Liquidity management is crucial, given highly volatile markets and increasingly complex investment options. The misalignment of a portfolio’s liquidity profile with cash flow demands can lead to a liquidity squeeze. This problem is particularly challenging in stressed market environments, as demonstrated by the global financial crisis (GFC) of 2008. An efficient liquidity management program can help mitigate the challenge. In this paper, we discuss various approaches and considerations for non-profit organizations looking to establish a holistic liquidity management program, including:

1. Establishing the cash flow expectations and requirements of the fund,
2. Utilizing various approaches to achieve the required liquidity profile, and
3. Documenting and frequently monitoring the fund’s liquidity profile.

Why is liquidity management important?

Liquidity management means enabling the investment portfolio to (a) stay within its targeted asset allocation bands and (b) be able to meet cash flow obligations as they come due, without incurring unacceptable losses. If there are mismatches between the maturity of the non-profit’s investments and its scheduled cash outflows (where “maturity” is defined as the time required to liquidate assets in an orderly manner, without incurring forced losses), the portfolio is exposed to a potential liquidity squeeze. It is also important to take into account not only anticipated or budgeted liquidity needs, but also additional liquidity needs which may arise from unanticipated or “surprise” events.

Total-return investors have long embraced opportunities in less-liquid assets, such as private capital, for an expected return premium relative to liquid assets, given the long-term nature of the investment pools. The GFC, however, left many investors coping with illiquidity at a time when the liquid portion of the portfolio did not hold up. As the portfolios struggled with the loss in value of the public equity allocation, the illiquid portion came to represent a larger
percentage of the total portfolio – and yet was not available to meet cash outflow needs without the investors’ incurring significant losses. In order to meet their immediate liquidity needs, many non-profits’ were forced to liquidate securities at deep discounts, to delay important projects and, in some cases, to borrow funds during a period of extreme market stress and high borrowing rates. Unfortunately, many concurrently saw their donation streams drying up.

Illiquidity is not necessarily an undesirable attribute; it just needs to be managed. In addition, each portfolio has unique circumstances, and thus, aligning the liquidity profile of the portfolio with the time horizon and the cash flow demands of the non-profit is crucial. A well-thought-out, holistic liquidity program can go a long way toward minimizing liquidity squeeze for institutions.

A holistic approach means taking a total-enterprise view. Investors should evaluate the portfolio under multiple lenses as well, in order to truly understand the potential liquidity stressors. For instance, considering investment vehicles and securities types; looking at the portfolio in both normal and stressed environments; examining different asset allocation scenarios – all of these are different lenses for analyzing the liquidity composition.

Determining the right amount of liquidity

Liquidity management starts with identifying cash flow requirements and constraints. Sources of cash inflow differ among non-profit organizations, as do the uses of cash (cash outflow). It is worth distinguishing between the liquidity needs of the investor (the non-profit institution) and the liquidity characteristics of the investments. While the liquidity of the investments may be the same for two different investors, their liquidity needs may be different. The more clarity investors have about their liquidity needs, including a good understanding of expected cash inflows and outflows, the easier it will be to manage liquidity. At a very high level, some of the questions non-profit investors should address are:

- What is the need for cash in the next three, six, 18 months? What flexibility is there around these values?
- Are additional cash inflows expected, or, as is the case with many private foundations, is the funding complete?
- Is the asset pool perpetual, or is there a targeted date on which the fund will cease to exist?

Cash inflows: Private foundations are generally established with an initial corpus, and their cash flow patterns (i.e., no additional contributions, aside from investment income) differ significantly from those of other foundations and school endowments (for which ongoing cash inflows are often expected). For instance, a university endowment expects to receive ongoing donations from alumni and other interested stakeholders. When a university commences a capital campaign, the expectation is that it will experience significantly increased cash inflows during the campaign period. When one source of donations or inflows disappears, other potential sources must be identified. Public universities have experienced this with the decline in government funding. They have needed to reach out to their alumni base to raise cash in a more focused way, just as private colleges and universities have done for many years.

