

Pooled swap funds under the new flexible pension arrangement

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INTRODUCTION

The transition to the new Dutch pension contract (“Wet toekomst pensioenen”, or Wtp) is currently underway for most pension funds. This article focusses on the role pooled swap funds can play in hedging interest rate risk under the new flexible pension arrangement (“Flexibele pensioenregeling” or FPR).

In an FPR scheme, interest rate hedging is directly implemented through the investments held by each individual member. This means that, in most cases, it needs to be carried out via unitized pooled investment funds or mandates. Pooled swap funds are therefore a useful tool under FPR. They exist in different flavors, but usually operate in a similar manner – a target interest rate sensitivity is achieved and managed by placing euro interest rate swaps in a collective investment fund together with cash or bonds. The cash or bonds are then used to meet the margin requirements of the interest rate swaps.

This article focuses on back-testing the use of pooled swap funds in an FPR setting. We discuss the resulting member experience and how the strategic importance of these funds can be communicated to them. For brevity, we focus in this article on a back-test over the period 2005-2024. When constructing an FPR lifecycle strategy, this would likely be supplemented by a stochastic ALM analysis as an integral part of the design process.

LIFECYCLE MODELLING

FPR solutions under the Wtp will typically adopt a de-risking lifecycle approach as the participant approaches retirement. The allocation to risky assets decreases over time, and the interest rate hedge ratio increases, both of which serve to reduce volatility in the (projected) pension. To illustrate the impact of adopting pooled swap funds, we consider three simplified lifecycles with just two categories: listed equities (the risky asset) and a Liability Driven Investment (LDI) portfolio (the interest rate hedging asset). The LDI portfolio will be either formed of pooled swap funds together with additional cash, or a “perfect” bond portfolio. In the former case, the pooled swap funds meet the required interest rate hedging at the target hedge percentage and the remainder of the LDI portfolio allocation is held in additional cash (outside the pooled swaps funds themselves). In the latter case, the bond portfolio exactly matches the projected pension payments up to the target hedge percentage. No leverage is therefore applied in that case.

This article will back-test two members using 20 years of historical returns (2005 – 2024). At the start of the back-test, one member will be at retirement age (assumed to be 68) and one will be at age 48 (when de-risking is assumed to begin). This period covers several extreme events in terms of both equity market and yield curve volatility, including:

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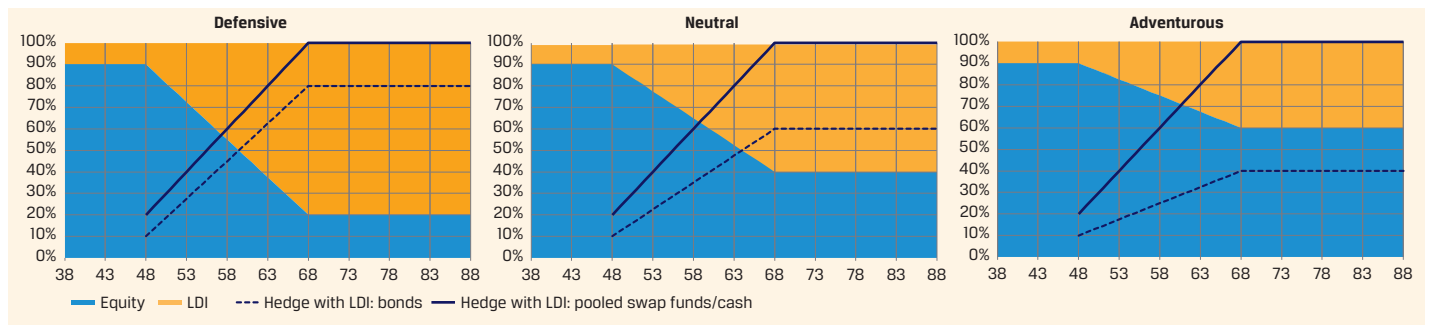


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Chart 1
Three lifecycles with matching bonds or pooled swaps funds and cash



- The Global Financial Crisis (GFC)
- The Eurozone crisis
- The Covid-19 crisis
- The onset of the war in Ukraine, and subsequent high inflation and interest rates

The last example is of particular interest, since it contrasts with the long term downward trend during the previous years. This provided an opportune “test” for the liquidity management procedures of an FPR pension scheme when using pooled swap funds.

