

Thoughts on RFQ for Technical Feasibility Assessment of Alternative AE Proposal

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These notes refer to the [RFQ from the Pensions Council \(21 June 2023\)](#). It is best to have first read my entry for the Institute and Faculty of Actuaries' [2022 Redington Prize](#), which is reproduced (anonymously) in Appendix B of the RFQ; also, my [article for the Actuary](#) magazine and my [presentation to a TASC seminar](#) in March 2023.

1. It is reassuring that Minister Heather Humphreys' request for an independent evaluation of the smoothed equity approach to auto-enrolled (AE) pensions includes specific reference to decumulation. A major failing in the DSP's proposal as set out in the [Draft Heads and General Scheme of the Bill](#) is that it ignores what happens post-retirement (Head 58 says that all payments from the Scheme will be in lump sum form until such time as regulations under Head 59 are commenced, with no indication as to when that might be). In contrast, decumulation is integral to the smoothed equity approach.

2. Point 2 of the RFQ reads:

"The Council is seeking an analysis of the proposed model and to understand the sources of outperformance compared to the AE system as currently set out in the Draft Heads and General Scheme of the Automatic Enrolment Retirement Savings System Bill 2022"

In order to make the comparison, assumptions are required on the likely outcome under the AE scheme, as set out in the Draft Heads and General Scheme of the Automatic Enrolment Retirement Savings System Bill 2022, in particular:

- i. The assumed asset mix for the Default Funds at different ages (Head 33 refers to just one Default Fund but the aim of risk levels varying by age, mentioned in the Explanatory Note, can only be achieved with a series of Default Funds where asset mix changes with age). DSP has not given any guidance on the asset mix of the default funds at different ages.
- ii. Charges pre-retirement. The Draft Heads of Bill give no indication of charges pre-retirement under the DSP's proposed scheme. The figure of 0.5% of assets under management has been mentioned but the actual charge is likely to be higher for the reasons mentioned in point 9 below.
- iii. Costs incurred at retirement and ongoing charges post-retirement. The estimate of a required contribution of 14% of earnings for an 'adequate' pension as stated in the [2018 'strawman' proposals](#) and repeated in Head 9 of the Draft Bill assumes that 100% of retirement proceeds will be used to buy an annuity. In comparing to the smoothed equity approach, I assumed a drawdown product at retirement under the DSP proposal, with admin and investment management costs equating to a 0.9% yield reduction and advisory costs equivalent to a further 0.6% yield reduction. I also assumed 25% cash at retirement, for consistency with the cash assumed under the smoothed approach. The modest average sums at retirement, the average member's lack of financial acumen and inadequacies in Ireland's regulatory structure, discussed in a [paper to the Society of Actuaries in Ireland in November 2022](#), all put upward pressure on costs.
- iv. The asset mix at different ages post-retirement. The answer is straightforward for an annuity – 100% in bonds all through retirement – but if a drawdown product is assumed, the bond proportion is likely to increase with age. In comparing the smoothed equity approach to the DSP's proposal, I assumed 50% in equities, 50% in bonds all through retirement under the DSP's proposal. Given that most AE retirees

will be of modest means, the average equity percentage at retirement will probably be less - probably 40% at most rather than the 50% I assumed - and will continue to fall through retirement, possibly to 10% or less by age 100 for survivors to that age.

3. Staying with point 2 of the RFQ and the requirement to understand the sources of outperformance relative to the approach set out in the Draft Heads of the Bill, lower volatility of returns under the smoothed approach is a major advantage in terms of members' peace of mind, which is hard to value.
4. Point 3(a) of the RFQ asks for an *'assessment of the financial outperformance suggested by the proposed model'*. Presumably this refers to the core assumption that equities will outperform bonds by 4% per annum on average in future, the "on average" being key. There is no shortage of academic literature on the subject. The study mentioned in note 32 of the paper indicates an average equity outperformance of 5.5% a year, significantly more than is assumed in the paper.
5. The first bullet point of Section 3(b) of the RFQ asks for *scenario testing of the proposed model*. The paper in Appendix B investigates two contrasting scenarios – the UK and Japan markets between 1990 and 2020. Spreadsheets showing smoothed returns for both markets for that 30-year period are in the pensions tab of colmfagan.ie (documents dated 1 and 2 July 2023). A further 2,000 scenarios, each of 60 years' duration, were investigated and are described in Sections 12.13 to 12.18 and Appendix 4 of the [January 2021 paper to the Society of Actuaries in Ireland](#).
6. The second bullet point of Section 3(b) of the RFQ asks to *investigate the impact of changing the two key variables in the smoothing formula on a periodic basis: (i) the expected long-term return (i_t) and (ii) the weighting (p) for prevailing market value.*

On (i), the second-last paragraph of Section 6 of the paper in Appendix B discusses how the long-term return assumed in the smoothing formula might be determined. In theory, it should be the trustees' / directors' best estimate of the expected long-term return at time t , inclusive of the ERP. Because of the uncertainties surrounding the ERP, it must be subject to careful governance. A committee of eminent economists should review " i_t " on a regular basis. While not trying to anticipate how that committee might operate, I suggest that they review it only once a year at most and that changes should be less than 0.25% pa other than in exceptional circumstances. The review could also take account of the relationship between smoothed and market value at the time of the review, i.e., if smoothed value is less than market value, the assumed long-term return should be slightly higher than if it's above market value and vice versa. Relatively minor adjustments to the assumed long-term investment return could help prevent smoothed value from straying too far from market value. That refinement was missing from my paper.

On (ii) above (the weighting " p " for current market value in the smoothing formula), the paper in Appendix B includes the paragraph (in Section 6):

"In Section 3, it was stated that, once a decision is reached on the weighting for current market value in the smoothing formula, that weighting should remain unchanged forever. It is important for the integrity of the smoothing approach that members can trust that the formula is tamper-proof. At the same time, it is impossible to know how the world might change in future. Will the value for " p " chosen at the outset still be appropriate 50 years from now? The solution may be to specify a fixed value for " p " at the outset, but to schedule a review after (say) 25 years, to confirm if the initial choice is still appropriate. Any review will need to be carefully circumscribed and accompanied by an assurance to members that no-one will be disadvantaged unreasonably by a change."

Therefore, there is no intention of changing the weighting " p " for current market value in

the smoothing formula on a periodic basis, as stated in the RFQ. However, if considered appropriate, the weighting may be changed when market and smoothed values are equal, without impacting members' expectations. The main reason for wanting to change "p" would be to vary the weighting for faithfulness to market value (a higher value for "p") or to smoothness of returns (a lower value for "p"). That task should be delegated to the 'committee of eminent economists.'

7. The first bullet point of Section 3 (c) of the RFQ asks for '*a list of the key assumptions and an assessment of these assumptions underpinning the proposed model*'. Listing the key assumptions is straightforward. Assessing them is a different matter. One of the key assumptions is that cash flows are unaffected by whether smoothed value is above or below market value. The entire edifice collapses if this assumption is unfounded, i.e., if cash flows reduce when smoothed value is greater than market value and/or increase when it is less than market value. This question is discussed in Section 2 of the paper of Appendix B of the RFQ and in the paragraphs after table 2 in Section 3. It is also discussed below in answer to question 1 on page 4 of the RFQ.

