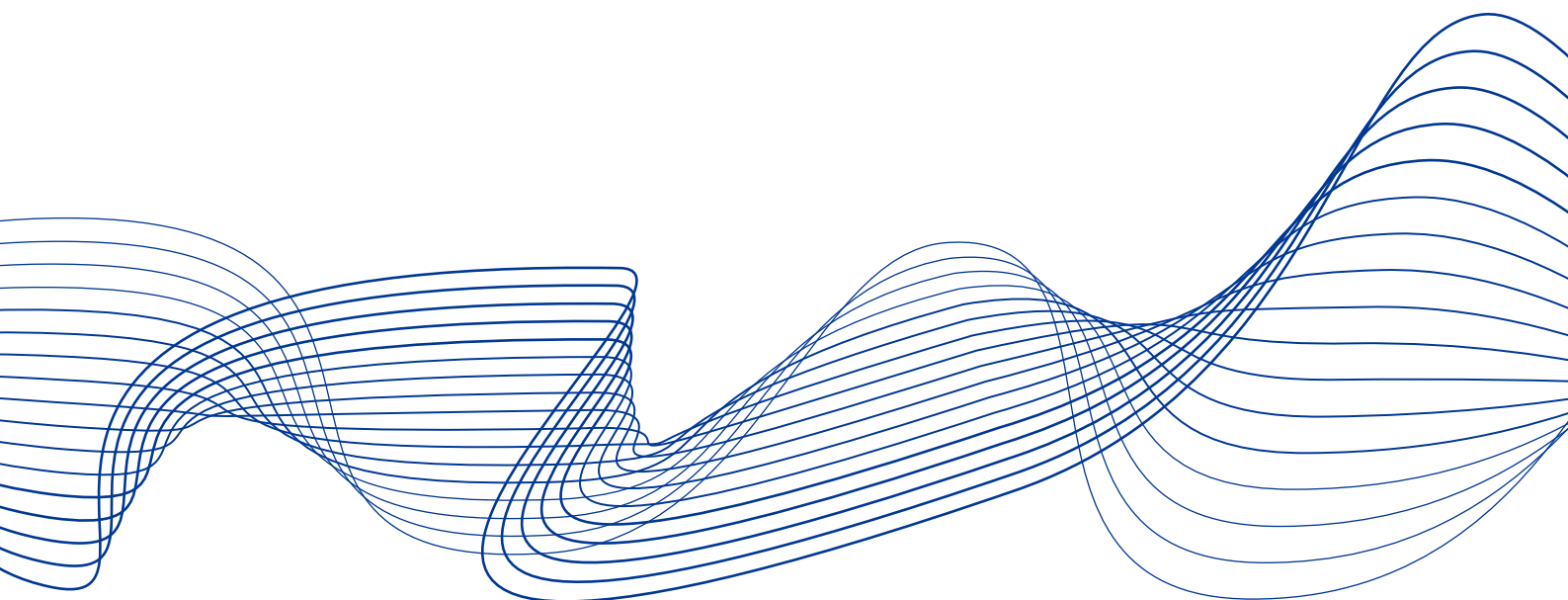


**Issues note on systemic  
vulnerabilities of and  
preliminary policy  
considerations to reform  
money market funds  
(MMFs)**

**July 2021**



**ESRB**  
European Systemic Risk Board  
European System of Financial Supervision

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## Executive summary

**This issues note sets out the ESRB's analysis of systemic vulnerabilities in money market funds (MMFs) and identifies a broad set of preliminary policy options for their reform.** The financial market turmoil at the onset of the coronavirus (COVID-19) pandemic revealed systemic vulnerabilities in MMFs which call for a reassessment of certain aspects of post-global financial crisis regulatory reforms. Some MMFs investing in private sector debt securities experienced acute liquidity strains when faced with a high level of redemptions by investors combined with a lack of liquidity in private debt money markets. This led to concerns that liquidity strains in those MMFs might amplify the effects of the COVID-19 shock in other parts of the financial system. The situation was particularly serious in the United States and the EU and improved only after exceptional measures were taken by the Federal Reserve System and the ECB under their respective monetary policy mandates. These events took place just over ten years after the global financial crisis, which itself had revealed systemic concerns relating to MMFs. Against this background, the ESRB identified systemic vulnerabilities in MMFs and a broad set of preliminary policy options to reform MMFs.

**There is underlying tension between the two economic functions performed by MMFs, which can become of systemic concern during market stress.** This is particularly the case for MMFs that invest primarily in non-public debt (low-volatility net asset value (LVNAV) and variable net asset value (VNAV) MMFs) as the assets they hold tend to be less liquid, especially during stressed periods, than the assets held by MMFs that invest in public debt. MMFs are key intermediaries in the financial system. They perform two primary economic functions for the financial system and the real economy: (i) providing short-term funding to issuers, mainly banks (in the EU); and (ii) being used as cash management vehicles by investors. The tension arises from the fact that MMFs offer on-demand liquidity to investors and are often assumed to be cash-like instruments, whereas the instruments in which they invest are not reliably liquid, especially during periods of stress. Under normal market conditions, MMFs are largely able to meet investor redemption requests from the liquidity within their portfolio, but market stress reveals the underlying tension in the liquidity transformation performed by MMFs. In such circumstances, MMFs can face increased redemption requests combined with a lack of sufficient portfolio liquidity (especially for private debt-focused MMFs) to meet this increased demand. This tension can be exacerbated in funds that offer a quasi stable net asset value, as such funds face an additional valuation constraint under already challenging circumstances.

**To inform the European Commission's review of the MMF Regulation (MMFR), the ESRB will refine the policy options set out in this issues note, being mindful of wider work underway internationally.** The ESRB believes that the macroprudential perspective offered by this issues note, including in the specific context of the EU's regulatory framework for MMFs, can inform the broader debate on MMF reform. The ESRB's ongoing analytical work will further consider 1) the markets in which MMFs operate, 2) the investors holding MMF shares/units, and 3) MMFs themselves. In view of the forthcoming review of the MMFR in 2022, the ESRB's policy work will focus on policy options that would address vulnerabilities within MMFs themselves. The ESRB has identified three key desired outcomes of this policy work: first, removing first-mover advantages for investors, which was also a key consideration in the previous ESRB Recommendation of 2012; second, not limiting the proposals to LVNAV funds but considering the vulnerabilities of the entire sector; third, ensuring the resilience and functioning of MMFs without the need for central banks to step in during crises.



# Introduction

**Money market funds (MMFs) are key intermediaries in the financial system.** They perform two primary economic functions for the financial system and the real economy: (i) providing short-term funding to issuers, mainly banks, and (ii) being used as cash management vehicles by investors. Euro area MMFs hold about €1.44 trillion in total assets (fourth quarter of 2020, according to ECB statistics). These assets are denominated in euro (45%), US dollars (32%) and pounds sterling (23%) and are domiciled mainly in a few countries, notably Ireland, Luxembourg and France.

**Significant changes have been made to the regulation and oversight of MMFs in recent years.** The centrepiece of such reforms in the EU is the MMF Regulation (MMFR)<sup>1</sup>, which came into effect in July 2018. This was the first piece of bespoke MMF regulation in the EU. The MMFR was introduced mainly as a response to the systemic risk generated by MMFs during the global financial crisis and was particularly informed by the experience of the US MMF sector during that period.

**Events in 2020 showed that those reforms did not address all sources of systemic risk posed by MMFs.** The COVID-19 market turmoil in March and April last year revealed systemic risks from certain types of MMF, namely funds that invest in private sector debt securities – low-volatility net asset value (LVNAV) and variable net asset value (VNAV) MMFs. These MMFs experienced acute liquidity tensions when faced with a high level of redemptions by investors combined with a lack of liquidity in private money markets. Following central bank action to support the monetary policy transmission mechanism, liquidity strains in money markets and outflows eased. European MMFs were able to meet redemption requests and none had to suspend redemptions. While the nature of the shock in March 2020 meant that public debt-focused MMFs did not experience large outflows, this does not mean that they could not be subject to liquidity stress in future crises.

**A policy response to mitigate systemic risk from MMFs and to enhance the resilience of the sector is required.** Reforms to MMF regulation are at the core of this, although other issues pertaining to the wider markets in which MMFs operate also need to be taken into account. These wider market issues include the behaviour and expectations of MMF investors (including the use of MMF shares/units for cash management, liquidity needs and flight-to-safety purposes); liquidity in private debt money market instruments (during normal and stressed times); the impact of other regulatory changes on the functioning of markets since the global financial crisis (including on dealer behaviour); the impact of central bank measures in the pursuit of monetary policy; and the development of macroprudential tools beyond banking for investment funds (IFs), including MMFs, and for other investors in MMFs, such as insurance corporations and pension funds (ICPFs). A better understanding of the issues in relation to short-term funding markets and investors would improve the diagnosis of the recent crisis and support the wider policy development process.

<sup>1</sup> [Regulation \(EU\) 2017/1131 of the European Parliament and of the Council of 14 June 2017 on money market funds \(OJ L 169, 30.6.2017, p. 8\).](#)



**This issues note sets out the ESRB’s preliminary findings and considerations on the reforms that are needed to enhance resilience in the MMF sector and reduce systemic risk.** It outlines potential policy reforms and a way to assess their impact in view of the upcoming ESRB input into the 2022 review of the MMFR. Reflecting this, the list of policy options considered is deliberately broad, acknowledging the effect of investor behaviours and the functioning of short-term funding markets on MMFs, and should not be interpreted as an indication that the ESRB intends to incorporate all of them in future policy proposals. This note 1) provides an overview of the MMF sector in the EU and describes the economic functions performed by MMFs; 2) sets out the vulnerabilities of MMFs and how these can become a systemic risk, with a focus on non-public debt MMFs, looking back at the events of March 2020 as a real-life manifestation of these vulnerabilities; and 3) identifies the objectives, scope and principles underpinning further policy analysis.

