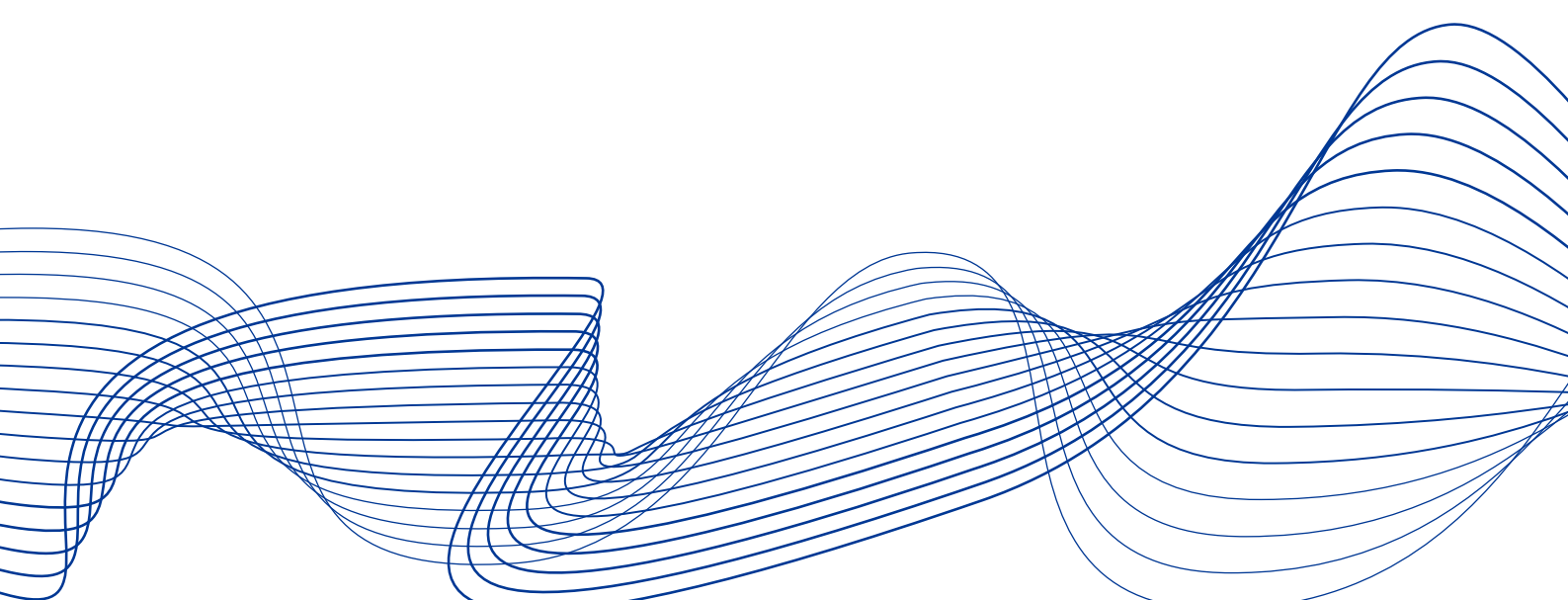


**Report on the economic
rationale supporting the
ESRB Recommendation of
2 December 2021 on
money market funds and
assessment**

January 2022



ESRB
European Systemic Risk Board
European System of Financial Supervision

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Executive summary

Money market funds (MMFs) perform two important economic functions for the financial system and the real economy. They provide short-term funding to issuers, which are mainly European Union (EU) banks and non-financial corporations (NFCs), and are used as cash management vehicles by investors. Investors do not have many options for managing potential intraday cash demands other than with MMFs: the short-term government debt security market is less developed in the EU than in the United States, and deposits at banks are constrained, particularly in the negative interest rate environment.¹

Despite regulatory reforms implemented after the global financial crisis of 2008, MMFs still exhibit certain systemic weaknesses, as manifested during the outbreak of the coronavirus (COVID-19) pandemic. These weaknesses emerged following an interplay of market dynamics and decisions taken by relevant market participants. This was because there is an underlying tension between the cash management and funding functions provided by MMFs. This is particularly the case for those MMFs that invest primarily in non-public debt (i.e. low-volatility net asset value (LVNAV) and variable net asset value (VNAV) MMFs). 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 MMFs invest in are not reliably liquid. In normal times, MMFs are able to meet investor redemption requests from the liquidity within their portfolios (including from regulatory requirements on the minimum amounts of daily and weekly maturing assets as set out in the Money Market Fund Regulation, MMFR²) and without having to resort to extraordinary measures. However, market stress, such as that observed in March 2020, reveals the underlying tension.

The manifestation of systemic risk from MMFs arises from a complex interplay of market structures, the economic functions of MMFs and the decisions and actions taken by a number of market participants under stressed market conditions, namely:

- **MMF unit holders (the investors)** and how they decide to meet their liquidity needs;
- **MMF managers** and their reactions to increased redemptions (or the expectation of increased redemptions to come);
- **wider market participants that have an impact on the money markets**, e.g. dealer banks.

This interplay has important policy implications. It affects how the underlying risks and their emergence should be targeted by policy reforms to make MMFs more resilient and reduce their systemic vulnerabilities.

In response to these vulnerabilities, the European Systemic Risk Board (ESRB) has prepared a Recommendation³ to ensure that the economic functions performed by MMFs

¹ In the absence of entities offering cash management, investors might use ad hoc solutions such as investing in exchange-traded funds or using (reverse) repurchase agreements.

