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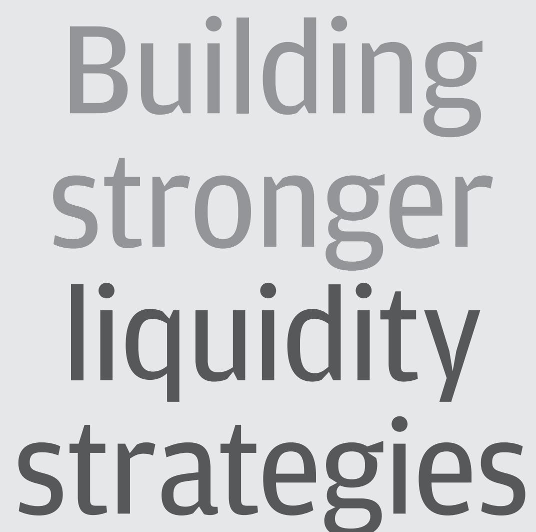

Building stronger liquidity strategies

Introduction to money market funds and ultra-short duration strategies

J.P.Morgan
Asset Management

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Introduction

The short-term fixed income universe features many options for investors looking for liquid and secure alternatives to holding deposits. The two main liquidity products are money market funds (MMFs), also known as liquidity funds, and ultra-short duration bond funds, also called managed reserve funds at J.P. Morgan Asset Management.

Many institutional investors and treasury professionals choose these liquidity products because of the benefits that pooled funds, such as MMFs, can offer over conventional deposits or direct investments in money market securities.

MMFs were first launched in the early 1970s in the US. Since that time, they have become popular with investors not only in the US but across Europe, Asia and other fast-developing markets. The global MMF industry has grown to over USD 5.3 trillion, with institutional investors accounting for USD 3.9 trillion.[1] The Chinese MMF industry has rapidly grown to USD 1.23 trillion,[2] driven by both institutional and retail investors.

In this brochure, we focus on providing a thorough overview of MMFs, while also highlighting situations where a step-out to ultra-short duration bond funds may be appropriate. We begin with a discussion about cash segmentation and identifying various needs for cash, to help determine appropriate liquidity product options. We then explain the key characteristics of MMFs, look closely at their structures and holdings and explore how they can be used to meet investment objectives.

MMFs are among the least risky investment options and are supported by increasingly rigorous regulatory and industry standards. Even so, MMFs are not risk free and can vary significantly in terms of liquidity, security and yield. We take a close look at the main risks and the ways that these risks can be managed, including using external ratings, adopting an internal credit risk management process and maintaining rigorous oversight.

A solid understanding of the fundamental characteristics of MMFs can help investors better differentiate between MMF options, as well as step-out strategies, such as ultra-short duration bond funds, before making a selection. We conclude with considerations for carrying out due diligence, including the emerging importance of technology in liquidity investing.

For your reference, terms that are highlighted in bold and are not defined in the text appear in the glossary.

[1] Source: iMoneyNet as of 31 December 2020.
[2] Source: Wind data as of 31 December 2020.

Choosing a liquidity product

In order to choose the most appropriate liquidity product it is important to consider the purpose of the cash investment and to have a clear understanding of the differences in product structures and holdings. In this section, we start with a brief discussion on cash segmentation. We then move on to a fundamental overview of MMFs, including their key characteristics and benefits, and then discuss their typical structures and holdings in more detail. Lastly, we explore how traditional MMFs compare with other **cash equivalents**, as well as step-out strategies, such as standard MMFs and ultra-short duration bond funds, which introduce an incremental level of risk and return potential.

CASH SEGMENTATION

With good cash forecasting an organization can segment its funds into three separate buckets depending on its need for liquidity, security and yield.

- **Operating cash** is for day-to-day needs; it is likely volatile and needs same day liquidity and high levels of security. Traditional money market funds and overnight time deposits are suitable for this type of cash.
- **Reserve cash** is for medium-term needs, such as dividends and stock repurchases. The time horizon is typically three to nine months and liquidity needs are lower. Adding longer-**maturity** instruments, reducing liquidity and decreasing credit quality can add additional yield, without significantly increasing overall risk.
- **Strategic cash** is for longer-term needs, such as capital projects. The time horizon is typically nine to 24 months and liquidity needs are extremely low. Once again, extending the maturity and broadening the credit and counterparty range can add even more return, for a limited increase in risk.

CASH INVESTMENT POLICY STATEMENT

A cash investment policy statement lets an organization define its short-term investment objectives and strategies for achieving them. It creates a sound foundation and promotes consistent, long-term discipline in decision-making through all market conditions, so that crucial liquidity and investment goals are met.

An organization's cash investment policy statement should maintain a list of approved short-term investments and instruments, including suitable time deposits and approved liquidity fund vehicles. It should also specify the ability to do separate accounts and detail minimum rating requirements, concentration limits and other criteria. In addition, the policy should establish clear parameters for cash segmentation and investment diversification.

To find out more please visit:

www.jpmgloballiquidity.com/liquidityinsights/cashinvesmentpolicystatement

KEY CHARACTERISTICS OF MMFs

MMFs are highly regulated pooled mutual funds that invest in short-term, high-quality debt instruments and may be classified as cash equivalents. MMFs are structured as independent corporate entities, with a board of directors to safeguard shareholders' interests. Each investor in an MMF becomes a shareholder and part-owner in the fund. Assets are ring-fenced and held remotely from the fund manager's own balance sheet.

The primary objectives of MMFs are to preserve capital, with a high degree of liquidity, while generating competitive returns relative to other cash equivalents. MMFs seek to achieve these goals through diversification and active management, which also bring additional benefits.

Capital preservation

Capital preservation is paramount for liquidity investors. Investing in a diversified range of short-**tenor**, high-quality securities is the primary way managers of MMFs aim to protect capital. Leading MMF managers will also conduct their own credit analysis in addition to considering ratings from independent **credit rating agencies**. A manager's in-house credit analysis capability is an important point for investors to consider when choosing a MMF.

Liquidity

A high level of liquidity is equally important for MMF investors and therefore MMFs typically offer investors same day (**T+0**) or next day (**T+1**) access to their investment. MMF portfolio managers are able to offer this facility by maintaining high levels of daily and weekly liquid assets while investing in securities that are easily liquidated, if necessary.

This is helpful for treasury teams when the ability to accurately predict cash flows is difficult. In addition to daily liquidity, MMFs may also have later cut-off times than some alternative cash investment options, meaning that treasury departments have more time during the day to make decisions regarding the company's liquidity needs.

