Q3 2023

# Rethinking DC Portfolio Diversification

## A Case Study on the UK

## Executive Summary

Most DC portfolios today rely on varying mixes of traditional market exposures to drive growth during the accumulation phase and to mitigate bad investment outcomes in the years before and after retirement. This simple stock/bond formula worked well in recent decades characterised by falling yields and low, stable inflation. But what if stock/bond diversification ain't what it used to be? Even supposedly lower risk DC portfolios suffered substantial losses in 2022, as equity and bond markets sold off together. Prospects for stock/bond portfolio returns and diversification look bleaker than the rosy past.

Where else can DC investors find returns and diversification that they can access now? We make the case for an allocation to *liquid alternatives* as a viable and versatile complement to existing DC portfolios.

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# Introduction

The seismic shift from defined benefit (DB) to defined contribution (DC) pension investment continues, with global DC assets decisively overtaking DB assets in recent years.[1] In the U.K., the DC landscape has evolved rapidly over the last decade, with the advent of auto enrolment, pensions freedoms, and the growth of Master Trusts. There are now more people saving into DC schemes than DB schemes,[2] and the U.K.'s DC assets are predicted to overtake DB within the next 15-20 years. As they become a central component of post-retirement incomes, DC schemes have become an active area of focus for the U.K. government and regulators, keen to ensure pension savers receive adequate retirement provision and value for money.

Most DC pension providers have rightly emphasized simplicity and low costs for their members. Higher risk, higher return portfolios are designed to harness the long-term equity premium for capital growth during the accumulation phase, while lower risk portfolios rely on diversification across stocks, bonds and cash to reduce the risk of large losses before and after retirement.

In this article we make the case that DC investors cannot expect such strong performance from stock/bond combinations as was delivered in recent decades. Expected returns are lower, and the chances of simultaneous stock and bond losses are higher. Macroeconomic volatility has risen after the exceptionally benign 2010s, and such volatility tends to persist.[3] The risks inherent in bond allocations have recently materialized after lying dormant for decades, and may not have been well-understood by DC savers (DB schemes were also caught out, as their so-called LDI strategies backfired in September 2022). The U.K. government and the pensions regulator have taken note, with the latter reminding DC trustees of their duty to ensure pre-retirement portfolios are properly aligned with members' retirement choices.[4]

How can DC portfolios be improved in this environment? Are investors missing out on other sources of diversification that could fill the gap left by bonds? Are such diversifiers available in a liquid, low-cost and DC compatible format?

We discuss the implications of different retirement choices on optimal asset allocation, and propose *liquid alternatives* as a viable and versatile complement to existing DC portfolios. Most recently it has been the inclusion of private assets in DC portfolios that has received more attention. But dynamic liquid alternatives—with prudent use of financial tools such as shorting and modest leverage—have the potential to be even more diversifying, as demonstrated by their substantial gains in 2022. We argue that liquid diversifiers significantly broaden the investment opportunity set and deserve a strategic role in DC portfolios.

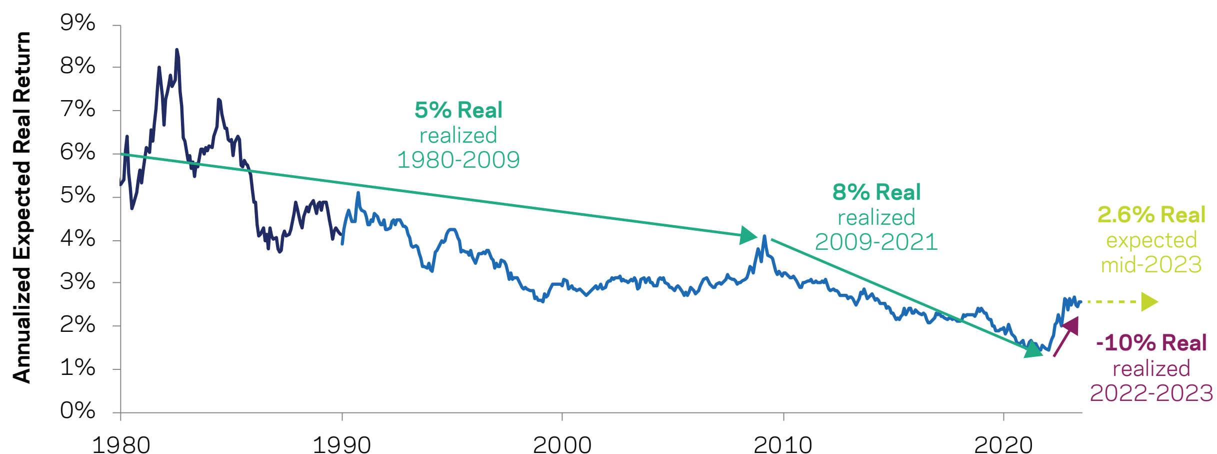
1 According to the *Global Pension Assets Study 2023* by WTW's Thinking Ahead Institute, the proportion of global DC assets in major pension markets has risen from 41% to 55% over the past 20 years.
2 According to the Office for National Statistics' *Employee workplace pensions in the UK*, DC pensions have been the dominant type of pension among U.K. employees since 2019.
3 See Brooks (2023), "Certainly Uncertain."
4 See "*Trustees must not lose focus on protecting savers from economic volatility*," blog by Louise Davey, Pensions Regulator Director of Regulatory Policy, Analysis and Advice, June 2023.

