NORTHERN TRUST

WHITE PAPER

CASH: AN ASSET IN ADOLESCENCE

If the investment industry has a rebellious teenager in the house today, that teenager would be cash: it costs you more, is more challenging and offers little in return.

Since the 2008 global financial crisis, liquidity's growing pains have become an increasingly critical issue for institutional investors, insurers and asset managers. A difficult mix of market trends, a sustained low interest rate environment and the unintended consequences of a variety of market regulations have all contributed to make cash an increasingly problematic and high-maintenance asset class. Whether investors are seeking to obtain a return on un-invested cash or find liquidity to support investment strategies, they face an array of challenges that have continued to grow in complexity. How can investors and their asset managers effectively manage their liquidity requirements in this difficult environment?

While there is no magical solution for overcoming the liquidity conundrum, investors can take steps to "future-proof" their investment policies to ensure a balance of security, liquidity, yield and operating efficiency. Before that is possible, investors must develop a comprehensive understanding of the liquidity picture and the factors involved.

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WHO IS AFFECTED:

The confluence of these factors has affected firms and funds differently. Pension funds, arguably, are coming under the greatest amount of pressure.

For active funds open to new members, the challenge posed by a liquidity deficit is not as significant. Their members and parent sponsors are still contributing cash, which gives a natural cash flow within the scheme that can be used to meet liquidity requirements. And while the fund will have time in the future to attempt to repair its current deficit, it will retain more options by addressing the issue earlier.

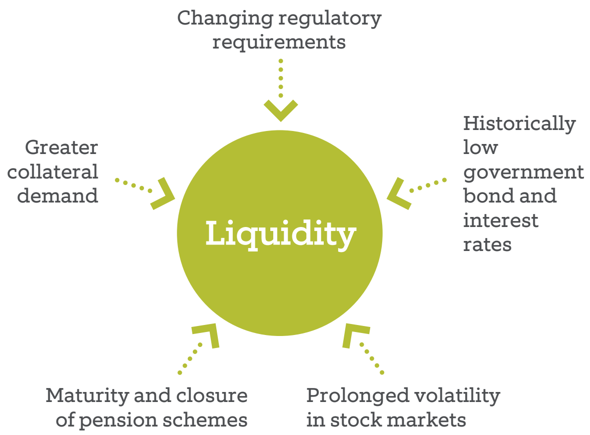
But the majority of defined benefit schemes are closed to new members. For those in net decumulation, with no new cash flow, finding liquid assets has never been more important. Across Europe, schemes have struggled to meet their required funding levels and been forced to take difficult decisions.

Life insurance companies also continue to be hurt by both low yields and tightening spreads. Due to insurance companies' rate-sensitive products and investments, the US National Association of Insurance Commissioners and the US Center for Insurance Policy and Research have identified low interest rates as a major threat to life companies.[1]

Meanwhile, traditional and alternative investment managers and their financial services providers are also all under pressure. In addition to the challenges of the low-yield environment, regulatory changes require managers to reassess relationships and the classification of cash they hold.

[1] National Association of Insurance Commissioners, "*Low Interest Rates,*" 24 May 2016

HOW LIQUIDITY HAS BECOME THE INDUSTRY'S PROBLEM CHILD



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CASH DRAG

Holding cash has become a challenge for many market participants. Driven by the need to support evolving investment strategies, some pension schemes have increased their allocation to cash from 1% or 2% of their investment portfolios to in some cases as high as 6% or 7%. In the past, cash could earn an institutional investor a return of 2% to 3%. It was an incidental, but necessary, part of any portfolio. But in today's low interest rate environment, investors can expect a zero rate of return, which can become negative after inflation. Cash has gone from being a benign by-product of investing to arguably the essential facet of a lot of investment strategies.

This cash position presents other challenges, such as counterparty risk. Investors with three times the amount of cash in their portfolios than in years past will likely struggle to find a bank with the capacity to take the assets on their balance sheet or to provide a positive yield. As a result, the investors will have to place their assets with a less ideal partner: perhaps a bank with a lower credit rating or one in need of funds itself. Holding cash, therefore, becomes a material risk for investors instead of an "invest and forget" option.

