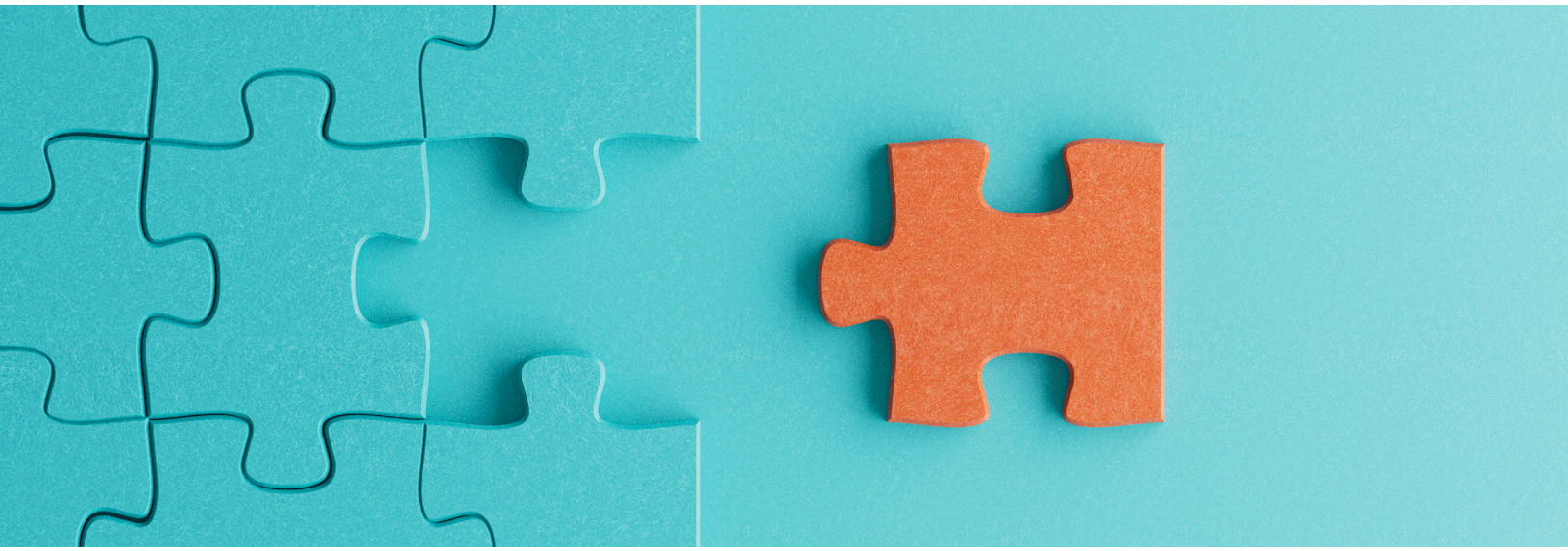
NEUBERGER BERMAN



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Unlocked Potential: Enhancing DC Outcomes With Private Equity

The private equity asset class has long been recognised for its appealing risk/return characteristics, particularly over the long-term investment horizon afforded to pension investors. However, inclusion in defined contribution plans in the UK market has often been limited by structural considerations such as fee-cap, regulation, liquidity and other factors. As product innovations reduce such barriers, however, we believe it's time for defined contribution (DC) schemes to take a fresh look at the asset class.

In this article, we present a hypothetical study to illustrate the potential impact on asset accumulation of including private equity in a multi-asset solution, and how that affects the level of income that can be bought at retirement. We also highlight the different investment management approaches, and therefore considerations for DC schemes in choosing an investment partner.

Executive Summary

- We modelled two hypothetical DC portfolios with a 40-year glide path.
- One portfolio includes only traditional equities, while the other included an allocation to private equity, substituting part of the traditional equity allocation.
- The higher risk-adjusted return profile of private equity investments improve not only mean return, but also, in a Monte Carlo simulation, the range of hypothetical portfolio returns.
- These potential advantages would more than overcome the increased fees associated with the addition of private equity.
- The resulting higher level of wealth-accumulation potential allows for the purchase of a larger annuity stream, increasing potential retirement income.

Defined contribution (DC) schemes have over the years looked for ways to increase participation, enhance investment choices and help participants reach better retirement outcomes. However, one area that has at times proved a struggle is introducing investments that can meaningfully enhance diversification beyond traditional equities, fixed income and cash. Private equity, which has historically provided an attractive risk/reward relationship in the context of defined benefit plans, has been an enticing but elusive category when it comes to the DC world, where inclusion has been limited by structural impediments such as illiquidity, limited transparency, regulation and fees. However, with structural improvements on all these fronts, combined with the ambition to introduce private market asset classes into DC schemes—highlighted by the signing of the Mansion House Compact in 2024—we believe that it is now appropriate for schemes to consider the addition of private equity, alongside other private market asset classes. There are still hurdles, however, and investors should be aware of the range of investment outcomes that are possible in private markets. It is therefore important to understand the impact of selecting between different managers and different approaches to private equity investing.

That is where this short paper comes in. Leaving aside the above practical considerations, we believe it is crucial for DC schemes to recognise that evaluating the suitability of private equity for DC plans is indeed "worth the effort." To that purpose, we provide an analysis that considers the hypothetical impact of moderate private equity allocations on DC portfolio outcomes, and then to the income streams potentially provided to "typical" retired participants through annuity payouts. Our return and risk assumptions are based on our forward-looking estimates of index results, while fees are roughly in line with industry averages. The net result is a meaningful improvement of potential retirement outcomes for participants, as described on the following pages.[1]

[1] Assumptions are for modeling purposes only and alternative assumptions may result in significant or complete loss of capital. There can be no assurance that the strategy will achieve comparable results, that targeted diversification or asset allocations will be met, that the strategy will be able to or will ultimately elect to implement the assumptive investment strategy and approach described in the model.

