[PRELIMINARY]

# New Activities, Familiar Risks?
# Potential Financial Stability Implications of New Money-Like Products[1]

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## 1. Introduction

Money and money-like assets are central components of our financial system and economy, so the recent emergence of new types of nonbank money-like products, such as stablecoins, tokenized money market funds (MMFs), and MMF exchange-traded funds (ETFs), could be transformative for finance. These nonbank products may offer significant potential benefits, such as enhanced liquidity and higher returns for investors as well as reduced costs for a wide range of transactions, from everyday consumer purchases to large international deals. At the same time, like other money-like assets, such as uninsured deposits and MMFs, the new products can be susceptible to costly, disruptive runs and thus contribute to financial system vulnerabilities.

In this note, we introduce a general framework for analyzing the vulnerabilities in novel money-like products. Our framework builds on the well-documented vulnerabilities in an older nonbank innovation with wide-ranging benefits and well-understood risks – MMFs – and the features that contribute to MMF vulnerabilities. Specifically, we examine the extent to which each novel product: (1) engages in liquidity transformation, or the conversion of illiquid assets into liquid liabilities; (2) serves as a private money-like asset, that is, the degree to which it is perceived as safe and liquid; (3) is subject to threshold effects, which are sharp discontinuities in investors' expected payoffs amid stress; (4) poses contagion risks because problems in one

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product trigger runs on similar products; and (5) has a base of reactive investors who are more prone to run during periods of stress.

As reported in Table 1, using this framework, we find that features that contribute to vulnerabilities are present to varying extents in MMF ETFs, tokenized MMFs, and stablecoins. Consider, for example, MMF ETFs where liquidity transformation is potentially lower than MMFs because MMF ETFs may have the flexibility to redeem largely in-kind. MMF ETFs' floating net asset values (NAVs) probably diminish their status as private money-like assets relative to most MMFs. Threshold effects in MMF ETFs are likely smaller than those in MMFs, in part because of ETFs' floating NAVs, but MMF ETFs may increase contagion effects if ETF price discounts signal that MMF investors should redeem their shares. Finally, the reactivity of the MMF ETF investor base is uncertain relative to that of MMFs because of the offsetting effects of ETFs' floating NAVs and intraday liquidity.

**Table 1. Features that contribute to vulnerabilities of money-like products**

| Features that contribute to vulnerabilities | Description | Presence of these features (relative to those for comparable MMFs)* | | |
|---|---|---|---|---|
| | | MMF ETFs | Tokenized MMFs | Stablecoins |
| 1. Liquidity Transformation | Transforming illiquid assets into liquid liabilities, which creates incentives for investors to redeem amid stress. | Potentially lower | Similar | Probably similar |
| 2. Private Money-Like Assets | Perceived as unquestionably safe and liquid during normal times; a change in this perception can trigger runs. | Probably lower | Greater | Probably lower |
| 3. Threshold Effects | Discontinuous changes in the expected payoffs for investors when certain thresholds are reached. | Lower | Similar | Lower |
| 4. Contagion Effects | An adverse shock on one product propagates stress to similar products. | Greater | Greater | Lower |
| 5. Reactive Investors | Investors whose incentives, preferences, or resources make them quick to redeem or run during periods of stress. | Uncertain | Uncertain | Lower |

*Our assessments are based on comparisons of each product to *comparable* MMFs. For example, we compare government MMF ETFs to government MMFs and prime MMF ETFs to prime MMFs.

We focus on MMF ETFs, tokenized MMFs, and stablecoins because these products may grow rapidly in scale and scope and be offered to a wide range of investors, from households to

large financial institutions.[2] Some other money-like products, such as specialized investment funds that offer cash-management options for a narrow set of investors – notably, tokenized private fund shares – could be analyzed using the framework we offer in this note. However, we limit our examination to newer instruments that seem most likely to grow large enough to have meaningful potential effects on aggregate financial vulnerabilities to illustrate the utility of our framework for products.[3]

To be sure, the new products we examine are still evolving rapidly, and their novelty limits our ability to foresee the full range of possible uses and how they might affect financial stability. Even so, by comparing the new products' features to MMFs, which have vulnerabilities that are extensively documented in both the academic and official-sector literatures, we can learn much about how new products can contribute to financial vulnerabilities as they evolve. Moreover, the analysis provides some key insights into what to watch as products develop. For example, a pivotal issue for MMF ETFs is whether they redeem in-kind or in cash, and a key issue for tokenized MMFs is whether the underlying fund is a prime or government MMF.

Section 2 of this note provides a brief introduction to each of the novel products we examine: MMF ETFs, tokenized MMFs, and stablecoins. Section 3 describes our framework for assessing how these products may contribute to financial vulnerabilities. Section 4 analyzes each product using our framework. Section 5 concludes.

## 2. Background on Novel Money-Like Products

### 2.1. MMF ETFs

First introduced in 2024, MMF ETFs are Securities and Exchange Commission (SEC)-regulated funds that are both MMFs and ETFs. As MMFs, they must adhere to the risk-limiting provisions of SEC Rule 2a-7, including maximum portfolio maturity and minimum liquidity requirements. Like other ETFs, an MMF ETF transacts only with specified market makers ("authorized participants" or APs) and issues shares that other investors can buy or sell on an exchange. Thus, in contrast with investors in MMFs, who buy or redeem shares in transactions