Diversification

Diversification is an important feature of MMFs and is critical to preserving capital, generating returns and ensuring liquidity. MMFs hold a highly diversified range of securities from a wide range of issuers and maturities and focus on securities with the highest short-term credit ratings available. For example, a MMF is generally permitted to hold no more than 5% in a single issuer (there are exceptions for repurchase agreements and overnight bank deposits, as well as for government securities). MMFs allow investors to participate in a more diverse portfolio than they could achieve individually.

Diversification does not guarantee positive returns and does not eliminate the risk of loss.

Active fund management

Active fund management is essential to ensuring the key objectives of a MMF — capital preservation, liquidity and maximizing returns — are achieved. MMF portfolio managers will actively adjust the fund's exposure to different issuers and sectors depending on their credit outlook. Active managers will also adjust the maturity of investments and the **duration** of the fund to reflect interest rate views and the expected cash inflows and outflows of the fund. For example, in times of market volatility or uncertainty, the amount of liquidity held will typically be increased.

A MMF can free treasury professionals from the business of evaluating counterparties and trading securities — while offering a high degree of transparency. In fact, MMF providers have become even more transparent about their underlying investments and usually provide holding reports detailing the underlying securities on a monthly or more frequent basis.

STRUCTURE OF MMFs

With an understanding of key objectives and characteristics of MMFs, we can take a more in-depth look at some of the variations in MMF structures and their typical holdings.

A MMF is a type of very short-term bond fund, but what makes it unique is the accounting methodology used. Historically, clients could purchase and redeem shares of MMFs at the same price with an extremely high degree of confidence, so that stable **net asset value** (NAV) accounting was the norm.

Following the volatility of the financial crisis of 2008 to 2009, when even the highly stable values of MMFs were impacted, regulators changed the guidelines and the accounting methodology for MMFs to include several new structures. The additional MMF structures reflect differences in risks, based on which securities can be held in the portfolio and which clients can buy the MMF.

As a result, there are now three main types of short-term MMF NAV structures:

- **Constant NAV (CNAV) or stable NAV** MMFs use **amortized cost** accounting for all fund assets with the goal of maintaining a net asset value of $1 per share. These funds are typically rounded to two decimal places. The fund's income can be distributed or accumulated.
- **Low volatility NAV (LVNAV)** MMFs use amortized cost accounting for fund assets with maturities less than 60 days and **mark-to-market** accounting for fund assets with maturities greater than 60 days. The fund maintains a constant net asset value of $1 per share provided the fund does not deviate by more than 0.20% from par.
- **Variable or floating NAV (VNAV or FNAV)** MMFs use mark-to-market pricing for all fund assets. This implies the net asset value will vary, albeit by only a small amount due to the short-duration, high-quality nature of the assets in the fund. These funds are typically rounded to four decimal places. The fund's income can be distributed or accumulated.

MMF STRUCTURES AND KEY CHARACTERISTICS BY REGION

US

Since October 2016, all MMFs in the US are classified as either retail (intended for individual investors), government/treasury (invest at least 99.5% in cash, government securities or repurchase agreements that are fully collateralized by government securities) or institutional (intended for institutional investors). Retail and government MMFs can use a CNAV structure, while institutional MMFs can only use a FNAV structure.

	CNAV MMF	FNAV MMF
WAM (max)	60 days	60 days
WAL (max)	120 days	120 days
Maturity (max)	397 days	397 days
Daily liquid assets (min)	10%	10%
Weekly liquid assets (min)	30%	30%
Dealing NAV	Two decimals	Four decimals
Valuation	Amortized cost	Mark-to-market
Gates and fees	Optional not tied to daily and weekly assets	Optional and mandatory triggers

Source: Security and Exchange Commission (SEC) Guidelines, Rule 2a-7, as of 25 May 2021.

WAM: Weighted Average Maturity

WAL: Weighted Average Life

EUROPE

Since 2019, all MMFs domiciled in Europe must be classified as either a short-term MMF or standard MMF, depending on how strict their guidelines are. Short-term MMFs can have either CNAV (if at least 99.5% of holdings are in government assets), LVNAV or VNAV structures; standard funds can only use the VNAV structure due to the higher level of interest rate risk that makes it harder to maintain a CNAV.

	SHORT-TERM MMF			STANDARD MMF
	CNAV MMF	LVNAV MMF	VNAV MMF	VNAV MMF
WAM (max)	60 days	60 days	60 days	Six months
WAL (max)	120 days	120 days	120 days	12 months
Maturity (max)	397 days	397 days	397 days	397 days or less, or 2 years when the next interest reset is within 397 days
Daily liquid assets (min)	10%	10%	7.5%	7.5%
Weekly liquid assets (min)	30%	30%	15%	15%
Dealing NAV	Two decimals (provided NAV deviates <50 bps)	Two decimals (provided NAV deviates <20 bps)	Four decimals	Four decimals
Valuation	Amortized costs	Amortized cost for instruments ≤75 days; Mark-to-market for instruments >75 days	Mark-to-market	Mark-to-market
Gates and fees	Optional and mandatory triggers	Optional and mandatory triggers	Optional	Optional

Source: European Security and Markets Authority (ESMA) Guidelines, as of 25 May 2021.

CHINA

Historically, all MMFs in China used a CNAV structure, however, since April 2019, any new MMF must use a VNAV structure.

	CNAV	VNAV
WAM (max)	120 days	120 days
WAL (max)	240 days	240 days
Maturity (max)	Bonds: 397 days TD and repo: one year FRN: Max 20% if tenor >397 days	Bonds: 397 days TD and repo: one year FRN: Max 20% if tenor >397 days
Daily liquid assets (min)	5%	5%
Weekly liquid assets (min)	10%	10%
Dealing NAV	T+1	T+1
Valuation	Stable NAV	Variable NAV
Gates and fees	Yes*	Yes*

