

SRA Notes | Issue Number: 03 | May 21, 2021

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1. Summary

Twice in the past 12 years, prime and tax-exempt money market mutual funds (MMMFs), collectively non-government MMMFs, have experienced large investor redemptions and runs. In both cases, the runs contributed to significant strains in short-term funding markets, an important source of funding for businesses and municipalities. These strains only abated after the Board of Governors of the Federal Reserve System and the United States Department of the Treasury took emergency actions, including the establishment of lending facilities for non-government MMMFs.

Policymakers are now examining potential reform options to enhance non-government funds' resilience and reduce run risk. An option worth examining is a requirement that all non-government MMMFs convert to government MMMFs, which remained resilient – and even experienced large inflows – during periods in which non-government funds experienced runs.

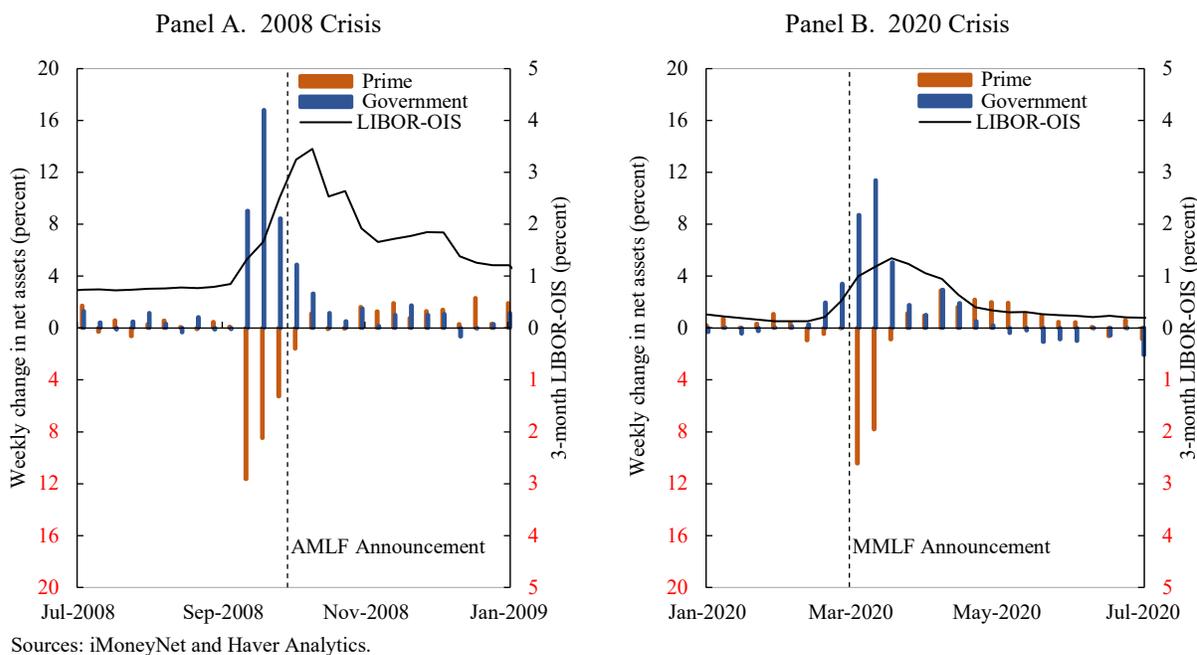
The remainder of this note is organized as follows. Sections 2 and 3, respectively, describe past runs on non-government MMMFs and the impact of these runs on the short-term funding markets. Section 4 discusses official sector actions that were taken to stem the runs. Past and potential reforms are described in Section 5. The penultimate section highlights some cash management vehicles that may have vulnerabilities like those of non-government funds. A conclusion follows in Section 7.

¹ Corresponding author: ken.anadu@bos.frb.org. We thank Antoine Malfroy-Camine for excellent research assistance. We are grateful to Eric Rosengren for very helpful discussions. We also thank Patrick McCabe, Patrick de Fontnouvelle, John Levin, James Bohn, and Sean Baker for their helpful comments and suggestions. The views expressed in this note are ours and do not necessarily reflect those of the Federal Reserve Bank of Boston or Board of Governors of the Federal Reserve System.