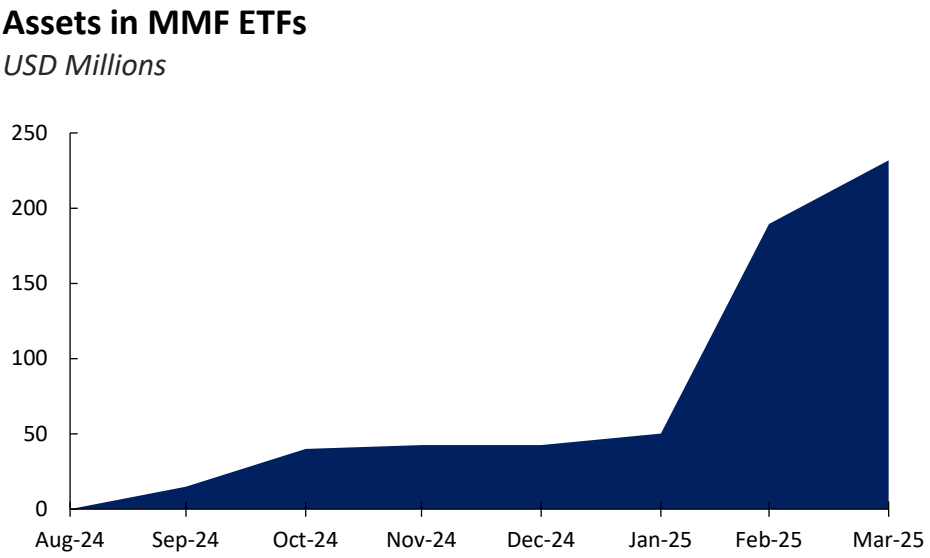
[2] For example, Citi Institute (2025) estimates that the stablecoin market could reach $3.7 trillion in 2030, from less than $250 billion today. This growth, they note, could be driven, in part, by a shift from USD liquidity vehicles held by corporations and households to support their cash management and payments needs.

[3] Some novel money-like products, such as tokenized deposits, are (or build on) deposits and other banking products. We focus on nonbank products and hence exclude deposit-related products from our analysis.

with the fund itself, most investors in MMF ETFs buy or sell shares only in secondary markets. The ETF structure allows continuous transactions of fund shares during market hours, whereas MMF shares are typically transacted just once per day with the fund.

As of March 2025, net assets in MMF ETFs stood at about $232 million (Figure 1).

**Figure 1. Net Assets in Money Market Fund Exchange Traded Funds**



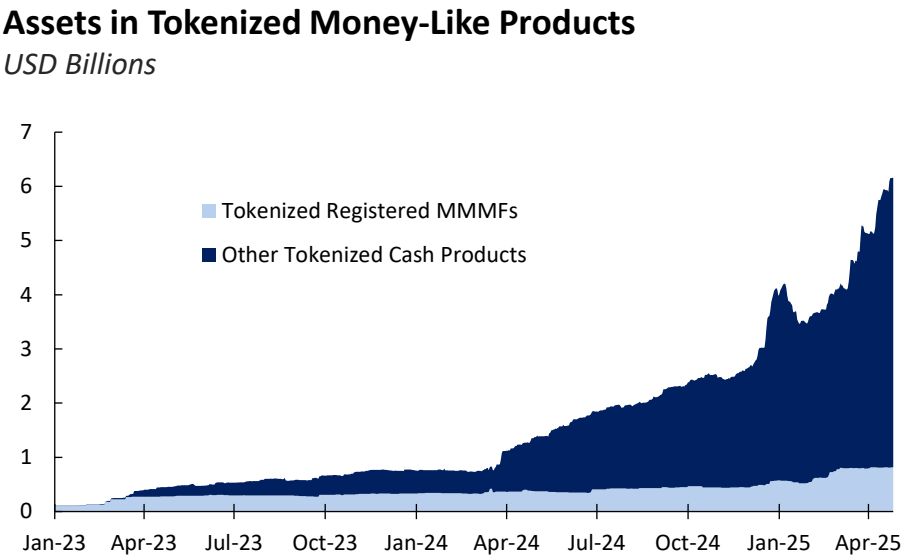

Source: Morningstar Direct

## 2.2. Tokenized MMFs

A tokenized MMF is a unique digital representation on a blockchain of shares in an MMF. The underlying MMF – the reference asset for the tokens – is a fund that, like other MMFs, complies with the SEC's Rule 2a-7. Although the tokenized MMF structure is still evolving, the tokens may offer investors some advantages over MMF shares, particularly if token transactions can effectuate transfers of ownership of the underlying MMF shares. If so, tokens might be used as payment vehicles that offer low-cost, 24/7 instantaneous settlement and also as collateral in financial transactions.

First introduced in 2021, tokenized MMFs had net assets of almost $815 million, as of April 2025 (Figure 2).

**Figure 2. Net Assets in Tokenized Money-Like Products**




Source: rwa.xyz

## 2.3. Stablecoins

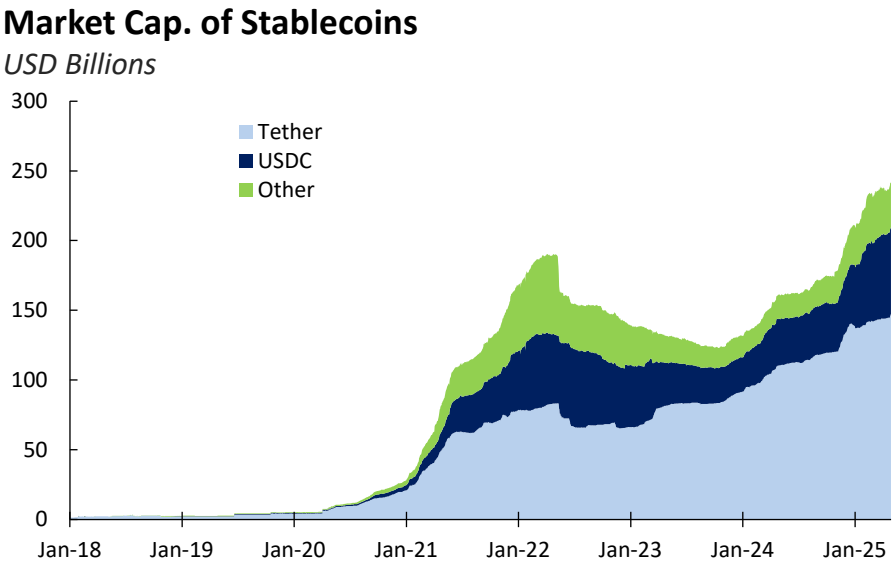
First created in 2014, stablecoins are digital assets that are designed to maintain a relatively stable price per token, usually $1.00. The most popular type is the reserve-backed stablecoin, which typically claims to back each issued token with traditional financial assets, such as US Treasury securities and commercial paper.[4]