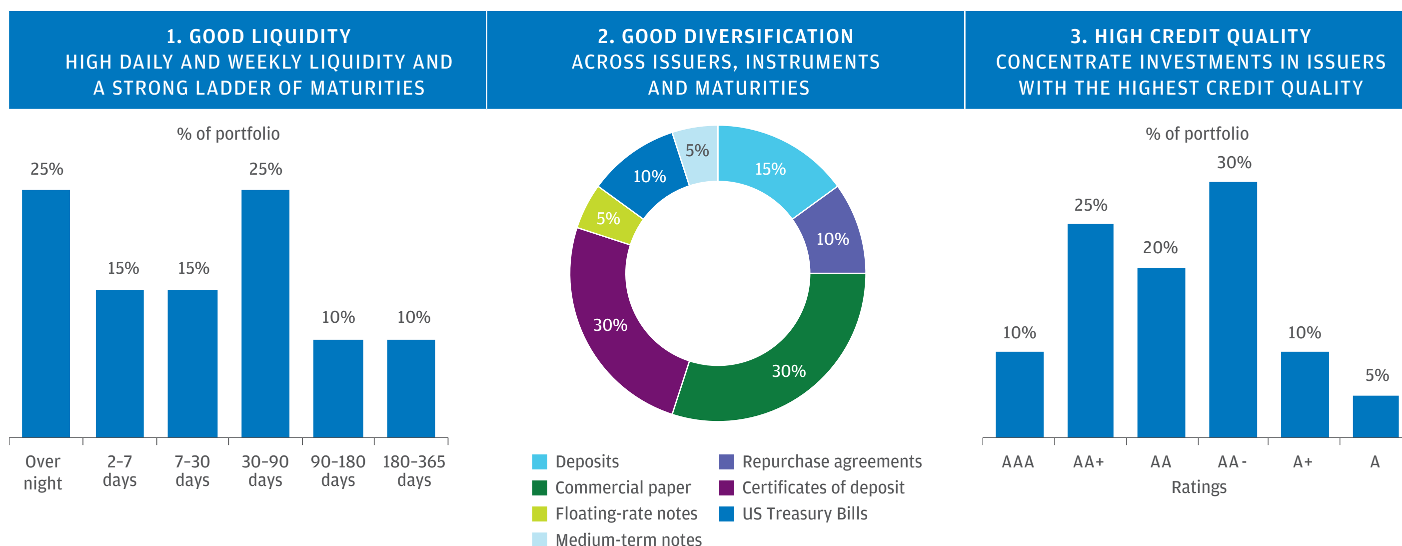
Source: China Securities Regulatory Commission (CSRC) Guidelines, as of 25 May 2021. FRN: floating-rate note. TD: term deposits.

*Fees: 1% fee charged on individual investor redemptions >1% if WLA is <5% and NAV deviation is negative. However, this can be waived if the fund manager and custodian agree an exception is in the best interest of the fund. Gates: If redemptions are more than 10% per investor per day, the asset manager can partially delay or postpone the redemption.

A TYPICAL MMF PORTFOLIO

A MMF aims to hold a highly diversified portfolio of short-term debt instruments from a broad range of highly-rated issuers, including governments, financial institutions and top-rated corporate organizations. Multiple securities may be held in a fund and investments typically include commercial paper, time deposits, certificates of deposit, floating rate notes, medium-term notes, repurchase agreements (repos), agency securities and government bonds or Treasury Bills that typically have a maturity of less than one year.

KEY CHARACTERISTICS



Source: J.P. Morgan Asset Management. For illustrative purposes only.

KEY SECURITIES

	COMMERCIAL PAPER (CP)	CERTIFICATE OF DEPOSIT (CD)	GOVERNMENT BILLS	FLOATING-RATE NOTES (FRNs)
Summary	Tradable promissory notes	Similar to term bank deposits and can be traded on the secondary market	Short-term fixed interest securities often known as Treasury bills in the US	Securities that reset their rate of interest periodically
Features	Highly liquid Allows diversification across different industries Wide range of maturities allows terms to be targeted precisely	Highly liquid – issuing bank often willing to repurchase before maturity	Liquid and highly active market Sovereign issuer Wide range of maturities Low risk reflected in low yield	Attractive when interest rate outlook is uncertain Variable rate makes them less exposed to interest rate risks
Maturity	Overnight to one year (typically < 95 days)	One day to two years	Four weeks to one year	Typically one year or greater
Issued by	Corporate and financial institutions, agencies and supranationals	Banks	Governments	Corporate and financial institutions, agencies and supranationals
Interest rate	Fixed	Fixed*	Fixed	Variable
Interest paid	At maturity**	At maturity	At maturity**	During term

	REPURCHASE AGREEMENTS (REPOs)	ASSET-BACKED COMMERCIAL PAPER (ABCP)	MEDIUM-TERM NOTES (MTNs)
Summary	Agreement between two parties to sell and repurchase a security with interest. MMFs typically do reverse repos, lending cash and taking in collateral	A bankruptcy remote special purpose entity which issues commercial paper and uses the proceeds to acquire a portfolio of assets, such as receivables, securities and loans	Securities that are issued with fixed interest rates
Features	Negotiated individually so interest and term can be highly tailored MMFs usually only have government debt as collateral, which is typically priced at a discount for additional security Ultra-short duration funds can do **non-traditional repos**	Backed by collateral or financial assets, such as trade receivables (bills) Contains liquidity and credit support features designed to cover asset / liability mismatches between the underlying collateral cash flow and the ABCP, as well as the credit performance of the collateral	Highly liquid Allows diversification across different industries Wide range of maturities
Maturity	Overnight to one year, typically overnight	One day to two years	Typically one year or greater
Issued by	Financial institutions	Special purpose vehicle established by a highly-rated financial institution	Corporates, financial institutions, agencies and supranationals
Interest rate	Fixed	Fixed	Fixed
Interest paid	At maturity**	At maturity**	During the term or at maturity**

* Certificates of Deposit can be issued as fixed or floating and with coupon or at a discount.

** Via the security being issued at a discount to face value.

Source: J.P. Morgan Asset Management. For illustrative purposes only. These investment examples are included solely to illustrate the investment process and strategies which may be utilized by the Fund. Please note that these investments are not necessarily representative of future investments that the Fund will make.

COMPARING MMFs TO BANK DEPOSITS AND ULTRA-SHORT DURATION BOND FUNDS

With a thorough understanding of MMFs, we can now compare them with other liquidity investment options, such as cash deposits or ultra-short duration bond funds, to better evaluate the benefits and risks of each.

MMFs vs bank deposits

MMFs and bank deposits are complementary, not competing products, and both belong in a treasury professional's toolkit. Two important benefits of investing in MMFs rather than in bank deposits are investment efficiency and cost. Using MMFs relieves treasury professionals from some of the day-to-day operational activities associated with overseeing numerous individual cash investments. In addition, most MMFs offer a T+0 or T+1 settlement cycle for withdrawing assets; cash managers using a **ladder** of various bank deposits with different maturities may be forced to break a bank deposit agreement should they suddenly need a larger amount of cash than expected.

MMFs also prioritize capital preservation by investing in a diversified portfolio, spreading counterparty risk and reducing volatility. In contrast, deposits may be concentrated with a limited number of counterparties. However, this diversification benefit of MMFs may be balanced by the fact that in some countries, bank deposits up to a specified value are protected by government guarantees, although these guarantees do not always apply to institutional investors.

Lastly, the return on MMFs may be higher than for bank deposits. MMFs can seek to enhance yield through investing in a broader range of short-tenor instruments. In standard market conditions, when the yield curve is upward sloping, MMF portfolio managers can invest in underlying securities with longer durations to increase a portfolio's yield.

