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Scoring Goals in a Changing World

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New thinking on how to solve Australia's post-retirement challenge

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This publication is written by Paul Newfield and reflects my personal opinion on post-retirement in Australia. They do not and should in no way be taken to necessarily represent the formal view of Towers Watson (my employer).

Abstract

This paper examines the relative merits of a tontine or pooled-survival fund ("PSF") as a way of providing longevity insurance compared with conventional instruments like a life annuity. It specifically considers the relative merits of a PSF arrangement in the context of Australia's superannuation system.

The current economic, financial and regulatory environments in much of the industrialized world have increased this long-forgotten instrument's attractiveness.
The paper advances the case that a PSF, the modern version of a tontine, can provide a superior combination of longevity insurance and income compared with traditional solutions and annuities in particular. Given the scale and robust legislative, governance and operational framework of Australia's MySuper environment the PSF could be readily integrated into the existing pension system. The result will be a superior outcomes for members, society and regulators relative to the current retirement options and regulatory framework.

Keywords – post-retirement, tontine, pooled survival fund, longevity, MySuper, retirement income, allocated pensions, annuities.

Executive Summary

Australia is often touted as having a strong well designed retirement or superannuation framework and often such analysis will focus on concepts of adequacy, sustainability and integrity (referring to the strength of governance and prudential oversight).

However, there are I believe three areas which are critically flawed and which warrant urgent attention. These three areas are summarised below.

1. Mission

It is interesting that since the initiation of the Superannuation Guarantee in 1992, Australia has had a somewhat firm structural core for pre-retirement accumulation of retirement assets, and yet seems to lack a firm structure or framework for post-retirement benefits and rather leaves individuals to their own devices.

This seems strange, because if you ask people, even industry experts about the purpose of superannuation, you almost always get something along the lines of

- *to provide for financial wellbeing in retirement;* or
- *to provide for financial security in retirement;* or
- *to provide an income in retirement (often with additional words such as adequate or sustainable).*

However, the current understanding of the purpose of superannuation I believe arises from old stories which have been passed from "experts" to others or from boards to others and has developed into self-sustaining industry folklore.

The closest thing to a legislative framework which defines the purpose of superannuation is the ***sole purpose test*** embedded in Australia's Superannuation Industry Supervision ("SIS") legislation and I believe this is quite flaky when it comes to a specific purpose.

The sole purpose test says nothing of:

- *How much retirees should aim to save?;*
- *What adaptive levers they have to adjust when their circumstances or needs change?;*
- *What or how they can provide for themselves within retirement?;*
- *Whether benefits should be taken as income or lump sum?;*
- *How to assess whether the system or individuals have been successful in achieving their retirement mission?*

Having no clear mission also makes it very easy for politicians (from all sides) and Trustees to say they have achieved success because there are no clear goals or benchmarks (although the author does acknowledge that Trustees and funds have been substantially better than politicians) in articulating their mission and in setting clearly defined return and risk objectives.

The point is, unless we know definitively what we are trying to achieve with superannuation (and I believe the mission should relate to post-retirement) we will almost certainly fail to achieve it!

An old Chinese saying says "if you do not know where you are going, then any road will take you there".

MySuper post retirement default

There were few as happy as I when I read the Cooper Review which said under the recommendations released in June 2010:

Recommendation 7.1

MySuper products must include one type of income stream product, either through the fund or in conjunction with another provider, so that members can remain in the fund and regard MySuper as a whole of life product. The Government should consult comprehensively with industry before mandating the post-retirement arrangements to apply to MySuper products.

I strongly support this recommendation but when the Government issued their Stronger Super response on 16 December 2010 it said in relation to the above recommendation:

Noted

The Government will consult with relevant stakeholders on whether post retirement products should be mandated for MySuper products at some time in the future.

The Cooper Review highlighted the growth in post-retirement members and growth in retirement assets and also the fact that Australia's population is ageing and there was a need for an appropriate, default, post-retirement solution. The fact that no such default has been put forward and we are still awaiting consultation nearly four years after the Stronger Super response…..illustrates a lack of commitment or political hesitation to resolve this important issue.

Perhaps the key reasons put forward (in discussions and hearsay since not much appears in writing) are reasons associated with complexity and the lack of the type of solutions which could be used as a default. This latter point is the focus of this paper and it presents a solution which is not only suitable as a simple MySuper default but also provides a solution which addresses retirement needs.

2. Post-Retirement product

Options for post- retirement solutions are many, some are *insurance* based which provide some form of income certainty, while others are *investment* based, which provide less certainty of income but which allow for greater flexibility for member drawdowns while at the same time avoiding loss of the capital invested (and hence bequests) on death (which often arises in the case of a traditional annuity if an annuitant dies early). Today there are a myriad of potential solutions being discussed, all of which have potential benefits.

However, I believe there is another solution, not traditionally given due consideration and which has in centuries past had poor outcomes and received poor press. Yet I believe that the present economic environment, the structural issues within our post-retirement system, our ageing demographic and our strong regulatory/prudential framework in Australia all lend themselves to this solution – I believe its time has truly come.

The potential solution is a **tontine or pooled-survival fund ("PSF")**.

Before discussing the concept of PSF's – I wanted to briefly touch on Collective DC schemes.

There are a number of examples in the world today, where collective (but mutual types) vehicles are being considered or where innovation is bring such products to various markets. The concept of Collective DC is certainly gaining momentum. Collective pension schemes aim, but do not guarantee, to provide a certain level of benefit for a fixed known contribution (i.e. it is a DC scheme but with a targeted defined benefit in mind). Ultimately, however, the benefit paid will depend on investment returns and the benefit itself is not guaranteed.

The Netherlands operates industry-wide collective pension schemes. Under their schemes, benefits are defined as an annuity. In Australia, UniSuper already operates a defined contribution/defined benefit scheme for employees of the higher education sector. This is sometimes referred to as a "defined ambition" scheme.

Collective DC schemes have also, very recently (November 2013) been touted as a potential post-retirement solution for the UK where the Government released a paper titled "Reshaping Workplace Pensions for Future Generations" (interestingly the UK has historically had a heavy reliance on annuities).

The concept of Collective DC was also discussed, briefly, within the Cooper Review. "Nevertheless, the ability to pool risk over time can result in a higher level of certainty than a normal defined contribution scheme.

These schemes are likely to be more attractive where the expected benefits exceed the standard SG defined contribution rate. If the employer contributions of a collective pension scheme and a standard scheme are the same, then the expected returns to members are likely to be similar. For this reason, it seems appropriate that policy neither encourage nor discourage collective pension schemes. This seems to be the general result of the current regulatory rules so no change is suggested."

