, should be included in the above recommendations when assessing the retirement income product market.

3. Government: Direct role in managing risk of retirement income products

3.1 Public provision of underlying financial instruments

A direct method to support the supply of retirement income products would be for government to participate in the market by issuing long term related financial instruments that help to manage longevity, market and asset liability mismatch risk. These could take the form of longevity, infrastructure, and inflation linked bonds, allowing the private sector to better deal with the risk accumulating on the balance sheets of reinsurers and lower the cost of risk capital. Some of these are investigated in Evans and Sherris (2009).

As an example, this could involve an inflation-indexed longevity bond, where payments increase with inflation but are based on the expected number of survivors in a given group. A coupon would be payable based on the proportion of that age group that survives over a given interim periods until maturity. If the proportion of survivors is higher (lower) than the number anticipated when the bond is issued, then the bond payments are also higher (lower).

The provision of inflation linked bond instruments could provide capital for current infrastructure needs, are a natural match to infrastructure investments (without creating a balance sheet issue for government), while also making longevity products cheaper to provide for the financial system (de Cure, 2014). The outcome would be welfare improving since it would allow the

private sector to do what it does best (insure the idiosyncratic risk) while government takes on the more difficult stop-gap systematic longevity risk.

Recommendation 10: The inquiry should investigate the options for government to directly provide underlying financial instruments that would support the longevity insurance market, including long duration longevity, infrastructure, and inflation linked bonds.

3.2 Public provision of longevity products to consumers

An alternative form of government intervention is the provision of longevity insurance products directly to consumers. This could be provided more cheaply than is possible by the private sector since government has lower costs of capital (Evans and Sherris, 2009) and a ready-made means of distribution and payment. It could, for example, be done through buying additional Age Pension income and be offered through Centrelink or Australia Post. The apparent market failures around longevity products suggest that there is a rationale for this kind of intervention.

Recommendation 11: The Inquiry should assess options for the government provision of longevity insurance products through existing distribution channels and payments systems (e.g. Centrelink or Australia Post) directly to consumers.

4. People: Facilitating choice

It is often observed that in Australia there is a “lump sum mentality” which disproportionately influences choices regarding retirement asset drawdowns. To some extent, this is true everywhere but observed preferences for retirement income streams (i.e., lifetime annuities) are often associated with default settings (Benartzi et al., 2011). We believe that in Australia, this cultural attitude has developed as much from historical tax-benefit incentives towards lump sum withdrawal and information framing as from any inherent and immutable “mentality”. By facilitating product availability and choosing appropriate policy and regulatory settings that affect decision making, an “income” mentality could be engendered which would better serve the core purpose of superannuation.

4.1 Financial literacy

Due to the presence of many default options and products, the Australian Superannuation system allows people to be inattentive until retirement, when they are then forced to interact with choices about current and future consumption, complex products and means testing of other government benefits.

Australians tend to perform better on financial literacy tests than is the case in some other countries, but their levels of financial literacy are still quite low (Bateman et al., 2014e; Agnew et al. 2013a). They also know little about the superannuation system and have low product knowledge (Agnew et al., 2013b).

Levels of numeracy, financial literacy and super system and product knowledge are positively related to ‘engagement’ or ‘personal interest in superannuation’ (Bateman et al., 2013a) and ability to take account of investment risk (Bateman et al., 2014a; Bateman et al., 2014b) and longevity risk (Bateman et al., 2013a; Wu et al., 2013) in decisions around superannuation investments and retirement benefits.

People with better numeracy skills and higher levels of financial literacy are less influenced by ‘framing’ effects (i.e., the way that information is presented or disclosed to them) (Bateman et al., 2014a, 2014b, and 2014c); while those who have poor numeracy skills are particularly susceptible to confusion and poor decision making (Bateman et al., 2014b and 2014c; and Bateman et al., 2013a).

In fact, while planning for retirement tends to be ‘patchy’ (Agnew et al., 2013c), people with better financial literacy skills are more likely to plan for retirement (Agnew et al., 2013a). For example, more than half of Australians in their 50s and 60s have not planned key aspects of retirement.

Recommendation 12: The development and delivery of appropriate financial literacy education (broadly defined to include superannuation system and product knowledge), specific to stage-of-life and across different media and settings, should be considered.

4.2 Disclosure and information provision

While regulators and the financial services industry have made attempts to explain superannuation fund and investment option to ordinary people, research suggests that people are strongly influenced by the ‘frame’ or the presentation of the information (Bateman et al., 2014a, 2014b, and 2014c on the impact of alternative presentation formats for investment risk) and may not use the information as intended by regulators or industry (Bateman et al., 2013b). For example, in the new shorter financial product disclosure statement where the focus of policy makers was the presentation of expected returns and risk, a pie-chart showing asset allocation had the largest marginal impact on investment choices (Bateman et al., 2013b).