² **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).**

³ ESRB (2022).



continue to be fulfilled in a manner that is resilient to shocks. Both policy work and analytical work have been undertaken to support the delivery of the Recommendation. Together, this work considers policy discussions at the international (Financial Stability Board, FSB and International Organization of Securities Commissions, IOSCO) and European (European Securities and Markets Authority, ESMA) levels⁴. The Recommendation makes proposals to reduce threshold effects, to reduce liquidity transformation, to impose on redeeming investors the cost of their redemptions and to enhance the monitoring and stress-testing frameworks. It is intended to feed into the MMFR review scheduled for 2022. In addition to the policy work, analytical work considers (i) the markets in which MMFs operate, given their large footprint and the disruptions observed in March 2020, (ii) the investors holding MMF shares/units and (iii) MMFs themselves.

This report supports the ESRB Recommendation and provides (i) an overview of the systemic vulnerabilities of MMFs and of the main issues identified in the short-term debt securities market, (ii) the economic rationale for the Recommendation and (iii) an assessment of its impact.

⁴ See FSB (2021b) and ESMA (2021b).

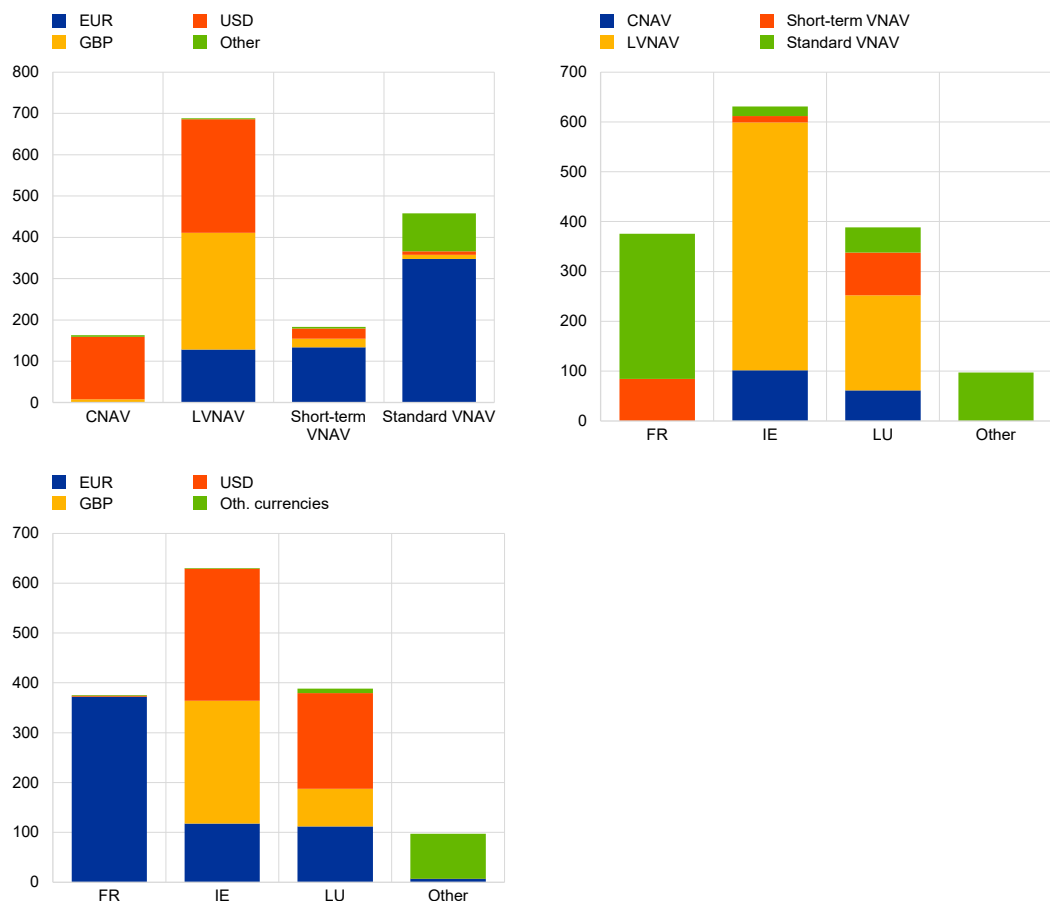


1 Systemic vulnerabilities

1.1 Overview of the MMF sector

As of the end of 2020, assets under management (AuM) by money market funds (MMFs) amounted to €1,492 billion. These were split between public debt constant net asset value (PDCNAV) MMFs (11% of total AuM), low-volatility net asset value (LVNAV) MMFs (46%), short-term variable net asset value (VNAV) MMFs (12%) and standard VNAV MMFs (31%). Ireland was the main domicile of MMFs (42% of total AuM), followed by Luxembourg (26%) and France (25%). MMFs were mostly denominated in euro (41% of total AuM), in US dollars (31%) and in pounds sterling (22%); see Chart 1.

Chart 1
Overview of the MMF sector as of end-2020



Sources: MMFR database and European Securities and Markets Authority (ESMA).



1.2 Systemic vulnerabilities of MMFs

In July 2021, the European Systemic Risk Board (ESRB) published an issues note on systemic vulnerabilities of MMFs.⁵ This issues note provides an overview of the European Union (EU) MMF sector – the asset side, the investor side and the different types of MMF according to the MMFR – and summarises the systemic vulnerabilities of MMFs both from a conceptual point of view and taking into account the events of March 2020 and the outbreak of the coronavirus (COVID-19) pandemic.

Conceptually, systemic stress can arise from MMFs upon the following chain 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 to meet liquidity needs elsewhere (e.g. margin calls, emergency cash needs for corporates); or
 - on a voluntary basis (e.g. for flight-to-quality reasons).
- **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 markets⁶; and/or (iii) reduce their purchases of new money market instruments in order to reduce the weighted average maturity 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 unit holders to their money, for example by imposing redemption gates. 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.

The events of March 2020 were a real-life example of the manifestation of systemic concern in relation to particular types of MMF, namely those that invest in private debt. They served as a real-life stress test of the MMFR framework and the wider functioning of short-term funding markets, both of which are relevant to the policy debate.