Chart 1 shows the three simplified lifecycles considered. All three start with a 90% equity, 10% LDI allocation and de-risk linearly from equities to LDI over the 20 years before retirement to 20% (“defensive”), 40% (“neutral”) or 60% (“adventurous”) equity allocations at retirement.

Where the LDI allocation is formed of bonds, the hedge percentage will rise from 10% to the percentage LDI allocation in retirement (i.e., no leverage is assumed). Where the LDI allocation is formed of pooled swaps and cash, it will rise from 20% to 100% at, and during, retirement. The leveraged interest rate sensitivity offered by the pooled swap funds makes a higher hedge ratio possible – the difference between the dashed and dotted lines in Chart 1.¹

PLACING POOLED SWAP FUNDS IN A MATCHING ALLOCATION CAN SIMPLIFY THE COLLATERAL PROCESS FOR THE MEMBER

For this article, we do not consider younger members (i.e. before de-risking begins) as the arguments for and against interest rate hedging are less clear cut. The primary focus then is on generating a long-term real return rather than hedging projected pension payments, which lie far into the future and are thus very uncertain.

MEMBER 1 – RETIREMENT PHASE (AGES 68-88)

In the retirement phase, the focus for the member is on the pension in payment and its variability. We consider variable pension amounts which are calculated using the pension capital and annuity factor at each month-end. No smoothing of pension benefits nor risk reserve is considered in order to retain simplicity and focus on the impact of using leveraged pooled swap funds to reduce risk.

Table 1 shows a higher equity exposure would have led to a higher average pension. This highlights that, despite the largest financial crisis in living memory, a typical member living for

Lifecycle	Allocations		Average monthly pension paid per €100k initial capital = €566 initial monthly pension		Monthly pension amount changes		
	LDI	Hedge in retirement	Nominal	Real	Std. Dev.	Maximum monthly fall	Maximum cumulative drawdown
Defensive (20% equity)	Bonds	80%	€ 615	€ 510	0.8%	-2.7%	-14.9%
	PSF* & cash	100%	€ 657	€ 543	0.8%	-2.7%	-12.7%
Neutral (40% equity)	Bonds	60%	€ 666	€ 547	1.6%	-5.3%	-27.9%
	PSF* & cash	100%	€ 755	€ 617	1.5%	-5.4%	-24.3%
Adventurous (60% equity)	Bonds	40%	€ 718	€ 586	2.4%	-8.0%	-39.1%
	PSF* & cash	100%	€ 871	€ 704	2.3%	-8.1%	-34.5%

Source: Bloomberg, Aegon Asset Management. *PSF = pooled swap funds

20 years after retirement (who could tolerate the additional volatility in pension amount) would have been better off in euro terms with a higher equity allocation. Also, for the same equity allocation, a higher hedge ratio (i.e., using pooled swap funds rather than physical bonds) resulted in a higher pension outcome. This is expected given the long-term downward trend in rates during this period (except for the notable rises in 2022). However, it also demonstrates that the additional room for equity exposure, created by using a leveraged interest rate exposure approach, would have benefited members.

Charts 2A and 2B below show the drawdowns in pension amount across two periods: 2005 – 2020, where the Global Financial Crisis is the dominant shock; and 2020 – 2024 where the invasion of Ukraine led to high inflation and interest rises.