Paradoxically, a behavioural scientist might argue that, in the real world, cash flows to the smoothed scheme might increase in relative terms rather than reduce, as a super-rationalist might expect, when the ratio of smoothed to market value exceeds 100%. To understand why, consider a repeat of experience from January 2000 for a scheme starting on that date, as shown in table 2. A worker who joined the smoothed scheme on 1 January 2000 has seen returns of +4%, +2% and +1% in 2000, 2001 and 2002 respectively, while a colleague who joined a market-based scheme on the same date has seen returns of minus 6%, minus 13% and minus 23% in the same years. While the super-rationalist might argue that the member of the smoothed scheme should move to a market based one when the market is on the floor, the member himself or herself is more likely to thank their lucky stars that they chose the smoothed scheme and to stay with it, while the colleague who joined a market-based scheme could ignore the rational advice to stay where they are and might wish to move to the smoothed scheme for greater peace of mind.

The opposite could also be true, i.e., workers might be tempted to leave the smoothed scheme if markets perform exceptionally well for a number of years and smoothed returns lag market returns. Such departures would be a boon for continuing members who would benefit from the accumulated excess of market value over smoothed value for leavers. A personal view is that workers familiar with the operations of the smoothed scheme would be unlikely to leave it in those circumstances.

8. The second bullet point of 3(c) requires '*stress testing of individual assumptions/ scenario testing; and model a number of plausible adverse scenarios (e.g., 1-in-25-year stress events to market or mortality/longevity risk) at varying spot years in future*'.

The longevity risk challenge is straightforward. It only affects the optional longevity benefit and is only relevant from when the first pensioners reach age 75. The mortality projections in the paper (Section 5) assume a deduction for longevity benefit of 2.45% a year for members opting for the benefit and mortality as implied by the assumed survival rates in table 5, i.e., for every 1,000 reaching age 75, 538 survive to age 90 and 122 to age 100. Those assumed survival rates are much higher than current survival rates and reflect a combination of factors, including that it will be at least 30 years, possibly closer to 40 years, implying 30 or 40 years of mortality improvements, before significant numbers reach those ages, and that there will be an element of self-selection in that retired members in poor health are unlikely to opt for longevity protection. It is worth adding however that anyone who dies shortly after opting for longevity protection will only have lost the extra charge for

the duration since attaining age 75. That will reduce the extent of self-selection. The directors/ trustees will review the deduction for longevity protection on a regular basis (probably triennially) and will vary the charge on actuarial advice and subject to regulatory approval if projections for life expectancy change. In the longer term, the trustees may change the age at which members may opt for longevity protection, to ensure fairness across generations.

In relation to market stress events, the model copes well with short-term market shocks, so they are not a concern. See for example table 1 of the paper, which shows markets falling 25% in the first quarter of 2020, yet smoothed returns show no signs of stress and MV and SV are back in equilibrium after 6 months. Even longer-term market stresses are generally not a problem. Table 2 shows markets falling almost 40% over three years from 1 January 2000 yet smoothed values remain positive for the entire period and MV and SV are back in balance by 2003.

The biggest challenge to the smoothed approach is a prolonged market downturn, especially if it happens when the scheme is mature. The Japanese experience since 1990, explored at the end of Section 3, shows the scale of the challenge. The Japanese market fell 40% in 1990 and was down another 25% over the next two years. Even after 30 years, the Index with dividends reinvested was still 12% below its starting level three decades previously.

Even for Japan post-1990, the smoothing formula holds up remarkably well in the early years. I posted separately the spreadsheet showing market and smoothed returns for Japan since 1 January 1990 (document dated 2 July 2023 on the pensions tab of my website). The spreadsheet shows that, for the first ten years, the ratio SV/MV never gets near the threshold where it's better for a young worker to cease contributing to the smoothed scheme, on the analysis in Appendix 1 of the paper. However, problems start to emerge from the early 2000s, then ease before getting even bigger by the time of the GFC. To put the Japanese experience in context, the market index (with dividends reinvested) in December 2008 is down more than 65% from its starting level on 1 January 1990. This is well into '1 in 200' territory.

Ratios of SV to MV over 170% prove problematic for the smoothed approach. The ratio for Japan was over 190% in February 2009. This raises a number of questions:

- a) How likely is it that the decades-long stasis that afflicted the Japanese economy, stock market and property market post-1990 will be repeated on a global level at some future date (remembering that the smoothed AE fund will be invested globally)? Has the world learned how to prevent what happened then in Japan happening globally in future? Would world leaders work together to restore economic activity? I am not a macroeconomist, so I am not qualified to answer, but I believe the risk of a repeat at global level of Japan's experience in the decades post 1990 is extremely remote.
- b) Even if it were to happen, how likely is it that workers and employers would abandon the smoothed scheme? It is by no means certain that they would. The average return on the smoothed fund over the 30 years Jan 1990 to Dec 2019, assuming contributions invested entirely in Japan and cash flows as per the spreadsheet, would have been fractionally under plus 3% a year. The corresponding 20-year return from 1990 is 2.6% a year. (Both should be netted for the management charge of 0.5% a year). Considering the low returns for Japanese savers in that period, not to mention the wild ride they would have experienced by investing in the stock markets, those returns are quite acceptable.

- c) Even if workers and employers lose faith in the smoothed approach, the prohibition on transfers out ensures that the fund survives and will still be able to pay pensions and gratuities as they fall due. What happens when/ if the smoothed scheme starts experiencing negative net cash flows is discussed at the end of Section 4 of the paper and later in this note. However, that discussion, which shows things working out well, assumes what might be called ‘managed decline’. It is far from desirable for the scheme to be terminated in circumstances similar to those hypothetically experienced in Japan in 2009. Nevertheless, it would not of itself require financial intervention by government. The risk will be investigated later in this note.
 - d) It could be argued that the Japan scenario shown in the spreadsheet of 2 July 2023 paints an optimistic picture, since it shows minimal (zero actually) accumulated funds when the market is at its peak and cash flows growing strongly when markets are falling. Things would not work out so well if the scheme were well established by 1990, because it would already have accumulated substantial funds and there would be far less certainty of net positive cash flows riding to the rescue in falling markets. That is true, but there are mitigating factors. One is that the Japanese market enjoyed an extraordinary boom in the late 1980’s, so smoothed values would have been considerably less than market values by the time the market peaked on 31 December 1989. That cushion would have provided some protection. Whilst not wishing to enter the debate on whether markets tend to revert to mean, history shows that most stock market busts are preceded by booms. Another consideration is that, if the scheme is sufficiently mature by the time of the downturn, a buffer account will have been established, to be deployed gainfully when cash flows turn negative (see references to the buffer account at the end of Section 4). A third consideration is that the smoothing formula in the spreadsheet of 2 July assumes (for ease of modelling) that the rate of return assumed in the smoothing formula will remain unchanged (at 4% a year). In practice, the ‘committee of eminent economists’ will reduce the assumed future rate of return if economic prospects are poor, if inflation is very low and if smoothed value is at a premium to market value. This will help reduce the gap between smoothed and market value.
9. Point 3(d) of the RFQ asks for an assessment of the drivers of performance in the proposed model. The main drivers of performance relative to the approach proposed by the DSP are (i) higher investment returns pre-retirement; (ii) higher investment returns post-retirement; (iii) lower admin costs pre-retirement; (iv) lower administrative costs post-retirement; (v) lower advisory costs, particularly post-retirement; (vi) lower investment expenses pre- and post-retirement; (vii) lower costs at point of retirement; (viii) better longevity protection. I estimate that their combined effect will more than double the value for money compared with the scheme proposed by the DSP, with considerably less volatility of returns. As a result, the required contribution for an “adequate” pension falls from the strawman’s 14% to 7%, made up of 3% employees, 3% employers, 1% state. Needless to say, whoever wins the RFQ from the Pensions Council will have to do their own calculations to confirm the reasonableness or otherwise of the 7% estimate.