CENTRAL CLEARING REFORMS

Part of the liquidity crunch is driven by regulatory developments. While these regulations were a necessary result of the financial crisis, they also have had intended and unintended consequences.

In Europe, the European Markets Infrastructure Regulation (EMIR), and in the US, the Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank), aim to reduce risks and improve transparency in the derivatives market. The goal is for all over-the-counter (OTC) derivatives to be cleared through a central clearing counterparty (CCP), with stricter rules on margin, reporting and record-keeping, and the introduction of more derivative flavours and counterparties.

Alongside the requirement to centrally clear certain derivatives, the regulation also:

- Requires reporting of the modification or termination of any derivative to trade repositories on a T+1 basis. (An existing requirement that came into effect in 2014.)
- Mandates the posting of initial margin and variation margin (VM) for OTC derivatives, with higher requirements for those not centrally cleared.
- Requires initial margin to aim to cover the potential future exposure to a counterparty default.
- Requires VM to aim to fully collateralise the mark-to-market exposure at any given time. Of particular significance for liquidity purposes, VM for cleared trades must be posted in cash (or cash and certain securities if bilaterally traded), potentially multiple times a day.

While more central clearing has de-risked the market, it has unintentionally given investors new kinds of liquidity challenges.

The last point is the most challenging. In March 2016, two of Europe's largest pension schemes, the Dutch asset manager APG, which manages money on behalf of the €351 billion ABP fund; and the Dutch pension fund provider PGGM, which invests on behalf of the €161 billion PFZW scheme; wrote to Jonathan Hill, Europe's former financial services commissioner, to express concern about falling bond liquidity and increasing cash holding requirements.[2]

The funds, which were joined by Insight Investment and MN, cited an independent report published by Europe Economics and Bourse Consult for the European Commission as a reason for their concern.

CLIENT CASE STUDY: CREATING A LIQUIDITY MANAGEMENT STRATEGY

The client's driver for focusing on liquidity is the central clearing of derivatives, and generating liquidity to meet margin calls. The £20 billion corporate pension scheme currently has about £2.8 billion in repos, and it has no issue with liquidity. It is about 90% funded.

The fund is at the start of its liquidity management journey, and needs better visibility around potential future flow needs. The scheme's current primary concern is interest rate hedging. It is aware of the growing importance of liquidity, but is currently in the planning phase. The fund has always forecasted cash needs, but in a very piecemeal manner, and it has never connected cash inflows and outflows.

As with other externally managed schemes, liquidity is mainly dealt with by the appointed investment managers. And like many other corporate pensions, it is not set up to review and forecast liquidity at the scheme level.

The pension department has concluded that, for its size, it should be further advanced in focusing on and forecasting liquidity. The issue is rapidly moving up the team's and trustees' agenda of priorities.

[2] Letter to Jonathan Hill, "*Call for Evidence on EU Regulatory Framework for Financial Services,*" 29 January 2016

The report estimated that if European pension funds were required to clear their derivatives trades and post cash as VM, the total cash collateral needed by them to support a 100 basis points (1%) move in interest rates would range from €205 billion to €255 billion. In more stressed scenarios, it could reach €420 billion.

If interest rates in the current market environment move by a quarter of a percent – which some industry participants argue would not be uncommon – then, collectively, European pension funds would be required to post intraday margins of approximately €55 billion. So, while more central clearing has de-risked the market, it has unintentionally given investors new kinds of liquidity challenges.

While the letter acknowledged that EMIR provided European pension funds a temporary exemption from the requirement to centrally clear derivatives, it expressed concern that the new regulations force pension funds to post VM in cash only, and not bonds. Although a reversal is highly unlikely, the ability to post bonds as VM would be a welcome move.

