



A new approach to managing capital awaiting deployment to private assets

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Michael Walsh
Solutions Strategist



Niklas Jeschke
Solutions Analyst

KEY POINTS

- The gradual nature of private markets investing means allocations to these assets create a number of governance and operational issues. Specifically, it raises the question of how the movement from the funding, or legacy, asset into private markets investments should be managed and accounted for.
- As Local Government Pension Scheme (LGPS) funds increase allocations to private markets, the unique characteristics of these assets amplify the governance and operating challenges in managing this movement.
- We set out a possible framework for managing committed but undeployed capital, using a clear 'rules-based' approach – which depends only on the expected time to deployment.
- We also suggest the current approach to judging the success of private markets investments (IRR) should evolve to an approach also capturing the returns (and costs) of the committed capital during the period it is undeployed. The combined return of 'money waiting and money working' is, in our view, more representative of the success of private markets investing¹.
- Our 'strawman' solution is low governance and simple to implement. The solution is transparent and adaptable to differing risk tolerances.

1. MJ Hudson in its paper 'Safe Storage of Dry Powder: A Committed Capital Solution' also suggest this.

Introduction

Private assets investing was once largely the preserve of endowments and foundations² – but this is no longer the case. Institutional investors, such as pension plans and insurance companies, have vigorously embraced opportunities in this segment of the market.

LGPS¹ are participating in this trend, committing capital to funds with pre-defined life spans, with this capital being drawn down and invested over a period of years. Although the period over which the capital will be put to work is generally known, the precise timing of the calls is not known with certainty – as it depends on deal transactions of the selected fund. However, and critically, meeting these capital calls is a contractual obligation.

Recently, the challenge of management of this committed, but undeployed, capital has been further complicated by delays in the commencement of many investment programmes. This is likely due to the significant wave of capital being allocated to private markets.

These characteristics create a number of governance and operating challenges for LGPS funds:

- Given it takes a number of years to fully deploy committed capital, how should the movement of capital from the funding, or legacy, asset class to private markets be managed?
- What are appropriate expectations for the return and risk characteristics of the committed but undeployed capital as it is waiting to be deployed?
- How should the performance, risks and costs of this undeployed capital be allocated by the LGPS fund? Should these be included in the funding asset, the private markets programme, or accounted for in some other way?
- Once mature, distributions from the private assets programme are likely to occur at the same time as commitments to new programmes take place. Are cash flow management processes adequate to capture the additional complexity of managing this process?

Currently there is no ‘best practice’ among LGPS funds on how to manage capital committed to private assets as it is waiting to be called. A number of different approaches have been adopted, many of which are more pragmatic and ad-hoc in nature. For many investors, we believe a clearly set out and pre-planned approach to managing such capital would be more appropriate. This is of increasing relevance as the allocations to private assets increase and the resulting cash flows become more complex. Such an approach improves governance, addresses operational risks and optimises cash flow management.

Our paper examines these issues and sets out a possible pathway to address these challenges.

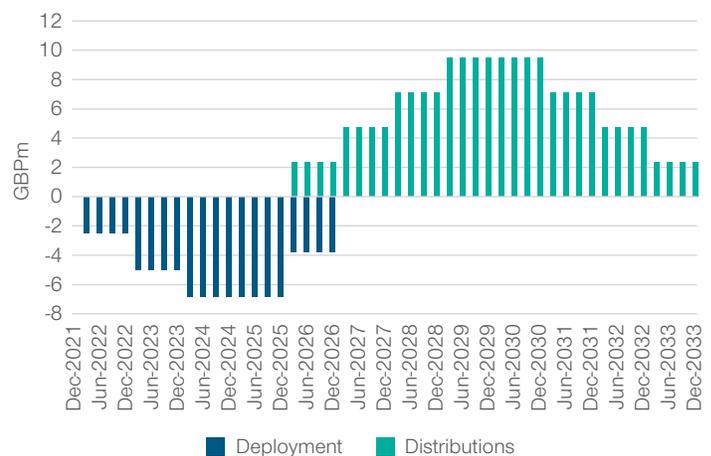
2. Real Estate or property has been a feature of many investors portfolios. For the purpose of this paper private assets refer to private equity, private debt, unlisted infrastructure.

An alternative approach to assessing the outcomes of private markets investments

The success of a private markets programme is judged largely on the money-weighted returns delivered by private assets managers in the form of Internal Rates of Return (IRR). However, this calculation focuses only on the returns generated on capital once it has been deployed into private assets – it does not take into account the return on capital waiting to be deployed. This leaves the return generated and risks incurred by this ‘money waiting’ to be accounted for elsewhere within the LGPS portfolio as an unintended consequence.

Figure 1 shows high-level modelling of cash flows for an indicative private equity cycle. We highlight some of the issues on the chart.

Figure 1: Cash flows for an indicative private equity cycle beginning at end 2021



Capital awaiting deployment: this is the time period between the LGPS fund's decision to allocate to private markets and ALL the capital having been deployed. How should this be managed and accounted for? What sort of risk should this capital bear?

The market standard IRR calculation captures the return only on capital from deployment and until distribution.

For illustrative purposes only. Source: T. Rowe Price. Analysis by T. Rowe Price. See Appendix 2 for important information regarding this analysis

Therefore, judging the success of allocations to private markets by looking solely at the IRR of the private assets strategy – without capturing the full return and risks of the overall amount of committed capital – does not properly represent the performance of the private assets programme. In our view, the frictional aspects of private markets investing should be captured in the assessment of the success of the private markets allocation, and not be lost in the overall fund accounting.

Is there an alternative to the current accepted norm? Yes, we believe it is more appropriate to consider the performance measured from the point of commitment, as this more accurately reflects the return to the private assets programme³.

The aim of this paper is to explicitly consider the combined impact of investment decisions concerning the management of the committed capital yet to be deployed – ‘money waiting’, as well as the experience of the capital once it has been deployed as ‘money working’.

A model for investing committed private markets capital

Our starting point is to separate the committed capital at the effective date of the LGPS fund’s decision to allocate to private markets. Having decided to allocate to private markets, research has demonstrated there is no uniform approach on how to manage, or allocate, to these assets⁴. When a strategic asset allocation decision is made to invest in a liquid asset class, legacy assets are transitioned at the same point, if not before, the investment into the new mandate. This is not possible with illiquid investments, which causes a significant governance issue.

A key question all investors should consider when making a commitment to private assets is how the cash to fund this allocation will be sourced. Options include legacy assets in another asset class, benefit contributions, or recycled distributions from previous private assets investments.

Once this has been determined, for good governance, the next decision must be how the assets will be managed before deployment – for example, what is the return ambition and what risk can be tolerated? All the while, investors must be cognisant that once called, capital must be delivered to the private assets manager per the contractual agreement. As a result, a high level of liquidity is vital.

Again, a number of options exist – including the simple status quo of leaving the legacy asset exposure in place. Alternatively, the

route often taken is to either move into assets with low expected correlation to public markets, with a view to avoiding drawdown risk, or allocate to assets more positively correlated to public markets, with a view to generating returns while awaiting deployment.

