



The Dialogue

Leading the conversation

A Framework to 'Maximise' Retirement Income

Jim Hennington and Andrew Boal

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Acknowledgement of country

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A photograph of an elderly couple walking barefoot on a sandy beach. The man is on the right, wearing a grey long-sleeved shirt and khaki pants, with his arm around the woman's shoulder. The woman is on the left, wearing a light blue long-sleeved shirt and khaki pants. They are looking out at the ocean under a blue sky with light clouds.

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A note on terminology used in this paper

In Australia's retirement conversation there can be a lot of confusion around the terms 'retirement income' versus 'retirement spending' and 'investment income'.

'Investment income' is a term used by the Australian Taxation Office (ATO) to include interest, dividends, rent and income you receive from trusts. Capital gains are treated separately and are not taxed until they are realised and the income is effectively distributed. All of these amounts could be regarded as investment earnings or investment return.

'Retirement income' is an interesting concept. For assets outside superannuation, it is likely to include the investment income that ends up in your bank account and can be spent (or re-invested). For superannuation assets, retirees are likely to consider it to be the amount drawn down out of their superannuation fund and paid into their bank account to spend. However, there can be a disconnect between the investment income earned on a superannuation fund's underlying assets, the amount that is drawn out each year and the amount that is actually spent by the person each year. In the extreme, a person could choose to take up to their entire superannuation balance out in any year, and may regard this as retirement income even if they do not need to spend it for many years.

Because of this, people need to be aware of the differences between the terms 'retirement spending' and 'retirement income'.

We make two important assumptions in this paper which we need to highlight.

1. For the purposes of the Retirement Income Covenant, we assume that the amount people draw down from their superannuation each year gets spent rather than being drawn down and saved outside superannuation. In some cases, because of the minimum draw down requirements and income from other assets, some retirees (particularly the wealthy) may, however, draw down more than they need to spend.
2. There are some in the community who believe they should be able to live off a combination of the Age Pension and investment income alone and not have to draw down their capital in retirement. For this paper, we assume that most people will need to consume (spend) all or most of their superannuation 'capital' over the course of retirement, not just their investment earnings, in order to live as comfortable a retirement as they can reasonably afford, without leaving unnecessarily large amounts behind as a bequest to adult children, or other beneficiaries, of their estate.

As such, most retirees are assumed to gradually draw down their superannuation throughout retirement to match their spending needs and, in order to 'maximise their retirement income', would need to consume (spend) all the capital in their superannuation fund as well as the investment earnings (i.e. there would be no death benefit payable from superannuation). Of course, this is where the Retirement Income Covenant comes in, highlighting the need to balance this with the chance of living beyond the point when your account balance would reach zero (which we call **'longevity risk'**).



When thinking about retirement income, an important reference point for trustees to consider is a risk-free retirement income stream and the reward retirees can expect in return for taking on some investment risk and/or longevity risk.

1. Executive summary

- This Dialogue explores how superannuation trustees may need to approach any quantitative requirements and analysis in order to satisfy Australia's new Retirement Income Covenant legislation from 1 July 2022. In particular, we focus on a cohort that represents 'middle Australia' when entering retirement.
- This approach may help trustees and their advisers determine their fund's definition of 'retirement income' and 'period of retirement' for the purposes of the strategy for each cohort, and the modelling required to 'maximise' retirement income.
- When we look at the needs of individuals within the 'middle Australia' group, it becomes clear that setting a fixed end date for their 'period of retirement' is unlikely to deliver the confidence they need in order to maximise their sustainable spending from superannuation.
- To increase the efficiency of how they spend their retirement savings, and to minimise any unintended bequests, retirement strategies need to consider the lifespan of each individual.
- When thinking about retirement income, an important reference point for trustees to consider is a risk-free retirement income stream. An inflation-linked annuity addresses the three main retirement risks, being longevity risk, investment risk and inflation risk¹. It also automatically measures retirement income in terms of an *annual* level – which can align with the retiree's ongoing living costs.
- Many retirees may be willing to take on some investment risk and/or longevity risk in the hope that they can do better than this 'risk-free' retirement income. In doing so, they need to understand the risk they are taking on ('retirement income risk') and the reward they expect in return for taking those risks on (the amount of additional 'expected retirement income per annum') – in terms that are easy to understand.
- Retirees can use different combinations of products to suit their circumstances, taking into account the likelihood that their income will fall below a 'risk-free' level and how much they are potentially rewarded for taking on additional risk. As discussed in Appendix C, this can be difficult to manage as the Age Pension is legislated to increase with wage inflation, so getting a mix of products that will increase a retiree's total income with price inflation can be challenging.
- The ideas and thinking in this paper may also assist the Australian Securities and Investments Commission (ASIC) with setting out guidance for Superannuation Calculators and Retirement Estimates – in a way that is consistent with the significant progress made as Australia's Retirement Income Framework continues to take shape.

¹ In practice no product (including cash) is 100% risk free as there are still a number of risks, including credit risk, liquidity risk/surrender risk (if they have unexpected lump sum needs) to consider, and potentially some residual inflation risk if products put limits on the amount of inflation risk they take on.

Superannuation trustees need to help members maximise their expected retirement income while managing risks.



2. Australia's new Retirement Income Covenant legislation

In February 2022, new legislation was passed to implement a Retirement Income Covenant, (the Covenant), for superannuation trustees². The Covenant takes effect from 1 July 2022 and is intended to support retirees to have the confidence to spend more of their savings, while enabling choice and competition in the retirement phase of superannuation.

The legislation codifies the obligation for superannuation trustees to have a retirement income strategy that outlines how they plan to help members who are retired or are approaching retirement to achieve and balance three objectives:

1. maximise their expected retirement income;
2. manage expected risks to the sustainability and stability of their expected retirement income; and
3. have flexible access to expected funds during retirement.

The legislation covers things like the requirement for trustees to take reasonable steps to gather information to formulate a fund's strategy and the need to document the strategy and key decisions in writing. It also allows trustees to determine what class of beneficiaries the strategy applies to and to divide its membership into sub-classes and make different provisions in respect of those sub-classes.

Applying this to 'middle Australia'

To maximise something, it helps to be able to measure it. In this Dialogue we delve into some key quantitative elements that superannuation trustees should consider in order to maximise expected retirement incomes.

We acknowledge that the 'best' strategy for different cohorts of Australians (indeed, for each individual) may be very different to each other. As a result, the quantification issues will be correspondingly different. As an example, less affluent members are likely to perceive the Age Pension as being sufficient to deliver enough safe, lifetime spending to meet their income needs, such that their superannuation can act as a flexible buffer to meet any emergency spending needs and/or to support higher spending for a limited period. At the other extreme, very affluent

² https://www.aph.gov.au/Parliamentary_Business/Bills_Legislation/Bills_Search_Results/Result?bld=r6817

Australians might be able to meet their lifetime spending needs from investment earnings alone and, rightly or wrongly, may seek to leave a significant part of their superannuation balance as a bequest.

In this Dialogue we specifically focus on 'middle Australia'. We envisage a large cohort of Australians who we expect will desire a lifestyle that is more than what the Age Pension alone provides and would not want most of this extra income to ever run out (noting that the desired lifestyle in retirement may fall to some extent during retirement, especially as discretionary spending on some items such as leisure activities declines). In other words, they want to be able to meet their reasonable spending 'needs' throughout retirement, no matter how long they live, and they also expect to be able to meet some additional 'wants' particularly at the start of retirement while they are healthiest. They also would like flexible access to some additional savings in the case of unforeseen needs or emergencies.

It is this middle group of Australians for whom the quantification issues are likely to be the most difficult. This Dialogue explains why and proposes a potential approach that superannuation trustees could consider.

In terms of numbers, the Retirement Income Review (RIR) final report defined 'middle-income' Australians as those earning between 30% and 80% of the income distribution.

Appendix 1 gives insight into the likely characteristics of this 'middle Australia' cohort. In 2020 about 65% of Australians retired with less than \$250,000 in superannuation and about 25% had between \$250,000 and \$750,000. These figures are for individuals though, whereas most people enter retirement as a couple and represent two individuals. In addition, the superannuation system is not yet fully mature for many Australians with the Superannuation Guarantee only reaching the 9% level in 2002. Over the next 20 years, these bands (\$250,000 to \$750,000 in today's dollars) will reach about 50% of retirees consistent with the RIR definition. With around 5.4 million Australians currently aged between 55 and 75, the number of retirees in this cohort is expected to grow significantly over the next 20 years

The number of retirees in the \$250,000 to \$750,000 segment is expected to grow significantly over the next 20 years.



A close-up, slightly blurred photograph of a desk. In the foreground, a black pen with a silver tip and a small orange ring is positioned diagonally. To the left, a pair of black-rimmed glasses is partially visible. The background is filled with various documents, including a bar chart with blue bars and a line graph, and a table with columns labeled 'DESCRIPTION' and 'Product 1'. The overall scene suggests a professional or financial setting.

*For many older
Australians,
understanding the
complexities of
retirement and the
financial risks is a
daunting problem.*

Current legislation allows trustees to divide beneficiaries into sub-classes and make different provisions in respect of those sub-classes.

2. Trustee determinations required

As part of their response to the Covenant, superannuation trustees will have two difficult determinations to make, being:

1. The fund's definition of **'period of retirement'**.
Section 52AA(6) states "The trustee must determine the meaning of period of retirement for the purposes of the strategy."
2. The fund's definition of **'retirement income'** over the period of retirement.
Section 52AA(5) of the retirement income covenant states "The trustee must determine the meaning of **retirement income** for the purposes of the strategy, which must include income, net of tax, received **during the period of retirement ...**". It goes on to state that retirement income must include income from superannuation interests, the Age Pension and other sources the trustee determines appropriate.

Section 52AA(4) allows trustees to divide beneficiaries into sub-classes and make different provisions in respect of those sub-classes.

3. How do we measure retirement income?

The Explanatory Memorandum to the legislation states the following:

"17.44 Trustees are not required to meet any objective quantitative measure of 'maximised' expected retirement income due to the requirement to balance this with the other objectives of the strategy. The objective of maximising expected retirement income reflects the role of superannuation in providing income in retirement and that trustees should assist beneficiaries to drawdown superannuation balances.

17.45 It is expected that determining what assistance is required to 'maximise' retirement income should involve considering:

- current and expected behaviour of beneficiaries (for example, regular drawdown behaviour or the size and frequency of lump sum withdrawals);



It is important, yet inherently difficult ex ante, to be able to accurately measure the aspects of retirement income and the period of retirement.

- potential volatility (including situations of varying investment returns, inflation scenarios and mortality outcomes); and
- appropriate modelling and analysis, including modelling of expected Age Pension entitlement.”

While the trustee is not required to meet any objective quantitative measure of ‘maximised’ expected retirement income, when trying to ‘maximise’ something it is generally considered helpful to be able to measure it in some way. This means also being able to accurately define it.

In this instance, there are two dimensions to what we are measuring: **retirement income** and the **period of retirement**.

As noted earlier, Section 52AA(5) of the Superannuation Industry (Supervision) Act (SIS Act) requires the trustee’s definition of retirement income to include “income, net of tax, received during the period of retirement”. It does not require ‘income’ to be **received** as an annual (or monthly/ weekly) level. This seems to be unsatisfactory, as if you take a purely mathematical view and ignore future investment earnings, one way to “maximise retirement income” from superannuation would be to simply withdraw 100% of the account balance on the first day of the period of retirement³! This would deliver the maximum ‘income’ by ensuring 100% of the balance gets paid as income and removing any risk of the retiree dying with any unused balance.

Indeed, such an approach might be satisfactory for some less affluent retirees, but it is unlikely to be appropriate for the needs of ‘middle Australia’ and more affluent retirees.

Another major problem, that is acknowledged in the Explanatory Memorandum, is that the end of each retiree’s period of retirement is unknown:

“A trustee may wish to consider the retirement patterns of their members when working out the start of that period [of retirement] and consider the distribution of life expectancies of their members in forming views about the end of the period.”

It also states that:

“Sustainable retirement income is income that is reliable, durable and lasting for a beneficiary’s entire period of retirement.”