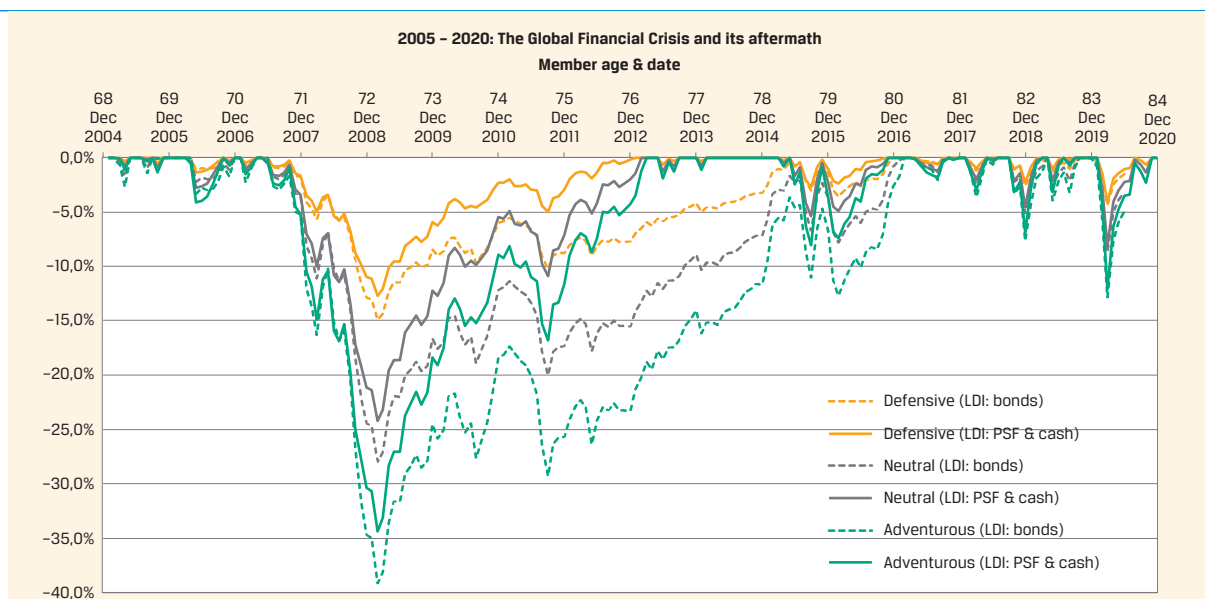
We see here that the adventurous lifecycle (the green lines) with a larger equity allocation clearly led to much larger drawdowns

during the GFC. Equities fell by almost 50% from their peak in 2007 before the recovery started in early 2009. Equities also regularly fell by more than 5% in a month during this period, and some months significantly more.

A higher interest rate hedge ratio reduced the drawdowns for the same equity exposure (the solid lines versus the dotted lines with the same color) and also led to a much faster recovery of the pension amounts. The pooled swap fund strategies with a 100% interest rate hedge (solid lines) would have recovered by the beginning of 2013 whilst the strategies using only physical bonds would have taken until 2017 to recover to the pre-GFC pension amounts.