MMFs vs ultra-short duration bond strategies

With interest rates at record lows, holding all cash in liquidity funds or time deposits is no longer a viable strategy. As discussed earlier, one of the key advantages of cash segmentation is the ability to earn higher returns from the reserve cash and strategic cash buckets.

An ultra-short duration bond fund is one of the first strategies investors might consider as they step out from money market funds. Ultra-short duration bond funds typically blend money market securities, such as commercial paper and certificates of deposit, with short-dated bonds. The funds tend to hold securities with final maturities out to either three years or five years, depending on client preference. The longer securities in the blend include government, agency, covered and corporate bonds with some securitized credit, such as AAA-rated asset-backed securities (ABS). Derivatives are generally only used for hedging purposes.

An ultra-short duration strategy typically allows a weighted average duration out to a maximum of one year, compared to a weighted average maturity cap of 60 days for short-term money market funds and 180 days for standard money market funds. This additional duration risk is one lever to help generate additional returns. Credit risk is the other lever. Whereas money market funds have a minimum credit-rating floor of single A, ultra-short duration strategies typically include down to BBB-rated securities.

The widening of the bond universe not only allows an ultra-short duration strategy to generate additional returns, but also offers greater diversification of underlying issuers, which is important because an increasing number of corporate issuers are rated BBB. Furthermore, whereas money market funds offer exposure mainly to issuers from the financials sector, the one- to three-year and one- to five-year corporate bond markets also include issuers from the industrials and utilities sectors.

When it comes to producing consistent incremental returns across the credit and interest rate cycle, it is crucial for investors to seek out strategies that are backed by a strong investment process, particularly with credit risk dispersion elevated in today's markets. We discuss more about credit risk, as well as liquidity and interest rate risk, in the next section.

Ultra-short duration strategies are available as funds, separately managed accounts and ETFs.

KEY DIFFERENCES BETWEEN MMFs, BANK DEPOSITS AND ULTRA-SHORT DURATION STRATEGIES

	MMFs	CASH DEPOSITS	ULTRA-SHORT DURATION STRATEGIES
Operational requirements	Actively managed on investors' behalf with no need for reinvestment	Requires daily management and reinvestment by the investor	Actively managed on investors' behalf with no need for reinvestment
Objective	Actively managed for capital preservation, liquidity and yield	Achieve return, capital preservation and liquidity by locking up cash at a pre-set interest rate and for a preset tenor	Actively managed for return, capital preservation and liquidity
Costs	All portfolio management, custody, administration, accounting and transfer agency fees accounted for in the total expense ratio (TER)	Custody expenses, rolling and breakage fees and the cost of treasury resources can all apply	All portfolio management, custody, administration, accounting and transfer agency fees accounted for in the total expense ratio; ETFs also have a bid-ask spread on the shares
Security risk	Risk is diversified among multiple securities	Moderate risk from investing in one deposit vehicle	Risk is diversified among multiple securities
Counterparty risk	Risk is diversified among multiple counterparties and assets are held off balance sheet with a third-party depository	High, due to investing with one counterparty on their balance sheet	Risk is diversified among multiple counterparties and assets are held off balance sheet with a third-party depository
Liquidity	Aim for daily access at all times	Daily access only with overnight deposits	T+1 or T+3 liquidity depending on fund
Credit rating	Many MMFs carry a AAA rating	Few AAA-rated banks available to depositors	Fund ratings are less typical, but for many ultra-short portolios, the weighted average credit quality is in the single-A category
Credit research	Manager provides ongoing credit analysis for all securities and issuers	Onus on investor to access and monitor bank's credit rating	Manager provides ongoing credit analysis for all securities and issuers
Interest	Option to pay out or reinvest income	Usually paid out daily	Option to pay out or reinvest income

Evaluating and managing risks

Liquidity products are designed to be among the least risky of all investment choices – after all, their primary purpose is to preserve capital and remain highly liquid. However, even liquidity products are subject to inherent investing risks – just to a lesser degree than most bond or equity funds. In this section we will start with an overview of the three key risks faced by MMFs: interest rate risk, liquidity risk and credit risk. We then discuss in detail the main resources that both portfolio managers and investors can use to evaluate and mitigate these risks. These include: regulations, which provide a level of mandatory risk management, particularly for MMFs, with clearly defined rules regarding security and liquidity; rating agency guidelines, which offer additional credit rules and independent oversight; finally a fund manager's internal investment limits and oversight, which add an additional layer of restrictions.

Interest rate risk

MMFs and ultra-short duration bond funds may be subject to interest rate risk because they invest in short-term fixed income securities that can increase or decrease in value based on changes in interest rates. If rates increase, the value of the fund's investments generally declines, and vice versa. Securities with longer maturities typically offer higher yields, but have greater interest rate sensitivity. Usually, changes in the value of fixed income securities will not affect cash income but may affect the value of an investment in the fund. WAM and duration measure the sensitivity of a bond's price to changes in interest rates. The interest rate risk of a fund can be mitigated by limiting the maximum WAM or duration of the product.

Liquidity risk

Liquidity risk can affect any type of fund, but it is most important for MMFs because they are meant to be used for daily cash needs. There are two main types of liquidity risks:

- **Funding liquidity risk** is the possibility that a fund's liquidity is insufficient to meet redemption calls from investors. There are a number of steps that a MMF can take to minimize this risk, including maintaining high overnight cash balances, building a strong ladder of maturities and instituting conservative investor concentration limits to ensure a diversified investor base.

  Recognizing the importance of liquidity, the latest MMF regulations and rating requirements typically specify minimum requirements for **daily liquid assets (DLA)** and **weekly liquid assets (WLA)**. Fund managers will typically hold higher DLA and WLA to provide an additional cushion against unexpected outflows.

- **Market liquidity risk** occurs when a volatile market environment and market stress lead to a lack of liquidity and make selling securities more difficult. In such circumstances, a MMF fund manager may struggle to sell securities or be forced to sell securities below the mark-to-market price in order to meet large redemptions or maintain regulatory limits. This could affect the value of investments in the fund.

  Market liquidity risk can be mitigated by holding a diverse range of instrument types and issuers. Holding smaller concentrations of each issue with diversified maturities – particularly for less liquid securities – can help minimize the impact of security price volatility on the fund. MMFs typically pursue a buy-and-hold investment strategy, which can help a fund weather market liquidity risk, as securities mature at par. Maintaining strong broker relationships can also help ensure good liquidity.

Credit risk

Credit risk, which can affect all fixed income and bank deposit products, considers the possibility that issuers or counterparties can default or be downgraded — with significant implications for investors. Default risk is the possibility that issuers or **counterparties** fail to repay on securities, time deposits or repurchase agreements. Downgrade risk is the possibility that the credit rating of a security or issuer may be downgraded by a rating agency.