There are a number of elements of the above which can be debated, but the key point is that it suggests that the current regulatory framework would facilitate such a scheme.

A PSF or pooled survival fund is a modernised version of a tontine and modernised version of a Collective DC scheme. In the case of a PDF both the accumulation phase and the retirement phase are largely DC in nature whereas in a Collective DC, the retirement phase is more akin (in terms of expectations) to a defined benefit.

PSFs are investment vehicles that can be used to provide retirement income. Basically, a PSF is combines the features of an annuity and an account based pension. Within traditional tontines, as investors in the pool died, their shares were forfeited to the survivors in the pool, with the entire fund going to the last surviving investor. However the PSF proposed here using a simple mechanism to fairly distribute the defaulted amounts to all survivors on a periodic basis. This means that the total survival pool does not accrue and then get paid to the last survivor (which may promote moral hazard).

An important caveat – for a PSF scheme to work, I believe the following are necessary conditions:

Desired industry characteristic	Australia today
A large defined contribution/accumulated framework	✓
A well regulated superannuation and Trustee environment	✓
A relatively concentrated number of very large funds (as envisaged under Australia's MySuper framework)	✓
An environment on the verge of potential medical advancements which could increase life expectancy (and where there is much uncertainty as to how profound the impact would be)	✓

A lower interest rate environment, which significantly increases the cost of annuities also increases the appeal of a PSF. While such schemes have existed in centuries past – I will detail in this paper why I believe their time has come and why adoption of such a retirement income framework, will give rise to superior outcomes for both individuals and society, and importantly can more easily be integrated into our existing superannuation framework than other proposed solutions.

Importantly, a PSF or tontine:

- Can provide both **flexibility** (as per an account based pension) and some **longevity** protection (as per an annuity);
- It can be done **far more cheaply than a traditional annuity**;
- May be **allowable under current Australian laws (although this point is open to much debate regarding regulations)**;
- Can be **explained to members** far more easily and is likely to have better "buy-in" from members compared to annuities;
- Can **easily be integrated into existing superannuation funds'** operational platforms (and will be operated along similar lines to account based pensions today);
- Can be **integrated into Australia's MySuper** to provide a post-retirement solution in the MySuper space (as was originally intended under the Cooper Review);

- Ensures a MySuper fund can act as a "**cradle to the grave solution**" without the need for partnering arrangements with an insurance providers;
- Is the only post-retirement product which provides some longevity protection and **ensures with 100% certainty that the pool is and always will be 100% funded** (i.e. it is perfectly efficient with respect to utilisation of capital);
- Operationally is not as complex as one would think.

There is no perfect retirement system which can maximise all variables and desires of retirees simultaneously, however I believe that a tontine or pooled survival fund is better when compared with all other opportunities.

Background

Within any country (and in particular given the recent weaknesses in first world country balance sheets around the globe) the provision of adequate and secure retirement incomes for the older citizens is not a straightforward task. Having a robust policy framework is a long term assignment that must span many decades, and the journey fraught with both economic considerations (some, unfortunately more short term than long term) and political interference (not always for the better).

Australia currently has one the largest superannuation systems in the world (at AUD $1.6 trillion dollars presently), the majority of which is defined contribution ("DC") or accumulation. At retirement, there is no compulsion or direct penalty for various retirement choices. Retirees can take out their entire balance tax free in most cases. There is no compulsion to annuitise and a very small annuity market. What's more all default arrangements enshrined in legislation pertain to pre-retirement and the legislation is painfully silent with respect to the post-retirement landscape. At retirement, retirees can elect to take out all their capital or put this in some sort of annuity (rarely done) or put their capital into an account based pension. An account based pension is a DC scheme in reverse….there is no longevity protection in that once a retiree's capital is depleted that is it. There are no capital contributions into an account based pension once it commences, and there are minimum amounts of capital which must be drawn down each year. The beauty (or incentive/carrot) here is that a retiree will enjoy a 0% tax rate on their investment earnings IF they leave their savings in an account based pension. Another similarity is that retirees can have full investment choice over their account based pension balance. A key choice is really this for a retiree "take out the capital, invest it on my own and be taxed at my marginal rate on investment earnings or put my capital into an account based pension, be taxed at 0% and still have all the flexibility to withdraw amounts as I see fit each and every year, subject to a minimum".

To be successful in post-retirement design I believe Australia needs two essential ingredients to act as the genesis for a long term prosperous framework:

- Firstly, a little vision to think for ourselves and develop a plan which is simple and robust (and not a total import of plans which have worked well in overseas environments where circumstances were materially different);
- Secondly a little courage – and in penning such a paper I am mindful of the vested interest groups who may staunchly protest at a suggestion such as the one on which this paper is predicated – but we need a little courage for as Winston Churchill once said "Courage is rightly considered the foremost of the virtues, for upon it, all others depend".

People are living longer, populations are getting older, tax bases are getting narrower, and government balance sheets are looking less solid than they once were. The issue of retirement savings – its adequacy, sustainability and governance framework is one of continuous discussion, is subject to debate and strongly held opinions and is not without political interference.

Desirable properties for a post-retirement solution

The purpose of this paper is to reflect on my own view on a potential post-retirement solution to assist in providing retirement incomes for retirees in Australia which best meets the competing demands of adequacy, sustainability and sound governance. At the same time, I think the solution of a PSF or tontine better achieves all of following things, which are highly desirable from an individual perspective:

- Longevity protection (but not guaranteed protection)
- Inflation protection
- Transparency
- Flexibility
- Low costs
- Maximise integration with the Age Pension

The Edward Lloyd story - where risk sharing began

Many people may not be aware but one of the earliest insurance arrangements or insurance pools was Lloyd's of London. This market began in Edward Lloyd's coffeehouse around 1688 in Tower Street, London.

His establishment was a popular place for sailors, merchants, and ship owners and Lloyd catered to them with reliable shipping news. The shipping industry community frequented the place to discuss insurance deals among themselves. The first insurance pools involved sailors who were going out to sea. Each sailor would put in a coin into a pool, and Edward Lloyd would hold the pool and charge a small fee. When the ship returned, the families of those sailors who did not return split the pot.

While this was effectively death insurance in a true pooled form and did not necessitate any reserving by Edward Lloyd, since the benefits paid out reflected exactly the capital invested by the sailors less a small fee, the same concept can be applied to survival insurance i.e. to protect against the risk that you survive and outlive your own capital.

This is the essence in the philosophy behind a PSF or tontine, the only difference being that the benefits are paid out if you survive rather than if you die.

What are tontines and where did they come from?