Several aspects could be further investigated in order to gain a full understanding of the chain of events that occurred following the outbreak of the COVID-19 pandemic. Market intelligence with French corporate treasurers indicates that despite the strong need for cash to meet the costs generated by the pandemic, non-financial corporations (NFCs) were not willing to issue commercial paper (CP) at a rate above 4 to 5 basis points (i.e. paying just a few cents on

⁵ ESRB (2021).

⁶ In some countries, such as France, MMFs have a large footprint in these short-term debt securities markets, which can amplify vulnerabilities through contagion effects; see ESRB (2021).



every €100) which appears to run contrary to the need to raise cash quickly. Another aspect is that it is difficult to trace the use of cash, which prevents a holistic understanding of liquidity in stressed times. For example, if MMF redemptions served to pay margin calls, then how did these counterparties use this cash?

1.3 Overview of the short-term debt securities market⁷

This section provides an overview of the short-term debt securities market, which is the market in which MMFs operate. MMFs are among the main investors in short-term debt securities market globally, with their share ranging from 30% to 60%. Compared with US MMFs, euro area MMFs account for a larger share of the short-term debt securities market in the domestic currency.⁸ The European market for short-term debt securities is fragmented and composed of four main blocks: the market for Negotiable European Commercial Paper (NEU-CP), the market for Euro-commercial paper (Euro-CP), other national CP and certificate of deposit (CD) markets and the market for sovereign short-term bills. This fragmentation and the lack of information on these markets, in particular on secondary over-the-counter (OTC) markets, makes it difficult to assess their size and liquidity, which is important for assessing in turn whether MMFs are able meet large redemption requests via the selling of assets if necessary.

1.3.1 Components of the short-term debt securities market in Europe

The European short-term debt securities market is fragmented. Broadly speaking, it is composed of four main blocks: the market for NEU-CP, the market for Euro-CP, the other national CP/CD markets, and the market for sovereign short-term bills. In addition, a label called “STEP” (an acronym standing for “Short-Term European Paper”) has been set up by industry bodies to standardise short-term securities, and this label can apply to any European CP/CD.

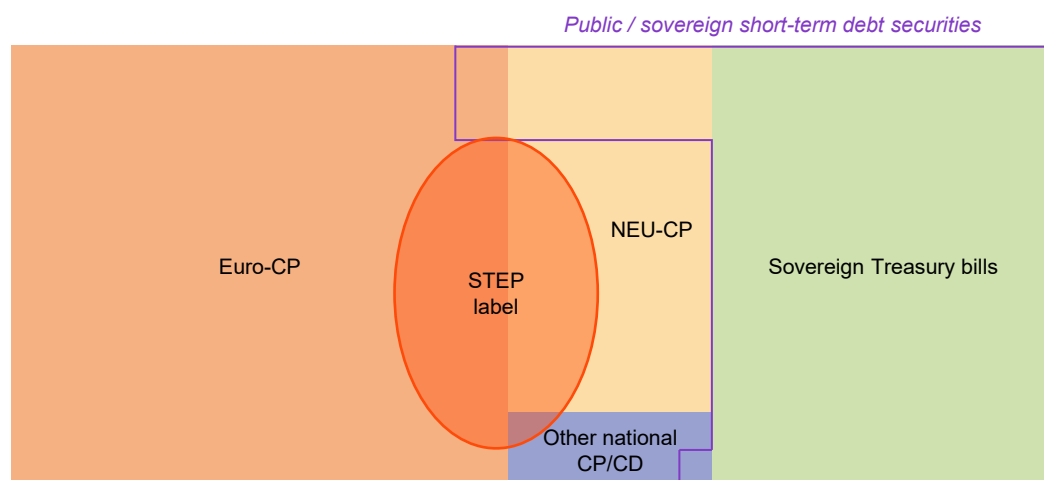
⁷ This section builds on the analysis provided by Darpeix (2022).

⁸ They hold 80% of financial CP, 56% of non-financial CP and 74% of CDs; see Table 1 of FSB (2021b).



Figure 1

Attempt to represent the structure of the short-term debt securities market in Europe



Source: Autorité des Marchés Financiers.

NEU-CP (Negotiable EUROpean Commercial Paper)

In 2016, the reform of the negotiable debt securities market⁹ introduced the standard NEU-CP and opened up the French-based CP/CD market to international issuers and investors (in particular by allowing the financial documentation to be written in languages other than French). This market is organised and regulated by the Banque de France. With this reform, the distinction between CP and CD vanished, as both types of short-term securities are now labelled NEU-CP (although the Banque de France offers a decomposition by issuer type, i.e. financial, non-financial or public). NEU-CP has a maturity of one year at the most. The minimum amount that it is possible to issue is €150,000, and NEU-CP can be denominated in euro or in any other currency.

General information about the key features of the NEU-CP market is presented on the Banque de France's website. As of the end of July 2021, the Banque de France reports an outstanding amount of NEU-CP worth €260 billion, of which €101 billion was issued by NFCs and €159 billion by financial issuers. In total, 85% of this debt was issued in euro.

The primary market is transparent. The Banque de France maintains a public list of issuers, with centralised access to the legal documentation for the issuance programmes. However, information about the actual rate and ISIN code of any given issuance under an issuance programme is not publicly available. The Banque de France also publishes an average weekly issuance rate, broken down by maturity and rating bucket. Detailed information on weekly volumes of CP issuance, matured CP and outstanding amounts of CP at the issuer level is available on the website. A full history of monthly analyses is available permanently (with an additional breakdown by currency).

⁹ Banque de France (2016).