An increase in a fund's credit risk can have several negative implications. First, it can lead to greater volatility in the price of the security, thereby impacting the value of the fund. Second, the MMF may become a forced seller, because the security no longer meets regulation or rating agency rules — while at the same time, the reduced rating may affect the security's liquidity, making it more difficult for the fund to sell it.

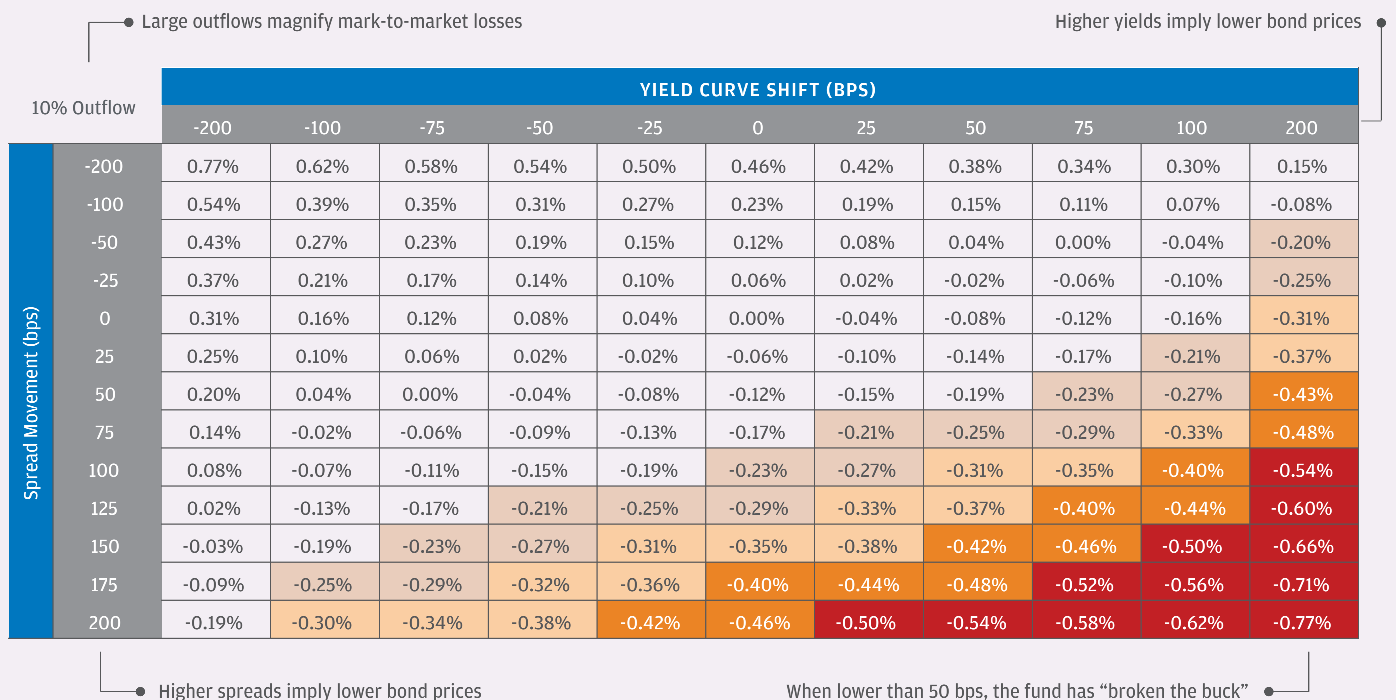
Credit risk can be mitigated through the use of external or internal credit research, designed to monitor the credit quality of the issuer or counterparty. Credit rating agencies, either international or domestic, publish credit ratings which are an opinion on the default risk of a particular bond or issuer. Rating agencies also signal the likely future path of credit ratings with a "rating outlook" for the next six to 24 months and a "rating watch" for a three-month time horizon. Rating agencies generally need to consider multiple factors and parties before taking rating action, which may limit their effectiveness. Therefore, a comprehensive, internal credit analysis process and credit risk management framework, that is integrated with MMF portfolio management, can minimize the risk of suffering unanticipated downgrades or defaults.

In the next section we discuss in detail how both external ratings and internal credit risk assessment can be used to manage credit risk in liquidity products.

STRESS TESTS

There are numerous portfolio management risk analysis tools available, such as measuring standard deviation or value-at-risk, to name a few. However, stress tests are the best method of risk analysis for MMFs and ultra-short duration funds, and are even required as part of several regulators' rules for MMF's. The following table illustrates an example of a stress test which considers the MMFs sensitivity to changes in interest rates (x-axis), credit spreads (y-axis) and liquidity flows. Risk managers can use stress tests to ensure MMFs are conservatively managed with sufficient capacity to avoid a significant decline in the value of an investment in the fund.

STRESS TESTS ARE THE BEST METHOD FOR RISK ANALYSIS FOR LIQUIDITY FUNDS



10% Outflow	YIELD CURVE SHIFT (BPS)										
Spread Movement (bps)	-200	-100	-75	-50	-25	0	25	50	75	100	200
-200	0.77%	0.62%	0.58%	0.54%	0.50%	0.46%	0.42%	0.38%	0.34%	0.30%	0.15%
-100	0.54%	0.39%	0.35%	0.31%	0.27%	0.23%	0.19%	0.15%	0.11%	0.07%	-0.08%
-50	0.43%	0.27%	0.23%	0.19%	0.15%	0.12%	0.08%	0.04%	0.00%	-0.04%	-0.20%
-25	0.37%	0.21%	0.17%	0.14%	0.10%	0.06%	0.02%	-0.02%	-0.06%	-0.10%	-0.25%
0	0.31%	0.16%	0.12%	0.08%	0.04%	0.00%	-0.04%	-0.08%	-0.12%	-0.16%	-0.31%
25	0.25%	0.10%	0.06%	0.02%	-0.02%	-0.06%	-0.10%	-0.14%	-0.17%	-0.21%	-0.37%
50	0.20%	0.04%	0.00%	-0.04%	-0.08%	-0.12%	-0.15%	-0.19%	-0.23%	-0.27%	-0.43%
75	0.14%	-0.02%	-0.06%	-0.09%	-0.13%	-0.17%	-0.21%	-0.25%	-0.29%	-0.33%	-0.48%
100	0.08%	-0.07%	-0.11%	-0.15%	-0.19%	-0.23%	-0.27%	-0.31%	-0.35%	-0.40%	-0.54%
125	0.02%	-0.13%	-0.17%	-0.21%	-0.25%	-0.29%	-0.33%	-0.37%	-0.40%	-0.44%	-0.60%
150	-0.03%	-0.19%	-0.23%	-0.27%	-0.31%	-0.35%	-0.38%	-0.42%	-0.46%	-0.50%	-0.66%
175	-0.09%	-0.25%	-0.29%	-0.32%	-0.36%	-0.40%	-0.44%	-0.48%	-0.52%	-0.56%	-0.71%
200	-0.19%	-0.30%	-0.34%	-0.38%	-0.42%	-0.46%	-0.50%	-0.54%	-0.58%	-0.62%	-0.77%

Source: J.P. Morgan Asset Management. For illustrative purposes only.