Portfolio Construction

In our study, we created a glide path of allocation that gradually shifts growth assets to fixed income and cash as the retirement date approaches, modelled on the typical glide paths followed by DC default funds currently on the market. We considered two hypothetical glidepaths:

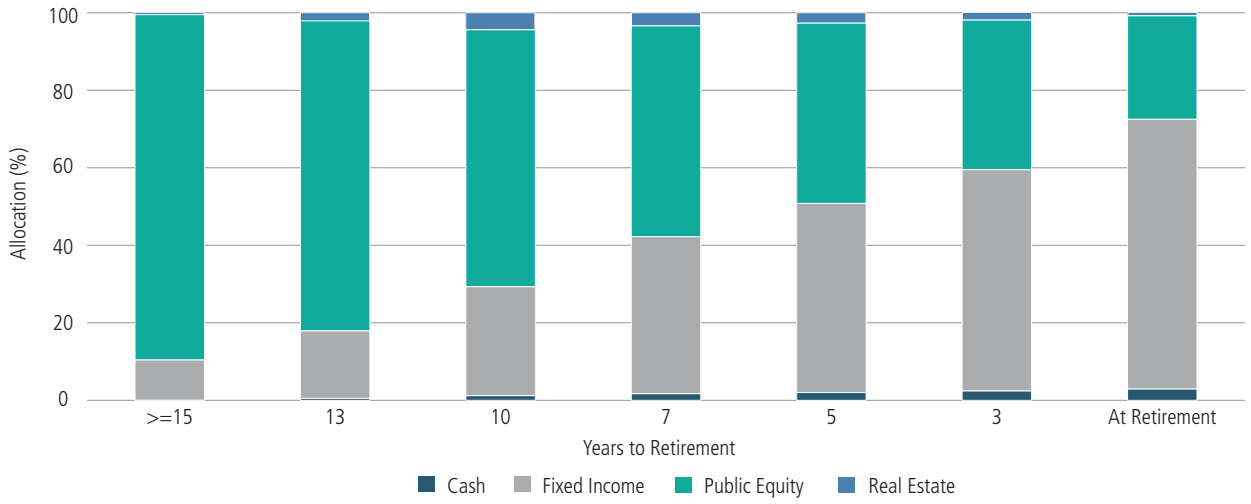
(1) One with an allocation to traditional equities

(2) Another in which a portion of that equity allocation (10% at the outset, gradually declining to 0% at retirement) is devoted to private equity.

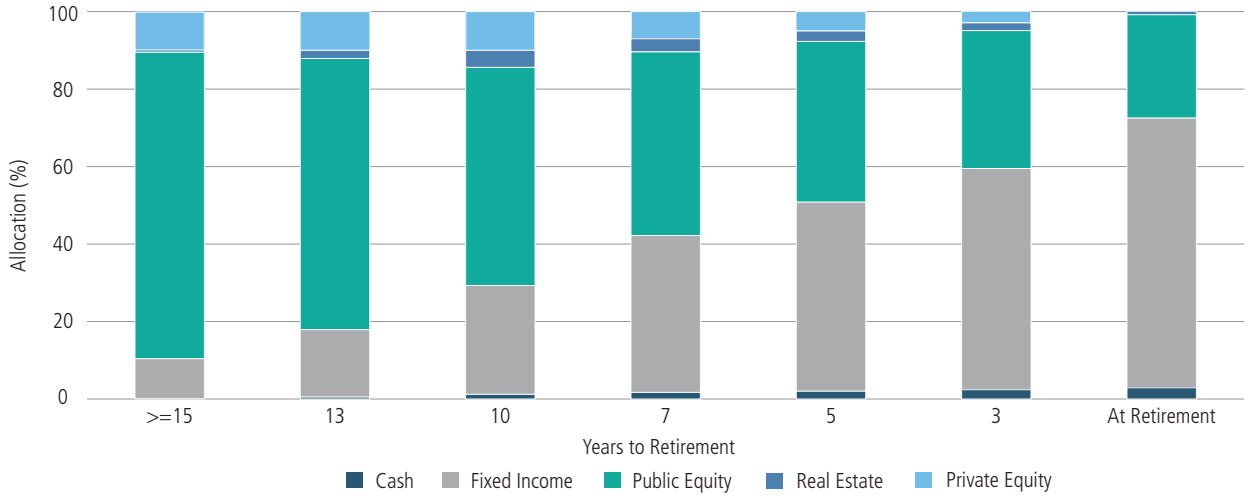
Due to the ability of UK retirees to take a 25% tax-free cash lump sum from their savings, our approach assumes no illiquid allocation at the point of retirement. We note that, in reality, the fund could retain some illiquid private equity into the decumulation phase, albeit at a smaller allocation, as the larger proportion of assets remain invested after retirement rather than being fully distributed.

FIGURE 1. GLIDE PATHS FOR HYPOTHETICAL DC PORTFOLIOS

No Private Equity (modelled on the typical glide paths followed by DC default funds currently on the market)



With Private Equity (replacing public equity sub-asset classes proportionally)



Source: Neuberger Berman. For illustrative purposes only.

