



Development of the framework for Comprehensive Income Products for Retirement

Discussion Paper

Mine Wealth + Wellbeing Submission

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Introduction

The purpose of this paper is to address Treasury’s follow-up questions on our CIPR discussion paper submission in July 2017. The questions include:

1. To what extent are our conclusions robust across a broader suite of products including deferred life annuities (DLAs) or group self-annuitisations (GSAs)?
2. Would Account-based Pension (ABP) + DLA, with DLA purchased through instalments, help to overcome some of the concerns regarding the value of the residual benefit?

Question 1

One of the conclusions of our submission paper was that the current CIPRs framework, expressed through a lifecycle framework with an individual’s preferences represented by MDUF v1, would not add incremental value compared to the status quo. In this section, we explore the robustness of our conclusions across a broader suite of products including GSAs and DGSA.

In our submission paper, we discussed the different designs of CIPRs with products such as life annuity (LA) and DLA. Based on the analysis, ABP + DLA would potentially have a major role to play in CIPRs as it possesses the three features: income, risk management and flexibility.

Proposed CIPRs Framework

Would CIPRs under the current framework add value beyond an ABP applying the minimum drawdown (MDD) rules? The CIPR considered in our original submission paper was ‘the cut’ type solution that delivers a targeted constant real income using the ABP and a 20-year DLA. In this paper, we also consider 100% GSA and 20-year DGSA¹. **Table 1** provides the details of our modelling assumptions and **Table 2** and **Table 3** provide comparisons of these retirement products. The amount of DLA/DGSA is determined such that the expected incomes from ABP and DLA/DGSA are the same (to comply directly with Test 1). The CIPRs do not incorporate the Age Pension into its design, however the eligible Age Pension amount is included in total income calculations.

Table 1: Modelling assumptions for retirement products

| Retirement Products | Mortality | Investment | Fee | Age Pension Treatment |
|---------------------|------------------------------------------|---------------------------|--------|------------------------------------------------------------|
| ABP | N/A | 50% risky + 50% risk free | No fee | Current Age Pension Rule |
| LA | Government Actuary Life Tables (ALT1005- | Risk free rate | | Given the current Age Pension rule is unclear for deferred |

¹ GSA and DGSA design is based on Australian Government Actuary’s paper “Towards more efficient retirement income products”.

| | | | |
|------|-----------------------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| DLA | 07) + 25 years improvement | | longevity products, we use Actuarial present values to work out the Age Pension entitlements for all longevity products. |
| GSA | Same mortality assumption as LA & DLA with a closed pool of 500 | Same investment mix as ABP (50% risky + 50% risk free) | |
| DGSA | | | |

We define the following measures used throughout the paper:

- **Risk-Adjusted Income (\$):** the constant level of consumption which delivers an equivalent level of consumption utility.² This measure focuses on the income component only.
- **Risk-Adjusted Residual Benefit (\$):** the constant level of residual benefit which delivers an equivalent level of residual benefit utility.³ This measure focuses on the residual benefit component only.
- **MDUF Score:** the constant level of consumption (considering the trade-off against residual benefit) which delivers an equivalent level of expected utility. This is the overall measure that considers both income and residual benefit. The MDUF Score is equivalent to the Risk-Adjusted Income when the residual-benefit motive is zero.
- **Welfare Gain (\$):** the additional initial wealth required for an inferior solution to achieve the same expected utility as a superior solution. In this case, we use the ABP with MDD rule as the base solution. A negative welfare gain which is effectively welfare loss of the solution compared against ABP with MDD rule.

Table 2: MDUF Scores and related measures for the two proposed CIPRs (ABP + DLA and ABP + DGSA), GSA and ABP with MDD rules. This assumes members have residual-benefit motive.

| Retirement Balance | Risk-Adjusted Income | Risk-Adjusted Residual Benefit | MDUF Score | Welfare Gain |
|---------------------------|----------------------|--------------------------------|------------|--------------|
| \$200k, CIPR (ABP + DLA) | \$30,443 | \$26,052 | 6,723 | -\$67,806 |
| \$200k, CIPR (ABP + DGSA) | \$31,824 | \$27,435 | 7,079 | -\$59,025 |
| \$200k, GSA | \$35,171 | \$0 | 0 | -\$233,168 |
| \$200k, ABP MDD | \$30,708 | \$36,735 | 9,479 | - |
| \$500k, CIPR (ABP + DLA) | \$35,236 | \$26,374 | 6,806 | -\$164,062 |
| \$500k, CIPR (ABP + DGSA) | \$37,665 | \$28,074 | 7,244 | -\$153,268 |
| \$500k, GSA | \$51,146 | \$0 | 0 | -\$331,469 |

² Consumption utility is the expected utility with the residual benefit component set to zero.