EXTERNAL FUND RATINGS

When selecting a liquidity product, the money market fund ratings given by the independent credit rating agencies can be a good starting point for assessing a fund's security and creditworthiness. However, while fund ratings are important, they are not the only criteria to consider when selecting liquidity products. In fact, although most investors find ratings useful, funds are not required to be rated and in some markets ratings are not available. We discuss a variety of other important questions and criteria in the upcoming section on due diligence.

All three major rating agencies – Moody's, Standard & Poor's and Fitch – provide ratings specifically for MMFs. Ratings can range from investment grade to speculative, although in practice, most MMFs will seek to maintain a AAA rating. To achieve a AAA rating, funds must meet certain investment criteria regarding maturity, credit rating and diversification of securities and issuers. Rating agencies will also assess the fund manager's operations, such as the investment process, level of experience, reporting and disaster recovery preparedness. MMFs are also rated on their ability to maintain stability of principal. Rating agencies carry out weekly reviews of a rated MMF and annual onsite visits to the fund manager to ensure that the fund is adhering to their criteria.

The AAA fund rating can give treasury professionals comfort that they are investing in the highest available quality fund, which may also be helpful for satisfying internal investment policy guidelines.

EXTERNAL RATING AGENCY AAA FUND RATINGS

AGENCY	RATING	DEFINITION
Standard & Poor's	AAAm	Extremely strong capacity to maintain principal stability and limit exposure to principal losses due to credit market and/or liquidity risks.
Moody's	Aaa-mf	Very strong ability to meet the dual objectives of providing liquidity and preserving capital.
Fitch	AAA-mmf	Extremely strong capacity to achieve money market fund's investment objective of preserving principal and providing shareholder liquidity through limiting credit, market and liquidity risk.

Source: Fitch Ratings, Moody's Investor Services, S&P Global Ratings; data as of 31 May 2021.

RATING DIFFERENCES: MMF RATINGS AND BOND FUNDS

MMF RATINGS			BOND FUND RATINGS		
Consider the fund's credit quality, diversification, liquidity and duration characteristics Prescribe guidelines to achieve rating Consider the fund managers' experience and expertise in managing this style of fund			Consider the average credit quality of the fund Prescribe guidelines to achieve rating Consider the fund managers' experience and expertise in managing this style of fund		
S&P	**Moody's**	**Fitch**	**S&P**	**Moody's**	**Fitch**
AAAm	Aaa-mf	AAAmmf	AAAf	Aaa-bf	AAA
AAm	Aa-mf	AAmmf	Aaf	Aa-bf	AA
Am	A-mf	Ammf	Af	A-bf	A
BBBm	Baa-mf	BBBmmf	BBBf	Baa-bf	BBB
BBm	B-mf	BBmmf	BBf	Ba-bf	BB
Dm	C-mf	Bmmf	Bf	B-bf	B
			CCCf	Caa-bf	CCC
				Ca-bf	
				C-bf	

Source: Fitch Ratings, Moody's Investor Services, S&P Global Ratings; data as of 31 May 2021.

For bond funds, including ultra-short duration bond funds, fund ratings are less common than they are for MMFs. Funds will often report the weighted average credit quality of the underlying portfolio instead. The weighted average credit quality for many portfolios in the ultra-short duration space is in the single-A category.

CREDIT RISK MANAGEMENT

Having an experienced and independent internal credit research team is increasingly critical to avoiding downside credit risks in MMFs and ultra-short duration bond funds. Liquidity investors should therefore carefully review a fund manager's credit research and credit risk management team and process when selecting a fund.

The internal credit research team is responsible for maintaining a pre-approved list of all issuers and monitoring these for the entire period they are on the list. The approved credit list should be dynamic, with new suitable issuers added when available, and existing issuers removed, if they fail to satisfy rating or risk criteria. The credit risk management team's primary function is establishing appropriate concentration and tenor limits based on the assigned internal credit rating to properly manage credit risks. Let's take a look at each of these considerations and how they impact the fund.

- **Ratings**: Securities with higher credit quality ratings naturally bring less risk to a fund than lower-rated securities. A strong internal credit analysis process will use independent internal ratings, in addition to considering those of the external rating agencies. These internal ratings are often more conservative than the external ones.
- **Concentration**: Credit risk can be managed by reducing the concentration of lower-rated securities in the fund. Each issuer is assigned a portfolio concentration limit corresponding to its internal rating, which is lower than the regulatory or rating agency limit and represents the ceiling. A smaller concentration reduces the potential negative impact of issuer price volatility on the portfolio. Consolidated exposures – direct, issuer-guaranteed or lines of credit – are aggregated for concentration measurement.
- **Tenor**: Tenor is the length of time a security has until maturity; securities with lower tenors are deemed lower risk. Each issuer is assigned a tenor limit corresponding to its internal rating that is lower than the regulatory or rating agency limit, which represents the ceiling. A shorter tenor minimizes the risk that a security will be downgraded or default before maturity.

Putting it all together, internal ratings can establish ceilings for total exposure, concentrations and maturity; better-rated issuers generally receive higher concentration and tenor allocations.

FIVE KEY FUNDAMENTAL CREDIT CONSIDERATIONS

- **Capital** should be tangible and appropriate relative to earnings volatility.
- **Asset quality** is assessed through the underlying credit quality and inherent liquidity of underlying assets.
- **Management** should be consistent and operate with integrity.
- **Earnings** are reviewed for consistency and quality over prolonged time periods.
- **Liquidity** is assessed through matched funding, backup credit lines or a stable retail funding base (for banks).

OTHER FACTORS OFTEN CONSIDERED IN A ROBUST CREDIT ANALYSIS

- **Industry and operating trends,** including cash flows, industry or product dominance and relative performance compared with peer groups, can be insightful in analyzing credit risk.
- **Alternative repayment options**, such as providing collateral, usually offer better recovery value in a credit event.

Regulation

Defining which instruments are truly cash equivalents is one of the most difficult tasks for modern treasurers. Globally, cash investors look to regulators to define and clarify suitable cash investment instruments and structures. This is especially true in the US, Europe and China, where the size and systemic importance of liquidity and MMFs made this a critical regulatory issue following the 2008–2009 financial crisis. However, regulations in other countries and jurisdictions may be less detailed.

