

Meeting public benefit obligations in good and bad times

Volatile markets and recent equity market drawdowns highlight the long-term effects that short-term dislocations can create. For pension plans, ensuring plan participants receive their scheduled payments can prove difficult in volatile markets, depending on their funding situation and where these payments are sourced. In some cases, plans become forced sellers of illiquid assets, “locking-in” a loss and extending the time until achieving a sustainable funding level.

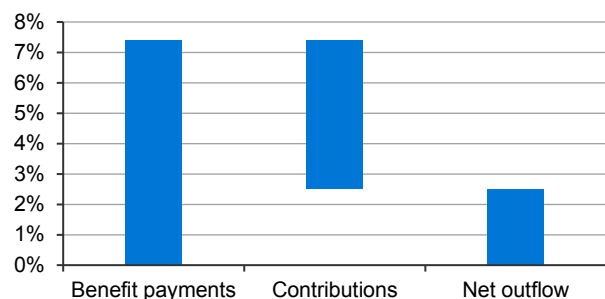
In this piece, we introduce an investment framework to help address these challenges. A liquid sleeve of the plan’s portfolio can help meet immediate cash flow needs and insulate the rest of the portfolio from the impact of having to make the required payments - hence protecting plan members further in cases of severe market stress.

How big an issue is liquidity?

Low (and falling) risk-free returns have reduced the yield opportunities in global capital markets, pressuring plans to allocate to less liquid opportunities to capture an illiquidity premium. This is primarily driven by a need to maximize the expected return of the plan (which serves as the discount rate to determine plan liabilities). In stressed markets, this narrows the sources of funding for benefit payments, ultimately forcing plans to sell their more liquid assets at lower prices and potentially higher transaction costs to meet their benefit obligation.

Most public pension plan portfolios experience significant outflows as a percentage of their asset base. While plans benefit from both employer and employee contributions, these inflows are generally smaller than the outflows, creating a substantial need for liquidity to satisfy the net outflows. To further complicate things, some private investments have investment schedules that create another obligatory outflow. This can cause a drag on expected return (committed but non-invested capital doesn’t earn the illiquidity premium) while simultaneously putting more pressure on outflows (cash needs to be available).

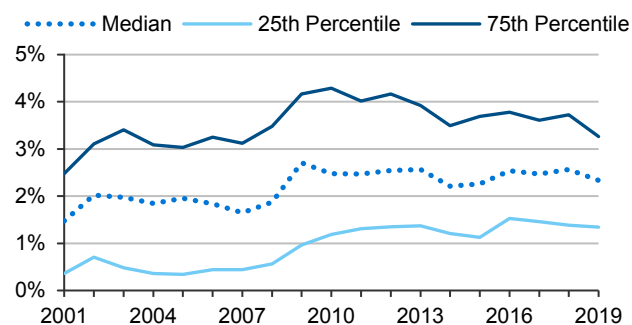
Figure 1: Annual liquidity needs as % of plan assets



As of December 31, 2019. Source: LGIMA, Public Plan database.

Based on our database, the average public plan has annual net outflows of 2-3%. Some plans have even greater liquidity needs, as summarized below.

Figure 2: Annual net outflow as % of plan assets



As of December 31, 2019. Source: LGIMA, Public Plan database.

We can see that liquidity demands on public plans have persisted for years, and in some cases, greatly varied in magnitude - while Figure 2 shows the 25th and 75th percentiles, our database highlights that plans on the higher end of the spectrum could experience 10-25% net outflows.

In the remainder of this paper, we will describe a straightforward approach to addressing this liability-based challenge.

Defining a hurdle rate

Hurdle rate can be defined as the asset growth rate to maintain funded status position. One way to calculate it is to add the discount rate and the normal cost (rate of benefit accrual) and adjust for the funding ratio. While this approach doesn’t address benefit payments (for clarity and simplicity), it provides a

basic framework for understanding the necessary level of return over a given year, to ensure that the funding position doesn't deteriorate. Below is an example, assuming the discount rate is 7%, normal cost is 2% and funding ratio is 75%.

- a. Liability growth: Discount rate (7%) + Normal Cost (2%) = 9%
- b. Adjustment for asset size relative to liabilities: Hurdle rate = 9% / Funding ratio (75%) = 12%

In the example above, ignoring contributions, the plan assets need to return 12% to ensure the deficit doesn't worsen. Should contributions add up to 8%, the required return would fall to 4%.

The hurdle rate calculation shows that the hurdle rate is a function of the funding ratio; for example, if the funding ratio had been 90% rather than 75%, the hurdle rate would have dropped from 12% to 10%. A lower funding ratio implies a higher hurdle rate, so the assets are expected to return more just to maintain the funded status.