We believe capital pending deployment should be allocated in a structured and risk aware way, and in many cases would benefit from a more dynamic approach – considering both return and risk characteristics. We identify three asset classes which are particularly suited to this role:

- Cash, or short-term money market instruments
- Fixed interest, particularly higher quality assets with low correlation to equity markets
- Global equities, or other growth seeking assets

Over the rest of this paper, we model the experience of the private markets cycle, where committed but undeployed capital, as well as distributions returned from the private equity investments, are allocated solely to three liquid components: (1) cash; (2) a conservatively managed fixed income strategy; and (3) global equities. This work is based on resampling analysis of historic, contemporaneous equity, cash and conservative fixed income returns to generate 1,000 paths of simulated monthly returns over the entire cycle for each allocation. These are then combined with the deterministic private equity cash flows shown in figure 1 above.

As can be seen in figure 1, distributions are expected to be in excess of drawdowns from year six onwards, and these are held in the same components through the later years of the private equity programme.

In table 1, we demonstrate the impact of the different allocations on the overall return on capital committed from the private equity cycle over its entire life, as well as the variability of the outcomes. In each case, we consider performance measured from the point of commitment to a single final distribution at the end of the cycle – reflecting the overall experience of the capital committed.

Table 1: Indicative return on capital invested, by portfolio

Return on capital invested	Return on capital invested – 5th percentile	Return on capital invested – 25th percentile	Return on capital invested – median	Return on capital invested – 75th percentile	Return on capital invested – 95th percentile	Probability of running out of funds to meet capital calls
Cash	5.3%	5.4%	5.6%	5.7%	5.8%	0.0%
Conservative Fixed Income	5.7%	6.4%	6.8%	7.3%	8.0%	0.0%
Global Equities	3.9%	6.2%	8.0%	9.7%	12.7%	14.4%

Source: T. Rowe Price. Analysis by T. Rowe Price. **For illustrative purposes only.** See Appendix 2 for disclosures on assumptions used.

3. Asset Management consultancy MJ Hudson has produced a recent paper exploring this topic in detail: ‘Safe Storage of Dry Powder – A Committed Capital Solution’.

4. MJ Hudson paper: ‘Safe Storage of Dry Powder – A Committed Capital Solution’.

This modelling shows holding committed but undeployed capital, as well as distributions from the private equity investments, in global equities – instead of cash – delivers a more than 2% p.a. higher overall return on capital over the cycle. However, this also comes at the cost of a much wider range of overall outcomes, due to the higher volatility of global equities. It also introduces the possibility that capital held to meet arising commitments may be insufficient.

The range of outcomes emphasizes the view that the investment of capital awaiting deployment should be considered in a thoughtful and structured manner. Our analysis shows the trade-offs between different approaches, especially where LGPS funds invest across a range of different private market assets. The approach for managing capital committed to a private equity programme may differ from that taken for managing commitments to invest in infrastructure debt, for example.

Investing committed but undeployed capital – key factors

LGPS funds are, in many cases, looking to their respective pools to provide access to private markets. Pools are responding by providing regular investment cycles into various types of private assets – such as private equity, real estate, infrastructure and private debt. As fundraising for each cycle is completed, the focus moves to investing the amounts committed by the LGPS funds with the private asset managers chosen for the cycle. Meanwhile, planning for a new cycle begins.

Given this approach, we believe it makes sense to focus on the investment of committed but undeployed capital at the level of each private assets cycle. This allows LGPS funds to pass the amount committed in one tranche at the start of the cycle, rather than deal with requests to provide capital on an ad-hoc manner throughout the deployment phase of the cycle. It acts to simplify the measurement of the overall performance of the capital committed to the private assets cycle, and also aims to ensure a similar experience for each LGPS fund invested in that cycle.

Designing the investment approach for committed but undeployed capital within a private assets cycle should consider the following key factors:

- Ensuring capital is available to meet calls.
- The expected timescales of the calls. A longer (shorter) time horizon would suggest a mix of investment with higher (lower) risk.
- The level of uncertainty associated with the calls within the cycle. In general, the higher the uncertainty the less risky the approach, while more certain projections allow a higher risk tolerance.
- The appetite for risk and desired hurdle rates for the capital pending deployment may vary depending on the type of private assets and upon expected speed of deployment.

- Asset return and risk considerations – with a particular focus on shorter-term measures of risk, such as Value at Risk or drawdown risk.
- Any investment management or other fees payable to the private market managers on committed capital not yet deployed. At least, investors would prefer the investment of undeployed capital to maintain its value (depending upon drawdown timeframe) and cover any associated costs.

The result should be a clear framework for how capital will be invested pending drawdown. Expected time to drawdown, risk tolerance and the market environment are just some of the considerations to be evaluated as the progress of capital being deployed is dynamically monitored.

As well as bringing more structure to the management of the committed but undeployed capital, such an approach offers clear advantages to LGPS funds from a governance perspective. Stakeholders have a clear understanding of how this capital will be invested while it is awaiting deployment – with an investment approach based on agreed expectations for both the level of desired return and the amount of risk to be taken.

Developing a solution for the committed but undeployed capital

In some cases, it may suffice to set a static allocation for capital through the private assets cycle. For example, by investing commitments for a private equity cycle in equities, or funding requests for capital to deploy from liquidity holdings. This remains an explicit decision, however, and should be accounted for accordingly. As allocations to private markets increase and capital awaiting deployment makes up a larger proportion of the overall assets of LGPS funds, a dynamic approach may be more appropriate. For example, having capital invested entirely in equities in the lead up to a large deployment intuitively seems overly risky – especially if it would be difficult to make up any shortfall in the value of the requested capital at short notice.

We believe a clearly set out dynamic approach can offer advantages in practice. A useful investment parallel is the defined contribution (DC) lifestyle structure. Here, the risk characteristics of an overall asset allocation varies following a broadly predefined glidepath based on the time remaining to a defined event – in this case, an individual's expected retirement date. Early in the individual's career, a high proportion of DC savings are invested in risky asset classes, such as equities. As the individual begins to approach target retirement date, risk is reduced with increased exposure to fixed income and cash assets. This is logical, as an investor close to retirement is less able to bear the risk of a sharp drawdown, as the impact on savings may be a major impediment to retirement plans.

