

29 March 2018

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Dear Sirs

Prudential Standard SPS 225

Introduction

The Australian Prudential Regulation Authority (APRA) has proposed changes to its prudential requirements to assist registrable superannuation entity licensees to be better positioned to deliver sound outcomes for fund members.

The Actuaries Institute (the Institute) and its members have a long history of assisting Trustees achieve this goal.

This submission focusses on *Draft Prudential Standard SPS 225 – Outcomes Assessment (SPS 225)* and *Draft Prudential Practice Guide SPG 225 – Outcomes Assessment (SPG 225)*.

The Institute is concerned that the guidance relating to the metrics to be used to assess member outcomes does not adequately allow for the complexity that results from the interaction of the factors affecting member outcomes and the volatility of those outcomes.

The Institute believes that the impact on member outcomes of this interaction and volatility can only be properly assessed by projecting the outcomes for a representative sample of members. If Trustees only consider current metrics (without a projection) or the proposed metrics in isolation, then the assessment of member outcomes may lead to decisions that are not in the best interests of all members of their fund.

Assessing member outcomes

SPS 225 sets out “requirements for RSE licensee to annually assess the outcomes provided to beneficiaries and identify opportunities for improving these outcomes for consideration”.

Further, **SPS 225** states in paragraph 8, that the assessment “must, as a minimum, detail:

(c) the metrics that the RSE licensee uses to measure the outcomes being provided to beneficiaries;

(d) the calculation of each of the metrics specified by the RSE licensee under paragraph 8(c) for the period covered by the assessment in both absolute and relative terms, with reference to:

(i) objective benchmarks and targets, both internal and external, used by the RSE licensee; and

(ii) outcomes provided to beneficiaries of other RSEs.”



The Institute believes that to fulfil the above requirements we need to work through the five steps below.

1. Define member outcomes.
2. Develop a set of metrics that capture the range of member outcomes.
3. Develop the methodology required to assess member outcomes.
4. Develop the methodology required to assess the impact of member outcomes on business decisions.
5. Be able to use the quantified results to compare the outcomes of other RSEs.

There are many factors (e.g. investment, mortality, fees, insurance etc.) that will affect the outcomes generated for superannuation fund members. **SPG 225** sets out several metrics that APRA expects Trustees to consider. These factors will interact with each other and will generate different outcomes for different members under different scenarios. The Institute believes that the only way to properly compare and assess the impact of these factors on member outcomes is to carry out projections which incorporate all these factors. Member outcomes at the fund level should then be aggregated from projections on representative members in different segments as suggested in **SPS 225**.

This submission and its Appendices provide detailed analysis and case studies to demonstrate the importance of using projections to adequately assess member outcomes. We acknowledge that many of the activities undertaken by superannuation funds such as marketing and website development would only indirectly impact member outcomes. These impacts are also difficult to quantify. We would like to clarify that the focus of this submission and its Appendices is on directly quantifiable member outcomes.

Each of the five steps outlined above are considered below.

Step 1 - Define member outcomes

Before considering the metrics that should be used we need to define “what are member outcomes”.

The primary objective of the superannuation system is:

“To provide income in retirement to substitute or supplement the Age Pension”

Member outcomes cannot be defined in isolation from the broader objective of the superannuation system. The Institute believes Trustees should focus on helping members to optimise total incomes in retirement.

One issue that Trustees will have to consider when defining member outcomes is how they should consider the impact of the benefits provided by their fund on the Age Pension entitlements of a member.

A possible option might be to optimize the member outcomes generated by their products, regardless of the impact that this may have on a member’s Age Pension entitlements. The Trustee would then rely on the member’s financial or other advisor to use the fund’s products to ensure that the total income provided in retirement suited the member having regard to their personal circumstances.



Another option might be to consider how their products (particularly the default products) impact on a member's Age Pension entitlements for different cohorts of members. Trustees may consider it is important to incorporate the Age Pension when defining member outcomes. This is because the interaction between retirement products and the Age Pension entitlement has important implications to retirement product design.

For example, for lower balance members the Age Pension might be the major source of their retirement incomes. The Age Pension also provides good longevity protection for members who have lower levels of consumption. As a result, when the Trustees design default retirement products for the lower balance member cohorts, the focus might be more on security of capital than longevity protection and consumption at advanced ages. This could be very different for higher balance member cohorts. Defining member outcomes without considering the Age Pension might lead to sub-optimal retirement product designs for different cohorts of members.

Regardless of the approach used, it is important that Trustees consider or provide information and tools that help members understand the impact of their benefits on their Age Pension entitlements.

We define member outcomes as the income that is generated in retirement with the focus of providing:

- 1) regular incomes to support members' living in general; and
- 2) bequests, reversionary benefits or residual benefits on death.

In assessing the income generated in retirement we believe that Trustees should consider the impact of the member outcomes of their products (particularly default products) on the Age Pension entitlements of members.

We also believe that 'member outcomes' should include income on the death or disablement of a member before retirement.

Step 2 - Develop appropriate metrics

The importance of projections

The metrics used need to be able to assess whether a product/business decision would be expected to improve or impair final member outcomes.

SPG 225 provides several examples of metrics such as fee and cost structures, insurance cost and cover, and net investment returns. These metrics are direct, based on factual (historical) information and should be straightforward to calculate. These metrics provide a starting point for any assessment of member outcomes. However, these measures only focus on one particular time point (current) and lack clear links to member outcomes (future). The impact of these factors on member outcomes is likely to vary over time and will depend on a member's personal circumstances. Considering any of these factors in isolation at one point of time only could provide misleading conclusions for decision-making.

To achieve the objectives of **SPS 225**, we believe it is crucial to understand and give due consideration to the interaction between the metrics we are using and its impact on member outcomes.