Determining the point when a member is at the start of retirement is a non-trivial matter for a trustee to determine. This is due to the wide range of unique household situations that arise as Australians ‘phase’ into retirement. Most Australians also enter retirement as a couple and often at different times and ages.

It is therefore likely to be very difficult for a trustee to estimate, let alone help to manage, the erratic cashflows that their members face as each individual, and their potential spouse or partner, adjusts their personal situation for the following real-life issues.

- Spouses of different ages: this results in highly irregular Age Pension income patterns due to the fact each spouse qualifies at a different point in time and has a material impact on how much Age Pension their household receives each year.
- Spouses with different working patterns: this can result in highly irregular cashflows – where each spouse leaves the workforce at a different time – potentially from illness, redundancy or reducing their hours for an extended period.

³ If a retiree delays taking any part of their superannuation balance past day 1 of the period of retirement then, mathematically, you won’t maximise retirement income ‘received’ for all retirees as some will be expected to die on day 1 then day 2 of the period of retirement and so on.

A key problem is that the 'end' date of each beneficiary's period of retirement is also highly variable.

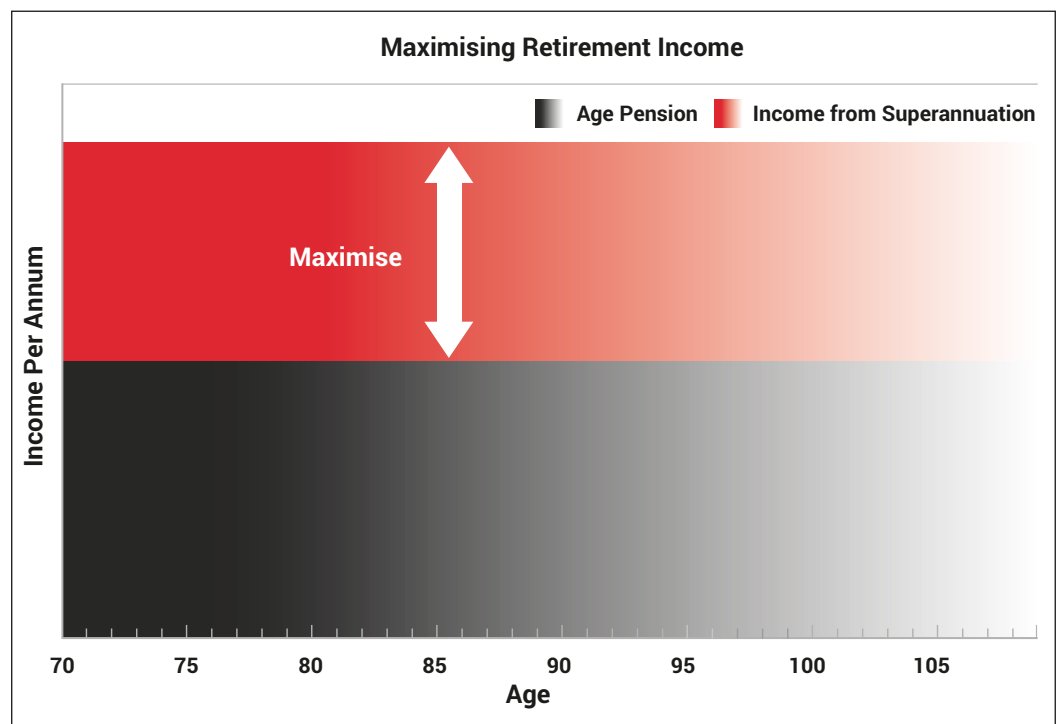
- Decisions to use either non-superannuation savings or withdrawals from superannuation to top up these lumpy cashflow scenarios – especially if one or both of their salaries reduce or stop prior to both spouses reaching their Age Pension Age and/or starting a superannuation income stream.

As a result, members are likely to need considerable flexibility with how they access their superannuation until both individuals in a couple have reached their Age Pension age and have finished working. These are arguably qualitative matters and, in this paper, our focus is on what happens after that point. From a qualitative point of view, the elephant in the room is that the 'end' date of each beneficiary's period of retirement is also highly variable and is unknown in advance. Retirement ends upon death and the timing of death for each individual within a group is highly unpredictable years in advance.

Figure 1 below helps to demonstrate the nature of this problem. The black shaded area represents the income a single pensioner might expect to receive from the Age Pension (in today's purchasing power). The shading reflects the probability of being alive at each age to receive that income. The dark shading at younger ages reflects that there is a high probability the person is alive at those ages. The light shading at older ages reflects that there is a low probability they are alive to receive it. By design, the 'period of retirement' for the Age Pension ends upon the pensioner's death.

The addition of the red shading is a representation of the concept of 'retirement income' based on a layman's use of that phrase⁴. The shading of the red area reflects the probability of being alive at each age to receive that additional income from superannuation. The dark shading reflects a high probability of being alive to receive it and the light shading reflects a low probability of being alive to receive it.

Figure 1: Retirement income is needed for an unknown timescale



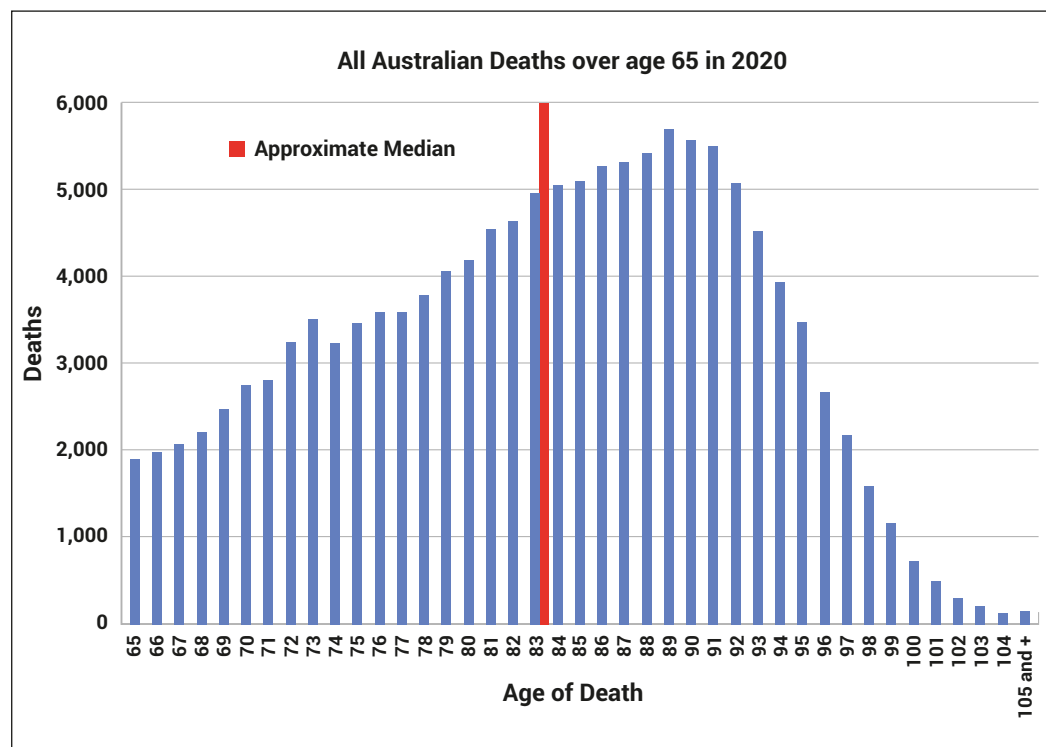
This starts to raise the question: How can superannuation funds measure retirement income when we do not know how long that income needs to last?

⁴ A typical definition of the word 'income' means regular payments that a person receives in return for providing a product or service, investing capital or receiving a pension. For most people, it is counterintuitive to treat spending their capital as 'income' (although the concept of 'buying' an income stream is generally understood).

Tension can arise between designing products that either last a long time or pay a higher annual income.

Actual data for the end of the 'period of retirement' for Australians who died in 2020 is shown in Figure 2. Individuals entering retirement do not know, in advance, where they land on Figure 2. It is therefore impossible to determine an end date for their 'period of retirement' in advance.

Figure 2: End of 'period of retirement'



Source: Australian Bureau of Statistics figures. Note: Median is the 50th percentile, i.e. half of the deaths in Figure 2 occurred before that age and half above that age.

The retirement products currently offered by most superannuation funds are individually allocated to members. They require the member's balance to be gradually withdrawn over time to generate their retirement income⁵. This creates a tension between designing products that either last a long time or pay a higher annual income, especially during the earlier years of retirement while the person is healthier. Individually allocated balances cannot achieve both goals at once as discussed further in Section 4. An uncomfortable trade-off would be required.

To choose a metric for measuring retirement income we might consider using:

- an **annual** income metric; or
- a **total** income metric over part of the period of retirement.

Both have their challenges. A problem with measuring and maximising retirement income using individually allocated balances is the metrics are not purely 'outcomes' or 'outputs' from a given strategy. The amount withdrawn each year is a fundamental part of the strategy itself.

⁵ The account-based pension minimum withdrawal rates are a version of this. ASIC's Moneysmart retirement calculator applies a different approach – where the level of withdrawals are assumed to be set such that the person reduces their balance to zero at age 90 (by default). Whilst age 90 is slightly above average life expectancy for 65 year olds, couples have two chances of living longer than average and therefore need to plan for longer. For a typical couple entering retirement to be 80% confident that they will not outlive their retirement plan, it needs to be able to last 35 years. <https://actuaries.asn.au/Library/Miscellaneous/2020/RNLifeExpectancy.pdf>

Leaving material balances at the time of death is an inefficient use of retirement savings that were intended to deliver retirement income.



4. How do we 'maximise' retirement income?

The rules for account-based pensions require the member to make a major strategic decision regarding their drawdown strategy.

Annual withdrawals are subject to a minimum percentage of the member's balance that is required to be withdrawn each year. The minimum percentage starts at 4% for members below age 65 and increases at key ages up to 14% after age 95. Taking the minimum is a drawdown strategy that, instead of ending at a fixed age, delivers a fairly prudent (cautious even) income that reduces gradually if the member reaches advanced ages. Drawing the minimum is unlikely to maximise retirement income over the lifespan of each member. Doing so generally results in an overall drawdown pattern (including the Age Pension) that increases during retirement rather than giving the member confidence to increase their total drawdown in the first 10-15 years of retirement while the person is healthier and likely to desire a more costly lifestyle. Most people who draw down the minimum amount will have at least some unused balance remaining on death and in many cases it will be quite material. Leaving material balances at the time of death is an inefficient use of retirement savings, including tax concessions, that were intended to support an income during retirement and not left as a bequest to children or the estate.

Using a fixed end age for retirement income

One approach a superannuation trustee might take is to define the 'period of retirement' as ending on a fixed age. For example, one starting point that a trustee might consider is to use average life expectancy to determine their 'period of retirement' end date.

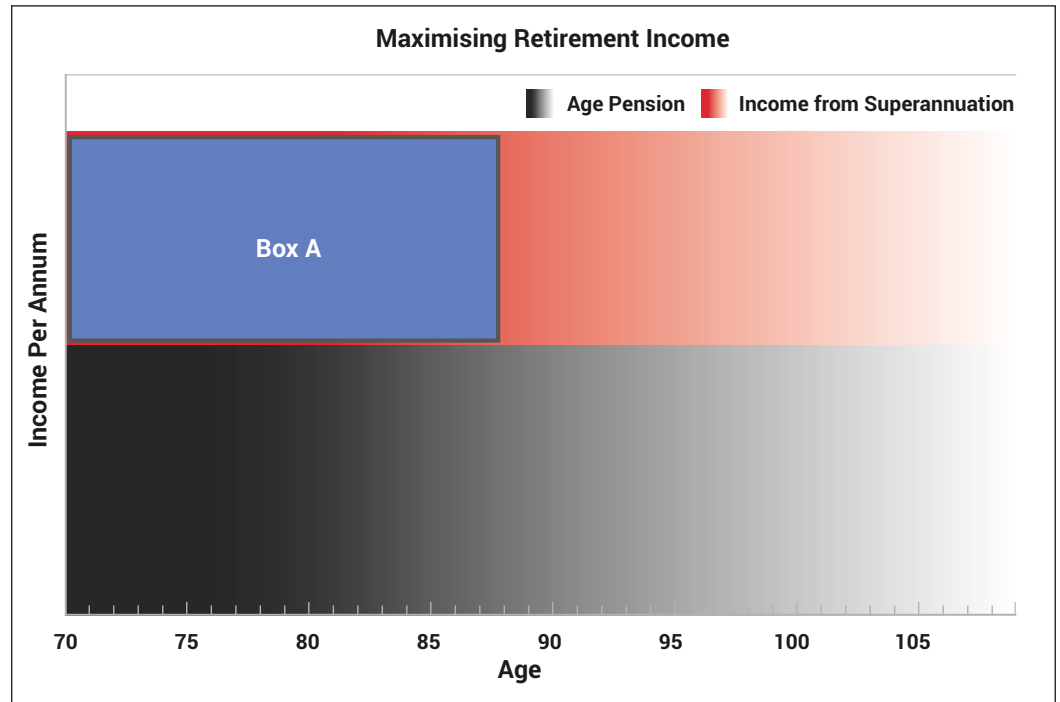
Such an approach is shown by Box A in Figure 3 on the following page. This approach would allow the trustee to design a withdrawal strategy that maximises retirement income over this known period. The strategy would deliver the maximum retirement income for the 'average' member.