**The ESRB is conscious of wider work underway elsewhere in the EU and internationally on MMF reform and aims to contribute to the debate from a macroprudential perspective.** While being mindful of work undertaken elsewhere,<sup>2</sup> the ESRB believes that the macroprudential perspective offered by this issues note, including in the specific context of the EU’s regulatory framework for MMFs, can inform the broader debate on MMF reform.

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<sup>2</sup> For work being undertaken at EU level, see, in particular, ESMA (2021b).



# 1 Overview of the EU MMF sector

**Money market funds (MMFs) are important intermediaries in short-term funding markets and are used by investors to manage liquidity.** MMFs buy short-term money market instruments issued by financial institutions, governments and corporations. MMFs also provide liquidity management services to institutional investors and corporate treasurers. The promise of instantaneous liquidity and a reasonably stable value means that investors see MMFs as an attractive way to store cash. Investments in MMF shares/units offer diversified issuer risk and market yields that are often higher than yields on bank deposits. According to ECB statistics, MMFs in the euro area hold about €1.44 trillion in total assets (fourth quarter of 2020). Euro area MMFs are mainly exposed to non-euro area banks (33% of assets), euro area banks (31%), other non-euro area issuers (18%), euro area sovereigns (8%), other euro area financials (6%) and euro area non-financial corporates (4%). MMFs are exposed to a similar extent to euro area issuers (49% of total assets) and non-euro area issuers (51%). Around 53% of MMF shares/units are held by foreign investors, while euro area residents hold around 47%.

## 1.1 Asset side: MMFs as providers of short-term funding

**MMFs invest in a range of short-term instruments, mainly issued by financial institutions.** MMFs invest in short-term instruments such as commercial paper (CP), certificates of deposit (CDs), short-term government debt, bank deposits and repurchase agreements (repos). MMFs are mainly exposed to financial institutions: exposures to banks account for 68% of total assets, governments 11% and non-financial corporations 8% (Chart 1, panel a).<sup>3</sup>

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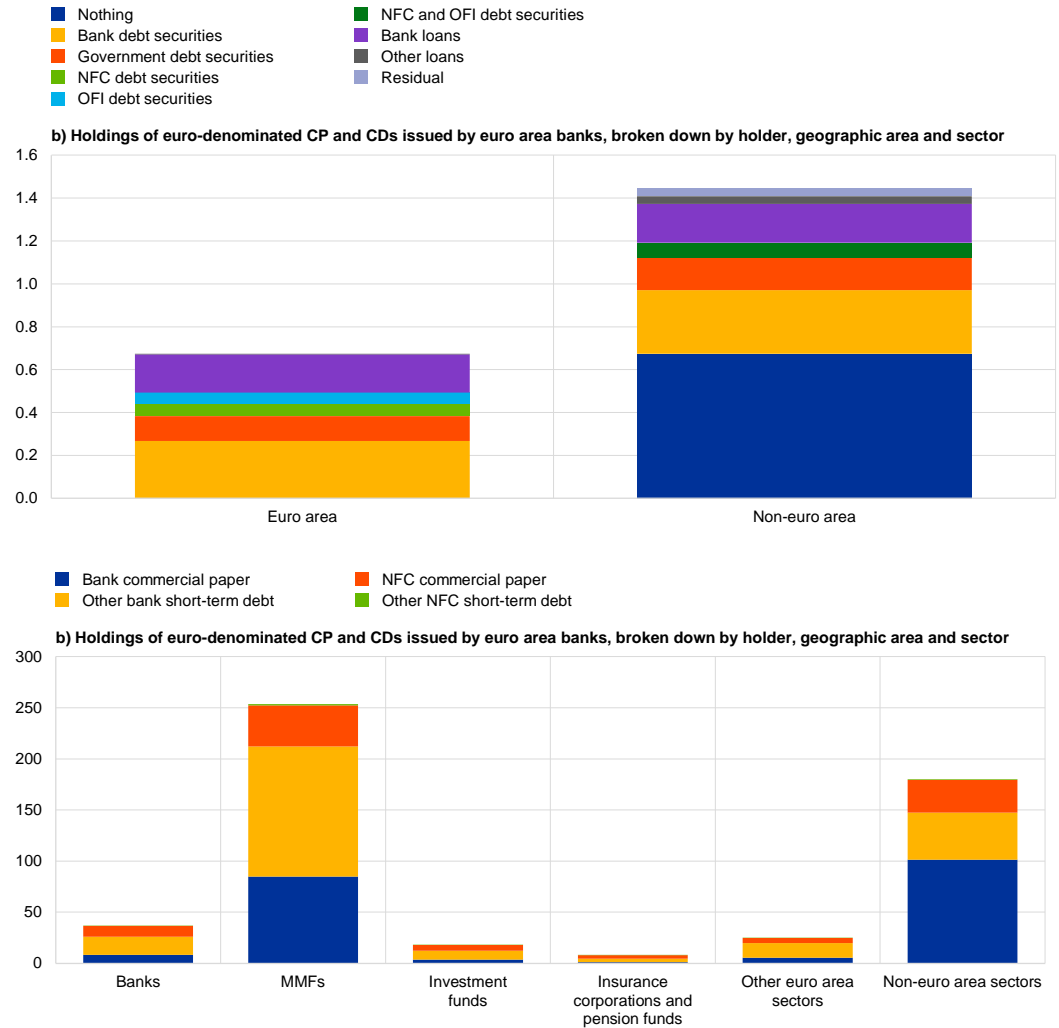
<sup>3</sup> See Box 8 in ECB (2020a).



Chart 1

**Role of MMFs in funding short-term debt of banks and NFCs: MMFs predominantly hold bank debt issued in the euro area and abroad (panel a); MMFs are the main investors in key segments of euro area short-term funding markets (panel b)**

(panel a: EUR trillions; panel b: EUR billions)



Sources: Panel a: MFI balance sheet items (BSI) statistics and ECB calculations; panel b: ECB securities holdings statistics and ECB calculations.

Notes: "Bank loans" include bank deposits. Euro area "OFI debt securities" are made up of other financial institution (OFI) issuances (98%) and insurance corporation and pension fund (ICPF) issuances (2%). Non-euro area debt securities can be broken down into bank and government-issued securities. It is assumed that the remaining debt securities were issued by the same sub-sectors as in the euro area. "Bank" refers to MFIs. X-axis in panel a: issuer domicile. Panel a data: Q4 2020. Panel b data: Q4 2020.

**MMFs are estimated to be the main investors in euro area short-term debt markets, although data gaps make it difficult to precisely estimate their market footprint.** At the end of 2019 MMFs held about €250 billion of CP and CDs issued by banks and €40 billion issued by non-

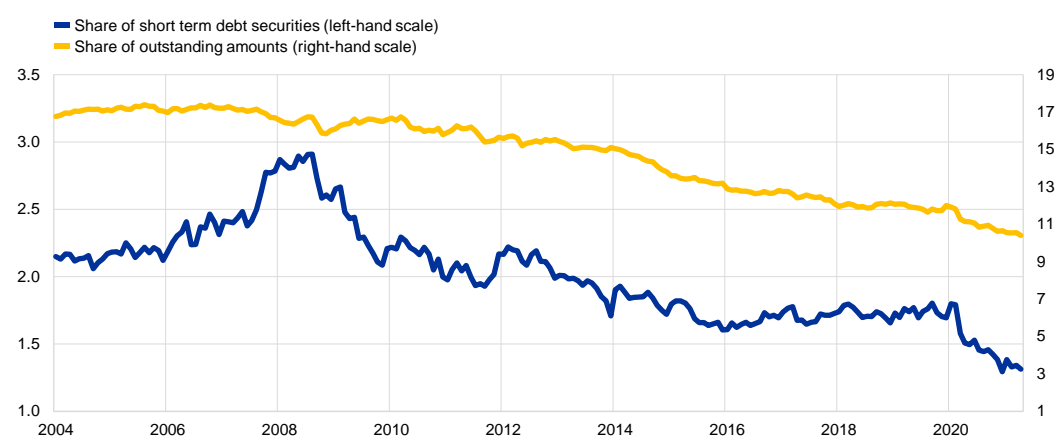


financial corporations (NFCs) (Chart 1, panel b).<sup>4</sup> MMFs are estimated to hold more than half of the USD, EUR and GBP financial CP issued, suggesting a very significant market footprint for MMFs in these segments. However, data on the overall size and liquidity of these markets is not readily available, making it difficult to estimate precisely.<sup>5</sup>

**CP and CDs can be a meaningful source of wholesale funding, although euro area banks on aggregate do not rely heavily on short-term debt as a source of total funding.** At the end of January 2020 the total amount of short-term debt securities (including CDs) issued by euro area banks was €600 billion, representing less than 2% of euro area banks' total liabilities. The share of short-term debt in bank liabilities declined between the end of the global financial crisis and 2016, since when it has been relatively stable. The share of total debt securities in bank liabilities has also declined since the global financial crisis, but to a lesser extent than the share of short-term debt (Chart 2). Although CP is a minor source of total bank funding, the Bank for International Settlements (BIS) found that it provides a meaningful source of wholesale unsecured short-term funding, especially in US dollars for internationally active non-US banks.<sup>6</sup>

**Chart 2**  
**Short-term and total bank securities issued as a share of total bank liabilities**

(percentages)



Sources: MFI BSI statistics, SEC and ECB.

Note: Short-term debt securities issued with up to one-year (original) maturity.

## 1.2 Investor side: MMFs as cash management vehicles

**MMFs provide liquidity management services to institutional investors and corporate treasurers.** MMFs offer instantaneous liquidity (daily or intraday redemptions), diversification of

<sup>4</sup> Euro area MMFs account for about half of the EU short-term debt market. Besides CP and CDs from banks and NFCs, euro area MMFs hold government debt securities, OFI debt securities and bank loans. See Box 7 in ECB (2020a).

