Partners Group

REALIZING POTENTIAL IN PRIVATE MARKETS

Adding private markets to DC pension plan portfolios – a case study

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Important information

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Executive summary

For decades, investments in private markets have been a performance driver for defined benefit (DB) pension plans. However, despite their positive contribution to DB returns,[1] they have not yet been widely adopted as a component of an investment strategy for defined contribution (DC) pension plans.

At a point when DC pension plans are poised to overtake DB pension plans as the predominant pension system globally, this paper analyzes the potential benefits of adding private market investments to a DC pension portfolio.

Taking a theoretical approach, we first examine the effects that an allocation to private markets can have on the risk/return profile of a portfolio consisting of traditional asset classes (Section 1).

We then set out to examine the potential impact a relatively modest allocation to private markets could have on an illustrative DC plan over a long-term time horizon (Section 2). Using historical and forward-looking glidepath analyses, we illustrate how an exposure to private markets has the ability to improve the overall risk/return characteristics of a DC plan portfolio and potentially improve the monthly retirement income for beneficiaries by more than 15%.

Lastly, we touch on some of the structural reasons DC plans have historically been unable to invest in private market funds. We argue that most of these obstacles can be overcome today by private market investment managers, enabling DC beneficiaries the flexibility to access private market investments – an accretive portfolio allocation that DB beneficiaries have enjoyed in the past (Section 3).

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1 Alicia H. Munnell, Jean-Pierre Aubry, and Caroline V. Crawford, "Investment Returns: Defined Benefit vs. Defined Contribution Plans"; 2015.

Introduction

In the world of pensions, a tipping point has been reached – defined contribution (DC) plans today represent almost half of all pension assets globally, following growth at more than twice the pace of assets held in defined benefit (DB) pension plans.[2] On a country level, the transition to DC across major pension systems has advanced to varying degrees: in the US, DC pension assets have firmly overtaken DB pension assets in terms of volume; in the UK, although total DC assets still lag those of DB, there are more active members of DC pension plans than DB pension plans.[3] In Australia, DC pension plans have been the standard form of pension saving for decades and currently account for almost 90% of all pension assets.[4]

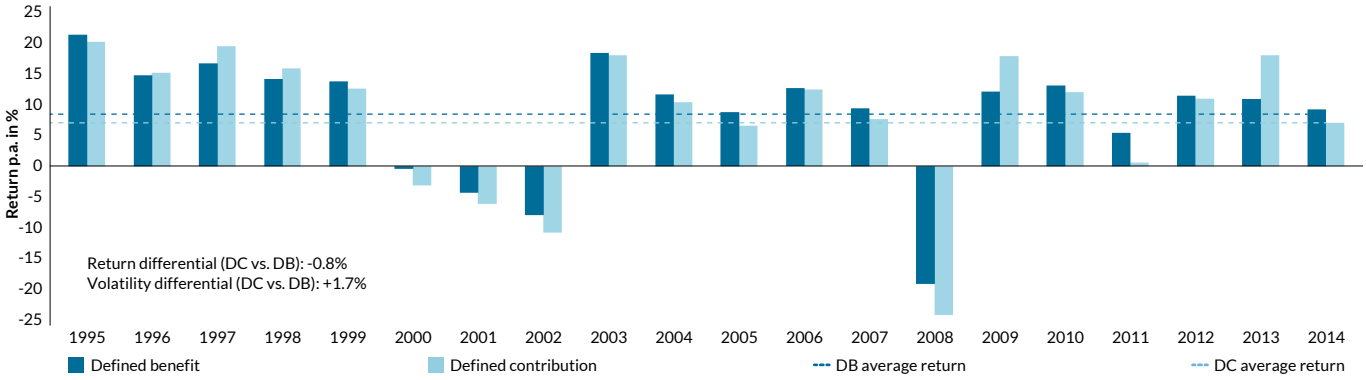
Unfortunately for DC beneficiaries (who, unlike DB beneficiaries, personally bear the risk of their retirement income falling short), early studies have shown that DC pension plans are lagging DB plans in terms of performance. One study from 2015 shows DC plans lagging DB plans by 0.6% to 1.4% annually between 1990 and 2012, depending on the pension fund size.[5] In the US, for example, as illustrated in the graph below, DB plans outperformed DC plans by 0.8% annually over the period from 1995 to 2014, despite DC plans having benefitted from a substantially higher allocation to growth assets such as public equities, which contributed positively to returns (albeit at the expense of higher risk).[6]

Several factors have been suggested to account for the performance differential between DB and DC plans: an excessive focus on the operational aspects of managing DC plan assets, higher running costs resulting from the operational burdens DC plans bear, and the constraints of regulations or guidelines which have led to remarkable differences in how DC plan asset allocation is constructed in contrast to DB plans. It is this last factor that this paper will focus on.