Stablecoins have grown very rapidly: Market capitalization reached $241 billion in April 2025, up from just $5 billion in 2019 (Figure 3). The stablecoin market is currently highly concentrated, with two stablecoins, Tether (USDT) and US Dollar Coin (USDC), comprising almost 90 percent of aggregate market capitalization. These two stablecoins' combined holdings of Treasury securities are comparable in magnitude to those of major foreign governments.[5]

[4] Other types of SC arrangements include crypto-backed stablecoins, which are backed by crypto assets, and algorithmic SCs, which are unbacked but use computer algorithms to match supply and demand.

[5] For more details see: ticdata.treasury.gov/resource-center/data-chart-center/tic/Documents/slt_table5.html.

**Figure 3: Market Capitalization of Stablecoins**




Source: CoinGecko

## 3. A Framework for Analyzing Vulnerabilities

Our framework for assessing the vulnerabilities of novel money-like products builds on the well-documented vulnerabilities of MMFs. Academic research and official publications have highlighted several features that contribute to vulnerabilities in MMFs and other money-like products. Hence, we begin with a description of those features, which provide a structure for analyzing the vulnerabilities of novel cash-management products, and which are summarized in the first two columns of Table 1.

### 3.1. Liquidity transformation

Liquidity transformation is the transformation of illiquid assets into liquid liabilities. Diamond and Dybvig (1983) demonstrated in a theoretical setting how liquidity transformation can lead to bank runs, and both theoretical and empirical research has shown that liquidity transformation can make investment funds vulnerable (for example, Chen, Goldstein, and Jiang, 2010; Feroli, Kashyap, Schoenholtz, and Shin, 2014; Goldstein, Jiang, and Ng, 2017; Zeng, 2017). Liquidity transformation can make an investment vehicle more vulnerable than the assets it holds, because liquidity transformation can motivate investors to redeem the vehicle faster than it would sell its underlying assets, for two reasons (Bouveret, Martin, and McCabe, 2022). First,

in episodes of stress, investors who redeem fast from a vehicle that holds (or is backed by) a mix of liquid and less-liquid assets have a first-mover advantage if they get out before the vehicle depletes the liquid assets. Second, when market liquidity costs rise amid financial stress, a vehicle that does not charge a liquidity (or similar) fee for the costs arising from redemptions is effectively subsidizing those redemptions.

### 3.2. Private money-like assets

Private money-like assets are seen as "money-like" because they are so safe and liquid – at least in normal times – that investors need not question their value. This no-questions-asked (NQA) property allows investors to avoid costly research to verify the products' value and facilitates use for cash management (Holmstrom, 2015). However, status as a money-like assets, or "moneyness," can be fragile, and if doubts emerge about safety or liquidity or questions are asked about value, investors may dump these assets quickly (Gorton, 2017). Even if an asset has no other sources of vulnerability, investors who use it as money may dispose of it quickly if it no longer serves that function.

### 3.3. Threshold effects

Some products have structures or rules that can cause abrupt, discontinuous changes in the expected payoffs for investors when certain thresholds are reached.[6] An example is the maintenance of stable net asset values (NAVs) in some MMFs and other short-term investment vehicles (such as short-term investment funds and local government investment pools) via rounding: When the share price declines and no longer rounds up to $1.00, it can drop suddenly and discontinuously. As such, thresholds may motivate investors to redeem preemptively, before a threshold is crossed (Cipriani, Martin, McCabe, and Parigi, 2014).

### 3.4. Contagion effects

When money-like products are similar or are sensitive to similar shocks, problems for one product can motivate investors to redeem other products. Contagion effects may arise

[6] Threshold effects are inherent in the structure or rules for a product and can have a direct impact on *all* its investors. Other effects, such as rules that govern certain users of a vehicle, may cause sudden shifts in demand among some users and contribute to the reactivity of investor bases and contagion effects, but in this framework, we do not consider them "threshold effects."

because portfolio holdings are similar or because investor bases are similar, so an adverse shock to one fund is likely to hurt others. Opacity regarding portfolio holdings or investors may exacerbate contagion risks in private money-like assets because, after a shock occurs, investors in an opaque vehicle may be unable to verify that it is safe (and are apt to get rid of any money-like asset if its value comes into question).

### 3.5. Reactive investor bases

Certain types of investors – particularly large and institutional investors – may be especially reactive to stress in a money-like vehicle. For example, institutional investors historically have been quicker than retail investors to redeem when MMF risks become salient, so runs on institutional MMFs have been more severe than those on retail funds. The tendency of some types of investors to regard an asset as more money-like or to put it to uses that are appropriate only if it retains its money-like status can amplify their reactions if that status is questioned. This type of investor reactivity, in which investors suddenly redeem or dispose of assets when their role as money is questioned, is very different from regular volatility of investor flows in response to routine fluctuations in performance or other characteristics.