Looking at each of the above drivers in turn:

i. ***Higher investment returns pre-retirement:***

I am suggesting that the comparison should assume 80% equities, 20% bonds for the default funds proposed by the DSP until 10 years before retirement, falling to 40% equities, 60% bonds by retirement, compared with 100% in equities throughout for

the smoothed equity fund, and that equities outperform bonds/cash by 4% a year. It would be advisable to compare the above with actual proportions in AE default funds at various ages for other countries.

ii. ***Higher investment returns post-retirement:***

Post-retirement, my paper for the IFOA assumed 50% in equities, 50% in bonds for a scheme similar to that proposed by the DSP. I now think that bond proportions post-retirement will be higher for retirees from the DSP scheme. The average AE member will be of limited means, so is likely to be advised to invest a higher proportion in bonds. They will probably also be advised to increase the bond proportion at older ages. Currently, there is a 'fashion' to advise annuitization at older ages, e.g., from age 85, implying 100% in bonds from that age. Given the above, it is more appropriate to assume 60% in bonds on average at retirement, increasing further at older ages, e.g., to 90% by age 100.

iii. ***Lower administrative costs pre-retirement:***

The smoothed scheme will be much easier to establish and easier and cheaper to administer on an ongoing basis than the scheme proposed by the DSP. It will also involve less operational risk.

While unit-linked administration systems should have little difficulty allocating and deallocating monies to the various funds under the scheme proposed by the DSP, workers must decide at the start and on an ongoing basis whether they want to invest in a default fund or in one of the three risk-rated funds (low, medium, or high). The need to record that choice increases operational risk. Also, to ensure that contributions are allocated to the correct default fund for a member's age (there will probably be more than 40 such funds), ages will have to be recorded correctly. Correction of age misstatements and consequent reallocation of contributions to funds with different price histories could cause admin problems.

There are also operational risks deciding dates on which contributions from employees, employers and state are applied to buy units in the chosen funds. None of these problems arise for the smoothed scheme since there will be just one fund, and each month everyone will be credited with the same return.

Dealing with member queries could also cause significant overheads for the scheme proposed by the DSP. The vast majority of members will have little or no experience of investing and may find fluctuations in account values (particularly falls in value) difficult to understand, especially when they won't have the support of a pension adviser. The fact that two people working side by side could earn different returns despite both having chosen the default option, simply because of differences in age, could also lead to confusion. Lack of familiarity with the volatility of unit-linked funds may account, in part at least, for high termination rates under the NEST scheme. High termination rates increase admin costs per member.

The special provisions under Heads 10, 11 and 12 of the Draft Bill in relation to opt-out, re-enrolment, suspension of contributions and re-enrolment will be a nightmare to administer under a unit-linked arrangement. They could also cause significant adverse selection which may need special consideration before being written into law. The same provisions will cause much less difficulties under the smoothed approach, but there may also be adverse selection with the smoothed approach that will need to be investigated before being written into legislation. Those issues are beyond the scope of this study.

Given the above considerations, it is most unlikely that the scheme proposed by the

DSP can be administered in the long run for 0.5% of AUM, as promised in earlier presentations. Interestingly, that promise is missing from the Draft Heads of Bill. The NEST experience may have given cause for thought. NEST, now well over a decade in existence, had a cumulative deficit of over £800 million at March 2022. Its average management charge is close to 0.5% of AUM. NEST now faces a higher interest rate environment, making it more difficult to repay the outstanding balance. NEST has more than ten times as many members as the Irish scheme can ever hope to have. Therefore, it is highly probable that the charge under the DSP's proposed scheme will have to be considerably higher than 0.5% to break even in the long run. The actual charge can only be confirmed when the Department of Public Expenditure, NDP Delivery and Reform has agreed to DSP's proposal. To the best of my knowledge, the discussions between the two Departments have not yet taken place. For comparison purposes, I assumed that the charge for the scheme proposed by DSP would be 0.5%.

I am confident that the proposed smoothed scheme can be administered (including asset management) in the long-run for less than 0.5% per annum, for the reasons set out in [Slide 14 for the TASC seminar](#) and because retention rates should be much higher than under a scheme modelled on the UK's NEST scheme, resulting in higher revenues and lower unit costs. In the very long-run, I expect that the smoothed scheme can be administered for 0.3% a year, allowing a transfer of 0.2% of AUM to the buffer account each year from year 20 or so.

iv. ***Lower administrative costs post-retirement:***

Under the scheme proposed by the DSP, workers must leave at retirement and lose the benefit of the lower fees for asset management, etc. that the trustees/ directors will have negotiated for active members. Instead, they will have to buy individual products (annuities or ARF's) with charges appropriate to individuals rather than to groups. In contrast, under the smoothed approach, members remain in the scheme post-retirement and continue to enjoy the same low charge as active members.

v. ***Lower advisory costs, particularly post-retirement:***

Under the proposed smoothed scheme, members will never need investment advice, before or after retirement, thereby saving the associated cost. There will be no choice of funds when joining or subsequently. They will remain in the scheme post-retirement, earning the same smoothed returns as active members.