Additional Estimated Return More Than Compensates for Higher Fees

Management fees are a central issue for most DC schemes and have sometimes represented a stumbling block to the inclusion of private equity strategies in DC portfolios. As part of our study, we wanted to show the potential benefits of private equity in terms of return and diversification relative to their higher costs. Our analysis considered the impact of management fees on asset class returns and portfolio accumulation, with the following assumptions:

- Cash and short-term bonds: 10 basis points (bps)
- Public fixed income: 25bps
- Public equity: 10bps
- Real estate: 50bps
- Private equity: 200bps for both fees and carry

For private equity fees, we assumed the use of a (predominantly) co-investment strategy given what we consider the category's advantages for use in multi-asset solutions, which we discuss in more detail later in this paper.

In our study, shifting the allocation from public equity to private equity caused higher fees overall, but those additional fees were small relative to the return boost provided to the total hypothetical portfolio. Specifically, with a 10% reallocation, overall portfolio fees increased by 19 bps, while the portfolio's annualised net return increased by 67 bps. The change reduced the hypothetical DC portfolio's overall volatility (even after de-smoothing the return series by removing autocorrelation), given private equity's diversification benefit against public equity.

FIGURE 2. PRIVATE EQUITY COST/BENEFIT TRADE-OFF

Portfolio fee is the estimated weighted average of asset class fees for all years through retirement.

Depending on the allocation, PE typically raises annual fees by 6 – 19bps, but increases overall portfolio net returns by 20 – 67bps.

	Years to Retirement	>=15	13	10	7	5	3	At Retirement
No Private Equity	1-Year Estimated Net Return	7.54%	7.28%	6.89%	6.50%	6.23%	5.97%	5.57%
	Fee (bps)	11.8	13.5	16.0	17.4	18.4	19.3	20.8
Includes Private Equity	1-Year Estimated Net Return	8.20%	7.95%	7.56%	6.96%	6.57%	6.17%	5.57%
	Fee (bps)	30.8	32.5	35.0	30.7	27.9	25.0	20.8
Difference	**1-Year Estimated Net Return (bps)**	**66.8**	**66.8**	**66.8**	**46.8**	**33.4**	**20.0**	**0.0**
	Fee (bps)	**19.0**	**19.0**	**19.0**	**13.3**	**9.5**	**5.7**	**0.0**

Source: Neuberger Berman. For Illustrative Purposes Only. Estimated returns and estimated volatility (risk) shown are hypothetical and are for illustrative and discussion purposes only. They are not intended to represent, and should not be construed to represent, predictions of future rates of return or volatility. Actual returns and volatility may vary significantly. Unlike actual investment performance, hypothetical model results do not represent actual trading and accordingly they may not reflect the impact that material economic and market factors might have had on decision making if assets were actually managed during the relevant period. Investing entails risks, including possible loss of principal. Indexes are unmanaged and are not available for direct investment. **Past performance is no guarantee of future results.** See additional disclosures at the end of this paper.

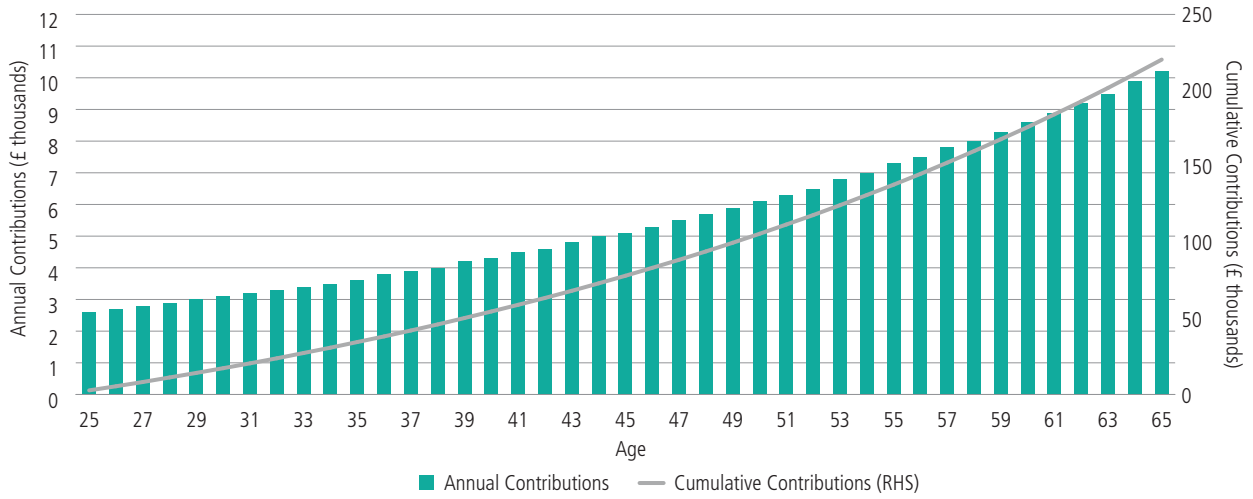
Participant Savings: Steady Contributions Over Time

Thus far, we have considered the issue of private equity inclusion at the DC portfolio level. Now, it's time to bring in a hypothetical investor to determine the potential individual impacts of an allocation decision around private equity. In the study, we simulated retirement savings for a hypothetical person from age 25 to age 65, with an initial gross annual salary of £32,292 that grows by 3.5% per year, or roughly a 0.34% real growth rate (over inflation). The participant contributes 8% of salary annually, with 5% from earnings and 3% from an employer match. The accumulation of these contributions is tracked below. Note that the contribution amounts are below the maximums, which is consistent with the savings patterns of many participants.

FIGURE 3. ANNUAL AND CUMULATIVE CONTRIBUTIONS

Initial salary: £32,292
(grows by 3.5% each year thereafter)

Annual contribution: 8% of salary
(5% from earnings, 3% from employer match)



Source: Neuberger Berman. Salary growth of 3.5% is equal to 0.34% plus 3.16%, which was the 30-year breakeven inflation rate as of December 2024. For Illustrative Purposes Only.