³ Residual benefit utility is the expected utility with the consumption component set to zero.



| | | | | |
|-------------------------|----------|----------|--------|------------|
| \$500k, ABP MDD | \$39,256 | \$52,224 | 13,475 | - |
| \$1m, CIPR (ABP + DLA) | \$36,159 | \$26,644 | 6,875 | -\$291,698 |
| \$1m, CIPR (ABP + DGSA) | \$39,992 | \$0 | 0 | -\$460,820 |
| \$1m, GSA | \$64,592 | \$0 | 0 | -\$460,820 |
| \$1m, ABP MDD | \$45,577 | \$72,615 | 18,734 | - |

From the results in **Table 2**, we observe that when we include the residual-benefit motive, there are substantially higher MDUF Scores for ABP (applying MDD rules) than for each of the proposed CIPRs; this applies for all three retirement balances. 100% GSA, despite having the highest income, is heavily panelised for not being able to provide any flexibility through residual account value.

Table 3: MDUF Scores and related measures for the two proposed CIPRs (ABP + DLA and ABP + DGSA), GSA and ABP with MDD rules. This assumes members do not have residual benefit motives.

| Retirement Balance | Risk-Adjusted Income | Risk-Adjusted Residual Benefit | MDUF Score | Welfare Gain |
|---------------------------|----------------------|--------------------------------|------------|--------------|
| \$200k, CIPR (ABP + DLA) | \$30,443 | \$0 | 30,443 | -\$5,217 |
| \$200k, CIPR (ABP + DGSA) | \$31,824 | \$0 | 31,824 | \$22,006 |
| \$200k, GSA | \$35,171 | \$0 | 35,171 | \$87,997 |
| \$200k, ABP MDD | \$30,708 | \$0 | \$30,708 | - |
| \$500k, CIPR (ABP + DLA) | \$35,236 | \$0 | 35,236 | -\$79,256 |
| \$500k, CIPR (ABP + DGSA) | \$37,383 | \$0 | 37,383 | -\$36,917 |
| \$500k, GSA | \$51,146 | \$0 | 51,146 | \$234,434 |
| \$500k, ABP MDD | \$39,256 | \$0 | 39,256 | - |
| \$1m, CIPR (ABP + DLA) | \$36,159 | \$0 | 36,159 | -\$185,682 |
| \$1m, CIPR (ABP + DGSA) | \$39,992 | \$0 | 39,992 | -\$110,108 |
| \$1m, GSA | \$64,592 | \$0 | 64,592 | \$374,913 |

