

## Strategic liquidity

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### Executive summary

Lower return expectations have pushed investors further out the risk curve and have forced many to consider higher allocations to illiquid assets. These assets are attractive to many investors as they offer the prospect of higher returns and additional diversification in the portfolio, but illiquid assets come with added complexities for the investment program that cannot be captured in a traditional asset allocation study.

An analysis of illiquid allocations across a universe of portfolios suggests that institution type and size may be the determining factors in how much capital is allocated to illiquid assets. We believe illiquid allocations should be based on the financial situation of the institution. Verus has developed a framework to analyze the impact illiquid asset programs have on the overall portfolio. This framework can be integrated with existing asset allocation studies to answer three strategic liquidity questions:

- Will private assets need to be sold to fund cash flow needs?
- What percent of the portfolio is being liquidated for cash flow needs?
- How likely is a breach of strategic asset allocation bands?

### The current environment

There are several benefits to having liquidity in the portfolio as identified in Figure 1<sup>1</sup>. As investors allocate capital away from liquid investments the

ability to utilize/exercise these benefits are reduced in exchange for higher expected returns and portfolio diversification. Weighing the benefits of liquidity versus adding illiquid assets is not a simple task. There is no industry standard approach to analyze these considerations and the additional complexities introduced with private assets can be difficult to identify and quantify. Recommendations of how much illiquid assets to hold will vary by consultant, and decisions surrounding the appropriate allocations will vary based on the Boards' level of comfort and sophistication.

FIGURE 1



According to the InvestorForce universe data summarized in Table 1, which is grouped by plan type and size, most plans allocate somewhere between 15-50% to illiquid assets – this is a very wide range, representing variety of risk tolerances and needs. Large endowments typically allocate towards the high end of that range while smaller corporate defined benefit plans tend to allocate towards the lower end.

TABLE 1

Plan Type	Allocation to Illiquids <sup>2</sup> by Plan Size		
	\$50-250M	\$250-\$1B	>\$1B
Corporate Defined Benefit Plans	15%	16%	18%
Public Defined Benefit Plans	18%	20%	27%
Taft-Hartley Defined Benefit Plans	23%	30%	31%
Endowment/Foundation	37%	48%	51%

The differences in allocations are quite striking, specifically among the plans with similar size. This table suggests that Plan type and size may be the determining factors in illiquid allocations. Larger institutions having higher allocations makes intuitive sense as more complex investments will require additional resources. But is the disparity among plan types of similar size appropriate, and how is that appropriateness best judged? In reality we believe that illiquid allocations should be based on the financial position of the institution. By assessing this financial position, we can determine if a medium sized defined benefit plan should move from 20% illiquid assets to 25%. We have developed a framework that can be used to assist investors in making illiquid allocation decisions.

### Strategic liquidity framework

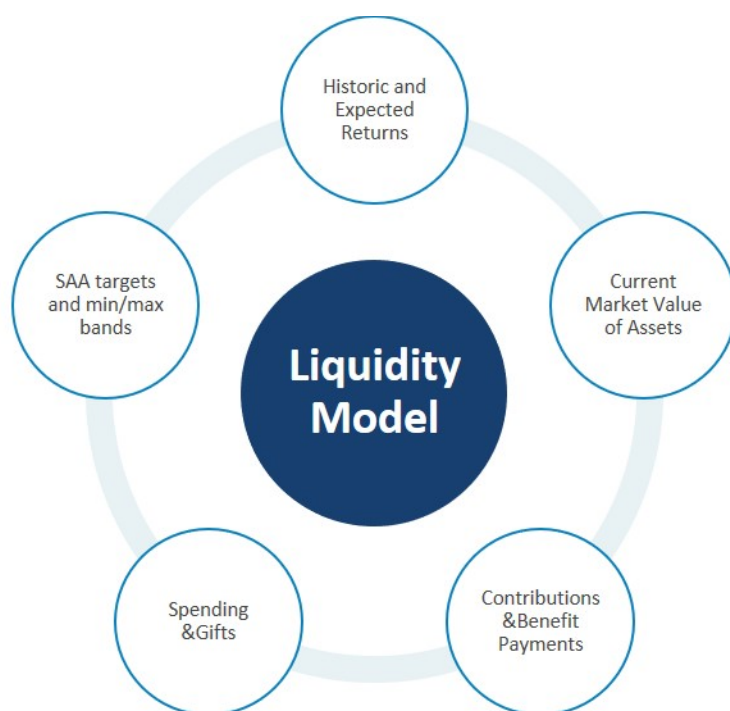
To understand a Plan's liquidity profile, we start by gathering all the necessary cash flow data.