Over the past decade, global regulators have strengthened MMF guidelines. They now demand higher levels of liquidity, impose tighter investment limits and require increased diversification. These new rules have raised the standard of MMF investing while significantly reducing the likelihood of funds suffering losses, albeit at the expense of lower potential returns.

These rules and regulations vary from prescriptive, listing specific approved and unapproved instruments, to abstract, outlining key sources of investment risk and limits to mitigate them. Regardless of the regulator's philosophy, the ultimate goals remain the same — to ensure adequate liquidity and minimize the probability of losses.

MMF regulation continues to evolve, incorporating lessons learned from periods of volatility. Regulators also consider financial market changes, local market characteristics and international developments when creating new guidelines. Notably, over the past decade, regulatory gaps between different country and regional guidelines have been narrowing.

WHAT IS "BREAKING THE BUCK" AND WHY IS IT IMPORTANT?

- Subscriptions and redemptions to a money market fund occur at $1 per share (no capital gains or losses are realized).
- To ensure all redemptions can be paid at $1 per share, the mark-to-market value of the portfolio should be extremely close to the amortized value of the portfolio at all times. The acceptable range for US, European and Chinese stable NAV funds is +/- 50 basis points (bps) +/- 20 bps, and +/- 50 bps, respectively.
- The deviation beyond which regulators and the rating agencies deem this is no longer the case is known as "breaking the buck."

GLOBAL COMPARISON OF MMF REGULATORY GUIDELINES

GUIDELINE	US - SEC RULE 2A-7	EU – ESMA SHORT-TERM MMF	CHINA – CSRC MMF
Product structure	CNAV: government, retail VNAV: institutional prime, municipal	CNAV: government LVNAV: credit VNAV: government, credit	CNAV VNAV
Max WAM*	WAM 60 days/WAL 120 days	WAM 60 days/WAL 120 days	WAM 120 days/WAL 240 days
Max maturity	Fixed 397 days FRN/VRN non-US government: 397 days	397 days	Bonds: 397 days TD and repo: one year FRN: Max 20% if tenor > 397 days
Min credit rating	Must present minimal credit risks to the fund as determined by the fund's board	Must present minimal credit risks to the fund	Long term: AA+ (domestic ratings) Max 10% of below AAA-rated issuers (2% per issuer) Approval required for below AA+ rated banks, term deposits (TD) or negotiable certificates of deposit (NCD)
Diversification/ concentration	Issuer Concentration: max 5%	Max 5% per issuer Rule 5/10/40: positions between 5% and 10% must not in aggregate exceed 40%	Max 30% (excluding redeemable TD) 20% per bank with custody license 5% per bank without custody license Max 10% per bank's net assets
Repo (lend collateral) / Reverse Repo (lend cash)	Repo: not allowed Reverse repo: max 5% per counterparty; no limit per counterparty if fully collateralized by U.S. Treasuries, U.S. government agency securities or cash	Repo: max 10% Reverse repo: max 15% per counterparty; collateral must be money market eligible securities; max maturity of two business days	Repo: max 20% Reverse repo: max 40% per issuer
Illiquid securities	Max 5%[1]	n/a	Max 10% in TD and repo with maturities >10 days
Portfolio liquidity	Min 10% daily[2]/min 30% weekly[3] Tax-free MMF exempt from daily liquidity	CNAV: Min 10% daily/min 30% weekly[4] LVNAV: Min 10% daily/min 30% weekly[4] VNAV: Min 7.5% daily/min 15% weekly[5]	Min 5% daily[6] Min 10% weekly[7]

Source: J.P. Morgan Asset Management, Securities and Exchange Commission (SEC), European Securities and Markets Authority (ESMA), and China Securities Regulatory Commission (CSRC). As of 31 December 2020.

* WAM = weighted average maturity, WAL = weighted average life. [1] Illiquid securities include repos and depos >seven days. [2] Assets must be in cash, US Treasury securities, or securities that convert into cash within one day. [3] Assets must be in cash, US Treasury securities, certain other government securities with remaining maturity of 60 days or less, or securities that convert into cash within five business days. [4] 17.5% of weekly liquid assets can be US Treasuries or certain other foreign government positions with 190 days or less to maturity. [5] 7.5% of assets outside of the weekly maturity bucket can be counted toward weekly liquid assets. [6] Assets must be in cash, government bonds, People's Bank of China bills, policy bank bonds. [7] Assets must be in cash, government bonds, PBoC bills, policy bank bonds or securities with remaining maturity of five days or less.

Due diligence

Equipped with a solid understanding of liquidity products, their risks and the differences between them, treasury professionals can carry out independent due diligence to find the best match of liquidity products to their unique needs and internal guidelines.

Below we highlight five areas that investors should consider in their due diligence process:

1 STRENGTH AND EXPERIENCE OF THE MANAGER

Investors will want to assess the strength of a MMF manager through careful examination of the manager's current and historic financial position, as well as considering its commitment to and the size of its liquidity business. A thorough investigation of the manager's experience and track record – particularly through volatile markets – is critical in the selection process.

2 CREDIT ANALYSIS CAPABILITIES AND INVESTMENT PROCESS

Prospective investors should probe the strength and track record of the credit analysis capabilities and the investment process by asking about the structure, experience and resources of the credit team. Topics to address include how are funds stress-tested, whether anything in a portfolio has been downgraded or a fund manager has had to buy out any holdings, the underlying investment diversification, if the fund is rated by a Nationally Recognised Statistical Rating Organisation (NRSRO) and what additional internal restrictions beyond the regulatory limits are used.

3 LIQUIDITY, INVESTOR CONCENTRATION AND ACCESS

As a key goal, the liquidity conditions of a money market fund should be a priority for prospective investors. Investors should ask if the fund maintains high levels of overnight liquidity and a strong ladder of maturites to meet all potential redemptions and if there are restrictions to ensure an adequate level of client diversification. Clients should also inquire if the fund has ever restricted withdrawals. Some additional service and operational considerations that are important include cut-off times, management fees and minimum subscription levels.

4 ENVIRONMENTAL, SOCIAL AND GOVERNANCE (ESG) CONSIDERATIONS

ESG considerations are becoming an increasingly important part of investing and the due diligence process. Investors that are seeking to incorporate ESG into their liquidity fund selection process may want to look closely at how ESG is incorporated into credit analysis and the security selection process. If the analyst believes that the ESG factors are material and may impact issuer risks, the analysis will be reflected in the analyst's credit opinion.

At J.P. Morgan Asset Management, ESG risks are systematically considered as part the fundamental company credit and industry analysis. Credit analysts examine all aspects of a company, including how ESG risks and opportunities are currently affecting a company's cash flows as well as how cash flows may be impacted in the future. At the sector level, considerations include industry positioning, the regulatory environment, public sentiment, climate considerations, resource usage and secular trends.