Cash outflows: Identifying the uses or areas of cash outflow is important as well. Some of the common areas of cash outflow include:

1. Grant payments
2. Operating budget
3. Capital budget/expenditures
4. Future investment commitments (committed capital calls)

Most of these cash uses, while relatively fixed commitments, do increase in value with inflation (i.e., the cost of educating each student increases each year). Future capital commitments, if not planned properly, could easily become the biggest cash uses for endowments. In fact, future private equity investment commitments accounted for more than 10% of assets, or roughly a third of private equity allocations,² prior to the GFC. Because these commitments are legal obligations of the non-profit, large capital calls may result in a competition between meeting capital call and other cash flow requirements.
Liquidity classifications

Once the sources and uses of cash are identified, it is useful to allocate the cash requirements of the asset pool based on time horizon. Such a classification allows the non-profit to match liquidity requirements with the investments’ liquidity profile. There are multiple dimensions on which liquidity profiling may be done.

Russell’s liquidity profiling categorizes various assets as ranging from highly liquid to illiquid. In most scenarios, highly liquid assets can be liquidated within days, whereas the orderly liquidation of semi-liquid securities could take up to a year. Illiquid securities are those that will take more than 18 months to liquidate. Most private capital investments (including some real asset investments, such as timber) could be classified as illiquid by this definition, as can some hedge funds. The National Association of College and University Business Officers (NACUBO) classifies illiquid investments as any investment that takes more than 365 days to liquidate. The investment committee should clarify its choice of liquidity buckets – and the terminology it uses to describe them – to ensure that all members have the same understanding. A sample liquidity classification is shown below.

<table>
<thead>
<tr>
<th>Daily</th>
<th>Monthly</th>
<th>Semi-annually</th>
<th>Quarterly</th>
<th>Annually</th>
<th>Illiquid (&gt;365 days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highly liquid</td>
<td>Daily</td>
<td>Monthly</td>
<td>Quarterly</td>
<td>Semi-annually</td>
<td>Illiquid (&gt;365 days)</td>
</tr>
</tbody>
</table>

Liquidity profiling should include not only the consideration of the different types of assets – such as public vs. private, equities vs. fixed income, Treasuries vs. distressed debt – but also the investment vehicle (i.e., a commingled, daily liquid fund vs. a separate account investment with longer locks).

According to the 2012 NACUBO-Commonfund Study of Endowments (NCSE), roughly 71% of surveyed institutions use a system of liquidity classification for their assets – up from 32% in the 2010 study, when this question was included in the survey for the first time. Of these institutions, the majority of assets are allocated to investments with daily liquidity as shown in the charts below. Another interesting observation is that the larger endowments tend to have more illiquid assets, and a smaller allocation of assets with daily liquidity, than their smaller counterparts.

Exhibit 1: Percent allocated to liquidity categories in fiscal year 2012

$51–$100 million (123)

Daily

$51–$100 million (123)
Approaches for managing liquidity

Various approaches can be utilized for establishing and managing liquidity requirements in an investment program. Some of the approaches are purely focused on the fund, such as asset allocation, while other approaches may impact the entire enterprise, such as the issuance of debt. We believe it is important to incorporate more than one approach for the optimal management of liquidity. While the summary below is not exhaustive, it captures the primary approaches used, which are:

- Asset allocation
- Sensitivity/stress test analysis
- Spending policy and rate
- Rebalancing
- Derivatives
- Loan program/debt issuance

Asset allocation

The approach to asset allocation has gone through a metamorphosis: from traditional asset allocation by types of assets to a roles-based asset allocation approach. It is no longer recommended to evaluate portfolio allocation solely along the lines of asset types, such as equity vs. fixed income. In addition to evaluating asset allocation along risk factors, such as interest rate risk, inflation risk, equity risk and currency risk, it is also important to consider the role an asset fulfills in a portfolio—and furthermore, the liquidity of both the role and the strategy.

As an example, as shown in Exhibit 2 below, Russell allocates assets into four primary roles for total-return investors: growth, return enhancement, risk reduction and inflation responsive (which may include assets that are deflation-responsive depending on the market environment). Exhibit 3 below gives an example of a portfolio allocated by roles.