Under adverse market conditions, the funding ratio is likely to drop, resulting in an increased hurdle rate. In these times, plans are likely to be forced sellers of assets to meet benefit payments. Plan sponsors can therefore find themselves in a challenging situation:

- Increased hurdle rates
- Shrinking asset pool
- Potential missed opportunities if the higher yielding assets must be sold to meet benefit promises

It is therefore important to have a liquidity framework in place so that plan sponsors can at least mitigate the impact of having to liquidate assets at potentially the worst possible time. In doing so, plans can potentially hold on longer to the assets that are expected to meet the higher hurdle rate, or to at least reduce the impact of higher transaction costs implied by more volatile market conditions.

In a future publication we will directly address some ways plans can reduce the impact of adverse markets on the portfolio.

Liquidity Coverage Ratio for a public pension plan

The Liquidity Coverage Ratio (LCR) is a banking regulation concept where banks are required to have liquid assets to cover 30 days of liquidity needs in the event of a "run on the bank". We can apply the same concept to pension plans over longer time periods, for example using an annual metric rather than a monthly one.

$$\text{LCR} = \text{High quality liquid assets} / \text{Total net cashflows}$$

For example, banking regulations typically require a ratio of 1.0 and apply a haircut to non-Treasury investments as most assets tend to lose value and become less liquid in times of crises.

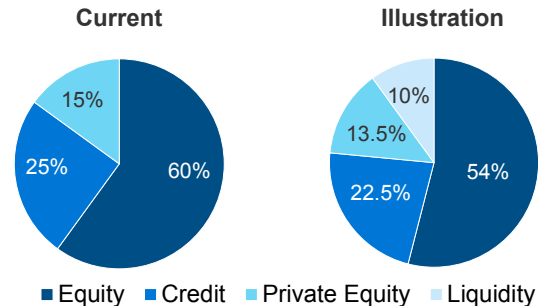
In the rest of the publication, let's consider a sample plan's asset allocation: 60% global equities, 15% private equity and 25% in bonds.

This example plan sponsor used the LCR framework described previously and determined they're looking for a liquidity sleeve that represents 10% of the assets to meet 18 months' worth of expected outflows.

The liquidity sleeve can be built in various ways. The following illustrates how this portfolio could evolve and the trade-offs inherent in each construction.

- Cash portfolio
- Treasury portfolio
- Cashflow matching portfolio
- Synthetic exposure to free up capital and top up liquidity sleeve
- Full Strategic Asset Allocation replication within liquidity sleeve

Figure 3: Constructing a liquidity sleeve



Cash portfolio

To ensure obligations are met, plans can create a portfolio of cash to cover some period of payments. However, while this solves the liquidity issue in the short-term, this could create a substantial drag on expected return and put the long-term health of the plan at risk.

Given our sample asset allocation, this would require setting aside 10% of the asset allocation, which would have to be sourced from other asset classes. Assuming no return on cash, this would penalize the long-term return by the following amount:

$$\text{Liquidity sleeve } 10\% \times \text{Expected long-term return on asset class where cash is sourced}$$

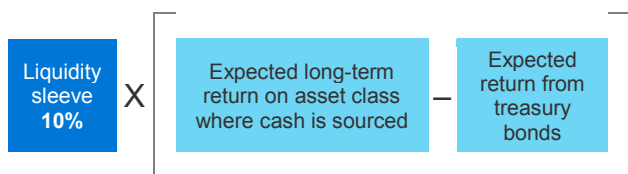
While this could work for plans with minimal cash needs, this strategy would otherwise put the plan at odds with itself – the more cash needs, the greater the required reserves and the greater the drag on return. A more thoughtful approach is required.

Treasury portfolio

It may be prudent to create a liquidity portfolio consisting of Treasury bonds given the high transaction costs during volatile times.

Given the highly liquid nature of Treasuries, the portfolio could include a wide variety of Treasury products optimizing for yield, duration, and curve exposure.

Using our case asset allocation, the expected drag on return is now:



Investors expect to be compensated for holding Treasury bonds, so this should reduce the drag on expected return relative to a cash-only liquidity buffer. In other words, the long-term expected return using this approach should be higher than under the cash-only approach, but it would still result in a lower expected return compared to not having a liquidity buffer.

There is, however, a potential additional benefit of using a liquidity sleeve based on Treasuries. If history serves as a guide, flight-to-safety has at times resulted in Treasuries outperforming some of the other asset classes. This would provide added diversification and a much-needed buffer when the rest of the portfolio is experiencing a decline in value. See *Figure 4* below.

While this approach will still experience a drop in long-term expected returns, it is certainly a step in the right direction compared with holding cash: it is relatively liquid and has the potential to provide some diversification at the time it might be needed the most.