However, from the members' point of view, this means half of people who use the product can expect to run out of superannuation whilst they are still alive – as indicated by the remaining red shading in Figure 3. This is an undesirable outcome for many retirees. A recent survey by Challenger found 49% of Australians over age 45 were concerned about running out of superannuation before they die⁶.

⁶ <https://www.afr.com/policy/tax-and-super/one-in-two-australians-worried-about-outliving-super-20211125-p59c3p> and <https://www.challenger.com.au/-/media/challenger/documents/thought-leadership/balancing-retirement-income-risk-report.pdf>.

It would be helpful if there was an industry accepted standard of what it means for a retiree to have high and medium levels of confidence their savings will last as long as they live.

Figure 3: Using a fixed end age for retirement income

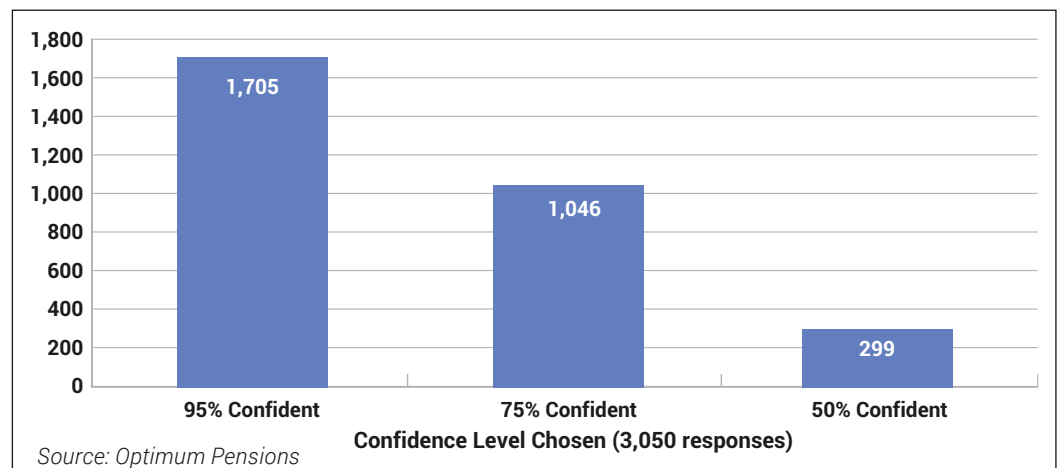


If our 'middle Australia' cohort desires a lifestyle that is in excess of the Age Pension for life, then their needs will be only met for a certain number of years then stop abruptly.

Data from over 3,000 users of a recent online lifespan planning tool⁷ shows that most people want a high or medium likelihood that their retirement savings will last as long as they might live. Just under 10% of users opted to have 50% confidence (i.e. average life expectancy as per Box A).

Note, in offering users these choices, this tool described a 95% confidence level as being 'high' and a 75% confidence level as being 'medium'. It would be helpful if there was an industry accepted standard of what high and medium levels of confidence means, so that there is consistency across different education materials and online tools and calculators. Of course, individual members could still be allowed to vary the level of confidence to match their own circumstances but the default starting position would be an agreed industry standard.

Figure 4: Desired level of confidence that retirement income will last for life



⁷ <https://www.optimumpensions.com.au/lifespan-calculator/>

Any retirement income strategy that has a fixed end date cannot simultaneously provide retirees medium to high levels of confidence and maximise their retirement income.

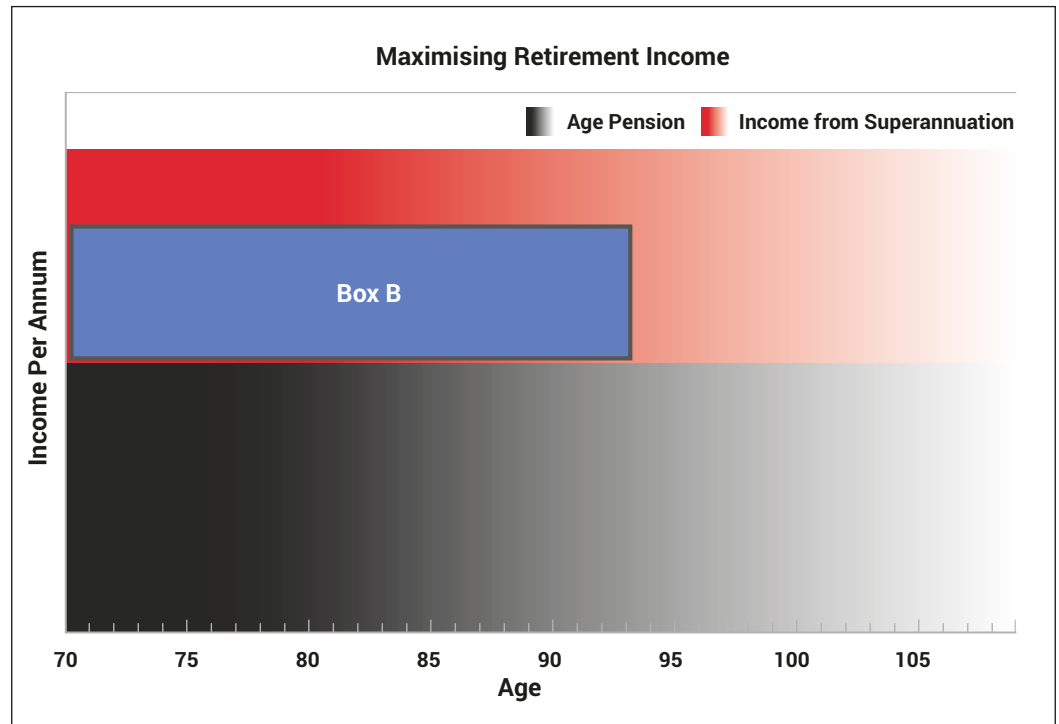
From the individual’s point of view, death is a binary outcome. In each future year of retirement, the individual will either be (a) alive needing income or (b) dead. Each individual’s lifespan does not ‘fade out’ like the red shading in Figure 3⁸ on the previous page.

For the purposes of the Age Pension, the Department of Social Services has effectively determined the ‘period of retirement’ ends on the death of each individual.

Another trustee might acknowledge that their members require better than a 50/50 chance their superannuation will last their whole life. This trustee decides to add a margin to life expectancy when setting an end date for the ‘period of retirement’, but still sets a fixed age.

This approach is shown by Box B in Figure 5 below. In this case the fund is able to give their members more confidence that their superannuation can last for their whole lifespan but may fail to ‘maximise’ annual retirement income – because, to achieve this result using individually allocated balances, the trustee would have to be more conservative with withdrawal rates earlier in retirement. Such an approach would mean more members would die with more material unspent balances that could have been used to support higher retirement income.

Figure 5: Using a fixed end age plus a margin



If members want more than a 50/50 chance that their retirement income will last for life, then strategies based on retirement ending at a fixed age cannot at the same time ‘maximise’ that member’s retirement income.

⁸ Trustees should think twice before designing strategies that weight future cashflows by the probability the member is alive. Such an approach only works if looking at the whole cohort in aggregate. It is inappropriate for target customers who want confidence due to the on-vs-off nature of each individual’s needs if they do survive.

Many retirees spend cautiously in order to help manage their own longevity risk.



5. Allowing for an uncertain timescale: period of retirement

Behavioural evidence: what does 'middle Australia' want?

The Institute submission to the Retirement Income Review⁹ highlights that members seem to be aware of the uncertainty they face around their life expectancy. It is common sense for retirees to take into account the fact some will die within a year of commencement whilst others will live closer to the end of the Australian Life Tables (which is age 109).

There are studies that show many retirees spend cautiously in retirement in order to help manage their own longevity risk, to leave a bequest and/or to maintain some flexible spending.

"Studies of retiree behaviour based on Centrelink data¹⁰ show that the median pensioner spends little of their assessable wealth (mainly financial) in retirement. The vast majority of their balances get paid as death benefits when they pass away. The reasons for this are likely to be:

- 1) *A fear that reducing their balance could leave them short in later life. A particular problem is that people don't know when they will die. A natural response to this uncertainty is to err on the side of caution and maintain a reserve (i.e. millions of individuals are self-insuring their own longevity risk).*
- 2) *A desire to leave money to children. This, presumably, is contrary to the objective of our tax-incentivised superannuation system.*
- 3) *A need to have money set aside for large expenditures, particularly possible health care or Aged Care costs which are likely to arise in retirement."¹¹*

How do we maximise something that is subject to an uncertain timescale?

The Retirement Income Review's final report noted that in order to safely spend down a retiree's superannuation balance by a fixed age in a way that acknowledges their need to have confidence in not running out, a longevity product is needed to provide income after that fixed age¹².

9 <https://www.actuaries.asn.au/Library/Submissions/2020/retirementreview.pdf>

10 Asher, A., Meyricke, R., Thorp, S., & Wu, S. (2017). *Age pensioner decumulation: Responses to incentives, uncertainty and family need*. Australian Journal of Management, 42(4), 583-607 <https://journals.sagepub.com/doi/10.1177/0312896216682577>

11 Pages 21 and 22 of <https://www.actuaries.asn.au/Library/Submissions/2020/retirementreview.pdf>

12 Retirement Income Review Final Report p197 and p522 – 523. The Review assumed a 5% allocation to an innovative deferred longevity product as a way for trustees to meet the sentiments in the proposed Retirement Income Covenant but notes on page 523 (Table 6A-13) that higher incomes can be achieved by allocating more to longevity products.

It can be helpful to look at approaches used in other countries for a single metric to measure 'retirement income'.

Please note: Before you continue, it is important to understand that on 1 July 2017 new laws were enacted to enable a broader range of complying retirement income stream types in Australia. Prior to this, a 'lifetime annuity' generally meant fixed rate annuities that guarantee **both** investment risk and longevity risk. Lifetime annuities now do not need to guarantee a fixed rate based on today's low rates of interest.

Investment linked annuities and innovative lifetime income streams can pass on the investment performance of a chosen portfolio. They unbundle longevity risk from investment guarantees and can be an important tool for superannuation trustees to have at their disposal. For more information, see the *Actuaries Digital* article [What is an investment-linked annuity?](#)¹³

A possible solution for dealing with S52AA

It can be helpful to look at approaches used in other countries for a single metric to measure 'retirement income' given the uncertain timescale. For example, in the UK, pension funds (superannuation funds) must provide members with a projection of the yearly income they are expected to receive in retirement. See Appendix B for an example statement from a UK pension fund. **The UK rules require this projection to be based on the use of an insurance product that hedges the uncertain time dimension**¹⁴.

The insurance product type used for these projections is a lifetime income stream (i.e. using a prescribed theoretical annuity formula¹⁵). This product class can determine a defined level of annual income and absorbs the impact that the individual's uncertain lifespan has on how much they can spend per year in retirement.

This approach acknowledges the fact that the individual cannot set a figure for their own lifespan and therefore shows outcomes based on a product class that removes this risk.