One of the predominant differences between DB and DC plans in terms of asset allocation is the proportion of assets allocated to so-called alternative investments. By way of example, a recent study shows that the average allocation to private equity investments was 17% among DB plans, while for DC plans it was only 2%.[7]

Private market investments, which Partners Group defines as including private equity, private real estate, private infrastructure and private debt, are frequently captured alongside other alternative investments, such as hedge funds and commodities, in a pension plan's asset allocation matrix – we think erroneously so.[8] We would contend the relative under-allocation to private markets in DC pension plans is a significant factor in the difference in performance between DB and DC plans. In the following sections, we will illustrate how a relatively modest allocation to private markets can, over the long term, increase the return potential and reduce the overall volatility of a typical DC plan portfolio.

US defined benefit vs. defined contribution plan performance 1995-2014



Source: Employee Benefits Security Administration, United States Department of Labor, "Private Pension Plan Bulletin Historical Tables and Graphs 1975-2014", September 2016.

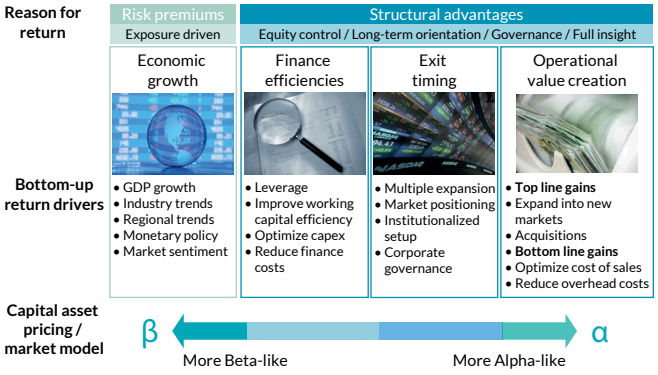
2 Willis Towers Watson, "Global Pensions Assets Study 2016".
3 UK Pensions Regulator, Annual Statistics 2014-2015.
4 Willis Towers Watson, "Global Pensions Assets Study 2016".
5 Alicia H. Munnell, Jean-Pierre Aubry, and Caroline V. Crawford, "Investment Returns: Defined Benefit vs. Defined Contribution Plans"; 2015.
6 As an example, the S&P 500 Index has outperformed both DC and DB plans over the period of 1995-2014 referenced in the chart above with an annualized total return of 9.8% p.a. This higher return would have come at the expense of higher risk, with an -37% total return in the year 2008. Source: Bloomberg.
7 James Farrell & Daniel Shoag, "Asset management in public DB and non-DB pension plans"; 2014.
8 Partners Group favors an asset allocation approach underpinned by underlying risk premia rather than based on which instruments are used to access those risk premia (i.e. private equity and public equity both represent exposure to the equity risk premium, albeit accessing it via private markets allows for the capture of additional value creation and therefore alpha potential).

Section 1: brief summary of the benefits of including private markets in a long-term investment portfolio

Private markets offer better risk-adjusted returns

It is widely accepted that an allocation to private markets can improve the risk-adjusted return potential of a long-term investment portfolio. Taking private equity as an example, indices representing broad industry averages suggest a historical net outperformance of +4.1% vs. public markets over the last 16 years.[9] While this paper will not delve into an in-depth analysis of private market outperformance, it is worthwhile to briefly recap the key fundamental drivers of private market returns.

Bottom up: key drivers for private market performance



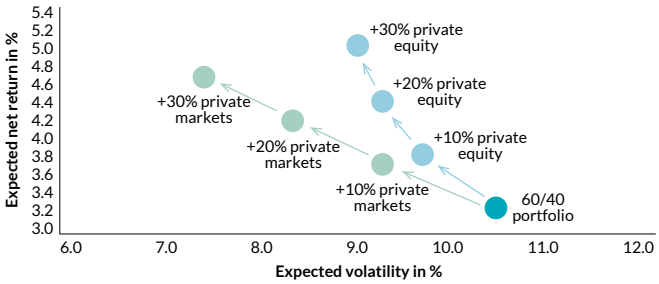
Source: Partners Group illustration, 2017.

While the underlying components of the assets can have similar risk premia to their public market counterparts, structural advantages enable private market managers to capitalize on additional return drivers, provided the capabilities needed for successfully implementing the respective value creation initiatives on an asset level are in place.

In addition to increasing the return potential of a portfolio, private market investments can also benefit overall diversification by broadening the set of risk premia captured.[10] The following chart shows how adding varying allocations to private markets can improve the risk/return characteristics of an illustrative, traditional portfolio composed of 60% public equities and 40% bonds. As the private market allocation is assumed to be growth-oriented, it replaces part of the allocation to public equities in all cases in the chart.

The chart also shows how allocations to different private markets complement a traditional portfolio in a distinct manner: while adding only private equity predominantly provides a return-enhancing component, adding a diversified private market allocation (private equity, private infrastructure, private debt and private real estate) shows relatively stronger diversification benefits.

Adding private markets to a traditional portfolio



Source: Partners Group illustration, H1 2017.