There is much less information on the secondary market, which is essentially OTC. The Banque de France does not report information on the prices and volume exchanged, nor does it report information on bid/ask quotes and volumes. Little information is available concerning central bank interventions on this specific market.¹⁰

Euro-commercial Paper, Euro-CP

The market for Euro-CP (also referred to as “E-CP”) is much less consolidated than the NEU-CP market. Despite its name, Euro-CP can be denominated in euro or in any other currency (“Euro” stands for the domiciliation in Europe, just as it was common to talk of the “Euro-dollar” to refer to offshore dollar funding from the US point of view).

It appears that most Euro-CP is governed by English law and that the minimum amount that can be issued is USD 500,000 or the equivalent in another currency. The International Capital Market Association (ICMA) indicates that the market is “traditionally based in London” and has “largely absorbed the UK domestic sterling CP market”. Legal documentation on the requirements and definitions is not readily accessible.

There is no centralised public database providing a consolidated view of the Euro-CP market. Using data from the private data provider CMFportal.com, ICMA¹¹ estimates that the Euro-CP market represents an outstanding of slightly less than USD 1,000 billion as of March 2021 (42% in EUR, 33% in USD and 18% in GBP).

Some information about the primary market is published on the Bank of England’s website. The Bank of England’s database provides monthly data on issuances and repayments by sector, domicile of the issuer and currency, but simply uses the general abbreviation “CP”. It is therefore not clear whether it is only referring to Euro-CP, and significant reconciliation is probably required so as not to double-count issuances of other types of CP in these series (e.g. in the case of a UK firm that issues NEU-CP). It also indicates data on outstanding amounts of CP (pounds sterling, euro and other currencies) issued by UK-resident banks, as well as data on UK-resident banks’ holdings of CP issued by UK-resident banks, with a further decomposition according to the ownership of the UK-resident bank (e.g. Japan-owned, EU-owned, etc.). As of 31 July 2021, UK-resident monetary and financial institutions (MFIs) had issued GBP 121 billion of CP in pounds sterling and GBP 170 billion in foreign currencies (including GBP 56 billion in euro). In total, UK-resident banks’ CP outstanding amounted to GBP 291 billion by the end of July 2021, although UK-resident banks held less than GBP 5 billion of this CP. No information is available on the amounts issued by other types of issuers, and the Bank of England provides no information on rates at issuance.

Euroclear provides some further insights on the market: it reports average daily yields for one-month and three-month Euro-CP primary issuances settled on its books (Euroclear Bank), broken down by currency (euro, US dollars and pounds sterling). Since March 2016, yields have no longer

¹⁰ The ECB publishes aggregated data on the holdings of CP on the primary and secondary markets in the pandemic emergency purchase programme.

¹¹ ICMA (2021).



been reported for euro issuances. A further decomposition by issuer type and rating is available at a weekly frequency. The outstanding amounts on which these yields are computed are unknown.

The secondary market is again mostly OTC, with very limited information on volumes, prices, and positions.

Other national CP/CD markets

Other national CP/CD markets are even more fragmented, and information is very limited.

According to ICMA, “there are a number of other, well-established domestic CP markets, mainly serving domestic issuers and investors. These include Belgium, Germany, and Spain. Meanwhile, some jurisdictions are in the process of developing their own domestic CP markets, notably Italy.”

Sovereign short-term bills

The sovereign short-term debt instruments issued by the EU Member States can take several forms.

The most widespread appears to be sovereign short-term bills, issued on specific auction platforms, with a limited number of auction participants, generally called primary dealers (for Spain and Malta, it seems that the auctions are open to all investors). The European Commission recently issued EU-Bills in the amount of €5 billion on the Banque de France’s TELSAT auction platform. This platform is also the one used for the issuance of the French Treasury bills (*Bons du Trésor à taux fixe et intérêt précompté* – BTF) and longer-term bonds (*Obligations assimilables du Trésor* – OAT). Italian *Buoni del Tesoro*, German BuBills and Spanish *Letras del Tesoro* are other examples of auction-type short-term sovereign debt instruments. In some countries, two types of such securities coexist. This is the case for Hungary (Discount Treasury Bonds and one-year Hungarian government securities) and in Ireland (Treasury Bills and Exchequer Notes).

Some sovereign Treasuries also issue paper on the CP markets (i.e. either on the Euro-CP market, on the US CP market, or even on their domestic CP market). For instance, the Belgian, Dutch, Danish, Irish and Swedish Treasuries report issuing Euro-CP. The Austrian Treasury mentions issuances of Austrian CP (although these securities are governed by UK law), while the Italian Treasury indicates that it issues “CP” (interestingly enough, Italian sovereign CP seems to be referred to as “Treasury bills” in the legal documentation). Eventually, the Danish and Dutch Treasuries will also issue CP on the US market.

Information on both the primary and secondary markets is scarce. Data on these financial instruments are fragmented, and proper investigation on aggregate amounts as well as on the existence of a secondary market capable of absorbing significant selling pressure without central bank intervention is still warranted. In general, information on sovereign CP issuance is less readily available.



Short-Term European Paper (STEP)

STEP is an overarching label set up by ACI Financial Markets Association and by the European Banking Federation, two business associations. One of the conditions for the label is that information must be provided to the European Central Bank (ECB)/European System of Central Banks (ESCB), which produces and publishes statistics on yields and volumes. The label can be applied to NEU-CP, Euro-CP, domestic CP and sovereign short-term bills.

The ECB publishes some data on STEP, but the actual composition of the STEP perimeter (in terms of NEU-CP versus Euro-CP) is unknown, and there is no information on the secondary market. The ECB provides data on outstanding and gross issues on a daily basis, broken down by residual time to maturity, rating category and issuer type. As of the end of July 2021, STEP paper outstanding amounted to €410 billion. The ECB also reports data on yields for new issues on a daily basis.