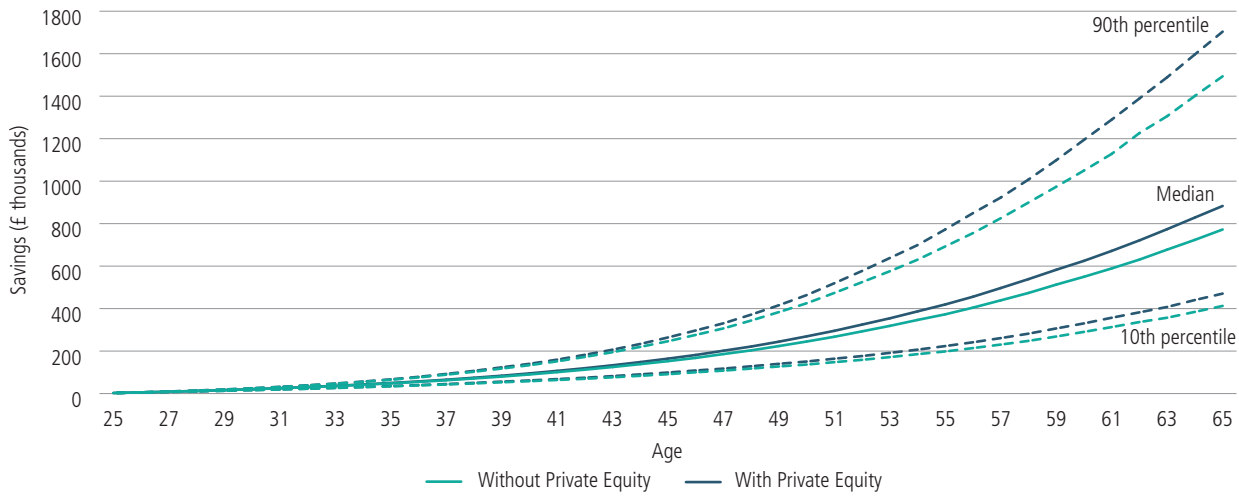
Enhanced Range of Outcomes

Given that retirement investing success is a probabilistic exercise, we wanted to run our hypothetical through a Monte Carlo simulation to see how the addition of private equity could perform in a range of possible outcomes. In other words, would devoting a portion of equity exposure to private markets, even if providing an advantage in average scenarios, increase risk of underperformance across more difficult environments?

We calculated 10,000 different hypothetical return scenarios for the portfolio and ranked the results. In the chart, the median result (or 50th percentile) is represented in green for the portfolio without private equity and blue for the portfolio that includes private equity, while the 10th and 90th percentile outcomes are shown with dotted lines. Given the moderate diversification benefits of private equity, its addition elevates the range of potential outcomes, including downside scenarios, reflecting its ability to reduce portfolio risk even at extreme levels.

FIGURE 4. ADDING PRIVATE EQUITY ENHANCES HYPOTHETICAL OUTCOMES

Median, 10th and 90th percentile outcomes from 10,000 hypothetical return simulations for portfolios with and without private equity



Source: Neuberger Berman. See figure 1 for the starting asset allocations and glide path allocations for both portfolios. The projections or other information generated by this analysis regarding the likelihood of various investment outcomes are hypothetical in nature, do not reflect actual investment results and are not guarantees of future results. These hypothetical returns are used for discussion purposes only and are not intended to represent, and should not be construed to represent, predictions of future rates of return. Actual returns may vary significantly. Our assumptions are subject to change without notice. **Past performance is no guarantee of future results.** See additional disclosures at the end of this paper.

Translating Asset Growth Into Retirement Income

Although total portfolio assets provide valuable information about portfolio performance, it is typically less relevant to the plan investor than the retirement income it generates. To complete our study, therefore, we wanted to see the concrete impact that including private equity in portfolios could have on income during retirement. Specifically, we assumed that immediately upon retirement, participants would use all account proceeds (post-25% tax-free cash lump sum) to purchase a rest-of-life guaranteed annuity. Based on prevailing annuity pricing listed on Legal & General's website in March 2025, a £750,000 (assuming £1 million pension pot, with 25% taken as a tax-free cash lump-sum) up-front payment would translate into a £49,350 annual payment. Using nominal values, the ending value of the portfolio without private equity, £772,374, would then translate into a £193,093 tax-free lump-sum payment and £3,176 in monthly income. Meanwhile, the ending value of the portfolio that includes private equity, £883,136, would convert into a £220,784 tax-free lump-sum payment and £3,632 of monthly income, an increase of 14.3% for both the lump sum and the monthly payment.

Of course, suitability will vary and is based on individual circumstances. However, the overall point is the potential for income generation in retirement where the larger principle resulting from the inclusion of private equity has the potential to generate additional income—simply as a larger base from which to draw yield.