This involves sourcing all the cash inflows and outflows over a projected time period. Since illiquid allocations are a strategic decision for investors, we are less concerned with liquidity over a period of 1-6 months (this is an operational liquidity concern that needs to be addressed separately) and more concerned over a period of 5-10 years. We will be referring to liquidity over this time period as “strategic liquidity”.

Figure 2 identifies the components of the liquidity model. By focusing on cash flows - all the money going in and out - we can create an analysis that applies to any type of Plan. While the types of cash flows differ between Plans, the dynamics of how cash flows interact with an asset base are consistent for all investors. We input the Strategic Asset Allocation (SAA) in order to simulate expected /historic portfolio return paths and we also use the SAA bands to determine if any potential breaches occur through time. The framework allows investors to conduct an analysis considering changing benefit payments/contributions or gifts/spending policies and the resulting liquidity impact.

Illiquid assets come with additional considerations surrounding regulations, reporting, implementation, and sourcing managers, which will not be discussed in this piece.

FIGURE 2



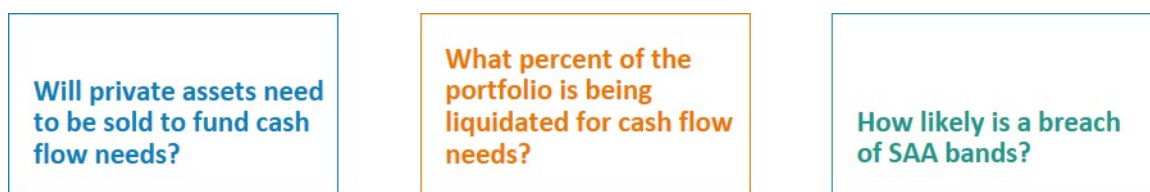
### Liquidity risk tolerance

When investing in illiquid assets, investors have different long-term objectives, contractual obligations and risk tolerances which lead to varying illiquid allocations. The health of a plan is

largely determined by the current and future cash flows they must make. All things equal, a plan that has positive cash flows today (and expects that to continue in the future) will be able to more safely invest in illiquid assets because they will have a buffer to protect in downside events. If a Plan is cash-flow negative, it does not preclude them from investing in private assets, however, it is important they understand how their cash flow status is impacted with the introduction (or expansion) of a private asset program.

Risk tolerance comes down to an investors ability and willingness to accept a risk. Ability is driven largely by the health of the plan, and willingness is driven by the risk tolerance of the investor. An investor's liquidity risk tolerance identifies how much risk is acceptable in pursuit of their goals. In most cases, goals will include an explicit return target. Quantifying strategic liquidity risk is difficult because there are several variables to consider and a significant amount of uncertainty surrounding each variable, however, we believe our framework can help. By identifying and quantifying the three questions in Figure 3, we believe an investor can better understand their strategic liquidity risk tolerance.

**FIGURE 3: STRATEGIC LIQUIDITY QUESTIONS**



As illiquid assets increase in the portfolio the likelihood of these negative cash-flow events increases. If the likelihood of the events can be quantified, then we can detect a risk tolerance level more explicitly. Most investors will find it difficult to pinpoint an exact probability level at which they cease being comfortable pursuing additional risk. An investor may not have an aversion to a 25% allocation to illiquid assets, but if that allocation implies 7% of the portfolio needs to be liquidated on average to fund annual cash flow needs and there is a 10% chance those private assets will need to be sold to fund cash flow needs, the investor can more tangibly determine their risk tolerance to holding illiquid assets.

To answer these questions, we combine our best guess of the returns we expect in the future (Monte Carlo analysis) with what we have experienced in the past. We include historic data, because as we have observed through time investors' predictions about the future can be wildly different than expectations, especially in predicting drawdowns.

#### **WILL PRIVATE ASSETS NEED TO BE SOLD TO FUND CASH FLOW NEEDS?**

Any investor that allocates capital to illiquid assets should consider the likelihood of being forced to sell those assets prior to fully realizing their value. A secondary market exists for private assets, but buyers of those assets require significant discounts and selling in these markets should be avoided. In the subprime crisis of 2007-2008, we witnessed Plans not having the liquidity to fund capital calls. In this situation, an investor is forced to:

1. Sell illiquid assets at a large discount in order to meet capital calls
2. Borrow money to fund capital calls
3. Default on capital calls.