1.3.2 Main issues identified with the short-term debt securities market

The overview in the previous section shows that the European short-term funding market is fragmented and opaque. Four main structures coexist: NEU-CP, Euro-CP, domestic CP and sovereign short-term instruments (which themselves follow national ad hoc auction processes). Several large issuers are active on two or three of these sub-markets (e.g. the French Social Security authority issues both NEU-CP and Euro-CP; as pointed out in the previous section, the Irish and Belgian governments issue both Treasury bills and Euro-CP), and investors also hold various types of instruments. As a consequence, although separate, the sub-markets are also intricately intertwined.

Size of the short-term debt securities market and MMFs' market footprint

At present – and given the public information available – it is very difficult to get a clear picture of the total size of the European short-term debt securities market. In April 2021, the ECB produced an analysis of the CP/CD market¹² based on its internal data. In its analysis, it estimated the overall size of the market to be €675 billion as of the end of 2020, although it excluded sovereign bills from the scope and mostly focused on the NEU-CP and STEP segments (where it collects data). A large share of the Euro-CP market was therefore missing from the analysis. ICMA estimated the size of the Euro-CP market to be around \$1,000 billion as at the first quarter of 2021 (roughly €850 billion) with another €250 billion for NEU-CP. This shows that several hundred billion euro worth of CP have not yet been considered in existing studies.

This lack of data makes it difficult to analyse the events that followed the outbreak of the COVID-19 pandemic. The lack of proper data on consolidated amounts outstanding on the short-term debt securities market makes it hard to estimate precisely the market footprint of MMFs. In addition, it prevents an understanding of the interplay of the various currencies in the short-term debt securities market and the connection with the structure of the European MMF industry. Finally,

¹² ECB (2021).



information on the ratings of the various programmes and issuers by the major credit rating agencies (CRAs) would be helpful, as these were crucial for determining eligibility for the ECB's pandemic emergency purchase programme. Access to more information would allow a better understanding of the March 2020 crisis.

Secondary market data

The secondary market for short-term debt is largely OTC, and an assessment of its depth and liquidity is impossible. No data on actual trades (including volume and settlement price) are publicly available, and information concerning the demand for and supply of short-term instruments (bid and offer quotes, volumes posted) is difficult to gather. As a consequence, the bid/ask spreads and the volumes offered or demanded by the various players are broadly unknown. This prevents an assessment of the structural liquidity of the market and its ability to cope with significant selling pressure both in normal times and in stressed conditions.

Access to standardised data on the short-term debt securities secondary market would help to assess its liquidity compared with that of other markets. The question of the relative liquidity of short-term bonds against that of corporate paper is an issue worth investigating, as is the question of the relative liquidity of sovereign bills against that of sovereign CP and other CP on the secondary market. This last aspect is all the more important given that even the US Treasury market (a market which is much deeper and much more homogenous than the 27 EU sovereign debt markets) is reported to have experienced dysfunctions during the COVID-19 crisis.

1.3.3 Central bank interventions

Following central bank interventions, the functioning of short-term debt securities markets was restored relatively quickly. The start of purchases of non-financial CP in the ECB's corporate sector purchase programme (CSPP)¹³ and the ECB's US dollar operations provided an important backstop in these markets. It appears that purchases of short-term paper and other measures had the desired effect, as many dormant CP programmes were reactivated. In addition, in the euro area, the average tenor of new non-financial CP issuances increased relative to the levels observed in the weeks preceding the announcement.¹⁴

Liquidity in bank-issued short-term debt markets was supported by further measures. The Eurosystem also increased the concentration limits for bank-issued unsecured debt in its collateral framework, which incentivised banks to buy other banks' short-term debt, thereby supporting liquidity in the CP market.¹⁵

Non-financial CP purchases by the Eurosystem were more intense in the early days of the crisis; as conditions stabilised, purchases were scaled down.¹⁶ As of the end of May 2020,

¹³ Non-financial CPs also include securities of certain non-bank financial corporates, such as insurance corporations.

¹⁴ See de Guindos and Schnabel (2020a).

¹⁵ See de Guindos and Schnabel (2020b).

¹⁶ See Schnabel (2021).



total holdings of CP amounted to €35.5 billion (with more than 80% purchased on the primary market). As of the end of July 2021, CP on the ESCB's balance sheet had declined to less than €4 billion.¹⁷ The purchases were relatively small compared with the overall amount of short-term debt securities but were still sizeable when compared with the outstanding amount of non-financial CP (the size of the euro-denominated corporate CP market was estimated by the ECB to be around €75 billion in March 2020¹⁸) and also considering that there were few private sector buyers.

The ECB's asset purchases have been expanded to include corporate securities with shorter maturities (CP), subject to the CSPP eligibility requirements. Some European corporate CP programmes are fully compliant with the CSPP eligibility requirements (e.g. regarding listing, custodian, common safekeeper, format of the securities and guarantee in the case of issuance via a special purpose vehicle). Requirements also include what the Eurosystem considers to be an investment grade rating. This particular requirement can be met with both short-term and long-term ratings included in the Eurosystem's credit quality steps 1 to 3.¹⁹ The Eurosystem encourages unrated issuers to obtain ratings and, more generally, to update the legal documentation of CP programmes.²⁰

Information on the CP purchases under the Bank of England and HM Treasury's Covid Corporate Financing Facility has been provided weekly since 1 April 2020. The Bank of England's intervention exclusively targeted the primary market, and the maximum amount of CP in the balance sheet was GBP 20.5 billion on 20 May 2020. As of 15 September 2021, only GBP 3.6 billion was still on the balance sheet. Note that the abbreviation "CP" used in relation to the series could include all types of CP or only Euro-CP.