FIGURE 5. STRONGER PERFORMANCE DURING ACCUMULATION ENHANCES ANNUITY INCOME

Investor purchases a lifetime guaranteed annuity with 75% of account assets at retirement, assuming the investor takes their option of a 25% tax-free cash lump sum

At age 65, a £750,000 up-front payment can purchase a £49,350 gross, pre-tax annual income for the rest of the investor's life, according to Legal & General as of March 2025

Adding private equity to the portfolio produces an additional £456 per month in retirement income under the median scenario shown in figure 4

		Assets at Retirement (£ thousands)		Tax-free Cash (£ thousands)		Monthly Retirement Income (£)		Income Replacement Ratio
		Nominal Value	Inflation-adjusted Value	Nominal Value	Inflation-adjusted Value	Nominal Value	Inflation-adjusted Value	
No Private Equity	10th Percentile	413	119	103	30	1,697	488	16%
	Median	772	222	193	56	3,176	914	30%
	90th Percentile	1,494	430	373	107	6,142	1,768	58%
Includes Private Equity	10th Percentile	471	135	118	34	1,935	557	18%
	Median	883	254	221	64	3,632	1,045	34%
	90th Percentile	1,704	490	426	123	7,007	2,016	66%
Additional Benefits	**10th Percentile**	**58**	**17**	**15**	**4**	**239**	**69**	**2%**
	Median	**111**	**32**	**28**	**8**	**456**	**131**	**4%**
	90th Percentile	**210**	**61**	**53**	**15**	**865**	**249**	**8%**

Source: Neuberger Berman. Income replacement ratio is an annuity's monthly payment divided by pre-retirement monthly salary. The projections or other information generated by this analysis regarding the likelihood of various investment outcomes are hypothetical in nature, do not reflect actual investment results and are not guarantees of future results. These hypothetical returns are used for discussion purposes only and are not intended to represent, and should not be construed to represent, predictions of future rates of return. Actual returns may vary significantly. Our assumptions are subject to change without notice. **Past performance is no guarantee of future results.** See additional disclosures at the end of this paper.

Other Considerations

Beyond selecting the appropriate investment content, we recognise that DC schemes must balance several factors, such as cost, liquidity, valuation frameworks and the UK government's objective of encouraging pension schemes to invest in domestic assets, particularly domestic private assets. That means choosing the appropriate structure or wrapper is an important consideration.

- **Value for Money.** It is essential to provide exposure that delivers the best investment outcomes for members while also being fee-efficient to fit within schemes' existing cost structures. At the same time, agreeing on a form or structure for the investment that ensures alignment between the pension scheme and its private markets managers is vital.
- **Liquidity Matching.** The potential mismatch between the liquidity of a DC scheme and the underlying private market funds requires a thoughtful approach to liquidity management. Some schemes may prefer to manage liquidity at the master fund or scheme-level portfolio, while others may opt to invest in structures such as evergreen or semi-liquid vehicles that offer more liquidity than traditional private equity funds. Understanding the pros and cons of these options is a crucial consideration for DC schemes.
- **Robust Valuation Framework.** Adapting the typical quarterly valuation framework of the private markets to the needs of DC schemes is another important factor. Partnering with a manager who has a well-established valuation methodology that can be adapted to meet specific criteria set out by schemes is an important consideration.
- **Respecting the Mansion House Compact.** The Mansion House Compact is an industry-led voluntary expression of intent to take "meaningful action" to secure better outcomes for UK savers through increased investment in unlisted equities. The intention is to achieve a minimum 5% allocation to private equity through DC pension funds and other long-term savings, underpinned by a requirement to act in the best interests of savers.[2] While there is no requirement in the Compact to invest in UK-based assets, the Compact is part of the UK government's broader "Mansion House 2023 Reforms" that explicitly aim to "unlock capital for our most promising industries" and "incentivise companies to start and grow in the UK."[3]

[2] "Mansion House Compact," at https://www.theglobalcity.uk/PositiveWebsite/media/Research-reports/Mansion-House-Compact-Signatories-updated.pdf.
[3] "Mansion House 2023," at https://www.gov.uk/government/collections/mansion-house-2023.

Bearing these criteria in mind, we believe that, from among the major sectors of private equity primaries, secondaries and co-investments, co-investments are an appropriate fit for UK DC schemes, particularly given their fee-efficient and capital-efficient characteristics.

While investing in primary funds can help to build a well-diversified portfolio over time, they typically incur significant fees at the LP level and can take considerable time to fully invest the committed capital. Investing via secondaries can speed up the capital deployment, but the fees are similarly high. In both cases, the LP has little control over what goes into the portfolios.

In comparison, we believe co-investments, which are direct investments into private companies made alongside a private equity manager rather than through a fund, offer significant benefits for DC schemes. Co-investing enables managers to be more actively involved in the investment selection and due diligence processes and have greater control of the investment decision, allowing them to start and stop investing depending on the environment. Co-investment capital is also highly valued by private equity firms and is therefore typically offered with lower management and performance fees than a traditional fund, and sometimes with no fee at all. Though all these advantages make co-investing resource-intensive compared to a primary or secondary approach, having control over investment selection enables managers to better align portfolios with scheme objectives, by targeting specific sectors or regions, for example, or balancing between growth equity and buyouts; and lower fees result in higher net returns, all else being equal.

As one might expect, picking a co-investment partner that can provide consistent and high-quality deal flow is an important requirement for a successful a co-investment strategy. We believe that being able to draw on an established private markets platform with strong relationships across numerous private equity managers is vital. We also believe that partners need to understand the specific challenges of UK DC schemes, and have the skills to structure the appropriate solutions to meet those challenges.

With regard to the Mansion House Compact, we recognise, along with most industry participants, that there is likely to be a tacit emphasis on UK investments among signatories. That said, the explicit aim of the Compact is "to secure better financial outcomes" for savers, and in our view diversification, including regional diversification, is a cornerstone of prudent investing. While it is reasonable to give UK DC schemes' private equity assets a domestic tilt, in terms of standard investment practice as well as to honour the spirit of the Compact, we believe a meaningful portion of the allocation should be reserved for complementary global exposure.