### 3.6. Applying the framework to *novel* products

Because the products we assess are novel, many may still be unfamiliar to most investors, which limits the extent to which they currently exhibit features that may make them vulnerable. For example, unfamiliar products are unlikely to achieve the NQA property of well-established cash equivalents, like MMFs, or to attract highly risk averse, highly reactive institutional investors. As such, we assess the potential for these products to exhibit these features once they become a more familiar part of the financial landscape.

## 4. Analyzing Vulnerabilities in Money-Like Products

In this section, we use our framework to assess potential vulnerabilities in novel money-like products by examining the extent to which they exhibit each of the five features that have made MMFs vulnerable. To provide some context, we begin our analysis of each feature by reviewing how it affects MMFs.

## 4.1. Liquidity transformation

### *4.1.1. Money market funds*

Many MMFs – particularly prime funds – engage in significant liquidity transformation because they hold private short-term debt instruments, including commercial paper (CP) and negotiable certificates of deposit (NCDs), that have little or no secondary markets and become illiquid amid stress (Financial Stability Board, 2021).[7] Hence, investors who redeem early in stress before a fund depletes its most liquid assets have a first-mover advantage. Indeed, prime MMFs that faced runs in 2008 quickly sold their most liquid holdings and left non-redeeming investors holding claims on riskier portfolios (Strahan and Başak, 2015). Moreover, even when market liquidity costs rise, MMFs typically offer redemptions without any charge for the liquidity costs resulting from the redemptions, so MMFs effectively subsidize redemptions amid financial stress.[8]

Liquidity transformation is particularly acute in prime MMFs but less so in government MMFs, which hold assets that are typically more liquid than those held by prime MMFs.

### *4.1.2. **MMF ETFs.** Liquidity transformation is **potentially reduced** relative to MMFs.*

Most ETFs allow only in-kind creations (purchases) and redemptions. In such transactions, the fund and an AP exchange fund shares for a basket that approximately replicates the fund's portfolio holdings. Thus, when an AP redeems, it receives portfolio holdings, not cash, for its shares.[9] As such, liquidity transformation is diminished in these ETFs, and redemptions do not deplete their liquidity or create incentives for investors to redeem before others do (Anadu, Kruttli, McCabe, and Osambela, 2020). The benefit of reduced liquidity transformation from in-kind redemptions could be especially significant for prime MMF ETFs, since prime

[7] Thus, MMFs cannot necessarily rely on selling assets to meet redemptions. Indeed, SEC liquidity rules for MMFs are based on the maturities of the instruments they hold, not on the funds' ability to sell them in secondary markets.

[8] One type of MMF *does* charge redeeming investors for liquidity when certain conditions are met: Institutional prime MMFs have been required since October 2024 to charge a dynamic liquidity fee to redeeming investors on days when net redemptions exceed 5 percent of the fund's assets.

[9] To be sure, an AP may choose not to engage with the ETF during turbulent times, which could result in a large ETF price discount to its NAV. Under this scenario, the ETF effectively functions like a closed-end fund, which have limited obvious liquidity transformation implications.

MMFs hold less liquid assets and thus engage in more liquidity transformation than government MMFs.

However, in practice, two of the three MMF ETFs introduced to date (unlike many other ETFs) transact primarily in cash, rather than in-kind.[10] Hence, for these MMF ETFs, the vulnerabilities associated with liquidity transformation are likely similar to those for the MMFs themselves.

#### *4.1.3. **Tokenized MMFs.** Liquidity transformation is **comparable** to MMFs.*

Since tokenized MMFs are digital representations of MMF shares, liquidity transformation for tokenized shares is largely the same as that of the underlying MMF. For example, when token investors wish to convert a token to an MMF share and redeem it, they – like any investors in an MMF – receive cash for MMF shares that are backed by assets that may be illiquid.

#### *4.1.4. **Stablecoins.** Liquidity transformation is likely **comparable** to MMFs but uncertain.*

Stablecoin liquidity transformation differs from that of MMFs in two important but potentially offsetting ways, so liquidity transformation in these products is probably similar to that in MMFs, but the comparison is uncertain.

On the one hand, liquidity transformation may be higher for stablecoins because some reserve-backed stablecoins hold reserve assets that can be substantially less liquid than the portfolio assets that MMFs are able to hold under SEC rule 2a-7. For example, Tether holds a material portion of its reserves in corporate bonds and "other investments" that include risky assets. Although USDC reserves are reportedly invested primarily in cash and short-duration U.S. Treasuries, in 2023 USDC was holding a substantial portion of its reserve assets in uninsured deposits in a bank (SVB) that failed; such investments would not be allowable for an MMF.

[10] Texas Capital Government Money Market Fund notes that "Creation Units generally are issued and redeemed "in-kind" for securities and partially in cash." (See, https://fundsmanagement.texascapital.com/wp-content/uploads/2025/05/BG-Texas-Capital-Government-MM-ETF-MMKT-Pro.pdf ). BlackRock's iShares Prime Money Market ETF and Government Money Market ETF both create and redeem for cash, rather than in-kind (see, respectively, https://www.sec.gov/Archives/edgar/data/1761055/000119312525019990/d107669d497k.htm and https://www.sec.gov/Archives/edgar/data/1761055/000119312525018106/d766835d497.htm.)

On the other hand, liquidity transformation may be lower in stablecoins because issuers can charge fees for certain types of redemptions, which reduces the liquidity of their liabilities (the tokens) and diminishes the drain on cash arising from redemptions. For example, Tether has a minimum redemption amount of $100,000 and charges a 0.10 percent redemption fee.[11] Circle, which issues USDC, offers free redemptions up to $2 million per day and charges up to 0.10 percent fee for redemptions exceeding that amount.[12]

## 4.2. Private money-like assets

### *4.2.1. Money market funds*

Sponsors of MMFs have long positioned these funds as money-like products. For example, from their origins in the 1970s, MMFs sought to replicate features of bank deposits, such as maintaining a stable $1.00 share price and offering check-writing services. MMF shares are a component of the Federal Reserve's money-stock measures and – supported by SEC guidance – are considered cash equivalents. The success of this model has established MMF shares as private money-like assets, but it has also contributed to their vulnerabilities amid stress if investors begin to question their ability to serve as money (see, for example, Gorton, Lewellen, and Metrick, 2012; Gorton, 2017).