2. Introduction and background

During the 2008 global financial crisis, prime MMMFs experienced large investor redemptions and runs.² Amid the onset of the COVID-19 pandemic in the U.S. in March of 2020, prime MMMFs experienced runs like those observed nearly 12 years earlier. Net outflows from prime MMMFs were approximately 19 percent and 17 percent in the worst two weeks of the MMMF runs in 2008 and 2020, respectively.³ In contrast, over the same reporting periods in 2008 and 2020, government MMMFs experienced large net inflows in the wake of investor flight to safety.

Figure 1: Net flows from prime and government MMMF and funding market spreads



² Prime MMMFs invest primarily in short-term corporate debt, such as commercial paper (CP) and certificates of deposit (CD). This note focuses on publicly-offered prime MMMFs. There are also institutional prime funds that are not available to the public such as “central funds,” which asset management firms use for internal cash management by their other investment funds. As of month-end March 2021, net assets in institutional non-public prime funds was about \$238 billion, compared to \$440 billion in institutional publicly-offered prime funds (source: SEC Form N-MFP). Government funds invest substantially all their assets in cash, short-term U.S. government and agency securities, and repurchase agreements collateralized by those securities.

³ Tax-exempt MMMFs, which invest substantially in short-term municipal debt, experienced peak outflows of approximately eight percent in both September 2008 and March 2020.

3. Impact of the runs on short-term funding markets

In both 2008 and 2020, the runs on prime and tax-exempt MMMFs contributed to dislocations in the short-term funding markets, and exacerbated instabilities in the broader financial system. Indeed, measures of stress in short-term corporate debt markets, such as LIBOR-OIS, surged during both periods in 2008 and 2020 in which prime MMMFs experienced large redemptions (Figure 1, Panels A and B, respectively).⁴ In addition, new issuance of short-term corporate debt declined and average tenors shortened notably during this period (President’s Working Group (2020)). Similarly, measures of stress in short-term municipal bond markets, such as the SIFMA municipal swap index, surged as tax-exempt MMMFs experienced large outflows.⁵

4. Official sector interventions

With approval from the U.S. Treasury, the Board of Governors of the Federal Reserve System took numerous emergency actions in 2008 and 2020, including those aimed at halting runs on MMMFs and restoring the functioning of the broader short-term funding markets.⁶ Specifically, under authorization from the Board of Governors, the Federal Reserve Bank of Boston established the Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF) in 2008 and the Money Market Mutual Funds Liquidity Facility (MMLF) in 2020.⁷

⁴ LIBOR-OIS is the difference between the 3-month London Inter-Bank Offered Rate, a measure of bank credit risk, and the 3-month Overnight Index Swap rate, a risk-free proxy. LIBOR-OIS tends to rise during periods of market stress and decline when such stresses subside. Other measures of short-term funding market stress, including AA and A2/P2 nonfinancial CP-OIS spreads, also increased during this period.

⁵ The SIFMA municipal swap index rate spiked by nearly 400 basis points in a week in March 2020, from 1.28 percent on March 11 to 5.2 percent on March 18. It declined to about 1.83 percent on April 1, 2020.

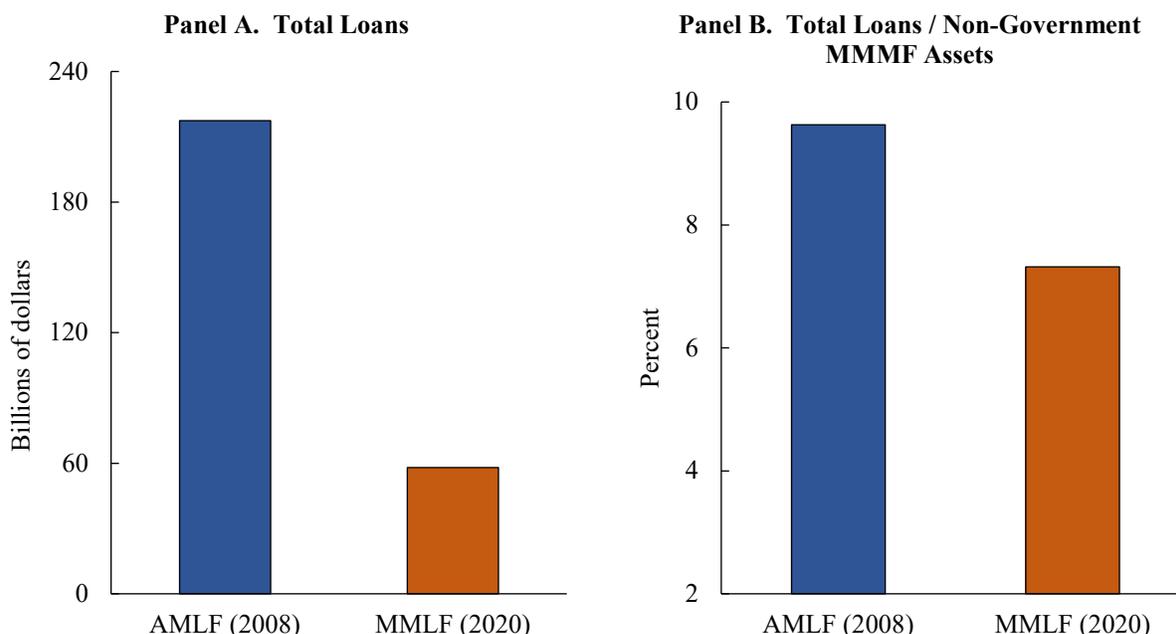
⁶ In addition, in March 2020, the Treasury Secretary provided \$10 billion of credit protection from the Exchange Stabilization Fund.