For illustrative purposes only. 60/40 portfolio refers to a portfolio with an allocation of 60% to global public equities and 40% to global bonds. The private market portfolio consists of 40% private equity, 10% private debt, 25% private real estate and 25% private infrastructure. The charts are based on Partners Group's assumptions for asset class expected returns (see Partners Group Expected Return Framework on page 9 of this report), volatilities (using statistical unsmoothing procedures for private market data) and correlations, which can be provided upon request. Expected returns are net of typical fee levels for the respective asset class (see Partners Group Expected Return Framework on page 9 of this report for a detailed list of assumptions used). Past performance is not indicative of future results and such forecasts of future results are not a reliable indicator of future performance. Diversification does not ensure a profit nor does it guarantee protection against a loss.

9 Public benchmark figures from Bloomberg (NDDUWI Index). Private equity performance from Cambridge Associates, one quarter end-to-end pooled returns of indirect private equity investments from 2000 to 2016. Past performance is not indicative of future results.
10 Diversification does not ensure a profit and nor does it guarantee protection against loss.

Section 2: the potential impact of private markets on DC fund performance and retirement outcomes

While Section 1 highlights the widely accepted benefits of adding an allocation to private markets from a portfolio construction perspective, it has not been contextualized to account for the impact this can have on DC plans specifically. In this section, we set out to provide a case study that not only exemplifies the potential benefits private markets investment can bring at pension plan level, but also considers the impact for the underlying beneficiary. To do this, we model a set of scenarios using glidepath analysis to show the return impact an allocation to private markets can have on an underlying DC beneficiary's monthly retirement income.

Given the global scope of this paper, such analysis, including the choice of the glidepath development (and various other input parameters) is intended to be illustrative in nature. It seeks to balance the objective of illustrating the benefits of adding private market investments to DC plans to the broadest possible audience, with that of being specific enough to remain relevant. It is acknowledged that there is no 'one-size-fits-all' solution and that more bespoke modeling, both in terms of parameters and categorization used, is needed to account for country- and plan-specific circumstances.[11]

The glidepath design

For the analysis that follows, we compare two portfolios: a standard glidepath portfolio and a private market glidepath portfolio. To represent a typical DC default design, both portfolios start with a high exposure to growth assets at the outset of the accumulation phase, transitioning gradually into a more income-oriented allocation along the glidepath as retirement approaches. The glidepath used is divided into three phases over time. During the accumulation phase the beneficiary creates the foundation of his or her retirement plan. More risk, in terms of tolerance for short-term fluctuations, can be borne in this phase as no withdrawal is expected over the short to medium term. The transition phase is characterized by higher contributions and lower risk capacity as the beneficiary nears the end of their working life. Risk is progressively reduced as the beneficiary gets closer to retirement. The distribution phase relates to the beneficiary's actual retirement. Risk is reduced and the primary objective becomes to compensate for inflation and avoid market loss.

The standard glidepath portfolio is exclusively invested in public securities (bonds for income and equities for growth), whereas the private market glidepath portfolio adds a private market component to the growth bucket.[12] For the purpose of simplicity in this illustrative context, we use a private market portfolio that spans private equity (60%), private real estate (15%), private infrastructure (15%) and private debt (10%). As the private market allocation applied for this illustration is growth-oriented with only limited income characteristics, it is funded from the allocation to public equities. Thereby, we maintain a growth/income split close to that of the standard glidepath. Further optimization of the private market portfolio mix throughout the duration of the glidepath (e.g. by moving from an initial growth-oriented allocation weighted to private equity to an income-oriented allocation weighted to private debt and private infrastructure as retirement approaches) is beyond the scope of this paper and is left for further analysis.

The private market allocation for the enhanced glidepath develops as follows:

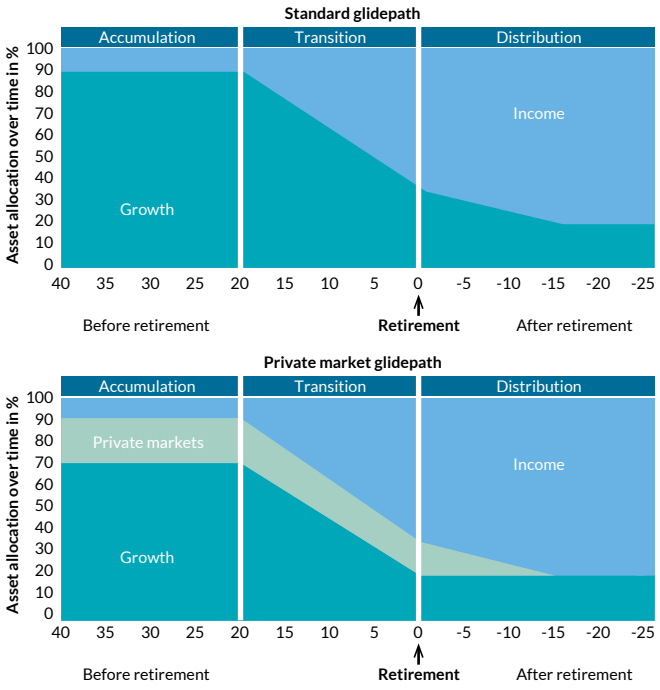
- Accumulation (aged 25 to 45): *20%*
- Transition (aged 45 to 65): *20% gradually reduced to 15%*
- Distribution (aged 65+): *15% gradually reduced to 0% over 15 years*

The initial exposure to private market investments is set at 20% and is subsequently maintained at that level until 20 years before retirement. Adopting a conservative approach in the transition and distribution phases, the private market allocation is reduced more rapidly than the allocation to public equities. While from a market risk perspective, the private market allocation could stay in the portfolio longer than public equities, the illiquidity associated with private market investments may require a carefully planned phase-out period. We account for that by reducing it over a period of 20 years in the transition phase to result in a private market allocation of 15% at the time of retirement. During the distribution phase, the private market allocation is reduced to zero by 15 years into retirement. The average exposure to private market investments over the full glidepath is 16%.