"These rules would require pension funds to either divest physical assets (such as bonds and equities) to release the required cash, or avoid using derivatives," stated the letter. "This would increase the likelihood that pension funds would not be able to manage their solvency prudently. We also believe this goes against policymakers' desire for further investment and growth in the economy." A fire sale of assets in difficult times would have a significant implied cost in either distressed pricing or widened spreads.

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CLIENT CASE STUDY: MANAGING DRAG FROM HOLDING CASH

This client is a medium-sized firm based in London, operating in a specialist insurance market. It is fully funded with a priority of matching cash inflows with outflows. Previously, it had performed informal cash-flow matching to achieve this.

The Solvency II regulation has meant the firm needs to put a more formal matching structure in place. Without a robust structure it runs the risk of being classed insolvent. As a result, the firm has defined sources and uses of their cash more clearly. It regularly stress-tests portfolios for movements in derivative positions held, and undertakes its own liquidity coverage ratio (LCR) calculations.

The need to ensure cash-flow matching, and the need to maximise return, has meant the firm has undertaken new techniques and found new instruments in which to invest their cash.

The client found certain banks still willing to trade repo and repo-type solutions with them, but the firm knows this is due to the banks receiving good derivative and FX flows from it. The client has instituted a number of new trades to maximise returns, including tri-party collateral upgrade trades.

REGULATORY REQUIREMENTS TO HOLD MORE CASH

Dodd-Frank and EMIR are not the only regulations with unintended consequences. The Solvency II Directive (Solvency II also requires higher collateral. This puts pressure on the balance sheets of insurance companies, many of which had previously undertaken internal, informal liquidity coverage ratio (LCR) monitoring only. They now have less potential to be providers of liquidity for others.

Dodd-Frank and EMIR are not the only regulations with unintended consequences.

The Third Basel Accord (Basel III), meanwhile, measures a bank's ability to withstand short-term high, volume outflows in the event of a financial crisis or idiosyncratic stress. It requires banks to distinguish between "operational" and "non-operational" short-term deposits under its LCR rules. Banks must hold high-quality liquid assets (HQLA) that can easily be converted into cash to meet potential outflows over a defined period of 30 days, at little or no loss of value. These must be equal to 25% of operational deposits, 40% of non-financial corporate deposits and 100% of non-operational financial corporate and financial institution deposits. The return on, and banks' appetite for, cash depends on its classification, which necessitates relationship reviews to establish an optimal model and holdings.

Both the risk of, and the banks' appetite for, cash deposits depends greatly on the classification of cash being deposited and the composition of each bank's balance sheet. Under leverage ratio (non-risk-based) rules, banks must also hold Tier 1 capital greater than 3% of their assets. In practical terms, this could limit the ability of an institution to hold all cash deposits with banking providers and affect the interest rates offered on certain deposits. Traditional sources of funding from banks, such as credit facilities and loans, may become challenged as well – particularly with developments in areas such as shadow banking and peer-to-peer lending.

In fact, wholesale banking balance sheets supporting traded markets have decreased by 40% in risk-weighted assets terms and 20% in total balance-sheet terms since 2010, according to a report by Oliver Wyman and Morgan Stanley. The consultancy anticipates investment banks are likely to shrink by another 10% to 15% by March 2017.[3]

Several larger US banks have already been deleveraging their balance sheets. In February 2015, one bank requested some of its biggest customers to consider moving their deposits elsewhere or incur fees, indicating that holding large deposits had become too costly under new liquidity rules. Others were already charging some customers for large deposits. Sometimes, these deposits find their way back to central banks via money market funds (MMFs). Either banks are placing deposits directly with central banks, or if clients are forced to remove their cash from bank balance sheets, they might invest in MMFs, which in turn might use reverse repurchase programmes offered by central banks.

And post-Brexit, the potential lower-forever rate environment has also been concerning for investors, who have been forced to move further up the risk curve and sacrifice liquidity to gain yield.