Conclusion

We see a strong case for adding private equity to DC portfolios based on the large and growing universe of privately owned companies available for investment, the enhanced performance potential and the diversification benefits private markets can bring. For many investors who may not qualify for traditional private markets vehicles or may be uncomfortable choosing among more retail-oriented products in the segment, their DC pension scheme may provide the only opportunity to gain private equity exposure. Clearly, inclusion of private equity in DC plans requires due diligence, the navigation of regulatory hurdles and satisfaction of liability concerns tied to introducing new or innovative asset classes. However, we believe such issues are surmountable, and ultimately less consequential than the potential advantages that private equity offers in pursuit of better retirement outcomes.

ADDITIONAL DISCLOSURES

Hypothetical Portfolio Asset Allocations

No Private Equity (modelled on the typical glide paths followed by DC default funds currently on the market)

Years to Retirement	>=15	13	10	7	5	3	At Retirement
Cash	0.0%	0.5%	1.2%	1.7%	2.0%	2.4%	2.9%
Cash	**0.0%**	**0.5%**	**1.2%**	**1.7%**	**2.0%**	**2.4%**	**2.9%**
UK Government Bond	0.0%	2.1%	5.2%	9.1%	11.7%	14.3%	18.3%
UK Corporate Bond	5.8%	6.5%	7.6%	14.5%	19.1%	23.7%	30.6%
Global Government Bond	4.4%	4.9%	5.6%	8.1%	9.8%	11.4%	14.0%
Global IG Bond	0.2%	1.9%	4.4%	3.9%	3.6%	3.3%	2.8%
EMD	0.0%	1.8%	4.4%	4.0%	3.7%	3.4%	2.9%
Global HY	0.0%	0.4%	0.9%	1.0%	1.0%	1.0%	1.1%
Fixed Income	**10.4%**	**17.4%**	**28.1%**	**40.5%**	**48.8%**	**57.1%**	**69.6%**
US Equity	47.5%	43.6%	37.8%	31.3%	26.9%	22.6%	16.0%
Europe Equity	27.4%	24.0%	19.0%	15.5%	13.3%	11.0%	7.5%
UK Equity	7.9%	6.9%	5.4%	4.3%	3.5%	2.8%	1.6%
EM Equity	6.4%	5.5%	4.1%	3.3%	2.8%	2.3%	1.6%
Public Equity	**89.1%**	**80.0%**	**66.3%**	**54.4%**	**46.5%**	**38.6%**	**26.7%**
UK Real Estate	0.6%	2.1%	4.4%	3.4%	2.7%	2.0%	0.9%
Real Estate	**0.6%**	**2.1%**	**4.4%**	**3.4%**	**2.7%**	**2.0%**	**0.9%**
Private Equity	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Private Equity	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**
1-Year Expected Gross Return	7.66%	7.41%	7.05%	6.67%	6.42%	6.16%	5.78%
1-Year Expected Net Return	7.54%	7.28%	6.89%	6.50%	6.23%	5.97%	5.57%
1-Year Asset Volatility	13.6%	12.7%	11.4%	10.1%	9.3%	8.5%	7.5%

With Private Equity (replacing public equity sub-asset classes proportionally)

Years to Retirement	>=15	13	10	7	5	3	At Retirement
Cash	0.0%	0.5%	1.2%	1.7%	2.0%	2.4%	2.9%
Cash	**0.0%**	**0.5%**	**1.2%**	**1.7%**	**2.0%**	**2.4%**	**2.9%**
UK Government Bond	0.0%	2.1%	5.2%	9.1%	11.7%	14.3%	18.3%
UK Corporate Bond	5.8%	6.5%	7.6%	14.5%	19.1%	23.7%	30.6%
Global Government Bond	4.4%	4.9%	5.6%	8.1%	9.8%	11.4%	14.0%
Global IG Bond	0.2%	1.9%	4.4%	3.9%	3.6%	3.3%	2.8%
EMD	0.0%	1.8%	4.4%	4.0%	3.7%	3.4%	2.9%
Global HY	0.0%	0.4%	0.9%	1.0%	1.0%	1.0%	1.1%
Fixed Income	**10.4%**	**17.4%**	**28.1%**	**40.5%**	**48.8%**	**57.1%**	**69.6%**
US Equity	42.0%	38.0%	32.1%	27.2%	24.0%	20.8%	16.0%
Europe Equity	24.3%	21.0%	16.1%	13.5%	11.8%	10.1%	7.5%
UK Equity	7.0%	6.0%	4.6%	3.7%	3.1%	2.5%	1.6%
EM Equity	5.8%	4.8%	3.5%	2.9%	2.5%	2.1%	1.6%
Public Equity	**79.1%**	**70.0%**	**56.3%**	**47.4%**	**41.5%**	**35.6%**	**26.7%**
UK Real Estate	0.6%	2.1%	4.4%	3.4%	2.7%	2.0%	0.9%
Real Estate	**0.6%**	**2.1%**	**4.4%**	**3.4%**	**2.7%**	**2.0%**	**0.9%**
Private Equity	10.0%	10.0%	10.0%	7.0%	5.0%	3.0%	0.0%
Private Equity	**10.0%**	**10.0%**	**10.0%**	**7.0%**	**5.0%**	**3.0%**	**0.0%**
1-Year Expected Gross Return	8.51%	8.27%	7.91%	7.27%	6.85%	6.42%	5.78%
1-Year Expected Net Return	8.20%	7.95%	7.56%	6.96%	6.57%	6.17%	5.57%
1-Year Asset Volatility	13.5%	12.6%	11.2%	10.0%	9.2%	8.4%	7.5%