11 Partners Group is able to provide such bespoke modeling on request.

12 We have used two main building blocks to build the "standard glidepath portfolio". The first block named "Growth" is composed of public developed and emerging markets equities. The second block, "Income", includes investment grade government and corporate bonds. TIPS and cash are also included in this bucket and allocations to these are increased closer to retirement and at retirement.

Adding private market investments to a glidepath



Source: Partners Group illustration, 2017.

Using the glidepaths defined above, we proceed to analyze the expected performance, risk and monthly retirement income resulting from the two glidepaths. We simulate the hypothetical past performance (using a back test based on historical data derived from broadly accepted asset class benchmark indices) and estimate the forward-looking performance potential (making use of Partners Group's Expected Return Framework across private and public asset classes).[13]

Historical glidepath analysis

For the purpose of the historical simulation, we assume that an individual starts to contribute to their retirement savings in the form of a DC plan at the age of 25 in the year 1975 and retires at the age of 65 in 2015. The salary used in the illustration is derived from the US national average wage index, which is the reference to compute a person's retirement benefit.[14] The final salary before retirement stands at approximately USD 46,500. We use a pension contribution of 11%[15] of the individual's yearly income, which results in a total contribution of approximately USD 120,000 throughout the beneficiary's working life.

Enhancing the glidepath to include an average allocation of 16% to private markets through the course of the beneficiaries' saving and retirement periods increases the income available at retirement by more than 15%, from USD 2,734 to USD 3,188 per month.[16] What at first glance seems to be a relatively modest annual outperformance results in a marked improvement in the income of the beneficiary at retirement due to compounding over several decades. Focusing on the most recent 20 years,[17] a period characterized by increased availability and reliability of benchmark data, the outperformance of the private market glidepath stands at +0.8% per year with the private market glidepath achieving +5.9% annualized return vs. +5.1% for the standard glidepath.[18]

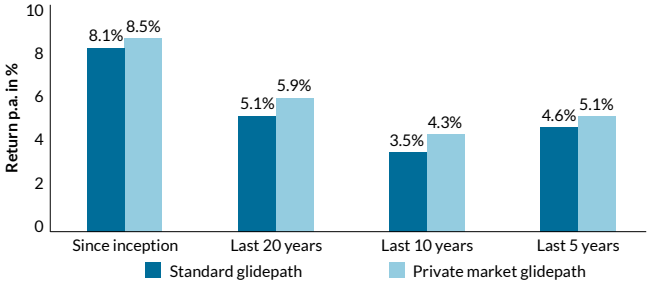
Historical glidepath analysis results

Statistic		Standard glidepath	Private market glidepath
Monthly income at retirement (in USD)		2,734	3,188
Return p.a.	*since inception*	8.1%	8.5%
	last 20 years	5.1%	5.9%
Volatility p.a.	*since inception*	11.8%	10.1%
	last 20 years	10.8%	8.9%

Source: Partners Group illustration, 2017.

The historical simulation results in attractive annualized net returns in the context of today's low return environment for both the standard and the private market glidepaths. This does not come as a surprise given the backdrop of the time period used (1975-2015), which was characterized by relatively high growth, and falling inflation and interest rates – a market environment favorable to a broad set of asset classes,

Horizon returns: standard vs. private market glidepath



Source: Partners Group illustration as of December 2015. Quarterly return data underlying the simulation available on request.

13 Past performance is not indicative of future results and such forecasts of future results are not a reliable indicator of future performance. Diversification does not ensure a profit nor does it guarantee protection against a loss.
14 National Average Wage Index, Social Security: https://www.ssa.gov/.
15 According to PSCA Release Results of 59th Annual Survey of Profit Sharing and 401(k) Plans (12/19/2016), the average participants are saving 6.8% of their pay and the average employer contribution is 4.7% of pay.
16 Assuming the beneficiary has a life expectancy of 80 years.
17 Data from 12/31/1995 to 12/31/2015.
18 Public equity performance is measured by the MSCI World Equity Index (NDDLWI Index) and MSCI Emerging Markets Index (MXEF Index). Investment grade bonds are measured by the Citi World Government Bond Index (SBWGL Index) (inception 03.31.1985, for the period before that 10-year Treasury Bills returns are used) and the Citi Broad Investment Grade Index (SBBIG Index) (inception March 1980, for the period before that 10-year Treasury Bills + 2.6% spread p.a. are used). Private equity performance (buyout) is based on Cambridge Associates data (inception June 1986, for the period before that MSCI World Equity + 3% p.a. is used). Private real estate performance is based on Cambridge Associates data (inception June 1986, for the period before that the FTSE EPRA/NAREIT United States Index is used). Private infrastructure performance is based on Cambridge Associates data (inception March 1995, for the period before that private equity returns minus 2% p.a. are used). Private debt performance is based on Cambridge Associates data (mezzanine) (inception June 1986, for the period before that the returns have been estimated using public investment grade corporate bonds returns + 3% p.a.). After September 2016, expected returns based on Partners Group Expected Return Framework have been applied. Income at retirement is calculated using historical returns based on respective asset class benchmarks from 12/1975 until 09/2016 and projected returns are based on Partners Group Expected Return Framework from 09/2016 until 12/2030. All data are based on quarterly returns and portfolio performances are calculated using a quarterly rebalancing methodology. Asset class performance data is net of fees. The cost considered for management of the DC plan is 0.8% p.a. Further details on the back test methodology can be provided upon request. Hypothetical or simulated performance results have certain limitations. Unlike the results shown in an actual performance record, these results do not represent actual trading. Past performance is not a reliable indicator of future performance. Returns from investments are subject to currency fluctuations, and may increase or decrease as a result.