Furthermore, with respect to risk presentation, APRA and ASIC prescribe the ‘standard risk measure’ requires that investment risk be presented to consumers as the ‘frequency of negative annual returns over a 20 year period’. Yet as shown in Bateman et al. (2014b), this presentation format which describes risks using frequencies results in a significantly greater likelihood of investment ‘mistakes’ (as measured by deviations from an expected utility benchmark) than risk presented using ranges or probabilities. Similar conclusions using Prospect Theory based preference specifications are found in Bateman et al, (2014a).

Recommendation 13: Attempts by regulators, policy makers and the financial services industry to simplify information to assist people to make superannuation (and other complex financial) decisions should be comprehensively consumer tested on the basis of *how* people use the information to make decisions.

4.3 Presenting income stream information

The overall aim of superannuation is to provide income in retirement, yet information about superannuation account balances and measures of adequacy are presented as ‘amounts accumulated’ (i.e., in an investment frame) rather than ‘income streams’ or amounts that can be spent (i.e., in a consumption frame). ASIC regulations in fact preclude the provision of income stream information in member statements.

The Netherlands has pioneered retirement income information provision in recent years and online decision aids (e.g., de Vaan et al., 2013; Bruggen et al., 2013; and Mastrobuoni, 2010).

Recent proposals include further refining online personalised financial dashboards and alerts for those whose low accruals may result in low retirement incomes.

Research suggests that presenting superannuation information in a ‘consumption’ frame is far more likely to move people in purchasing/taking retirement benefit products with longevity protection features (Brown et al., 2008 and 2013).

People have trouble converting lump sums to income streams (Goldstein et al., 2014) as well as finding it difficult to work out how long they might live (Wu et al., 2013).

Recommendation 14: Superannuation account information (such as annual member statements) should be presented as projected retirement incomes rather than ‘current’ accumulations, taking account of anticipated Age Pension payments and with projections for different retirement ages.

4.4 Cognitive decline

The ageing of the population means that an increasing proportion of future consumers of retirement income products will comprise the oldest old. Systems therefore need to be put in place to protect ageing consumers of Superannuation products, including those using SMSFs.

Boyle et al. (2013) demonstrated that age had a strong effect on financial literacy, with about half of the effect of age on literacy due to decrements in executive functions and episodic memory. In addition, executive function had an indirect effect on literacy via decision making style (i.e., risk aversion), with education and word knowledge having independent effects.

Agarwal et al. (2010) provided an overview of the differential trajectories of change and decline for cognitive abilities across the lifespan. An inverted U-shaped association existed between increasing age and good financial decision making related to credit card management, home equity loans, lines of credit, or car loans. Younger and older adults were more likely to make errors of judgement in determining the optimal financial choice. Stricter regulations for financial products were proposed together with the implementation of more draconian approaches such as financial ‘driving licenses’ and mandatory financial advance directives for older adults. These measures were recognised, however, as ethically and politically contentious.

Li et al. (2013) presented a more optimistic view of older adults’ financial decision making based on the proposed hypothesis that the preservation of ‘crystallised’ cognitive abilities in older age (i.e. those abilities that are the product of education and life-experience) could provide alternate pathways to good financial decisions when ‘fluid’ (abstract reasoning) abilities decline.

On balance, there appears to be a case for providing special protection for ageing consumers interacting in the market for financial products.

Recommendation 15: The Inquiry should assess how regulations can protect ageing consumers of Superannuation products, including those using SMSFs, in the event that they experience cognitive decline.