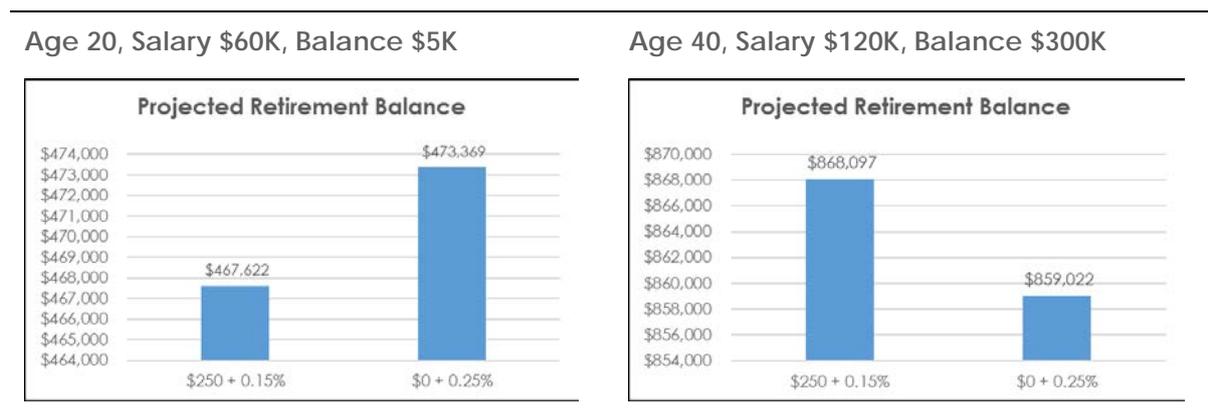


For example, consider the administration fee charged by a fund. Every superannuation fund has a slightly different administration fee structure. It could be a fixed dollar annual fee, a percentage annual fee based on members' balances, or a combination of the two. The same fee structure could impact members differently based on their situations.

Consider a fund that has two proposed fee structures: one consists of a fixed dollar fee of \$250 and a 0.15% fee on balances; the other one is a 0.25% fee on balances only. **Figure 1** shows the projected retirement balances (in deflated dollars adjusted for price inflation) for two members at very different stages of their careers. This is a deterministic projection based on the expected experience of the fund in the future.

A younger member with a lower starting balance and salary would accumulate a higher retirement balance under the higher percentage driven fee (0.25%) compared to the combined fixed dollar fee (\$250) and a lower percentage fee (0.15%). On the other hand, a middle age member with a relatively higher starting balance and salary would prefer the combined fee structure due to his/her consistently higher account values.

Figure 1: Projected retirement balances for two members based on different administration fee structures.



The left panel is for a younger member age 20 with a salary of \$60K and balance of \$5K. The right panel is for a middle age member age 40 with a salary of \$120K and balance of \$300K.

If we convert 100% of their retirement balances to life annuities, then we can see the ultimate impacts of the different fee structures on their retirement incomes (see **Figure 2**). Simply looking at fee structures in isolation would not give you enough information to assess member outcomes. Measures based on projections are needed.



Figure 2: Projected retirement income for two members based on different administration fee structures.



The left panel is for a younger member age 20 with a salary of \$60K and balance of \$5K. The right panel is for a middle age member age 40 with a salary of \$120K and balance of \$300K. 100% of retirement balance is converted to price-inflation linked life annuities. Age Pension is not incorporated.

It is important to note that a comparison of administration fees and costs based on a Representative Member with a balance of \$50,000 would be of little value in assessing the impact of the fee structures on member outcomes.

We also note that in paragraph 18 of **SPG 225** and Attachment A of *Draft Prudential Practice Guide SPG 221 – Strategic and Business Planning (SPG 221)*, reference is made to “net returns”. The Institute suggests that it should be made clear that this refers to returns net of investment fees only (i.e. net investment returns) as indicated in paragraph 6 of SPG 225.

In the above example, we have focussed on administration fees. Similar analysis can be conducted to assess the impact of different investment fees and different insurance premiums.

The Institute therefore believes that the interaction of the metrics being considered can only be achieved by using projection techniques and that Trustees should be required to consider the results of such projections as well as the metrics suggested in SPG 225.

The impact of volatility

In the above projections (**Figure 1** and **Figure 2**) which illustrate the impact of the fee structures we have used deterministic projections based on the expected levels of the relevant inputs.

With respect to future investment experience, the volatility of investment returns will mean that there is a wide range of possible future outcomes. Further, the greater the proportion of assets invested in growth assets, the wider this range becomes. The only way that this volatility can be captured is by using stochastic projections (or perhaps, in some situations, several historical scenarios).

Appendix A provides an example to illustrate how investment risk could impact retirement outcomes. The Aggressive investment option will generate higher expected retirement incomes. However, the range of possible incomes will be wider and have a bigger potential downside than that generated by the Conservative investment option.



The final choice between the Aggressive and Conservative investment options will depend on the risk appetite of a member. However, an investment portfolio with a higher growth focus might be the better option for a member with a long-term investment horizon.

Further, if we want to assess how insurance cover affects member outcomes, we might also need to use stochastic projections. The projection may, for example, have to incorporate risk factors that reflect the possibility and timing of the members making insurance claims in the future.

Reducing insurance costs could lead to a better outcome in retirement for members due to lower premiums. However, this would usually be achieved by reducing the level of insurance cover. Whilst a simple linear measure on cost of insurance would make an easy comparison between funds/policies, it ignores the more relevant question, "What is the appropriate level of insurance cover for members and at what premium would it be deemed reasonable or acceptable to the members?"

To strike the right balance, we believe there is a need to use measures based on stochastic projections of the possible range of outcomes the members might experience.

Step 3 - Assessing member outcomes

The results of using stochastic modelling is multi-dimensional (the level of incomes and the range of incomes), hence making comparisons difficult. This is before considering the additional dimension about members' death and disablement benefits.

Retirement income projections are quite complex as there could be multiple retirement products and the interaction with these products and the Age Pension needs to be considered. We need metrics that could capture the stochastic nature of retirement outcomes. Some examples of the metrics used in the industry include shortfall risk, funded ratio and utility framework.

Shortfall risk tells you the likelihood of not meeting the retirement income need, but it does not tell you how far away you are from meeting it.