Government MMFs are probably more widely viewed as money-like than prime funds, especially since 2016, when SEC rules required prime MMFs sold to institutional investors to have floating NAVs (Baghai, Giannetti, and Jager, 2022). In addition, rules implemented in 2023 require institutional prime funds to have dynamic liquidity fees. In contrast, institutional government MMFs can still have stable NAVs and are not required to have liquidity fees.

### *4.2.2. **Money market fund ETFs.** Moneyness is probably less than that of MMFs.*

Two features of MMF ETFs affect their moneyness in offsetting ways, so the net effect on their moneyness – relative to that of MMFs – is uncertain. First, the market-based pricing of MMF ETFs likely *reduces* their moneyness relative to that of MMFs that maintain stable,

[11] See, https://tether.to/en/fees/.

[12] USDC uses a tiered fee structure: redemptions between $2 million to $5 million incur a 0.03 percent fee; those between $5 million to $15 million are assessed a 0.06 percent fee; and those over $15 million pay a 0.10 percent fee. See, https://help.circle.com/s/article/USDC-redemption-structure?language=en_US&category=Fees_and_Billing.

rounded NAVs. Share prices of MMF ETFs are expected to fluctuate routinely, both for the APs that transact directly with MMF ETFs as well as for the investors who buy and sell shares in secondary markets. In contrast, government MMFs and retail prime MMFs maintain stable, rounded NAVs – typically $1.00 per share – that almost never move. And even compared to the floating NAVs of institutional prime MMFs, the secondary-market prices of prime MMF ETFs may be more volatile.

A second feature of MMF ETF shares, their intraday liquidity, may *increase* their moneyness relative to that of some MMF shares, but relative moneyness likely depends on the type of MMF that underlies the ETF. Many MMFs – such as retail funds and prime funds – can only be purchased or redeemed once per day. In contrast, investors can buy and sell ETF shares in secondary markets whenever markets are open, so MMF ETFs are more liquid than many MMFs. An important exception is government MMFs, which can offer hourly redemptions and sales and same-day settlement to institutional investors, so intraday trading for ETFs may not enhance their moneyness relative to that of government MMFs.

Given the somewhat limited benefits of the additional intraday liquidity for MMF ETFs, we believe that these products are likely to be, on net, less money-like than MMFs.

#### *4.2.3. **Tokenized MMFs.** Moneyness is likely **increased** compared to MMFs.*

Like MMF ETFs, MMF tokens have features that could both increase and decrease their moneyness relative to that of MMFs. On the one hand, MMF tokens' moneyness may be diminished if their prices can deviate from those of the underlying MMF. If so, token prices could fluctuate more than those of the underlying MMF shares (particularly for government MMFs and retail prime funds, which have stable NAVs).

On the other hand, if tokenized MMF transactions can be used to transfer ownership of the underlying MMF shares, the tokens could be more money-like than the MMF shares. Like MMF ETFs, tokenized MMF transactions would not be limited once-per-day like those of many MMFs. But tokens may offer payment and liquidity options beyond those available to ETF shareholders. For example, tokens might be used for low-cost, round-the-clock payments with instantaneous settlement, a function that would facilitate service as medium of exchange and one that is not available to MMF (or MMF ETF) shareholders.

In addition, unlike MMF shares, tokenized MMF shares could potentially serve as collateral in both traditional finance and digital asset trading. To the extent that tokenized MMFs take on these money-like roles, they may indirectly extend the reach of MMFs in the financial system and amplify the disruptive impact of MMF vulnerabilities in a stress event.

#### *4.2.4. **Stablecoins.** Moneyness is likely **reduced** compared to MMFs.*

Like other novel money-like products, stablecoins have features that could both increase and decrease their moneyness relative to that of MMFs. On net, stablecoin moneyness is diminished somewhat by their fluctuating prices, which generally are not as stable as those of stable-NAV MMFs. In addition, the absence of a regulatory framework for stablecoins, their consequent heterogeneity, and a lack of familiarity among the broader public limits the moneyness of stablecoins for many investors.

At the same time, stablecoins are already used for a broad range of money-like functions within the digital asset ecosystem. Most notably, stablecoins are used as the clearing asset and a medium of exchange for decentralized finance (DeFi) platforms. On DeFi exchanges and other crypto venues, the money-like functions of stablecoins appear to accord them a NQA status among the participants. Moreover, treatment of stablecoins as money may expand quickly. Issuers are investing in tools and partnering with payment processors to facilitate use of stablecoins to make retail payments.

## 4.3. Threshold effects

### *4.3.1. Money market funds*

The MMF structure embeds several types of threshold effects that played keys roles in the disruptive runs on MMFs in 2008 and 2020. For example, many MMFs maintain stable $1.00 share prices (NAVs) by rounding the market values per share of their portfolios to the nearest cent. While this fosters MMFs' money-like status in normal times, if market values drop and a fund's NAV no longer rounds to $1.00, the fund "breaks the buck" as its NAV drops discontinuously. One fund breaking the buck in 2008 contributed to a full-scale run on the prime MMF sector (McCabe, 2010).