A tontine is an investment scheme through which shareholders derive some form of profit or benefit while they are living, but the value of each share devolves to the other participants and not the shareholder's heirs on the death of each shareholder. The tontine is usually brought to an end through a dissolution and distribution of assets to the living shareholders when the number of shareholders reaches an agreed small number. So a number of shareholders join, as each dies their shares are distributed to those who remain in the tontine.

> "*If people know about tontines at all, they tend to visualize the most extreme form - a joint investment whose heritable ownership ends up with the last living shareholder. The all or nothing nature of that form is memorable. The last survivor principle has been the basis for a number of dramatic works whose plots hang on the machinations of a tontine participant to murder his co-investors to insure the core property reverts to him. In fact, tontines are far more innocuous and served as an important step both in developing modem insurance plans and providing some of the earliest reliable actuarial data on which the later insurance plans could be developed*"
>
> Fordham Journal of Corporate & Financial Law, Kent McKeveer, Volume 15, Issue 2 2009 Article 5

So how would the PSF (or tontine) work in the Australian DC ("MySuper") context?

In historical tontines, when each member died, their account balance (i.e. their contributions plus investment earnings) were distributed to the surviving members of the pool as "mortality gains."

Conceptually, there are two ways in which such gains can be shared:

- In historical tontines, these mortality distributions were divided equally among the survivors. This was not fair, since it did not appropriately take into account people of different ages have a different likelihood of surviving.
- Under a PSF scheme, considered in this paper, this shortfall is properly addressed by weighting each participants share fairly based on their likelihood of survival (this is discussed and illustrated later in the paper).

However, the PSF proposed in this paper is operated on a fair value basis and is calculated in the manner described below which ensures that each participant gets a fair deal and there are no favoured groups.

A possible illustration of a simple solution would operate as follows:

- Each member in a MySuper plan on reaching age 65 would have their balance transferred to the post-retirement section of a fund (which would be DC as per today's account based pensions);
- We would then see a portion of this balance each year (or perhaps every three years), say 75%, being totally unrestricted, as it is at present whereby members can drawdown as much or as little as they desire and invest precisely as they desire;
- The remaining 25% (or more at the member's election) would be invested in a "survival pool", and at extreme ages the capital which each member commits to this pool could be reduced to free up the capital to be expensed (as this would be needed once the initial 75% referred to previously has been depleted);
- Each member with assets in the pool would have a sum at risk (calculated as the value of their assets in the pool, times by the probability of death based on the member's age). A member's sum at risk relative to the total sums at risk in the pool as a whole, would determine the portion of "survival profit" which the member would be eligible for at the end of the year i.e. at the end of the year, those members who have died would have their 25% stake divided up amongst the survivors ;
- Each member should also have the option at any time to elect to risk more than 25% (but no less and noting 25% is the example floor). This is particularly important if a) the member expects to live longer than the average person of the same age in the population or b) the member has not saved enough money to sufficiently provide for retirement if they live to even average life expectancy. In this latter case, the shortfall will need to be made up by either taking on more investment risk or by risking more capital (and if the member survives they will get their capital plus the mortality profits or share of capital from those who have not survived);
- At the end of each year (or perhaps longer), members who survive are 'refunded' their pool balance from the start of the year plus (or minus) investment earnings.

- Members who do not survive the year forfeit their entire pool balance (i.e. the original 25%) and investment earnings, and these amounts are instead paid out to the surviving members of the pool in proportion to their share of the total sum at risk for surviving members. Note in this example, 75% of the member's balance which was invested in an account based pension will be payable to their beneficiaries or estate.

- The process then starts again, with surviving members depositing 25% (or more) of their assets into the pool. To avoid selection and reduce moral hazard (which is discussed later) ideally the process would run on a longer three or five year cycle.

- The pool itself does not provide a *guaranteed* longevity benefit (but then again neither does the current account based pension framework). However all the survivors in the pool will benefit from those who do not survive through the year. **The benefit for society as a whole are that the pool is always fully funded, it provides a form of longevity insurance, and the assets can be invested in more growth orientated strategies than traditional retirement products.**

This is represented in the diagram below:

Note this is simply a conceptual framework and the structure (e.g. the percentages) could change. However I would expect it to ultimately remain fairly simple. While numerous other rules can be included, I would strongly encourage any framework to be as simple as possible – this would make member understanding easier, get better member buy-in and assist with transparency, governance and cost minimisation.

Historical issues which have arisen with respect to tontines

A historical criticism of tontines or PSFs is that in centuries past they operated in some instances like Ponzi schemes in that those who ran the administration of the schemes often spent the money or left town with it Another issue was that such funds in times past did not have sufficient moral hazard protections and so some participants withdrew their funds when they became ill and expected that death was imminent or worse still others in the fund killed fund members to benefit themselves!

Moral hazard can be present any time two parties come into agreement with one another. Each party in a contract may have the opportunity to gain from acting contrary to the good faith principles laid out by the agreement. It usually emerges when there is information asymmetry between the two parties, information which should be known to both parties when operating on good faith principles. The most common example of moral hazard in finance today is life insurance. If a person suddenly became aware of their imminent death (say via a disease with a very high mortality) then in the absence of any constraints, that person could seek to take out a very large life insurance policy. To counteract this, life insurers generally require the provision of medical/health evidence prior to granting insurance cover. This helps to protect the insurer from moral hazard, where people may use the information they have (which relates to the risk being underwritten i.e. their death) to their economic benefit.

I will address both of these criticisms head-on in the context of this paper:

a) In relation to **survivorship bias and the moral hazard** associated – I would put forward there are two counter arguments in the context in which I will present the possible tontine solution for Australia.

   Firstly, if ultimately implemented through large superannuation funds the risk of any individual acting to increase their net benefit to the detriment of another individual is diminished because it will ultimately be the experience across a very large pool of people rather than one single death which will benefit the individual. In fact as any single member typically receives only a small portion of another member's assets which are defaulted into the survival pool on the death of that member. The point is given the size of the pools and the level of governance in superannuation ("MySuper") funds in Australia today, such moral hazards do not exist and should not act as an impediment to progressing a PSF.

b) With regard to the **safety of the capital itself** – I can easily see how such arrangements resulted in large capital losses in times past where strong regulatory frameworks did not exist. However, if such an arrangement were implemented via Australia's large superannuation funds which exist in Australia today (and the MySuper funds in particular), I would argue they are currently subject to ("endure") some of the toughest regulatory controls in the world's financial markets and if we cannot have confidence in these very large pools in terms of them not acting as a Ponzi scheme, ignoring the tontine or PSF concept altogether, we actually have far far bigger problems.