Funded ratio could be a useful measure when we are measuring relatively constant income streams. However, retirement incomes are less likely to be constant especially after including the Age Pension.

Utility framework is more powerful than the other two. It can capture the volatility of incomes throughout retirement and the trade-off between retirement incomes and death and disablement benefits. However, it is also more complex to use, or at least to fully understand, since it is parameter-dependent.

In **Appendix B**, as examples, we used the metrics mentioned above to illustrate how the results of stochastic projections can be used to assess member outcomes. We note that all the approaches support an investment in an Aggressive investment option for a member aged 40. The results could be different when we look at younger/older members with different investment horizons and risk aversion levels.



There is a clear need to use suitable methodologies that allow Trustees to assess and compare member outcomes. There are several approaches that can be used to consider the implications of the member outcomes calculated in Step 2. Trustees will need to consider which of the possible metrics should be used having regard to their circumstances and how they should be applied for their fund.

Regardless of the methodologies used, projections of member outcomes are required to enable Trustees to properly assess the potential outcomes that might be generated.

Step 4 - Assessing the impact of member outcomes on business decisions

The analysis of member outcomes starts by considering the outcomes of individual members. Trustees then need to be able to use these individual results to determine the impact these business decisions will have on different segments of the fund's membership and on the fund as a whole so they can develop appropriate business plans.

Different approaches can be used to aggregate individual member outcome results into a result that applies to the whole fund.

In **Appendix B**, metrics based on the Member's Default Utility Function (MDUF) metric are used to determine the dollar value of a decision at the individual member level. We used the same MDUF metric to explore how to quantify the value of the decision at the whole fund level in **Appendix C**.

The analysis in **Appendix C** shows that some business/product decisions might only be beneficial to some member cohorts but not all. The outcomes for different cohorts of members will depend on their risk appetite and their drawdown strategy after retirement. It is important to be able to understand the impacts of the decisions on different segments of a fund's membership. It would help the fund to make sure their decisions would not unintendedly disadvantage some of their member cohorts. This has important implications on default retirement strategy design and appropriate member segmentations as suggested in **SPS 225**.

It is important to note that the analysis set out in Appendix C requires the projection of member retirement incomes and residual benefits, which supports our view that projections of member outcomes are required.

Step 5 - Comparison with other RSE outcomes

In the above we have considered the outcomes for members within a fund. **SPS 225** also requires Trustees to assess the outcomes of their fund's products with the products offered by other RSEs.

It is likely that the designs of similar products offered by different funds are different. Again, comparison of the current terms of other RSE products will not capture how the various factors interact over time.

Trustees will need to use stochastic projections to compare their outcomes with those of other RSEs for the same reasons they need stochastic projections to develop business strategies for their funds.



Conclusion

SPS 225 is a great step forward to motivate the industry to start thinking about how we should assess member outcomes. In this submission (and its Appendices), we worked through the five steps we believe are essential to fulfil the **SPS 225** requirements for “RSE licensee to annually assess the outcomes provided to beneficiaries and identify opportunities for improving these outcomes for consideration”.

Based on our analysis, the Institute believes that consideration of the metrics suggested in **SPG 225** without the addition of stochastic projections may lead to the development of business plans that generate sub-optimal member outcomes and incorrect comparisons with products offered by other funds.

We encourage the industry to further explore and develop member outcomes metrics. We hope our response provides a valuable perspective and will assist APRA with the consultation process.

We would be happy to discuss this issue with you if required.

Please do not hesitate to contact myself or the Chief Executive Officer of the Actuaries Institute, Elayne Grace (phone 02 9239 6106 or email elayne.grace@actuaries.asn.au) if you would like to discuss any aspect of this letter or if you need further information.

Yours sincerely,

Ben Facer
Convenor, Superannuation Practice Committee

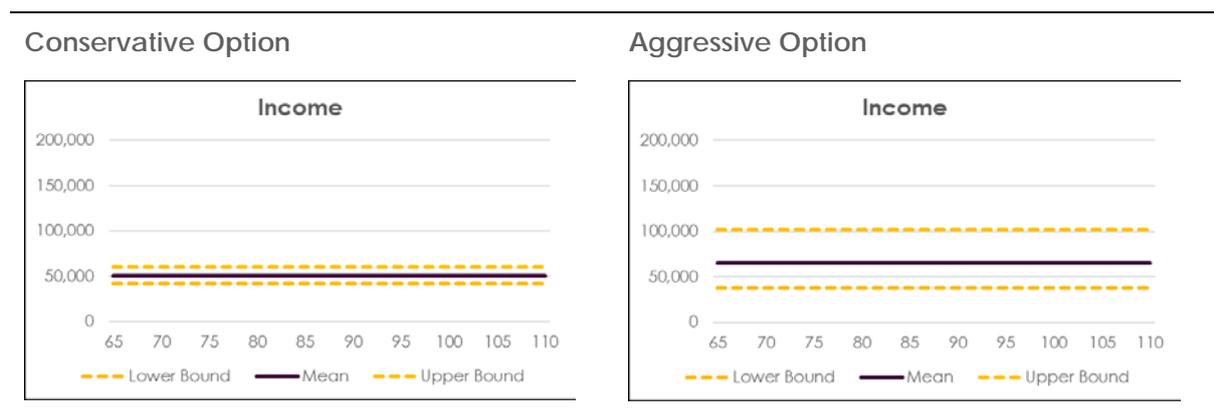


Appendix A - Impact of volatility

Consider a fund reviewing its members' default investment option. The fund's current default option is a Conservative option, and they want to assess whether it should be switched to an Aggressive option for the benefit of the members. The Aggressive option has a higher expected return and a higher risk than the Conservative option. Providing deterministic projections based on expected return without considering the risk of achieving it is flawed. To assess the impact of this decision on member outcomes, the fund needs to perform stochastic projections of members' retirement outcomes.