<sup>5</sup> Public data on the overall size and liquidity of CP and CD markets in the EU are not readily available. For the USD CP markets, estimates are based on US and EU USD MMFs. See also Bouveret and Danieli (2021).

<sup>6</sup> See Aldasoro et al. (2021).





issuer and market risk and reasonably stable value (low-volatility of MMF shares/units), and remunerate investors with market yields. They are often higher yielding than bank deposits and, owing to the short-term nature of their assets, MMFs are considered more liquid than short-term bond funds while offering more stable value. Compared to a direct investment in money markets, they also save investors costs related to the setting up of a trading infrastructure and internal credit risk assessment. Corporate treasurers may use MMFs as part of their liquidity management across different currencies and jurisdictions. Tax and legal considerations may also play a role in cross-jurisdictional dealings. Institutional investors may use MMFs to manage cash needs, e.g. arising from margin calls or fund redemptions, and they may store excess cash in MMFs to avoid poorer and sometimes negative yields associated with bank deposits.

**Investors tend to see MMF shares/units as cash-like products, rather than investment products.** Under EU regulation, MMFs are required to clearly state in their prospectuses that MMF shares/units are different from bank deposits and are not guaranteed either by the issuer or through deposit insurance. However, investors often use MMFs as a substitute for bank deposits. In particular, they value the diversification of counterparty risk – partly because corporate and institutional investors are not protected by deposit insurance to the same extent as retail investors – and the lower credit risk than short-term bond funds, owing to tighter regulatory requirements. In addition, under certain conditions, MMFs can be considered cash-equivalents from an accounting perspective,<sup>7</sup> which can be a further reason to see MMFs as cash-like products.

**A large proportion of euro area MMF shares/units are held by corporate and institutional investors and – depending on the fund domicile – the shares/units are predominantly held by investors outside the euro area.** Ireland and Luxembourg in particular are popular domiciles for MMFs that attract global investors, whereas shares/units in MMFs domiciled in France are held mainly by domestic investors. Overall, around two-thirds of MMF shares/units, mainly denominated in US dollars and pounds sterling, are held by investors outside the euro area (Chart 3, panel a). Among these global investors the proportion of non-financial corporate treasurers is very large (Chart 3, panel b) and is estimated to be much larger than among euro area investors. Within the euro area, MMFs are predominantly held by IFs and ICPFs. There are particular concentrations in the MMF investor base; for example a high share of euro-denominated LVNAV MMFs domiciled in Ireland are held by Dutch pension funds. Unlike in the United States, there is a negligible share of direct retail investors in euro area MMFs.

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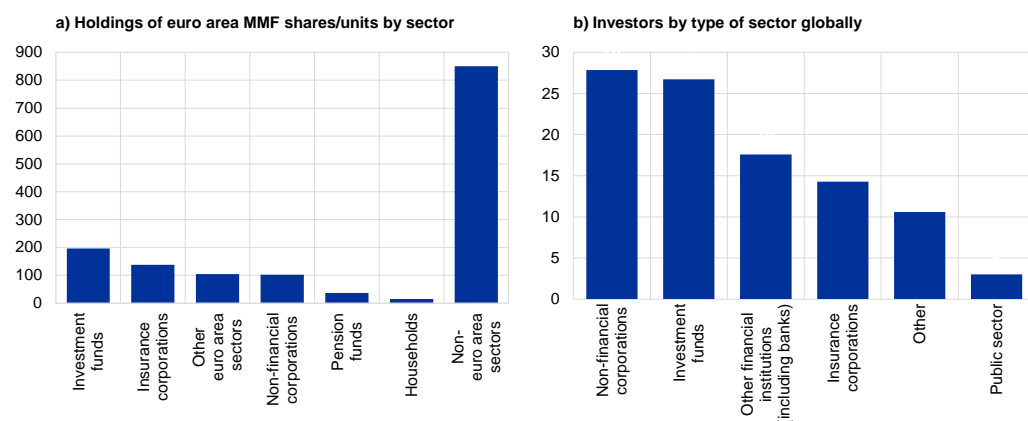
<sup>7</sup> For example, according to the Autorité des marchés financiers (AMF), in France shares/units in VNAV MMFs are presumed to be considered cash-equivalent under the accounting norm IAS 7, provided that the MMFs are used as a short-term cash management vehicle rather than as an investment. The presumption of negligible risk of change in the value of these funds can be refuted based on the events and circumstances relating to market trends, notably in periods of tension (AMF, 2018). In the United States, the Securities and Exchange Commission (SEC) has a similar interpretation, as stated in its 2014 Final rule on MMF reform (SEC, 2014, p.134): “The Commission’s position continues to be that, under normal circumstances, an investment in a money market fund that has the ability to impose a fee or gate under rule 2a-7(c)(2) qualifies as a ‘cash equivalent’ for purposes of U.S. GAAP”.



Chart 3

**Investors in MMFs : Non-residents hold two-thirds of euro area MMF shares/units (panel a); Globally, corporates and non-banks are the main investors in euro area MMFs (panel b)**

(panel a: EUR billions; panel b: percentages)



Sources: Panel a: ECB securities holdings statistics and ECB calculations; panel b: Fitch, ECB and the European Securities and Markets Authority (ESMA).

Notes: Panel a: holdings of MMF shares/units by non-euro area sectors are computed as the difference between total assets and holdings by euro area sectors. Data: Q4 2020. Panel b: Ownership of EU MMF shares/units by investor type. The category "Other" corresponds to MMFs sold through third-party platforms. Data: Q4 2019.

### 1.3 Types of MMF

**The MMF Regulation provides for three main types of MMF (see also Box 1), which are denominated in three main currencies.** Public debt constant net asset value (PDCNAV) MMFs account for 7% of all EU MMFs, low-volatility NAV (LVNAV) MMFs account for 48%, and variable NAV (VNAV) MMFs account for 45%. The funds are mainly denominated in euro (45%), US dollars (32%) and pounds sterling (23%). Almost all constant net asset value (CNAV) funds are denominated in US dollars, whereas VNAV funds are denominated predominantly in euro (Chart 4). The very low share of euro and sterling-denominated PDCNAV funds may be explained by European sovereigns offering short-term yields in deeply negative territory.

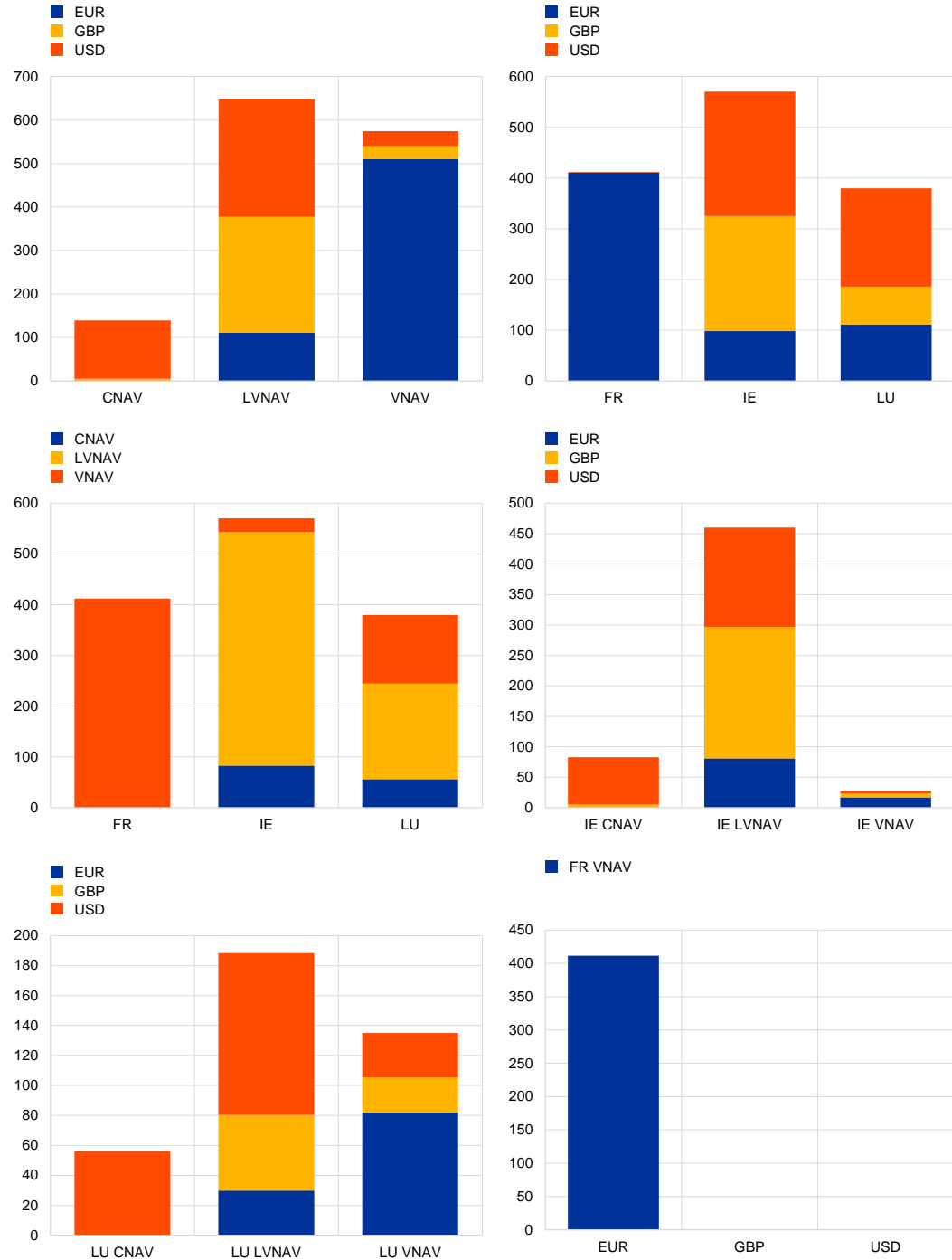
**There are significant differences in market structure across the three largest fund domiciles.**

The French market is mainly domestically-oriented, comprising almost exclusively VNAV funds denominated in euro. Both Ireland and Luxembourg serve other European and global markets in all three main currencies. Ireland has a somewhat higher share of sterling-denominated funds, presumably owing to its geographic proximity to the United Kingdom. LVNAV funds, which are not present in the domestically-oriented French market, account for more than 50% of MMFs in Luxembourg and almost 85% in Ireland.