[3]Oliver Wyman and Morgan Stanley, *Wholesale and Investment Banking Outlook*, 19 March 2015

CLIENT CASE STUDY: A HEDGE FUND SEEKING A HAVEN FOR UNENCUMBERED CASH

A hedge fund client currently holds €250 million of unencumbered cash collateral with its prime broker. Under a key change in the Basel III banking regulations, this cash is considered to be non-operational. As a result, it is capital intensive, as the prime broker must work on the basis this cash will run off its balance sheet in a period of idiosyncratic stress.

The prime broker has asked the hedge fund to convert this unencumbered cash into government bonds to reduce the balance sheet implications. The hedge fund does not want to change the make-up of its portfolio.

The hedge fund is now seeking alternative solutions, such as notice deposit products, that will allow it to hold its unencumbered cash with other providers. This would still be in the form of cash, albeit without access to daily liquidity, but in a manner less capital intensive for the provider.

REPO MARKETS

As a further result of Basel III, repo markets have contracted as European banks became more dependent on central bank funding. One high-profile bank announced it would close its tri-party US Treasury business in June 2016. As a result, the repo market's value fell to less than US$4 trillion at the end of 2015 from US$7 trillion in early 2007.[4]

MARKET UNCERTAINTY

Uncertainty in markets has not helped investors and asset managers either. Panic over Brexit initially wiped US$2 trillion from the world's markets, with Moody's, the credit rating agency, pushing its outlook for the UK banking system from stable to negative.[5] The firm said it expected the referendum result to "lead to reduced demand for credit, higher credit losses and more volatile wholesale funding conditions for UK financial institutions."

In the US, Moody's has warned recent market volatility will negatively affect the performance of several large US pension schemes, with unfunded pension liabilities growing by at least 10% in the fiscal year 2016, even in the most optimistic scenarios.[6]

CENTRAL BANK INTERVENTION

One-third of all euro area government bonds now have negative yields[7] and there is an estimated US$13 trillion of global negative-yielding debt, according to some reports. That compares with US$11 trillion before the Brexit vote, and almost no negative yield debt in mid-2014.[8]

The extent of the low rate environment varies across markets. Some are in negative territory while others are operating in a lower-for-longer environment.

> Investors are well aware of the challenges. Forty-five percent of attendees at Northern Trust's May 2016 Nordic Conference felt derivatives central clearing regulation would most affect their liquidity arrangements, while 37.5% believed central bank monetary policy would have the biggest impact.

[4] PI Online, "*J.P. Morgan Exit from Repo Market Seen as Further Regulatory Fall-Out*," 16 August 2016

[5] Moody's, "*Moody's Changes Outlook on 12 UK Banks and Building Societies*," 28 June 2016

[6] Moody's, "Volatile Market Likely to Increase Unfunded US Public Pension Liabilities in FY 2016" 17 March 2016

[7] Business Insider UK, "*A Third of All Euro-Area Government Bonds Are Now Negative*," 7 December 2015

[8] The Wall Street Journal, "*Black Hole of Negative Rates is Dragging Down Yields Everywhere*," 11 July 2016

CLIENT CASE STUDY: ALTERNATIVE APPROACHES TO CREATING SHORT-TERM LIQUIDITY

A pension fund is a €50 billion European scheme in net decumulation and in deficit. Its priority is to secure available sources of economically attractive emergency funding. In the current market, this has proved challenging.

The fund has constructed a liquidity waterfall comprised of repurchase agreements (repos), uncommitted facilities and equity replacement, where synthetic exposure is swapped on existing investments to generate cash.

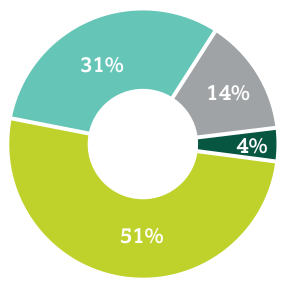
The pension scheme regularly stresses its portfolio for movements in derivative positions held. It has shifted its liquidity policy to align with a broader investment policy stipulation that it will never be a forced seller of securities. As a result, its liquidity policy influences its strategic investment portfolio decisions.