A similar principle can be applied over the timescale of the private assets cycle. Undeployed capital would be gradually switched from higher to lower risk assets as the time to the expected capital call reduces. Each LGPS fund would provide the total amount of committed capital to a private assets cycle offered by the pool in a

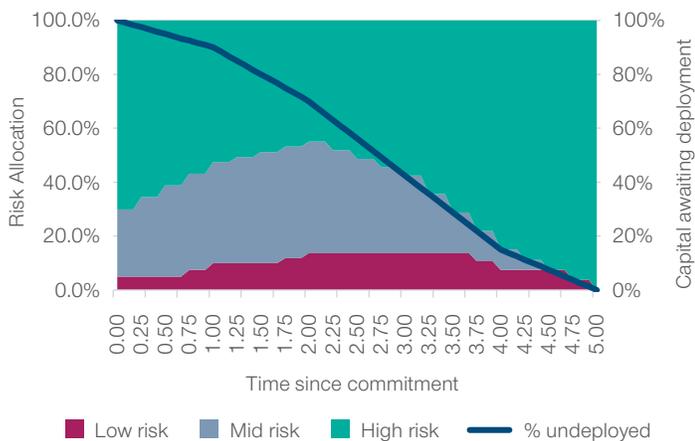
single tranche prior to the fundraising period of the cycle closing. Within the cycle, a transparent rules-based structure would then apply to the investment of capital not invested, using a number of agreed highly liquid, complementary building blocks. This would allow a high level of customisation for each cycle, as well as potential operational efficiencies – while reducing the governance burden in comparison to more complex approaches.

The allocation would be set by the overall risk appetite for the committed but undeployed capital agreed by the LGPS fund investors in the cycle prior to launch. This risk appetite may be informed by the destination asset class. For example, investors in a private debt cycle may have a lower risk appetite in comparison to investors in a private equity cycle.

We illustrate the approach for the indicative private equity cycle introduced in figure 1 below, in terms of allocations to low, mid and high-risk assets from the time capital is initially committed.

On commitment, there is likely to be a considerable lag to the deployment of capital, allowing investment of an increased proportion in higher risk assets. Deployments tend to be highest in years 2-4 of the cycle, so investment risk is reduced ahead of and during this period. From year four onwards, deployments tail off, as committed capital has been called by the private asset managers, so any remaining capital (including initial distributions) are again directed towards high risk assets.

Figure 2: Allocation to different risk portfolios at differing times since commitment



For illustrative purposes only. Source: T. Rowe Price. Analysis by T. Rowe Price. See Appendix 2 for important information regarding this analysis.

This approach would also have the benefit of delivering a broadly consistent experience to all investors within a particular private assets cycle.

A possible framework for investing the committed but undeployed capital

For the purposes of this paper, we propose building a small number of bespoke multi-asset portfolios, where the committed but not yet deployed capital for each private assets cycle would be invested. For our analysis, we include three simple highly-liquid building blocks – sterling cash, global equities, and a conservatively managed fixed income strategy as a ‘bridging asset’. For this final element, we believe a focus on wealth preservation, as well as explicit diversification from equities and more economically sensitive assets, is key to managing drawdown risk for the multi-asset portfolios overall. We therefore illustrate this component based on the characteristics of our Dynamic Global Bond strategy, rather than solely government bond or credit assets.

In practice, the tailored nature of the approach for each private assets cycle means a wide range of potential liquid building blocks, based on both physical assets and derivative components, could be used.

The mix of these three components in our analysis allows the construction of diversified portfolios with a range of sources of return. It also accommodates different risk appetites – from investing purely in the liquidity and stability offered by cash, to adopting a high-risk approach through a large allocation to global equities.

Similar to the DC lifestyle example, capital expected to be deployed in the near future would be heavily weighted towards cash and fixed income, with allocations to equities increasing where capital deployment is not likely in the short term.

Within each portfolio, the allocations over time would be determined by clearly defined switching rules, reflecting the expected profile of drawdowns of capital within that cycle, and the return and risk expectations of investors. This ensures a low governance, ‘no surprises’ approach. A range of indicative approaches are shown below:

Table 2: Indicative switching rules between portfolios of differing risk levels, based on time to deployment

Switching rules	Investing in the low-risk portfolio	Investing in the mid-risk portfolio	Investing in the high-risk portfolio
Defensive	Cash flows expected in less than 9 months	Cash flows expected between 9 & 36 months	Cash flows expected beyond 36 months
Central	Cash flows expected in less than 6 months	Cash flows expected between 6 & 24 months	Cash flows expected beyond 24 months
Aggressive	Cash flows expected in less than 3 months	Cash flows expected between 3 & 18 months	Cash flows expected beyond 18 months

For illustrative purposes only. Source: T. Rowe Price.

At a minimum, we generally anticipate return expectations for each portfolio would be in excess of any investment management fees to be paid on committed but not yet deployed capital.

In practice, a wide range of approaches and portfolios would be possible, depending on the requirements of the LGPS fund investors in each cycle.

The framework is based on a high degree of visibility on the amount and timing of capital deployments for each cycle, across the range of private assets. Successful execution of the solution requires a 'cash flow aggregator' for each cycle. The cash flow aggregator is a party with visibility on the different streams of cash flows (in and out), which can develop initial estimated cash flow profiles based on projections from the appointed private assets managers within the cycle, as well as historical data for the private asset class. As the cycle progresses, the cash flow aggregator would regularly update the estimated cash flow profile for the coming periods. This would allow the target allocations between the low, mid and high-risk portfolios to be set within the cycle, and use the switching rules to direct any resulting cash flows to the investment managers for the liquid equity, fixed income and cash components.

The switching rules adopted would be agreed with the LGPS funds investing in the cycle prior to launch. Investing committed but undeployed capital in higher risk assets boosts the indicative overall return on invested capital for the private market cycles, but at the cost of increased volatility and drawdown risk.

Investing committed but undeployed capital – private equity cycle analysis

As in table 1, we have modelled three portfolios where undeployed capital, as well as distributions over the life of the private assets cycle, are allocated solely to the three liquid components mentioned above: (1) cash; (2) a conservatively managed fixed income strategy; and (3) global equities. Here, we also model the outcomes for a dynamic approach, moving between a combination of low, mid or high-risk portfolios according to the central switching rules set out in table 2. Distributions are expected to be in excess of drawdowns from year six onwards, allocations to the high-risk portfolio are then constant throughout the later years of the private equity programme.

We again use resampling analysis of historic, contemporaneous equity, cash and conservative fixed income returns to generate 1,000 paths of simulated monthly returns over the entire cycle for each allocation. These are combined with the deterministic private equity cash flows shown in figure 1 of the paper.

We show the impact on different allocations on overall return on capital invested from the private equity cycle over its entire life, as well as the variability of these outcomes for each indicative allocation below. In each case, we consider performance measured from the point of commitment to the final distribution at the end of the cycle, reflecting the total experience of capital committed and awaiting deployment.