**Chart 4**  
**MMF assets by MMF type, currency and domicile**

(EUR billions)



Sources: AMF, Banque Centrale du Luxembourg (BCL) and Central Bank of Ireland (CBI) data covering the whole MMF sector in these countries.

Notes: Net asset value as at 31 December 2020. There is a large share of non-EUR MMFs. Regulatory types differ by country. French MMFs are mainly denominated in euro, while Irish and Luxembourg MMFs are more currency diverse.



## Box 1

### Money Market Funds Regulation

**The Money Market Funds Regulation (MMFR) was published in July 2017.**<sup>8</sup> The MMFR applies to collective investment undertakings (funds) that (a) require authorisation as an undertaking for collective investment in transferable securities (UCITS) or are alternative investment funds (AIFs) under the Alternative Investment Fund Managers Directive (AIFMD); (b) invest in short-term assets; and (c) have distinct or cumulative objectives offering returns in line with money market rates or preserving the value of the investment.

**Owing in part to the systemic risk related to MMFs witnessed during the 2007-08 global financial crisis, the MMFR was designed to make these investment products more resilient and resistant to contagion risks.** It does this by imposing rules on eligible assets, portfolio diversification, portfolio maturity, valuation of assets, reporting and stress testing and introduces new categories of MMF, some of which can offer a constant net asset value (NAV) per share if they meet certain requirements.

**The MMFR provides for three types of MMF:**

#### 1. Variable NAV (VNAV) MMFs

- Use mark-to-market or mark-to-model valuation methods to value assets and offer a fluctuating/floating NAV.

#### 2. Public debt constant NAV (PDCNAV) MMFs

- Must invest 99.5% of assets in government debt instruments, reverse repos collateralised with government debt, and cash, and are permitted to maintain a constant dealing NAV. PDCNAV MMFs are permitted to value underlying assets using the amortised cost method.

#### 3. Low-volatility NAV (LVNAV) MMFs

- Permitted to maintain a constant dealing NAV provided that certain criteria are met, including that the market NAV of the fund does not deviate from the dealing NAV by more than 20 basis points. LVNAV MMFs are permitted to value underlying assets using the amortised cost method, as long as this valuation doesn't deviate from their market value by more than 10 basis points.

**The MMFR provides that MMFs should be classified as either short-term or standard MMFs.**

All types of MMF may be authorised as short-term MMFs, but only VNAV MMFs may be standard.

**A short-term MMF** is an MMF that invests in eligible money market instruments referred to in Article 10(1) of the MMFR and is subject to the portfolio rules set out in Article 24 of the MMFR.

- It can be a VNAV, LVNAV or PDCNAV MMF.

<sup>8</sup> The MMFR entered into force on 20 July 2017 and applied to all new MMFs from 21 July 2018. A transitional period was provided for existing MMFs, which had until 21 January 2019 to comply and become authorised.



- It may invest in money market instruments that mature in 397 days or less.
- It has a weighted average maturity (WAM) of no more than 60 days and a weighted average life (WAL) of no more than 120 days.

**A standard MMF** is an MMF that invests in eligible money market instruments referred to in Article 10(1) and (2) of the MMFR and is subject to the portfolio rules set out in Article 25 of the MMFR.

- It can only be a VNAV MMF.
- It may invest in money market instruments with a residual maturity until the legal redemption date of less than or equal to two years, provided that the time remaining until the next interest rate reset date is 397 days or less.
- It has a WAM of no more than six months and a WAL of no more than 12 months.



## 2 Systemic vulnerabilities of MMFs

**Despite regulatory reforms over the last decade, systemic vulnerabilities still exist within the MMF sector, some of which materialised in March 2020.** These vulnerabilities arise from a complex interplay of market structures, the economic functions of MMFs, as well as the decisions and actions taken by a number of market participants. While the outbreak of the COVID-19 pandemic was a particularly extreme shock that affected multiple parts of the financial (and non-financial corporate) system, it provides a basis on which to assess the tail risk that is still present in certain MMFs.

### 2.1 Source of systemic MMF vulnerabilities<sup>9</sup>

**There is an underlying tension between the two economic functions provided by MMFs as outlined in Section 1.** This is particularly the case for those MMFs that invest primarily in non-public debt (LVNAV and VNAV MMFs). The tension arises from the fact that MMFs offer on-demand liquidity for investors and are often assumed to be cash-like instruments, whereas the instruments in which they invest are not reliably liquid.

**This tension does not manifest itself under normal market conditions.** MMFs are largely able to meet investor redemption requests from the liquidity within their portfolio (including from required minimum amounts of daily and weekly maturing assets as set out in the MMFR) and without having to resort to extraordinary measures, except during certain crises.

**Market stress reveals the underlying tension, however.** In such circumstances, MMFs can face increased redemption requests combined with a lack of sufficient portfolio liquidity (especially for private debt-focused MMFs) to meet this increased demand. This tension can be even greater for funds that offer stable NAVs (such as PDCNAV<sup>10</sup> and LVNAV MMFs in the EU), as these face an additional constraint (maintaining a constant NAV) in already challenging circumstances.

**This underlying tension can become a cause of systemic concern.** This is based on the following potential sequence of events:

- An **exogenous shock emerges**, such as COVID-19 or a credit shock on banks.
- In response, **investors redeem MMF shares/units**:
  - on a forced basis in order to meet liquidity needs elsewhere (e.g. margin calls<sup>11</sup>, emergency cash needs for corporates); or
  - on a voluntary basis (e.g. for flight-to-quality reasons).

<sup>9</sup> This section outlines how MMFs can be systemically vulnerable. It is not intended to describe how this manifested in 2020, which is set out in Section 2.3.

<sup>10</sup> PDCNAV MMFs cannot, however, invest in private debt securities in a material amount.

<sup>11</sup> See Box 8 in ECB (2020b).



- **MMFs attempt to meet this unexpected increase in redemption demand**, although in doing so they may **generate two potential externalities**:
  - **Disruptions in short-term funding markets**: To honour redemptions MMFs may (i) use maturing assets; (ii) sell assets, potentially disrupting the functioning of wider short-term funding markets; and/or (iii) reduce their purchases of new money market instruments in order to reduce the weighted average maturity (WAM) of their assets. This can affect the flow of funding to financial institutions and the real economy.
  - **Propagation of liquidity strains elsewhere in the system**: MMFs can also manage their liquidity risk by restricting the access of unitholders to their money, for example by introducing fees on redemptions or even redemption gates<sup>12</sup>. This could in turn transfer the liquidity risk to other parts of the system, e.g. to central counterparties (CCPs), which might be left short on variation margin calls, or to bilateral counterparties to derivative contracts.

**Both externalities are relevant for systemic risk, although experience from the global financial crisis and the COVID-19 shock<sup>13</sup> has been tilted more towards disruptions in funding markets rather than propagating liquidity strains.** This is because no MMF resorted to gating or suspending redemptions, although some of the redemptions may well have been driven by investor concerns that MMFs might not be able to meet their liquidity needs in full.

**Non-public debt MMFs in particular are exposed to three intertwined challenges regarding liquidity on their asset side (Figure 1):** 1) they have a large market footprint in the private asset classes in which they invest, 2) they have a high degree of portfolio overlap with one another, and 3) the markets in which they invest are not very liquid even in normal times. Each challenge is described in more detail below.

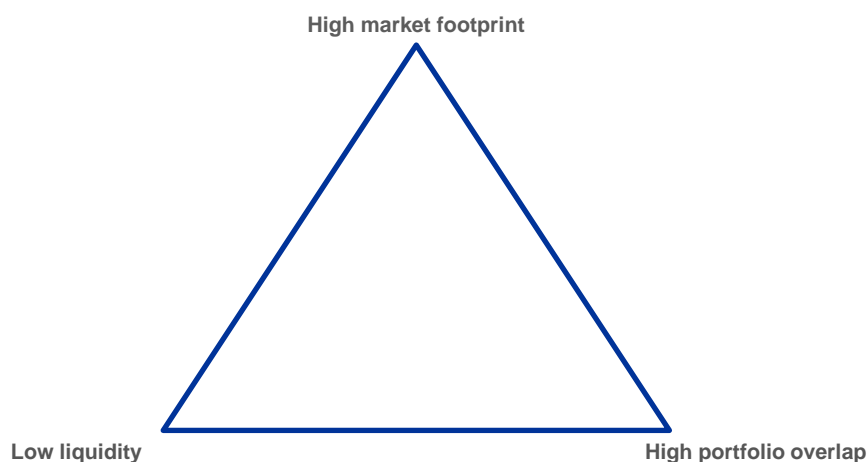
<sup>12</sup> Redemption gates refer to the temporary suspension of redemptions.

<sup>13</sup> The global financial crisis differed from the COVID-19 shock in that the former was a credit and liquidity event whereas the latter was only a liquidity event.



Figure 1

### Common vulnerabilities in the assets of non-public debt MMFs



Source: ESMA.