particularly public equities and bonds. The following chart illustrates the glidepath returns over various time periods:

The private market glidepath shows outperformance over the standard glidepath over all time horizons. While returns have decreased on an absolute level over the last 20 years, the private market glidepath generally shows a higher relative outperformance over the standard glidepath during this more recent period, which was characterized by lower risk premia across the board. It is worth noting that this time period encompasses the financial crisis in 2008/2009.

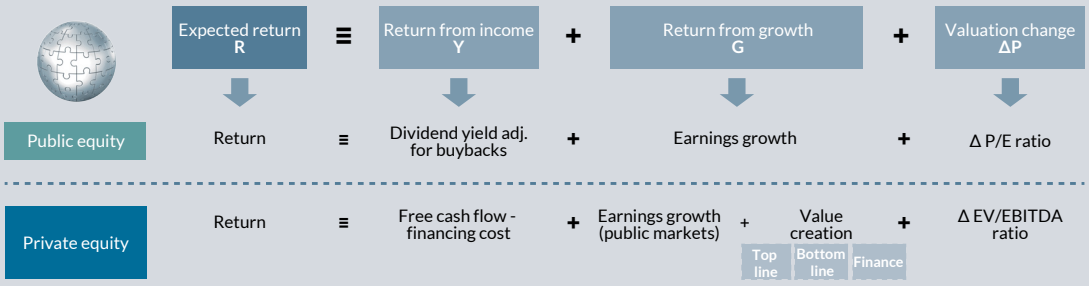
Forward-looking glidepath analysis

It is generally acknowledged that past performance is not always the most reliable indicator of future return potential. We have therefore also undertaken the glidepath analysis using expected returns rather than historical ones to see how the results of the study are impacted by using forward-looking return estimates.

While estimating forward-looking asset class returns is an inherently uncertain undertaking (particularly over shorter periods of time), we make use of Partners Group's Expected Return Framework as a basis for our projections. Partners Group's Expected Return Framework aims at estimating risk premia, and therefore the long-term return potential, prevalent across public and private asset classes. It does so by analyzing return sources stemming from contributions, subdivided by income, growth and the change in valuation of an asset. In addition to measuring current levels of income and expectations of growth, the framework follows the basic assumption that valuations tend to revert to the mean over longer periods of time. The information box below provides more information on Partners Group's Expected Return Framework, applying the model to public equities as a starting point before further developing it to private equity.[19]

19 Due to the long-term time horizon, the valuation change factor tends to have a limited contribution to overall return estimates.

Partners Group Expected Return Framework



Our Framework calculates expected asset class returns for public and private markets based on fundamental drivers (income, growth and valuation change) over a seven-year horizon. The Framework complements our qualitative relative value investment approach by adding a quantitative component, reflecting **broad industry returns.**

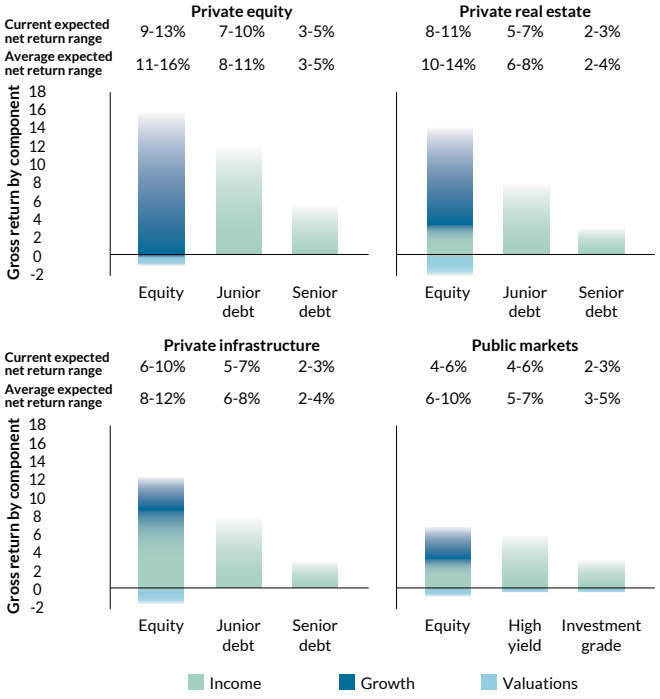
Return from income: annual cash flows from the investment and other income-like components of an asset's return, like buyback-adjusted dividend yield on equities or interest received on a bond.