Indices Used and Index Definitions

Asset Class	Benchmark Index	Index Definition
Cash	Bloomberg Sterling Gilts Index	The **Bloomberg Sterling Gilt Index** is a measure of the GBP-denominated, fixed-rate, investment-grade public obligations of the United Kingdom.
UK Government Bond	Bloomberg Sterling Gilts Index	The **Bloomberg Sterling Gilt Index** is a measure of the GBP-denominated, fixed-rate, investment-grade public obligations of the United Kingdom.
UK Corporate Bond	Bloomberg Sterling Credit Corporate Bond Index	The **Bloomberg Sterling Credit Corporate Bond Index** tracks the performance of fixed-rate, investment-grade, sterling-denominated corporate bonds.
Global Government Bond	Bloomberg Global Treasury Index	The **Bloomberg Global Treasury Index** is a benchmark that tracks the performance of fixed-rate, investment-grade, local currency government bonds from developed and emerging markets. It is a sub-index of the **Bloomberg Global Aggregate Index**.
Global IG Bond	Bloomberg Aggregate Bond Index	The **Bloomberg Global Aggregate Bond Index**, is a broad-based, market capitalisation-weighted bond market index representing intermediate term investment grade bonds traded worldwide.
EMD	50% JPMorgan EMBI / 50% JPMorgan CEMBI	The **JPMorgan Emerging Markets Bond Index (EMBI)** includes US dollar-denominated Brady bonds, Eurobonds, and traded loans issued by emerging markets sovereign and quasi-sovereign entities. The **JPMorgan Corporate Emerging Markets Bond Index (CEMBI)** is a market-capitalisation weighted index of corporate bonds issued by entities in emerging countries.
Global HY	Bloomberg Global High Yield Bond Index	The **Bloomberg Global High Yield Index** is a multi-currency measure of the performance of the global high yield debt market which brings together the Bloomberg US High Yield, Pan-European High Yield and Emerging Markets Hard Currency High Yield indices.
US Equity	S&P 500 Index	The **S&P 500 Index** consists of 500 US stocks chosen for market size, liquidity and industry group representation. It is a market value-weighted index (stock price times number of shares outstanding), with each stock's weight in the Index proportionate to its market value.
Europe Equity	MSCI Europe Index	The **MSCI Europe Index** captures large- and mid-cap representation across 15 Developed Markets countries in Europe. With 427 constituents, the index covers approximately 85% of the free float-adjusted market capitalisation across the European Developed Markets equity universe.
UK Equity	MSCI UK Index	The **MSCI United Kingdom Index** is designed to measure the performance of the large and mid cap segments of the UK market. With 82 constituents, the index covers approximately 85% of the free float-adjusted market capitalisation in the UK.
EM Equity	MSCI Emerging Markets Index	The **MSCI Emerging Markets Index** is a market-value weighted index designed to represent the performance of large- and mid-cap securities in 26 emerging markets.
UK Real Estate	FTSE/S&P Global UK Real Estate Index	The **FTSE/S&P Global UK Real Estate Index** tracks the performance of stocks classified as members of the GICS Real Estate Sector that are included in the S&P UK Broad Market Index.
Private Equity	Burgiss Buyout Index	The **Burgiss Global Buyout Funds Index** tracks the performance of closed-ended private equity buyout funds in the Burgiss Manager Universe, converted to US dollars.

Capital Market Assumptions

Estimated Return, Volatility and Correlations

Asset Class	Rating	Est. Gross Return (%)	Fee (bps)	Exp. Net Return (%)	Ann. Vol (%)
Cash	AAA	4.07	10	3.97	0.6
UK Government Bond	AA3/A1	4.54	25	4.29	8.9
UK Corporate Bond	A3/BAA1	5.34	25	5.09	8.4
Global Government Bond	AA2/AA3	4.57	25	4.32	3.0
Global IG Bond	A3/BAA1	5.38	25	5.13	6.2
EMD	BAA3/BA1	5.91	25	5.66	8.8
Global HY	BA3/B1	5.14	25	4.89	8.0
US Equity	NA	7.97	10	7.87	16.7
Europe Equity	NA	7.77	10	7.67	14.6
UK Equity	NA	7.29	10	7.19	13.4
EM Equity	NA	9.67	10	9.57	20.5
UK Real Estate	NA	6.53	50	6.03	11.3
Private Equity	NA	16.53	200	14.53	17.7

	Cash	UK Government Bond	UK Corporate Bond	Global Government Bond	Global IG Bond	EMD	Global HY	US Equity	Europe Equity	UK Equity	EM Equity	UK Real Estate	Private Equity
Cash	1.00												
UK Government Bond	0.02	1.00											
UK Corporate Bond	0.01	0.77	1.00										
Global Government Bond	0.16	0.85	0.72	1.00									
Global IG Bond	0.05	0.64	0.86	0.80	1.00								
EMD	0.04	0.34	0.68	0.53	0.84	1.00							
Global HY	0.08	0.16	0.43	0.24	0.46	0.48	1.00						
US Equity	-0.02	0.22	0.55	0.28	0.59	0.65	0.46	1.00					
Europe Equity	-0.05	0.14	0.53	0.18	0.52	0.62	0.48	0.82	1.00				
UK Equity	-0.05	0.09	0.45	0.08	0.41	0.55	0.40	0.68	0.89	1.00			
EM Equity	-0.01	0.09	0.45	0.20	0.56	0.73	0.44	0.70	0.68	0.61	1.00		
UK Real Estate	-0.04	0.57	0.80	0.54	0.72	0.63	0.47	0.70	0.76	0.69	0.53	1.00	
Private Equity	-0.12	0.08	0.40	0.13	0.47	0.59	0.43	0.67	0.68	0.58	0.74	0.53	1.00

Source: Analytics as of December 31, 2024. Volatility and correlations are estimated based on the historical time series from January 2007 to December 2024.