#### 2.1.1 Large market footprint

**The footprint of MMFs in the CP and CD markets is estimated to be substantial.** With the exception of public debt CNAV MMFs, EU MMFs invest mainly in CP and CDs, and these two asset classes account for more than 50% of the portfolios of LVNAV and VNAV MMFs. US dollar-denominated MMFs (in the United States and in the EU) are estimated to own around 50% of USD financial CP issued by financial institutions (and 70% of the USD financial CP issued by non-US financial institutions). EU MMFs are estimated to hold more than 50% of EUR and GBP financial CP, although precise estimates are challenging owing to a lack of transparency in some segments of the European CP market (Bouveret and Danieli, 2021).

#### 2.1.2 High portfolio overlap

**Since non-public debt MMFs have very large common exposures, when faced with a large liquidity shock, multiple MMFs will try to dispose of the same asset at the same time.** MMFs tend to be exposed to the same types of issuer across CP and CDs, partly reflecting the high concentration of issuers.<sup>14</sup> Such common exposure can be measured by estimating the similarity of MMF portfolios on a scale of 0 (no similarity) to 1 (identical portfolios). Figure 2 illustrates the very high level of portfolio similarity across EU and US MMFs investing in USD CP. The network chart only shows edges between MMFs where the portfolio similarity is very high (above 0.76).<sup>15</sup> The chart is quite dense, implying a high degree of portfolio overlap between US prime funds and EU

<sup>14</sup> In addition, as MMFs invest in issuers with very low credit risk, MMF exposures tend to be clustered around issuers with high credit ratings.

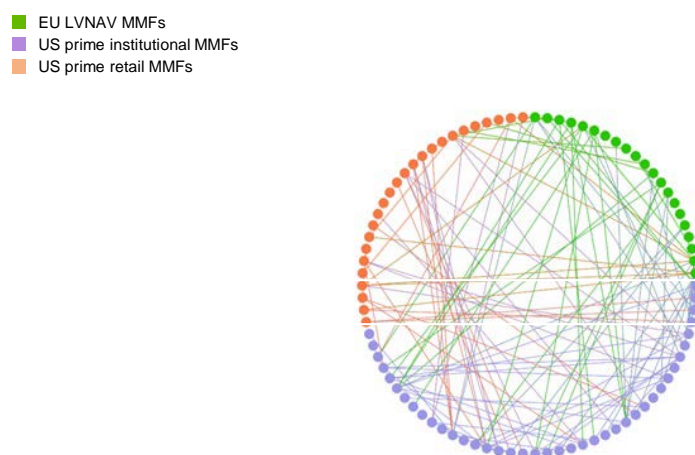
<sup>15</sup> If the MMFs had a similarity index below 0.76, the chart would be empty as no lines (edges) would be displayed. For more information, see ESMA (2021a).





USD LVNAV MMFs, indicating a high level of common exposure towards the same issuers of CP. Such a high degree of overlap is found across non-public debt MMF types and currencies and remains stable over time (Georg et al., 2020).<sup>16</sup> This implies that if a set of funds try to dispose of their assets at the same time, there will be high selling pressure on a limited number of instruments and issuers. This coordination failure can create additional stress, especially given the high portfolio overlap, high market footprint and low liquidity of the markets in which MMFs invest.

**Figure 2**  
**Substantial portfolio overlap between USD MMFs (US-domiciled prime funds and EU-domiciled USD LVNAV MMFs)**



Sources: Crane, ESMA.

Notes: Portfolio similarity index by MMF type. Only values above 0.76 are displayed for purposes of readability.

### 2.1.3 Lack of reliable asset liquidity

**Secondary market liquidity in CP and CDs tends to be low even in normal times.** This is due to a range of reasons. First, owing to the short maturity of CP, investors tend to buy and hold instruments until maturity, implying low trading volumes on secondary markets. The distribution of CP at issuance also plays a role. Most CP is sold through a group of dealers or banks that agree to sponsor and make markets at issuance in the CP issuer's programme in exchange for a fee. Programme members usually provide liquidity in the secondary market at or close to fair price, but they have no obligation to do so.<sup>17</sup> Non-programme institutions would generally not buy CP they did not help issue, as they do not have sufficient information on the issuer for commercial reasons. Finally, banks need balance sheet capacity to be able to intermediate large amounts of CP. Limited capacity of banks to buy back their own CP and CDs in markets might be due to prudential regulation (IOSCO, 2020). Market participants have argued that the liquidity coverage ratio (LCR)

<sup>16</sup> Using a sample of US prime MMFs and EU USD LVNAV MMFs, we estimate the portfolio similarity as at the end of February 2020. The index is based on holdings of financial CP by issuer. Two MMFs will be very similar if they share exposures to the same issuer for the same relative amount (as a percentage of their NAV).

<sup>17</sup> Under normal market conditions there is low activity on secondary markets, but MMFs are able to sell CP to dealers, and dealers can find buyers without any difficulty.



disincentivises intermediation because (i) financial CP does not meet the criteria to be considered high-quality liquid assets, and (ii) non-financial CP only meets the criteria for being considered level 2.a or level 2.b assets and is therefore subject to liquidity weights of 85% and 50% respectively (Box 2).

## 2.2 Interconnectedness and the low interest rate environment

**The vulnerabilities described above show that MMFs can contribute to the spread and amplification of crises across sectors and countries.** MMFs are key intermediaries in the financial system. They connect several sectors: on the investor side, ICPFs, IFs and NFCs; and on the asset side, mainly banks, but in some cases also NFCs and public administrations. In addition, investors might not be located in the same country as the assets, and the majority of euro area MMFs are in foreign currency. MMFs can therefore contribute to the propagation of shocks, notably through their balance sheet.<sup>18</sup> As an illustration, assume that an ICPF holds MMF shares/units for cash management purposes. When the ICPF faces large margin calls on its derivative positions owing to high volatility, the ICPF will redeem its MMF shares/units, propagating the liquidity shock to the MMF manager.<sup>19</sup> The MMF manager in turn will have to sell assets, which could increase liquidity risks for MMFs exposed to the same assets. Finally, the issuer of the assets could face higher refinancing costs or a sudden drying up of rollover possibilities. In addition, since issuers, MMFs and investors tend to be located in different countries, the shock is also likely to spread across countries. This “liquidity multiplier” contributes to the propagation of shocks.<sup>20</sup>

**Another aspect that might reinforce the vulnerabilities identified is the low interest rate environment and the pressure this puts on system-wide liquidity.** Since 2016 the share of cash holdings and highly liquid assets held by MMFs has fallen. This might be partly due to negative returns on, in particular, euro-denominated short-term debt. Since 2016 euro-denominated MMFs have consistently delivered negative returns, while US dollar-denominated MMFs have delivered positive returns. The low interest rate environment will continue to challenge the business models of LVNAV and CNAV MMFs. Owing to negative rates, EUR CNAV MMFs have all but disappeared, with a combined NAV of less than €100 million.<sup>21</sup>

## 2.3 Manifestation of systemic risk in MMFs

**The actual manifestation of systemic risk from MMFs, based on the sequence outlined in Section 2.1, arises from a complex interplay of market structures, the economic functions of MMFs, as well as the decisions and actions taken by a number of market participants:**

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<sup>18</sup> The propagation could be from the liability to the asset side, but other firms could also be affected, e.g. via indirect or reputation contagion.

<sup>19</sup> See also Box 8 in ECB (2020b).

<sup>20</sup> See Kashyap (2020).

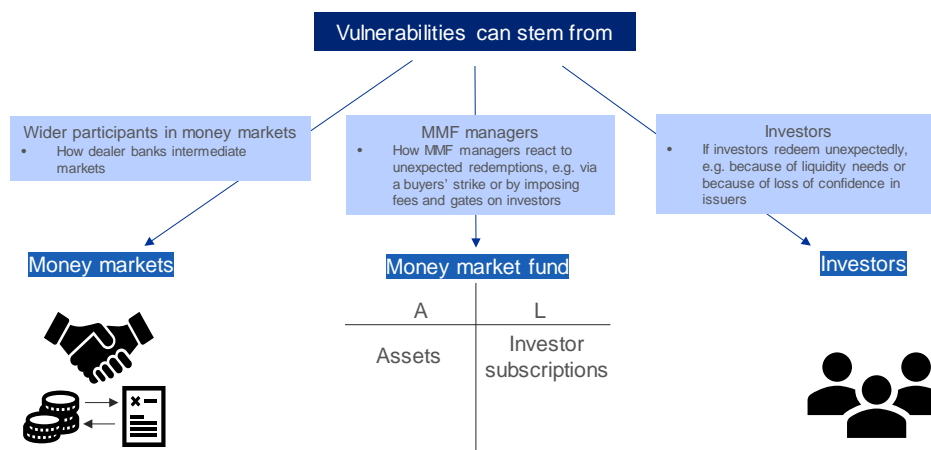
<sup>21</sup> For more considerations on the low interest rate environment, see ESRB (2021).



**MMF unitholders (the investors)** and their decisions about their liquidity management practices, e.g. placing money in MMFs for the specific purpose of being able to access it for margin calls (without having to close out positions). This can leave them with no choice but to redeem MMF shares/units upon the emergence of a shock, as they are forced to redeem in order to meet liquidity needs elsewhere (assuming their positions are still open). Even if unitholders have a degree of choice, they may still choose to sell MMF shares/units, for example for flight-to-quality reasons, which adds additional pressure on the MMF.

- **MMF managers** and their reactions to increased redemptions (or the expectation of increased redemptions to come) can determine whether MMFs amplify the shock; i.e. they may try to use parts of their buffers to meet redemption demand or they may use maturing assets, which can lead to reductions in or the disappearance of liquidity from short-term markets as described above.
- **Wider market participants that have an impact on money markets**, such as dealer banks, which intermediate markets, and issuing banks, which may or may not be willing to buy back their own paper.

Figure 3  
Systemic vulnerabilities around MMFs



Source: ESRB.

Note: A "buyers' strike" is a situation in which MMFs stop buying the instruments in which they normally invest.