\$1m, ABP MDD

\$45,577

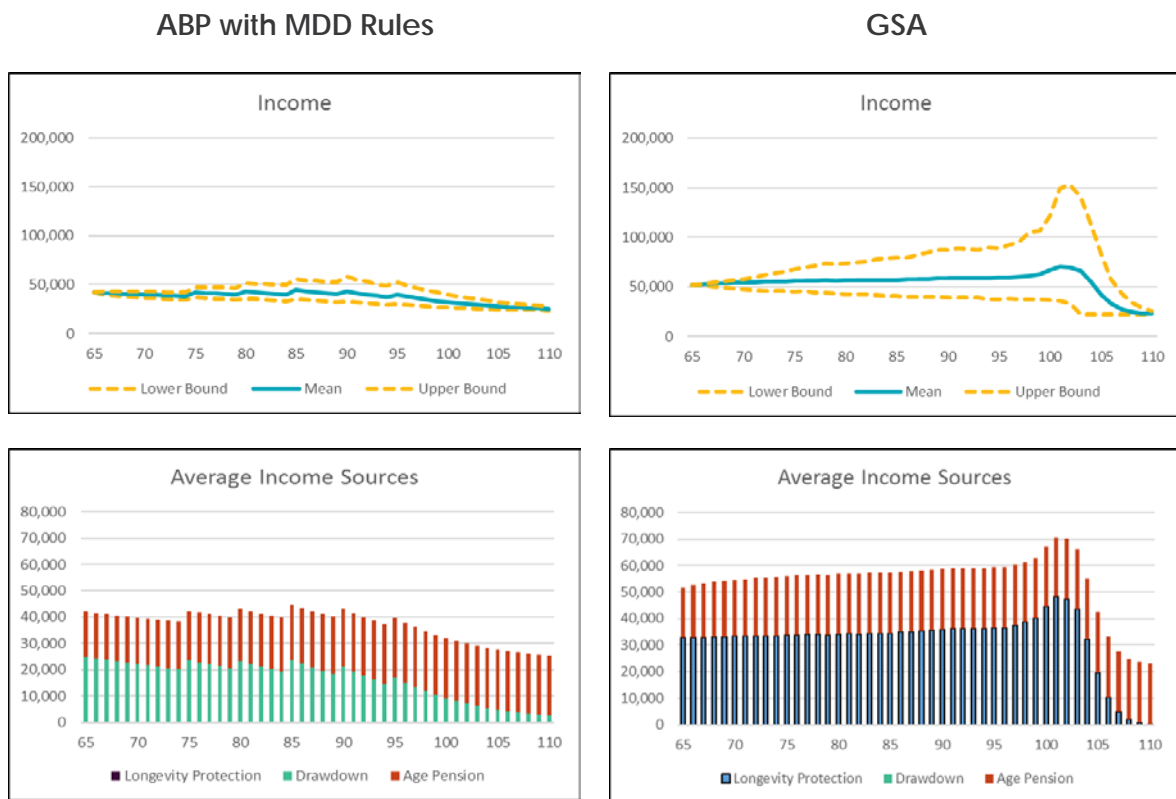
\$0

45,577

-

When the residual-benefit motive is removed (see **Table 3**), GSA unsurprisingly outperforms all other products by providing the highest level of risk-adjusted income. A comparison of income profiles and average income sources between ABP with MDD rules and 100% GSA is provided in **Figure 1** below.

Figure 1: Income profiles and average income sources for ABP with MDD rules and 100% GSA, based on simulation. The results are based on \$500K retirement balance.



ABP with MDD rules outperforms the two CIPRs with smaller marginal benefits. One exception is the 200K balance where ABP + DGSA outperforms ABP with MDD with a welfare gain of about \$22K.

This result can be explained by the following design weaknesses in the proposed CIPRs framework:

- The CIPRs framework uses expected outcomes (investment return, mortality) in its design (see **Figure 2**). Possible shortfalls due to poor outcomes are not explicitly considered and accounted for in the product design. “The cut” type CIPRs may result in shortfalls before the deferred longevity incomes start to kick in (see **Figure 3**).
- The CIPRs framework does not incorporate the Age Pension into its design. The resulting income profiles after adding back the Age Pension entitlement might be suboptimal and less

likely to be constant in expectation especially for higher balances (see average income source in **Figure 2**).

Figure 2: Income profiles and average income sources for the two proposed CIPRs: ABP + DLA and ABP + DGSA, based on design. The results are based on \$500K retirement balance.