⁷ The AMLF (and U.S. Treasury’s Temporary Guarantee Program for Money for MMMFs in 2008) and MMLF directly benefitted MMMFs. Other emergency actions, such as the Commercial Paper Funding Facility, which was established in both 2008 and 2020, indirectly benefitted MMMFs. For more details on the Federal Reserve’s emergency lending tools, see: <https://www.federalreserve.gov/monetarypolicy/policytools.htm>.

These emergency lending tools were successful in stemming the runs on prime and tax-exempt MMMFs and restoring functioning in the short-term funding markets. For example, for the MMLF, see, Li et al. (2020), Cipriani et al. (2020). For the AMLF, see, Duygan-Bump et al. (2013).

Each of these facilities lent billions of dollars to eligible banks purchasing eligible assets from prime and (in the case of the MMLF) tax-exempt MMMFs (Figure 2, Panel A). Although total lending under the AMLF was three times as large MMLF in dollar terms, the size of the non-government MMMF sector was much smaller in 2020. As a result, the intensity of facility usage when measured relative to total assets of non-government funds in 2020 was only slightly lower than in 2008 (Figure 2, Panel B).

Figure 2: Total usage of the Federal Reserve’s AMLF and MMLF



Sources: authors’ calculations based on data from Haver Analytics and the Federal Reserve. Notes: Panel A is total loans made under each facility. Panel B is normalized by daily average assets of prime and tax-exempt fund assets over the facility usage period.

5. Past reforms; potential future reforms?

Two notably different episodes of financial distress resulted in a similar need for official sector support of prime and tax-exempt MMMFs.

The run in 2008 began after the Reserve Primary Fund (RPF), a large prime MMMF, “broke-the-buck” due to its holdings of debt issued by Lehman Brothers. The RPF suspended redemptions and its investors faced a long liquidation period to recoup their funds. Fearing potential runs at other funds, investors began to redeem en masse from prime and tax-exempt

MMMFs.⁸ Following 2008's runs on prime and tax-exempt MMMFs, the Securities and Exchange Commission (SEC) adopted two sets of reforms, in 2010 and 2014, to improve resilience, enhance transparency, and address run risks in MMMFs. The 2010 reforms included new Daily Liquid Assets (DLA) and Weekly Liquid Assets (WLA) requirements, enhanced disclosure of portfolio holdings, and shorter maturity limits, among other changes.⁹

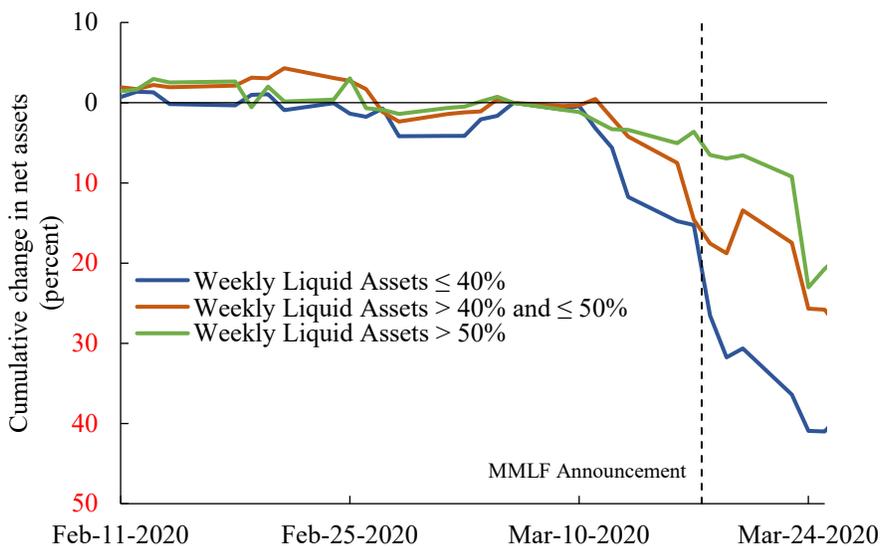
The 2014 reforms had two main components: (1) a requirement that prime and tax-exempt MMMFs offered to institutional investors transact at a floating net asset value per share (NAV) rather than the stable NAV that had previously been used and (2) a requirement that the board of a non-government fund have the ability to impose liquidity fees or to halt redemptions if the fund's WLA fell below 30 percent of net assets.