**This interplay has important policy implications and deserves further investigation.** It affects how the underlying risks and their emergence could be targeted by policy reforms in order to make MMFs more resilient and reduce their systemic vulnerabilities. Further investigation of the behaviour of investors (what do they do with the funds they redeem from MMFs? what do other agents receiving that money do and why do they not invest in money markets? what are the



alternatives for investors looking for cash management vehicles?) and of money markets (how important they are for banks and NFCs? what are the alternatives?) would inform policy reforms.

**The events of March 2020 are an example of the manifestation of systemic concern in relation to particular types of MMF, namely those that invest in private debt.** They can serve as a real-life stress test of the MMFR framework as well as the wider functioning of short-term funding markets, both of which are relevant to the policy debate. It is therefore crucial to assess the precise events of March 2020 and their underlying causes in order to begin the discussion on the policy response.

## 2.4 The events of March 2020

**In March 2020 some segments of the EU MMF market were subject to acute stress on both sides of their balance sheet.** The liquidity mismatch materialised for LVNAV and VNAV MMFs as the sector faced heavy unexpected redemptions on the liability side. Despite the magnitude of the stress, all funds were able to pay out redemptions and none had to suspend. The low liquidity on the asset side, exacerbated by the COVID-19 outbreak and subsequent volatility and uncertainty, made it challenging to dispose of assets to meet these unexpected redemptions. Levels of weekly liquid assets (WLA) deteriorated significantly, and mark-to-market NAV declined, reflecting losses and prompting further outflows.

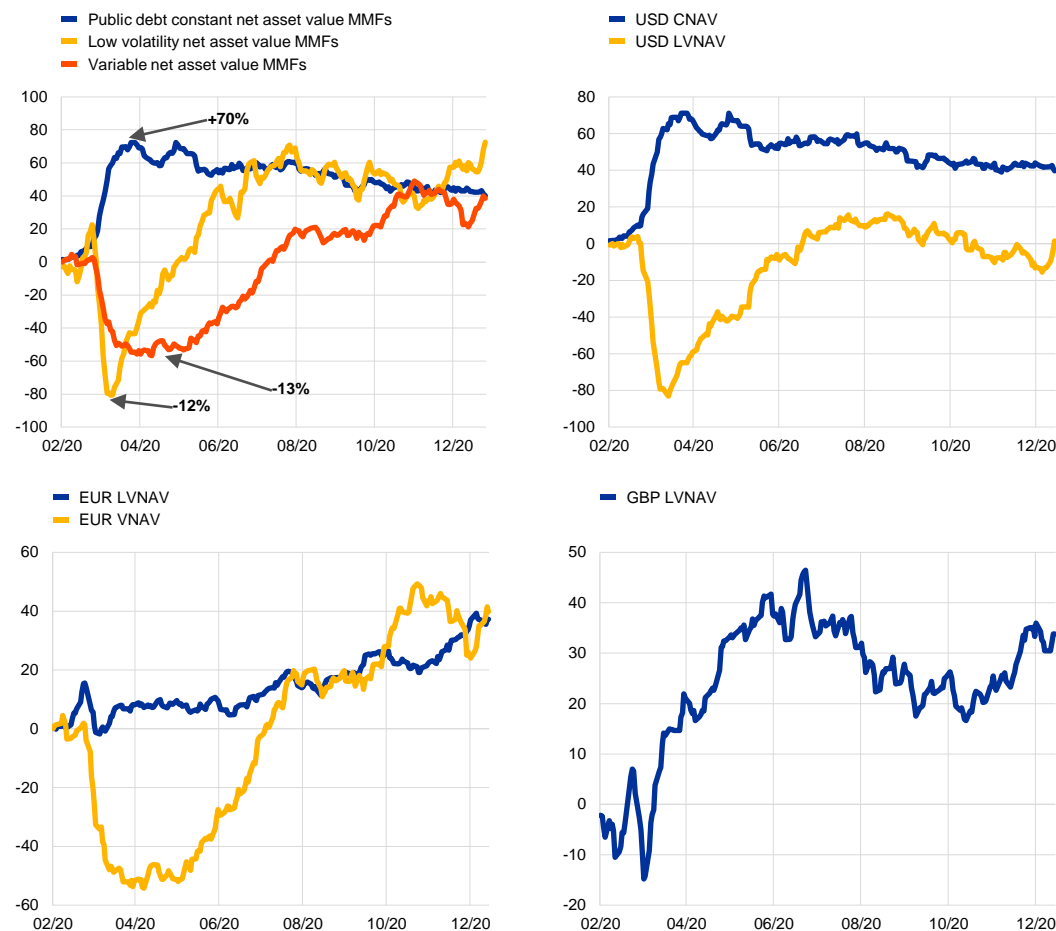
**Investor redemptions were massive in mid-March across non-public debt MMFs.** As the “dash for cash” took place (IOSCO, 2020; FSB, 2020), investors raised cash by redeeming MMF shares/units across the main MMF types (LVNAV and VNAV MMFs). In the second half of March, outflows amounted to 27% of assets for USD LVNAV MMFs (€90 billion), more than 10% for GBP and EUR LVNAV MMFs (at €22 billion and €17 billion respectively) and 10% for EUR VNAV MMFs (€41 billion, including €40 billion for France alone) (Chart 5). At the same time, USD CNAV MMFs saw very high inflows (€40 billion, 44% of NAV), reflecting substitution effects between LVNAV MMFs and government MMFs<sup>22</sup> – a sign of a “flight to safety” as government MMFs invest almost exclusively in public debt. NFCs that redeemed shares/units in VNAV MMFs seem to have put the proceeds into bank accounts.

<sup>22</sup> Similar patterns were observed in the United States with large outflows from US prime MMFs (which have an investment profile similar EU USD LVNAV MMFs) and large inflows into government MMFs (similar to EU USD CNAV MMFs).



Chart 5  
**Cumulated daily flows in 2020 by type of MMF**

(EUR billions)



Sources: AMF, CBI and CSSF data.

Notes: Data are from 18 February to 31 December 2020 and represent 100% of the French market, 100% of the Irish market and 75% of the Luxembourg market as at the end of 2020. The boxes in the top-left panel indicate the highest/lowest variation in NAV.

**The large and unexpected redemptions from MMFs can be related to liquidity demands from investors and apparent flight to safety.** Since MMFs are used in many cases as cash-like products, investors who needed to raise cash quickly redeemed their MMF shares/units. Part of the redemptions could also be related to the need of investors to meet variation margins on their derivatives portfolio. For example, there were exceptionally high margin calls on derivative positions of Dutch ICPFs, which are some of the main investors in Irish MMFs. In addition, the variability of redemptions across different fund structures might be indicative of flight-to-safety behaviour and concerns about the structure of some MMFs: USD LVNAV MMFs recorded high outflows while USD CNAV MMFs had large inflows. Such substitution effects could reflect a perception among



investors that the underlying investments of PDCNAV MMFs were more appealing at a time of acute liquidity strain than the non-public debt securities in which LVNAV and VNAV MMFs invest.<sup>23</sup>

**Some market participants have also argued that regulatory provisions on stable NAVs might incentivise investors to run.**<sup>24</sup> For LVNAV and CNAV MMFs, the MMFR sets regulatory thresholds which, when breached, might lead to action by MMF managers. In particular, MMFs have to consider imposing fees and gates when the level of WLA falls below 30% and the fund faces daily outflows above 10%.<sup>25</sup> As the WLA level declines towards the regulatory threshold of 30%, investors might have an incentive to run pre-emptively to avoid being subject to fees and gates. In the United States, Li et al. (2020) provide evidence that US prime funds with the lowest WLA had higher outflows than MMFs with higher levels of liquid assets. Chart 6 also shows that MMFs with low WLA experienced higher outflows than MMFs with high WLA. In addition, LVNAV MMFs are subject to a NAV deviation limit (collar) of 20 basis points (bps) (before switching to mark-to-market valuation), which could lead investors to redeem in advance of the switch to avoid mark-to-market losses.<sup>26</sup>

**At the same time, MMFs faced challenges in selling assets as the liquidity of money markets strongly deteriorated.** Simultaneous sales by MMFs and the limited absorption capacity of private money markets (for CP and CDs), accentuated by stresses on the balance sheets of dealer banks, made it difficult for MMFs to dispose of the main components of their portfolios. MMFs had to sell instruments at a discount, which resulted in a decline in their mark-to-market NAV. For some USD LVNAV MMFs, the deviation of the market NAV from the constant NAV came close to the 20 bps collar (without breaching it) which triggers the conversion to VNAVs, with some MMFs recording a deviation of 18 bps. Some LVNAV MMFs sold liquid assets<sup>27</sup> to meet redemptions, which resulted in some funds breaching the 30% regulatory requirement for WLA and might have triggered additional redemptions owing to investor concerns about fees and gates.

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<sup>23</sup> In France, outflows from EUR VNAV MMFs combined with a large increase in bank deposits might also point to concern about MMF structures (see AMF, 2021).

<sup>24</sup> See BlackRock (2020) and Li et al. (2020). Other market participants have highlighted the differences between the US and EU frameworks (see EFAMA, 2020).

<sup>25</sup> In Europe, when the level of WLA is below 30% and daily outflows above 10%, the MMF manager is required to inform the fund board, which in turn is required to consider whether or not to impose fees or gates, although the final decision is for the fund board to take. By contrast, in the United States the regulator imposes fees and gates when certain thresholds are breached. Some have argued that investors based outside the EU may not have internalised that the EU framework is less automatic.