Exhibit 2: Roles-based asset allocation framework

Not all securities within each asset class share the same liquidity profile. Different investment vehicles have different liquidity constraints. The 2012 NCSE report also reported that 48% (sharp increase from 28% in 2011) of responding institutions planned to change their asset to enhance liquidity in their portfolios, or were considering doing so.
Investment committees should carefully evaluate private capital allocations and future capital commitments. Private capital allocations could induce unforeseen shifts in the strategic asset allocations over time. Modeling portfolio allocations to take into account the illiquid nature of these investments could identify such shifts and enable the investment committee to set private allocations and future capital commitments appropriately. For most institutions with significant allocations to alternatives (private capital, hedge funds and real estate), laddering of private equity allocation should significantly reduce the potential for liquidity squeezes.

As part of the asset allocation process, investment committees and staff should not only determine the parameters for allocation to broad asset classes and/or investment roles, but also seek to understand the potential impact of investment vehicles on the near-term liquidity pool. Exhibit 3 below gives an example of a dashboard Russell Investments utilizes with our clients to map out their liquidity profile vis-à-vis their asset allocation, using these four roles categories. This matrix is based solely on the investment vehicles (funds), as opposed to the underlying assets.

Exhibit 3: Sample liquidity matrix based on investment vehicles

<table>
<thead>
<tr>
<th>ALLOCATION</th>
<th>ASSET CLASS</th>
<th>INVESTMENT VEHICLE</th>
<th>LIQUIDITY LEVEL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>DAILY</td>
<td>QUARTERLY</td>
</tr>
<tr>
<td>Growth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20.0%</td>
<td>Global Equity</td>
<td>Fund A</td>
<td>100%</td>
</tr>
<tr>
<td>5.0%</td>
<td>Emerging Markets</td>
<td>Fund B</td>
<td>100%</td>
</tr>
<tr>
<td>5.0%</td>
<td>Long/Short HF</td>
<td>Fund C</td>
<td>0%</td>
</tr>
<tr>
<td>Return</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>enhancement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.5%</td>
<td>Private Equity</td>
<td>Fund D</td>
<td>0%</td>
</tr>
<tr>
<td>5.0%</td>
<td>Global HYD</td>
<td>Fund E</td>
<td>50%</td>
</tr>
<tr>
<td>5.0%</td>
<td>Emerging Market Debt</td>
<td>Fund F</td>
<td>100%</td>
</tr>
<tr>
<td>Risk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>reduction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0%</td>
<td>Core Bonds</td>
<td>Fund G</td>
<td>100%</td>
</tr>
<tr>
<td>2.5%</td>
<td>Cash</td>
<td>Fund H</td>
<td>100%</td>
</tr>
<tr>
<td>15.0%</td>
<td>Non-Directional Hedge Funds</td>
<td>Fund I</td>
<td>0%</td>
</tr>
<tr>
<td>Inflation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>responsive</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.0%</td>
<td>Private Real Estate</td>
<td>Fund J</td>
<td>0%</td>
</tr>
<tr>
<td>4.0%</td>
<td>Commodities</td>
<td>Fund K</td>
<td>100%</td>
</tr>
<tr>
<td>3.0%</td>
<td>Global Listed Infrastructure</td>
<td>Fund L</td>
<td>100%</td>
</tr>
<tr>
<td>3.0%</td>
<td>Global Listed Real Estate</td>
<td>Fund M</td>
<td>100%</td>
</tr>
<tr>
<td>100%</td>
<td>100%</td>
<td>Total weighted average</td>
<td>57%</td>
</tr>
</tbody>
</table>

Shown for illustrative purposes only.

Sensitivity/stress test analysis

Evaluating the liquidity profile of the portfolio in both normal and stressed environments is critical. For each of the asset classes, the liquidity expectation in normal environments should be identified and then compared against the estimated downside experience in bad markets. An example of a liquidity profile of a normal vs. a stressed market environment is shown in Exhibit 4. The asset allocation was kept constant in both normal and stressed scenarios, this example doesn’t take into account any change in asset valuations.