We leverage a banking regulation framework to formulaically measure this dynamic. In the Basel III accord, regulators defined the Liquidity Coverage Ratio (LCR) as the ratio of highly liquid financial assets relative to short term obligations. This formula has been modified and applied to institutional portfolios in order to capture the total liquidity available relative to the liquidity needs. Equation 1 identifies the LCR formula.

EQUATION 1: LIQUIDITY COVERAGE RATIO

$$\text{Liquidity Coverage Ratio (LCR)} = \frac{\text{Liquidity Available}}{\text{Liquidity Needs}}$$

While the equation stays the same, the inputs vary by the type of institution. Equation 2 below identifies the appropriate inputs for an Endowment/Foundation and Equation 3 identifies the appropriate inputs for a pension.

EQUATION 2: ENDOWMENT LIQUIDITY COVERAGE RATIO

$$\text{Endowment LCR} = \frac{\begin{array}{c} \text{Liquid Financial Assets} \\ \Sigma(\text{Distributions for Illiquid Assets}) \\ \Sigma(\text{Investment Income}) \end{array}}{\begin{array}{c} \Sigma(\text{Spending}) \\ \Sigma(\text{Capital Calls for Illiquid Assets}) \\ \Sigma(\text{Expenses/Other withdrawals for stressed needs}) \end{array}}$$

EQUATION 3: PENSION LIQUIDITY COVERAGE RATIO

$$\text{Pension LCR} = \frac{\begin{array}{c} \text{Liquid Financial Assets} \\ \Sigma(\text{Distributions for Illiquid Assets}) \\ \Sigma\left(\frac{\text{Employer}}{\text{Employee}} \text{Contributions}\right) \\ \Sigma(\text{Investment Income}) \end{array}}{\begin{array}{c} \Sigma(\text{Benefit Payments}) \\ \Sigma(\text{Capital Calls for Illiquid Assets}) \\ \Sigma(\text{Plan Expenses}) \end{array}}$$

The cash flow types and sources may differ across institutions, but the takeaway from the LCR calculation is the same. The higher the ratio, the healthier liquidity coverage. The lower the ratio, the more likely illiquid assets will be needed to fund cash flow needs. The threshold for the LCR is 1. Any value below 1 indicates illiquid assets will need to be sourced for cash flow needs. Most investors will have an extremely low risk tolerance for encountering a situation where the LCR falls below 1.

#### **WHAT PERCENT OF THE PORTFOLIO IS BEING LIQUIDATING FOR CASH FLOW NEEDS?**

Funds that are liquidating higher percentages of their portfolio each year should be less willing to accept strategic liquidity risk. This analysis looks at the percent of both the total portfolio and liquid asset portfolio assets being liquidated to fund cash flow needs. Liquid assets are the source the Plan wants to use to fund cash flow needs, so understanding these implications are important.

#### **HOW LIKELY IS A BREACH IN SAA BANDS?**

In the investment policy statement, the board typically sets allocation targets and allowable ranges for each asset class. Given the targets and allowable ranges, we aim to identify the likelihood of a zone breach. This analysis can help stakeholders determine if the allocation and its ranges are appropriate. This last question does not carry the same repercussions as having to sell illiquid assets to fund cash flows. It becomes valuable in initiating a discussion of how to react to a potential future zone breach. Will a Plan decide to halt commitments? Will they stay the course and let the portfolio operate outside the allowable range?

### **Integrating strategic liquidity into asset allocation**

The strategic liquidity framework can be integrated with traditional asset allocation studies. Using a simple example, we will demonstrate how this framework can provide valuable information when constructing portfolios. Plan XYZ is considering increasing their private asset program. They currently allocate 20% to private assets and are interested how a potential expansion would impact their overall plan. Plan XYZ has zero risk tolerance for an event where illiquid assets are used for cash flow needs, and they are sensitive to increasing the amount of liquid assets they are selling each year for cash flow needs. Their CIO has authority to operate outside of the SAA bands, but is required to report the status of any breaches to the board on a quarterly basis. The mixes considered are identified in Table 2 along with risk/return expectations using Verus' capital market assumptions:

TABLE 2: ASSET ALLOCATION

Asset Class	Allocation (%) <sup>3</sup>		
	SAA	Mix 1	Mix 2
Global Equities	40	30	20
Private Assets	20	30	40
Core Fixed Income	40	40	40
<i>Expected Return</i>	6.4	6.7	7.0
<i>Expected Volatility</i>	11.1	11.8	12.8
<i>Sharpe Ratio</i>	0.4	0.4	0.4

By expanding the private asset program, Plan XYZ can increase their expected returns by up to 60 basis points. These mixes maintain similar Sharpe ratios, so the increase in expected returns is largely coming from additional portfolio volatility. In addition to the traditional mean variance analysis, Verus conducts scenario analysis, stress tests and risk factor analysis in our asset allocation studies. These are excluded here for the sake of brevity. The strategic liquidity framework summarizes several important scenarios in Tables 3A & 3B. Table 3A displays the expected likelihood of having to use illiquid assets for cash flow needs under each of the mixes. Table 3B displays the average outcome for each of the scenarios listed.