In addition, MMFs between 2016 and 2023 were allowed to impose gates or fees on redemptions if their "weekly liquid assets" fell below 30 percent of assets. When MMFs' weekly

liquid assets fell to near 30 percent in March 2020, investors accelerated redemptions to avoid suddenly facing gates or fees (Li, Li, Macchiavelli, and Zhou, 2021). Finally, the closure and liquidation of a distressed MMF can impose very large liquidity costs on investors who do not redeem before the closure, as they can wait years to receive their money (McCabe, Cipriani, Holscher, and Martin, 2013).

#### *4.3.2. **Money market fund ETFs.** Threshold effects are **diminished** relative to those of MMFs.*

The ETF model substantially mitigates a couple of threshold effects associated with MMFs. First, because ETFs trade at market-based share prices, they do not have the threshold effects associated with stable, rounded NAVs in MMFs. Second, the option for investors to liquidate shares in the secondary market is an important "relief valve" that standard MMFs do not offer. When an MMF permanently closes and begins liquidation, MMF shareholders may lose access to their cash for months or even years.[13] In contrast, even if an ETF closes and no longer accepts redemptions, investors may still be able to sell shares to a third party.

#### *4.3.3. **Tokenized MMFs.** Threshold effects are **similar** to those of MMFs.*

Threshold effects for tokenized MMFs are likely similar to those of MMFs because the tokens probably pass through key threshold effects in the underlying MMF. Importantly, if underlying MMF shares have stable, rounded NAVs, the threshold effects of the fund "breaking the buck" would also affect the tokens. Moreover, if tokens can be used in ways that MMF shares cannot, such as for collateral in financial transactions, the tokens may amplify disruptions caused by breaking the buck. (In contrast, the MMF ETF structure appears to be incompatible with a stable NAV in the underlying MMF and hence would not be susceptible to breaking the buck.)

One way in which tokenized MMFs may reduce threshold effects is if tokens can be sold to third parties in the event that the underlying MMF closes and no longer accepts redemptions.

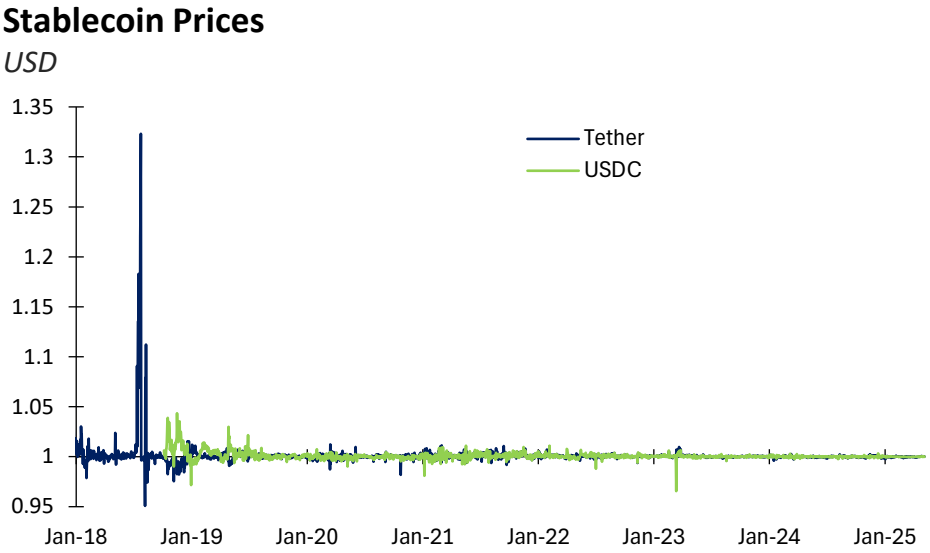
[13] For example, the Reserve Primary Fund took several *years* to complete the distribution of its assets to shareholders (McCabe, Cipriani, Holscher, and Martin, 2012).

#### *4.3.4. **Stablecoins.** Threshold effects are **diminished** relative to those of MMFs.*

Stablecoins, like MMF ETFs, have less pronounced threshold effects than MMFs. Because stablecoins trade in relatively liquid secondary markets with regularly fluctuating prices, they avoid the thresholds associated with stable, rounded NAVs and fund liquidation.

To be sure, a stablecoin's market price provides information about the functioning and solvency of the stablecoin, and investors could respond to a significant deviation by rushing to redeem. However, Figure 4 shows that secondary market deviations from $1.00 for Tether and USDC occur regularly and there does not appear to be a specific threshold that motivates investors to redeem.

**Figure 4: Secondary Market Prices of Tether and USDC**




Source: CoinGecko

### 4.4. Contagion effects

#### *4.4.1. Money market funds.*

Vulnerabilities in MMFs are exacerbated by contagion risks that stem from the similarities of their portfolios. MMF regulations (and ratings-agency guidelines) require the funds to hold only the obligations of governments and firms in the highest tiers of investment-

grade credit quality. Since there are relatively few firms with such ratings that also issue short-term instruments, MMFs tend to hold obligations of the same issuers, and the funds' portfolios have a high degree of similarity (Financial Stability Oversight Council, 2012). Hence, stress in one MMF may rapidly erode the private money-like status of other MMFs.

During the 2008 run on prime MMFs, redemptions surged after one fund announced that it had broken the buck (McCabe, 2010). In addition, high portfolio overlaps and large market footprints – combined with the very limited capacity of short-term funding markets to absorb secondary-market sales – imply that when MMFs are subject to a common liquidity shock they are likely to face acute challenges in disposing of their assets to meet redemptions (Baes, Bouveret, and Schaanning, 2021).