As is evident from the charts, the daily and quarterly liquidity portion of the portfolio has shrunk in the stressed market environment scenario. This could be due to a variety of factors. In a normal market environment, some asset classes, such as hedge funds and core real estate, have quarterly liquidity; in a stressed environment, however, gates go up and actual liquidity can be one to two years. Similarly, credit normally typically has daily liquidity, but during a stressed environment, liquidity can disappear unless the investor is willing to pay huge bid-ask spreads. Another aspect to consider is whether some of the private equity is winding down and expected to pay out in the next two years; in a stressed environment, there is a likelihood that this timeline will extend. Hence, the investor probably needed to adjust those expectations.

Understanding expectations for draws on capital and expected capital commitments in both normal and stressed market environments is critical. In addition, knowing the investment terms is important; for instance, what is the likelihood of a gate being enforced during a
market downturn? The investment structure – as well as the terms of the private capital investments, including any locks-ups and redemption constraints – needs careful consideration and evaluation as part of the due diligence process.\(^7\) The better investors understand what drives locks, the better placed they are for analyzing liquidity.

Such stress-testing and scenario analyses can enable the investment committee and/or fiduciaries to determine their illiquidity tolerance, as well as their ability to meet spending targets in a stressed market environment.

**Exhibit 4: Sample liquidity profile in normal vs. stressed market environment**

<table>
<thead>
<tr>
<th>Normal market environment – Liquidity profile</th>
<th>Stressed market environment – Liquidity profile</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 - 5 Years</td>
<td>Illiquid 12%</td>
</tr>
<tr>
<td>4%</td>
<td>Daily 57%</td>
</tr>
<tr>
<td>&lt; 2 Years</td>
<td>Daily 54%</td>
</tr>
<tr>
<td>12%</td>
<td>Illiquid 12%</td>
</tr>
<tr>
<td>Quarterly</td>
<td>Daily 57%</td>
</tr>
<tr>
<td>15%</td>
<td>2 - 5 Years</td>
</tr>
<tr>
<td></td>
<td>4%</td>
</tr>
<tr>
<td></td>
<td>&lt; 2 Years</td>
</tr>
<tr>
<td></td>
<td>25%</td>
</tr>
<tr>
<td></td>
<td>Quarterly</td>
</tr>
<tr>
<td></td>
<td>5%</td>
</tr>
</tbody>
</table>

The liquidity profiles shown above are based on the asset allocation shown in Exhibit 3. Stressed market environment based on experience in 2008/2009 when some investments became less liquid than expected. There is no guarantee that any stated expectations will occur. Some portfolios in stressed market environments may have more drastic impact on liquidity than the scenario depicted above. This is an example for illustrative purposes only.

**Spending policy and rate**

There are two primary components to calculating the amount of cash outflows:

1. The targeted amount spent (the spending rate), such as 5% per annum, and
2. The method by which the rate is calculated, which we call the spending policy.\(^8\)

Both need to be taken into consideration to determine liquidity needs. When the spending rate is within the typical 3% to 5% range, the liquidity needs of the portfolio should not be impacted too much, particularly in normal environments. However, if the expected draw from the portfolio is high, as in cases where the endowment supports a large portion of the non-profit’s operating budget (or if there are other required distributions), this may impact the investor’s choice of liquidity profile. This will be particularly evident in challenging market environments. As mentioned earlier in this paper, in a cycle when markets are down, if the value of the liquid portion of the portfolio declines drastically, the percentage of the illiquid investments will go up.

A well-designed spending rule would have enough flexibility to accommodate unforeseen decreases in portfolio value and to avoid forced liquidations and permanent loss of endowment value. Spending rules that use asset averaging can lend meaningful smoothing to payout without putting endowment sustainability at risk (depending on the length of time of the averaging).\(^9\) For instance, a spending rule that is a weighted average of the preceding year’s spend and a percentage of beginning-year market values could help stabilize spending.
Rebalancing

Most organizations test their position against their rebalancing ranges at a policy-determined fixed interval (i.e., monthly or quarterly). According to the NCSE report, about 79% of the responding institutions reported rebalancing their portfolios at least once in 2012. The most commonly followed rebalancing strategies are calendar-based (i.e., monthly or quarterly) or market-based (target or range-based, or in response to a major gift or other cash flow).