In looking at this model, and the most efficient ways to achieve its objectives, the fund has considered outsourcing elements of its treasury function to a service provider. It has also discussed its liquidity management strategy at the trustee board level, as do the majority of larger schemes.

Low and negative interest rates also mean holding cash is a zero-sum game, as discussed earlier. Given the yield imperative, asset owners need to ensure 100% of their assets are return-seeking. If pension schemes have to hold on to increasingly large amounts of cash for collateral or liquidity reasons, it becomes harder to overcome their deficits. It is another vicious cycle, where the more cash a pension fund holds in a low interest rate environment, the more the cash costs.

Pension funds and other asset owners are coping with the low and negative return environment by searching for greater amounts of illiquidity premium, via infrastructure bonds, direct corporate loans, catastrophe bonds and emerging market debt.[9] This will, of course, affect their ability to raise cash.

Eighty-two percent of delegates at Northern Trust's May 2016 Nordic Conference believed that trustees' allocation to alternative assets would increase over the next five years.



Private equity and infrastructure were predicted to have the highest new allocations.

BALANCING THE NEED FOR LIQUIDITY WITH LOW YIELDS

The move towards investing in private equity and infrastructure is indicative of a bigger trend. As pension funds go into net decumulation, their liquidity requirements get more asymmetrical. Because they need a reasonable degree of inflation-linked income, they are pressured to take more risk-on style investments and accept a degree of illiquidity. As a result, they may move from low-yielding government bonds to assets with a greater illiquidity premium. Illiquid assets such as private equity and infrastructure involve large cash calls during their life spans. This requires pension schemes to put cash aside, which means that when schemes want to construct liquidity positions, illiquid assets cannot be included, as they cannot raise cash against them.

At the same time, pension funds are drawn into matching cash flows with highly liquid assets used to support their de-risking transactions. This forces them into a Catch-22 situation. Longer-term investments are less liquid, but

[9] Reuters, "*Pension Funds Seek Riskier, Illiquid Bets To Make the Returns They Need,*" 14 March 2015

shorter-term investments are not high yielding enough. Pension funds try to extend their money as much as possible, but they expose themselves to more risk if they cannot effectively manage their liquidity budgets. This all takes place against the backdrop of lower cash flow from investment income and contributions: 10-year gilts at rates of less than 1% and significantly diminishing contribution streams.

On top of this, some market commentators have pointed out that governments seeking to kick-start their economies with infrastructure projects are going to the markets, and to pension funds, to raise the cash they require. These governments are essentially encouraging pension schemes to fund infrastructure projects while simultaneously enacting regulation that forces the schemes to shy away from illiquidity.

PUTTING THE GROWING PAINS BEHIND YOU

For managers and investors alike, it is important to understand your sources of liquidity from both the provider and market perspectives and – most importantly – what would happen to them in a market stress situation. When you are long on cash, what instrument or investments are you comfortable investing in? Equally, when you require cash, what sources of cash can you draw upon? A holistic understanding of the liquidity picture can help you manage and understand the opportunities and threats involved.

CORE TENETS OF LIQUIDITY MANAGEMENT	
Security	Consider what your minimum comfort level is. What is the minimum counterparty or instrument quality in which you would choose to invest?
Liquidity	Consider how liquid you need cash, or your broader portfolio, to be. Cash forecasting, the ability to segment cash and knowing how liquid your portfolio is, starts with the ability to forecast current and future obligations.
Yield	Understand the level of performance you need to achieve, and how yield and duration will play into it.
Operating Efficiency	While some sophisticated investors have the in-house capability to manage their investment process, others do not have the resources or expertise. But managing overall operating efficiency is essential to any liquidity management strategy.
Cost	Many industry participants would concur there is now a fifth tenet – cost. As a result of the market environment, the cost of placing and sourcing liquidity is now an additional major factor that must be taken into account for an effective liquidity management strategy.