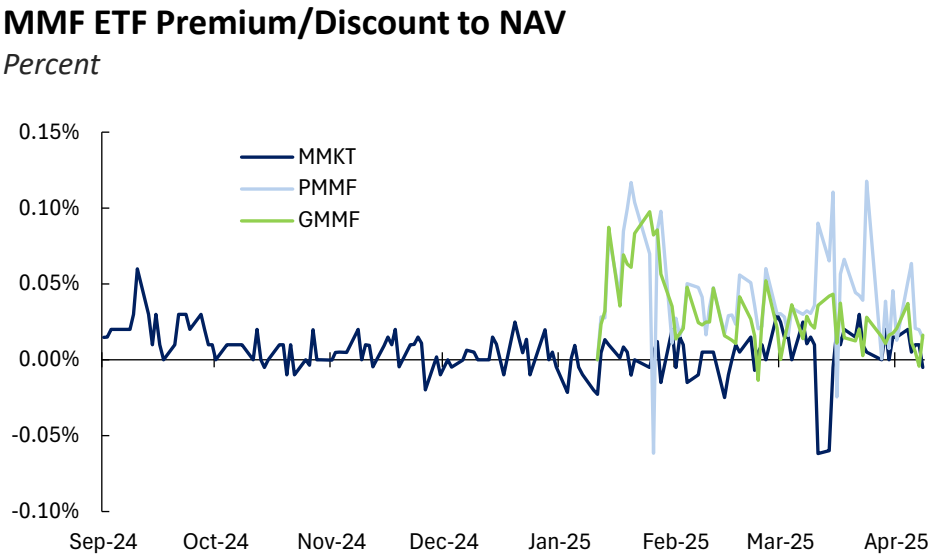
#### *4.4.2. **Money market fund ETFs.** Contagion effects are likely **greater** than those of MMFs.*

Since MMF ETFs are subject to the rules that govern MMFs, these ETFs are also likely to be susceptible to the contagion effects that arise in MMFs because of the similarity of their portfolios.

In addition, MMF ETFs may exacerbate *cross-product* contagion effects in MMFs during episodes of stress by providing secondary-market pricing information that MMF investors see as a signal to redeem because their shares are overvalued. This is a concern for both prime and government MMFs. For prime MMFs, real-time valuation of portfolio assets – especially private debt instruments like CP and NCDs – is hampered by a lack of active secondary markets for those assets, so funds often rely on pricing services to provide estimates. Meanwhile, MMF ETFs typically trade in secondary markets at small premiums or discounts relative to the fund's NAV. As shown in Figure 5, discounts are regular occurrences. However, substantial MMF ETF discounts in a period of financial stress could indicate that MMFs' estimated portfolio valuations are too high and hence be a signal to investors to redeem overpriced shares.

For government (and retail prime) MMFs, which typically maintain stable $1.00 NAVs, substantial declines in the market prices of government and prime MMF ETFs that hold similar assets could be a signal that MMF shares are worth less than $1.00 and thus should be redeemed.

**Figure 5: MMF ETF Premium and Discounts to NAV**




Notes: MMKT is Texas Capital Government Money Market ETF; PMMF is iShares Prime Money Market ETF; and GMMF is iShares Government Money Market ETF. Source: Bloomberg.

#### *4.4.3. **Tokenized MMFs.** Contagion effects are likely **greater** than those of MMFs.*

Contagion effects in tokenized MMFs are likely to be similar to those in MMF ETFs. The MMFs that underlie tokens – like MMF ETFs – are governed by MMF rules and hence have contagion effects that arise from the similarity of MMF portfolios. Moreover, MMF tokens may exacerbate *cross-product* contagion effects in MMFs in the same way that MMF ETFs do: declines in prices for MMF tokens could provide destabilizing signals to investors in MMFs. In addition, the transfer of tokenized MMFs shares for less than NAV may create an arbitrage opportunity that would add redemption pressure on the fund.

Finally, interconnections between tokenized MMFs and stablecoins – such as stablecoins holding tokenized MMFs as reserve assets – may further amplify spillover effects as redemption pressure on either the stablecoin or the tokenized MMF could put pressure on its counterpart. This risk is likely more salient for prime MMFs as they tend to be more vulnerable than government MMFs.

#### *4.4.4. **Stablecoins.** Contagion effects are probably **smaller** than those MMFs.*

Stablecoins are not currently subject to a broad regulatory framework or rules governing their reserve assets. As such, the composition of reserve assets varies substantially for different stablecoins, and stress for one stablecoin issuer may not necessarily presage stress for others. Although past periods of stress for algorithmic stablecoins, such as the collapse of TerraUSD, in 2022, have been disruptive, the large reserve-backed stablecoins that we examine (and that currently dominate the sector) are likely less susceptible to contagion-driven outflows than MMFs.

Nonetheless, we note two caveats to our assessment. First, notwithstanding the lower contagion risks among stablecoins, the concentration of stablecoin assets means that problems at one large issuer may put a substantial share of the sector's assets at risk. Moreover, the two largest stablecoins now hold more than $200 billion in U.S. Treasury securities, so a rapid liquidation of one of these stablecoins might be a source of contagion through its effects on the liquidity of the Treasury markets.

Second, interconnections between stablecoins and MMFs – such as stablecoins holding MMFs as reserve assets – may amplify cross-product contagion effects.

### 4.5. Reactive investor bases

#### *4.5.1. Money market funds*

Historically, institutional investors have proven to be highly reactive to stress in MMFs – much more so than retail investors. Redemptions from institutional MMFs during the runs in September 2008 and March 2020 far exceeded those from retail funds, and MMF redemptions amid the European debt crisis in 2011 came overwhelmingly from institutional MMFs (Baba, McCauley, and Ramaswamy, 2009; President's Working Group (PWG), 2010 and 2020; McCabe, 2010; Chernenko and Sunderam, 2014; Schmidt, Timmerman, and Wermers, 2016; Cipriani and La Spada, 2024).