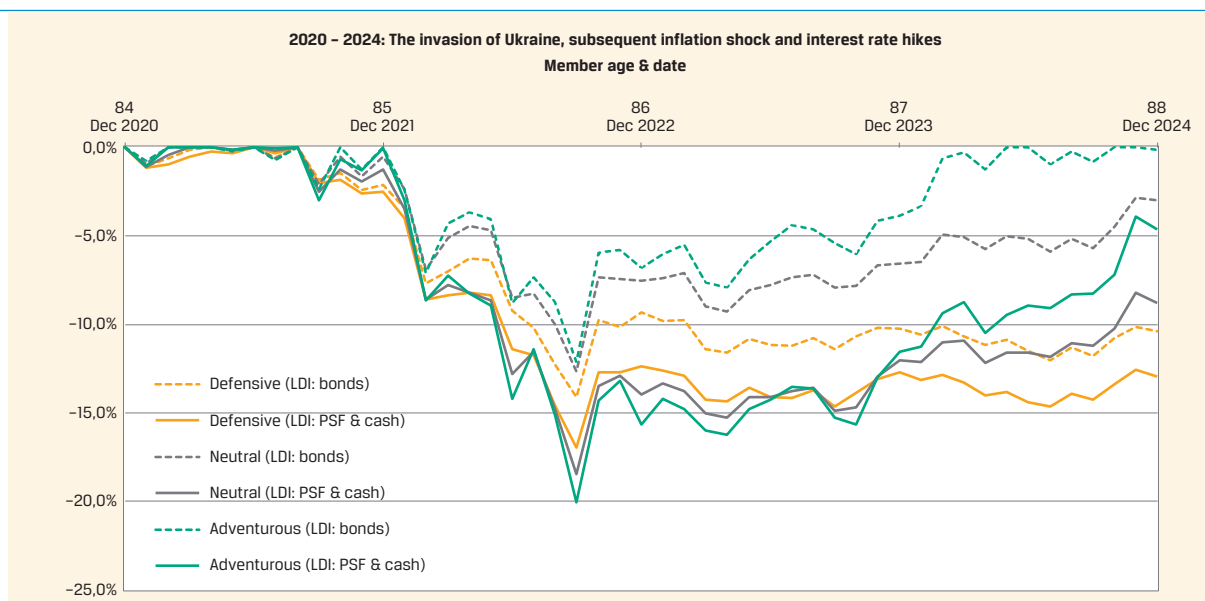
Although much less severe than the GFC, there were also several other shocks later during this period, including the eurozone crisis, the market turbulence in 2015-16 related to the Chinese stock sell-off, and the Covid-19 pandemic in early 2020. During

Chart 2A
Maximum (ongoing) drawdowns of pension amounts per strategy during the 2007-2009 Global Financial Crisis



Source: Bloomberg, Aegon Asset Management

Chart 2B
Maximum (ongoing) drawdowns of real pension amounts (base = end December 2020) during and after the start of the war in Ukraine in early 2022



Source: Bloomberg, Aegon Asset Management, Eurostat

these crises, similar trends played out – higher equity allocations generally led to greater shocks, and a higher interest rate hedge mitigated some of the shock and also led to a quicker recovery.

In Chart 2B the impact of the inflation shock that followed the Russian invasion of Ukraine, and subsequent central bank interest rate hikes, is shown. Given the high inflation, we have shown the changes in real terms relative to the position at the end of 2020. Strategies with a higher hedge ratio using pooled swap funds saw larger shocks to pension amounts (due to the increasing interest rates) and took longer to recover. Strategies with a higher equity exposure would have recovered much quicker, driven largely by a booming technology sector.

MEMBER 2 – DE-RISKING PHASE (AGES 48-68)

In the de-risking phase, members will focus on both their capital value and projected pension amount. Whereas for the retired Member 1, we focused on the pension paid, we now look at changes in both the capital value and the projected pension.

In line with the interest rate hedging strategies applied after retirement, we apply a hedging strategy which increases linearly from 20% to 100% (when pooled swap funds are used) during the de-risking phase. If bonds are used the hedge is limited to the allocation to the LDI portfolio at each age.

OUR BACK-TEST COVERS SEVERAL EXTREME EQUITY AND INTEREST RATES EVENTS

Table 2 shows that the returns on capital have been much higher than the returns on the projected pension, reflecting the shift downwards in interest rates during that time (which makes it more expensive to purchase pension benefits). As a result, the higher hedge ratio offered by the pooled swap funds leads to higher returns on both capital and projected pension. However, whilst it reduces the volatility of projected pension, it also *increases* the volatility in capital.

We note too that over the second half of the 20 year period (2015-2024), the returns have favored the lower hedge with physical bonds, albeit with a higher projected pension volatility. This supports the idea that, as many pension schemes implemented under the “Financieel Toetsingskader” (FTK), there may be added value in having an interest rate hedging policy which can be adjusted over time for FPR schemes.