In contrast, under the scheme proposed by the DSP, workers will have to decide when joining and subsequently whether to opt for the default funds or for one of the three risk-rated funds. It is unclear whether they will be offered any help in making that choice. The likelihood is that the vast majority will opt for the default funds. On retirement, they will have to make a number of difficult choices and will most likely need professional advice. Good advice doesn't come cheap. They will have to decide between an annuity and a drawdown product. In either case, they will need help in choosing a product provider. For an annuity, they will need to decide on a guarantee period, whether to opt for escalation or not, etc. For a drawdown product, they will need to decide the mix between equities, bonds, cash, other assets and which providers' funds to invest in. That advice will need to be refreshed every few years - at a cost.

vi. ***Lower investment expenses pre- and post-retirement:***

Under the scheme proposed by the DSP, investment of members' funds will require the trustees/ directors to make difficult decisions when devising strategies for the

various funds, starting with the low-risk, medium-risk and high-risk funds, then the default funds, which will probably consist of different combinations of the risk-rated funds. In this regard, one problem that has come to light recently with lifestyle investing is the need to decide whether so-called low-risk funds, particularly those considered appropriate for members close to retirement, should be invested primarily in bonds or in cash. An investment strategy based primarily on long bonds is appropriate for someone considering an annuity, while one based primarily on cash is more appropriate for someone considering drawdown. The sharp recent increases in interest rates caused so-called 'safe' funds, which were invested mainly in long bonds, to suffer sharp falls in market value, causing unpleasant surprises for members considering drawdown. That experience has highlighted the importance of ascertaining whether members close to retirement are considering annuities or drawdown products and deciding the "safe" investment strategy accordingly. It is difficult to see how members who don't have a pension adviser can be guided through that decision-making process without they – or the scheme administrators - incurring significant costs. Furthermore, it also points to the need to have two types of "low risk" funds for members approaching retirement, one for those considering annuities and one for those considering drawdown products. The end result is significantly higher costs in devising and implementing investment strategies and in communicating them effectively to members. It could also result in a substantial increase in the number of default funds. To the best of my knowledge, none of these issues has received serious consideration up to now.

In contrast, the proposed smoothed scheme will have just one fund for active and retired members, which will be invested entirely in equities (or investments with equity-like attributes in terms of expected returns and risk). At the start, until such time as amounts invested are significant, it will probably suffice to invest entirely in passive, low-cost world equity funds. Later, the fund can consider unquoted investments, infrastructure, etc., particularly as it will only need to be valued once a month (versus daily or weekly valuations required for unit-linked funds) and current market value will get only a 1% weighting in the calculation, removing the need to have 100% accurate valuations at all times.

vii. ***Lower costs at point of retirement:***

Retirement itself can prove costly for members of DC schemes, including AE schemes like that proposed by the DSP. At retirement, a worker must cash their accumulation account, take their gratuity and reinvest the balance in a different product (annuity or ARF), incurring frictional exit and re-entry costs. Experience shows that when investors, particularly less sophisticated ones, exit the market (as they must in order to cash the accumulation product), it can take some time to muster the courage to get back in. While the delay may help them avoid the risk of substantial losses, being out of the market is costly on average. Members also need to consult with pension/ investment advisers in order to make the right choices, and to reward them appropriately for their efforts, either through fees or commission. Under the proposed smoothed scheme, the member holds exactly the same investments, earning exactly the same returns, post-retirement as they did pre-retirement (less the 25% cash at retirement). The only choice is the percentage to withdraw each year, between the specified lower and upper limits (3% lower and 8% upper, with higher upper limits over age 80, have been suggested but are not written in stone). The decision on withdrawal percentage will depend on personal

circumstance, e.g., someone with a part-time job post-retirement might take a lower percentage; someone not yet entitled to a state pension might take a higher percentage until the state pension kicks in, etc. Whatever decision they take can be changed subsequently, provided the change is for demographic or personal financial reasons rather than to exploit differences between smoothed and market values. That objective can be achieved easily, even by simply requiring members to give good advance notice of their intention to change the percentage. Neither is there a requirement under the smoothed scheme to specify a retirement date in advance. Under the scheme proposed by the DSP, members must specify a planned retirement age when joining. My understanding is that it will be the state pension age, irrespective of the physical demands of the job.

viii. ***Better longevity protection:***

The longevity protection option under the smoothed scheme gives retired members full protection from the risk of outliving their savings, without obliging them to sacrifice any of their capital entitlement and without losing any of the benefits of equity investment. The only cost is a reduction in the rate of return credited to their accounts from age 75. It is also worth adding that, because funds will be invested entirely in real assets, the smoothed scheme will offer retired and active members good long-term protection against inflation. Annuities force members to sacrifice some of their capital entitlement on early death and also force them into bonds.

A final thought under this heading is that one byproduct of the lower contribution under the smoothed scheme is that it will leave more scope for private institutions to sell top-up pension and other savings arrangements to AE scheme members.

10. Point 3(e) of the RFQ reads:

“Assessing the various assertions made in relation to the proposed model in an Irish context including the acid test of the proposed model’s durability in the event the scheme is closed to new entrants at some future date and net assets fall to zero.”

The RFQ is right to focus on the possibility of the scheme’s eventual decline and closure.

Section 4 of the paper explores its natural evolution: growth, maturity, and eventual decline, including the possibility of final termination.

Positive net cash flows (contributions exceed benefit outgo) are expected for the first 30 years or so. During that time, existing and new contributors buy from departing members at smoothed value and the excess of contributions over benefit outgo is added to the fund.

Positive net cash flows pull the ratio SV/MV back towards 100% whenever it strays in either direction and are a powerful stabilising force, helping to minimise the risk of SV departing significantly from MV – see the algebraic inequality at the start of Section 4.

From circa year 30, net cash flows are projected to turn negative. This is the ultimate ‘steady state’. Without preventative action, net negative cash flows will have a destabilising impact on the ratio SV/MV, in exactly the same way as positive cash flows have a stabilising impact, and for the same reason, i.e., the inequality at the start of Section 4.

A buffer account will be established to prevent this. The buffer account will be funded from the excess of management charges over administrative costs as follows:

In the first 15 years or so, admin costs will exceed management fee income. The excess (with interest) will accrue as a debt against the management entity. The interest rate on the debt will reflect government’s promise to fund excess costs in the early years, like the promise to fund excess costs in the early years under the scheme proposed by the DSP.

From year 16 or so, income from management charges is projected to exceed admin costs

and the excess will be used initially to repay borrowings accumulated in earlier years. By year 20 or so, borrowings (including interest) are projected to have been repaid and the excess of management fee income over admin costs will be used to create a buffer account. From that point on, the buffer account will be credited with an average of 0.2% of AUM each year (0.5% management fee less estimated 0.3% admin costs). By year 30 or later, when cash flows turn negative, the buffer account will have grown to c2% of AUM.

Once net cash flows turn negative, the buffer account will be deployed to pay any excess of smoothed value over market value for net exits. Similarly, the buffer account will be credited whenever market value exceeds smoothed value for net exits. The net result is that the ratio SV/MV will be the same immediately after funds have been withdrawn as it was before. These transactions between the buffer account and the fund ensure the fund's absolute integrity: its assets are hypothecated exclusively to existing members, with no seepage to past or future members.

The buffer account, which will continue to be funded by the excess of management fees over admin costs, must always have sufficient funds to pay any excess of SV over MV for net exits; otherwise, the scheme is insolvent. Insolvency is discussed in detail below in answer to Question 3 on page 4 of the RFQ.

If the scheme closes to new entrants, assets and liabilities will both eventually fall to zero in tandem. That will not threaten the scheme's viability, provided the buffer account always has enough funds to pay any excess of smoothed value over market value for net exits (and also to pay excess admin costs over fee income during the run-off period, unless government reinstates its commitment to cover such costs). Eventually, the scheme will be terminated, and remaining members will be transferred out, probably to an insurance company. Their entitlements will probably be converted to guaranteed amounts, with the balance in the buffer account being used to compensate them for losing entitlement to future equity returns. This is similar to how a with-profits fund might be closed.