Prisoners and Post-Retirement (an important metaphor for tontine pooling)

The prisoner's dilemma is an example of a game, analysed in game theory, which shows why two individuals might not cooperate, even if it appears that it is in their individual and collective best interests to do so.

It was originally framed by Merrill Flood and Melvin Dresher working at RAND in 1950. I think it is particularly powerful as a metaphor in the post-retirement context because the analogy it illustrates is how potentially with no pooling or cooperation, there are very real risks that all participating individuals and indeed society (as represented by the two prisoners collectively) as a whole face. It demonstrates that each of us and society could be better off if we work together.

The classical prisoner's dilemma can be framed as follows:

In the prisoner's dilemma, person A and B are picked up by the police and interrogated in separate cells without a chance to communicate with each other. For the purpose of this game, it makes no difference whether or not A or B actually committed the crime (but suppose for purity sake they are both innocent). Person A and B are both told the same thing:

- If you both confess, you will both get four years in prison;
- If neither of you confesses, the police will be able to pin part of the crime on you, and you'll both get two years;
- If one of you confesses but the other doesn't, the confessor will make a deal with the police and will go free while the other one goes to jail for five years.

Each prisoner must make the choice of whether to betray the other/confess or to remain silent. However, neither prisoner knows for sure what choice the other prisoner will make.

So this dilemma poses the question: How should the prisoners act?

The dilemma can be summarised thus:

	Prisoner B Stays Silent	Prisoner B Confesses
Prisoner A Stays Silent	Each prisoner will serve 2 years	Prisoner B is freed and A gets 5 years
Prisoner A Confesses	Prisoner A is freed and B gets 5 years	Each prisoner serves 4 years

The dilemma arises when one assumes that both prisoners only care about minimising their own jail terms (and the analogy is where neither has enough capital to truly protect against their own longevity but at the same time do not want to subsidise others but as we have already noted previously, most retirees do not have sufficient capital). Each prisoner has two options: to cooperate with his accomplice and stay quiet, or to defect from their implied pact and betray his accomplice in return for a lighter sentence.

From an individual's point of view, the dilemma can be considered from two perspectives:

(a) A specific, assumption based, expected value perspective whereby we assume that the prisoners are equally likely to talk or stay silent.

The dilemma or perspective of each individual and society as a whole can be summarised as follows:

From individual's perspective:

Option for the individual	**Their expected outcome/result**
Expected Term if they stay silent = (shaded cells in the table above)	50% times 2 years + 50% x 5 years = 3.5 years
Expected Term if they confess =	50% times 0 years + 50% times 4 years = 2 years

* in practice as outlined in (b) below, the case for each prisoner confessing and maximising their individual outcomes, is independent of the probabilities associated with the other prisoners course of action.

Hence from a single person's point of view it makes sense to confess and receive an expected lower sentence; or

(b) A more generalised, probability independent, perspective. In this case, if prisoner A considers he knows nothing about the likely action of prisoner B and has two choices – stay silent or confess.

If prisoner A confesses, prisoner A will either be freed or serve 4 years (which is dependent on prisoner B's course of action which is unknown), whereas if prisoner A stays silent, he will either serve 2 or 5 years (again, dependent on prisoner B's course of action which is unknown). The point is in all cases confessing will dominate the outcome for prisoner A for each of the two possible courses of action which prisoner B may take. It therefore makes sense from an individual maximisation perspective (which is for that prisoner to minimise their jail time) to confess.

Also, at the same time, prisoner B thinking the same way and also confesses. And so both prisoners confess and the same outcome as the expected value model is achieved.

From a post-retirement perspective, I think this can be seen to illustrate that if members are concerned they have insufficient capital at retirement and yet are reluctant to pool (I can understand why a member would be reluctant to purchase an annuity, after all close to 30% (see Table 3 of ""Explaining the Demand for Life Annuities in the Australian Market" in reference list) of the capital evaporates on day one), then members/retirees may think that they will be better off.

But in total for society as a whole (and if this is represented by the A and B pooling and thinking collectively):

Combination of choices for society as a whole	**Outcomes for Society as a whole**
If no one confesses, then the total number of years served by both prisoners =	4 years (2 years by each A and B)
If both confess, then the total number of years served by both prisoners =	8 years (4 years by each A and B)
If one confesses, then the total number of years served by both prisoners =	5 years (by one of A and B)

Hence it makes sense for the group as a whole for both prisoners to remain silent.

Resultant Outcomes of the Prisoner's Dilemma

In practice if considered from an individual perspective, both may confess as it appears in their individual interests to do so. The result is both members individually and from a societal/collective perspective are worse off i.e. in the pursuit of individual maximisation (with no consideration of societal outcomes) has actually resulted in both individual and collective minimisation.

In theory, both members are likely to confess thinking they will betray the other and hence get an expected 2 year term. But if both think with this "rationality" then both will confess and hence each will get 4 years (which is close to the worst mathematical outcome a prisoner could have received by themself, noting they had a potential set of 0 years, 2 years, 4 years or 5 years to start off with). Also from the collective/societal perspective there will be 8 years in prison in total (4 by each prisoner) which is definitively the worst mathematical outcome possible.

But in practice pooling helps, both individually and collectively

If both members had stuck with the pool i.e. remained silent, then each would serve 2 years and society would have 4 years served in total (which is mathematically the best possible outcome from a collective perspective). I believe that combining a traditional account based pension and a tontine or PSF in the way described within this report – will assist in maximising multiple criteria to the best extent possible and the pooling in this simple manner under a PSF will result in both individual and societal maximisation of retirement outcomes.

So how does a PSF stack up against an annuity?