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Estimated returns and estimated volatility (risk) shown are hypothetical and are for illustrative and discussion purposes only. They are not intended to represent, and should not be construed to represent, predictions of future rates of return or volatility. Actual returns and volatility may vary significantly. Unlike actual investment performance, hypothetical model results do not represent actual trading and accordingly they may not reflect the impact that material economic and market factors might have had on decision making if assets were actually managed during the relevant period. Investing entails risks, including possible loss of principal. Indexes are unmanaged and are not available for direct investment. **Past performance is no guarantee of future results.**

Description of Neuberger Berman's Proprietary Stochastic Model

Neuberger Berman Private Equity uses stochastic modeling capabilities to forecast capital call / distribution activity and Net Asset Value ("NAV") development of private market investments. NB's stochastic model uses a Monte Carlo Simulation, projecting, with varying levels of confidence, how a private markets portfolio of funds, co-investments and secondaries will develop over time. The model projects capital calls, distributions and NAV development based on asset class, current NAV, vintage year and drawn amount of each investment in the portfolio, as well as additional (potential) future investments and commitments.

The input and assumptions used in the model are based on information from Thomson Reuters's Thomson ONE database covering 25 years of private equity industry data (cash flow, NAV development, etc.). Cash flows represent the pooled cash flows of all private equity funds that report performance data to Thomson Reuters and are net of all underlying fund fees and expenses. The industry performance assumptions used in the analysis are based on long-term averages from the Thomson ONE database, not on NB's historical or projected returns. The inputs used within the model include the median historical net IRR, median historical yield, average holding period, mean and standard deviation of contributions for various private market asset classes (i.e., large-cap, small & mid-cap buyout, venture & growth capital, special situations, private credit, real estate and infrastructure debt) and strategies (i.e., primary fund investments, secondary fund investments, direct co-investments and direct credit investments). Yield is calculated as actual annualised cash coupon of current unrealised investments divided by current unrealised invested capital.

The assumptions are for illustrative purposes only and are not intended as a promise or prediction of performance. There can be no assurance that the fund will achieve comparable results, that targeted diversification or asset allocations will be met, that the fund will be able to or will ultimately elect to implement the assumptive investment strategy and approach described in the model. Alternative assumptions may result in significant differences or complete loss of capital in such projections.

Note, all targets and underlying assumptions can be adjusted if desired as requested by the client. There is no guarantee that returns targeted in any underwriting process will be realised or achieved or that an investment strategy will be successful, and actual returns may be significantly lower than the targeted returns referenced herein. Investors should keep in mind that the securities markets are volatile and unpredictable. There are no guarantees that the historical performance of an investment, portfolio, or asset class will have a direct correlation with its future performance.

Asset Class Assumptions and Estimates

Capital market assumptions used herein reflect Neuberger Berman's forward-looking estimates of the benchmark return or volatility associated with an asset class. Estimated returns and volatilities are hypothetical return and risk estimates generated by Neuberger Berman's Institutional Solutions Group. Estimated returns and volatilities do not reflect the alpha of any investment manager or investment strategy/vehicle within an asset class. Information is not intended to be representative of any investment product or strategy and does not reflect the fees and expenses associated with managing a portfolio or any other related charges, such as commissions and surrender charges. Estimated returns and volatilities are hypothetical and generated by Neuberger Berman based on various assumptions and inputs, including current market conditions, historical market conditions and subjective views and estimates. Capital market assumptions shown reflect Neuberger Berman's long-term (20+ years into the future) estimates or intermediate-term (5-7 years into the future) estimates which are reviewed at least annually. Results will differ depending on whether they are based on Neuberger Berman's long-term (20+ years into the future) or intermediate-term (5-7 years into the future) capital market assumptions. Neuberger Berman's capital market assumptions are derived using a building block approach that reflects historical, current, and projected market environments, forward-looking trends of return drivers, and the historical relationships asset classes have to one another. These hypothetical returns are used for discussion purposes only and are not intended to represent, and should not be construed to represent, predictions of future rates of return. Actual returns may vary significantly. Neuberger Berman makes no representations regarding the reasonableness or completeness of any such assumptions and inputs. Assumptions, inputs, and estimates are periodically revised and subject to change without notice. Estimated returns and volatilities should not be used, or relied upon, to make investment decisions.

Rate of Return Estimate: Rate of return or geometric return is a measure of average returns of an investment over a period of time. Geometric rate of returns are typically referred to as annualised compound rate of returns and are always less than or equal to the arithmetic mean return of the same time series. Geometric rate of returns are used for straight-line calculations within the analysis, for example, the cash flow calculations. In straight-line calculations, each year is represented as a gain, so the compound (geometric mean) rate of return is used to adjust for the amount needed to make up for a loss in a given year. For example, if you lose 5% in one year, and gain 5% the year after, you still have less than you started with at the beginning of year one.

Arithmetic Mean Estimate: Arithmetic mean or average return is calculated by dividing the sum of a series of numbers by the number of overall items. This is more typically thought of as an "average" of the data set. Arithmetic mean or average return ignores the impact of compounding in the context of analysing investment returns and is the simple average of returns observed over a period of time. Arithmetic mean returns are used in this material and, if applicable, the Efficient Frontier, because, through randomisation, losses and gains are being accounted for each year.

Standard Deviation: A statistical measure of the volatility based on the distribution of a set of data from its mean (average value). For example, a portfolio with an average return of 10% and a standard deviation of 15% would return a result between -5% and +25% the majority of the time (68% probability or 1 standard deviation), almost all of the time the return would be between -20% and +40% (95% probability or 2 standard deviations). If there were 0 standard deviation then the result would always be 10%. Generally, more aggressive portfolios have a higher standard deviation and more conservative portfolios have a lower standard deviation.

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