A rebalancing policy that is not based solely on current market values, but also on possible declines in the market values of the less-liquid asset classes and the expected cash outflows (e.g., private equity) could minimize the unnecessary activity and costs associated with rebalancing, since their valuation can be slower to respond to market declines than publicly traded securities.

The following hypothetical (Exhibit 5) two-year analysis shows how liquidity constraints can cause a portfolio to stray from its intended target asset allocation. A $500 million portfolio begins with a 33% allocation to illiquid alternatives, 27% to liquid fixed income and 40% to liquid equity. By drawing down from the liquid portion of the portfolio at a fixed rate of 5% every year, and assuming an annual return of 8.7% on the total portfolio, it can be seen that at the end of two years, the allocation to alternatives has increased, from 33% to 37%. Without considering any potential market fluctuations, in just two years in this scenario, the illiquid portion of the portfolio is now much larger than originally intended. This example highlights the risk of unintended increases in illiquidity, in the absence of a deliberate and periodic rebalancing program.

Since it is easier to add money to illiquid alternatives than to redeem, alternative allocations should be monitored closely and proactively reduced to avoid this situation. Annual rebalancing or a continuously monitored redemption-request process can help mitigate this risk.

Exhibit 5: Example of changing liquidity in a portfolio

<table>
<thead>
<tr>
<th>Market value BoY 1</th>
<th>TOTAL PORTFOLIO</th>
<th>ALTERNATIVES (ILLIQUID)</th>
<th>FIXED INCOME (LIQUID)</th>
<th>EQUITY (LIQUID)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$500 M</td>
<td>$165 M (33%)</td>
<td>$135 M (27%)</td>
<td>$200 M (40%)</td>
<td></td>
</tr>
<tr>
<td>Asset return %</td>
<td>$44 M (8.7%)</td>
<td>$17 M (10%)</td>
<td>$7 M (5%)</td>
<td>$20 M (10%)</td>
</tr>
<tr>
<td>Spending 5% of BoY</td>
<td>-$25 M (5%)</td>
<td>-$0 M</td>
<td>-$10 M</td>
<td>-$15 M</td>
</tr>
<tr>
<td>Market value EoY 1</td>
<td>$519 M</td>
<td>$182 M (35%)</td>
<td>$132 M (25%)</td>
<td>$205 M (40%)</td>
</tr>
<tr>
<td>Asset return %</td>
<td>$45 M (8.7%)</td>
<td>$18 M (10%)</td>
<td>$7 M (5%)</td>
<td>$21 M (10%)</td>
</tr>
<tr>
<td>Spending 5% of BoY</td>
<td>-$26 M (5%)</td>
<td>-$0 M</td>
<td>-$10 M</td>
<td>-$16 M</td>
</tr>
<tr>
<td>Market value EoY 2</td>
<td>$538 M</td>
<td>$200 M (37%)</td>
<td>$128 M (24%)</td>
<td>$210 M (39%)</td>
</tr>
</tbody>
</table>

Notes: Assumes 5% spending rate. EoY = End-of-year; BoY = Beginning-of-year. Numbers may not add up exactly, due to rounding differences.

Derivatives policy/use of derivatives

Derivatives, which have been used widely and quite effectively by investors for decades, allow investors to take additional exposure in their portfolios without actually owning the assets. On the other hand, derivatives can lead to a liquidity squeeze if a margin call occurs. A common solution available to institutional investors to reduce the costs of managing the increasing demands on liquidity, is the use of futures overlays. One of the main reasons for using futures for overlays is that they are an unfunded solution – that is, for an investor to obtain market exposure, only a fraction of the cash available is needed to post as collateral for the futures. The balance of cash available can then be invested in actively managed return-seeking strategies. However, since there is a financing cost associated with the use of futures overlays, the use of this strategy would be justified only if the capital that is freed up can yield a higher return than the financial cost of the futures, or if the freed-up capital can satisfy liquidity needs. Derivatives can increase the complexity and risk in portfolios; hence, their use requires considerable expertise and careful implementation and oversight.
Potential for loans