Return from growth: the rate at which the value of an investment increases due to fundamental drivers. For fixed income instruments, return from growth is usually zero. For equities, this is earnings growth. In the case of private markets, in addition to the beta-related earnings growth that can also be observed in public markets, return from growth is complemented by any returns generated through value creation strategies, like platform growth or operational improvements.

Valuation change: the change in the price the market pays for a cash flow stream consisting of both income and growth. For public market equities, this is the change in the price to earnings ratio, for private equity it is the change in the Enterprise Value (EV) to Earnings before interest, tax, depreciation and amortization (EBITDA) ratio. For private infrastructure and private real estate it is the asset's sensitivity to a change in underwriting Internal Rate of Return (IRR) and cap rate, respectively. Given the floating rate nature of private debt, valuation change is usually close to zero while fixed income, public market bonds are impacted by duration. The underlying assumption is that valuations revert to long-term averages over the seven-year horizon.

The Partners Group Expected Return Framework indicates that we are in a period of lower absolute returns across both public and private markets, with the outperformance potential of private markets versus their public market equivalents remaining intact.

Partners Group Expected Return Framework: expected broad industry returns p.a. by asset class



Source: Partners Group illustration, H1 2017.
For academic purposes only. All of the above data is derived from Partners Group calculations and assumptions and should not be construed as representative of Partners Group investments. Partners Group utilizes historical market data and academic research to generate the above calculations, a full list of which can be provided on demand. Please note all value creation inputs are based solely on Partners Group's internal research. There is no assurance that expected returns will be achieved. Public asset classes are assumed to be invested passively, with a flat management fee of 0.20% p.a. for equities, 0.25% p.a. for investment grade bonds and 0.50% p.a. for high yield. The fee structure assumed for private equity includes a management fee of 2.0% p.a. and a performance fee of 20% subject to an 8% hurdle. Real estate and infrastructure fees on equity investments include a management fee of 1.5% p.a. and a performance fee of 20% subject to an 8% hurdle for real estate and 15% subject to a 6% hurdle for infrastructure. Private equity junior debt fees include a management fee of 1.5% p.a. and a performance fee of 15% subject to an 8% hurdle. For real estate and infrastructure junior debt, fees include a management fee of 1.25% p.a. and a performance fee of 10% subject to a 5% hurdle. Senior loan fees for all asset classes include a management fee of 0.75% p.a. and a performance fee of 7.5% subject to a 4% hurdle. Hypothetical or simulated performance results have certain limitations. Unlike the results shown in an actual performance record, these results do not represent actual trading. Past performance is not a reliable indicator of future performance.

Not surprisingly, applying forward-looking asset class return estimates based on today's prevailing low risk premia results in a substantially lower potential return for pension portfolios going forward. However, like the most recent 20 years of the historical glidepath analysis, the difference in performance between the private market glidepath (+4.6% p.a.) and the standard glidepath (+3.7% p.a.) in the forward-looking analysis is even more pronounced than in the full historical analysis. The private market glidepath outperforms the standard glidepath by +0.9% in absolute terms.

Forward-looking glidepath analysis results

Statistic	Standard glidepath	Private market glidepath
Monthly income at retirement (in USD)	2,616	3,306
Return p.a.	3.7%	4.6%
Volatility p.a.	13.7%	11.6%

Source: Partners Group illustration, 2017.

Among other factors, this stems from performance projections which reflect the current macro-economic environment characterized by relatively low growth. In a low growth environment, value creation tends to be a more significant driver as a percentage of total returns and thus private markets have a greater outperformance potential versus their public market counterparts. Due to the compounding effect over time, this difference in annualized returns translates into a substantial uptick in retirement capital: while the standard glidepath results in a monthly income of USD 2,616, the monthly income obtained from the private market glidepath stands at USD 3,306, representing more than a +25% increase.[20]

Risk assessment

After having predominantly focused on the return impact of adding private markets to a DC plan's glidepath, we conclude this section with a few considerations regarding the impact of a private market allocation on the risk side of the equation.