References

- Agarwal, S., J. Driscoll, X. Gabaix, and D. Laibson (2010) What is the age of reason? Centre for Retirement Research, Boston
- Agnew, J. R., H. Bateman, C. Eckert, F. Iskhakov, J. Louviere, S. Satchell and S. Thorp (2013d) Individual Judgment and Trust Formation: An Experimental Investigation of Online Financial Advice, CEPAR Working Paper 2013/26
- Agnew, J. R., H. Bateman and S. Thorp (2013a) Financial Literacy and Retirement Planning in Australia, Numeracy, Vol 6, Issue 1: 1-25
- Agnew, J. R., H. Bateman and S. Thorp (2013b) Superannuation Knowledge and Plan Behaviour, JASSA, Issue 1, 2013: 45-50
- Agnew, J. R., H. Bateman and S. Thorp (2013c) 'Work, Money, Lifestyle: Plans of Australian Retirees', JASSA, Issue 1, 2013: 40-44.
- Alai, D., H. Chen, D. Cho, K. Hanewald, and M. Sherris (2013) Developing Equity Release Markets: Risk Analysis for Reverse Mortgages and Home Reversions, accepted and forthcoming North American Actuarial Journal, October 2013
- Alai, D., and M. Sherris (2012) Rethinking Age-Period-Cohort Mortality Trend Models, Article published on line 16 Apr 2012, Scandinavian Actuarial Journal
- APRA (2005) Superannuation Trends, www.apra.gov.au/Super/Publications/Documents/Superannuation-Trends-PDF.pdf
- APRA (2014) Annual Superannuation Bulletin, APRA
- ABS (Australian Bureau of Statistics) (2013a) Cat6238.0 Retirement and retirement intentions, Canberra
- ABS (Australian Bureau of Statistics) (2013b) Cat 3101.0 Australian Demographic Statistics, Canberra
- Banks, J., and Z. Oldfield (2006) Understanding pensions: Cognitive function, numerical ability, and retirement savings, IFS Working Paper
- Bateman H., A. Lai and R. Stevens, (2014a) Risk Information and Retirement Investment Choices under Prospect Theory, Journal of Behavioral Finance, in press, accepted 02/14.
- Bateman H., G. Kingston and J. Piggott (2001), Forced Saving: Mandating Private Retirement Incomes, Cambridge University Press.
- Bateman, H., and J. Piggott (2010) Too much risk to insure? The Australian (non-) market for annuities, CPS Discussion Paper
- Bateman H., C. Eckert, F. Iskhakov, J. Louviere, S. Satchell and S. Thorp (2013a) Disengagement: A Partial Solution to the Annuity Puzzle', School of Risk and Actuarial Studies Working Paper 2013/10
- Bateman H., C. Eckert, F. Iskhakov, J. Louviere, S. Satchell and S. Thorp (2014d) Default and 1/n heuristics in annuity choice, School of Risk and Actuarial Studies Working Paper 2014/1.
- Bateman H., C. Eckert, J. Geweke, J. Louviere, S. Satchell and S. Thorp (2012) Financial Competence and Expectations Formation: Evidence from Australia, The Economic Record, Vol 88, issue 280: 39-63
- Bateman H., C. Eckert, J. Geweke, J. Louviere, S. Satchell and S. Thorp (2014c) Financial Competence, Risk Presentation and Retirement Portfolio Preferences, Journal of Pension Economics and Finance, Vol 13(1): 27-61
- Bateman H., C. Eckert, J. Geweke, J. Louviere, S. Satchell and S. Thorp (2014b) Risk Presentation and Portfolio Choice, Review of Finance, in press, accepted 03/14

- Bateman H., I. Dobrescu, B. Newell, A. Ortmann and S. Thorp (2014e) Just interested or getting involved: An analysis of superannuation attitudes and actions, *Economic Record*, in press, accepted 12/13
- Bateman H., I. Dobrescu, B. Newell, A. Ortmann and S. Thorp (2013) As easy as pie: How retirement savers use prescribed investment disclosures, *CEPAR working paper 2013/10*
- Benartzi S., A. Previtro and R. Thaler (2011) Annuitization Puzzles, *Journal of Economic Perspectives*, Vol 25(4): 143-64
- Blackburn , C., K. Hanewald, A. Olivieri, and M. Sherris (2014) Life Insurer Longevity Risk Management, Solvency and Shareholder Value, *CEPAR working paper*.
- Blackburn, C., K. Hanewald, A. Olivieri and M. Sherris, (2013) Life Insurer Longevity Risk Management, Solvency and Shareholder Value, *CEPAR working paper*
- Boyle PA, Yu L, Wilson RS, Segawa E, Buchman AS, Bennett DA (2013) Cognitive decline impairs financial and health literacy among community-based older persons without dementia; *Psychology and Aging Sep;28(3):614-24*
- Brown, J.R., J.R. Kling, S. Mullainathan, and M.V. Wrobel (2008) Why don't people insure late life consumption: A framing explanation of the under-annuitization puzzle, *American Economic Review*, May 2013
- Brown, J.R., J.R. Kling, S. Mullainathan, and M.V. Wrobel (2013) Framing lifetime income, *The Journal of Retirement*, 1 (1), 27-37
- Bruggen, E., I. Rohde, and M. van den Broeke (2013) Different people, different choices: The influence of visual stimuli in communication on pension choice, *Design Paper 15, NETSPAR*
- Cannon, E., R. Stevens and I. Tonks (2013) Price efficiency in the Dutch Annuity Market, *Journal of Pension Economics and Finance*
- Challenger (Retirement Income Research) (2012) How much super do Australians really have? *Retirement Income Research: April 2012*
- Cho, D., K. Hanewald and M. Sherris (2013) Risk Management and Pay-out Design of Reverse Mortgages. *CEPAR Working paper*
- Chomik, R., and M. MacLennan (2014) Aged care in Australia: Part I – Policy, demand and funding, *CEPAR research brief 2014/01*
- Clare, R. (2008) Retirement savings update, *ASFA*
- Clare, R. (2011) Developments in the level and distribution of retirement savings, *ASFA*
- Clare, R. (2014) An update on the level and distribution of retirement savings, *ASFA*
- de Cure, M. (2014) Australian Superannuation and post-retirement income streams market: Background paper for CEPAR submission to Murray Inquiry, *Unpublished*
- Evans, J. and M. Sherris (2009) Longevity Management Issues for Australia's Future Tax System, for Australia's Future Tax System Review Panel
- Goldstein, D., H. Hershfield and S. Benartzi (2014) The illusion of wealth and its reversal, *Working paper, SSRN*
- Hanewald K. and M. Sherris (2013) Risk Management and Pay-out Design of Reverse Mortgages. *CEPAR Working paper*
- Hanewald, K., J. Piggott, and M. Sherris (2013) Individual post-retirement longevity risk management under systematic mortality risk, *Insurance: Mathematics and Economics*, 52, 1, 87–97.
- Hanewald, K., T. Post, and M. Sherris (2013) Portfolio Choice in Retirement - What is the Optimal Home Equity Release Product? *CEPAR Working paper*