The directors/ trustees will have to monitor the progress of the buffer account to ensure that it always has sufficient funds to meet any excess of smoothed value over market value. If there is a possibility that it won't have sufficient funds at some later date, the trustees/ directors will be obliged to take corrective action. The simplest is to cut costs or increase the management fee, subject to regulatory approval. Based on the above estimates of 0.5% charge and 0.3% costs, an increase of 0.25% in the management charge, from 0.5% to 0.75%, would more than double the regular transfer to the buffer account. Conversely, if the buffer account is getting too big, the trustees/ directors will reduce the management charge. This is the more likely outcome in the longer term.

Thoughts on Questions 1 to 14 on Page 4 of the RFQ of 21 June 2023

Question 1 on Page 4 of the RFQ asks about *the proposed model's reliance on one or more key assumptions and the reasonableness of the proposed assumptions in the long-term future.*

Assumption that cash flows are independent of whether smoothed value is greater than or less than market value

One of the most important assumptions is that all fund transactions— contribution income and benefit outgo – take place at smoothed rather than market values. Members would naturally like to contribute more when smoothed value is less than market value and to withdraw more when it's greater than market value, and conversely. AE is one of the very

few, possibly the only, arrangement where rules can be devised to prevent people from playing the system, e.g., contributions a fixed percentage of reckonable earnings; no AVC's (workers wanting to pay AVC's will have to contribute to a separate market-based scheme); no transfers in or out; members must take 25% at retirement and the balance as a regular income; etc. Section 2 of the paper discusses the restrictions in detail. They are not onerous for AE but would be in a voluntary non-exempt arrangement.

The rules cannot prevent workers from leaving the scheme (but only for new contributions; existing funds must remain in the smoothed scheme). The smoothed approach won't work if large numbers leave when smoothed value exceeds market value and rejoin when it is less than market value. However, ceasing contributions when smoothed value exceeds market value makes no sense in the short-term because the member would lose the benefit of the employer's and the state's contributions, i.e., lose €7 for every €3 they don't contribute. Furthermore, the analysis of Section 2 and Appendix 1 indicates that, even if they could make an immediate frictionless move to a lifestyle scheme, smoothed value would have to exceed market value by up to 70% (for a young contributor, less for an older one) to make the move worthwhile. The peace of mind that comes to smoothed contributors from knowing that the value of their pension accounts will remain broadly intact even in volatile markets is an important non-financial consideration at all ages.

An additional safeguard against members ceasing contributions when smoothed value exceeds market value, e.g., by joining an alternative employer-sponsored scheme, is the proposed rule stipulating that, if they leave the scheme, they must wait for a specified period before rejoining. A three-year waiting period was mentioned in the paper, but a shorter waiting period should suffice, especially in Ireland where there is no alternative AE scheme for members and employers to join, unlike in the UK. Exceptions could be allowed for temporary financial hardship.

The chances of the ratio SV/MV exceeding the 170% (or lower) threshold in Appendix 1 of the paper depend on (a) the volatility of investment returns, (b) the weighting "p" for current market value in the smoothing formula (1% was suggested, but up to 1.5%, possibly higher, would still ensure smooth returns) and (c) the scheme's maturity. The risk is extremely low in the early years, when net cash flows are a high percentage of AUM, irrespective of market movements. The risk increases in the scheme's later years, when net new cash flows are a lower proportion of AUM. By then, however, other protections will be in place. For example, the buffer account may have accrued significant funds; the Lifetime Income Fund and the Longevity Protection Fund (see Section 5) may be seen as attractive options post-retirement; economies of scale may allow charges to be reduced; etc.

There will always be opportunities at the margin for sophisticated investors to play the system, e.g., retire early, vary the drawdown percentage strategically in retirement, but the cost to the scheme of such selective behaviour is likely to be trivial, especially as sophisticated investors can only invest a small proportion of their wealth in the scheme. The trustees/ directors must always be on the lookout for such loopholes and must have the power to close them as quickly as possible.

Assumption of 4% Equity Risk Premium

It is universally accepted that there must be an equity risk premium. Otherwise, investors would always opt for risk-free investments. Experts differ on its size, however. The survey quoted in Note 32 of the paper shows an estimated average ERP of 5.5% for the US market

from 1,756 respondents, ranging from 3.1% to 8%. Relative to this, the 4% ERP assumed in the paper is conservative. The smoothed approach still works if the ERP is less than 4%. Arguably, the ERP should be higher in future because regulatory pressures are driving greater demand for risk-free investments to cover guaranteed liabilities, e.g., years ago, assets backing defined benefit pension liabilities consisted mainly of equities; more recently, regulators have demanded higher bond coverage of such liabilities, making less funds available for equity investment, so they should command a higher premium.

Question 2 on Page 4 asks for *the main determinants of outperformance of the proposed model*.

The main determinants of outperformance of the smoothed approach are as per point 9 above.

Question 3 on page 4 asks about *the differing levels and types of risk in the proposed model*.

Insolvency is of course the biggest risk. The paper ignores the risk of insolvency due to inadequate expense margins. It is assumed that government will cover expense overruns in the early years, as is presumed for the scheme proposed by the DSP. Expense overruns are discussed in point 10 above (referring to point 3(e) of the RFQ).

The scheme faces insolvency if (a) net cash flows are negative, AND (b) smoothed value exceeds market value, AND (c) the balance in the buffer account is insufficient to cover the excess of smoothed value over market value for net exits. All three conditions must be met for the scheme to be insolvent.

Looking at these in turn:

- a) **Cash flows are negative:** It is almost impossible for cash flows to go negative in the early years. They can only go negative if outgo from retirements and deaths exceeds contribution income. There will be few deaths or retirements in the early years and what few there are will have low account values due to short contribution periods. Furthermore, 75% of a retiree's account value must be taken as an income for life and just 25% in cash (with de minimis provisions). On the other hand, contributions will hold up even in testing market conditions because of the resilience of smoothed returns in the early years, as shown in table 3 of the paper and the compelling value for members (account value increases by €7 for every €3 contributed). Thus, the chances of negative cash flows within the first 25 years or so are extremely remote. Negative cash flows are the natural order when the scheme reaches a steady state, projected for some time after year 30. Benefit outgo should exceed contribution income from then on. The change from positive to negative cash flows could be delayed if the scheme is extended to the self-employed and/or to accepting maturing pots under conventional DC and DB schemes (mentioned as a possibility in the concluding comments of the paper in Appendix B) but could be accelerated if workers and employers lose faith in the scheme. The most obvious reason for losing faith would be if the smoothed scheme were to underperform relative to market-based ones over a long period. The main risk of that happening is if there is political interference in investment decision-making.