While some advocate annuities to protect against longevity and others advocate account based pensions to provide flexibility and bequests on death, I think the solution is somewhere in the middle. I believe that a tontine or PSF – whereby members invest as per an account based pension and if they die then a portion is forfeited into a pool and which would operate as outlined in this paper, has numerous merits relative to traditional annuities (and even more so with respect to deferred annuities) as outlined below:

	Annuity	PSF
Margins and Costs	You may be surprised to know but it is quite hard to track good data sources on embedded costs and margins (contingencies and profits) in annuity markets. In 2007, Amandha Ganegoda at the centre for pensions and superannuation at the University of NSW wrote a paper titled "Explaining the Demand for Life Annuities in the Australian Market" and the outcome confirmed what any decent actuarial student may have guessed that 30% of the cost of an annuity is simply eaten immediately by margins. That is 30% of the upfront capital! This is as a result of the combined effects of: • normal profit margins; • administration costs and system costs; and • contingency margins.	If you take an account based pension today, even one in retail land where management expense ratios (MERs) are relatively high, you will find that a present value calculation of all expected future fees on the invested capital is far lower than 30%. This is not surprising – since these will simply be profit margins and administration costs embedded for the investment platform and manager and will include no contingency margin for insurance purposes. The pool though is always 100% funded.
Longevity	Contingency margins are required by prudential life insurance regulators in order to allow for the possibility that the whole population of annuitants live longer than expected and provide a buffer to protect (but not guarantee) the financial solvency of the life insurance company. Note that if you as an individual member live to 99, that has little or no impact on the contingency reserve since another member may live to 66 after retirement and therefore provide capital to subsidise your longevity. It is only if all annuitants live longer that the contingency costs start to emerge and indeed if everyone lived to 110, even the largest life insurers and annuity pools would go broke.	While some may argue that a tontine or survival scheme may not provide the same guarantee as a true life annuity – I would argue that regardless of whether these two pools can or cannot provide sufficient funds for the longevity of a certain cohort – the outcome should be the same, since the capital invested and the longevity expectations of a certain given cohort are the same! This is effectively a working outcome which is related to the "Law of One Price"! This says if two transactions have the same present value, they must have the same ability in terms of the future cash flows they can generate. (Note that for the PSF to potentially generate the same/better outcome than the annuity, all participants would need to elect to put 100% into the survival

	Annuity	PSF
		pool). The real differences and benefits for the tontine over the annuity are: • It is more open and transparent • It provides more flexibility • It gives a sense of contributing to the team or capital needs of your peers rather than the profits of an unknown, anonymous insurance shareholder
Capital Needs	Reserves are needed and additional margins are needed to protect the solvency of the insurance pool and indeed the insurer. While this has an implied guarantee, the guarantee is not absolute (i.e. it may still come to pass that if everyone has extreme longevity, the pool is insufficiently funded). Note also, that if all retirees wanted such insurance, no single insurer is likely to be able to take this on due to the current capital requirements. They would therefore set about obtaining reinsurance….which itself would build in further profit and reinsurance contingency margins over and above the risk margin needed to cover the expected reinsurance costs. There is also a need (and a cost to society) to regularly monitor these capital/solvency needs and to take action when solvency margins fall.	There is no need for capital margins as the tontine or PSF is always 100% funded. All of the costs and margins ultimately paid to third parties (other than those being "insured") are held for the ultimate benefit of the participating cohort i.e. the members, trying to protect against longevity risk.

	Annuity	PSF
The Australian Age Pension	In September 2007, the Australian government reduced the asset test taper for the Age Pension from $3.00 to $1.50 for each $1,000 of assets, significantly increasing access to the age pension. However the Government also removed the 50% exemption from the asset test for annuities, thereby reducing the attractiveness of annuities.	A tontine or PSF can provide the same benefits as an insurance pool, but with lower costs and more transparency. In addition, as it is an account based pension in effect (and the integration with current legislation is discussed below) – any income derived or assessed for the age pension, is now on the same level playing field now as an annuity now that the 50% asset test exemption had been removed.
Integration with Super (and MySuper in particular)	The Cooper review initially contemplated a retirement income product being embedded in any MySuper Fund. This was later removed as a requirement. However no superannuation fund on their own can operate an annuity type pool and hence complex and potentially costly arrangements will be needed and in addition, it is possible that various superannuation funds may take various actions or set up different types of insurance for their retirees.	A tontine or PSF can be provided directly by the very funds with whom members have had long relationships and who members trust. It is a natural flow on from the pre-retirement accumulation framework embedded in MySuper without the need to integrate complex operational steps and insurance arrangements with third parties.
Regulation	Regulation is constantly changing with respect to life insurance and reserving needs. There are also regulation changes with respect to insurance accounting, tax and integration with the Age Pension.	A tontine or PSF can simply form part of superannuation and a very minor legislative change could automatically facilitate such an arrangement within MySuper. Even in the absence of such a change, I believe such a product can be facilitated in the Choice space.

	Annuity	PSF
Investments and net societal benefits	The risk premiums received from annuity sales are generally (in Australia and around the world) invested in Fixed Income and primarily in Government Bonds. These are amongst the lowest yielding and in our present view, higher risk, asset classes. An Australian 10 year bond at present will give you a nominal return of around 3% per annum (as at time of writing). This return is what is embedded into the annuity calculations and represents the effective rate a member is earning.	A tontine or PSF will potentially allow for longer term investing of the default pool, or more investing in growth orientated assets, as it will not require sovereign bond matching or reserving. This should be of benefit to both investors/annuitants and the economy more broadly. Note even if tontines or PSFs invest precisely as per insurance pools – the net return to members will be higher as there is no contingency cost loaded into premiums.
Scale	In times past it was argued that small employer-based pension funds lacked both the capital (as discussed above) and the necessary scale for insurance pooling to be viable. To this end in many countries it made more sense for life insurers to then collect a larger group of people and pool the longevity risk.	A criticism of tontines or PSFs was that they would lack scale. In the Australian context, with continued consolidation in the superannuation industry and the advent of MySuper, I would suggest that superannuation funds, by virtue of their large member bases, will have bigger pools of lives to aggregate than what insurers could potentially secure – especially given the fact that if members can make an active choice at the point of retirement, there will be a natural leakage and some will elect not to insure at all.

In summary a tontine or PSF is not unlike an annuity (no true guarantee but then again annuities only have such a guarantee to the extent the insurance pool remains solvent and there are examples where pool failures have materialised) but the benefits are that any defaulted amount or profit or contingency margin are shared amongst the pool (akin to a mutual) rather than being paid to the benefit of insurance shareholders.

Annuities were popular and likely more suitable in times gone past when:

- Yields used in pricing in the annuities were far higher (and perhaps less volatile) than they are today and so the return itself helped to make life annuities cheaper in terms of the upfront capital cost;

- Contingency margins and perhaps even upfront profit margins were lower than they are today;

- There was compulsion for annuitisation. In my view - no Government, especially an Australian Government will go down this path and even those who chose this path in times past are now moving away from this (as was originally proposed per a paper from the UK treasury entitled "Removing the requirement to annuitise by age 75" and this was in fact, recently, implemented when the UK government passed legislation in March 2014 which would Changes are being introduced in two phases, the first from 27 March, will ease current restrictions on income delivery, the second, from April 2015 will tear up the current rules annuity rules).

Also, the embedded fees in tontines or PSFs will be lower than the commissions and profit margin embedded in life insurance/annuity contracts.
Another benefit for a PSF in the Australian context is the continuity of service providers – a tontine or PSF on the back of a MySuper or traditional DC fund will make it easier to transition from an accumulation account balance to such a product as it would move along a continuum i.e. there would be no transition.