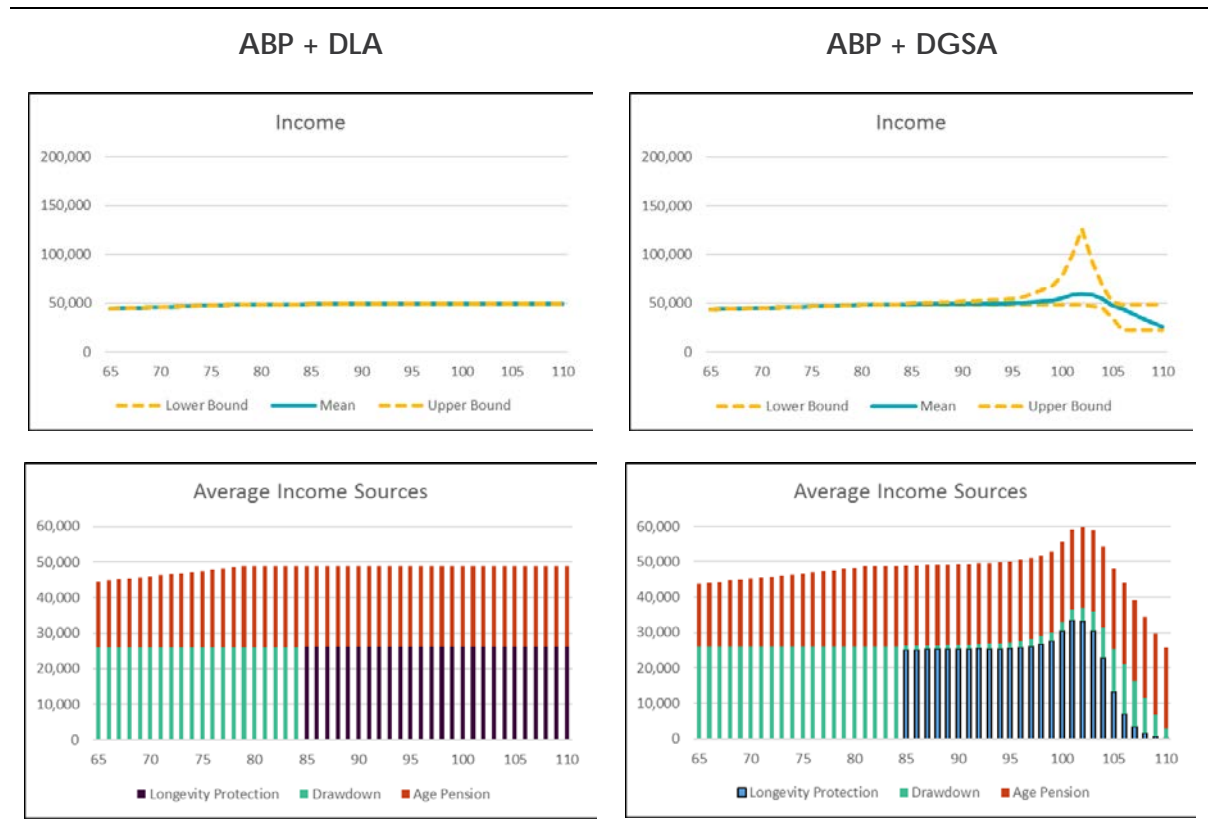
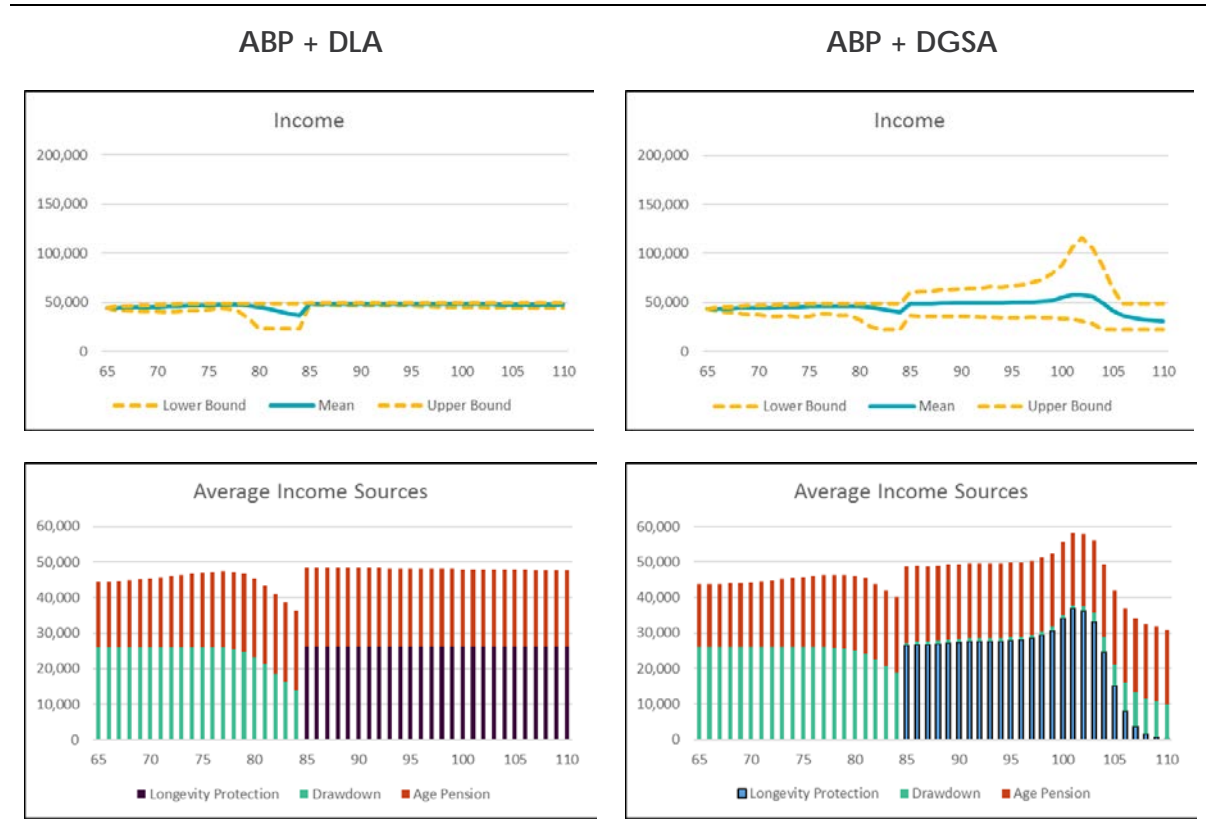


Figure 3: Income profiles and average income sources for the two proposed CIPRs: ABP + DLA and ABP + DGSA, based on simulation. The results are based on \$500K retirement balance.



The above analysis questions the value-add of CIPRs and raises a challenge with conflicting perspectives: if preferences such as risk aversion, higher & less volatile income streams and not running out of retirement savings, are important for members, and if it is intuitive and efficient to incorporate the Age Pension, then these case studies suggest that it is difficult for the current CIPRs framework to add incremental value.