For example, consider a member age 40 with a salary of 120K and a balance of 300K investing in the Conservative option and the Aggressive option. Assuming the member uses 100% of the retirement balance to purchase life annuities (no residual benefit). **Figure A1** shows the range of the member's projected retirement incomes. The higher risk (Aggressive) portfolio could result in higher expected retirement incomes compared to a lower risk (Conservative) portfolio, but at the same time the range of incomes will be wider and with a bigger downside (shown by the *Lower Bound* line on the right panel). Overall, the Aggressive option seems to generate higher incomes than the Conservative option in most circumstances.

Figure A1: Distribution of projected retirement income based on investment options.



The left panel is based on the Conservative option and the right panel is based on the Aggressive option. The scenario is for a member age 40 with a salary of \$120K and balance of \$300K. 100% of retirement balance is converted to price-inflation linked life annuities. Age Pension is not incorporated. The Lower and Upper bounds show the 90% confidence intervals based on simulation results.



Appendix B - Measuring the impact of member outcomes

There are many ways that can be used to measure how the potential member outcomes will impact on a member.

Calculating shortfall risk and funded ratio requires the use of reference income targets. For example, the shortfall risk could be determined and calculated as the probability of not achieving the income target throughout retirement. The funded ratio would be the average multiple of achieving this income target throughout retirement. A lower shortfall risk and a higher funded ratio indicate better member outcomes. The income target could be based on replacement ratio of the members or an industry standard such as the ASFA retirement living standards.

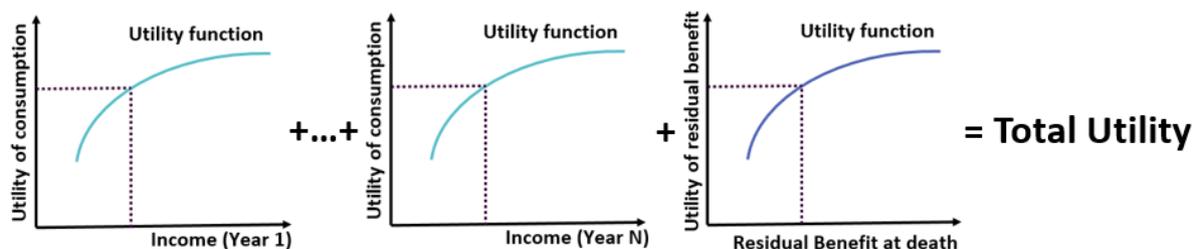
A more complex approach would be to consider the actual risk preferences of members using a utility framework.

An example of such a framework is the Member's Default Utility Function (MDUF)¹. To provide an insight into how members' risk preferences could be allowed for we have considered this approach in more detail below.

The MDUF metric captures the following five intuitive members' preferences:

1. Members prefer higher (rather than lower) income in retirement;
2. Members would prefer a smooth rather than a volatile income stream;
3. Members consider outliving their retirement savings is a bad outcome;
4. Members place value on residual benefits;
5. Members are economically risk averse.

Figure B1: Illustration of utility framework.



Source: MDUF custodian websites

A utility function is a mathematical formula that reflects the above members' preferences. A higher income level and a higher residual benefit level would produce higher utility. As shown in **Figure B1**, members' risk aversion is reflected in the concave curvature of the shape of utility function. Members' total utility is simply the summation of the utility of income/consumption in each year and the utility of residual benefit at the time of death. Members are risk averse when they view the joy from an income uplift to be less than the pain from an equally sized income

¹ Member's Default Utility Function (MDUF) is an open-architecture metric which was developed by a panel of academics and industry professionals to assist the industry in providing retirement outcome modelling. The related materials can be accessed from its custodian websites via [http://www.aist.asn.au/policy/member%E2%80%99s-default-utility-function-\(mduf\).aspx](http://www.aist.asn.au/policy/member%E2%80%99s-default-utility-function-(mduf).aspx) and <http://membersdefaultutilityfunction.com.au/>



drop. As a result, less volatile incomes generate greater utility scores. This is not captured in either shortfall risk or funded ratio.

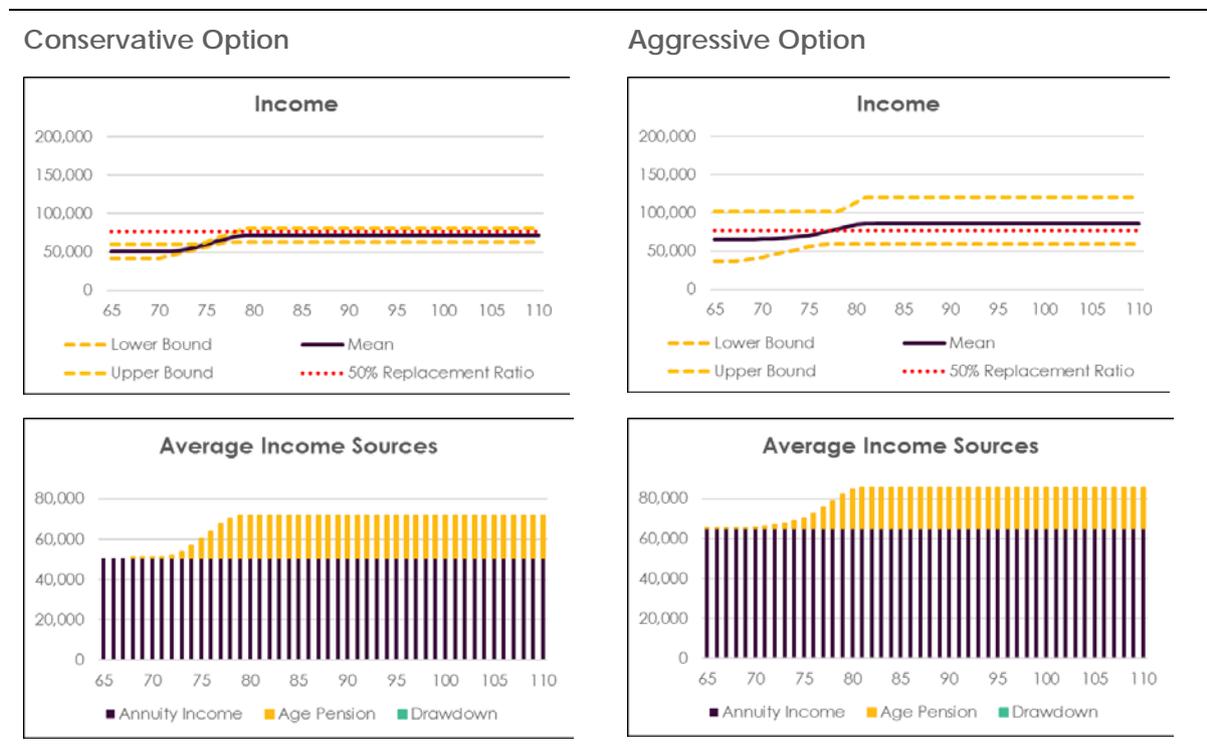
Total utility of a strategy for a member is calculated by adding the utility from incomes and utility from residual benefits. This is consistent with what the **SPG 225** is suggesting in paragraph 26: “applying multiple metrics, weighted by significance”. The weights allocated to the expected level versus the volatility of retirement income and residual benefit are reflected in the MDUF metric parameters derived from members’ preferences.