Australians are more used to lifetime annuities than many people think. For example, the government Age Pension is a very similar 'product' to a lifetime annuity that Australians are generally quite familiar with. Provided that means testing does not apply, then the outcome from the Age Pension is an exact match with how long the pensioner lives.

The idea of referencing a particular product type to inform strategy can be met with a form of skepticism from some Australian superannuation practitioners – with comments like “you cannot do that, it's about strategy first, not product”. Perhaps this reaction is due to unfamiliarity with the importance of annuities globally and historically, or a perception that annuities are poor value for money (due to traditional annuities providing long-term investment guarantees in addition to longevity protection). However, a strategy is less likely to succeed if it is blind to the tools that are available to help solve the problems. One could argue that a strategy designed from a starting point of individually allocated accounts (account-based pensions) is equally guilty of allowing a product type to influence strategy. It is just a matter of different reference points to provide perspective.

In other areas of finance, it is common to design strategies by reference to specific financial product categories. Cash is an obvious reference point for many investment strategies. Yields on government bonds are another example – often used as a risk-free rate for hedging longer-term cashflows. Using generic product categories to inform strategy is common practice.

Figure 6 shows how a lifetime income stream (Box C) can combine with the Age Pension to deliver income that matches a retiree's reasonable spending needs. Here the trustee might acknowledge that

¹³ <https://www.actuaries.digital/2021/09/27/what-is-an-investment-linked-annuity/>

¹⁴ <https://www.frc.org.uk/actuaries/actuarial-policy/technical-actuarial-standards/actuarial-standard-technical-memorandum-as-tm1>

¹⁵ The required calculation basis projects the member's balance to retirement then divides it by an annuity rate based on a prescribed real interest rate (for inflation linked annuities) or nominal interest rate (for level annuities) and using prescribed mortality table for UK pensioners. The results are understood to be broadly in line with market rates for annuities (but it is worth noting that most retirees in the UK are eligible for 'enhanced' annuities which offer a higher rate to customers with health issues recognising they have a shorter life expectancy). [Thank you to Henry Tapper of AgeWage in the UK for confirming the source of these requirements]

Annuities may impose limitations on income flexibility.

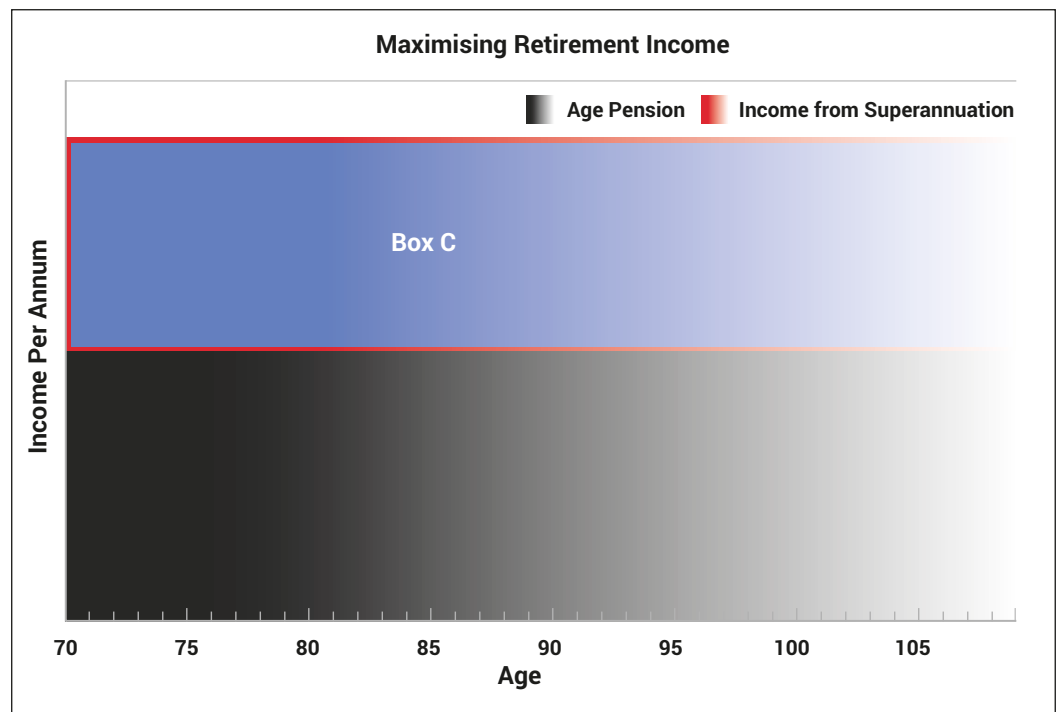
its members require confidence that their superannuation income will last their whole life. The lifetime income stream has the potential to *simultaneously*¹⁶:

- deliver higher expected income for members in retirement than Box B in Figure 5; and
- do this without any increase in the risk of outliving their savings.

This is made possible because lifetime income streams pool longevity risk. In effect, they redistribute money that would otherwise be paid as bequests in Figure 3 to provide additional income to surviving retirees as indicated by the shading in Figure 6. Individuals who pass away before their life expectancy leave behind reserves that get used to fund the income of those who live past life expectancy. This explains how the blue box in Figure 6 appears much larger than in the previous constructs. From the perspective of each individual, their income can continue for life. But from the perspective of the product provider, income only needs to be paid to retirees who remain alive. Investment-linked lifetime products can have the same investment mix as an account-based pension and insurance can be used to remove the remaining randomness of lifespans for a particular group of members.

Further, a lifetime annuity formula provides a metric that can measure ‘retirement income’ in a way that absorbs the impact each individual’s uncertain lifespan has on how much they can spend each year. However, annuities are not so flexible should the member wish to change their drawdown strategy or withdraw their investment in that product after it is purchased.

Figure 6: Combining a lifetime annuity and the Age Pension for retirement income*



* To discuss the main concepts in this paper, we assumed annuity payments and retiree spending increase in line with the Age Pension payment rate over time. However, in reality this detail can be more complex. The basic component of the Age Pension is legislated to increase at the higher of the Consumer Price Index (CPI), Pensioner and Beneficiary Living Cost Index (PBLCI) and Male Total Average Weekly Earnings (MTAWE) and retiree spending is generally thought to increase at a rate that is closer to CPI or lower. In Appendix C we discuss the practical consequences of these differences in increase rates.

¹⁶ https://treasury.gov.au/sites/default/files/2019-03/FSI2014-Comm_work_Towards-more-efficient-retiret-income-prods.pdf

Fund members need to consider the ability to absorb falls in the value of their investment(s).



Risk – Reward trade-off

If you take the cash example further, cash is regarded as the risk-free asset class and investors expect to be rewarded for any additional risk they take on. So, conceptually, a useful reference point to assist members to determine their income in retirement and to understand retirement risks is to start with a 'risk-free' retirement income strategy¹⁷. Like the UK projection statement, this 'base case' would be based on a product class that hedges both longevity risk and investment risk (and potentially also inflation risk).

If a retiree then chooses to (partially) take on any of these retirement risks, they might expect to be rewarded with higher payments and be provided with some information about the level of confidence in that outcome and the consequences if things go awry. It should be noted that for means-tested age pensioners, if investment returns are negative on account-based assets (or investment-linked income streams), their Age Pension income can increase and help to compensate.

A further advantage of using a lifetime income product as a reference point for retirement income is that under Centrelink means testing rules, the cashflow pattern of Age Pension income is steadier over the course of retirement than for an account-based pension. A problem with account-based pensions under the means test rules is they can result in an Age Pension that is low in the early years of retirement and higher later as the person's assessable assets reduce over time. This does not necessarily apply to a lifetime income product in the same way.

Capacity for loss

In 2011, the UK's Financial Conduct Authority referred to an important concept called the 'capacity for loss'¹⁸ when assessing the suitability of investment risk for households. Capacity for loss refers to the member's ability to absorb falls in the value of their investment(s). If any loss of capital (or income) would have a materially detrimental effect on their standard of living, this should be taken into account in assessing the risk that they are able to take.

When superannuation trustees decide how much risk their members might be exposed to in retirement, an important consideration is the consequences of those risks and, in particular, understanding how much downside would cause a materially detrimental effect on the beneficiaries' standard of living.

¹⁷ In practice, no product (including cash) is truly risk free as there are still a number of risks, including credit risk, liquidity risk/surrender risk (if they have unexpected lump sum needs), and potentially some residual inflation risk if products put limits on the amount of inflation risk they take on.

¹⁸ <https://www.fca.org.uk/publication/finalised-guidance/fsa-fg11-05.pdf>, page 3

One of the challenges for our retirement income system is to give retirees the confidence to spend more of their superannuation during the period they can derive more benefit from it.



6. A possible approach for 'middle Australia'

Clause 17.45 of the Explanatory Memorandum says "it is expected that determining what assistance is required to 'maximise' retirement income should involve considering:

- current and expected member behaviour (for example, regular drawdown behaviour or the size and frequency of lump sum withdrawals);
- potential volatility (including situations of varying investment returns, inflation scenarios and mortality outcomes); and
- appropriate modelling and analysis, including modelling of expected Age Pension entitlement."

We now look at these in turn.

The current and expected member behaviour

The middle Australia cohort has sufficient retirement savings to support a significantly higher lifestyle than the Age Pension on its own (refer to Appendix A for the likely characteristics of this cohort). Even at the lower end of the range, \$150,000 in retirement savings could support a lifestyle of around \$7,500 per annum more than the Age Pension alone, for life (a 30% uplift in living standard for life).

As mentioned earlier, there are studies that show many retirees spend cautiously in retirement in order to help manage their own longevity risk, to leave a bequest and/or to maintain some flexible spending.

If you consider the perspective of a person once they are well into their retirement, these findings start to make sense. Take for example someone who is 15 years into retirement and currently 82 years old. With an account-based product their balance would be significantly depleted since they entered retirement and yet, at age 82, they are still faced with the pressure of having to manage this investment to fund their lifestyle needs over a still unknown number of future years through unknown future market and inflation conditions. The natural reaction might be to reduce this risk by spending less in the early years of retirement. Whereas a lifetime income stream holder carries no such responsibility – they simply see their bank account topped up each month to help them cover their spending needs.

Retirement products that expose members to risk need to consider the consequences of those risks.

A University of Michigan study of over 20,000 retirees in the USA found that those with secure sources of lifetime income (such as annuities) have higher levels of retirement satisfaction than those who do not, even taking wealth effects into account¹⁹.

One of the more significant challenges for our retirement income system is to give retirees the confidence to spend more of their superannuation (and other savings) in the earlier years of their retirement while they enjoy better health.

Potential volatility (risk)

Any attempt to define and quantify 'risk' is implicitly making judgements about the retiree's various preferences.

A potential 'base case' for comparing retirement outcomes against would be a product that hedges the main risks in retirement: longevity risk and investment risk (and potentially also inflation risk).

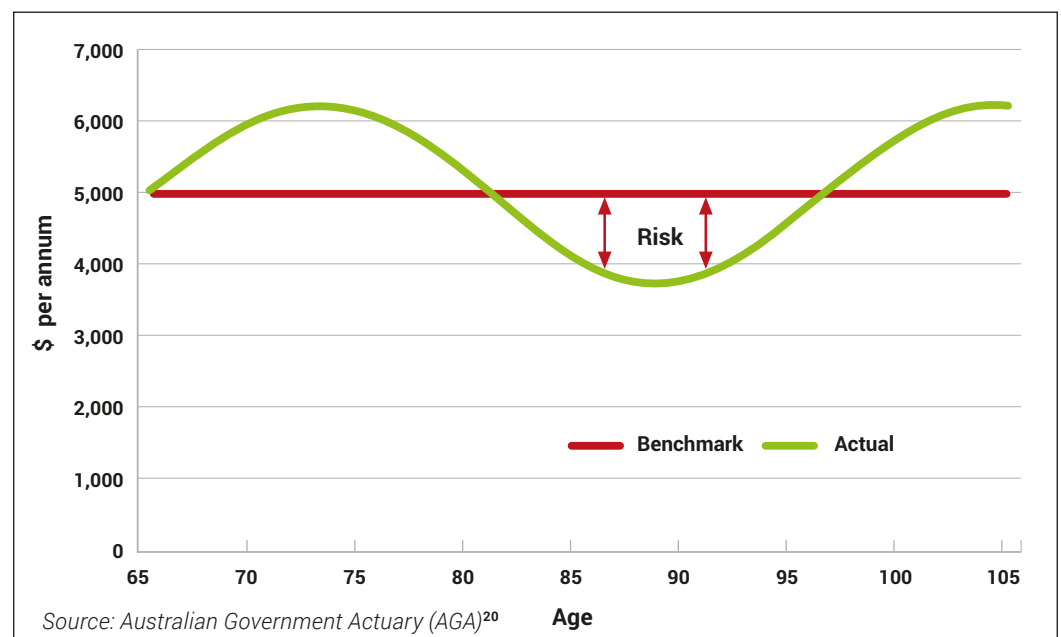
Products that introduce risk should consider the consequences of those risks and, in particular, whether the downside could cause a materially detrimental effect on the beneficiaries' standard of living (ie. their 'capacity for loss').