Enhanced CIPRs Framework v1

The design of the two CIPRs could be improved of course. For example, a margin of safety with conservative drawdown could be incorporated into the design rules of the ABP component. However, this will most likely come at the expense of expected income and the enhanced CIPRs may not pass the Actuarial Certification Tests (ACTs).

As shown in **Table 4**, the enhanced CIPRs v1, improved by incorporating the Age Pension in design and with conservative income targets, could indeed deliver values over ABP with MDD rules for all three retirement balances. In addition, DGSA tends to perform much better than DLA due to the

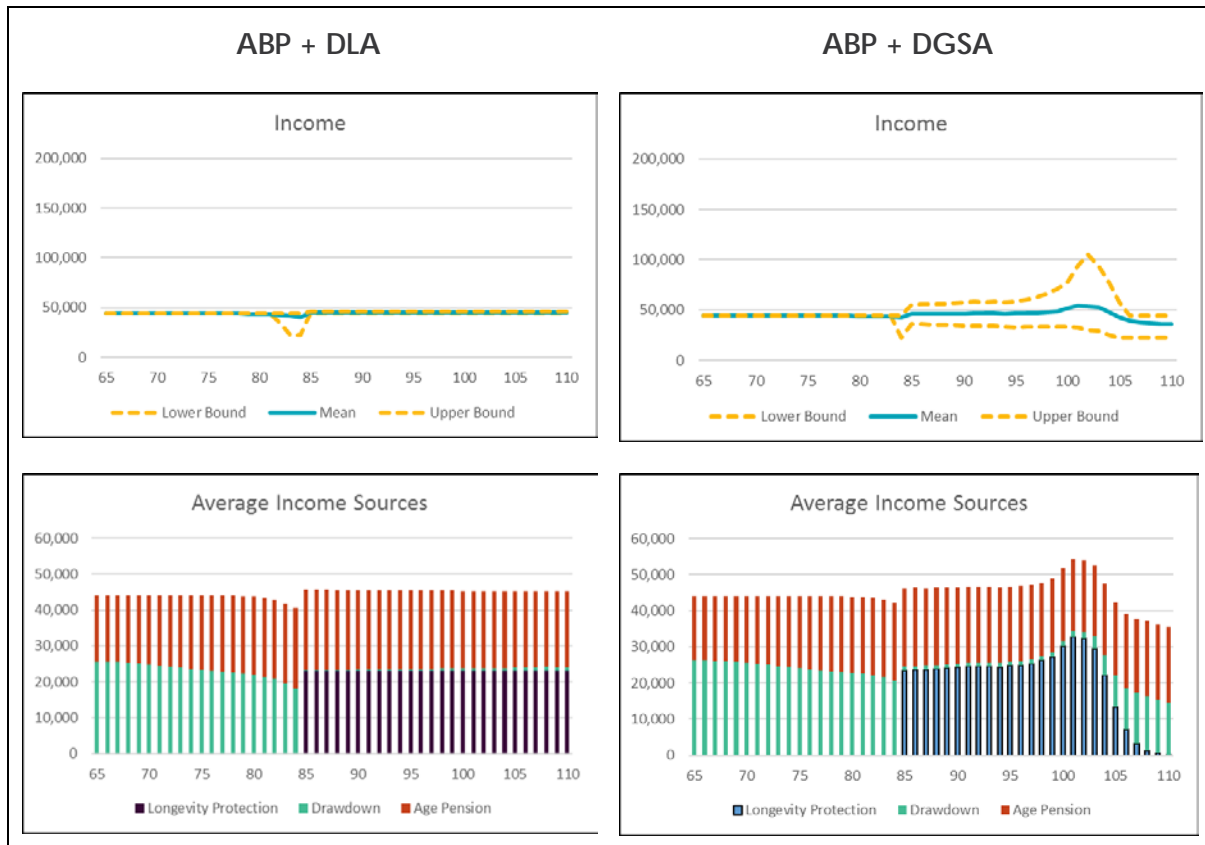


exposure to a riskier portfolio. Income profiles and average income source of the enhanced CIPRs v1 design for \$500K retirement balance is shown in **Figure 4**.

Table 4: MDUF Scores and related measures for the two enhanced CIPRs v1: ABP + DLA and ABP + DGSA, and ABP with MDD rules. The enhanced CIPRs v1 incorporates the Age Pension in design and conservative income targets. This assumes members do not have residual-benefit motive.