Figure 4: Total return during major historical meltdowns

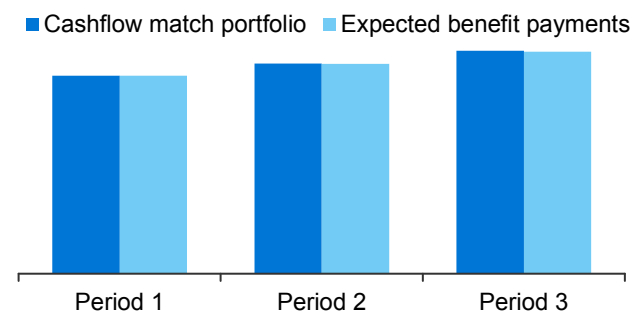
Start	End	Event	STRIPS 20+	Long Treasuries	S&P 500	US Long Credit
03/31/2000	09/30/2002	Telecom Crisis	109%	35%	-44%	29%
06/29/2007	03/03/2009	Financial Crisis	65%	25%	-52%	-6%
02/06/2020	3/19/2020	COVID-19 shock	9%	6%	-28%	-19%

Source: LGIMA

Cashflow matching credit portfolio

Adopting a cashflow matching framework is a proactive approach to pay pension obligations as they come due. With the primary goal of enhanced portfolio liquidity, we build customized credit portfolios unique to a plan's nominal benefit payments – as payments come due, coupon and principle payments are used to pay benefits. As payments are made, the portfolio is replenished to ensure the buffer is brought back to the desired level.

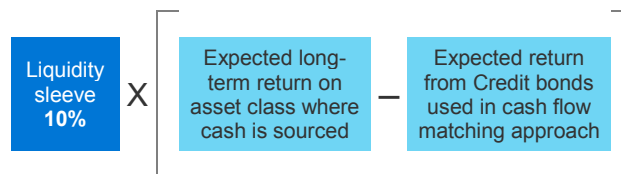
Figure 5: Illustrative cashflow match



While markets can be unpredictable, this approach ensures that plans will be able to meet their short-term obligations while leaving their return-seeking allocations untouched. To optimally preserve value, this strategy offers:

- **Customized diversification:** Sector, issuer, quality, maturity
- **Reduced trading costs:** Trading costs in credit markets can be substantial, especially in volatile markets
- **Long-term management of strategic themes and views:** Top-down investment themes, bottom-up views, and alpha opportunities through asset allocation, security selection, and industry rotation

Using our case asset allocation, the expected drag on return is now:



Using this approach, we benefit from credit investments which should help increase the long-term expected return relative to the two previous options. To minimize the return drag, it may make sense to source payments from the credit portfolio rather than from the equity allocation. Given the duration differential we still anticipate returns to lag to some extent, but this should be an improvement relative to the previous option.

Depending on the cash needs covered by this liquidity portfolio, it might be possible to just draw on this portfolio until the market bounces back rather than replenishing this portfolio. In other words, while markets are performing well, the portfolio is replenished as benefits are paid; but this process could be paused during market drawdowns to avoid drawing on higher-yielding assets thereby allowing these assets to benefit from a market recovery.

These bonds are still subject to default risk, so security selection is important. In addition, using this approach in the current yield environment still requires significant capital to be diverted from potentially higher yielding assets at inception.

We have, until now, identified three options with their pros and cons, by decreasing drag on long-term expected returns:

- Cash only
- Treasuries
- Cash flow matched credit

A combination of Treasuries and cash flow match credit allocation could provide some of the flight-to-safety benefits from the allocation to Treasuries, assuming the risk-off market behavior still favors Treasuries.

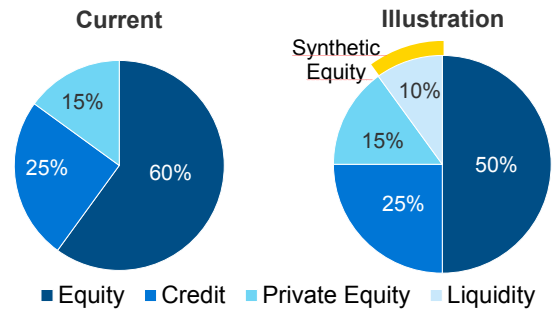
The common challenge to these three approaches remains the overall impact on expected return, which would hurt the asset growth potential to various degrees but would at least be a step in addressing liquidity challenges. Let's evolve this further to tackle the challenge of the drag on long-term expected return.