In 2018, the Australian Government Actuary (AGA) published a technical paper as part of Treasury's Retirement Income Disclosure Consultation²⁰. The request from Treasury was to quantify the key risks for any retirement income strategy and design a single metric that encapsulates these risks.

The AGA's proposed approach was to quantify the variation between the actual payments from a particular retirement strategy and a benchmark level of income that would mitigate fully against these retirement risks. The proposed benchmark was the first year's annual payment from the strategy, indexed to inflation (CPI) for the life of the retiree.

Figure 7 is a visual illustration of the risk being measured under this approach. The benchmark in real income terms is illustrated by the red line and the actual income from a particular strategy is illustrated by the green line.

Figure 7: Visual illustration of risk under the AGA's proposed Retirement Income Risk Metric



²⁰ <https://treasury.gov.au/consultation/c2018-t347107>

There is a balance to be struck between 'maximise retirement income' and a strategy's other features.

This approach results in a higher risk score for products that do not provide protection against inflation risk and/or investment risk for the full potential lifespan of the retiree (e.g. until the end of the life tables or some proxy where the vast proportion of the population would have passed away). The rationale for continuing to the end of the life tables (or a proxy like age 100) is that if you remain alive, your standard of living needs still continue even if the amounts change with age as you spend less on discretionary items like transport and leisure and more on items like household services and health²¹. Spending needs do not reduce in line with the probability you are alive. It is better for the risk measure to highlight the presence of risk, and for the retiree to consider this in light of their risk appetite and personal circumstances.

Calculating the AGA's proposed metric involves determining the income a retiree would receive across multiple (stochastically generated) scenarios in order to derive a distribution of retirement incomes payments that are expected from the strategy being examined. In each scenario, the product rules would be used to determine the payments from a strategy under each scenario up to when the majority of a cohort of retirees would have passed away. The risk metric then summarises the results from all simulations.

For examples of this risk metric applied to a range of retirement products, see pages 7-15 of the AGA's paper *Retirement Income Risk Measure* which was part of Treasury's Retirement Income Disclosure Consultation in 2019.

Such an approach would help to quantify the trade-off between higher retirement income (e.g. using an investment-linked lifetime income stream and/or an account-based pension) and higher retirement income risk.

Under this proposed approach²²:

- a CPI indexed lifetime annuity would receive a zero-risk score (presuming the annuity provider has a very strong credit rating); whereas
- an account-based pension invested in a defensive portfolio would receive a higher risk score – to reflect, for example, the higher chance that the annual income from the product would not keep pace with inflation for life.

Appropriate modelling

To develop and refine a retirement strategy for the middle Australia cohort, superannuation trustees will need to model and test various levers and choices that may impact beneficiaries the most. In reality there is unlikely to be an 'optimum' solution. Each household (or cohort) must make trade-offs to suit their particular preferences and models help to quantify those trade-offs. There is a balance to be struck between 'maximise retirement income' and a strategy's other features. Features that are likely to be important to retirees and require trade-off decisions include:

- having a benefit paid to protect the estate in the event of an untimely death;
- having sufficient access to flexible withdrawals; and
- reducing retirement income risks (as per the discussion earlier in Section 6).

This exercise has parallels to investment risk profiling (i.e. choosing between higher investment volatility and higher average investment returns). But retirement strategies need to take into account all of the above trade-offs, not just investment volatility.

²¹ 'Spending Patterns of retirees as they age – the needs of older retirees', ASFA Research and Resource Centre, July 2011, page 11.

²² <https://treasury.gov.au/sites/default/files/2019-03/Retirement-Income-Risk-Measure-FINAL-Consultation-1.pdf>

Sophisticated models can be used to calibrate and quantify these trade-offs. Judgement will then be needed to make decisions.

Superannuation trustees can use this process to help develop 'guided choice' architecture that leverages the results of such modeling. The goal is to provide tools to help assign and guide members to appropriate retirement strategy settings.



7. Conclusions

At first glance, the proposed requirements in Section 52AA of the SIS Act seem to be met from a compliance perspective if superannuation trustees use an average life expectancy to determine their fund's definition of 'retirement income' and 'period of retirement'. However, when we look at the individual retirement needs of middle Australia, it becomes clearer that setting a fixed end date for the 'period of retirement' is unlikely to:

1. deliver the confidence they need to maximise their retirement income and spend more of their savings earlier in retirement while they are healthier; and, at the same time
2. provide adequate protection against a large proportion of the target market (middle Australia) running out of superannuation during retirement, causing them to fall below a satisfactory level of income that meets their reasonably expected retirement needs.

Some other countries quantify 'retirement income' by referring to insurance products that absorb the impact of an individual's uncertain lifespan and how much annual income they can achieve. Such products (lifetime income streams) are an important reference point for designing retirement income strategies. They can help to achieve the objective of maximising annual retirement income whilst absorbing timeframe uncertainty.

For the past two decades, the superannuation sector in Australia has primarily focused on net investment returns to maximise a person's balance at retirement. There is a risk that some superannuation trustees still view the retirement phase through a pure investment-lens and use 'pure account-based' thinking to make the required determinations for Section 52AA of the SIS Act. However, this approach is unlikely to satisfy the income needs for many retiring Australians.

Lifetime income streams can be an important reference point for designing retirement income strategies.

Retirees can combine products to achieve appropriate risk-reward outcomes and their need for access to funds.

A possible approach for the trustee determinations required under the sections 52AA(5) and (6) for middle Australia is as follows:

Determination	Possible metric to use
Period of Retirement end date	The death of each individual retiree.
Safe Retirement Income	Annual income that can be expected using a 'risk-free' lifetime income stream (or partial use of a lifetime income stream). This could be informed by market rates ²³ and would provide a reference point when designing retirement income strategies for retirees.
Expected Retirement Income	Commencing level of annual income from a particular retirement strategy. A 'strategy' may combine a number of product types, investment strategies and drawdown strategies.
Retirement Income Risk	The AGA's proposed Retirement Income Risk Measure.

The use of a lifetime income stream (or an annuity formula) to quantify retirement income has the following potential advantages:

- it avoids the need to determine a fixed end date (e.g. age or number of years) for the 'period of retirement'; and
- it automatically measures retirement income in terms of an *annual* level of income – which can align against the retiree's ongoing living costs.

Retirees can then select a combination of products to suit their own circumstances, taking into account the likelihood that their income will fall below a 'risk-free' level and how much they are potentially rewarded for taking on additional risk.

Appropriate models can be used to quantify and assess the trade-offs between maximising expected annual retirement income and:

- having a death benefit;
- having flexible access to some funds;
- accepting some longevity risk; and
- accepting some investment risk and inflation risk.

When quantifying these trade-offs, superannuation trustees can approach the modelling on two distinct levels.

1. **Outcomes for a cohort 'in expectation':** Here we might look at the survival-weighted present value of future retirement incomes for **all** the members in a cohort, in aggregate. Each member's future retirement income can be projected, then multiplied by the proportion of members who are still alive in that future year to receive it. The result can

²³ For example, the average of product rates in the market.

An investment-linked lifetime income stream has the potential to provide efficient outcomes.

be summed across all members in the cohort. Such an approach gives a measure of how efficient a strategy is at a group level. It can be used to design/test strategies that are efficient for members 'on average'. It is effectively modelling the cohort as if it were a pool of lives but ignores the fact that a predictable number of the individual members may get poor outcomes – that do not align with the objectives of the target market. For example, Box A in Figure 3 might perform well using this methodology but fails to deliver lifetime income for around half of the members in the cohort.

- 2. Outcomes through the perspective of the individual:** For retirement solutions that are designed for middle Australia, the individuals in the target market require confidence that their superannuation income can continue for life. For example, if each individual member wants to be 80% confident that their superannuation income can last as long as they live, then a model should look at what income is achieved up until an age that has an 80% chance of covering their actual lifespan. For a male aged 65 years who is in average health, this means his income would need to be able to last to around age 95 years²⁴. For a female it needs to be able to last until around age 97 years and for a couple where the male is age 65 and female is 62 it would need to be able to last until the male reaches age 100. Healthier retirees tend to live even longer.

Initially the objective under approaches (1) and (2) seem to conflict with each other. But an investment-linked lifetime income stream has the potential to provide efficient outcomes on both these levels simultaneously. This is subject to having reasonable costs and a mortality basis that is accurate for the socio-economic demographics of the cohort.

At the end of the day, the objective of the Retirement Income Covenant is to improve the outcomes for individual members. As noted by the AGA, "*Lifetime income streams can be combined with account-based products to design solutions that meet a balance of carefully calibrated objectives and deliver 15% – 30% higher incomes*"²⁵.



²⁴ <https://actuaries.asn.au/Library/Miscellaneous/2020/RNLifeExpectancy.pdf>

²⁵ Modelling by the Australian Government Actuary for the Financial System Inquiry

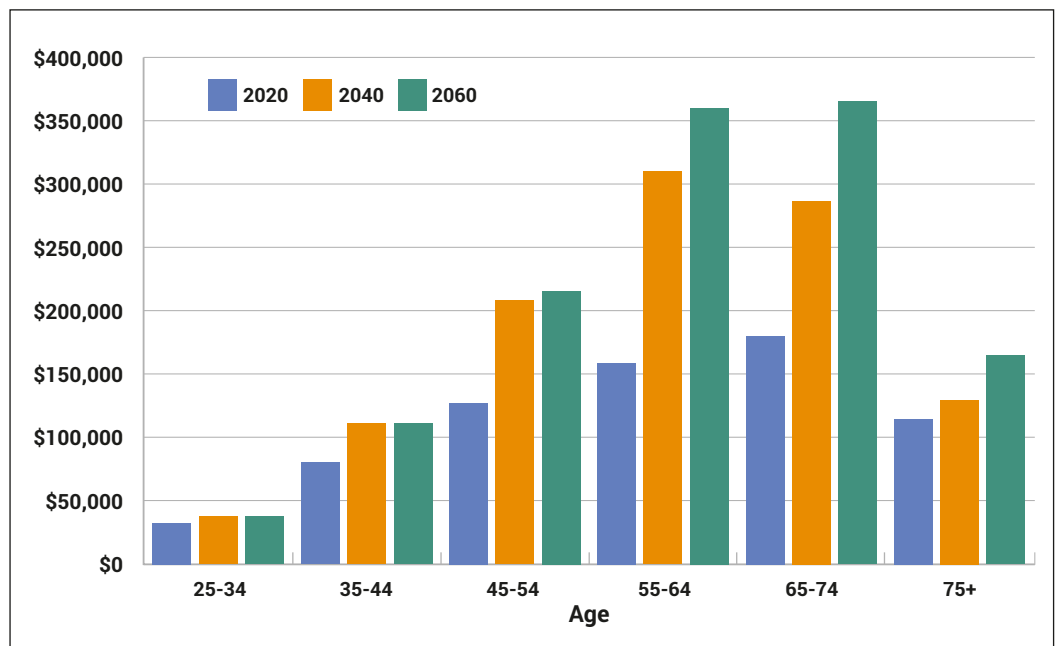
Appendix A

Understanding the ‘middle Australia’ cohort

The following two charts show projections from Treasury’s Model of Australian Retirement Incomes and Assets (MARIA). The model simulates the characteristics of each individual for every year for which the model is run. It begins with a data base which captures the entire Australian population aged 25 and over at a set point in time. This produces a lifepath for each individual and how it is expected to change in the future.