This introduces the wider question of governance. The scheme's governance should ensure that it is run exclusively for members, not to satisfy any political or other agendas. For example, the risk of political interference in investment decision-making is clear from page 23 of the [April 2023 Report of the Joint Oireachtas](#)

Committee. While the Committee's aims are laudable, e.g., invest to promote the Green Agenda, it's not politicians' money; the assets belong entirely to members and investment decisions must be made with their best interests in mind, not what politicians think their best interests are. The fact that the smoothed scheme will have a long investment horizon – at least 30 years, but probably closer to 50 years, since investment income will be sufficient to avoid assets being sold for years after net cash flows go negative – should ensure that the scheme's investment strategy will be closer to the ideal long-term strategy than if investments were being made with short-term goals in mind, such as to reduce volatility of returns for members close to retirement, as would be the case for default investment strategies under DC schemes. Good governance should ensure that there is minimal risk of investment underperformance relative to market-based arrangements.

- b) **Smoothed value exceeds market value.** The chances of smoothed value being more or less than market value at any future date are close to 50:50, irrespective of duration since scheme commencement date; however, the average deviation from market value, in either direction, and the average duration for which smoothed value remains above or below market value both increase as the scheme matures. This is discussed below in answer to question 6 on page 4 of the RFQ.
- c) **Insufficient funds in buffer account.** The buffer account is projected to have a zero balance until around year 20, at which point it starts to be funded from the excess of management fees over admin costs. By year 30 or so, it is projected to have reached its 'optimum' long-term percentage of assets under management. Thereafter, the trustees/ directors will keep it under review to ensure it doesn't grow too large or fall too low. By then, the assets of the buffer account, coupled with the trustees'/ directors' discretion to increase charges if necessary (subject to regulatory approval) should be sufficient to cover any likely adverse scenario. As a further precaution against insolvency, government could opt to pre-fund the buffer account from the start, say by transferring to it a percentage of what it saves compared to what it would contribute to the scheme proposed by the DSP (1% of reckonable earnings to the smoothed scheme versus 2% to the scheme proposed by the DSP). Any move on these lines would be purely precautionary as the chances of a call on the buffer account in the scheme's early years are remote.

Strangely, one possible risk is that the smoothed approach will seem too good to be true! Suppose for example that the start date coincides with a repeat of market conditions from 1 January 2000 (see table 2 of the paper). By September 2002, markets have fallen 40%, but smoothed contributors have enjoyed positive returns each month from the start. In this hypothetical scenario, there will be no shortage of doom mongers - insurance companies, pension consultants, etc. – claiming that it's a Ponzi scheme, a fraud on the public, especially when their (market-based) clients will by then have suffered almost three years of unrelenting gloom. The siren voices will emphasise the shortfall of market values from smoothed values (smoothed values 140% of market values by end September 2002) forcing existing and new contributors to pay over the odds.

The best protection against this risk is for workers and employers to be provided from the start with straight, honest information on how the scheme works. Because of its unique design, there will be a comprehensive national (and possibly international, because of its uniqueness in global terms) debate on its merits, so that, by launch date, financial and economic experts, including in the media, will have a thorough understanding of how it

works. That scrutiny will include teasing through various possible future scenarios, including ones similar to that described above. The experts will thus be able to reassure the public on the scheme's financial soundness. Also, since membership will by then be in the hundreds of thousands, with everyone getting exactly the same 'interest rate' each month, the current rate of return and its likely future direction will be live topics of national discussion, in coffee shops, pubs, workplaces, hairdressers, wherever. Apps will be developed to allow workers see what smoothed returns might be in future on different market return assumptions, etc. This should deal effectively with disinformation.

Another problem of success is pressure to extend the smoothed AE scheme to areas where there is more scope for adverse selection. For example, when the scheme is seen to be successful for employed workers, there will be calls to extend it to the self-employed. Terms and concepts which are essential to the scheme's success for employed workers, like 'wage', 'salary', 'retirement', etc., lose much of their meaning for the self-employed. The scheme's financial integrity must be protected from the risk of self-employed workers misstating their incomes in order to underpay or overpay, depending on whether smoothed value is more or less than market value. Similar challenges arise on when to 'retire'. Solutions can be found, but policymakers cannot be put under undue pressure to relax the rules to placate certain constituencies. This brings us back to the importance of governance, to ensure that directors/ trustees administer the scheme exclusively for members' benefit.

Question 4 on page 4 asks about ***the implications if the assumptions prove to be incorrect.***

If the equity risk premium differs from the assumed 4%, benefits for members will be more or less than indicated. The threshold percentages at the end of Appendix 1 of the paper also change. As noted earlier, the expert consensus view is that the ERP will be greater than 4%.

If the assumption that cash flows are independent of where smoothed value is relative to market value proves incorrect, i.e., if some members manage to play the system to their advantage, then returns to other members will be lower than they would otherwise be. The opportunities for selective contributions or withdrawals must be minimised. The trustees/ directors will have to be on the alert to the risk and must retain the power to change the rules if necessary to address it.

The assumption that, in the very long-term, admin costs will be considerably less than management fee income (0.3% costs v 0.5% fees) could prove to be incorrect, resulting in the buffer account being established later than expected and taking longer to reach its target size. This could threaten the scheme's longer-term viability. The trustees/ directors could address this risk by cutting costs, increasing the management charge (subject to regulatory approval), or seeking a subvention from government to cover a portion of admin costs in the longer term (as might happen for the scheme proposed by the DSP if costs under that scheme never fall to 0.5% of assets under management).

Question 5 on page 4 asks about ***any relevant limitations of the stochastic modelling assumed.***

The stochastic model underlying the 2,000 60-year projections in the [2021 paper to the Society of Actuaries in Ireland](#) assumed that dividends would follow a random walk without mean reversion and that dividend yields would fluctuate (with mean reversion) as indicated in Appendix 4 of that paper. The absence of mean reversion in dividend projections means that long-term returns projected by the model can fluctuate wildly, as indicated by the extreme results highlighted in Section 12 of the 2021 paper. Some models produce even

more extreme longer-term results, e.g., if they assume that total returns (dividends and capital gains) follow a random walk with higher variance than that for dividends.

The assumption of no mean reversion for either dividends or total returns is questionable, given the macroeconomic levers available to policymakers to reverse long-term economic decline, e.g., the “Greenspan put”. I am not a macroeconomist, so I am not sufficiently qualified to comment on how best to address this deficiency in standard forecasting models, without discarding the essential assumption of short-term randomness. I considered revisiting the ‘anchor model’ of paragraphs 13 to 15 of my [1977 paper to the Society of Actuaries in Ireland](#), but decided against it.

Question 6 on page 4 asks about ***the ability of the proposed model to allocate returns in a fair manner over the long-term on a steady state basis and when the fund is decreasing in size (for example due to long-term demographic changes) and/or there is a long-term shift (upwards or downwards) in relevant investment markets.***

The approach to auto-enrolment proposed in the paper allocates contributions to members at smoothed values rather than at market values. Benefits are also at smoothed values. As noted earlier, however, the amount withdrawn from the fund when there are net exits is the market value of assets for net exits, with any excess or shortfall of smoothed from market value being dealt with through the buffer account. Thus, the market value of the smoothed fund always equals the market value of continuing members’ interest in the fund.