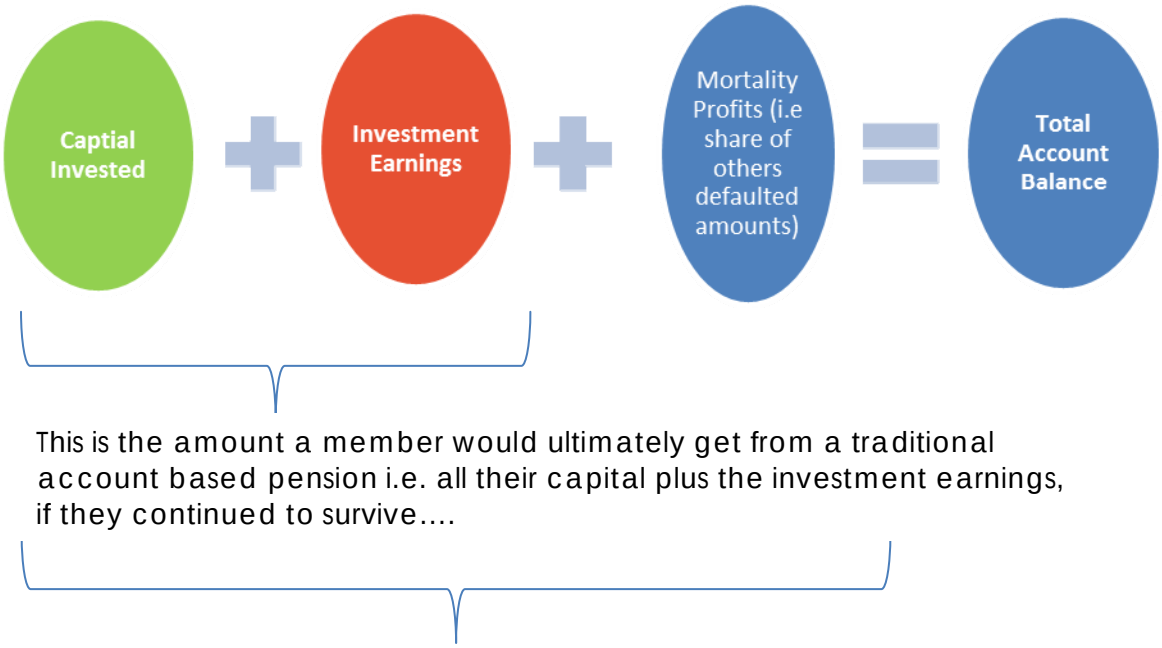
Superannuation funds themselves (putting in an argument to support Trustees considering this) also benefit as they can retain all of the funds (if every retiree purchased an annuity or deferred annuity, and considering the ageing population, think of the fund drawdown and capital amounts which would transfer from superannuation funds to insurance companies, noting that superannuation funds cannot self-insure).

What this means for MySuper funds is if a tontine or pooled- survival fund were linked to the backend of the accumulation side of MySuper, then these MySuper funds could be seen as a "cradle to the grave" superannuation solution for Australia.

Why are tontines or pooled-survival schemes preferable to an account based pension?

Quite simply an account based pension has no insurance element and so a member will only ever get their capital (plus investment earnings) back at best (they may get less with investment earnings if these are negative). In the case of a tontine or PSF the member will get their capital (plus investment earnings which again could be positive or negative) back plus a small share of the capital defaulted into the pool arising from those who did not survive.

This is demonstrated in the following diagram (if the member survives)



A tontine or PSF will also allow those who have insufficient savings to elect to forgo more of their capital on death and potentially secure even more capital (from mortality profits if the member survives) to protect against longevity risk.

Note an account based pension with no longevity protection is all well and good if a retiree has sufficient capital at retirement. However most retirees do not have sufficient capital to meet their retirement needs.

In a speech on 22 June 2011 titled "The Goal of Lifetime Income Security" (Ministerial Statement on Superannuation) Bill Shorten said "*Today, the average retirement lump sum of someone aged between 60 and 65 is $245,000 for men and $170,000 for women*".

A press release quoting the CEO of the Australian Superannuation Funds Association ("ASFA"), Pauline Vamos, in September 2011 stated:

"Given ongoing contributions and investment returns, average retirement payments in June 2011 are likely to have reached $250,000 for men and $145,000 for women. While these sums would fund a modest lifestyle, they are unlikely to be enough to fund a comfortable lifestyle in retirement. For a comfortable lifestyle, assuming part receipt of the Age Pension, the lump sum figures required at retirement are around $430,000 for a single and $510,000 for a couple"

A study by the University of Melbourne and Towers Watson released in March 2014, found that only 53% of couples and 22% of single people are on track to achieve a comfortable level of retirement income.
Now I am in no way proposing that a tontine or PSF will alleviate this gap (and indeed annuity pricing on the back of low bond yields in recent times would have served to widen this gap). Clearly a number of factors come into play here, including the level of contributions, the potential investment strategies and commensurate returns and career breaks to name but a few.

What is certain is that retirees with low balances are likely to even be worse off purchasing an annuity and forgoing an immediate cost of around 30% of their capital. However under a tontine or PSF, these members are far more likely to participate – since they can recover all of their capital (which is even more precious given they have little excess) if they survive and potentially secure even more capital from sharing in the survival pool.

The Australian Superannuation System – will it allow such a scheme (a tontine or pooled survival fund)?

There have been questions in the past as to whether tontine-type arrangements would be considered insurance under the Life Insurance Act 1995, which would preclude (say) a superannuation fund or a number of superannuation funds banding together to offer such a product without getting a life insurance licence. The common expectation of the Life Insurance Act 1995 is that a life insurance licence is needed is where there is a benefit contingent on death or continuation of life (which is clearly the case with a tontine or PSF). But there are a number of carve outs in the Life Insurance Act (See Section 11 of the Life Insurance Act 1995) which specifies that the following item (and there are other exclusions) ***does not*** constitute life insurance business:

"

c. business in relation to any scheme or arrangement under which superannuation benefits, pensions or payments to employees or their dependants (and not to any other persons) on retirement, disability or death are provided by an employer or by employees, or by both, wholly through an organisation established by the employer or employees or by both;"

It could be argued that even prior to MySuper, existing industry funds could meet this requirement (as they provided superannuation benefits wholly through an organisation established by the employees). I would expect that the type of simple PSF could be, given the above clause already embedded in within the Life Insurance Act, allowed to operate with no legislative changes necessary.