Treasury’s Figure A.1 below projects the median individual superannuation balance from 2020 to 2060 by age group. The figures are in today’s dollars (deflated by Average Weekly Earnings(AWE)). The median balance at retirement is projected to increase dramatically – from under \$200,000 in 2020 to around \$300,000 in 2040. Once you consider the fact that most people enter retirement as a couple, the total superannuation savings of ‘middle Australia’ will undisputedly be enough to fund a lifestyle that is higher than just the Age Pension for life.

Figure A.1: Median superannuation balances from 2020 to 2060, by age group (2019 dollars, AWE deflated)



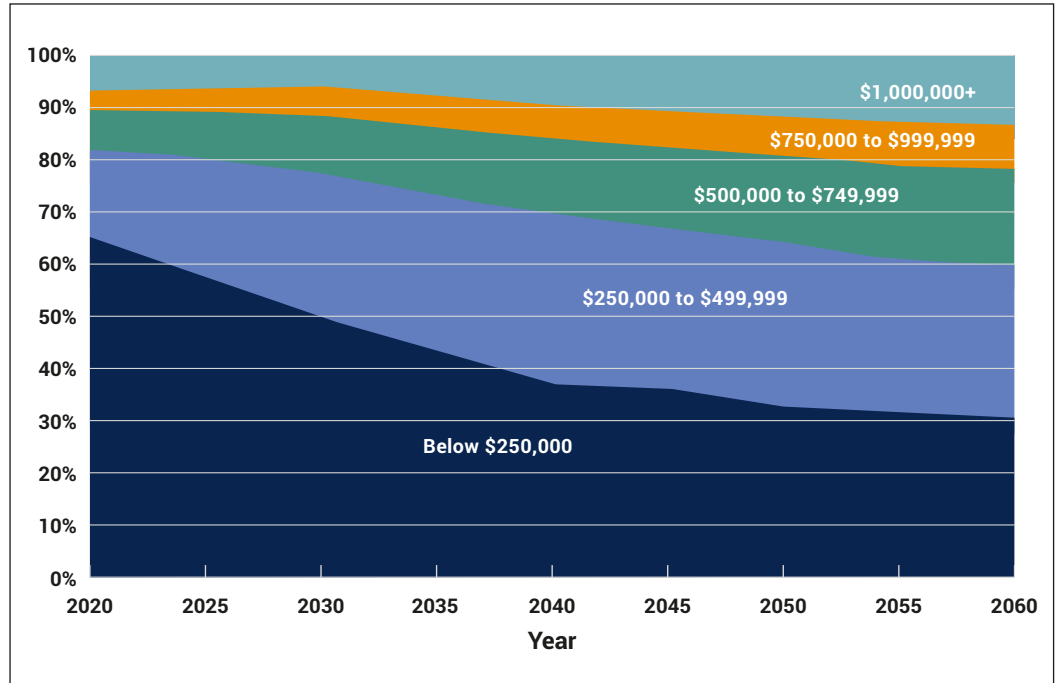
Source: Treasury²⁶

Treasury’s Figure A.2 on the following page shows the projected increase in the proportion of individual Australians at retirement who have higher superannuation balances over time (as the Superannuation Guarantee system continues to mature). By 2050 the proportion of individuals whose balances are below \$250,000 at retirement is projected to fall to around one third. Once you consider that most people enter retirement as couples, the proportion of households with combined superannuation under \$250,000 will be lower still. These figures are in today’s dollars (AWE deflated).

The proportion of people retiring with a superannuation balance of over \$500,000 is projected to grow over time to around 40% by 2060.

²⁶ <https://research.treasury.gov.au/treasurys-two-cents/superannuation-balances-retirement>

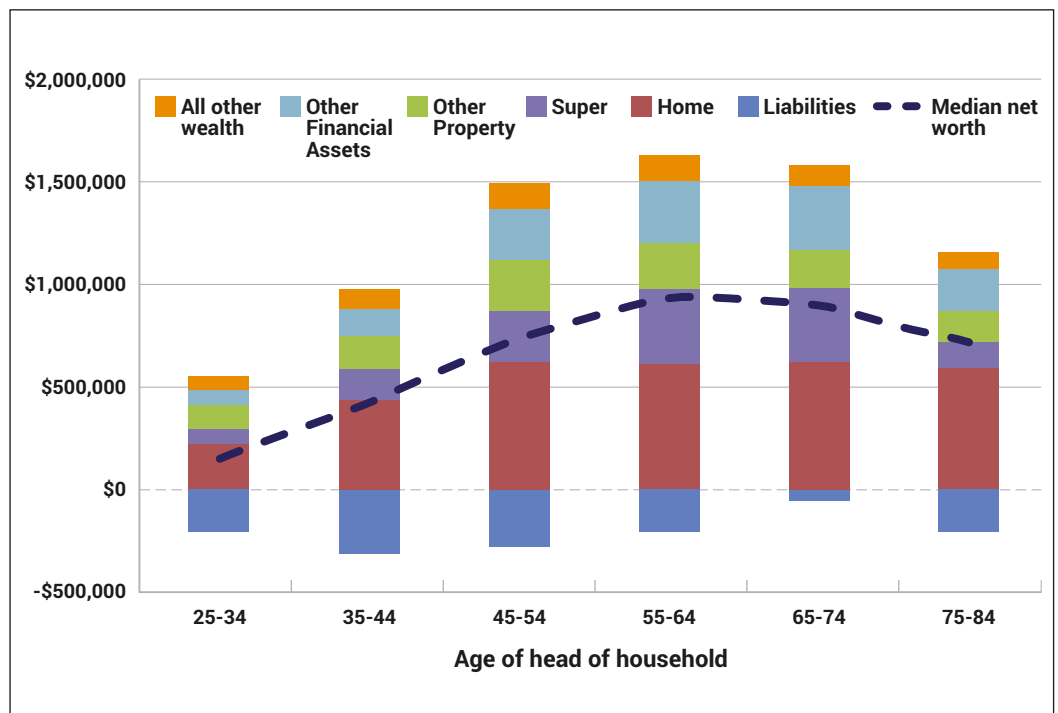
Figure A.2: Proportion of superannuation balance ranges at retirement (2019 dollars, AWE deflated)



Source: Treasury²⁶

Figure A.3 shows a breakdown of the wealth of Australians by age band. The coloured bars show averages but the dark dashed line shows the median which can be considered representative of the 'middle Australia' cohort.

Figure A.3: Mean and median net worth of Australian households by age band



Source: Analysis of ABS Survey of Income and Housing 2017-18

Age Pension and means testing data

Table A.1 shows that Australia has a total of nearly 2.6 million people in receipt of an Age Pension. 67% of these receive the full payment rate and 33% receive a means tested part pension.

Table A.1: Distribution of Age Pension payment

Payment type	Rate of Payment						Total
	Full Rate	Part rate – income test	Part rate – assets test	Part rate – total	Zero rate	Undetermined / manual rate	
Age Pension	1,722,388	455,700	384,840	840,540	5,476	6,289	2,574,643

Source: Department of Social Security Demographic Data September 2021

ABS data shows that there are nearly 3.6 million Australians aged 67 or more. This indicates that a further one million older Australians receive no income from the Age Pension and therefore are fully dependent on their own resources and savings.

The distribution of wealth level, partner status and homeowner status for Age Pensioners is shown in Table A.2.

Table A.2: Distribution of Assets

AGE PENSION – PARTNERED HOMEOWNER								
TOTAL ASSET VALUE RANGE	NO. OF CUSTOMERS	AVERAGE ASSET AMOUNT						
		DEEMED ASSETS	REAL ESTATE AND BUSINESS ASSETS	TRUST AND COMPANY ASSETS	PRIMARY PRODUCTION ASSETS	INCOME STREAMS ASSETS	FOREIGN ASSETS	OTHER ASSETS
\$0 - 49,999	161,673	\$11,287.68	\$240.10	\$29.80	\$36.37	\$206.20	\$1,069.40	\$14,887.56
\$50,000 - \$99,999	139,237	\$44,075.89	\$1,351.24	\$185.91	\$255.85	\$2,722.59	\$1,735.04	\$26,036.65
\$100,000 - \$149,999	119,522	\$81,623.18	\$3,178.59	\$370.31	\$638.28	\$8,935.57	\$2,035.79	\$29,630.35
\$150,000 - \$199,999	104,973	\$116,727.73	\$5,797.05	\$631.60	\$1,123.87	\$18,038.37	\$2,326.51	\$31,739.55
\$200,000 - \$249,999	92,851	\$150,202.13	\$9,819.02	\$824.50	\$1,682.71	\$28,661.26	\$2,336.75	\$33,003.23
\$250,000 - \$299,999	83,535	\$183,537.67	\$14,992.96	\$1,193.20	\$2,222.35	\$38,600.39	\$2,299.27	\$33,800.54
\$300,000 - \$349,999	73,992	\$214,757.90	\$21,122.65	\$1,436.73	\$2,762.95	\$49,326.75	\$2,153.02	\$35,113.78
\$350,000 - \$399,999	69,349	\$250,457.15	\$25,846.75	\$1,516.26	\$3,134.98	\$58,161.14	\$2,199.75	\$35,847.02
\$400,000 - \$449,999	56,532	\$278,722.78	\$33,010.10	\$1,924.49	\$3,286.23	\$71,437.43	\$2,329.62	\$35,201.59
\$450,000 - \$499,999	47,534	\$308,797.81	\$40,288.46	\$2,318.47	\$4,068.63	\$84,019.96	\$2,367.82	\$35,049.68
\$500,000 - \$549,999	41,971	\$338,821.12	\$47,084.10	\$2,658.45	\$4,309.90	\$95,922.71	\$2,731.38	\$35,709.84
\$550,000 - \$599,999	37,050	\$377,708.22	\$54,685.35	\$2,693.01	\$4,904.55	\$99,422.88	\$2,608.73	\$36,044.93
\$600,000 - \$649,999	32,836	\$413,739.02	\$61,390.81	\$3,380.09	\$5,866.36	\$104,093.01	\$2,925.72	\$35,963.71
\$650,000 - \$699,999	29,564	\$451,380.05	\$71,160.49	\$3,492.07	\$6,481.72	\$105,275.36	\$2,857.70	\$36,316.79
\$700,000 - \$749,999	25,600	\$499,370.87	\$78,072.09	\$3,993.46	\$6,517.17	\$99,583.52	\$2,708.74	\$36,816.33
\$750,000 - \$799,999	20,823	\$559,442.89	\$83,941.67	\$3,765.08	\$6,510.66	\$84,031.95	\$2,677.48	\$36,791.27
\$800,000 - \$849,999	15,267	\$613,256.89	\$95,066.37	\$4,481.76	\$6,826.28	\$67,230.34	\$2,040.22	\$37,086.49
\$850,000 - \$899,999	6,538	\$674,270.95	\$96,956.68	\$3,126.26	\$5,078.01	\$52,777.60	\$481.90	\$37,364.17
\$900,000+	243	\$800,391.86	\$98,141.33	\$959.28	\$4,111.62	\$27,969.91	\$2,766.60	\$25,688.42
Other	8,217	n/a	n/a	n/a	n/a	n/a	n/a	n/a
TOTAL	1,167,307	\$186,773.39	\$21,131.81	\$1,245.17	\$2,214.11	\$38,730.84	\$2,087.05	\$30,323.51