Table 3: Indicative return on capital invested, by portfolio

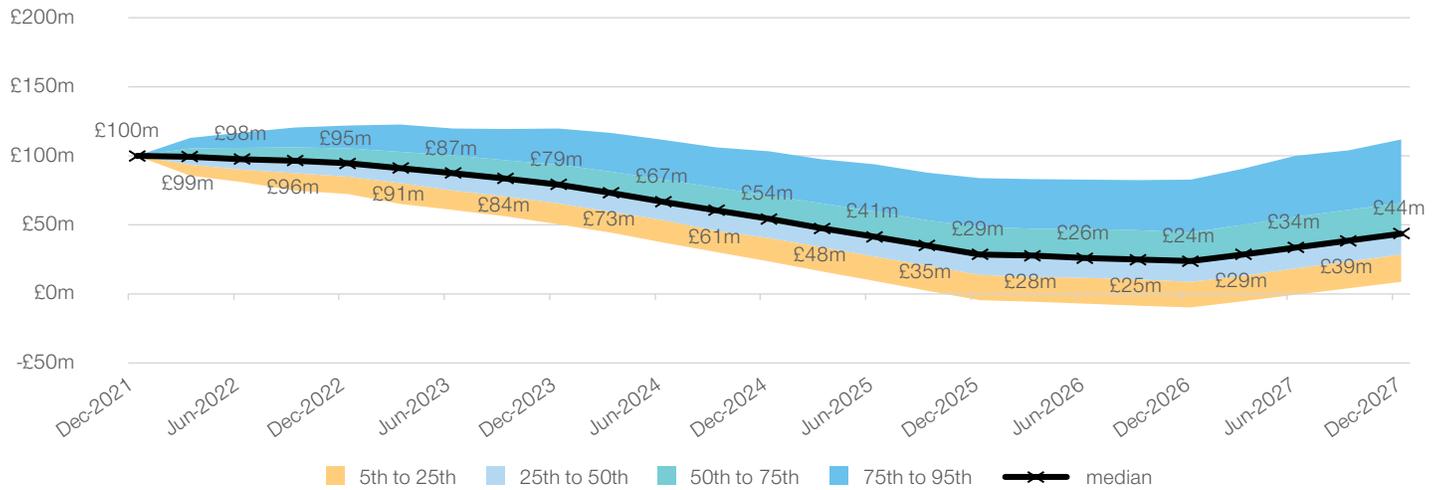
Return on capital invested	Return on capital invested – 5th percentile	Return on capital invested – 25th percentile	Return on capital invested – median	Return on capital invested – 75th percentile	Return on capital invested – 95th percentile	Probability of running out of funds to meet capital calls
Cash	5.3%	5.4%	5.6%	5.7%	5.8%	0.0%
Conservative Fixed Income	5.7%	6.4%	6.8%	7.3%	8.0%	0.0%
Global Equities	3.9%	6.2%	8.0%	9.7%	12.7%	14.4%
Dynamic	5.1%	6.5%	7.5%	8.4%	10.1%	2.3%

Source: T. Rowe Price. Analysis by T. Rowe Price. **For illustrative purposes only.** See Appendix 2 for disclosures on assumptions used.

Returns for the portfolios where riskier assets are used are notably higher, but with considerably higher variability. The dynamic approach results in a slightly lower median return on capital invested, in comparison to an approach where committed but undeployed capital is held solely in global equities, but with a considerably narrower range of outcomes.

We show the variability of the value of this capital while awaiting deployment over the first six years of the private assets cycle below. We note the value of this capital will naturally fall over the first five years of the cycle, as the private equity managers make calls on committed capital. In a situation where gains from the investment of capital awaiting deployment exactly offset management fees and expenses, and the full amount of committed capital was deployed as expected, the value of the remaining committed capital should be zero at the end of the deployment period.

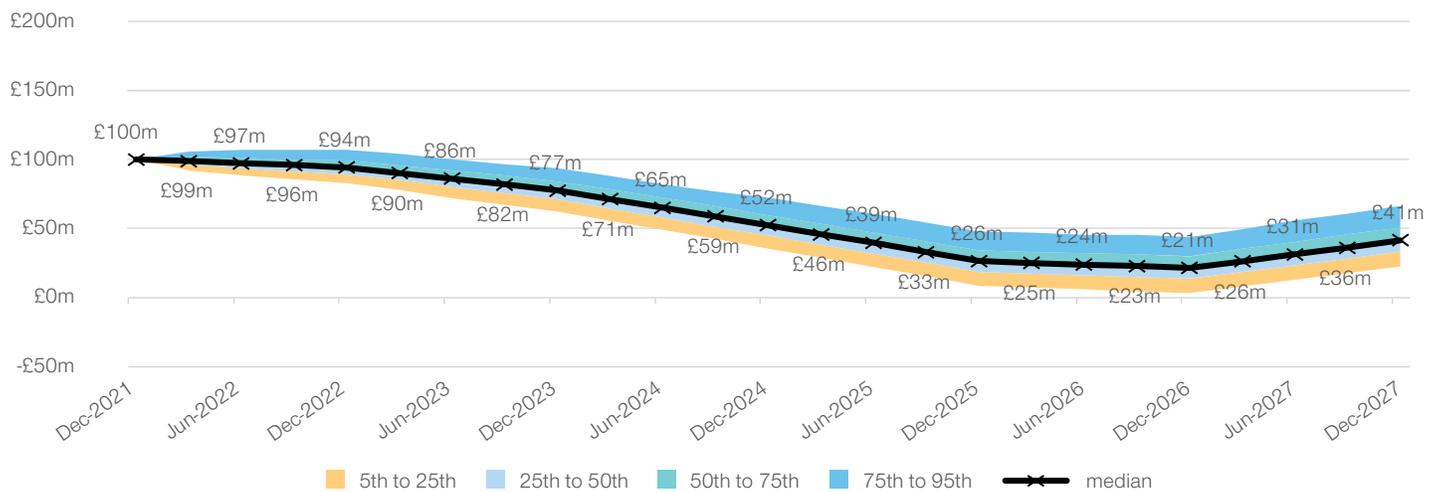
Figure 3: Values and confidence intervals of committed but undeployed capital – global equities



For illustrative purposes only. Source: T. Rowe Price. Analysis by T. Rowe Price. See Appendix 2 for important information regarding this analysis.

The modelling shows the likelihood of running short of capital to meet commitments is highest late in the deployment period, and prior to the beginning of distributions from the private equity investments. The likelihood of this occurring is low (roughly one in seven) but not negligible on this basis.

Figure 4: Values and confidence intervals of committed but undeployed capital – dynamic investment



For illustrative purposes only. Source: T. Rowe Price. Analysis by T. Rowe Price. See Appendix 2 for important information regarding this analysis.

The modelling shows the likelihood of running short of capital to meet commitments is again highest late in the deployment period, and prior to the beginning of distributions from the private equity investments. Here, the more dynamic approach eliminates the possibility of committed capital running out at the 95% confidence level, albeit the possibility is not eliminated entirely at higher confidence levels.

The level of variability of outcomes throughout the period is considerably less in comparison to the approach involving investment in global equities. For example, at the end of the fifth year of the cycle, the difference between the 5th and 95th percentile outcomes was £44m for the dynamic approach, versus about £100m where committed capital awaiting deployment was invested in global equities.

We model the impact of the proposed framework using illustrative cash flows in a similar way for another type of private assets – senior infrastructure debt – in Appendix 1.

One element not taken into account in this analysis is the possibility of a longer time to deployment than expected. Potentially large amounts of ‘dry powder’ may result in a lengthier time of deployment by private assets managers. The impact of delays can be significant.