5 TECHNOLOGY

As an organization's treasury team moves its trading and investment decisions online, a comprehensive, secure and easily-integrated technology platform for liquidity investments has become another important consideration for treasury professionals.

On average, global liquidity clients invest in at least three fund providers to ensure they have enough investment options to create a diversified, multi-manager, multi-currency portfolio that meets their liquidity needs. A strong technology platform will feature the following characteristics:

- **EASE OF INVESTING:** this includes access to a wide selection of funds, easy trading and helpful functions, such as the ability to view aggregated account information across entire portfolios, conduct in-depth risk analysis, model potential trades and compare available investment options. A provider's platform should also be able to integrate with a client's treasury management platform.
- **EFFECTIVE CONTROLS:** investment policy guidelines can be integrated into a technology platform and warn users in advance when a trade may create a breach.
- **OPERATIONAL EFFICIENCY:** ability to perform analysis, schedule custom reporting and execute trades both, in real time and in advance. Some platforms can facilitate multiple and more complex trading options, including host-to-host trading, Application Programming Interfaces (API) integration and support for multiple settlement instructions.

Conclusion

MMFs have become a popular choice for the allocation of surplus cash. They are among the least risky investments, thanks to their low interest rate risk, the diversification of counterparty risk and the high credit quality of their underlying investments. In many ways they can offer greater security than bank deposits, while also maintaining a high degree of liquidity and a competitive level of yield; these characteristics are particularly sought after in uncertain market environments.

In order to maximize the return on excess cash, while taking as little unnecessary risk as possible, we encourage investors to carefully select their MMFs. We believe a fund management company with a solid track record and the necessary financial strength, research resources and commitment will be best positioned to deliver on its funds' objectives. Investors should also perform the necessary checks and due diligence to ensure MMFs are able to meet their particular objectives for capital preservation, liquidity and yield across their cash portfolios.

Investors and treasury professionals that have clear and disciplined cash management strategies can further benefit by taking appropriate risk with reserve cash by investing it in step-out strategies, such as ultra-short duration bond funds. In an environment of exceptionally low interest rates, these higher-yielding liquidity products can complement traditional MMF investments.

Glossary

ACCOUNTING IMPLICATIONS The cash position on financial statements includes cash (cash on hand and overnight deposits) as well as cash equivalent holdings. The investment objectives and parameters of most short-term MMFs should enable them to be considered as a cash equivalent for the purposes of preparing a cashflow statement. Financial statements should also disclose information about the fair value of all assets and liabilities. This should be determined according to a three-tier hierarchy. As most short-term MMFs have prices that are declared and published daily, investment in these funds should be classified in level one of the fair value measurement hierarchy.

AMORTIZED COST/VALUE Measure of the cost of a security, whereby the cost value will change over time as the discount or premium paid for the security is gradually incorporated into the principal value as interest payments are received. This involves valuing a security at its cost initially and thereafter assuming a constant amortization to maturity of any discounts or premium, regardless of the impact of fluctuating interest.

AMORTIZED COST METHOD OF VALUATION Means of valuing securities in a money market fund, based on the acquisition price and the return at maturity rather than daily market prices so the fund's net asset value can remain constant.

BID-ASK SPREAD The difference between the highest price a buyer is willing to pay for an asset and the lowest price the seller is willing to accept.

CASH EQUIVALENT Instruments of such high liquidity and safety that they are virtually as good as cash. This is typically any highly liquid security with a known market value and a maturity, when acquired, of less than three months.

COUNTERPARTY RISK The risk to each party of a contract that the other party (counterparty) will not live up to its contractual obligations. In most financial contracts, counterparty risk is known as 'default risk.'

CREDIT RATING AGENCY Independent organization that rates companies, banks and other financial institutions on their ability to meet their financial commitments. This includes Nationally Recognized Statistical Rating Organization (NRSROs).

DAILY LIQUID ASSETS (DLA) Cash, government bonds or securities maturing within one business day.

DIVIDENDS As shareholders in the fund, investors receive a distribution in the form of a dividend. The dividend is calculated from the fund's net yield on a daily basis, accumulated and either paid out or reinvested on the first business day of the following month.

DURATION A measure of the sensitivity in the price of a bond (or other fixed income security) to a change in interest rates.

EXCHANGE TRADED FUND (ETF) A basket of securities, often tracking an index or a fund, that trades on an exchange. An ultra-short ETF is an ETF that holds short-duration debt securities.

LADDER Strategy of building a portfolio of instruments with varying maturities to create more predictable income streams and manage interest rate risk.

MARK TO MARKET The practice of valuing a financial asset based on current daily prices. See **Amortized cost method of valuation**.

MARK TO MODEL The practice of pricing financial assets using financial models, rather than normal market prices. See **Amortized cost method of valuation**.

MATURITY The maximum time that a bond can be outstanding; the date when principal capital will be repaid.

MEDIUM-TERM NOTE A note that usually matures in five to ten years.

NET ASSET VALUE (NAV) The value of the underlying holdings in an investment fund less liabilities and some costs. The share price of a money market fund tracks its NAV.

PRIME MMF A US term for money market funds that mainly invests in non-government securities.

REPURCHASE AGREEMENT (REPO) A form of short-term borrowing backed by collateral. The owner sells the securities to another party and then buys them back at a specified time. The buyer earns a rate of interest for this transaction and is said to engage in a reverse repo. While repo transactions are primarily overnight, they can be for any duration. In a tri-party repurchase agreement, a custodial bank is added as a third party to the transaction. By acting as an agent to both the owner and seller of the securities, the custodian bank is responsible to safeguard the securities before the repurchase happens. In the event of default by one party, this protects the interest of the other party. Non-traditional repos can include a wide array of investment types used as collateral.

RULE 2A-7 Regulation that governs how U.S. money market funds can invest.

TENOR The length of time a security has until maturity.

T+0 or **T+1** Refers to the time it takes to settle a trade, such that 'T' is the trade date, '+0' means it is settled on the same day and '+1' means it takes one additional day until the trade is settled.

WEEKLY LIQUID ASSETS (WLA) Assets must be in cash or in securities that convert into cash within five business days. Additionally, high quality issuers such as government securities may be counted towards this measure, though rules regarding maximum maturity and percentage vary by region.

WEIGHTED AVERAGE LIFE (WAL) Average of the legal final maturity of all securities held in the portfolio, weighted by each security's percentage of net assets.

WEIGHTED AVERAGE MATURITY (WAM) The average maturity of all instruments, taken to the next interest reset date, by each security's percentage of total assets.

Notes

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