Examples

Figure B2 below shows the retirement income projections for a member age 40 with a salary of 120K and a balance of 300K investing in the Conservative option and the Aggressive option. The projections assume 100% life annuities (no residual benefit) with the Age Pension entitlements projections through retirement. The Income figures show that it is more likely to achieve incomes higher than the 50% replacement ratio targets (red dotted line) with the Aggressive option than with the Conservative option.

Table B1 below shows that the results using different measures are quite consistent. Based on the shortfall risk metric, the Aggressive option produces better outcome for this member by reducing the shortfall risk of achieving the income target by 41%. Based on the funded ratio metric, the average incomes achieved over retirement are improved by 0.17 times the target level. Based on MDUF Scores, the member would overall be better off with the uplift in the level of the retirement income despite a larger potential downside. The value of the decision to switch to the Aggressive Option is worth approximately \$30K to this member.

Figure B2: Distribution of projected retirement income based on investment options.



The left panel is based on the Conservative option and the right panel is based on the Aggressive option. The scenario is for a member age 40 with a salary of \$120K and balance of \$300K. 100% of retirement balance is converted to price-inflation linked life annuities. The Lower and Upper bounds show the 90% confidence interval based on simulation results.



Table B1: Value analysis of the decision to switch from the Conservative option to the Aggressive option.

Retirement Strategy	Conservative	Aggressive	Value
Shortfall risk (50% replacement ratio)	89%	48%	41%
Funded ratio (50% replacement ratio)	0.87	1.04	0.17
MDUF (focus on income only)	54,035	55,580	\$30K

The scenario is for a member age 40 with a salary of \$120K and balance of \$300K. 100% of retirement balance is converted to life annuities.



Appendix C - Assessing impact of member outcomes at the fund level

In **Appendix C**, we explore how to quantify the value of the decision at the whole fund level. As an example, we used the MDUF metric.

The Building Blocks

We acknowledge that retirement strategies are not limited to only life annuities and could be a combination of several retirement products especially when we consider the fact that members place values on residual benefits at death. Superannuation funds might offer different default retirement solutions to members. As a result, we have expanded the universe of retirement strategies to include:

- Case 1 - 100% life annuities (LA)
- Case 2 - Minimum drawdown rule on Account-based Pension (ABP)
- Case 3 - Target 50% replacement ratio with ABP
- Case 4 - Target 50% replacement ratio with 50% in LA and 50% in ABP
- Case 5 - Minimum drawdown rule with 50% in LA and 50% in ABP

All life annuities (LA) are price-inflation linked life annuities. The figures have been converted to deflated dollars adjusted for price inflation.

Case 1 assumes the members use 100% of their retirement balance to purchase price-inflation linked life annuities income streams. Case 2 assumes the members put 100% of their retirement balance in an Account-based Pension (ABP) and drawdown incomes based on the age-based minimum drawdown (MDD) rule. Case 3 also assumes 100% ABP but the members target income drawdown at 50% of their salaries right before retirement. Salaries are assumed to be wage-inflation (1% higher than price inflation) indexed and converted to deflated dollars based on price inflation. Case 4 is a combined strategy of Case 1 and Case 3 where 50% is allocated to LA and 50% is allocated to ABP. The strategy also has a target income of 50% of their salaries right before retirement. Case 5 is a combined strategy of Case 1 and Case 2 with similar split as Case 4 where 50% is allocated to LA and 50% is allocated to ABP drawing down at MDD rule.

Figure C1 shows the retirement income projections for a member age 40 with a salary of 120K and a balance of 300K investing in the Conservative option and the Aggressive option. **Figure C2** shows the projections of residual account values over time.

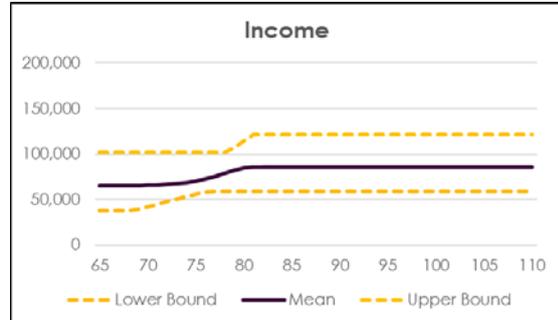
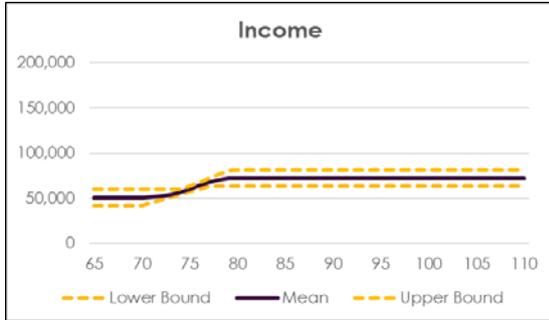


Figure C1: Distribution of projected retirement income based on investment options.