AGE PENSION – PARTNERED NON-HOMEOWNER								
TOTAL ASSET VALUE RANGE	NO. OF CUSTOMERS	AVERAGE ASSET AMOUNT						
		DEEMED ASSETS	REAL ESTATE AND BUSINESS ASSETS	TRUST AND COMPANY ASSETS	PRIMARY PRODUCTION ASSETS	INCOME STREAMS ASSETS	FOREIGN ASSETS	OTHER ASSETS
\$0 - 49,999	99,593	\$7,734.71	\$137.69	\$39.57	\$5.59	\$41.58	\$545.75	\$10,453.71
\$50,000 - \$99,999	27,363	\$47,517.23	\$1,357.91	\$409.86	\$101.62	\$908.20	\$2,324.08	\$25,499.49
\$100,000 - \$149,999	15,772	\$89,254.71	\$3,073.23	\$1,029.98	\$222.20	\$3,512.63	\$3,305.89	\$29,453.61
\$150,000 - \$199,999	11,372	\$130,775.94	\$6,700.31	\$1,519.97	\$547.89	\$7,028.81	\$4,479.21	\$32,827.45
\$200,000 - \$249,999	8,522	\$167,566.77	\$11,836.90	\$2,133.02	\$529.44	\$10,774.53	\$5,261.26	\$35,198.90
\$250,000 - \$299,999	6,671	\$201,792.14	\$18,963.38	\$3,127.77	\$730.43	\$16,596.33	\$6,950.88	\$35,739.10
\$300,000 - \$349,999	5,150	\$233,904.84	\$29,105.28	\$4,508.38	\$1,394.98	\$20,663.00	\$8,562.28	\$38,091.90
\$350,000 - \$399,999	4,011	\$271,675.00	\$40,171.81	\$5,205.19	\$2,865.06	\$23,611.08	\$9,329.19	\$37,794.20
\$400,000 - \$449,999	3,062	\$305,625.29	\$48,552.38	\$4,183.15	\$3,927.04	\$30,905.66	\$9,838.99	\$37,640.93
\$450,000 - \$499,999	2,516	\$344,077.12	\$57,103.04	\$7,718.59	\$3,508.20	\$36,032.43	\$12,815.61	\$39,745.35
\$500,000 - \$549,999	2,012	\$368,469.01	\$71,585.37	\$7,559.38	\$3,316.22	\$40,806.75	\$13,019.39	\$40,368.17
\$550,000 - \$599,999	1,777	\$401,682.42	\$84,170.48	\$4,891.14	\$4,281.67	\$51,243.49	\$14,415.49	\$38,110.02
\$600,000 - \$649,999	1,369	\$447,556.57	\$95,312.95	\$7,511.60	\$7,593.63	\$42,512.32	\$12,019.45	\$39,245.74
\$650,000 - \$699,999	942	\$491,639.47	\$103,753.40	\$10,706.87	\$2,321.83	\$48,666.60	\$13,199.26	\$34,213.52
\$700,000 - \$749,999	842	\$506,493.54	\$108,229.27	\$13,241.81	\$4,220.25	\$66,683.30	\$14,304.41	\$38,248.66
\$750,000 - \$799,999	590	\$554,179.10	\$133,460.47	\$10,444.37	\$9,215.23	\$44,127.57	\$12,498.13	\$35,044.03
\$800,000 - \$849,999	510	\$558,230.54	\$141,930.22	\$8,984.30	\$9,961.23	\$67,648.26	\$13,848.22	\$37,132.02
\$850,000 - \$899,999	440	\$612,705.58	\$153,007.17	\$18,600.38	\$7,849.99	\$70,044.88	\$20,548.79	\$36,584.84
\$900,000 - \$949,999	293	\$680,022.71	\$153,448.49	\$11,647.34	\$3,082.63	\$53,505.49	\$13,712.60	\$35,178.57
\$950,000 - \$999,999	263	\$712,036.81	\$159,387.02	\$14,753.37	\$15,307.98	\$35,575.04	\$24,328.17	\$32,125.43
\$1,000,000 - \$1,049,999	174	\$777,881.74	\$165,286.11	\$12,655.19	\$23,902.46	\$38,558.98	\$8,337.39	\$41,591.48
\$1,050,000 - \$1,099,999	110	\$776,962.80	\$197,548.96	\$12,231.80	\$6,657.99	\$19,711.43	\$18,627.31	\$51,831.76
\$1,100,000+	56	\$855,540.73	\$250,030.49	\$420.77	\$0.00	\$62,825.41	\$0.00	\$18,876.82
Other	1,216	n/a	n/a	n/a	n/a	n/a	n/a	n/a
TOTAL	194,626	\$84,428.76	\$10,284.08	\$1,288.80	\$600.76	\$6,284.09	\$3,031.15	\$20,855.61



AGE PENSION – SINGLE HOMEOWNER								
TOTAL ASSET VALUE RANGE	NO.OF CUSTOMERS	AVERAGE ASSET AMOUNT						
		DEEMED ASSETS	REAL ESTATE AND BUSINESS ASSETS	TRUST AND COMPANY ASSETS	PRIMARY PRODUCTION ASSETS	INCOME STREAMS ASSETS	FOREIGN ASSETS	OTHER ASSETS
\$0 - \$49,999	232,559	\$12,628.56	\$246.86	\$19.56	\$45.96	\$218.30	\$392.52	\$9,552.65
\$50,000 - \$99,999	124,222	\$52,993.03	\$1,758.79	\$112.79	\$355.00	\$2,999.19	\$769.40	\$15,477.04
\$100,000 - \$149,999	86,442	\$92,414.42	\$4,752.06	\$286.55	\$824.03	\$9,269.05	\$909.20	\$16,680.80
\$150,000 - \$199,999	65,989	\$128,421.86	\$9,165.81	\$446.59	\$1,241.62	\$17,771.00	\$1,005.47	\$17,152.55
\$200,000 - \$249,999	51,238	\$163,552.85	\$14,371.54	\$634.05	\$1,688.30	\$27,085.94	\$1,132.03	\$17,555.71
\$250,000 - \$299,999	40,619	\$199,493.66	\$18,465.58	\$845.72	\$1,825.34	\$36,331.96	\$997.93	\$17,202.46
\$300,000 - \$349,999	29,590	\$233,409.71	\$24,220.41	\$1,233.01	\$2,368.45	\$46,860.69	\$1,220.07	\$16,788.25
\$350,000 - \$399,999	23,323	\$270,184.58	\$28,387.30	\$1,371.41	\$3,045.63	\$55,285.99	\$1,313.59	\$17,153.49
\$400,000 - \$449,999	19,064	\$307,726.96	\$34,574.62	\$1,781.32	\$2,895.30	\$61,152.00	\$1,226.24	\$17,168.53
\$450,000 - \$499,999	15,485	\$353,937.68	\$39,042.73	\$1,940.11	\$3,776.32	\$59,758.18	\$1,136.52	\$17,089.54
\$500,000 - \$549,999	11,197	\$399,623.10	\$47,164.61	\$2,155.79	\$3,855.03	\$52,863.29	\$1,705.80	\$17,179.52
\$550,000 - \$599,999	4,696	\$450,645.48	\$55,640.05	\$1,522.19	\$3,862.80	\$39,664.02	\$715.52	\$17,038.62
\$600,000+	41	\$529,478.21	\$36,711.02	\$0.00	\$0.00	\$46,019.13	\$13,461.64	\$18,174.15
Other	5,777	n/a	n/a	n/a	n/a	n/a	n/a	n/a
TOTAL	710,242	\$104,524.59	\$8,817.03	\$430.68	\$971.93	\$15,342.31	\$796.45	\$14,306.03

AGE PENSION – SINGLE NON-HOMEOWNER								
TOTAL ASSET VALUE RANGE	NO.OF CUSTOMERS	AVERAGE ASSET AMOUNT						
		DEEMED ASSETS	REAL ESTATE AND BUSINESS ASSETS	TRUST AND COMPANY ASSETS	PRIMARY PRODUCTION ASSETS	INCOME STREAMS ASSETS	FOREIGN ASSETS	OTHER ASSETS
\$0 - \$49,999	326,167	\$7,108.04	\$109.75	\$24.53	\$6.38	\$57.50	\$223.18	\$5,773.49
\$50,000 - \$99,999	56,473	\$56,431.20	\$1,755.41	\$234.32	\$98.64	\$1,564.29	\$892.27	\$13,464.57
\$100,000 - \$149,999	32,114	\$97,544.16	\$5,483.76	\$607.92	\$332.43	\$4,385.64	\$1,327.39	\$15,972.51
\$150,000 - \$199,999	21,811	\$134,696.95	\$11,568.48	\$954.28	\$541.97	\$8,494.94	\$1,778.78	\$18,180.25
\$200,000 - \$249,999	15,474	\$168,775.76	\$20,459.07	\$1,391.56	\$921.81	\$12,281.20	\$2,395.42	\$20,459.40
\$250,000 - \$299,999	11,516	\$201,452.18	\$30,167.54	\$1,923.51	\$1,284.41	\$17,311.97	\$2,899.15	\$21,590.55
\$300,000 - \$349,999	8,722	\$234,171.90	\$42,222.66	\$2,568.40	\$2,016.30	\$21,735.09	\$3,457.80	\$21,325.99
\$350,000 - \$399,999	6,716	\$263,364.06	\$57,971.56	\$3,120.65	\$2,427.36	\$25,611.87	\$3,971.15	\$22,547.35
\$400,000 - \$449,999	5,295	\$298,079.59	\$70,140.99	\$3,704.20	\$3,223.98	\$26,076.41	\$3,661.08	\$24,075.94
\$450,000 - \$499,999	4,155	\$329,313.90	\$84,968.11	\$3,464.36	\$2,212.27	\$28,651.11	\$3,630.19	\$24,789.63
\$500,000 - \$549,999	3,062	\$370,508.26	\$93,867.47	\$4,531.67	\$3,028.85	\$29,611.58	\$3,903.45	\$22,887.86
\$550,000 - \$599,999	2,369	\$396,681.10	\$109,148.28	\$4,450.94	\$3,667.22	\$35,376.43	\$3,822.01	\$24,218.32
\$600,000 - \$649,999	1,749	\$432,096.02	\$122,422.74	\$3,958.10	\$3,387.38	\$34,751.61	\$3,593.56	\$25,671.08
\$650,000 - \$699,999	1,403	\$466,527.32	\$126,516.08	\$7,571.97	\$4,864.08	\$37,367.12	\$4,514.69	\$28,521.21
\$700,000 - \$749,999	973	\$514,896.32	\$138,677.01	\$4,234.84	\$4,696.90	\$35,873.17	\$2,925.98	\$23,060.60
\$750,000 - \$799,999	565	\$520,633.80	\$189,952.68	\$6,150.95	\$6,908.48	\$21,897.33	\$907.72	\$25,161.32
\$800,000+	87	\$553,016.40	\$175,543.14	\$1,607.17	\$1,959.77	\$70,819.91	\$9,165.68	\$19,416.18
Other	3,817	n/a	n/a	n/a	n/a	n/a	n/a	n/a
TOTAL	502,468	\$55,334.93	\$7,830.19	\$465.90	\$318.28	\$3,574.54	\$810.47	\$9,900.38

Source: Department of Social Services, Human Services, September 2021

Appendix B

UK retirement income projections use annuity formulas

Example retirement projection from a UK pension fund.

Your projections		
WHAT YOUR PENSION MIGHT BE WORTH AT RETIREMENT IN TODAY'S TERMS (BUYING POWER)		
<p>You have several options about how and when you can access your pension savings. This projection shows what your pension pot could be worth at your selected retirement age, after adjusting for inflation. We then show the <u>tax free</u> lump sum (25% of your overall pot) and what you could receive if you buy an income for life (an annuity) with the remaining balance.</p>		
£247,500 Your estimated total balance at retirement.	£61,875 Amount you could take as a lump sum without being taxed.	£4,295 per annum Inflation-linked income payable for life.
Assumptions		
Pension income <ul style="list-style-type: none">• In the example above, the annual income figure on the right is achieved through buying a guaranteed inflation-linked income for life (an annuity). Other options are available. Please see the supporting information provided with this statement.• The cost of buying an annual pension income of £1,000 is \$43,200.		

Source: Example based on a typical illustration by UK pension funds

Appendix C

Practical consequences of having different increase rates for spending, Age Pension and income from superannuation

The income charts in Sections 3-5 have been simplified in order to focus on the main concepts being discussed. In reality, the detail of how each component of retirement income increases can be complex and should be explored in more detail in a separate paper or article.

This Appendix simply gives a flavour of these issues. Those who design retirement strategies are likely to create a portfolio of retirement products to match the lifetime spending needs of the retiree.