Implementation of the framework in practice

The framework we set out has four key areas of responsibility where the private assets cycle is set up at the pool level. We summarise the roles of each at a high level below.

Table 4: Framework of responsibilities for the LGPS pool private assets cycle

LGPS fund	Pool	Cash flow aggregator	Liquid assets investment managers
Set fund specific investment strategy and expectations for private assets	Select private asset managers and vintages	Full visibility of different cycles across range of private assets	Invest capital awaiting drawdown in line with the agreed framework
Provide committed capital to selected private assets cycles	Manage private assets cycles	Develop initial estimated cash flow profile for each cycle based on manager projections and historical data	Provide input and analysis on characteristics of component portfolios
Monitor outcomes and adjust investment strategy as required	Monitor expected and actual deployments to private assets within each cycle	Regularly update estimated cash flow profile, which drives allocations between portfolios for each cycle	Report on investment of liquid assets

For illustrative purposes only. Source: T. Rowe Price.

Benefits of a framework for investing committed but undeployed capital

The framework outlined above offers a number of important advantages for LGPS funds:

- **Clarity:** The framework addresses the issues faced by LGPS funds and pools around the investment of undeployed private market capital in a transparent and governance-light way.
- **Robustness:** The approach is easily adaptable to a range of different cash flow profiles and desired risk levels and can be adjusted within each cycle over time.

Consider the situation, for the indicative private equity cycle discussed above, where the first deployment of capital occurs twelve months later than expected. There is no impact on the performance of the private markets cycle measured using a traditional IRR approach. However, measured from the point of commitment – not first drawdown – we calculate the overall return from the cycle would fall by almost 1.5% p.a. in the event of such a delay.

The potential for such delays, in our view, makes the attractiveness of a structured approach to investing capital awaiting deployment even greater. A longer expected time until deployment would seem to boost the case for investing capital in assets with higher expected returns. However, this needs to be thoughtfully balanced with the risk of being a forced seller of other assets outside the private markets programme, if drawdowns in value occur while capital is being called by private asset funds.

- **Flexibility:** Customisation to the requirements of different types of private market assets and the needs of investors in different cycles can be easily accommodated.
- **Simplicity:** The set of switching rules agreed upfront sets out clearly the investment strategy to be adopted at different points during the private markets cycle.
- **Ease of ongoing governance:** The roles of different stakeholders are clearly set out and investment outcomes for the committed but undeployed capital, and the overall private markets programme can be measured and monitored relative to expectations in a more structured way.

Conclusion

This paper seeks to help address some of the governance and operational challenges – the ‘frictional collateral’ – of private assets investing. The paper proposes the following:

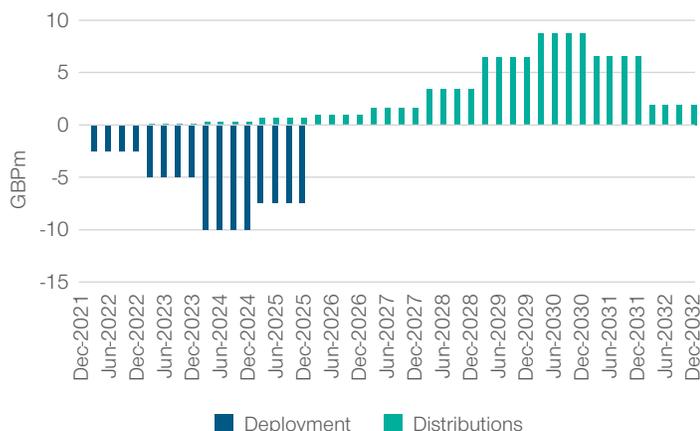
- Committed capital is separated from the funding, or legacy, asset from the effective date of the commitment to private assets (the SAA decision) and managed under a defined framework from the date of commitment.
- A pre-agreed destination for the committed capital. Our paper sets out a strawman approach to the management of this capital. The approach is flexible in nature to accommodate differing risk appetites, and adaptable to changes in circumstances or market conditions.
- Evaluating the success of private markets investing by combining the returns and costs of money waiting AND money working is, in our, view, more representative of the overall experience of private markets investing.
- A key component of our proposed framework is the ability to have a comprehensive and robust cash flow management process, which is able to manage such flows efficiently across the cycle and reduce frictional costs.
- Committed but undeployed capital is invested in line with clear guidelines, and actual deployments are regularly monitored versus expectations – with the adequacy of capital remaining to meet commitments also assessed.

Appendix 1

Investing committed but undeployed capital – infrastructure debt cycle analysis

We use a set of illustrative cash flows for an indicative senior infrastructure debt cycle to model the impact of the proposed framework in more detail. Appendix 2 includes details of the illustrative cash flows and assumptions used in the modelling – as well as the low, mid and high-risk portfolios used throughout.

Figure 5: Indicative cash flow profile – Infrastructure debt cycle



For illustrative purposes only. Source: T. Rowe Price. Analysis by T. Rowe Price. See Appendix 2 for important information regarding this analysis.

Table 5: Indicative return on capital invested, by portfolio

Return on capital invested	Return on capital invested – 5th percentile	Return on capital invested – 25th percentile	Return on capital invested – median	Return on capital invested – 75th percentile	Return on capital invested – 95th percentile	Probability of running out of funds to meet capital calls
Cash	1.6%	1.8%	1.9%	2.0%	2.1%	0.0%
Conservative Fixed Income	2.0%	2.6%	3.1%	3.5%	4.2%	3.6%
Global Equities	0.2%	2.5%	4.3%	6.1%	9.1%	19.5%
Dynamic	1.6%	2.7%	3.6%	4.4%	5.9%	6.2%

Source: T. Rowe Price. Analysis by T. Rowe Price. **For illustrative purposes only.** See Appendix 2 for disclosures on assumptions used.

Returns for the portfolios where riskier assets are used come in higher once again, as might be expected, but the impact of using higher risk assets to invest committed but undeployed capital can be more clearly seen. The range of potential outcomes from investing in global equities seems particularly undesirable when coupled with what might be regarded as a relatively low risk private assets cycle. Here, the characteristics of the dynamic approach are probably most comparable to investing in conservative fixed income.

We show the variability of value of capital awaiting deployment over the first six years life of this private assets cycle below. We note the value of this capital will again naturally fall over the first four years of the cycle, as the infrastructure debt managers make calls on committed capital.