Though some institutions might have restrictions on leveraging and accessing loan funds, where appropriate, non-profits can evaluate bank loans or structured loan programs for additional funding. About 74% of the 2012 NCSE survey respondents reported carrying debt; of those respondents, 41% said they have a formal debt policy. Given the all-time low interest rate environment, institutions have been taking advantage of the low borrowing costs by making greater use of bank lines of credit. About 50% of the participating institutions in the 2012 NCSE survey maintained a bank line of credit.

A well-designed loan program can not only enhance the liquidity profile, but can also provide a liquidity cushion in stressed market environments. In normal environments, a loan may also create additional funding capacity for short-term liquidity needs and allow better deployment of a non-profit’s funds in more long-term, return-seeking investments. For example, instead of liquidating an illiquid portfolio during a challenging time in the capital markets, making use of a proactive loan program (i.e., establishing credit lines with banks) can provide the necessary capital for a non-profit to:

- Meet capital calls and rebalance the portfolio.
- Support operating and endowment cash needs (e.g., a university’s need for operating cash prior to receipt of tuition payments).
- Support capital projects\(^{13}\) (e.g., a university’s construction of a new academic building).

A word of caution: during the GFC, many institutions found that banks withdrew lines of credit during crisis periods, when they were needed the most.

Other considerations

Broader risk management: Liquidity management should be an integral part of the broader risk management practice, and the liquidity profile of the portfolio should be monitored in conjunction with other critical risk measures used to calibrate and monitor risk in portfolios, such as standard deviation, value at risk (VaR),\(^{14}\) incremental VaR, etc. In addition, there are tools that can provide investors the ability to better monitor and assess liquidity, spending and risk and as a result can increase the effectiveness of making sound investment decisions.

Liquidity policy in the investment policy statement: Liquidity situations can and do change over time, and they vary across organizations. Therefore, incorporating clear liquidity guidelines is important, particularly periods of market stress. Such guidelines serve to document the degree of illiquidity acceptable in the portfolio during both normal and stressed environments. They can either be incorporated into the risk management section of an investment policy or be articulated separately under a liquidity management section.

Regulatory environment: Finally, fiduciaries should stay abreast of regulatory changes, to the extent that there are any changes that will have a direct impact on portfolio and the liquidity considerations associated with it.

Conclusion

Liquidity risk is a fairly benign risk for many assets during normal market periods, but it can become a dominant risk during times of market stress. Since liquidity touches on many aspects of investment management, from asset allocation to spending rules to rebalancing policy, it is important for a non-profit to have an effective liquidity management program that is frequently monitored.

Exhibit 6 is a checklist of the various considerations and tools mentioned in this paper – tools a non-profit organization can utilize to build out a liquidity management program. It is important to remember that no single liquidity profile is appropriate for all institutions; the right amount of liquidity depends on an institution’s specific spending and capital commitments, as well as its need for flexibility should unexpected events occur.
### Exhibit 6: Liquidity management checklist

**Fund cash flow requirements:**
- What is the need for cash in the next three, six, 18 months?
- Are additional cash inflows expected, or is the funding complete, as is the case with many private foundations?
- Is the asset pool perpetual, or is there a determined date on which the fund will cease to exist?
- What are the primary uses for the cash from the fund?

**Liquidity management approaches:**
- Asset allocation
- Sensitivity/stress test analysis
- Spending policy and rate
- Rebalancing
- Derivatives
- Loan program/debt issuance

**Documenting and reporting liquidity:**
- Investment policy statement
- Quarterly liquidity profile reports
- Risk tools and reporting

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4 See endnote 1.
5 See endnote 2.
9 See endnote 8.
13 See endnote 6.
14 “Value at risk” measures the downside risk to the portfolio and is a measure that should be combined with the spending needs of the portfolio to determine the true impact on resulting portfolio values in stressed environments.
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