# Evaluating DC Asset Allocation: Stock/Bond Tailwinds Have Shifted

Stocks and bonds have been the stalwarts of investment portfolios for more than a century. The past 30-40 years saw strong returns for stock/bond investors, but some of these returns were effectively 'borrowed from the future' in the form of falling yields and rising valuations. **Exhibit 1** shows a yield-based measure of expected real return for a stock/bond portfolio, and illustrates how this tailwind environment accelerated in the 2010s before coming to an abrupt end in 2022, with some cheapening of both asset classes. But portfolio yields are still low by historical standards. Whatever happens to valuations in the short-to-medium term, it seems unlikely that DC investors will enjoy another period of sustained richening. They will have to adjust to a world of lower investment returns, and this is likely to require (1) saving more, (2) lowering expectations for retirement wealth, and (3) embracing other sources of return.

**Exhibit 1: Recent Decades' Strong Returns Were Partly Borrowed from the Future**

Expected and Realized Annual Real Returns for Global 60/40 Portfolio, January 1980 – June 2023




Source: AQR, Bloomberg, Robert Shiller Data Library, Consensus Economics. Expected return for global 60/40 portfolio is 60% cap-weighted developed equities and 40% GDP-weighted 10-year government bonds. Prior to 1990, U.S. 60/40 is used due to data availability. Local real equity yield is simple average of two measures: (0.5 * Shiller E/P * 1.075) + 1.5% and Dividend/Price + 1.5%. 1.5% term is assumed long term real earnings-per-share growth. 0.5 multiplier reflects long-term payout ratio; 1.075 multiplier accounts for EPS growth during 10-year earnings window. Local real bond yield is yield minus long-term expected inflation. Realized real returns are annualized returns of 60% MSCI World GBP and 40% Bloomberg Barclays Aggregate Hedged in excess of UK CPI.

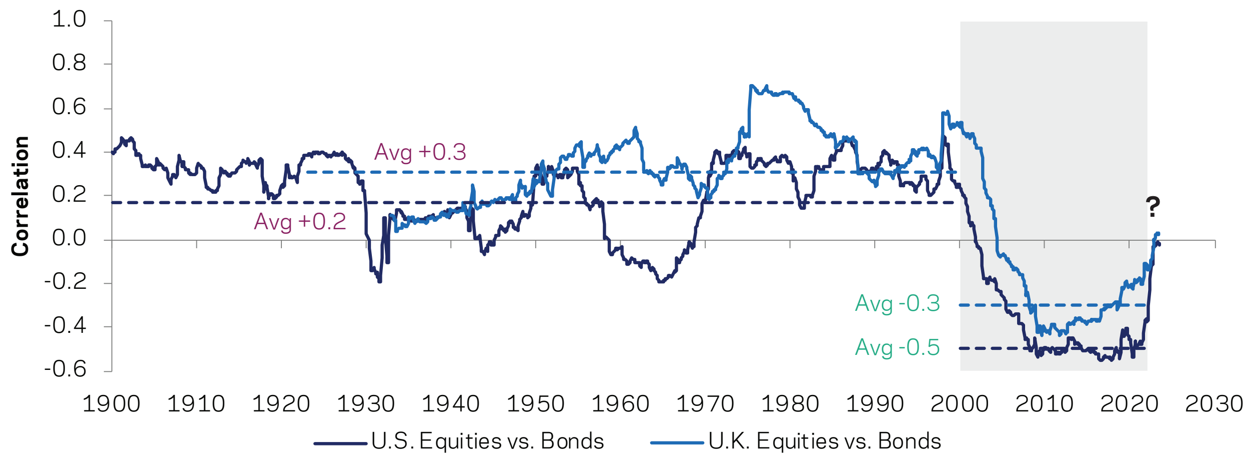
The stock/bond 'golden era' wasn't just about falling yields. For the first 20 years of this century, stocks and bonds were also unusually diversifying to each other, helping to cushion the bumps in portfolio performance (see **Exhibit 2**, which shows rolling correlations for U.S. and U.K. assets; other major markets show a similar pattern). The main driver of this negative stock/bond correlation was probably the unusually stable inflation environment.[5] In the 2020s so far, stock/bond diversification has a much patchier track record. The outlook