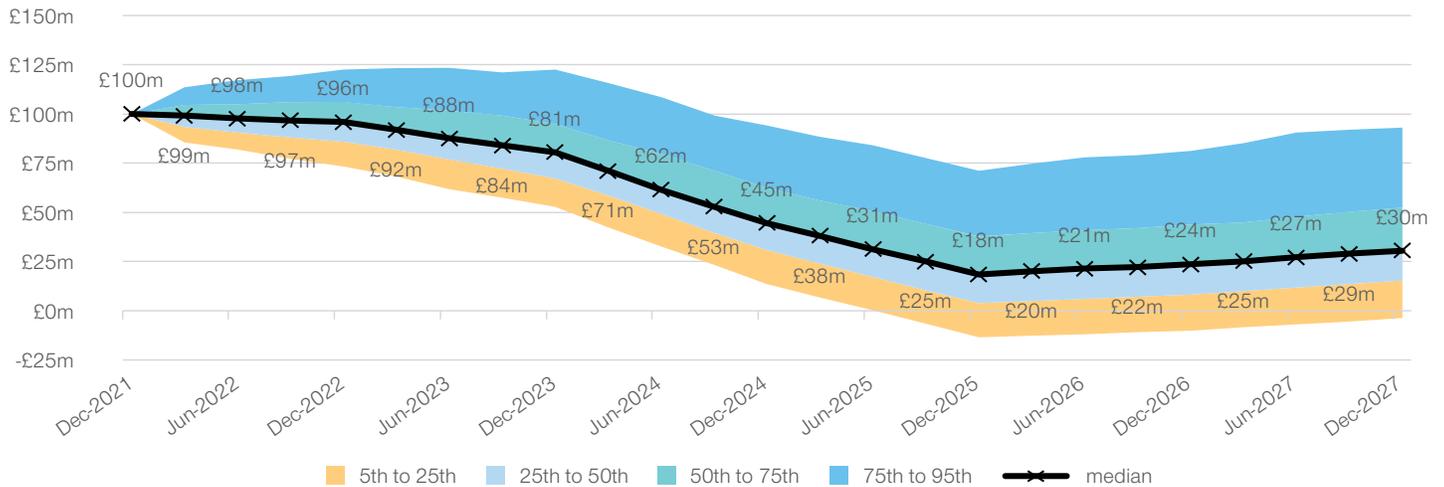
In each case, for the purposes of our analysis, we assume the value of committed capital is invested as one lump sum at the beginning of the cycle and distributed in one lump sum at the end of the cycle.

We again model three portfolios, where the committed but undeployed capital – as well as distributions over the life of the senior infrastructure debt investment cycle – are allocated solely to cash, a conservatively managed fixed income strategy and global equities. We also model the outcomes for a dynamic portfolio, again invested according to the central switching rules set out in table 2. The infrastructure debt cycle is slightly shorter than the earlier private equity example, with capital expected to be deployed over the first four years of the cycle. Distributions in the form of interest and maturity payments occur throughout the remainder of the cycle, and under the dynamic approach, are again assumed to be invested in the high risk portfolio until the end of the cycle.

Our analysis uses resampling analysis of historic, contemporaneous equity, cash and conservative fixed income returns to generate 1,000 paths of simulated monthly returns over the entire cycle for each allocation. These are combined with the deterministic infrastructure debt cash flows.

We show the impact of different allocations on overall return on capital invested from the infrastructure debt cycle over its entire life, as well as the variability of these outcomes for each indicative allocation below.

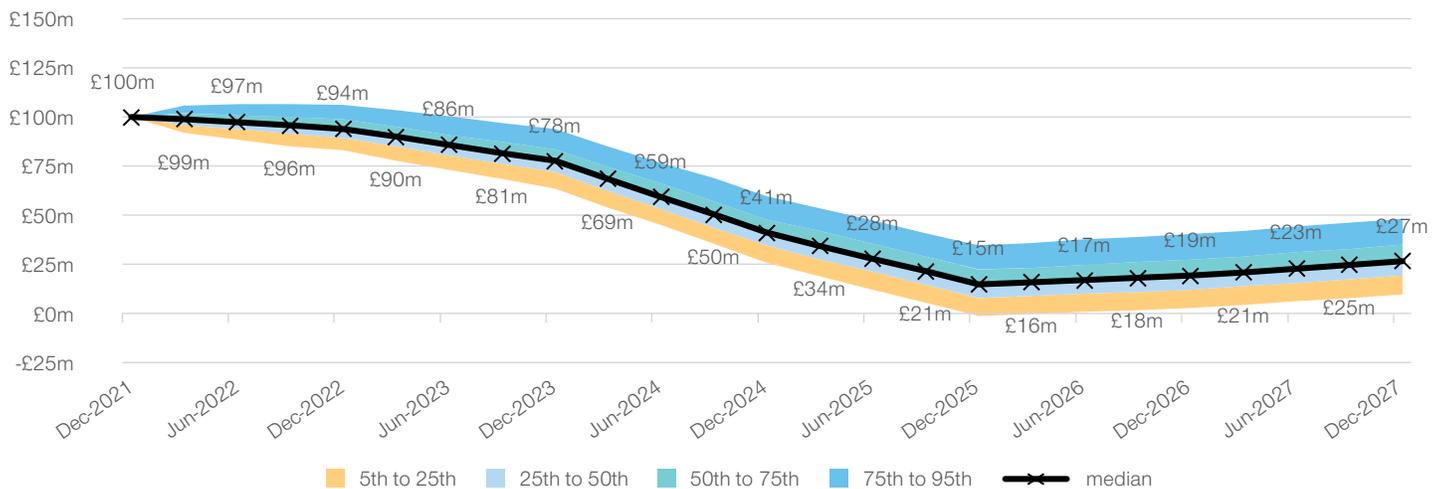
Figure 6: Values and confidence intervals of committed but undeployed capital – global equities investment



For illustrative purposes only. Source: T. Rowe Price. Analysis by T. Rowe Price. See Appendix 2 for important information regarding this analysis.

As would be expected, the modelling shows the likelihood of running short of capital to meet commitments is highest late in the deployment period.

Figure 7: Values and confidence intervals of committed but undeployed capital – dynamic investment



For illustrative purposes only. Source: T. Rowe Price. Analysis by T. Rowe Price. See Appendix 2 for important information regarding this analysis.

The modelling shows the likelihood of running short of capital to meet commitments is again highest late in the deployment period and prior to the beginning of distributions from infrastructure debt investments. The more dynamic approach reduces the likelihood of having insufficient capital to meet capital commitments at the time of calling, but does not entirely eliminate it at the 95% confidence level.

Appendix 2

Key assumptions for modelling purposes

General

Cash flows are indicative and refer to a single private assets investment cycle.

Capital committed, but undeployed, will attract fees payable from the date of commitment, and the cash flows shown are gross of these fees.

All cash flows are in British pounds (GBP), occur quarterly and are assumed to occur at the end of the relevant period.

There is no residual value of unrealised investments at the end of the modelling period.

Cash flows relating to distributions are net of carried interest and other private assets' charges and fees.

Transaction costs are not explicitly considered.

The private assets' drawdown and distribution of cash flows provided are treated as deterministic, while there is a very high level of uncertainty around how these will develop over time.

Characteristics of indicative cash flows generated – private equity

Asset class	Private equity fund of funds
Expected p.a. IRR, gross of fees, net of carried interest	15.00%
Management fees	2.00%
Expected commitment invested	100%
Life of fund (years)	12
Investment period (years)	5
Cash flow frequency	Quarterly

For illustrative purposes only. Source: T. Rowe Price.