The aim is that smoothed values are above market values around 50% of the time and below them around 50% of the time. Therefore, member outcomes are much the same ***on average*** as if purchases and sales were at market values. This conclusion is independent of whether the fund is growing, declining, or static; however, the average duration for which smoothed value could remain above or below market value depends on the scheme’s maturity. In the early years, the ratio of smoothed to market value can change quickly from over to under 100%. For example, in the hypothetical scenario of a scheme start date of 1 January 1990, with cash flows as assumed and contributions invested in the Japanese market, the ratio of smoothed to market value switches twelve times in the first five years, from over to under 100% or vice versa, despite the market falling 44% in the period (see spreadsheet of 2 July 2023 on my website). In later years, the duration for which smoothed value can remain above or below market value can extend into years before reversing. A prolonged period of smoothed value exceeding market value could disadvantage joiners and advantage leavers during that period and vice versa, but such prolonged periods of over- or under-valuation relative to market value cannot be predicted in advance and their impact on individual contributors depends randomly on whether the member is contributing to or drawing from the fund. Probably most importantly, in all cases members can expect to do considerably better under the smoothed approach than under a market-based approach that adopts a lifestyle investment strategy of switching into bonds at older ages.

Extreme outcomes are less likely under the smoothed approach than if all transactions were at market value. For example, if all transactions are at market value and the fund is invested entirely in equities, members who retire when markets are at a peak or trough do better or worse than average respectively for their 25% cash at retirement. Those peaks and troughs all but disappear under the smoothed approach.

Unlike with some versions of CDC, which favour older members, there is no bias in favour of any particular group under the smoothed approach - old or young, long-standing or recent,

active or retired, early or late joiners. Also, member outcomes are unaffected by whether the scheme is open or closed to new entrants.

Question 7 on page 4 asks about ***the potential risks and rewards to different cohorts of members through the smoothing formula.***

As can be seen from the answer to question 6 above, the smoothing formula offers no *a priori* advantage or disadvantage to any cohort of members. When the scheme is mature and cash flows are close to zero or negative (estimated to happen some time after year 30), members who join when smoothed value is considerably above market value may be at a disadvantage in relative terms, but the smoothed scheme should still be more attractive than a market-based scheme employing a lifestyle investment strategy.

Question 8 on page 4 of the RFQ asks about the ***effectiveness of the longevity option and its ability to provide a reliable and stable income.***

This question is probably best answered by exploring the example in table 4 of Section 5 of the paper. The example assumes that a retired member (rates are identical for males and females) decides at age 75 to opt for the longevity benefit in respect of €150,000 of their account, and to continue with 'normal' withdrawals (say between say 3% and 8% a year, with higher upper limits over age 80) for any balance over €150,000. The €150,000 transferred to the Lifetime Income Fund is divided into 15 subaccounts, each of €10,000. The member withdraws one subaccount (plus interest) each year. (They are not obliged to withdraw the subaccount; they could leave it for later, but that would be suboptimal as they would be paying the extra management charge and getting nothing in return.) The model assumes a constant 4.5% on the smoothed fund so a constant 2.05% a year on subaccounts, meaning that the member's income grows by that percentage each year on average, which should exceed inflation (a 1% risk-free rate is assumed, so inflation should be that or less). In practice, the return will vary from month to month but is unlikely to fall below zero. In the example of table 4 of the paper, the annual income grows from a starting €10,000 a year to €12,130 by year 10, to €14,850 in year 20 (the year up to the member's 95th birthday).

The income is reliable in that there is no risk of money running out before death. If mortality rates are lower than expected, leading to more people than expected surviving, the yearly deduction from the credited return is increased, subject to regulatory approval. The 2.45% deduction in table 4 assumes the survival rates in column 5 (i.e., 538 of every 1,000 joining at age 75 survive to age 90, etc.). Regular actuarial valuations will be needed to ensure that the fund is on track to pay the promised benefits to retirees.

Question 9 on page 4 asks ***the ability of the proposed model to adjust to a 1 in 200-year unforeseen event due to the assumptions in the proposed model (e.g., smoothing in the proposed model).***

A market shock equivalent to a 1 in 200-year unforeseen event will cause market values to fall sharply, with smoothed values remaining broadly unchanged or falling only marginally. The risk is that the resulting increase in the ratio of smoothed value to market value will cause existing contributors to cease contributions and potential new contributors to decide not to join.

As noted earlier, existing contributors are unlikely to stop contributing the short-term, but if the ratio SV/MV doesn't recover, they (and their employers) may try to source alternative arrangements. Thus, the risk under this heading derives less from a once-off shock and

more from a protracted downturn, where market values remain depressed and ratios of smoothed to market value remain elevated, causing members and employers to work together to source alternative arrangements. Smaller employers, who account for the bulk of employment in Ireland, are unlikely to be interested in such non-core activity.

The impact of a market shock also depends on when it happens in the life of the scheme and where smoothed value is relative to market value immediately beforehand. If the shock occurs shortly after the scheme's commencement, when cash flows are growing strongly, the impact is less than if net cash flows have slowed considerably or have gone negative. A market shock when market value exceeds smoothed value will also have less of an impact than if it occurs when smoothed value already exceeds market value.

The model's ability to adjust to a 1 in 200-year unforeseen event depends not just on market forces but also on how members (workers only - retired members must remain in the smoothed scheme irrespective of performance) and employers react to the shock. As noted earlier, there will be no great eagerness to leave the smoothed scheme in favour of a market-based one if market values have fallen substantially, because market-based schemes will have fallen much more. While the rational arguments in favour of such a move are clear, behavioural psychological considerations might lead to a different result. Therefore, the scheme's ability to adjust to a 1 in 200-year unforeseen event depends on complex interactions between stochastic/ mathematical, macroeconomic, and behavioural/ psychological factors. That assessment is beyond my capabilities.

Question 10 on page 4 asks about the performance of the proposed model in tail events including, if the smoothing formula can or should include a factor to take account of black swan events.

Aspects of this question have been addressed earlier.

One important protection against so-called black swan events is the prohibition on withdrawals other than on death, or on/ after retirement. In all cases, amounts payable on exit are clearly defined, with little or no optionality, and can be predicted reasonably accurately well in advance. Similarly, for reasons mentioned earlier, contributions will not suddenly dry up, even in the most extreme circumstances. In combination, they provide a high level of protection against black swan events.

While the power to change the smoothing formula in extreme circumstances is desirable from a solvency perspective, it is important to assure members that the formula is tamper-proof and that they will always be treated fairly. As discussed in Section 6 of the paper, a compromise may be possible that would allow the trustees/ directors to review the formula and the parameters in extreme circumstances. Any such power would have to be carefully circumscribed, be subject to regulatory approval, and accompanied by an assurance to members that no-one would be disadvantaged unreasonably by a change.

Another possible additional protection against so-called black swan events, mentioned earlier, is for government to pre-fund the buffer account from the scheme's start date, by contributing a portion of the saving relative to its required contribution to the scheme proposed by DSP (2% to the scheme proposed by DSP, 1% to the smoothed scheme)

Question 11 on page 4 asks about the impact of a 1 in 200-year adverse event (market or longevity/mortality or combination thereof) occurring after 20, 50 or 100 years on the sufficiency

of the proposed buffer account, and hence on the potential costs to the state should it be insufficient.