5 See Brixton et al. (2023), "A Changing Stock-Bond Correlation: Drivers and Implications."

for this relationship depends on the relative importance of growth versus inflation news, the role of demand versus supply shocks, and the ability of central banks to navigate difficult trade-offs. Bonds will probably continue to provide good diversification in some macroeconomic environments (specifically, disinflationary recessions). But again, a return to 'golden era' levels of diversification seems unlikely. More frequent episodes of simultaneous stock and bond losses would pose a significant challenge for the traditional DC investment model.

**Exhibit 2: End of an Era?**

10-Year Rolling Correlation Between Equity and Government Bond Returns, January 1900 – June 2023




Source: Global Financial Data, Bloomberg and AQR. Rolling 10-year series based on overlapping 3-month excess-of-cash returns at monthly frequency. Dash lines indicate average correlations for 1900-99 and 2000-21 periods. Shading highlights 2000-21 period, the era of sustained negative correlations. For illustrative purposes only.

# Retirement Choices and Implications

2022 highlighted the significance of diversification across the glidepath. DC schemes that relied on large bond allocations for their "low risk" pre-retirement portfolios suffered worse losses than schemes with a more diversified approach to asset allocation.

For savers who intend to purchase an annuity, there is a hedging benefit from holding bonds in the years before retirement, offsetting the risk of a fall in annuity rates (as occurred during and after the 2008 Financial Crisis). But since the Pension Freedoms legislation was introduced in 2015, many U.K. pension savers have chosen to take cash on retirement and/or stay invested: annuities account for only a small share of DC outcomes. Higher annuity rates may increase annuities' popularity in the 2020s, but the inherent surrender of control—combined with investor inertia—is

**Average Performance of 'Lower Risk' UK DC Portfolios in 2022[6]**

Older saver with 5 years to state pension age

**-9.8% Nominal**
**-18.4 Real**

6 Equal-weighted average performance across all 24 UK DC schemes with returns reported by CAPA Data for full year 2022. Real return is adjusted by U.K. CPI. The mainstream media has also picked up on the poor performance of supposedly low risk DC portfolios, for example *The Guardian*, March 2023: "Why do those retiring face 'massive' losses despite FTSE highs?"

likely to limit their appeal. For the majority of investors who choose to stay invested or take cash on retirement, a failure of stock/bond diversification (as experienced in 2022) can inflict significant harm on retirement wealth. Members nearing retirement also have less time for their portfolios to make up any losses, and so these members may have to defer retirement or accept a lower standard of living in retirement. Access to non-bond diversifiers is likely to be particularly valuable for these investors.

# Rethinking DC Portfolio Diversification

### Improving Outcomes for the Unluckiest Cohorts

Each DC saver gets only one shot at providing for his or her retirement. They won't necessarily have the luxury of waiting a few years for markets to recover if luck is against them. So if DC portfolio diversification is to mean anything, it must mitigate *sequencing risk*—in other words, improve outcomes for the unluckiest cohorts. These will usually be the savers who suffer a large market drawdown near retirement, when their pot is at its largest.

Reducing the risk of a bad outcome means adding investments that can perform well during periods when stocks and/or bonds suffer, preferably without sacrificing long-run returns. That's asking a lot. Is it achievable? Some diversifiers have a better chance than others.

### Popular Diversification Candidates

In recent years, many DC portfolio providers have introduced or considered introducing some exposure to **private and illiquid assets** such as private equity, venture capital, private debt, real estate and infrastructure. The industry-led Productive Finance Working Group established by the Bank of England, U.K. Treasury and Financial Conduct Authority (FCA) has attempted to encourage investment in these asset classes. Long Term Asset Funds (LTAFs), authorised by the FCA in 2021, removed some of the hurdles for DC schemes to invest in illiquid assets, and as of mid-2023 a few have already been launched. Private assets offer some benefits, but they also share underlying economic exposures with traditional stocks and bonds, limiting their diversification potential especially during prolonged bear markets. These are the type of markets where diversification is needed most.