During the 2014 reform deliberations, some academics and policy makers noted that fees and gates could serve as potential run accelerants (Federal Reserve Bank Presidents (2013) and, generally, Cipriani et al. (2014)). There is some evidence that concerns about fees and gates exacerbated runs. For example, Figure 3 suggests that institutional prime funds with WLA levels below 40 percent of net assets tended to experience more rapid net outflows in March 2020. Li et al. (2020) examined this empirically and found that institutional prime funds' outflows were highly sensitive to WLA during the COVID-19 crisis – funds with lower WLA had larger outflows – and the sensitivity of WLA was greater than in previous crises. To be sure, these observations do not suggest that runs would not have occurred absent the linkage between fees and gates and WLA levels, as funds with higher holdings of WLA also experienced large outflows (Figure 3).

⁸ "Broke-the-buck" means the RPF's NAV fell below \$1.000. At least 21 prime MMMFs would have also broken the buck absent voluntary support from their sponsors (Brady et al (2012)). See, McCabe (2010) for a more robust discussion on 2008's events.

⁹ DLA generally include cash, U.S. Treasury securities, or securities that mature within one day. WLA generally include cash, direct obligations of the U.S. government, certain other government securities that with a remaining maturity date of 60 days or less, and securities that mature or are subject to a demand feature exercisable and payable within five business days (SEC (2014)). See, <http://www.sec.gov/rules/final/2010/ic-29132.pdf>

Figure 3: Institutional prime fund net flows by Weekly Liquid Asset levels.



Sources: Largely adapted from Lei et al (2020) and authors' calculations based on data from iMoneyNet. Notes: weighted average assets are normalized to zero on March 6, 2020 and are calculated on a two-day lag from WLA.

Policy makers are now examining potential reform options for MMMFs.¹⁰ One option worth examining is to require institutional and retail prime and tax-exempt MMMFs to convert to government funds. The potential benefits of this option are three-fold.¹¹ First, the requirement is relatively simple to implement, and market adjustment to this change could be facilitated by an appropriately lengthy transition period. Second, government MMMFs have proved resilient during prior periods of severe stress. Therefore, this option reduces the vulnerabilities arising from the MMMF sector. Finally, the likelihood of future official sector support for MMMFs is substantially reduced under this option.

One obvious drawback is the reduced demand for short-term corporate and municipal debt held by non-government MMMFs. However, evidence from prior instances in which MMMF

¹⁰ See, for example, President's Working Group (2020).

¹¹ Although aggregate net redemptions from retail MMMFs were smaller than those from institutional funds in the week the RPF closed, some individual retail funds experienced redemptions that exceeded historical levels (Schmidt et al. (2013)). In addition, certain fund sponsors voluntarily supported their retail funds (as well as institutional funds) in 2008 (Brady et al. (2012)) and some used the AMLF and MMLF, ostensibly to reduce the risks of destabilizing runs. Finally, it is not unreasonable to posit that retail investors, who are less informed, on average, than institutional investors, could have accelerated their redemption activities absent the official sector interventions.

holdings changed significantly suggest that the effects of a further reduced prime and tax-exempt industry on the broader funding markets would be transitory.¹²

6. A note on other cash management vehicles with similar structural vulnerabilities

Besides U.S. MMMFs, other cash management vehicles that invest substantially in short-term debt instruments also experienced varying degrees of stress last March (Financial Stability Report (2021)). These vehicles may be suitable substitutes for some investors in non-government MMMFs. Accordingly, the risk-mitigation benefits of any potential reforms to MMMFs depend, in large part, on the degree to which activities migrate to other structures with similar vulnerabilities.¹³