However, it should be noted, that while ideally members should not be in a position to surrender the component of their benefit allocated to the survival pool (to minimise selection against the pool), the Australian Prudential Regulation Authority ("APRA") which regulates both insurers and superannuation may seek to mandate a surrender value calculation if a tontine or PSF was considered "insurance". The precise concept design of the tontine or PSF put forward in this paper has not been tested with the regulator (for those interested see "Life Insurance (prudential standard) determination No.8 of 2007" titled "Prudential standard LPS 4.02 Minimum Surrender Values and Paid-up Values").

Note too that the proposed type of simple PSF here is also consistent with the sole purpose test already embedded in Australia's Superannuation legislation (SIS Act, Section 62) which says that

"....Each trustee of a regulated superannuation fund must ensure that the fund is maintained solely:

(a) for one or more of the following purposes (the core purposes): "

and then says that benefits based on attainment of certain ages (which is consistent with how a PSF would operate).

Behavioural Finance and Tontines

So why would people choose a tontine? And would Behavioural Finance tend to support such an endeavour?

In 2010 a chapter in a paper undertaken by UCLA discussed precisely this. The paper was entitled *"Behavioral Finance and the Post-Retirement Crisis A Response to the Department of the Treasury/Department of Labor Request for Information Regarding Lifetime Income Options for Participants and Beneficiaries in Retirement Plans*"

In one section of the paper, the difference is contemplated in perceived fairness between:

a) individuals who contribute to an annuity pool and whose deaths benefit the large unknown life insurance company; versus

b) A group of fire-fighters who belong to a tontine whereby they all contribute to the pool and receive interest and dividends proportional to their contribution. As time passes and some retirees die, only those who are still alive share the interest and dividend payments.

The author goes on to say "Now compare conventional annuities and tontines in terms of perceived fairness. In the case of annuities, an uninformed retiree might believe that an early death benefits the financial institution. However, in the case of tontines, an early death benefits other fire-fighters, which is likely to be perceived as far more fair".

Interestingly, Professor Shu (the author of this section) tells us that in 1905 in the United States, there were 9 million tontine policies outstanding among a population of 18 million households (Ransom and Sutch, 1987). It then goes on to discuss their shortcomings in terms of corruption within the schemes and the fact that some were reputedly killed to benefit others. This report addresses why these concerns are less valid than in previous times in the modern day context (particularly in Australia with large MySuper funds) and the framework in which I have presented these.

Communication of a Pooled-survival fund to members (and just a little maths…)

The concept

At the outset each person would have a different dollar allocation to the pooled-survival fund with a floor of 25% of their account balance. Each person would also have an associated likelihood of death, this is public information which can be accessed via the Australian Bureau of Statistics and these life tables are updated periodically as new mortality studies are completed.

See the attached link
http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/3302.0.55.0012008-2010?OpenDocument.

A working example and explanation to members

For illustrative purposes, let us take a very simplified example.

Assume three individuals join the Fund:

- Curly is 65 and has an account balance of $300,000;
- Larry is 70 and has an account balance of $150,000; and
- Moe is 80 and has an account balance of $250,000.

We will ignore any investment earnings for simplicity.

Now Curly and Moe make no election and agree to allocate the minimum 25% of their account balance to the pooled-survival fund and maintain 75% of the their account balance in a traditional account based pension, with full member investment choice ("MIC"). Larry on the other hand recognises that his real risk is outliving his capital and so elects to put 50% into the pooled-survival fund and have 50% in an account based pension.

The breakdown of each fund member for the current year would appear as follows:

Table1

	Curly	**Larry**	**Moe**
Pooled-Survival Fund	= 25% x $300,000 = $75,000	= 50% x $150,000 = $75,000	= 25% x $250,000 = $62,500
Account based pension (member investment choice = MIC)	= $300,000 – $75,000 = $225,000	= $150,000 – $75,000 = $75,000	= $250,000 – $62,500 = $187,500

You will note from the table above that both Curly and Larry have $75,000 attributed to the pooled-survival fund. Even though they have different starting balances at the outset, the same amount is allocated to the survival pool because Curly has allocated the default 25% of his total account balance but Larry has elected to have 50% of his total account balance allocated to the survival pool. Note that because Curly and Larry are different ages and therefore have different likelihoods of death, their share of the amounts defaulted into the survival pool based on those who die, will be different and this is illustrated further in the tables below.

Now let us consider how the amounts which are defaulted to the pool from those who die are shared amongst the survivors.

Actual experience and assessing the outcomes

Table2

Name	Age	Sum in Pooled-Survival Fund (taken for each member from table above) (A)	Probability of Death* (B)	Sum at Risk (expected amount defaulted to pool or expected amount you will receive if all deaths occur as expected) = (A) x (B)
Curly	65	$75,000	0.01106	$830
Larry	70	$75,000	0.01846	$1,385
Moe	75	$62,500	0.03099	$1,937
Total				$4,152 (C)

*From Australian Life Tables 2008-10 Males

In practice Moe unfortunately dies and as a result he can bequeath or leave to his estate all the amounts in his account based pension or MIC option i.e. $187,500 from Table 1 above. The remaining $62,500 is defaulted into the survival pool and Curly and Larry share this amount based in proportion of their sum's at risk from Table2 above.

Mortality profit share = (My Sum at Risk/ Total Sum at Risk for survivors) x Amount defaulted into the Pool

Curley gets = [$830 / ($830 + $1,385)] x $62,500 = $23,420 (1)

Larry gets = [$1,385 / ($830 + $1,385)] x $62,500 = $39,080 (2)

So where has this left the survivors at the end of the year?

At the end of the financial year, Curly's and Larry's accounts are made up as follows:

Table3

Name	MIC money in previous year (See Table 1) (A)	MIC account spent in current year (assume 10% of (A)) (B)	Pooled Amount refunded (See Table 1) (C)	Allocation or Mortality Profit for survivors (See 1 and 2 above) (D)	Total Account Balance at the start (E) = (A) + (B) + (C) + (D)
Curly	$225,000	($22,500)	$75,000	$23,420	$300,920
Larry	$75,000	($7,500)	$75,000	$39,080	$181,580

How would you explain this to members in terms of anticipated benefits and actual experience?

In practice, just as we presently do for member balances in accumulation plans – we cannot say with complete certainty the amount that will be left at the end of each year, but we can provide appropriate estimates of the expected mortality profit at the start of the year (i.e. what each survivor could expect to receive if all deaths are as expected, based on Australian life tables).