Another candidate is explicit **tail risk protection strategies** that use options to deliver attractive payouts in the event of a sudden drop in markets. These may be useful in some cases, but like all explicit insurance policies they come at a cost: a substantial negative expected return over the long term. Their protective capabilities are also path-dependent—they tend to deliver large pay-offs in the event of a dramatic market crash like 2008 or 2020, but can disappoint investors in the case of more gradual losses as experienced in 2022 or the 'tech bust' of the early 2000s. Savers with limited investment knowledge are unlikely to appreciate these nuances unless they are clearly warned, and the costly strategies may

be hard to hold onto doing more normal market environments.

Finally, **liquid alternatives** are active strategies designed to deliver positive long-term returns that are lowly correlated to the traditional equity and bond markets that DC savers are exposed to. They often pursue strategies across several asset classes, using financial tools such as leverage, shorting and derivatives to target and manage risk. These strategies have been around for decades, and are available in daily or weekly dealt vehicles that are DC ecosystem friendly, with low minimum investment requirements. We explore them more in the next section.

**Exhibit 3: Three Candidates for Enhancing DC Diversification**

| | Illiquid Assets | Tail Protection | Liquid Alternatives |
|---|---|---|---|
| Pros | Long-term returns; volatility cushioning; thematic investments | Substantial payout in the event of a market crash | Long-term returns; strong diversification; macroeconomic resilience |
| Cons | Limited diversification, especially in prolonged bear markets | Long-term cost; path-dependent protection | Complexity; lack of investor familiarity |

Source: AQR. Diversification does not eliminate the risk of experiencing investment losses.

# Liquid Alternatives in DC Portfolios

For cost-conscious DC portfolios where simplicity is a virtue, the most relevant liquid alternative strategies are likely to be those taking advantage of well-documented risk premia or behavioural biases, such as value, momentum, quality and trend following, perhaps combining these with proprietary signals and portfolio construction techniques. The most promising candidates are as follows (see **Exhibit 4**):

- A **broad multi-style, multi-asset strategy** can be designed to deliver positive risk-adjusted returns that are uncorrelated to traditional markets over the long-term. The strategy systematically goes long assets with characteristics associated with outperformance, and short assets with the opposite characteristics.[7] Fees will depend on the risk level or volatility, which can be scaled to make the strategy a useful complement to bonds in pre-retirement portfolios.

- A macro-focused **trend following strategy** can use price-based and economic signals to take long and short positions across many markets, exploiting the tendency of recent trends to continue and behaving like a risk-mitigating tactical overlay to market exposures elsewhere in the DC portfolio. These strategies have exhibited the very useful property of outperforming during tough times for traditional assets, including equity bear markets, inflation shocks and periods of monetary policy tightening.[8]

7 For a fuller description see 'Understanding Style Premia' by Israel and Maloney (2014).
8 For a comparison of option-based tail protection and trend following strategies, see 'Tail Risk Hedging: Contrasting Put and Trend Strategies' by Ilmanen et al. (2021).

- A **risk-managed, long-only multi-asset strategy** can help cost- and governance-constrained schemes diversify across assets with different macroeconomic sensitivities, reduce exposure to individual assets with deteriorating prices or unsupportive macroeconomic fundamentals, and manage total portfolio volatility within a desired range.

### Exhibit 4: Examples of Liquid Alternative Strategies Designed for DC Portfolios

A. Long/Short Multi-Asset Alternative Risk Premia

| Value | Momentum | Carry | Defensive | Trend |
|---|---|---|---|---|
| Cheaper assets tend to out-perform more expensive ones | An asset's recent relative perform-ance tends to persist | Higher-yielding assets tend to provide higher returns | Low-risk and high-quality assets tend to earn higher risk-adjusted returns | An asset's recent performance tends to continue in the near future |

B. Diversified Trend Following

| Price Trend | | Economic Trend | |
|---|---|---|---|
| Long-Term Trends | Short-Term Trends | Growth & Inflation<br>Monetary Policy | International Trade<br>Macro Sentiment |