Characteristics of indicative cash flows generated – infrastructure debt

Asset class	Senior infrastructure debt
Expected p.a. IRR, gross of fees	4.50%
Management fees	0.50%
Expected commitment invested	100%
Life of fund (years)	11
Investment period (years)	4
Cash flow frequency	Quarterly

For illustrative purposes only. Source: T. Rowe Price.

Details of portfolios modelled

Allocations	Cash	Conservative Fixed Income	Global Equities	Expected Return p.a.	Expected Volatility p.a.
Low risk	30%	55%	15%	2.5%	3.0%
Mid risk	10%	60%	30%	3.4%	4.8%
High risk	10%	30%	60%	4.4%	8.6%
Cash	100%	0%	0%	0.2%	1.0%
Conservative Fixed Income	0%	100%	0%	2.7%	4.0%
Global Equities	0%	0%	100%	5.8%	14.4%

For illustrative purposes only. Source: T. Rowe Price.

The low-risk portfolio was constructed with an expected return well in excess of the 2% investment management fees assumed on capital committed to the private equity programme. The mid and high-risk portfolios were then selected as offering reasonable levels of diversification at higher levels of risk given the building blocks available.

We adopt T. Rowe Price's 10 year expected returns of 5.8% per annum for global equities and 0.2% for GBP cash, while the return on Dynamic Global Bond (DGB) is assumed to be GBP cash +2.5% – each net of assumed investment management fees.

Monthly returns for each of the modelled portfolios are then sampled assuming a normal distribution of returns for each portfolio.

The assumed correlations and volatility for each of the three asset classes are shown below.

Correlations	1	2	3	Volatility (p.a.)
UK Cash	1.00	0.06	-0.02	1.0%
DGB	0.06	1.00	-0.04	4.0%
Global Equity	-0.02	-0.04	1.00	14.4%

For illustrative purposes only. Source: T. Rowe Price.

Appendix 3

T. Rowe Price Methodology: Monte Carlo Analysis

Monte Carlo simulations model future uncertainty. In contrast to tools generating average outcomes, Monte Carlo analyses produce outcome ranges based on probability, thus incorporating future uncertainty.

Hypothetical in nature, the projections do not reflect actual investment results, and are not guarantees of future results. The simulations are based on assumptions. The materials present only a range of possible outcomes. Actual results are unknown – therefore results may be better or worse than the simulated scenarios. Investors should be aware the potential for loss (or gain) may be greater than demonstrated in the simulations.

Modelling Assumptions include:

The primary asset classes used for this analysis are outlined in Appendix 1. The analysis includes 1,000 simulations for each portfolio allocation. Payouts are made as detailed in the methodology in Appendix 1. Portfolios are assumed to be rebalanced on a monthly basis for the forward-looking simulation.

Material Assumptions include:

The primary assumptions underlying the analysis are the historical period from which returns are resampled and the rate of return of each asset class. Underlying long-term rates of return for the asset classes are not directly based on historical returns. Rather, they represent assumptions that take into account, among other things, historical returns. They also include estimates for reinvested dividends, rebalancing frequency, and capital gains.

Material Limitations include:

The analysis relies on return assumptions of asset classes (not investment products), combined with a historical resampling period, to generate a wide range of possible return scenarios. There is no certainty the future path of asset class returns is within the range of outcomes modelled. As a consequence, the results of the analysis should be viewed as comprehensive, but not exhaustive. Users should also keep in mind that seemingly small changes in input parameters, including the initial values for the underlying factors, may have a significant impact on results. This, as well as mere passage of time, may lead to considerable variation in results for repeat users.

Additional material limitations include:

Extreme market movements may occur more often than in the model.

Market crises can cause asset classes to perform similarly, lowering the accuracy of our projected return assumptions, and diminishing the benefits of diversification in ways not captured by the analysis. As a result, returns experienced by the investor may be more volatile than projected.

Asset class dynamics, including but not limited to risk, return and the duration of 'bull' and 'bear' markets, can differ than those in the modelled scenarios.

The analysis does not use all asset classes.

Taxes, transaction costs, other potential expenses, potential for alpha from active management, and investment management fees are not taken into account.

IMPORTANT: The projections or other information generated by T. Rowe Price regarding the likelihood of various investment outcomes are hypothetical in nature, do not reflect actual investment results, and are not guarantees of future results. The simulations are based on assumptions. There can be no assurance the projected or simulated results will be achieved or sustained. The charts present only a range of possible outcomes. Actual results will vary with each use and over time, and such results may be better or worse than the simulated scenarios. Clients should be aware the potential for loss (or gain) may be greater than demonstrated in the simulations.

The results are not predictions, but should be viewed as reasonable estimates.

Appendix 4

T. Rowe Price Dynamic Global Bond Strategy

As of December 31, 2021

In U.S. dollar

Domicile: United States

	Annualised		
	1 Year	3 Years	5 Years
Dynamic Global Bond (USD Hedged) Composite (Gross)	0.54	3.59	2.20
Dynamic Global Bond (USD Hedged) Composite (Net - Separate Account)	0.21	3.25	1.87
Custom Benchmark - Linked to ICE BofA US 3-Month Treasury Bill Index	0.09	1.03	1.34

Past performance is not a reliable indicator of future performance.

Net of fees performance reflects the deduction of the highest applicable management fee that would be charged based on the fee schedule appropriate to you for this mandate, without the benefit of breakpoints.

Dynamic Global Bond (USD Hedged) Composite

The Dynamic Global Bond (USD Hedged) Composite seeks to deliver consistent fixed income returns through a flexible, dynamic and diversified allocation to debt instruments from around the world. The strategy adopts a holistic and rigorous approach to risk management to protect clients on the downside, and particularly seeks to provide adequate diversification at times of equity markets' correction. (Created January 2015).

First \$50 million	37.5 basis points
Next \$50 million	30.0 basis points
Above \$100 million	30 basis points on all assets ¹
Above \$250 million	25 basis points on all assets ¹
Minimum separate account size	\$100 million

1. A transitional credit is applied to the fee schedule as assets approach or fall below the breakpoint.

GIPS® Composite Report

Dynamic Global Bond (USD Hedged) Composite

Period Ended December 31, 2021

Figures Shown in U.S. dollar

	2015 ²	2016	2017	2018	2019	2020	2021
Gross Annual Returns (%) ¹	5.23	5.07	-1.15	1.46	0.24	10.29	0.54
Benchmark (%)	0.28	0.75	1.28	2.34	2.36	0.66	0.09
Composite 3-Yr St. Dev.	N/A	N/A	N/A	2.05	2.67	3.81	3.95
Benchmark 3-Yr St. Dev.	N/A	N/A	N/A	0.20	0.16	0.26	0.30
Composite Dispersion	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Comp. Assets (Millions)	63.3	612.7	4,438.0	8,380.3	8,273.9	7,615.2	9,401.3
# of Accts. in Comp.	2	2	4	5	4	3	3
Total Firm Assets (Billions)	772.4	817.2	1,000.2	972.7	1,218.2	1,482.5	1,653.6 ³

1. Investment return and principal value will vary. Past performance is not a reliable indicator of future performance. Monthly composite performance is available upon request.
2. January 31, 2015 through December 31, 2015.
3. Preliminary – subject to adjustment.