KEY CONSIDERATIONS

Of course, not all investors have the same needs and requirements. For example, an open defined benefit scheme with positive member contribution flow, and still on a growth path, will have lower bond holdings, lower derivatives positions, higher equity and a continuing contribution cash flow. Therefore, it can afford to hold lower cash balances. A closed, mature scheme will need higher cash levels to meet its calls. Asset managers and alternative managers will have to think about navigating cash requirements while other types of investors may only be thinking about liquidity ratios because of regulatory drivers.

There are, however, some key considerations to take into account when reviewing an investment policy:

1. Maintain a liquidity ladder to forecast needs and match it with known cash flows. This can be done by using robust cash forecasts to segment cash (daily, reserve, strategic) and ensure you hold enough operational cash to settle obligations. This will help you understand what proportion of your cash flow portfolio you need to keep liquid, and what you can deploy over the long term. Start thinking about having an accessibility ladder for when it's required, and think about duration. Three months is probably not far out enough to get you extra duration and therefore yield. Those who put in place long-term liquidity forecasting at least a year before they need it will be in a much stronger position. A long-term forecast means understanding long-term strategy as well. Would your fund maintain its agility should a particular opportunity present itself?
2. Consider how to source cash in times of market shock/stress. Consider a bank facility or repo facilities, or facilities with central banks or a corporate sponsor who is often long cash. All these scenarios are important to consider. Plan for the worst. Emergency sources of funding can be very costly, so thinking about them ahead of time is important.
3. As a trustee or sponsor, look at the fund's long-term strategy and whether there are major moves on the horizon such as demerger, acquisition or funding changes. Particularly consider any form of de-risking transaction, such as pension buy-ins. All require a level of flexibility around holding liquid assets.
4. Model the asset liquidity profile and stress test it to understand the true benefit/cost of embedded funding costs, as well as margin requirements on derivative positions. For example, think about the cost of maintaining a cash position. If a fund holds 6% to 7% cash in a zero/ negative yield environment, what is the real rate of return and what impact does cash drag have?

	100% Invested (i.e. no cash holding)	95% Invested	
Scheme Assets	1,000,000,000	1,000,000,000	
Target Return of 5% p.a.	50,000,000	47,500,000	
Cash Drag*	0	2,500,000	25 bps

*Assuming zero yield from cash, but increased drag experienced if negative yield/after inflation

Five key considerations to make when reviewing an investment policy:

- Forecast needs and match with known cash flows
- Consider cash facilities in times of market shock/stress
- Anticipate the fund's long-term strategy
- Model and stress test the asset liquidity profile
- Identify any unusual sources of liquidity

5. Identify any unusual sources of liquidity the fund might have, such as securities for repo'ing, securities lending cash collateral and the establishment of new arrangements that could be called upon as needed. For example, would the pension scheme's corporate sponsor have a treasury function that can be called upon? It is not unusual for sophisticated asset owners to sell cash equity against TRS, for example.

SOLUTIONS TO ADDRESS THE LIQUIDITY CONUNDRUM

POTENTIAL OPTIONS FOR INVESTING CASH	POTENTIAL SOURCES OF RAISING CASH
Notice/ Term Deposit Solutions A simple solution, although not all financial institutions offer these and exposure to counterparties is unsecured.	**Uncommitted Overdraft Facilities** Pay-as-you-go, but this cannot always be relied upon.
Money Market Funds Capital preservation, daily liquidity and investment diversification.	**Committed Overdraft Facilities** A reliable source of funding, but expensive as must be paid for at the outset and on an ongoing basis.
Short-dated Bond Funds Improved yield, with an associated trade-off with liquidity. Diversification of risk beyond financial issuers.	**Repo** A good use of securities inventory, although traditional financial institution counterparties are reducing. A potential shrinking market via traditional counterparties.
Reverse Repo Collateralised investment which might require collateral management. A potential shrinking market via traditional counterparties.	**Selling Cash Equity for TRS** An efficient way of raising cash, although this might require collateral management.
Peer-to-Peer Repo An emerging option for lending cash, although not a mature market.	**Peer-to-Peer Repo** An emerging option for lending cash, although not a mature market.
Individual Instruments (CDs, CP, etc.) Good flexibility and existence of secondary markets, but requires trading expertise and resource.	