The Federal Reserve intervention was also 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 2020. This was less than 1% of the market, implying little capacity for intermediate CP trading. Only after the launch of the Federal Reserve System's Money Market Mutual Fund Liquidity Facility (MMLF) did dealers increase their CP inventories. Through the establishment of the MMLF, the Federal Reserve made loans available to eligible financial institutions. These loans were 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 participants in the MMLF and temporarily broadening the scope of assets accepted for the liquidity requirements.²¹

¹⁷ The composition of the CP purchased is not reported, i.e. whether it is Euro-CP, NEU-CP or other national CP.

¹⁸ See Chart 1 in de Guindos and Schnabel (2020a).

¹⁹ The Eurosystem credit assessment framework considers four external credit assessment institutions, namely DBRS Morningstar, Fitch Ratings, Moody's and Standard & Poor's, as well as national central banks' in-house credit assessment systems.

²⁰ See de Guindos and Schnabel (2020a).

²¹ See also Anadu, Cipriani, Craver and La Spada (2021).



2 Economic rationale

The ESRB Recommendation is composed of a set of four reform categories that are consistent with the Financial Stability Board (FSB) proposals and that take account of the specific characteristics of EU MMFs. There are some important contextual points to note that help give an understanding of the economic rationale of the package as a whole.

- **The events of March 2020 provided the basis for evaluating the policy reforms required, but these events have not been the sole focus of the policy deliberations.** While events of the magnitude of the COVID-19 shock are tail-risk events²² rather than normal-course risks, they nevertheless provide a good reference point from which to start the discussions as to which reforms might be warranted, bearing in mind the overall policy objective²³ of the work. However, in designing these policy reforms, the ESRB has aimed to take into account a wider range of concerns in respect of MMFs and not to limit the focus of the reforms solely to those funds that experienced acute stress last year, i.e. private debt-focused MMFs.
- **The analytical work has provided some findings that have helped inform the package of policy reforms.** The main findings are as follows.
 1. A significant share of EU MMF assets and liabilities are issued/held by non-EU entities, and more information would improve the monitoring of risks.
 2. EU MMF investors are mainly located in Ireland, France, Luxembourg and the Netherlands and are mainly investment funds (IFs), insurance corporations and pension funds (ICPFs) and NFCs (particularly in France); preserving the capacity of MMFs to offer daily dealings is important for these investors.
 3. MMFs hold a large share of short-term debt securities issued by euro area banks and NFCs, so preserving their funding capacity is important.
 4. Even less information is available on most secondary markets, but market and supervisory feedback is that they are not reliably liquid during stressed times; given the focus of the Recommendation on MMFs, the liquidity of MMF asset portfolios should be improved, while acknowledging the need to improve the functioning of the short-term debt securities market (e.g. in terms of transparency).
 5. MMFs aim to maintain a management liquidity buffer on top of the regulatory liquidity requirements; the usability of the regulatory buffers should be enhanced.
 6. Investors might be incentivised to redeem because of the regulatory provisions that require LVNAV and PDCNAV MMF boards to consider imposing fees or gates if the level of weekly

²² The COVID-19 shock was a liquidity shock, whereas the 2008 crisis was a credit shock. This is an argument in favour of a broad policy debate to cater for all types of shocks.

²³ The overarching policy objective, as set out in ESRB (2021), is 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 (as well as minimising the risk of moral hazard associated with central bank intervention).



liquid assets (WLA) falls below 30% and there are redemptions of 10% or more of the NAV of the fund in a single day; these should be addressed.

- **The measures can be split into two broad categories according to the objective they are trying to achieve:** measures that improve crisis management and the monitoring of systemic risk, especially by national and EU-level institutions in the EU; and measures that enhance the resilience of individual MMFs and the sector as a whole. The latter can be further split according to the categories of reforms proposed by the FSB²⁴, namely (i) reducing threshold effects, (ii) reducing liquidity transformation and (iii) imposing on redeeming (subscribing) investors the cost of their redemptions (subscriptions).
- **The measures need to be assessed as part of a package, not as individual measures:** as outlined in the analysis presented in ESRB (2021) and FSB (2021b), no single policy reform is likely to significantly reduce the systemic risk from MMFs on its own; therefore, individual measures need to be assessed on the basis of how they will operate in tandem with the other elements of the package.
- **The measures reflect the nature of the underlying money markets as well as how investors currently use MMFs:** the resilience-enhancing measures are specifically designed to target first-mover advantage, which can arise from investors using MMFs as cash management vehicles, while also enhancing the liquidity of MMFs' portfolios given the lack of deep, liquid markets for short-term private debt securities.
- **The measures are a mixture of ex ante and ex post, with a focus on ex ante:** the policy measures are skewed towards building resilience within the MMF sector on an ex ante basis to avoid the manifestation of systemic risk and potential intervention from public authorities. However, the package of measures also recognises that tail-risk events such as a COVID-19-type shock may arise, in which case additional countercyclical (and therefore ex post) measures are required to further enhance resilience.
- **The package has been designed to cover all types of MMF, but the scope of application differs across some of the individual measures, which are MMF-type-specific:** for instance, some measures apply to LVNAV only; some to private debt-focused MMFs (i.e. LVNAVs and VNAVs); and others to all MMF types, including PDCNAVs.

Table 1 provides an outline of the policies proposed in the Recommendation and compares them with those proposed in Recommendation ESRB/2012/1. The measures are segmented according to the four categories of measures outlined previously.

This package of measures would directly target the remaining systemic vulnerabilities of MMFs as observed during last year's COVID-shock. It would do so by combining measures that would reduce first-mover advantage, improve asset liquidity and provide authorities and the markets with better tools for assessing the build-up of systemic risk in the MMF sector.

²⁴ FSB (2021b).