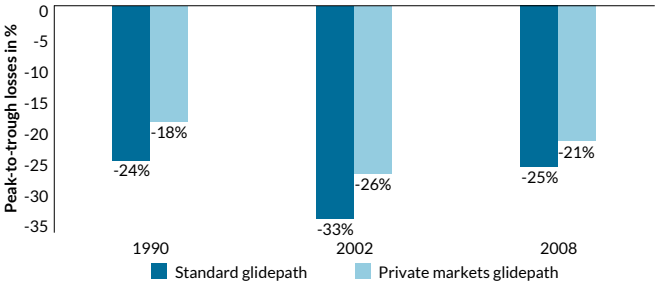
While we have shown at the outset of this paper that private markets can help reduce overall portfolio volatility, we believe that measuring monthly or quarterly changes in portfolio value is a less than ideal proxy for assessing the risk of falling short of a beneficiary's retirement income goals. Rather, when making financial decisions with a long-term time horizon, we believe one of the main risks is the probability of missing one's return targets altogether. By way of example, portfolios with large allocations to fixed income at close to zero yields have a very limited chance of creating enough value over the long term to provide a decent retirement income. While risk measured in terms of standard deviation is likely to appear relatively low, the probability of not meeting the required level of retirement income is a rather foreseeable reality.[21]

At the same time, it is acknowledged that, for an individual beneficiary, large portfolio losses (or 'drawdowns') can have a detrimental effect on retirement income, particularly if they occur shortly before retirement. While the glidepath is designed to mitigate this risk by moving from a growth-oriented portfolio to an income-oriented portfolio over time, comparing the

20 In this scenario, we have used the assumption of a 25-year-old beneficiary starting to contribute to his/her pension as of 30 September 2016, with a starting salary of USD 30,000 growing at 2% per year and a plan contribution rate of 11% (combined member and employer contribution). We have assumed a life expectancy of 80 years. For the sake of simplicity, we have also assumed that the expected returns outlined for the different asset classes in Partners Group's H1 2017 Expected Return Framework remain constant over the next 40 years.
21 For a more detailed analysis of this point please see: Partners Group, "Portfolio management: the tale of the mattress"; June 2013.

historical drawdowns of the different glidepaths can help us understand the difference in risk levels. Using the historical simulation, the chart below compares the three largest drawdowns:

Performance during the last three major market crises



Source: Partners Group illustration.
Returns are net of typical fee levels (see footnote on page 7 and chart on page 9 of this report for detailed explanations). Hypothetical or simulated performance results have certain limitations. Unlike the results shown in an actual performance record, these results do not represent actual trading. Past performance is not a reliable indicator of future performance.

The simulation shows that the total peak-to-trough loss is reduced on average by a fifth for the private market glidepath when compared to the standard glidepath. Importantly, the loss reduction is more substantial for the earlier drawdowns during the growth and transition phases, when private markets represent a more substantial share of the overall portfolio.

For those who still prefer to utilize more traditional ways of measuring risk, the standard deviation of returns for the historical analysis is reduced from +11.8% to +10.1% p.a., pointing to a reduction in overall portfolio risk levels of +14%.

Section 3: enabling DC pension plans to invest in private markets

Structural challenges inherent in the system

In the context of the current financial market environment characterized by lofty valuations and low risk premia across the board, there is a growing sense of urgency for DC plans to broaden their investment universe to allow for the inclusion of private market investments. Making the situation even more precarious, the predominant focus on costs in the DC system has led to portfolios that tend to lack 1) exposure to asset classes which have the potential to capture alpha through value creation and 2) appropriate levels of diversification due to the risk premia present in the portfolio being largely limited to public equity and public fixed income exposure.

Additionally, with DB pension plans slowly but surely losing share of the global pension market and DC plans being largely limited to public market investments, an important source of funding for entrepreneurs, property investment and infrastructure projects is drying up. The consequence could be a substantial distortion of the necessary flow of capital between a country's pension system and the funding needs for investment projects by limiting the flow to a small subset of listed companies which represent only a finite sample of the total economy.

Until recently, DC pension plans were largely unable to invest in private markets due to the illiquid structure of traditional private market vehicles. Typically, such structures involve a ten-year 'lock-up', provide only quarterly valuation information, have high minimum investment thresholds and are based on administration-heavy capital calls and distributions for single underlying investments. As such, they do not allow pension plans to simply rebalance during the holding period. These structural rigidities are compounded if a fund-of-funds approach (also often involving multiple layers of illiquidity and fees) is chosen to obtain a diversified exposure to private markets.

Conversely, DC plans typically require investment funds to meet certain eligibility criteria, such as a no minimum investment threshold, daily pricing, daily subscriptions and redemptions at NAV, as well as highly standardized subscription and redemption procedures. None of these requirements are met by the long-term, illiquid fund structures traditionally used by private market firms. However, more recently, innovative investment solutions have been created to cater to the DC industry's specific requirements.

The way forward

The first significant operational hurdle private market managers need to overcome to create offerings suitable for the DC market relates to the valuation of investments. Private market managers traditionally value their portfolio holdings on a quarterly basis using a 'fair value'[22] approach, making those valuations available 60-90 days post quarter end. Conversely, the nature of DC pension plans requires daily valuations to be available for a beneficiary's individual investments. In the case study section of this paper on page 12, we explain the valuation procedure implemented by Partners Group in order to meet this requirement.