TABLE 3A: STRATEGIC LIQUIDITY SCENARIO

Scenario	SAA	Mix 1	Mix 2
Illiquid assets used for cash flows	0.0%	0.5%	8.4%

TABLE 3B: STRATEGIC LIQUIDITY SCENARIOS (AVERAGE)

Scenario	SAA	Mix 1	Mix 2
Liquidity Coverage Ratio	1.40	1.32	1.17
% of Portfolio being liquidated for CF Needs	5.5%	6.9%	8.3%
% of liquid Portfolio being liquidated for CF Needs	9.5%	14.1%	20.6%
Illiquid SAA breach frequency	5.0%	15.2%	38.4%
Illiquid SAA breach severity	0.5%	2.5%	5.5%

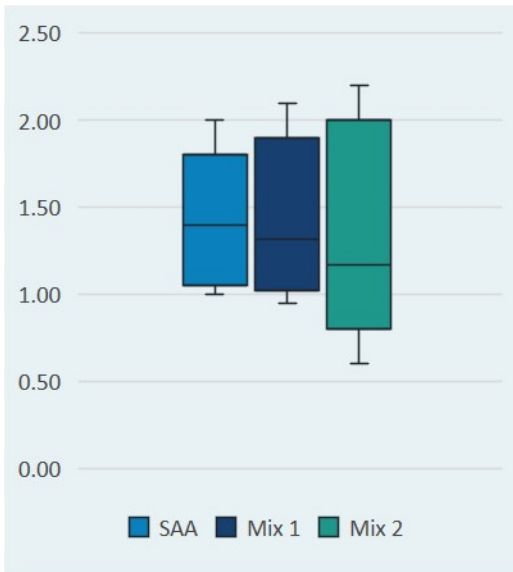
In Table 3A, we can see that Plan XYZ is not expected to have to sell illiquid assets for cash flow needs with the current SAA, however, they have a 0.5% probability under Mix 1 and an 8.4% chance under Mix 2.

The averages in Table 3B can be misleading as they are point estimates. We can further analyze each of these scenarios by considering their full distribution of expected outcomes. By combining both analyses, we can determine an expected value for each output, but also combine that with an understanding of risk and reward.



The average liquidity coverage ratio is expected to stay above 1 for all the mixes, but when we view the distribution of outcomes in Figure 4, we can see there are events where both Mix 1 and 2 fall below an LCR of 1, indicating illiquid assets would need to be sold for cash flow needs. This indicates that on average the LCR is above 1, but the tails of the distribution show the LCR falls well below 1 in Mix 2. Conversely, mixes 1 and 2 offer quite a bit more upside.

FIGURE 4: LIQUIDITY COVERAGE RATIO



On average 5.5% of the overall portfolio, and 9.5% of the liquid portfolio is being liquidated to fund cash flow. We can see the distribution of expected outcomes for each mix in table 5A and 5B.

FIGURE 5A: % OF TOTAL PORTFOLIO LIQUIDATED FOR CF NEEDS

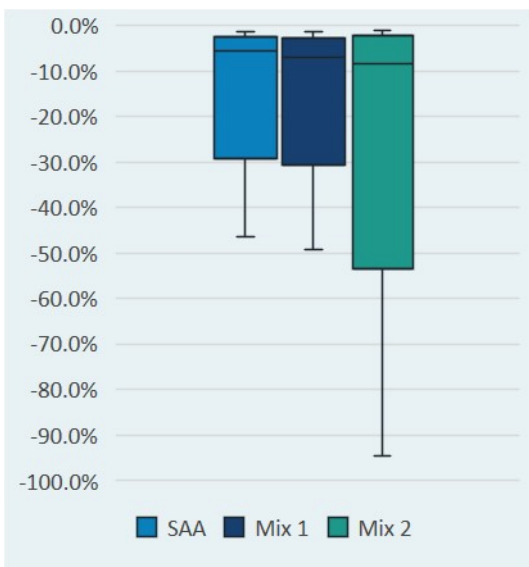
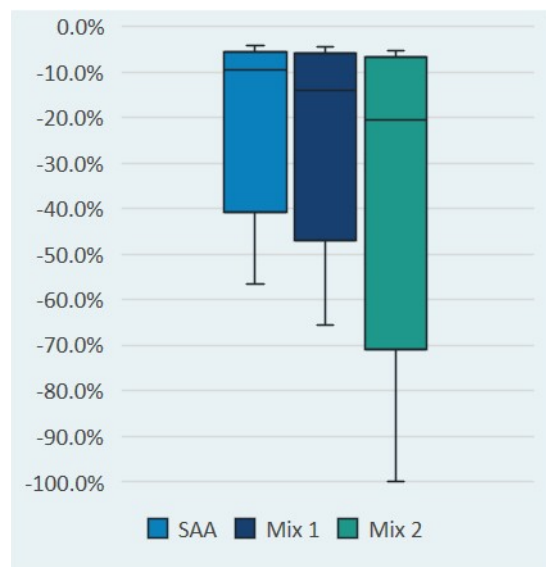