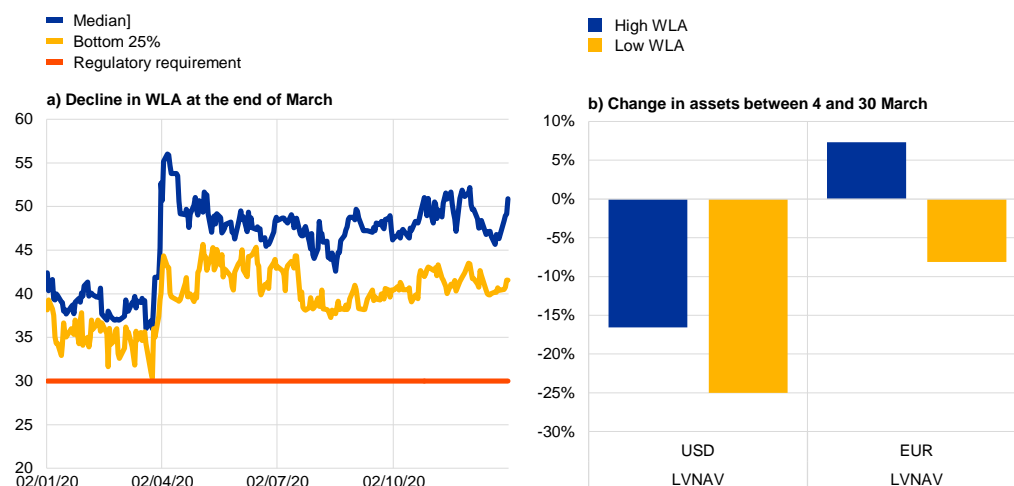
<sup>26</sup> Article 33 of the MMFR requires an LVNAV MMF to convert to a VNAV MMF following a deviation of 20 bps or more between its NAV calculated on an amortised cost basis and its NAV calculated on a mark-to-market basis. This is known as the 20 bps "collar".

<sup>27</sup> It is, however, not possible to tell whether individual LVNAV MMFs sold liquid assets or used their cash buffers to meet redemptions, as portfolio data are only monthly.



## Chart 6 Impact of MMF regulatory constraints

(panel a: percentage of NAV; panel b: percentage changes)



Sources: Crane and ESMA.

Notes: Panel a: WLA of USD LVNAV MMFs, based on a sample of 20 MMFs with a NAV of USD 330 billion. Panel b: MMFs split between low and high WLA (below or above 40% of NAV) based on WLA lagged by one day.

**The situation improved in early April, after central banks adopted exceptional measures affecting money markets and the broader market in order to support the monetary policy transmission mechanism.** In the euro area, the ECB launched a purchase programme targeted at euro CP issued by NFCs in view of its monetary policy mandate, which averted the materialisation of a systemic event. Although the exposure of MMFs to corporate CP is limited (around 5% of NAV as at the end of February 2020 for EUR LVNAV MMFs), the ECB's purchase programme might have had a positive signalling effect. Investors might also have been reassured by other exceptional measures taken by the ECB, such as the pandemic emergency purchase programme (PEPP). In the United States, the Federal Reserve also launched a CP purchase facility (the Commercial Paper Funding Facility), addressed to all US issuers of CP (including financial institutions), and a programme in which the Federal Reserve offered loans to financial institutions to purchase assets from MMFs (the Money Market Mutual Fund Liquidity Facility, MMLF). Following the announcement of the two facilities, stress subsided in money markets and MMFs started receiving inflows. EU USD LVNAV MMFs, whose asset holdings were not eligible for the ECB facilities (because they were US dollar-denominated) or the Federal Reserve's MMLF (because they were not US domiciled), initially suffered outflows but recovered a few weeks after the central bank announcements.

### Box 2

#### The US case and Federal Reserve intervention

**Federal Reserve intervention was key to improving liquidity in secondary markets.** In the United States, dealers' CP inventories amounted to around USD 10 billion at the end of February, less than 1% of the market, implying little capacity to intermediate CP trading. Only after the launch



of the Federal Reserve's Money Market Mutual Fund Liquidity Facility (MMLF)<sup>28</sup> did dealers increase their CP inventories (see Investment Company Institute, 2020, and Chart A). Through the establishment of the MMLF, the Federal Reserve made loans available to eligible financial institutions secured by high-quality assets purchased by the financial institution from MMFs. A key feature of this programme was the credit protection provided by the US Treasury (of USD 10 billion). In addition to the MMLF, the US authorities also took supervisory action to assist banks by granting relief from capital and leverage requirements for banks participating in the MMLF and temporarily broadening the scope of assets accepted for the liquidity requirements.

Chart A  
**US primary dealers' CP inventories**

(USD billions)



Sources: Federal Reserve and ESMA.

Note: The vertical grey line indicates the launch of the MMLF, including regulatory relief for participating banks, on 18 March 2020.

<sup>28</sup> See Federal Reserve (2020).





### 3 Further policy work to increase MMF resilience and reduce systemic risk

**Substantial reforms of the MMF sector followed the global financial crisis.** In 2012 the International Organization of Securities Commissions (IOSCO) published Policy Recommendations for Money Market Funds which were endorsed by the Financial Stability Board (FSB). At the same time, in the EU, the ESRB recommended a set of measures to reduce systemic risks arising from MMFs, in particular that Union legislation should require MMFs to have a fluctuating NAV.

#### Box 3

##### **ESRB Recommendation on MMFs<sup>29</sup>**

**In 2012, following the global financial crisis, the ESRB issued a Recommendation to the European Commission on MMFs.** This Recommendation highlighted vulnerabilities observed during the crisis which are similar to those described in this note, even though the landscape and types of MMF were different at that time. The Recommendation focused in particular on the risks posed by CNAV MMFs.

**In 2012 CNAV MMFs were exposed to underlying tensions similar to those to which LVNAV MMFs are exposed today. At that time, CNAV MMFs did not invest almost exclusively in public debt, but invested in private debt. The ESRB identified that the characteristics of CNAV MMFs exposed them to investors seeking first-mover advantages in periods of market stress: they offered immediate redemptions at a rounded constant price, which induced a transfer of loss to remaining investors if the actual value of assets decreased. The ESRB also identified possible sponsor support and the low interest rate environment as risks to financial stability.**

**The ESRB recommended a set of measures to reduce systemic risks arising from MMFs, in particular that Union legislation should require MMFs to have a fluctuating NAV.** The ESRB also recommended the introduction of stricter liquidity requirements on all MMFs, as well as increased public disclosure and reporting and information sharing requirements.

**The MMFR, which was introduced in 2017, changed the landscape of the sector, strengthening the regulation of MMFs in the EU and leading to the introduction of LVNAV MMFs.** CNAV models as they existed before the global financial crisis of 2007-08 have disappeared and have been replaced by public debt CNAV and non-public debt LVNAV models. VNAV MMFs have continued to exist, albeit with enhanced regulatory requirements as set out in the MMFR. The MMFR also introduced an enhanced regulatory framework (for more information, see Box 1).

**The MMFR introduced an enhanced regulatory framework for MMFs in the EU.<sup>30</sup>** This includes a clearer categorisation of MMF fund types, as well as bespoke rules and requirements around

<sup>29</sup> See ESRB (2012) and related annex.



asset portfolio compositions, daily and weekly maturing asset requirements, limits on weighted average maturity (WAM) and weighted average life (WAL), and valuation requirements. In addition, MMFs are subject to a range of provisions related to stress testing, including an annual exercise coordinated by ESMA using a stress test scenario designed by the ESRB.<sup>31</sup> Considering the stress experienced by certain types of MMF and the large-scale central bank interventions, the fact that, despite the size of the COVID-19 shock, there was no broad-based stress across MMFs, but rather pronounced strains for particular types of MMF across different currency denominations, attests to the overall efficacy of the regulatory framework.

**However, MMFs still exhibit important vulnerabilities that can materialise as a result of the interplay between market dynamics and decisions taken by investors, fund managers and other market participants.** The resulting collective actions can generate externalities for the wider financial system. Identified MMF vulnerabilities relate to three key dimensions: (i) vulnerabilities in money markets, (ii) risks related to the use of MMFs by investors, and (iii) vulnerabilities related to MMF structures. Addressing the risks and vulnerabilities comprehensively will require policies that consider the intertwined nature of all three dimensions.

**At this stage, the list of potential policy measures to be explored further is deliberately broad.** Chart 10 in Section 3.2 sets out the list of potential policy options. This list includes potential reform measures that have been suggested to date, including in international discussions. The list does not represent a proposal from the ESRB; rather, it is a list on which further policy development work will be based. The list is a combination of MMF regulatory reforms – given the scheduled review of the MMFR in 2022 – and wider considerations on the functioning of short-term funding markets and investor behaviours. Indeed, it is likely that regulatory reforms for MMFs will have an impact on these wider issues, and vice versa. As such, as much alignment and coordination as possible between any work on regulatory reform and the wider issues would be desirable.

**An organising framework is required to determine how to identify, assess and propose the policy reforms that should be adopted in respect of MMFs.** Such an organising framework should be developed with reference to the established objectives, scope and principles that will underpin the assessment of the efficacy of different policy reforms. It should also address MMF vulnerabilities and key decision-makers, as outlined above.

## 3.1 Policy objective, scope and principles

**The policy objective for this work should be to ensure that the economic functions performed by MMFs continue to be fulfilled in a manner that is resilient to shocks and minimises the need for central bank intervention.**<sup>32</sup> This means that the MMF sector as a whole

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<sup>30</sup> For a more detailed outline of the MMFR, see Box 1.

<sup>31</sup> The MMFR imposes extensive stress test requirements (Article 28 of the MMFR): MMFs are subject to a range of stress tests on a frequent basis, including shocks to credit risk, interest rates and redemptions. The ESRB and ESMA also define an annual stress test scenario that is applied to EU MMFs. While individual MMFs might be resilient to the adverse scenario when considered in isolation, this might not be the case when all MMFs face a shock at the same time (as observed in March 2020). This is because individual MMFs do not take into account what other MMFs might do.