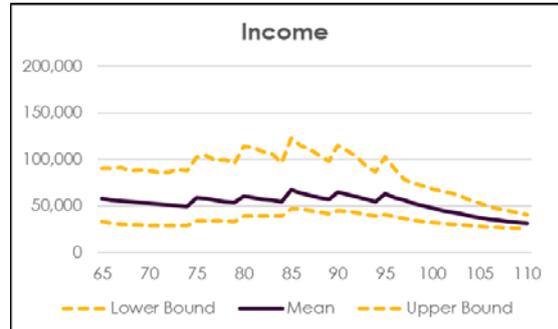
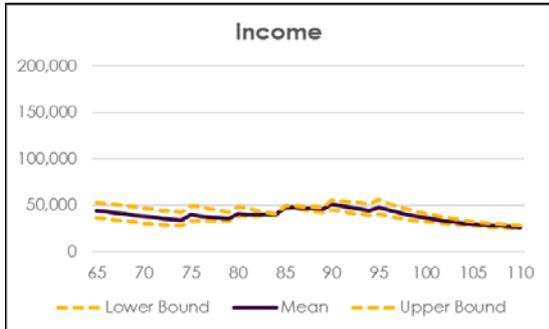
Conservative Option

Aggressive Option

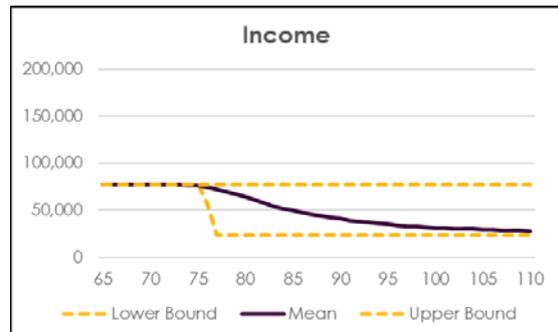
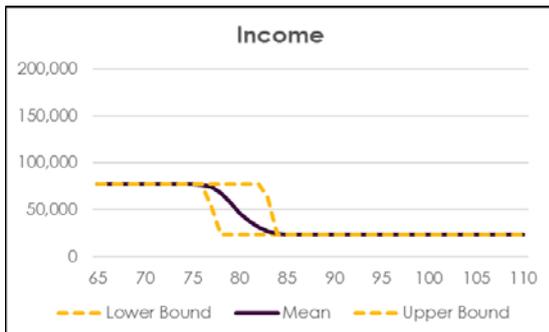
Case 1 - 100% LA



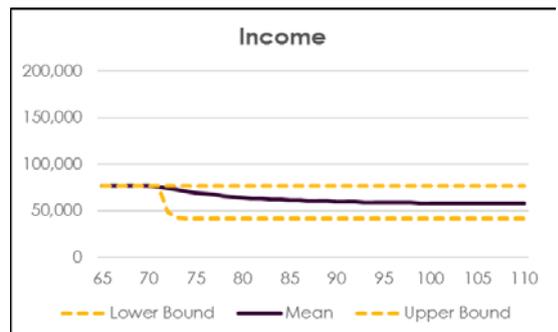
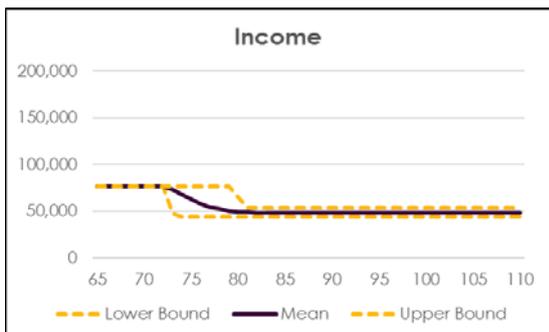
Case 2 - Minimum drawdown rule on ABP



Case 3 - Target 50% replacement ratio with ABP

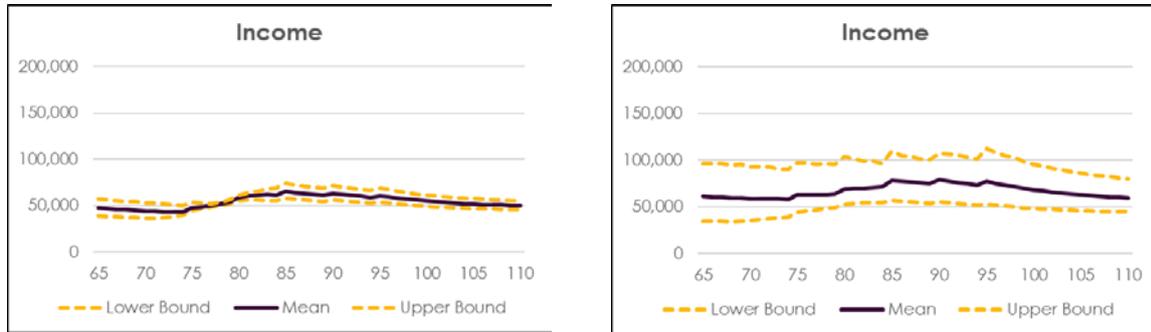


Case 4 - Target 50% replacement ratio with 50% in LA and 50% in ABP





Case 5 - Minimum drawdown rule with 50% in LA and 50% in ABP



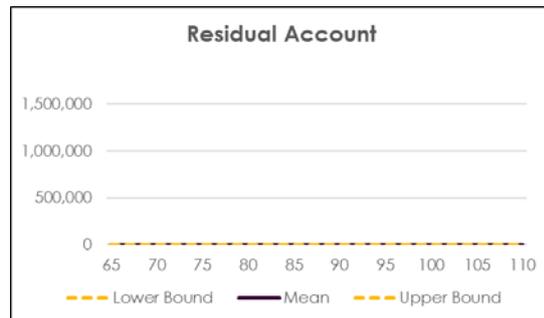
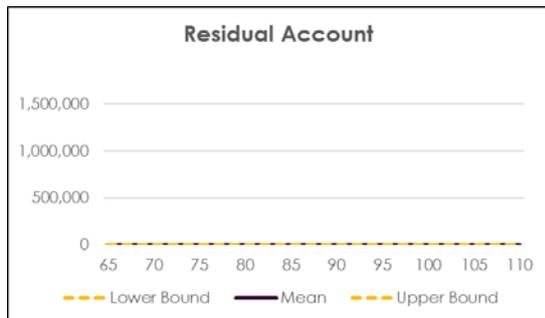
The left panel is based on the Conservative option and the right panel is based on the Aggressive option. The scenario is for a member age 40 with a salary of \$120K and balance of \$300K. The Lower and Upper bounds show the 90% confidence intervals based on simulation results.