The retiree's lifestyle and the various products that can be used to meet that lifestyle can all increase at different rates to each other – creating shapes that do not necessarily fit together neatly. For example:

- **Retiree spending and cost of living.** There is much debate around how much retiree spending changes as people age. Some studies indicate that retiree spending tends to increase at a rate that is lower than price inflation. Other specialists argue that retiree spending should keep pace with the increase in living standards of workers (e.g. referencing Average Weekly Earnings figures). Others highlight that retiree spending can follow a 'U' shape with spending higher during the initial 'active' phase of retirement then reducing somewhat in the 'passive' phase but rising again in the 'frail' phase.

The ABS publish the Pensioner and Beneficiary Living Cost Index (PBLCI²⁷) which was developed in recognition that price changes can impact different groups of households in the population differently. The PBLCI focusses on the out-of-pocket living expenses of Age Pensioners and other government transfer recipient households and for the past 10 years was slightly less than CPI.

- **Age Pension increases.** For those on a full Age Pension, the basic payment rate (excluding supplements) is currently legislated to increase at the higher of CPI, AWE and PBLCI. However, the means test rules are also subject to change from time to time. Some retirees are nervous to assume that the Age Pension rules will remain unchanged throughout their retirement in order to deliver them an income where they can rely on it increasing at a faster rate than consumer prices for life.
- **Lifetime income streams.** Different products can guarantee, or target, different increase rates. For example, traditional annuities commonly offer a choice of a level annuity (where income remains fixed in dollar terms throughout retirement) or an inflation-linked annuity (where income is increased in line with an index such as CPI) or something in between.

Investment-linked annuities can be designed to target a particular increase rate – depending on the objective of the product. For example, an investment-linked annuity can be designed such that a higher income gets paid in the early years of retirement but annual payments then only increase by investment performance less a hurdle rate²⁸. The hurdle rate is sometimes referred to as the Assumed Interest Rate (AIR) and it relates to the value of the extra income paid in the early years. A high AIR will result in higher income when the product commences but the income then increases more slowly during retirement. This can be useful when designing retirement strategies that fit together with the Age Pension.

²⁷ <https://www.abs.gov.au/methodologies/selected-living-cost-indexes-australia-methodology/sep-2021>

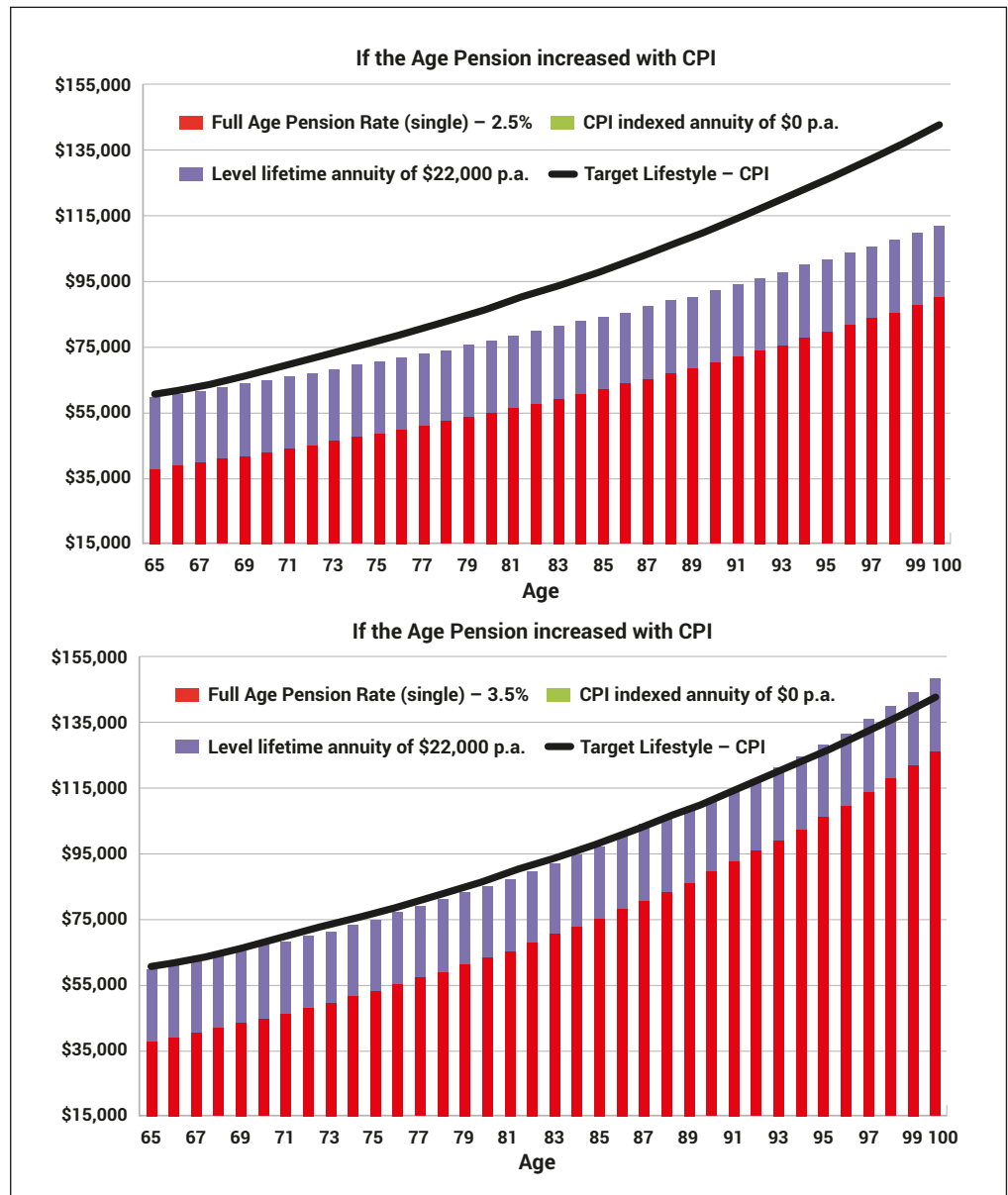
²⁸ <https://www.actuaries.digital/2021/09/27/what-is-an-investment-linked-annuity/>

- Account-based pension income.** The retiree must choose their own drawdown strategy (income) from an account-based pension, subject to a minimum percentage of the member's balance to be withdrawn each year. The minimums increase at key ages and the levels have been described as being designed²⁹ so that the pension payment in any one year broadly targets a reversionary, CPI-linked lifetime pension – but this depends on the investment returns assumed.

An example of this issue is as follows.

Consider a homeowner couple who are both age 67 and target a lifestyle of \$60,000 per year increasing with CPI. They face a jigsaw puzzle as they combine income products to meet that target. Figure C.1 shows how a full Age Pension of \$37,923 per annum (the maximum age pension amount in Feb 2022) plus a level annuity of \$22,000 per annum combine. In this example, CPI is assumed to increase at 2.5% per annum and we show the Age Pension increasing at two rates (i) 2.5% per annum and (ii) 3.5% per annum (which for illustrative purposes we assume is in line with increases in AWE).

Figure C.1: Targeting a CPI-linked lifestyle using a level lifetime annuity plus the Age Pension

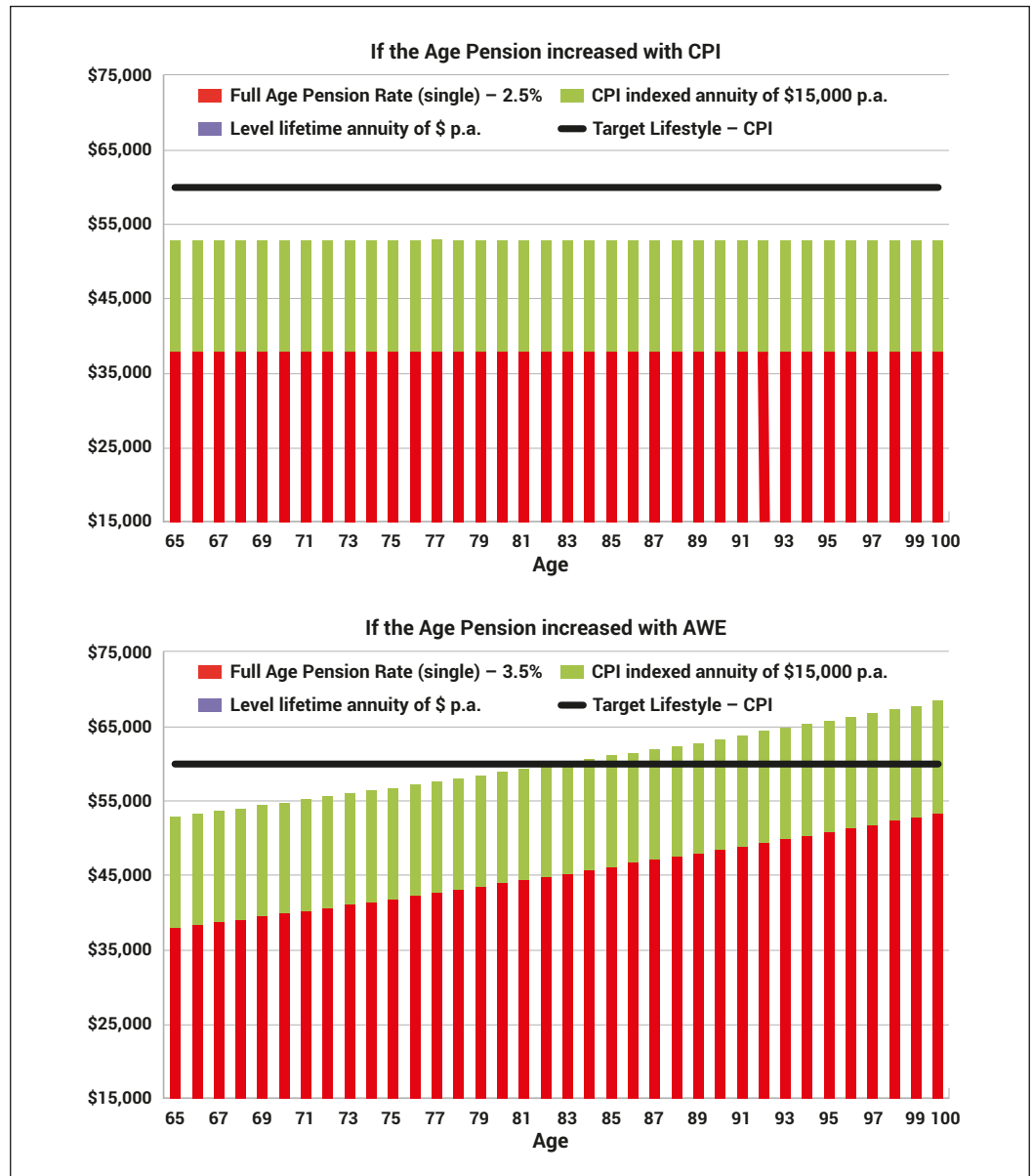


29 'Review of the provision of pensions in small superannuation funds Discussion Paper' Commonwealth of Australia, p24 <https://treasury.gov.au/sites/default/files/2019-03/c2005-pop-dp.pdf>

You can see from the bottom chart of Figure C.1 that if the Age Pension increases with AWE and is supplemented by a level annuity, then this retiree's income will start to exceed their needs later in retirement. However, the top chart shows that if the Age Pension only increased with CPI not AWE then using a level annuity would mean their total income would not keep pace with their needs.

In Figure C.2 we demonstrate a CPI-linked annuity instead of a level annuity. Here we show the figures in today's dollars – so it is clear to see that the person's annuity and desired lifestyle stay level in today's dollars. The bottom chart of Figure C.2 shows that if the Age Pension increases with AWE then the retiree's income would start to exceed their needs in their early 80s. But the top chart shows that if the Age Pension only increases with CPI then they would never meet their desired lifestyle.

Figure C.2: Targeting a CPI-linked lifestyle using a CPI-linked lifetime annuity plus the Age Pension (figures in today's dollars).



Combining different products with different increase rates (or AIRs) may let different retirees accommodate these issues and meet their personal objectives. The other dimension to consider is that the means-testing rules can further complicate the profile of cashflows from the Age Pension.





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