T. Rowe Price (TRP) claims compliance with the Global Investment Performance Standards (GIPS®) and has prepared and presented this report in compliance with the GIPS standards. TRP has been independently verified for the 25-year period ended June 30, 2021 by KPMG LLP. The verification report is available upon request. A firm that claims compliance with the GIPS standards must establish policies and procedures for complying with all the applicable requirements of the GIPS standards. Verification provides assurance on whether the firm's policies and procedures related to composite and pooled fund maintenance, as well as the calculation, presentation, and distribution of performance, have been designed in compliance with the GIPS standards and have been implemented on a firm wide basis. Verification does not ensure the accuracy of any specific composite presentation. TRP is a U.S. investment management firm with various investment advisers registered with the U.S. Securities and Exchange Commission, the U.K. Financial Conduct Authority, and other regulatory bodies in various countries and holds itself out as such to potential clients for GIPS purposes. TRP further defines itself under GIPS as a discretionary investment manager providing services primarily to institutional clients with regard to various mandates, which include U.S., international, and global strategies but excluding the services of the Private Asset Management group. The minimum asset level for equity portfolios to be included in composites is \$5 million and prior to January 2002 the minimum was \$1 million. The minimum asset level for fixed income and asset allocation portfolios to be included in composites is \$10 million; prior to October 2004 the minimum was \$5 million; and prior to January 2002 the minimum was \$1 million. Valuations are computed and performance reported in U.S. dollars.

Gross performance returns are presented before management and all other fees, where applicable, but after trading expenses. Net of fees performance reflects the deduction of the highest applicable management fee that would be charged based on the fee schedule contained within this material, without the benefit of breakpoints. Gross performance returns reflect the reinvestment of dividends and are net of nonreclaimable withholding taxes on dividends, interest income, and capital gains. Gross performance returns are used to calculate presented risk measures. Effective June 30, 2013, portfolio valuation and assets under management are calculated based on the closing price of the security in its respective market. Previously portfolios holding international securities may have been adjusted for after-market events. Policies for valuing portfolios, calculating performance, and preparing compliant presentations are available upon request. Dispersion is measured by the standard deviation across asset-weighted portfolio returns represented within a composite for the full year. Dispersion is not calculated for the composites in which there are five or fewer portfolios.

The strategy utilizes on a regular basis a variety of derivative instruments such as (but not limited to) currency forwards, fixed income futures, interest rate swaps, credit default swaps, synthetic indices, and options on all mentioned instruments, primarily to hedge certain market risks associated with the strategy's objective, to express directional opportunities on specific markets and to facilitate liquidity management.

Benchmarks are taken from published sources and may have different calculation methodologies, pricing times, and foreign exchange sources from the composite.

Composite policy requires the temporary removal of any portfolio incurring a client initiated significant cash inflow or outflow greater than or equal to 15% of portfolio assets. The temporary removal of such an account occurs at the beginning of the measurement period in which the significant cash flow occurs and the account re-enters the composite on the last day of the current month after the cash flow. Additional information regarding the treatment of significant cash flows is available upon request.

The firm's list of composite descriptions, a list of limited distribution pooled fund descriptions, and a list of broad distribution pooled funds are available upon request. GIPS® is a registered trademark of CFA Institute. CFA institute does not endorse or promote this organization, nor does it warrant the accuracy or quality of the content contained herein.

Key strategy risks

ABS/MBS risk – These securities may be subject to greater liquidity, credit, default and interest rate risk compared to other bonds. They are often exposed to extension and prepayment risk.

China Interbank Bond Market risk – market volatility and potential lack of liquidity due to low trading volume of certain debt securities in the China Interbank Bond Market may result in prices of certain debt securities traded on such market fluctuating significantly.

Contingent convertible bond risk – contingent convertible bonds have similar characteristics to convertible bonds with the main exception that their conversion is subject to predetermined conditions referred to as trigger events usually set to capital ratio and which vary from one issue to the other.

Country risk (China) – all investments in China are subject to risks similar to those for other emerging markets investments. In addition, investments that are purchased or held in connection with a QFII licence or the Stock Connect program may be subject to additional risks.

Country risk (Russia and Ukraine) – in these countries, risks associated with custody, counterparties and market volatility are higher than in developed countries.

Credit risk – a bond or money market security could lose value if the issuer's financial health deteriorates.

Currency risk – changes in currency exchange rates could reduce investment gains or increase investment losses.

Default risk – the issuers of certain bonds could become unable to make payments on their bonds.

Derivatives risk – derivatives may result in losses that are significantly greater than the cost of the derivative.

Emerging markets risk – emerging markets are less established than developed markets and therefore involve higher risks.

High yield bond risk – a bond or debt security rated below BBB- by Standard & Poor's or an equivalent rating, also termed 'below investment grade', is generally subject to higher yields but to greater risks too.

Interest rate risk – when interest rates rise, bond values generally fall. This risk is generally greater the longer the maturity of a bond investment and the higher its credit quality.

Issuer concentration risk – to the extent that a portfolio invests a large portion of its assets in securities from a relatively small number of issuers, its performance will be more strongly affected by events affecting those issuers.

Liquidity risk – any security could become hard to value or to sell at a desired time and price.

Prepayment and extension risk – with mortgage and asset-backed securities, or any other securities whose market prices typically reflect the assumption that the securities will be paid off before maturity, any unexpected behaviour in interest rates could impact portfolio performance.

Sector concentration risk – the performance of a portfolio that invests a large portion of its assets in a particular economic sector (or, for bond portfolio, a particular market segment), will be more strongly affected by events affecting that sector or segment of the fixed income market.

General Portfolio Risks

Capital risk – the value of your investment will vary and is not guaranteed. It will be affected by changes in the exchange rate between the base currency of the portfolio and the currency in which you subscribed, if different.

Counterparty risk – an entity with which the portfolio transacts may not meet its obligations to the portfolio.

ESG and Sustainability risk – may result in a material negative impact on the value of an investment and performance of the fund.

Geographic concentration risk – to the extent that a portfolio invests a large portion of its assets in a particular geographic area, its performance will be more strongly affected by events within that area.

Hedging risk – a portfolio's attempts to reduce or eliminate certain risks through hedging may not work as intended.

Investment portfolio risk – investing in portfolios involves certain risks an investor would not face if investing in markets directly.

Management risk – the investment manager or its designees may at times find their obligations to a portfolio to be in conflict with their obligations to other investment portfolios they manage (although in such cases, all portfolios will be dealt with equitably).

Operational risk – operational failures could lead to disruptions of portfolio operations or financial losses.

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