Figure C2: Distribution of projected residual benefits based on investment options.

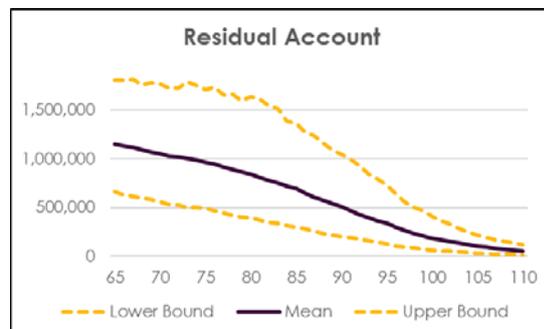
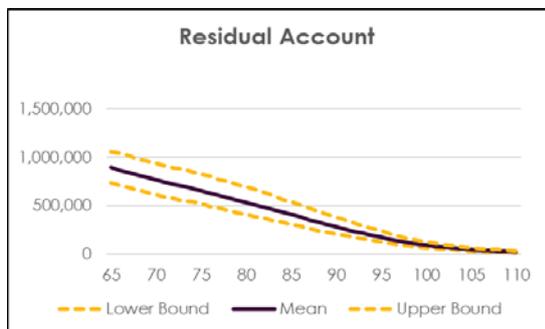
Conservative Option

Aggressive Option

Case 1 - 100% LA

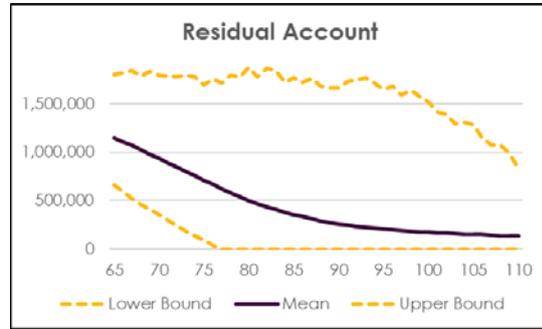
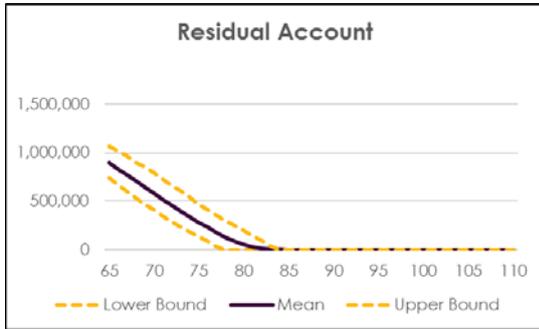


Case 2 - Minimum drawdown rule on ABP

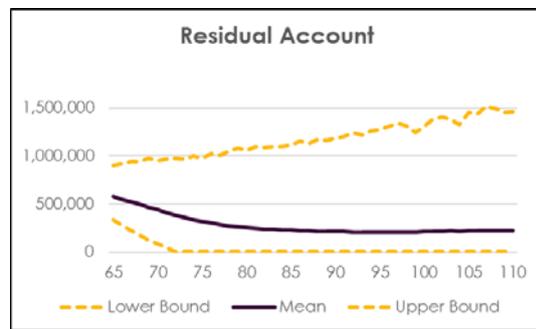
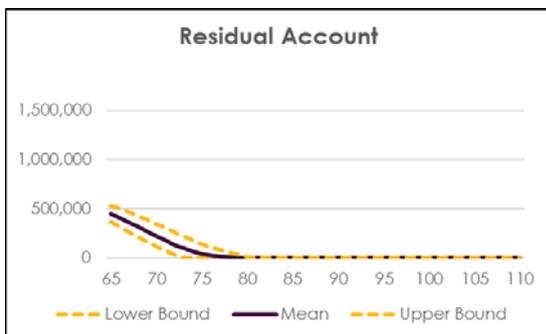




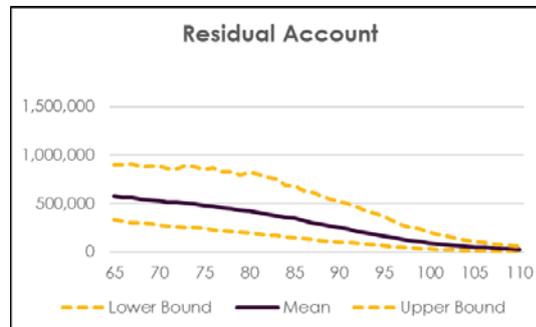
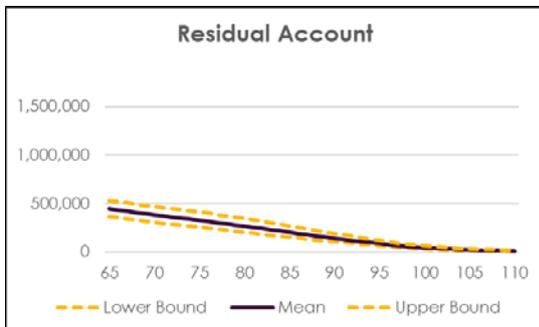
Case 3 - Target 50% replacement ratio with ABP



Case 4 - Target 50% replacement ratio with 50% in LA and 50% in ABP



Case 5 - Minimum drawdown rule with 50% in LA and 50% in ABP



The left panel is based on the Conservative option and the right panel is based on the Aggressive option. The scenario is for a member age 40 with a salary of \$120K and balance of \$300K. The Lower and Upper bounds show the 90% confidence intervals based on simulation results.