FIGURE 5B: % OF LIQUID PORTFOLIO SOLD FOR CF NEEDS

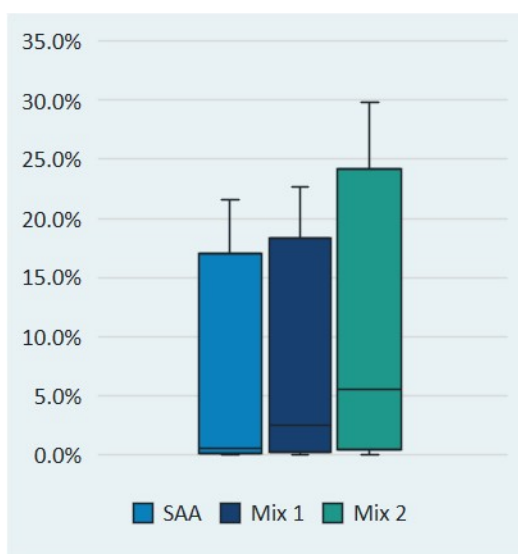




These figures display some striking possibilities - there is a chance that more than 40% of the current portfolio will be liquidated for cash flow needs. That type of situation (although rare) would be extremely difficult to recover from.

The last component is the potential breach in SAA bands. In this example we observe frequent breaches in the SAA zones. Table 3B shows that the current SAA is expected to breach 5% of the time. Mix 1 is expected to breach 15% and Mix 2 is expected to breach 38% of the time. The other important aspect of this scenario is the severity of the breach. We show the distribution of SAA breaches in Figure 6. We can see that while the average severity is low for the SAA (0.5%) and slightly higher for Mix 1 (2.5%), the possibility of a large breach in the SAA (20%) is possible.

FIGURE 6: SEVERITY OF SAA BAND BREACH



Plan XYZ has a tenuous strategic liquidity profile and is likely near their risk tolerance under the current SAA. Summarizing the analysis, we see:

- A large portion of the portfolio is being liquidated each year for cash flow needs. As we identified above, on average 5.5% of the portfolio is liquidated for cash flow needs, but there is a potential this will rise to 40% in a single year.
- The Plan's strong risk aversion to a scenario where they will be required to sell illiquid assets for cash flow needs, suggests mixes 1 and 2 should be eliminated from consideration.
- We expect frequent breaches in SAA zones, but Plan XYZ has planned for this event by codifying procedures in the investment policy statement and delegated authority to the CIO.

The challenge Plan XYZ faces is that they have been pushed out the risk curve and forced into illiquid assets, but they have essentially reached their capacity to hold those assets – and an argument can be made that they should have a lower allocation to illiquid assets. This plan needs to consider strategies to increase returns without allocating additional capital to illiquid assets.

## Conclusion

As lower return expectations push investors further out the risk curve, it's increasingly critical to understand how illiquid assets impact the overall investment program. The strategic liquidity framework helps investors integrate risk tolerance into asset allocation studies, with the goal of providing more information in the portfolio construction process. This framework can assist investors to determine if they are being overly conservative or aggressive in their approach to allocating capital to illiquid assets.

We recommend that investors periodically review strategic liquidity requirements and encourage them to apply these principles as a part of their long-term strategic asset allocation process. Reach out to your consultant to learn more about how Verus can offer you insights about strategic liquidity in your portfolio.

## Notes & Disclosures

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1. Kinlaw, Kritzman, and Turkington (2013). "Liquidity and Portfolio Choice: A Unified Approach." *The Journal of Portfolio Management*.
2. Assets categorized as illiquid include: Private Equity, Real Estate, Private Credit, and Infrastructure.
3. SAA bands are set at 50% of the target weights

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