Synthetic exposure to free up capital and top up liquidity sleeve

With the fall in expected return associated with a liquidity buffer, plans will need to enhance the return of the portfolio with reduced capital. Fortunately, derivatives can replicate many different exposures with potentially low capital requirements. In practice, a plan sponsor could obtain part of their equity exposure using equity derivatives, freeing up some capital for the liquidity sleeve

while keeping overall expected returns close to initial expectations. This is subject to funding costs at the time the exposure is implemented. It does not have to stop with equities as it is possible to approximate other asset class exposures.

Figure 6: Incorporating an equity overlay supported by the liquidity sleeve



Using our case asset allocation, the expected drag on return is now:

$$\text{Liquidity sleeve } 10\% \times \text{Cost of synthetic equity exposure}$$

Using synthetic exposure (e.g. futures, swaps) could enable plans to insulate capital for benefit payments. An additional benefit is that synthetic exposure could also be an effective tool to help keep plan allocations within the ranges of their intended strategic weights.

Example toolkit

- Equity index futures and total return swaps (OTC and cleared)
- Equity dividend futures and total return swaps
- Index credit default swaps (Index CDS or CDX)
- Interest rate futures, total return swaps and swaptions
- Commodity futures
- Exchange-traded products (ETF and ETN)
- Inflation-linked swaps

Full strategic asset allocation replication within liquidity sleeve

A liquidity sleeve that mimics strategic exposures

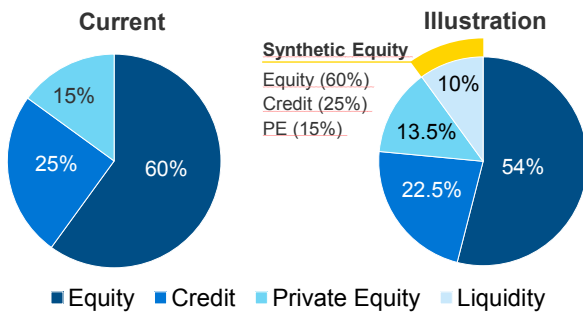
As an extension to synthetically replicating the asset class that provided the capital for the liquidity portfolio (e.g. equities above), plans could replicate the entire strategic asset allocation (SAA) in the liquidity sleeve.

Using our case asset allocation, the expected drag on return is:



We would replicate the SAA within this liquidity sleeve using highly liquid instruments so, in theory, the drag on return should be close to disappearing. This is because the liquidity sleeve is expected to have approximately the same return as the rest of the portfolio.

Figure 7: Incorporating an SAA overlay supported by the liquidity sleeve



Various instruments would be used, for example a combination of equity and bond futures for the equity and interest rates allocations of the portfolio. There are also ways to obtain credit spread exposure synthetically (e.g. CDX). As for private equity, we have developed a framework to approximate private equity exposure in a liquid format, so it would not be subject to capital calls or lock-in periods concerns. Our approach involves looking at the drivers of private equity returns and getting exposure to these factors directly, in a liquid form.

Benefits of this approach

The objective of this approach is to be able to tap into this sleeve as needed, while leaving the physical allocations intact. The physical allocations are the ones that are likely to be costlier to transact during times of market stress. In addition, as markets bounce back we need to ensure that the portfolios are fully exposed, so they can benefit from the rebound. The approach enables the plan to keep their long-

term expected return broadly neutral, relative to the portfolio that doesn't have a liquidity sleeve.

This strategy could reduce the relative amount of synthetic exposure per asset class, providing more derivative diversification as well as enhanced flexibility to shape plan outcomes. This flexibility comes in many forms, including trading and instrument cost considerations as well as exposure management through plan transitions and rebalances. Additionally, the plan can utilize tactical weights to express both short and long-term views for excess return generation.

How about leverage?

As comfort increases with the synthetic alternatives, plans can begin to utilize leverage. The right leverage and liquidity sleeve would be designed to allow for efficient risk management. It will be a function of the liquidity of the instruments used, and the costs involved. It usually makes sense to borrow at a low cost to invest in an asset class that is expected to earn a return premium over the long-term.

However, this strategy could also be fully collateralized for plans that do not allow leverage. Such plans would still benefit from the economies of scale implied by using a Treasury portfolio (e.g. using Treasuries as collateral for a synthetic equity position). It should be noted that an increasing number of public plans are using leverage as a tool to manage plan outcomes. Using an overlay can help maintain the long-term expected return and provide a margin for safety; it is therefore a compelling solution to consider in addressing liquidity challenges.

Continuing the conversation

In this piece, we sought to illustrate a spectrum of implementable liquidity solutions for public pension plans. In practice, a thorough discussion involves various considerations including funding costs and opportunity costs. The ideas were presented conceptually for brevity, and we would welcome the opportunity to develop these further with plan sponsors interested in collaborating on a liquidity investment solution adapted to their specific requirements using our extensive cross-asset expertise.

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