It's difficult to know how to answer this question, particularly the "after 50 or 100 years" part. As Brian Woods wrote on LinkedIn: *"I hope no-one with a sense of their own credibility will answer this question about conditions in 100 years' time or even the earlier timeframes."* I have no intention of going against Brian's advice by trying to predict conditions in 20, 50 or 100 years' time; however, some general comments should help provide an understanding of how the scheme might cope with extreme adverse events at those timescales.

Longevity is relatively straightforward. Adverse mortality events are all but irrelevant from an investment/ smoothing perspective. Their only impact of any significance is on the optional Longevity Protection Fund (LPF) of Section 5 of the paper. An adverse mortality event for LPF purposes is a sudden sharp reduction in mortality at ages over 75. The regular (probably triennial) actuarial review of the LPF should deal readily with 'normal' changes in mortality rates through small changes, of the order of 0.05% or so, in the deduction from members' account which is transferred to the LPF (initial deduction of 2.45% per annum is suggested in the paper). A sharp improvement in longevity might necessitate more frequent actuarial valuations and a larger increase in the deduction from investment returns. In the longer term, if longevity continues to improve, the trustees/ directors may increase the age at which retired members opt for longevity benefit, to ensure equity between generations. Any such increase will only apply to retirees reaching the starting age for longevity benefit after that date.

If a 1 in 200-year adverse investment event occurs within the scheme's first 20 years, the buffer account may not exist. The issue then is whether the event causes net cash flows to turn negative. This is addressed above in the answer to question 3 on page 4 of the RFQ. There is a further consideration that, by year 20, management fees are projected to exceed administration expenses by a comfortable margin (0.5% income versus 0.3% outgo) and the debt to government for advances to cover excesses of costs over revenues to year 15 is projected to be repaid in year 20, so some portion of the 0.2% excess of management fees over admin costs for that year may be available if required to fund any excess of smoothed values over market value for net exits, possibly resulting in a delay in clearing the deficit. It may also be possible to increase the management fee to more than 0.5%. As noted earlier, another possibility is for government to pre-fund the buffer account from the scheme's commencement date, in which case the buffer account will be well funded by the time the adverse investment event occurs.

If the market stress event occurs after 50 or 100 years, the buffer account should have a substantial balance (although not excessive, to ensure fairness between generations). Regular stress tests will have checked the scheme's resilience in the face of extreme events and the balance in the buffer account at that time will reflect the advice of risk professionals, having regard also to the trustees' / directors' power to increase charges in extreme adverse conditions to ensure the scheme's continued solvency.

On the question of potential costs to the state, it is difficult if not impossible to envisage how the state might have any exposure if an extreme market event occurs after 50 or 100 years, especially given the trustees' / directors' power to increase management charges, subject to regulatory approval. If an extreme event occurs after 20 years and government

has pre-funded the buffer account as described earlier, then the state is extremely unlikely to incur additional costs at that duration either.

Question 12 asks for a ***commentary on if/how costs could expand beyond the state, i.e., cost to participants (for example if they had to return to work to make up any shortfall).***

I don't understand what is being asked here. Obviously, as with any DC scheme, investments could underperform, causing benefits to fall short of workers' expectations. In such circumstances, workers might not be able to retire as early as they had planned. They might also have to seek part-time work post-retirement. This will be less of a risk with the smoothed scheme than with the scheme proposed by the DSP, since contributions under the smoothed scheme from employers and employees (and from the state) will be half those to the DSP's scheme, so there will be more scope for workers to pay AVC's to a separate scheme.

Question 13 on page 4 asks ***the most important lessons from the review of the proposed model to incorporate into any policy recommendations.***

It's best if I refrain from answering that question.

Question 14 on page 4 asks for ***any other observations that the successful candidate considers relevant.***

Once again, it's probably best for me not to answer this question.

Finally, the RFQ asks ***as part of the work and where relevant, the successful candidate should comment on the interaction between the assumptions and inputs made in the modelling and any implications for how the system will be administered and run in practice.***

I'm not sure what is being asked here; however, I will comment on aspects of the scheme's practical administration.

Assume the scheme starts on 1 January of year x. Contributions are collected from workers and employers during January, and government's contribution is added. Assume that 'interest' is only credited from the start of the following month. Therefore, contributions collected in January will start to earn 'interest' from 1 February. Assume also that contributions collected during January (from employees, employers, and the state) are transferred to the investment account on 1 February (however there's nothing to stop some or all of them being transferred sooner). Assume further that, at the start, contributions are invested entirely in a low-cost passive world equity fund.

On 1 February, the directors/ trustees will declare an initial 'indicative' smoothed rate of return equal to the long-term rate of return assumed in the smoothing formula (as decided by the committee of eminent economists) less 0.5% a year. For example, the committee might recommend an assumed long-term return of 6% a year, made up of 2% risk-free and 4% estimated equity risk premium. Unless markets experience a major upheaval during the year, that assumed long-term return (for insertion in the smoothing formula each month) will remain unchanged at least until the following January. Therefore, the initial smoothed rate of return is one-twelfth of 5.5% or 0.458% (ignoring the technicality of twelfth roots).

Assume that the total invested on 1 February is €50 million (say c200,000 workers, average reckonable earnings €3,600 a month, combined contributions of 7% (3% workers, 3% employers, 1% state) and that the market value at February month-end is €49.5 million (i.e.,

value falls slightly in the month). From this must be deducted one month's management fee. Assume that the equity fund in which contributions are invested carries a charge of 0.1% a year. Therefore, scheme administrators must deduct another 0.4% a year (.0333% a month). The charge deducted at end February is therefore .0333% of 49.5m = €0.02m, which is transferred to the administrator's account to help defray administration costs, so the net value of the fund at end Feb is €49.48 million.

Assume that the total net new investment at the start of March (contributions collected in February less payouts for deaths in February) is €52 million, so the fund's total market value at the start of March is €101.48 million (€49.48m + €52m).

The smoothed value at the start of March (in millions of Euros) in accordance with the smoothing formula $SV_t = CF_t + p * (MV_t - CF_t) + (1-p) * SV_{t-1} * (1+i_{t-1})$ is:

$$52 + .01 * (101.48 - 52) + .99 * 50 * (1.00458) = 102.222$$

The smoothed return for the month is therefore $(102.222 - 52)/50 - 1 = 0.444\%$, which is slightly lower than the 0.458% initial 'indicative' return. A slight reduction in the smoothed 'interest rate' is to be expected, given that market values fell slightly in February.

A similar calculation is completed at the start of April. The only required additional information is net new money at the start of April (contributions received during March, less death payouts in March – no retirements are likely in the first few months) and the fund's total market value at the start of April.

Finally, I would appreciate if you could write to me – colm@colmfagan.ie – if you see any errors, technical or grammatical, or any major omissions or excessive duplication in the above (some duplication is inevitable, because of similarities in some of the questions).

Colm Fagan 10 August 2023