| Retirement Balance | Risk-Adjusted Income | Risk-Adjusted Residual Benefit | MDUF Score | Welfare Gain |
|---------------------------|----------------------|--------------------------------|------------|--------------|
| \$200k, CIPR (ABP + DLA) | \$31,487 | \$0 | 31,487 | \$15,367 |
| \$200k, CIPR (ABP + DGSA) | \$31,956 | \$0 | 31,956 | \$24,621 |
| \$200k, ABP MDD | \$30,708 | \$0 | 30,708 | - |
| \$500k, CIPR (ABP + DLA) | \$40,429 | \$0 | 40,429 | \$23,139 |
| \$500k, CIPR (ABP + DGSA) | \$42,058 | \$0 | 42,058 | \$55,246 |
| \$500k, ABP MDD | \$39,256 | \$0 | 39,256 | - |
| \$1m, CIPR (ABP + DLA) | \$50,344 | \$0 | 50,344 | \$93,997 |
| \$1m, CIPR (ABP + DGSA) | \$54,221 | \$0 | 54,221 | \$170,433 |
| \$1m, ABP MDD | \$45,577 | \$0 | 45,577 | - |

Figure 4: Income profiles and average income sources for the two enhanced CIPRs v1: ABP + DLA and ABP + DGSA, based on simulation. The enhanced CIPRs v1 incorporates the Age Pension in design and conservative income targets. The results are based on \$500K retirement balance.



Enhanced CIPRs Framework v2

The design of the CIPRs could also be improved by having a more sustainable drawdown rule on the ABP components instead of having a constant income target. In order to satisfy Test 1 of ACTs, the drawdown ratio can be designed, based on the term annuity factor, to deliver constant expected income.

As shown in **Table 5**, the structured enhanced CIPRs v2 with the ABP drawdown ratios could indeed deliver much higher values than ABP with MDD rules for all three retirement balances. Income profiles and average income source of the enhanced CIPRs v2 design for \$500K retirement balance is shown in **Figure 5**.

Applying the ABP drawdown ratios has an advantage over target constant income because it can absorb the impact of adverse investment outcomes over time. This reduces shortfall risk significantly in later years and improves income sustainability. As shown in **Figure 5**, compared to the proposed

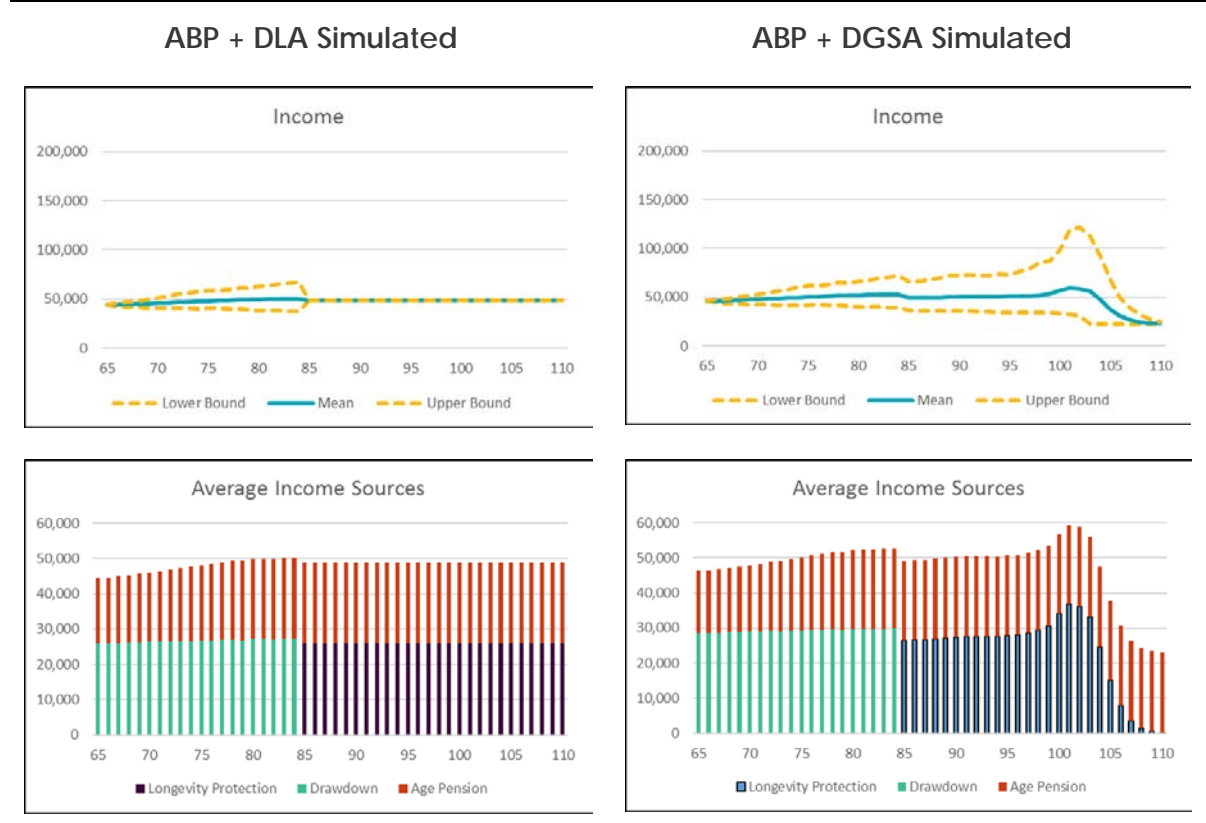


CIPRs and the enhanced CIPRs v1, the income profiles of the enhanced CIPRs v2 have lower probability of shortfall closer to the time before the DLA/DGSA incomes start to kick in.