How we use the building blocks at the member level

As an example, we consider how the MDUF metric can be used to assess these potential member outcomes.

First consider the member who does not need to leave residual benefit.

Table C1: Value analysis of the decision to switch from the Conservative option to the Aggressive option.

Retirement Strategy	MDUF Score (Conservative)	MDUF Score (Aggressive)	Value
Case 1 - 100% LA	54,035	55,580	\$30K
Case 2 - Minimum drawdown rule on ABP	37,253	40,248	\$59K
Case 3 - Target 50% replacement ratio with ABP	27,651	29,987	\$46K
Case 4 - Target 50% replacement ratio with 50% in LA and 50% in ABP	52,612	55,004	\$47K
Case 5 - Minimum drawdown rule with 50% in LA and 50% in ABP	46,510	48,794	\$45K

The scenario is for a member age 40 with a salary of \$120K and balance of \$300K assuming the member does not want to leave residual benefit.

Table C1 shows that based on MDUF Scores, Case 1 – 100% LA provides the best member outcomes amongst the five strategies under both investment options. This is because Case 1 maximises the member’s retirement incomes.

The Aggressive option produces better outcome for this member compared to the current Conservative option for all cases. However, the value of the decision to switch to the Aggressive option depends on the member’s selected retirement strategy.

Next consider the member who wants to leave some residual benefits.



Table C2: Value analysis of the decision to switch from the Conservative option to the Aggressive option.

Retirement Strategy	MDUF Score (Conservative)	MDUF Score (Aggressive)	Value
Case 1 - 100% LA	0	0	-
Case 2 - Minimum drawdown rule on ABP	18,850	20,434	\$39K
Case 3 - Target 50% replacement ratio with ABP	6,339	6,793	\$11K
Case 4 - Target 50% replacement ratio with 50% in LA and 50% in ABP	6,172	6,665	\$12K
Case 5 - Minimum drawdown rule with 50% in LA and 50% in ABP	13,222	14,710	\$37K

The scenario is for a member age 40 with a salary of \$120K and balance of \$300K assuming the member wants to leave some residual benefit and the strength of the motive is the same as MDUF v1 level.

Table C2 shows that Case 1 – 100% LA would no longer be an option for the member since the strategy does not provide any residual benefit at any point in time. The new set of MDUF Scores consider the trade-off between incomes and residual benefits and rank the solutions differently based on the different objectives.

How we use the building blocks at the fund level

Now consider how these results can be aggregated to the fund level.

Assume the fund’s membership is segmented into three cohort groups as shown in Table C3.

Table C3: Membership information of the fund.

Members’ cohort groups	Number of members
Group 1 - Age 20, Salary \$60K, Balance \$5K	10,000
Group 2 - Age 40, Salary \$120K, Balance \$300K	30,000
Group 3 - Age 60, Salary \$150K, Balance \$500K	20,000

If the fund’s default retirement strategy is the same as Case 2 - Minimum drawdown rule on ABP, we quantify the value of the decision at the individual member level in Table C4.



Table C4: Value analysis of the decision to switch from the Conservative option to the Aggressive option – Case 2 Strategy

	MDUF Score (Conservative)	MDUF Score (Aggressive)	Value
Group 1 - Age 20, Salary \$60K, Balance \$5K	14,012	15,580	\$39K
Group 2 - Age 40, Salary \$120K, Balance \$300K	18,850	20,434	\$39K
Group 3 - Age 60, Salary \$150K, Balance \$500K	15,523	16,391	\$21K

The scenario is for member of Fund A. Default retirement strategy is Case 2 - Minimum drawdown rule on ABP assuming the member wants to leave some residual benefit and the strength of the motive is the same as MDUF v1 level.

It seems that the decision to switch from the Conservative to the Aggressive investment option would be beneficial for all three groups of members. The value at the member level can then be aggregated to show a total value of \$2.0 billion (10,000 x \$39K + 30,000 x \$39K + 20,000 x \$21K) for the fund. This is a significant value gain and supports the decision to switch from the Conservative to the Aggressive option.

However, if the fund's default retirement strategy is similar to Case 4 but with a target 70% replacement ratio with 50% in LA and 50% in ABP, the decision to switch from the Conservative to the Aggressive option would not be beneficial to all members as shown in **Table C5**.

Table C5: Value analysis of the decision to switch from the Conservative Option to the Aggressive Option – Modified Case 4 Strategy

	MDUF Score (Conservative)	MDUF Score (Aggressive)	Value
Group 1 - Age 20, Salary \$60K, Balance \$5K	6,090	6,297	\$5K
Group 2 - Age 40, Salary \$120K, Balance \$300K	6,000	6,104	-\$3K
Group 3 - Age 60, Salary \$150K, Balance \$500K	6,040	6,033	-\$1K

The scenario is for member of Fund A. Default retirement strategy is Case 4 - Target 70% replacement ratio with 50% in LA and 50% in ABP. Assuming the member wants to leave some residual benefit and the strength of the motive is the same as MDUF v1 level.



Note that the MDUF scores shown in **Table C5** should not be compared with the MDUF scores shown in **Table C4**. They are based on different parameters for residual benefit motive. MDUF scores should only be used for comparison within the same set of parameters, as with any other utility functions.

The cost of the move to the Aggressive option in these circumstances to the fund would be \$60 million (10,000 x \$5K - 30,000 x \$3K - 20,000 x \$1K) and does not support a decision to switch across to Aggressive for all cohorts. However, the fund may want to consider only switching the investment options for Group 1 members as a result of the assessment.

The outcomes for different cohorts of members will depend on their risk appetite and their drawdown strategy after retirement. The business decisions that Trustees will make and the impact on member outcomes will depend on their assessment of these factors for each of the membership cohorts.