Chart 3 shows the full 20 year period of the back-test for the 48-year-old example member. The Global Financial Crisis again had by far the most detrimental impact on their projected pension. Despite the ongoing contributions, it would have taken until 2015-2017 for the strategies using pooled swap funds (the solid lines) to regain the pre-crisis levels of projected pension. For the strategies using physical bonds (the dashed lines), and thus with a lower hedge ratio, it would not have been until 2021. In real terms, it is striking that the example members would have been unlikely to reach the pension they were projected to have pre-GFC, despite their ongoing contributions and large capital gains.

COMMUNICATION TO PENSION SCHEME MEMBERS

Communication to defined contribution pension scheme members is not straight-forward. *Brüggen et al.*² for example, found a wide variety of communication strategies across the countries and schemes they surveyed, with many strategies unevidenced. Using pooled swaps funds within lifecycle strategies creates further communication challenges and so must be carefully considered.

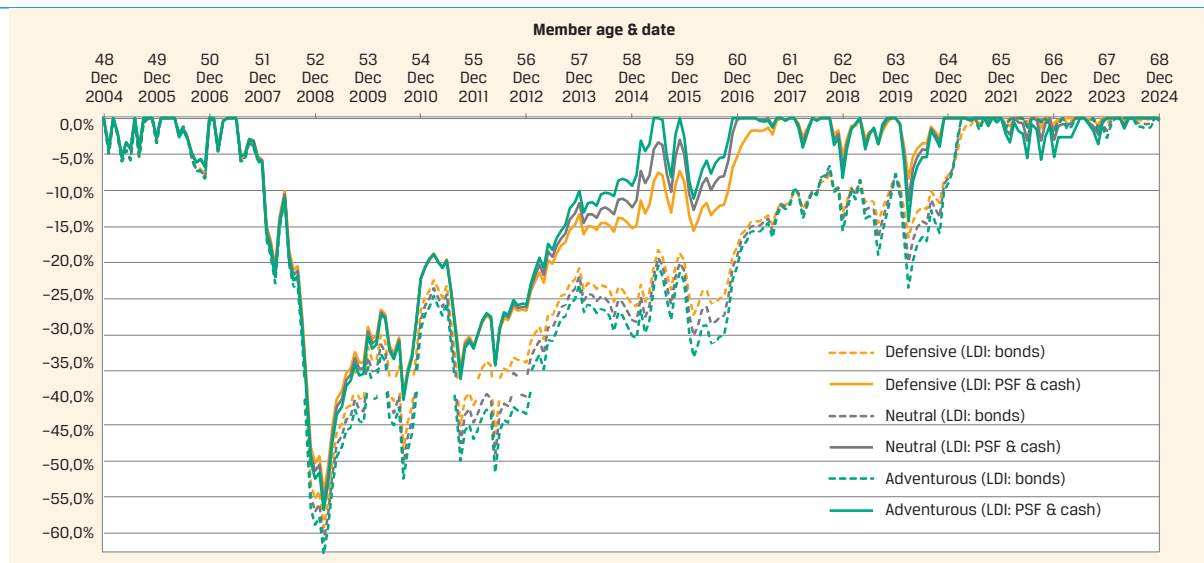
One issue with using pooled swap funds is that these do not translate well to a standard asset allocation, i.e. with target percentages for each asset category. The percentage of total assets which might be required to maintain the target hedge will vary according to interest rate levels and the amount of leverage the funds are offering at that point in time.