We highlight two potential MMMF substitutes: short-term investment funds (STIFs) and ultrashort-bond mutual funds, which hold approximately \$322 and \$246 billion in assets, respectively, and have both grown in recent years (Figure 4).¹⁴ Available data shows STIF assets increased from December 2019 to March 2020, alas, granular data on STIFs are not available. Therefore, the aggregated data likely masks shifts from prime-like into government-

¹² The 2010 reform experience is instructive on the potential impacts of a further reduced prime MMMF sector on the broader short-term funding markets. MMMFs' holdings of CP, CD, and other short-term debt issued by U.S. financial firms declined by \$146 billion or 66 percent from January 2015 to August 2017, with most of the decline occurring in 2016. This reduced demand for unsecured, short-term debt from prime MMMFs contributed to a spike in certain indicators of funding market pressures, which proved transitory (Anadu and Baklanova (2017)).

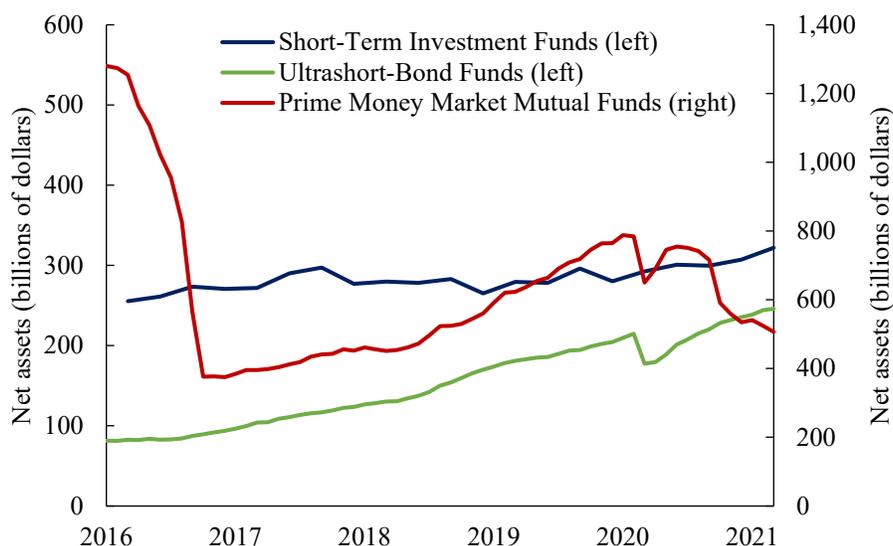
¹³ To be sure, the evidence from 2014's reforms suggest that assets could shift into government MMMFs. In the nine months preceding the October 2016 effective date of 2014's reforms, net assets in prime MMMFs declined by about \$1 trillion or 64 percent of net assets, while net assets in government funds increased by a similar magnitude. Since 2008, net assets in prime MMMFs have declined by \$1.5 trillion, while those in government funds have risen by \$2.8 trillion. In addition, over this time, MMMFs' relative size in certain debt instruments have declined. For example, prime funds held about 20 percent of outstanding CP in December 2019, down from 40 percent in December 2007. Source: Authors' calculations based on data from iMoneyNet and the Federal Reserve.

¹⁴ STIFs are collective investment funds (CIFs) that typically seek to maintain a stable NAV. The primary Federal regulators of CIF sponsors are the Office of the Comptroller of the Currency (OCC), Federal Reserve, or the Federal Deposit Insurance Corporation, depending on the type of sponsor. CIFs administered by state-chartered, limited purpose trust companies are overseen by the relevant chartering agencies. CIFs administered by OCC-regulated entities are governed by Rule 9.18, which was amended in 2012 to require, among other things, that STIFs maintain a WAM and WAL of 60 and 120 days, respectively, and report detailed portfolio data to the OCC. The degree to which non-OCC regulated CIF sponsors follow Rule 9.18 varies by state.