<sup>32</sup> As well as minimising the associated risk of moral hazard with central bank intervention.



should be able to absorb shocks and not amplify them by transmitting them to other parts of the system, while maintaining the same basic role they currently perform. There may be other ways to ensure that the economic functions of MMFs continue to be fulfilled, possibly by involving other actors in performing those economic functions, and without simply shifting the systemic risk to other parts of the system. In any case, central bank interventions should be minimised and the solution proposed should be resilient to shocks, such as the COVID-19 shock.

**All MMF types should be within the scope of the work, not just those particularly exposed during the COVID-19 market stress.** While more emphasis may be placed on reform measures that target weaknesses revealed by COVID-19, it is suggested that a sector-wide approach be taken in order to be comprehensive and reduce the potential for unintended consequences (e.g. enacting reforms in some parts of the MMF sector and not others could distort investor behaviour). In practice, some reform options would be applicable to the entire MMF sector, while others may be more appropriately targeted at particular MMF types and/or functions.

**From this overall objective, a set of principles can be developed against which prospective policy reform options can be considered.** These principles could be used to determine which options to pursue and which to discard. The suggested principles are:

- **Consider the wider impact of the policies proposed;** in particular, any unintended consequences of MMF reform on other regulatory frameworks, the role of MMFs in the money markets and the wider financial system, MMF investor perceptions and behaviour, and the supply of finance to the real economy and financial system.
- **Build resilience in the MMF sector as a whole and reduce first-mover advantages;** generally speaking, individual entities are of less concern than banks, and a more sector-wide focus is required.
- **Consider whether structural changes to MMFs themselves might be necessary.**
- **Consider both ex ante and ex post measures, with a preference for ex ante tools;**<sup>33</sup> good risk and liquidity management first helps to prevent the materialisation of risks, but should also include a toolkit to react when risks materialise.
- **Assess whether measures should be applied sector-wide or to specific MMF types/functions;** for example, the removal of stable NAV would only apply to CNAV and LVNAV MMFs.
- **Minimise negative spillover effects to other sectors and financial activities;** including the need to avoid moral hazard and to monitor any resultant risk-shifting in the financial system arising from individual policy options.
- **Reforms should avoid creating (new) cliff effects.**
- **Consider reciprocity and international cooperation in operationalising policy measures.**

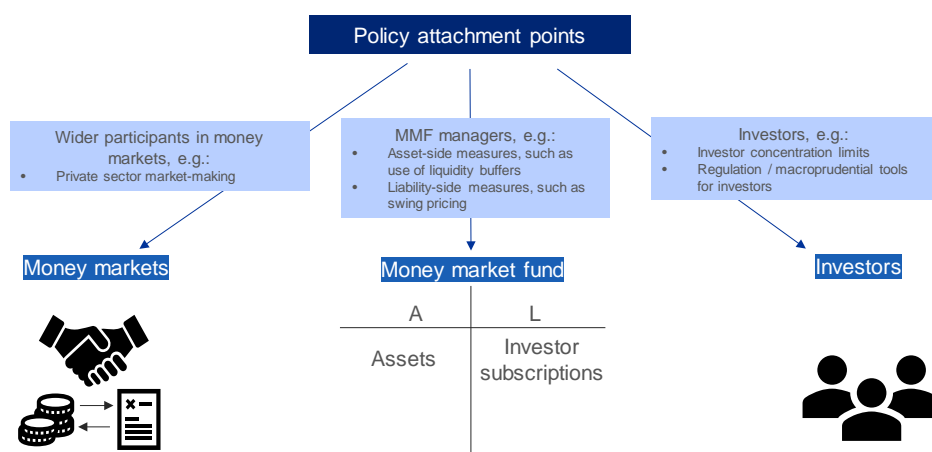
<sup>33</sup> While some of the measures could be deployed ex post, preparation would be required for their ex ante use. As such, even where the framework might be reactive, it should be predictable.



## 3.2 Possible reform options

Policies can be linked to three main areas, corresponding to the vulnerabilities stemming from 1) investors, 2) MMFs and 3) wider participants in money markets (Figure 3). Figure 4 visualises the corresponding policy attachment points and the table below the chart lists some initial policy options to reform MMFs and other areas that affect MMFs. The policy options for MMFs can themselves be split between those that are balance sheet specific, i.e. either targeting the asset or the liability-side, and those that have a broader impact on the MMF sector as a whole. In a broader context, external support which would directly or indirectly benefit MMFs could be considered, for instance via privately funded liquidity stabilisation mechanisms. In addition to market participants, supervisory authorities and macroprudential authorities could also play a role, for example, when deciding to activate a discretionary measure or when conducting stress tests.

Figure 4  
Policy attachment points



Source: ESRB.



Table 1  
Initial policy options to reform MMFs

Addressee	Potential measures		
	<i>Asset-side measures</i>	<i>Liability-side measures</i>	<i>Cross-balance sheet measures and measures external to the MMF</i>
MMFs (board and manager) – “money market funds”	<b>Composition and concentration requirements</b> for asset holdings;	Improved <b>availability and use (potentially mandatory use) of swing pricing/anti-dilution levies (ADLs)</b> to deter first-mover advantage.	The introduction of more <b>specific crisis preparedness requirements</b> for MMFs.
	Enhancing the <b>usability of liquidity buffers</b> <sup>34</sup> by: - <b>decoupling certain regulatory thresholds</b> ; - introducing a <b>time-varying</b> element to regulatory requirements; - examining issues relating to the <b>level, composition and transparency of the buffer</b> .	The introduction of <b>notice periods</b> for redemptions.	The use of better investor profiling to <b>improve MMF stress testing</b> , at both MMF and supervisor level, as well as continued refinements to evolving macro stress testing techniques.
		Consider <b>reforms to the functioning of stable NAVs, especially around the 20 bps collar for LVNAV MMFs</b> and/or <b>consider removing stable NAVs</b> .	<b>The use and activation of liquidity management tools</b> <sup>35</sup> by supervisors/NCAs, not just by fund managers.
		The introduction of “ <b>hold-backs</b> ” <sup>36</sup>	Clarifying the <b>current EU sponsor support restrictions</b> .
		The introduction of <b>capital requirements</b> for MMFs.	Investigating the potential for <b>privately-funded liquidity stabilisation mechanisms</b> . <sup>37</sup>
			Improving the <b>transparency of and data availability</b> on money markets in the EU generally.

<sup>34</sup> Note that liquidity buffers for MMFs differ from those for banks. The former consists of maturing assets, while the latter consist of a stock of high-quality liquid assets.

<sup>35</sup> “Liquidity management tools” could include, for instance, extending notice and/or settlement periods, redemptions-in-kind, gates and suspensions.

<sup>36</sup> “Hold-back” is a generic term for a number of proposals, but essentially it is where the redemption would be split in two phases. Investors would be able to redeem the majority of their investment without restriction, but would have to wait some time to receive the balance. The held-back amount would serve to absorb any losses that may have occurred during the period.

<sup>37</sup> One example of such a mechanism is the “liquidity exchange bank” (see U.S. President’s Working Group on Financial Markets, 2020). This could also be a privately-funded but publicly-operated mechanism based on levying MMFs in benign times to provide an asset purchase fund to be used during stressed times.



Table 2

**Other areas that affect MMFs**

<p><b>MMF unitholders – “investors”</b></p>	<p>A more <b>detailed insight into and understanding<sup>38</sup></b> of:</p> <ul style="list-style-type: none"> <li>- the <b>MMF investor base</b>, per MMF type and currency;</li> <li>- the <b>reasons why investors use MMFs</b>;</li> <li>- likely <b>investor behaviours</b> in stress scenarios.</li> </ul> <p><b>Investor concentration limits</b></p>
<p><b>Wider participants in money markets</b></p>	<p>Developing the <b>macroprudential toolkit that applies to other investors in MMFs, such as ICPFs and open-ended funds</b>, to allow better management of liquidity risks across the system.</p>
	<p><b>Investigating what incentives might be necessary to facilitate the development of a functioning secondary market in specific money market instruments.</b></p> <p><b>Investigating the potential impacts of post-global financial crisis reforms on short-term markets.</b></p>

<sup>38</sup> To be broken down, where possible, between different MMF types and currencies, and cross-border.



## 4 Conclusions

**The financial market turmoil at the onset of the COVID-19 pandemic revealed that systemic vulnerabilities still exist in the MMF sector, requiring a reassessment of certain aspects of post-global financial crisis regulatory reform.** Some MMFs investing in private sector debt securities experienced acute liquidity strains when faced with a high level of redemptions by investors combined with a lack of liquidity in private money markets. This led to concerns that liquidity strains in those MMFs might amplify the effects of the COVID-19 shock in other parts of the financial system. The situation was particularly serious in the United States and the EU and improved only after exceptional measures were taken by the Federal Reserve and the ECB under their respective monetary policy mandates. These events took place just over ten years after the global financial crisis, which itself had revealed systemic concerns with MMFs. Further policy reform to address the remaining systemic vulnerabilities appears necessary.

**There are three dimensions to the risks and vulnerabilities linked to MMFs: 1) the markets in which MMFs operate, 2) the investors holding MMFs shares/units, and 3) the MMFs themselves.** Not all the reform options would, however, have the same degree of impact if enacted, nor would they be cost-free. Some, for instance, would build resilience incrementally, using existing MMF structures as a starting point, whereas others would involve more fundamental change, especially around the economic functions of MMFs going forward. Therefore, it may be helpful to view the different reform options as occupying different points on a spectrum ranging from (i) incremental change at one end to (ii) fundamental change at the other.

**Different suites of options could be constructed based on this incremental/fundamental split.** Not all the options outlined above will be needed, but neither is there is also no single measure that will address all the systemic vulnerabilities identified. Reflecting this, it is likely that individual options will need to be combined into different suites of options designed to address the vulnerabilities identified. These suites of options could then be assessed on the basis of the aggregate impact they would have when applied together as a group. The composition of these suites of options could then be tailored to the level of reform that is deemed necessary, allowing different options to be added or removed when their aggregate impact is assessed.



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