One solution is to incorporate the pooled swap funds into a “matching allocation” with other matching fixed income categories (alongside any additional cash) which then has a specified strategic allocation at each age. The upside is that there is then also much less likelihood of requiring collateral from

Lifecycle	Allocation & hedge progression		Total annualized return		Annualized standard deviation of monthly returns	
	LDI	Hedge	Capital	Projected pension	Capital	Projected pension
Defensive	10-80% bonds	10- 80%	6.7%	1.1%	9.8%	13.1%
	10-80% PSF* & cash	20-100%	6.9%	1.4%	11.0%	11.8%
Neutral	10-60% bonds	10- 60%	7.4%	1.8%	10.0%	14.3%
	10-60% PSF* & cash	20-100%	7.9%	2.3%	12.0%	12.5%
Adventurous	10-40% bonds	10- 60%	8.1%	2.5%	10.5%	15.6%
	10-40% PSF* & cash	20-100%	8.9%	3.2%	13.0%	13.4%

Source: Bloomberg, Aegon Asset Management. *PSF = pooled swap funds

Chart 3
Maximum (ongoing) drawdowns of projected pension amount during the historical back-test



Source: Bloomberg, Aegon Asset Management.

other assets and the member can therefore see the matching allocation as a single allocation with its own returns.

Another communication issue is the volatility of members’ capital values. Using pooled swap funds in the asset allocation (versus only adopting physical bond funds) adds to the chance of large changes in capital value. This may therefore raise questions from members, especially during periods of rising rates when their capital value may see considerable falls.

COMMUNICATION AROUND POOLED SWAP FUNDS SHOULD STRESS THEIR PURPOSE – TO REDUCE THE VOLATILITY IN PROJECTED PENSIONS

The purpose of using pooled swap funds is to reduce volatility in (projected) pension amounts (and not capital values). One communication strategy may therefore be to clearly link the changes in the value to changes in the pension amount (alongside the changes in capital value).

A form of waterfall chart or table, such as that shown in Table 4, might therefore be useful. When shown on a consistent basis this can become a long-term story that resonates with the members.

Collateral calls and distributions are an integral part of pooled swap fund operations but also represent a communication challenge (as well as an administrative and operational challenge). If interest rates rise such that leverage levels become too high, assets must be transferred to the pooled swap funds to reduce the leverage. If the leverage levels are too low, cash can also be distributed from the pooled swap funds.

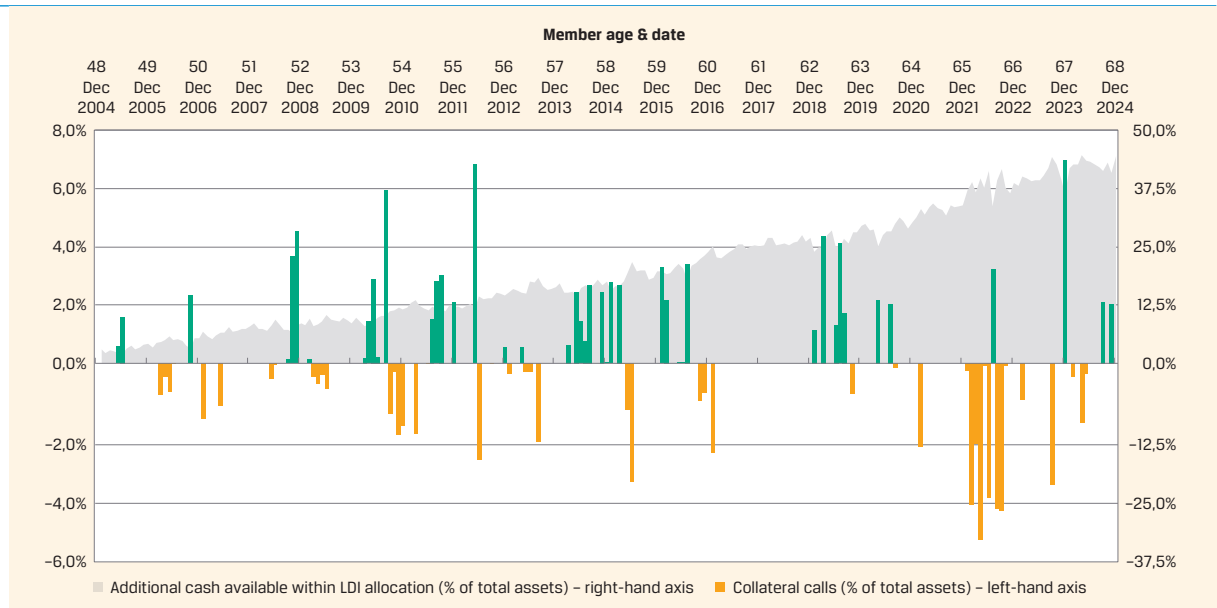
As an example, Chart 4 shows the monthly collateral calls and distributions for a typical pooled swap fund arrangement applied to Member 2 and the neutral lifecycle. These are expressed as a percentage of the total capital (left-hand axis). Also shown (right-hand axis) is the amount of additional cash assumed to be available within the LDI allocation (in reality, this might be invested in other liquid fixed income categories). We can see that whilst there may have been several large collateral calls, in particular the cluster during 2022, there was more than sufficient cash available to cover these, certainly if regular rebalancing of the asset allocation occurs (our analysis has assumed monthly rebalancing).