Consider, utilising all the calculations above and applying this to a far larger population, if we had a superannuation fund which had 1,250 members in the retirement or decumulation phase. These 1,250 members are made up of 500 Moes, 400 Larrys and 350 Curlys. At the beginning of the year, the expected fund demographics and experience over the coming year can be summarised as follows:

Table 4

Name	Total Number of similar people at the start of year (A)	Expected to Survive (B)	Expected to Die	Total $ defaulted = Pool to share amongst survivors (C) (A) From Table 2 x (B) here	Total Sum at Risk for All Survivors (i.e. what they insured x likelihood of death x survivors) (D)	Share of the survivor pool for each group (E) = [(D) / Total (D)] x Total (C)	Share per person in each group = (E) / (A)
Curly	500	494.47	5.53	$414,750	$410,163	$419,284	$848
Larry	400	392.62	7.38	$553,800	$543,577	$555,665	$1,415
Moe	350	339.15	10.85	$677,906	$656,898	$671,507	$1,980
	1,250	1,226.24	23.76	$1,646,456	$1,610,638	$1,646,456	

What the above table tells a member aged 65 such as Curly is that if he survives 1 year to Age 66, and all deaths occur as expected, he will receive the following amounts:

- His member investment choice account (plus investment earnings); plus
- The amount he allocated to the pooled-survival fund (plus investment earnings); less
- Any amounts he withdrew from his member investment choice account.

Note these first three amounts are what he would receive under a traditional account based pension. In addition to the three components above, the member will also receive

- Any mortality profit (plus investment earnings) which for a 65 year old under the fund is expected to be $848 (before investment earnings) in the current year.

  It is important to note that the amount of each members expected mortality profit each year will be heavily impacted by their age, the amount they allocate to the survival pool, and the mix/distribution of members both at the start of the year and those who die during the year.

Note that if the actual mortality/death experience in the year is worse than or better than expected or the demographics of the fund change during the year as a result of new members etc, then the actual amount received may differ from expectations – the point is the amount will always be positive (provided the member survives) and will ensure the total amount accumulated by an individual member is always more than what would arise under a traditional account based pension arrangement where a member continues to survive.

At the end of each fund year (or start of the next fund year), a member such as Curly could receive a statement which looked something like below (assuming the investment option Curly elected earned a return of 5% and the survival pool earned a return of 10%, of the starting balance for ease of the example):

	Account based pension (Unrestricted)	Pooled-Survival Allocation	Total
Opening Balance	$240,000	$80,000	$320,000
+ Investment Earnings	$12,000	$8,000	$20,000
+ Inflows (rollovers)	-	-	-
+ Refund from Survival Pool	$88,000	($88,000)	-
+/- Mortality Profit Received[1]	$2,000	-	$2,000
- Drawdown from account based pension[2]	($41,900)	-	($41,900)
- Expenses[3]	($100)	-	($100)
= Closing Balance at year end	$300,000	-	$300,000
+/- Allocation to Survival Pool	($75,000)	$75,000	-
= Opening Balance at Start of year	$225,000	$75,000	$300,000
Investment Strategy	Subject to your investment choice	Based on the long term strategy of the Survival Pool	
Receive this on Death	Yes	No	
Proportion of total account balance allocated to the pooled-survival fund (this can be changed at the your election)			25%
Expected Mortality Profit this year (an estimate only…with disclaimer)			$848

[1] Note all of the mortality profits are distributed back into the account based pension pool so members can spend these amounts. In practice though the term over which members can vary their allocations

to the pool could, and I would suggest should, be longer than 1 year to prevent selection/moral hazard against the pool. Perhaps 3 years or even longer.

[2] The national figures (December 2012) released for the ASFA Retirement Standard show that, in general, a couple looking to achieve a comfortable retirement needs to spend $56,339 a year, while those seeking a 'modest' retirement lifestyle need to spend $32,555 a year. Perhaps Curly uses the $41,900 from his account based pension and receives a partial age pension to get to the $56,339 each year. The latest version of the ASFA Retirement Standard can be found at http://www.superannuation.asn.au/resources/retirement-standard

[3] Please note I would **not** expect a pooled-survival fund to cost significantly more (and if so very minimally more) than a traditional account based pension. In practice the profit attribution will not be that complicated once it is systematic and effectively the above illustration would operate like an account based pension with 75% allocated to one investment strategy and 25% allocated to another investment strategy.

Conclusion

While other post-retirement solutions each have their own relative strengths compared with a tontine or PSF, on balance I think a tontine in the Australian context will better match and balance the multiple criteria being aimed for from both a member and societal perspective. In particular the tontine or pooled-survival framework considered in this paper:

- Is simple;
- Is transparent in terms of member disclosure (and I have outside of this paper already built a simple member communication framework with a member statement example);
- Can easily be integrated with the existing Australian DC ("MySuper") framework;
- Ensures individuals who survive will get more than they possibly could under a 100% account based pension solution;
- Allows individual members to customise the amount they wish to allocate to the survival pool and hence balance their own preferences or risk aversion to "outliving their capital" in which case they may allocate more to the survival pool or the desire to leave a bequest, in which case they may allocate less to the survival pool; and
- Is, I believe, allowable under current legislation as discussed in this paper – since a PSF would not constitute insurance under the Life Insurance Act 1995 and would be consistent with the sole purpose test under SIS legislation;

If such a conceptual framework were to proceed - I would expect (and hope) it to ultimately remain fairly simple. While numerous other rules can be included, I would strongly encourage any framework to be as simple as possible – this will make member understanding easier, member buy-in is improved and assists with transparency and governance and cost minimisation. A minimum floor could be contemplated for allocation to the survival pool – say 25% (or perhaps more) of your age 65 capital until age 75, then 20% of age 75 balances with incremental step downs at say 5% per year intervals thereafter.

While there clearly continues to be a desire to solve the post-retirement challenge and indeed there are many possibilities of potential post-retirement solutions, all of which have some merits in meeting the multi-faceted drivers and features desired by retirees, I believe a tontine or PSF which operates within and leverages off the scale and robust legislative, governance and operational framework already embedded within the current superannuation system will optimise benefits for both members, society, regulators and trustees.

There are already a number of examples where tontines or pooled survival funds are starting to be implemented in various places throughout the world and the utilisation or re-emergence of tontines was recently contemplated in an article in the Wall Street Journal which discussed the possibility of tontines providing a modern day solution to retiree needs (the article by Moshe Milevsky is detailed in the reference list).

There is no perfect retirement system which can maximise all variables and desires of retirees simultaneously, however I believe that a tontine or pooled survival fund is better than all others opportunities as a default post-retirement setting.

That there should be other available solutions (including annuities) should be facilitated to enable retirees who so desire to precisely meet their needs.

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