- Li, Y., M. Baldassi, E. Johnson, and E. Weber (2013) Complementary cognitive capabilities, economic decision making, and aging; *Psychology and Aging*, 28(3):595-613
- Mastrobuoni, G. (2010) The Role of Information for Retirement Behavior: Evidence based on the Stepwise Introduction of the Social Security Statement, Collegio Carlo Alberto, CeRP, Netspar
- Meyricke, R., and M. Sherris (2014) Longevity risk, cost of capital and hedging for life insurers under Solvency II, *Insurance: Mathematics and Economics*, Volume 55, March 2014, Pages 147-155
- Meyricke, R., and M. Sherris, (2013) The determinants of mortality heterogeneity and implications for pricing annuities. *Insurance: Mathematics and Economics* (2013), Volume 53, Issue 2, September 2013, Pages 379–387
- National Seniors Australia (2013) Retirees' Needs and Their (In)Tolerance for Risk, National Seniors Australia
- Ngai, A. and M. Sherris (2011), Longevity Risk Management for Life and Variable Annuities: Effectiveness of Static Hedging Using Longevity Bonds and Derivatives, *Insurance: Mathematics and Economics*, Volume 49, Issue 1, July 2011, Pages 100-114
- Nirmalendran, M., M. Sherris and K. Hanewald, (2014), Pricing and Solvency of Value-Maximizing Life Annuity Providers, *ASTIN Bulletin*, Vol 44, Issue 1, 39-62.
- Piggott, J., E. A. Valdez, and B. Detzel (2005), The Simple Analytics of a Pooled Annuity Fund, *Journal of Risk and Insurance*, 72(3): 497-520
- Qiao, C. and M. Sherris, M. (2013), Managing Systematic Mortality Risk With Group Self-Pooling and Annuitization Schemes, *Journal of Risk and Insurance*, Vol. 80, No. 4, 949–974
- Rocha, R., D. Vittas, and H. Rudolph (2011) Annuities and Other Retirement Products: Designing the Payout Phase, World Bank, Washington DC
- Rusconi, R. (2008) National Annuity Markets: Features and Implications, *OECD Working Papers on Insurance and Private Pensions*, No. 24, OECD Publishing
- Sherris, M. and Q. Zhou (2013) Model Risk, Mortality Heterogeneity and Implications for Solvency and Tail Risk, *CEPAR Working paper*
- Sherris, M. and S. Wills, (2008) Financial Innovation and the Hedging of Longevity Risk, *Asia Pacific Journal of Risk and Insurance*, Vol 3, Issue 1, 52-64
- Su, S. and M. Sherris (2012), Heterogeneity of Australian Population Mortality and Implications for a Viable Life Annuity Market, *Insurance: Mathematics and Economics*, 51, 2, 322–332.
- Vaan, de, K., D. Fano, H. Mens and G. Nicodano (2013) A reporting standard for defined contribution pension plans, *Design Paper 22, NETSPAR*
- Wills, S. and Sherris, M., (2010), Securitization, Structuring and Pricing of Longevity Risk, *Insurance: Mathematics and Economics* –Volume 46, Issue 1, February 2010, Pages 173-185
- Wong, A., M. Sherris, and R. Stevens, (2013), Managing Life Insurer Risk and Profitability: Annuity Market Development Using Natural Hedging Strategies. *CEPAR Working Paper*
- Wu, Shang, Ralph Stevens and Susan Thorp (2013) Die young or live long: modelling subjective survival Probabilities, *CEPAR Working Paper*