C. Risk-Managed, Long-Only Multi-Asset ('Risk Parity')

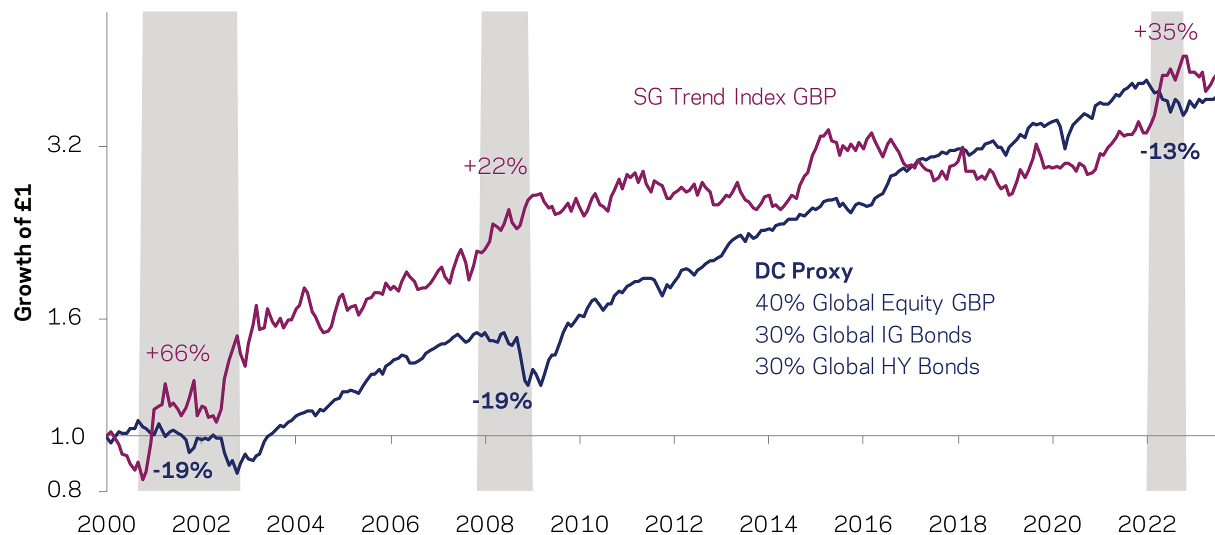
| Risk-Balanced with Dynamic Risk Overlay | | |
|---|---|---|
| Global Equities | Global Bonds | Inflation Protection Assets |

Source: AQR. For illustrative purposes only. Inflation protection assets typically include commodities and inflation-linked bonds. Diversification does not eliminate the risk of experiencing investment losses.

Liquid alternatives can be useful in both high-risk growth and lower-risk income portfolios. Some, offered at modest risk levels (compatible with DC fee constraints), may be best suited as bond complements, broadening the opportunity set and enhancing the diversifying power of that part of the portfolio. **Exhibit 5** illustrates how one liquid alternative strategy, trend following, reliably delivered outsize returns during the rare—but instructive—drawdown episodes of the stock/bond 'golden era'.

**Exhibit 5: Now That's What I Call Diversification...**

DC Proxy Portfolio and SG Trend Index, January 1, 2000 – June 30, 2023




Source: AQR, Bloomberg. Based on monthly data. Global Equities is MSCI World index, unhedged in GBP. Global IG and HY bonds are respective Bloomberg Barclays GBP hedged indices. SG Trend index is an equal-weighted combination of the largest trend managers, net of fees. Past performance is not a guarantee of future performance. Please read important disclosures in the Appendix.

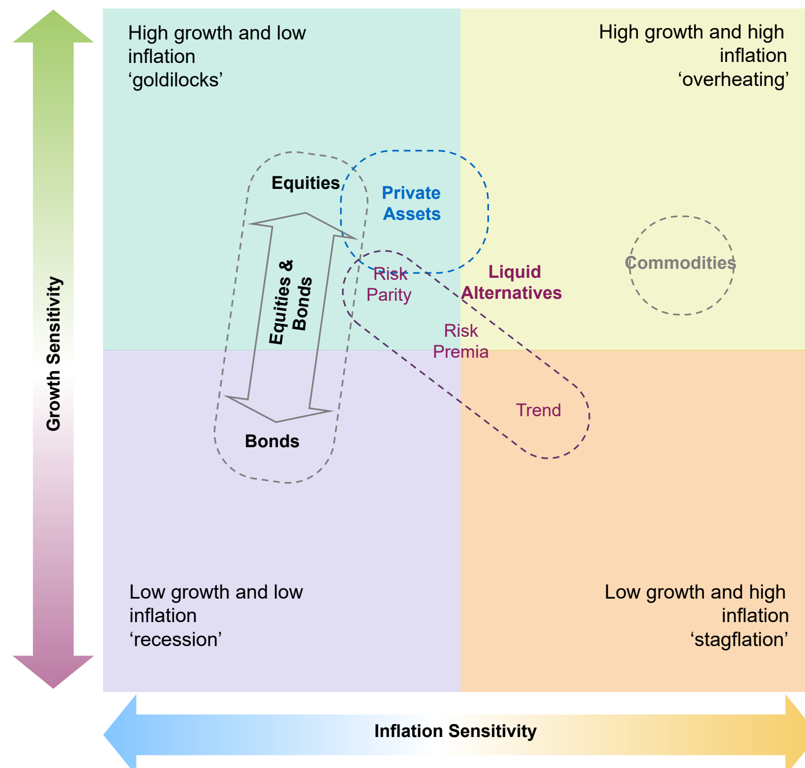
Liquid alternatives are complex strategies. Can they be explained to DC savers? We believe the answer is yes, by focusing on the fact that they provide exposure to different risks and sources of return than traditional assets. DC providers need to do a better job of explaining the risks of all assets, as demonstrated by the events of 2022, where government bonds turned out not to be such a low-risk asset after all!