The second hurdle relates to liquidity. Once a firm has developed the ability to value assets on a daily basis, it must then provide a certain level of liquidity in order to fulfill the minimum requirements DC plans need for rebalancing their portfolios, in line with daily contributions and withdrawals. The prime obstacle is that private market investments are highly illiquid and long-term in nature, with value creation initiatives (i.e. return generation) stretching over a typical holding period of 4-5 years of underlying portfolio investments. Therefore in order to meet DC plan liquidity requirements, solutions such as investing in asset classes with a greater liquidity profile, like private debt, listed private equity and listed infrastructure, alongside traditional illiquid private market investments, must be explored. The challenge then is to achieve the right balance in asset allocation between standard private market investments and these more liquid private market assets. The latter tend to be more correlated to public markets; increasing the allocation to such liquid private market investments can therefore reduce diversification benefits.

Costs are always an important topic when considering investment options. Private market costs are typically higher compared to other traditional asset classes. This is rooted in the complexity of private market investments and the active role taken by private market investment managers in the companies and assets they acquire in order to drive forward value creation initiatives. Nevertheless, private market firms need to adapt to fulfill certain DC pension requirements, such as 'caps' on total expense ratios, which, for example, make fund-of-funds structures involving multiple layers of management and performance fees incompatible with regulations and operational market standards. DC plans should aim to blend a private market allocation with passive investment content to find the optimal risk/return outcome at a total plan level. In this context, costs chargeable for the private market component will be diluted

22 Under IFRS and US GAAP, the fair value is defined as "the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date".

by the costs charged for the passively managed investment content. This enables pension fund managers to achieve a total expense ratio that is appropriate and complies with charge cap guidelines.

Case study: how to adopt daily valuations for private market investments

One major operational hurdle that private market managers need to overcome to be considered a viable investment option for DC plans relates to their ability to deliver fair and reliable valuations at regular intervals – in most cases on a daily basis. In order to fulfill this requirement, Partners Group uses a bottom up valuation framework that has different requirements for quarterly, monthly and daily valuations.

On a quarterly basis, all underlying investments are consistently valued in accordance with fair market valuation principles. To determine the fair valuation of direct investments in companies or assets, Partners Group uses a valuation recommendation which is typically based on the performance of the respective asset as well as private and/or public market comparables, including factors such as EV to EBITDA, price to earnings or other multiples. Each valuation is then reviewed and approved or rejected by the relevant asset class valuation committee. For investments held indirectly via investment partners, the valuation information reported by an investment partner is typically taken as a basis. However, such information may not necessarily represent the 'fair value' and/or may not be representative of the latest available information. In these instances, Partners Group gathers valuation-relevant information about portfolio companies which are held indirectly. This includes, but is not limited to, additional information supplied by investment partners and information published in industry news portals and/or other publications.

Quarterly valuations are used as the basis for monthly valuation adaptations. Every month, portfolio investments (whether held directly or indirectly) are re-evaluated based on any new material information that is available. Events that would typically trigger a monthly re-evaluation are new transactions such as M&A activity and/or an IPO, bankruptcy and business line discontinuations, new information from investment partner monitoring or new public information on portfolio and public company revaluations.

On a daily basis, the valuation process is based on a best-effort principle reflecting new valuation-relevant information. The process aims to capture valuation-relevant information for calculating the NAV on each valuation point, thus closing the information gap in between two month-end valuation processes. The table below shows the different elements considered in the daily valuation process that are used to adjust the latest monthly valuation.

Adopting a multi-layered, in-depth and bottom up approach for determining the fair value of private market investments has been a key component for Partners Group when designing private market offerings for many of its clients. Built on the foundations of our quarterly and monthly valuation processes, which have been tried, tested and refined over the last 15+ years, the daily valuation adjustments, which are characterized by fast processing times and are backed by Partners Group's strong operational capabilities across the globe, allow for the capturing of valuation-relevant information in a timely manner as required by today's DC market.

Examples of daily private market valuation drivers

Interest accruals	Linear daily accrual of cash and payment-in-kind interest of illiquid private debt instruments
Fund revaluations	Intra-month revaluations based on fund reports including rule-based expiration of fair value adjustments (FVA)
Listed companies	Valuation adjustment of publicly listed companies held in private market portfolios based on quoted market prices
Foreign exchange	Daily consideration of FX movements for all positions and transactions in the portfolio
Extraordinary events	Daily capturing of events deemed material and with significant impact on the valuation of an investment

Conclusion and outlook

This paper has illustrated how a relatively modest allocation to private markets can have a positive impact on the retirement outcome for a DC pension beneficiary. Private markets have the potential to increase the returns of a typical DC plan over the long term and therefore the retirement income of a beneficiary. An allocation to private markets has also been shown to have a risk-reducing impact on portfolios by lowering volatility and reducing the maximum drawdowns during historical stress scenarios.

We have identified several key challenges for private market managers when endeavoring to develop offerings that are deemed investable from a DC plan's perspective. However, the analysis in this paper shows that the potential benefits for DC beneficiaries of having access to private market investments are certainly worth the effort on the part of private market investment managers of designing offerings that overcome those hurdles.

Several private market managers have in recent years announced DC pension plan clients as an area of focus in terms of strategic business development. In 2015 and 2016, Partners Group launched three private market offerings tailored to the respective DC markets in the US, Australia and the UK. We expect to see more private market managers follow with similarly innovative investment structures in the coming years and envisage that private markets will play a key role in shaping DC pension outcomes in the future.

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