Table 1

Comparison of Recommendation 2021/9 with Recommendation 2012/1

Recommendation	Sub-recommendation, proposing that Union legislation:	Recommendation ESRB/2012/1
A – Reducing threshold effects	requires that all LVNAV MMFs have a fluctuating NAV.	This is consistent with Recommendation A(1).
B – Reducing liquidity transformation	provides for the regulatory thresholds in Article 34(1)(a) and (b) of the MMFR to be repealed.	N/A given that there were no such liquidity requirements in 2012.
	incorporates new liquidity requirements for VNAV and LVNAV MMFs, composed of daily maturing assets, weekly maturing assets and public debt assets.	This is consistent with Recommendation B(1).
	provides the possibility for MMF managers to take measures leading them to hold fewer weekly maturing assets and fewer public debt assets than required, provided that there are market-wide developments negatively affecting the assets MMFs hold or MMF unit holders and that MMF managers immediately inform their national competent authorities (NCAs) accordingly.	This is a new policy.
	empowers NCAs to specify a time limit defining the period during which MMFs under their supervision may hold fewer weekly maturing assets and public debt assets in the event of market-wide developments negatively affecting multiple MMFs.	This is a new policy.
C – Imposing on redeeming (subscribing) investors the cost of their redemptions (subscriptions)	provides for ESMA to coordinate the measures taken by NCAs when acting as specified above, in order to ensure consistency in the application of the measure across the Union.	This is a new policy.
	requires incorporation into the constitutional documents of MMFs and any other pre-contractual information at least one of the following liquidity management tools (LMTs): anti-dilution levies, liquidity fees, swing pricing for MMFs with a fluctuating NAV.	This is consistent with Recommendation (B3).
D – Enhancing monitoring and stress testing	mandates ESMA to develop criteria to be included in relevant Union legislation, facilitating the use of LMTs by the MMF manager in all market conditions, together with additional guidance on these criteria.	This is a new policy.
	incorporates provisions aimed at enhancing the timely sharing of data stemming from the regular reporting of MMFs to their respective NCAs.	This is consistent with Recommendation D(1).
	mandates ESMA to coordinate and, where necessary, harmonise requests from NCAs to MMFs to provide ad hoc data in times of stress resulting from market-wide developments.	This is a new policy.
	incorporates provisions ensuring the sharing of regular reporting and ad hoc data by NCAs with EU bodies that have a financial stability mandate.	This is consistent with Recommendation D(1).
	provides for ESMA to initiate and coordinate Union-wide stress tests on MMFs, to develop scenarios and parameters for an adequate Union-wide stress-testing regime for MMFs in cooperation with the ESRB, to publish an assessment of the impact of such scenarios on the MMF sector, including potential contagion effects on other market participants, and to coordinate, where appropriate, the follow-up supervisory actions.	This is a new policy.



2.1 Recommendation A – Reducing threshold effects

LVNAV and PDCNAV MMFs are subject to specific regulatory requirements that aim to protect investors, but which can also amplify first-mover advantages. LVNAV MMFs are allowed to use an amortised cost valuation method for some of their assets and constant NAV as long as their value remains within a collar range as compared with the NAV using the mark-to-market valuation method only. When the value of those assets or of the NAV breaches these collars, these MMFs need to use mark-to-market valuation for all of their assets. As identified in ESRB (2012) and in Ansidei et al. (2012), unlimited use of the amortised cost method provides a first-mover advantage that can incentivise runs. While LVNAV MMFs can use the amortised cost method under strict conditions, as long as their value is close to the market value, the run risk on those funds is not entirely removed by the previous reform. The Recommendation proposes a comparable solution to that adopted in 2012 to solve the issue, but only for LVNAVs, given that PDCNAVs have not been subject to runs during the COVID-19 outbreak. The second aspect is linked to the automatic consideration of fees and gates when LVNAV and PDCNAV MMFs breach their liquidity requirements, which has been reported as one element that accentuated larger investor redemptions in March 2020.

- **Remove the stable NAV feature of LVNAVs and make their NAV fluctuate:** this measure aims to remove the ability of LVNAV MMFs to offer “stable” NAVs by making the NAV fluctuate, similarly to the NAV of VNAV MMFs (including the removal of the amortised cost valuation and of two-digit rounding). The objective is to remove any first-mover advantage associated with investors seeking to redeem when the NAV does not reflect market valuations of the MMF’s assets. The measure does not entail a recommendation to remove the LVNAV category altogether because it focuses on the risks to financial stability that the ESRB identified. Recommendation B actually proposes increasing the liquidity requirements of LVNAV MMFs in order to ensure that they are relatively low-risk and low-volatility, which should limit the number of investors who might choose to disinvest, and therefore also to minimise the impact on the funding function of LVNAV MMFs – see Section 3.
- **Remove regulatory trigger effects around liquidity requirements for LVNAV and PDCNAV MMFs:** this measure removes the current references in Article 34(1)(a) and (b) of the MMFR that requires the boards of LVNAV and PDCNAV MMFs to consider imposing fees and gates in the event that the fund breaches the current MMFR requirement to hold 30% of its assets in the form of WLA and registers net daily redemptions above 10% (or, in accordance with Article 34(1)(b), to impose such fees and gates if the threshold of 10% is breached). The objective is to reduce the run risk associated with MMFs approaching the current regulatory thresholds of 30% WLA and 10% daily liquid assets (DLA), as this is the main risk from a financial stability perspective. The use of liquidity fees, redemption gates and other LMTs should be governed as specified in Recommendation C, and therefore the European Commission might choose to remove the whole article.