One idea is to introduce concepts of growth and inflation risks, to illustrate why it's important to diversify beyond just stocks and bonds (see **Exhibit 6**). Specifically, Panel B shows investors that stocks and bonds have offsetting growth exposures but similar inflation exposure—they are both on the left side of chart, meaning they tend to underperform when inflation rises. Any allocation that can shift the portfolio towards the centre of the chart (like liquid alternatives) is likely to enhance macroeconomic resilience and reduce sequencing risk.

**Exhibit 6: Not Just Strength, But Flavour Too: Improving Risk Insights for DC Savers**

A. Traditional Linear Risk Visualisation Underplays the Risk of Bonds

B. Schematic Illustration of Macroeconomic Exposures




Source: AQR. For illustrative purposes only. Panel B is a schematic representation of long-term empirical sensitivities. For more details see for example Thapar et al. (2021), "When Stock-Bond Diversification Fails."

# Can Liquid Alternatives Be Sustainable?

Liquid alternatives offer unique possibilities for addressing environmental, social, and governance (ESG) objectives. These are most commonly applied to long/short equity strategies or to the equity risk premia allocations of multi-asset strategies, with macro assets an ongoing area of research and development in the industry. The use of shorting allows investors to more fully express negative views on companies with poor ESG characteristics. While a long-only portfolio is restricted to divesting from such companies, going short can achieve greater impact as well as improving risk and return characteristics. Desirable impacts include raising management awareness of issues—as they tend to pay attention to short interest—and raising the company's cost of capital through downward

pressure on its share price.[9] Specific environmental objectives may be targeted too; carbon-aware liquid alternatives can efficiently hedge climate-related risks by tilting towards lower-emitting companies on the long side and towards higher-emitting companies on the short side, or towards a lower overall emissions profile than a reference universe, while still pursuing attractive risk-adjusted returns. Shorting in this context is not a panacea, but it can be a useful tool alongside other sustainable investment practices.

# Concluding Thoughts: Cost Versus Value

Fees are certain; returns are not. The benefit of lower fees compounds over time, and delivering a similar portfolio at reduced cost to their members is a worthy aim for DC schemes. But in this article we've argued that the performance of the lowest-cost portfolios—simple combinations of passive stocks and bonds—has been bolstered by falling yields and low, stable inflation in recent decades, and those tailwinds have turned. Liquid alternatives can be accessed within the constraints of the charge cap, yet only a small fraction of DC schemes are currently using them.

Risk matters for DC investors as well as cost, especially those nearing retirement, and that means diversification matters too. Bonds have an important role to play, but a portfolio that relies solely on bonds for diversification has yawning gaps in its defenses—namely, inflation and interest rate risks.

Present cohorts of DC savers face a challenging environment, with low expected returns and heightened macroeconomic volatility that is likely to persist. They will probably have to save a higher percentage of their earnings for a longer period, and expect less than their luckier predecessors. 'Save more for longer' is an especially tough proposition at a time when many real incomes have been stagnating or falling. DC providers can help their members by offering better diversified portfolios that deliver long-term value in a range of different macroeconomic outcomes. We believe liquid alternatives have made their case to be in the mix.

9 Campaigns to 'green your pension' tend to focus on divestment as an investor's main weapon against firms perceived to be misaligned with their values. If divestment is an effective tool, then shorting should be a more effective tool, as argued in Shorting Counts (Cliff's Perspective blog, 2022).

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