By adopting a “matching allocation” approach, so that the pooled swap funds are not an allocation in their own right, the collateral calls and distributions potentially stand out less (albeit at the risk of less transparency). Where communication is required, it is helpful to emphasize that these are transfers between (underlying) funds and that this is actually a reallocation rather than a cost.

Table 4
Example attribution analysis of monthly changes in capital and pension amount. For illustrative purposes only.

Pension capital at time 0	Pension paid	Returns on equity fund	Returns on matching allocation	Change in interest rates	Longevity effect	Pension capital at time 1
€ 250,000	- € 2,540	+ € 5,550	- € 6,950	N/A	+ € 1,050	€ 247,110
Monthly pension at time 0						Monthly pension at time 1
€ 2,540	N/A	+ € 55	- € 70	+ € 75	+ € 10	€ 2,610

Chart 4
Collateral calls and distributions from pooled swap funds for a member who is aged 48 in 2004 following the neutral example lifecycle



Source: Bloomberg, Aegon Asset Management

CONCLUSIONS

We have shown that the use of pooled swap funds would have supported FPR scheme members’ pension outcomes over the last 20 years – improving long-term returns, reducing volatility of projected and paid pensions, without compromising the preferred equity allocations. That said, the last few years have shown that high hedge ratios come at a cost when interest rates increase substantially over a short time horizon.

The Global Financial Crisis was the most severe crisis for pension savings in most people’s living memory. In this scenario, whilst all FPR scheme members would have likely seen large scale falls in their pension capital and pension projections, those with higher hedge ratios would have suffered less and seen their pensions in payment or projected pensions recover quicker. The sharp rises in interest rates during 2022 would have caused relatively large collateral calls from pooled swap funds. However, we can see that, for a wide range of equity allocations, there would not necessarily have been reason to sell equities at short notice.

The leverage available within pooled swap funds is more than sufficient to cover the hedging strategies considered in the article: increasing from a 20% to a 100% hedge ratio during the 20 years up to retirement. This leaves room to hold additional cash or to invest this in a “matching allocation” where the expectation is

that this matching allocation can be used to meet collateral calls when required. Such a matching allocation would therefore need to be liquid and have low transaction costs.

Member communication about the use of pooled swap funds remains an important and, many would argue, challenging subject. However, combining cash and/or bonds with the pooled swap funds to create a matching allocation for communication purposes can avoid the need for other assets to be sold to meet collateral calls. Communication about the high volatility of returns of pooled swap funds should be addressed in terms of their purpose in the portfolio – to reduce the volatility in projected pensions. We believe this is better achieved on an ongoing basis rather than as a reactive exercise if members see large negative returns when interest rates spike upwards. This must of course be in addition and complementary to the information required by law to be communicated to pension scheme members.

Noten

- 1 Whilst not considered in this article, leverage can also, in principle, be achieved by using bonds with longer maturities than the projected pension cashflows being hedged. However, this brings additional risks (curve and convexity risk).
- 2 Communication in DC Pension Plans: An International Perspective, Brüggem et al, February 2022, Netspar Industrial Series