The STIF data are not representative of the entire industry assets (see, footnote 17).

like STIFs during the stress period, as was seen in MMMFs.¹⁵ Ultrashort-bond Mutual Funds (MFs), SEC-registered funds that invest substantially in short-term debt instruments, also experienced large outflows in March 2020.¹⁶

Figure 4: Net assets in other cash management funds



Sources: iMoneyNet, Morningstar, Inc. and Call Report, Schedule RC-T, Memoranda 3.f. Notes: STIF data are limited to the six largest STIF sponsors that are Call Report filers.¹⁷

To reduce the likelihood that risk from prime and tax-exempt funds migrate into other structures with similar vulnerabilities, policy makers should consider specific enhancements to

¹⁵ In 2008, some sponsors provided voluntary support to their affiliated STIFs. For example, in February 2008, Northern Trust Corporation entered into Capital Support Agreements to cover potential losses arising from certain funds, including STIFs, exposures to debt issued by distressed Structured Investment Vehicles (see, <https://www.sec.gov/Archives/edgar/data/73124/000119312508035882/dex99.htm>). In September 2008, Bank of New York Mellon provided support to clients invested in certain funds, including STIFs (see, <https://www.sec.gov/Archives/edgar/data/1390777/000119312508200363/dex991.htm>). Also, in June 2010, State Street Global Advisors elected to make a cash contribution to certain STIFs used as cash collateral pools to restore their NAV to \$1.00 (see, <https://www.sec.gov/Archives/edgar/data/93751/000119312511047982/d10k.htm>).

In March 2020, concerns about heightened redemptions from STIFs prompted the Office of the Comptroller of the Currency to revise its STIF rules to allow national banks that sponsor STIFs to temporarily extend maturity limits on those funds. Specifically, the OCC extended the weighted-average maturity and weighted-average life limits from 60 and 120 days, respectively, to 120 and 180 days. The relief expired on July 20, 2020 (see, <https://www.occ.gov/news-issuances/news-releases/2020/nr-occ-2020-38.html>).

¹⁶ Ultrashort-bond MFs experienced net redemptions of almost \$33 billion or 15 percent of net assets in the month ended March 2020.

¹⁷ To the best of our knowledge, readily available data on CIFs, including STIFs, are limited to sponsors that file Call Reports with federal banking agencies. As such, these data do not capture assets in CIFs sponsored by entities that do not file Call Reports with federal banking agencies (e.g., state-chartered, non-depository limited purpose trust companies).

transparency and regulation for those structures as they are considering MMMF reforms. Possible measures could include enhanced transparency and disclosure for STIFs and mandatory swing pricing for ultrashort-bond funds.¹⁸

7. Concluding remarks

MMMFs play an important role in short-term funding markets. The 2008 runs on prime and tax-exempt funds (or non-government funds) revealed the vulnerabilities in MMMF structures. Post-crisis reforms promulgated by the SEC mitigated some of these risks; however, the subsequent runs in 2020 suggests that vulnerabilities remain.

Academics, policy makers, and industry participants are now exploring various reform options for MMMFs. An option worth examining is to require all non-government MMMFs to convert to government funds. Notably, the largest prime fund sponsor did so on its own last year.¹⁹ Policy makers should also pay attention to other cash management vehicles that may have similar vulnerabilities to non-government funds, and, as needed, consider potential reforms to ensure that the risks from non-government funds does not migrate to other vehicles such that the net effects of any new reforms is diminished.

¹⁸ A fund that adopts swing pricing will reduce its NAV by a previously established amount (swing factor) if net outflows exceed a certain threshold (swing threshold). Conversely, the fund will increase its NAV by the swing factor if net inflows exceed the swing threshold. A properly calibrated swing pricing regime could reduce run risk by creating a disincentive to redeem, as it forces redeeming investors to internalize the costs of their redemption activity at least partially.

While the focus of this note is on commingled funds that invest substantially in short-term debt instruments, the onset of the pandemic also shed further light on liquidity transformation risks in *long-term* MFs, particularly those that invest substantially in corporate and municipal debt. These funds experienced substantial redemptions in March 2020, which plausibly amplified strains in the bond markets. Therefore, a requirement to adopt swing pricing, which is currently voluntary for MFs, could reduce run incentives. For a general discussion on liquidity transformation risks in MFs, see, for example, Anadu and Cai (2019), also, Financial Stability Report (2021).

¹⁹ On August 27, 2020, Vanguard, the then-largest prime fund sponsor, announced it would reorganize its \$125 billion retail prime fund into a government fund, noting that "...the rewards of even the most conservatively managed prime funds are no longer worth the risk." (See, <https://pressroom.vanguard.com/news/Press-Release-Vanguard-Announces-Changes-Money-Market-Fund-Lineup-082720.html>.) Fidelity Investments and Northern Trust liquidated their institutional prime funds last year. (See, <https://www.fidelity.com/mutual-funds/institutional-prime-and-treasury-money-market-mutual-funds>, and <https://www.northerntrust.com/united-states/what-we-do/investment-management/northern-funds/funds-and-performance-institutional/money-market/NPAXX>.)

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