Currently, to meet existing requirements, investors can look to centralised collateral management, inventory management and collateral optimisation. They can also look to segregated collateral accounts.

Peer-to-peer lending is attracting particular attention, with many investors anecdotally indicating they will consider using it. At the International Securities Lending Association's (ISLA) 25th Annual Securities Finance and Collateral Management Conference in Vienna, a panel of beneficial owners felt peer-to-peer transactions will become more and more important going forward. Sixty-eight percent of the audience polled also viewed this as a key element of their approach in the coming years. Interestingly, according to a February 2016 report from the University of Cambridge's Centre for Alternative Finance, banks account for a quarter of peer-to-peer lending. In the meantime, some asset owners are also lobbying their home central banks to establish whether they are willing to discuss providing a liquidity facility for margining.

REASONS TO ACT NOW

Unfortunately, there is no one-size-fits-all solution to the liquidity conundrum. Peer-to-peer lending, raising cash against a TRS or accessing the repo market are all important tools. But in times of market stress, the repo market could shut down, or a bank may not be able to provide an investor with direct cash. Similarly, you might not be able to sell something in the market quickly.

When no solution can be guaranteed, it is necessary to use and combine a variety of solutions that give you the strongest protection. Understanding a portfolio from the point of view of how liquid it might be is critical – particularly as the cost of cash liquidity will only continue to increase. Like a rebellious teenager, guaranteed liquidity comes at a price, with no easy path to adulthood.

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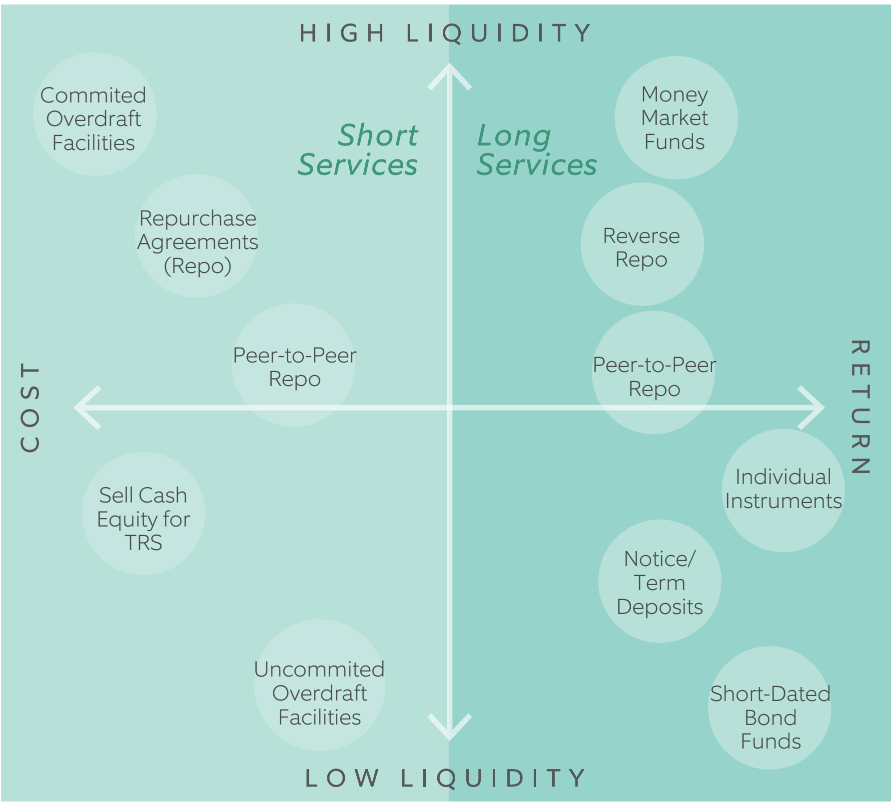
LIQUIDITY MATRIX



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