Table 5: MDUF Scores and related measures for the two enhanced CIPRs v2: ABP + DLA and ABP + DGSA, and ABP with MDD rules. The enhanced CIPRs v2 incorporates recommended minimum income rule on ABP drawdown. This assumes members do not have residual-benefit motive.

| Retirement Balance | Risk-Adjusted Income | Risk-Adjusted Residual Benefit | MDUF Score | Welfare Gain |
|---------------------------|----------------------|--------------------------------|------------|--------------|
| \$200k, CIPR (ABP + DLA) | \$32,887 | \$0 | 32,887 | \$42,971 |
| \$200k, CIPR (ABP + DGSA) | \$33,342 | \$0 | 33,342 | \$51,944 |
| \$200k, ABP MDD | \$30,708 | \$0 | 30,708 | - |
| \$500k, CIPR (ABP + DLA) | \$45,811 | \$0 | 45,811 | \$129,244 |
| \$500k, CIPR (ABP + DGSA) | \$46,220 | \$0 | 46,220 | \$137,308 |
| \$500k, ABP MDD | \$39,256 | \$0 | 39,256 | - |
| \$1m, CIPR (ABP + DLA) | \$55,224 | \$0 | 55,224 | \$190,211 |
| \$1m, CIPR (ABP + DGSA) | \$58,533 | \$0 | 58,533 | \$255,437 |
| \$1m, ABP MDD | \$45,577 | \$0 | 45,577 | - |

Figure 5: Income profiles and average income sources of the two enhanced CIPRs v2: ABP + DLA and ABP + DGSA, based on simulation. The enhanced CIPRs v2 incorporates recommended minimum income rule on ABP drawdown. The results are based on \$500K retirement balance.



Question 2

In this section we explore whether paying the DLA/DGSA premium through instalments (instead of upfront), would improve the MDUF Score of the ABP + DLA/DGSA (considered in Question 1 above).

We focus on the cases without residual-benefit motive as shown in **Table 6**. The results show that paying the premium through instalments has a lower expected utility (welfare) than paying the premium upfront. The two main reasons for this result are:

1. For the instalment method, the annual premium payment is a life-contingent liability. Closer to the time before the DLA/DGSA payments start to kick in, there is a chance that the balance could be very low because of poor investment performance in the past. This combined with the compulsory outflow would result in poor outcome such as higher income shortfall (see income profiles of **Figure 6** and **Figure 7**). This is less of an issue for the upfront method since a one-off deduction when the balance is high would not result in a utility penalty as high as the instalment method.

- Age Pension entitlement tends to increase slower with the instalment option due to a smaller reduction in residual benefits at the start of retirement (see Age Pension of **Figure 6** and **Figure 7**).

Given the current Age Pension rule is unclear for deferred longevity products, we use Actuarial present values to work out the Age Pension entitlements for these products. However, the actual Age Pension treatment for these deferred longevity products could be different from what we have assumed in this analysis. For example, the life-contingent liability might be excluded from the assets test, which means the Age Pension entitlements would be the same under both premium payment methods. **Table 7** shows the results are still consistent when we exclude Age Pension completely from the assessment of the products.

Table 6: MDUF Scores and related measures for the two proposed CIPRs: ABP + DLA and ABP + DGSA, with upfront and instalment premium payments for purchasing the DLA/DGSA. The results are based on \$500K and this assumes members do not have residual-benefit motive.

| Enhanced-CIPRs | Risk-Adjusted Income | Risk-Adjusted Residual Benefit | MDUF Score | Welfare Gain |
|-------------------------|----------------------|--------------------------------|------------|--------------|
| ABP + DLA (Upfront) | \$35,236 | \$0 | 35,236 | - |
| ABP + DLA (Instalment) | \$34,465 | \$0 | 34,465 | -\$15,201 |
| ABP + DGSA (Upfront) | \$37,383 | \$0 | 37,383 | - |
| ABP + DGSA (Instalment) | \$36,008 | \$0 | 36,008 | -\$27,110 |

Figure 6: Income profiles, Age Pension entitlement and residual account of the proposed CIPRs: ABP + DLA, with upfront and instalment premium payments for purchasing the DLA. The results are based on \$500K retirement balance.