Greater reactivity among institutional investors may arise because they have more resources to monitor MMFs for problems and face stronger incentives to avoid losses, since losses may expose institutional investors with fiduciary responsibilities to legal liability and jeopardize careers of professional cash managers (McCabe, 2010). Larger institutional investors were particularly prone to run in March 2020 (Avalos and Xia, 2021). Moreover, institutional

investors may be more likely to see MMF shares as safe and money-like relative to deposits (which for large institutions are mostly uninsured), so these investors may react especially badly to developments that erode MMFs' money-like status. The greater risk that institutional investors pose for MMFs led the SEC in 2014 and in 2023 to adopt substantially more stringent reform measures for institutional MMFs than for retail funds.[14] (To be sure, evidence from March 2020 suggests that retail investors may be becoming more run prone; see PWG, 2020 and Anadu, Levin, Lu, Malfroy-Camine, and Oefele, 2025.)

***4.5.2. Money market fund ETFs.*** *Investor reactivity is* ***uncertain*** *– it may be greater or less than that of MMF investors.*

As MMF ETFs have floating prices, they are less likely to attract highly risk-averse institutional investors that currently hold stable-NAV government MMFs. However, if intraday liquidity attracts institutional investors who currently hold floating NAV prime MMFs, the investor base for MMF ETFs may become more like that of institutional prime MMFs. Even so, these investors may pose lower risk to an MMF ETF than institutional investors in an MMF, as most investor ETF transactions will be on the secondary market.[15]

***4.5.3. Tokenized MMFs.*** *Investor reactivity is* ***uncertain*** *– it may be greater or less than that of MMF investors.*

Much like MMF ETFs, tokenized MMFs have features that could enhance or diminish their use by highly risk-averse reactive investors. For example, market-based prices are likely to reduce investor reactivity, whereas intraday liquidity probably increases it. Notably, at present, institutional investors represent a large share of the ownership of tokenized MMFs.

Some potential uses of MMF tokens, particularly as margin, would probably increase investor reactivity.

[14] The SEC in 2014 required that institutional prime funds have floating NAVs, while retail funds could continue to maintain stable, rounded $1 share prices. In 2023, the SEC required dynamic liquidity fees for institutional prime funds but not for retail funds.

[15] Because MMF ETF investors other than APs do not transact directly with the fund, investor reactivity is likely less consequential for these ETFs than it is for MMFs. The main concern is that investors rapidly selling MMF ETF shares would widen discounts to NAV that could prompt redemptions by APs.

Token investor reactivity – like reactivity among MMF ETF investors – would only indirectly affect underlying MMFs. Sales of MMF tokens do not directly pressure the MMF to sell assets, but rapid conversion of tokens to MMF shares and liquidation of the shares could amplify stress in the same way that other MMF redemptions can.

#### *4.5.4. **Stablecoins.** Investor reactivity is **likely lower** than that of MMF investors.*

Investors' loss of confidence in some stablecoins (e.g., TerraUSD collapse in 2024) has led to rapid liquidations that suggest that their investors are already quite reactive. Moreover, Anadu, Azar, Cipriani, Eisenbach, Huang, Landoni, La Spada, Macchiavelli, Malfroy-Camine, and Wang (2023) document flight-to-safety dynamics in stablecoins that are like those in MMFs: during periods of crypto market stress, investors tend to redeem from riskier stablecoins into those they perceive as less risky, on average.[16] However, in the absence of a comprehensive legal or regulatory framework for stablecoins, their appeal as money-like assets among risk-averse reactive investors will probably remain limited.

## 5. Conclusion: Assessing New Products

The novel products we examine continue to evolve, so both their benefits for investors and their future effects on financial stability remain highly uncertain. Nonetheless, our assessment of the extent to which the products exhibit features that make money-like assets vulnerable, and a comparison to similar features in MMFs, helps us understand how these products may contribute to financial vulnerabilities as they grow.

Although our analysis does not provide a clear ranking of vulnerabilities in the novel products, it does provide insights on what to watch as products develop:

***MMF ETFs.*** While this product is still very new, it is probably the easiest to analyze because it combines two familiar products, MMFs and ETFs, both of which are subject to well-established regulatory frameworks. A key question in assessing vulnerabilities in MMF ETFs relative to those in MMFs is whether the ETFs redeem in-kind, as in-kind redemptions diminish liquidity transformation and would reduce vulnerabilities substantially.[17] In addition, it is useful

[16] For example USDC faced redemptions on news regarding exposure to SVB: SVB Fallout: USDC Stablecoin Firm Circle Reveals $3.3 Billion SVB Exposure - Bloomberg.

[17] However, in-kind redemptions are challenging for MMFs, given their heavy use of repo, which cannot be easily transferred to new owners.

to note that if MMF ETFs could completely replace MMFs, the net effect likely would be a reduction in aggregate vulnerabilities – but as long as MMFs remain sizable, the cross-product contagion effects of MMF ETFs likely add to vulnerabilities.

***Tokenized MMFs.*** The benefits and uses of MMF tokens could expand very significantly if movement of tokens could easily effect the transfer of MMF shares. If so, a key financial stability concern would be that greater use of tokens throughout the financial system – for example, as collateral and for margin – would amplify impacts of existing vulnerabilities in MMFs. Hence, a pivotal issue for tokenized MMFs is whether the underlying fund is a prime or government MMF, since prime funds have proven to be so much more vulnerable. (That said, even government MMFs have some susceptibilities, including to interest-rate risk.)

***Stablecoins.*** Our assessment shows that features that contribute to vulnerabilities in money-like products are *currently* present to a lesser extent in stablecoins than in MMFs, in part because stablecoins are not governed by a broad regulatory framework and are thus not used widely as money by risk-averse institutional investors. Hence, our stablecoin assessment is sensitive to changes in industry practices and regulatory developments, which could alter the extent to which stablecoins exhibit each feature we examine.

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