Figure 7: Income profiles, Age Pension entitlement and residual account of the proposed CIPRs: ABP + DGSA, with upfront and instalment premium payments for purchasing the DGSA. The results are based on \$500K retirement balance.



Table 7: MDUF Scores and related measures for the two proposed CIPRs: ABP + DLA and ABP + DGSA, with upfront and instalment premium payments for purchasing the DLA/DGSA. Age Pension is excluded. The results are based on \$500K and this assumes members do not have residual-benefit motive.

| Enhanced-CIPRs | Risk-Adjusted Income | Risk-Adjusted Residual Benefit | MDUF Score | Welfare Gain |
|-------------------------|----------------------|--------------------------------|------------|--------------|
| ABP + DLA (Upfront) | \$1,603 | \$0 | 1,603 | - |
| ABP + DLA (Instalment) | \$1,542 | \$0 | 1,542 | -\$1,203 |
| ABP + DGSA (Upfront) | \$1,790 | \$0 | 1,790 | - |
| ABP + DGSA (Instalment) | \$1,678 | \$0 | 1,678 | -\$2,208 |

To assess whether instalment payments overcome some of the concerns regarding the value of the residual benefit, we add back residual-benefit motive and show the comparisons in **Table 8** and **Table 9**. If we include the Age Pension, the results in **Table 8** show that using instalment payments option provides only very small welfare gain of about \$0.5K for ABP + DLA, and a welfare loss of about \$3K for ABP + DGSA.

If we exclude the Age Pension, the results in **Table 9** show no incremental benefits in using instalment payments in both cases. In fact, when we exclude the Age Pension entitlements in a strategy that could potentially result in a large shortfall, the MDUF Scores are near-zero. This indicates how nonaligned the strategy are against members' preference presented in MDUF v1.

Based on all the analysis in this section, we conclude that using an instalment payment option to purchase the DLA/DGSA component adds little or negative value, compared to using an upfront payment option.

Table 8: MDUF Scores and related measures for the two proposed CIPRs: ABP + DLA and ABP + DGSA, with upfront and instalment premium payments for purchasing the DLA/DGSA. The results are based on \$500K and this assumes members have residual-benefit motive.

| Enhanced-CIPRs | Risk-Adjusted Income | Risk-Adjusted Residual Benefit | MDUF Score | Welfare Gain |
|---------------------|----------------------|--------------------------------|------------|--------------|
| ABP + DLA (Upfront) | \$35,236 | \$26,374 | 6,806 | - |

| | | | | |
|-------------------------|----------|----------|-------|----------|
| ABP + DLA (Instalment) | \$34,465 | \$26,464 | 6,829 | \$566 |
| ABP + DGSA (Upfront) | \$37,383 | \$27,762 | 7,164 | - |
| ABP + DGSA (Instalment) | \$36,008 | \$27,278 | 7,039 | -\$3,075 |

Table 9: MDUF Scores and related measures for the two proposed CIPRs: ABP + DLA and ABP + DGSA, with upfront and instalment premium payments for purchasing the DLA/DGSA. Age Pension is excluded. The results are based on \$500K and this assumes members have residual-benefit motive.

| Enhanced-CIPRs | Risk-Adjusted Income | Risk-Adjusted Residual Benefit | MDUF Score | Welfare Gain |
|-------------------------|----------------------|--------------------------------|------------|--------------|
| ABP + DLA (Upfront) | \$1,603 | \$1,183 | 305 | - |
| ABP + DLA (Instalment) | \$1,542 | \$1,183 | 305 | \$0 |
| ABP + DGSA (Upfront) | \$1,790 | \$0 | 0 | - |
| ABP + DGSA (Instalment) | \$1,678 | \$0 | 0 | \$0 |

Conclusion

This paper addresses the two follow-up questions from Treasury on our submission. When viewed through the eyes of a welfare-maximising member (with preferences represented by MDUF v1) rather than through the lens of fiscal policy, we conclude that the proposed CIPRs framework does not improve benefits for individuals.

This conclusion is robust across a broader suite of products including deferred life annuities (DLAs) and deferred group self-annuitisations (DGSA) as well as under the assumption of no residual-benefit motive. However, the CIPR framework can be improved by incorporating the Age Pension in design and allowing more flexibility in ACTs. This includes allowing for more conservative income targets or using a more sustainable drawdown rule on ABP rather than constant-income targets. The enhanced CIPRs designed under the improved frameworks would indeed provide enhanced benefits to members. In addition, we find no incremental benefit of using an instalment payment method for purchasing the longevity component of CIPRs compared to an upfront premium payment.

We hope this response further illustrates our key points and helps inform Treasury with future decisions. The team at Mine Wealth + Wellbeing are happy to share our modelling with Treasury and the AGA.