2.2 Recommendation B – Reducing liquidity transformation

Measures on the asset side are proposed to reduce the asset-liability mismatch of MMFs, both in normal and crisis times. One of the main vulnerabilities identified in MMFs relates to their liquidity mismatch, as explained above (they offer investors the possibility of redeeming on a daily/intraday basis because they are used as cash management vehicles, while the assets they invest in are not reliably liquid). MMFs need to be better able to meet periods of heightened redemption requests without destabilising wider money markets. As such, increasing their liquidity requirements should reduce risks in the portfolio. In addition, diversifying the type of liquid assets by requiring the holding of a minimum amount of public debt assets should contribute to greater liquidity in the portfolio. Although public debt is not necessarily liquid and low-volatility in all states of the world, it is typically more liquid than private debt. Reflecting this, the maturity of public debt assets that can be included within the new liquidity requirements can be longer than one week and may be aligned with the maturity of other money market instruments held by MMFs. Section 3 and the appendix to this report provide an assessment of the impact of this proposal.

Besides increasing the amount and quality of liquidity that MMFs should hold, a proposal is made to ensure that MMFs are better able to use this liquidity when they need it. In practice, MMF managers tend to maintain liquidity above regulatory requirements, for example by having a “management” liquidity buffer that they can use to absorb outflows. However, feedback from LVNAV MMF managers during the COVID-19 shock was that they were unable to use these buffers due to certain elements of the regulatory framework, namely the requirement to consider imposing fees and gates if the WLA requirement of 30% were breached and those funds received net redemptions of 10% on a single day. To address this, Recommendation A proposes removing the regulatory requirement to consider imposing fees and gates or to impose them, depending on which threshold is breached. In addition there is the need to incentivise the use of liquid assets by MMFs in times of crisis, while Recommendation B proposes a mechanism that explicitly allows MMFs to use their liquid assets and a role for NCAs in the event that they observe market-wide developments affecting multiple MMFs negatively.

- **Incorporate new liquidity requirements for VNAV and LVNAV MMFs:** this measure replaces the current concept of MMF liquidity as solely concerning levels of WLA and replacing it with a new overall liquidity requirement composed of three elements: WLA, (which include) DLA and public debt assets. For VNAV MMFs, the liquidity requirements should distinguish short-term VNAV from standard VNAV MMFs, as the latter have a higher liquidity transformation. For LVNAV MMFs, the Recommendation proposes higher liquidity requirements in order to provide for the existence of a relatively low-risk and low-volatility category of MMFs. This should ensure a greater depth of liquidity in the asset portfolio of MMFs as well as providing greater stability in the NAV of private debt-focused MMFs. In addition, the holdings of public debt assets should ensure a diversification of issuers. This might be possible mainly for euro-denominated public debt. In the cases where there would not be sufficient public debt assets available, MMFs should be allowed to use deposits with credit institutions to meet their liquidity requirements, provided that they comply with the diversification requirements as set out in Article 17(1)(b) of the MMFR, or reverse repurchase agreements collateralised with public debt assets. Given the short settlement period of public



debt, cash at bank and reverse repurchase agreements should be eligible only if they can be terminated within a day.

- **Ensure that MMFs are allowed to hold fewer WLA and public debt assets in the event of stress resulting from market-wide developments:** this measure reinforces the responsibility of the MMF manager to use its liquidity to meet redemptions in crisis times. In such cases, MMF managers should explicitly be allowed to use their liquidity and hold fewer weekly maturing assets and public debt assets in response to stress resulting from market-wide developments. In the event that they use this flexibility, MMF managers should immediately inform their NCAs. This measure, a response to market-wide stress, would complement the existing flexibility provided for in Articles 24(2) and 25(2) of the MMFR, which permits MMFs to breach their liquidity requirements for reasons beyond their control.
- **Empower NCAs to specify a time limit defining the period of time during which MMFs may hold fewer WLA and public debt assets:** additionally, and in order to provide additional capacity to the MMF sector to address prolonged systemic strain, NCAs should be given (sub-)sector-wide power. If NCAs observe that multiple MMFs are affected by market-wide events and that MMFs may need time to go back to the required liquidity levels, they should have the power to specify the period of time that all or a subset of MMFs under their supervision can take to go back to the required levels. This measure still places the responsibility on the MMF manager to use the liquidity as needed but combines a power at (sub-)sector level that would provide a system-wide response and support to MMFs. NCAs should be able to specify which categories of MMFs (per type and currency) could benefit from this extended period of time, thereby signalling that flexibility will be applied with regard to the requirements. ESMA should have a coordination role when NCAs decide to use this power, so that NCAs which have the same type of MMFs and/or which have MMFs denominated in the same currency can also consider the application of such flexibility.

2.3 Recommendation C – Imposing on redeeming (subscribing) investors the cost of their redemptions (subscriptions)

The policies proposed address another dimension of run risk in MMFs: the impact that redeeming investors have on non-redeeming investors. This risk is not specific to MMFs but common to all types of open-ended funds. Liquidity management tools (LMTs) that more appropriately reflect redemption (and subscription) costs should reduce incentives for investors to run. This will be achieved by ensuring that those investors seeking to redeem from (and subscribe to) the fund will have to bear any associated transactions costs, rather than leaving these costs with the remaining (or existing) investors, as is currently the case, and thus to avoid dilution of remaining investors.

- **Mandate the availability of at least one LMT that reflects redemption and subscription costs:** this measure is aimed at making sure that all EU MMFs incorporate into their constitutional documents and any other pre-contractual information a tool that can better reflect redemption and subscription costs. Tools of this kind are swing pricing, anti-dilution



levies and liquidity fees. While swing pricing is considered compatible with fluctuating NAV funds only (given that the mechanism affects the calculation of the NAV), anti-dilution levies and liquidity fees should be available to all MMFs. This measure is consistent with the 2017 ESRB Recommendation²⁵ asking the Commission to propose that Union legislation incorporate a common Union legal framework governing the inclusion of LMTs.

- **Facilitate the use of LMTs via criteria and guidance:** in addition to the above, and in order to increase the actual use of LMTs among MMFs, the EU regulatory framework should be enhanced to provide more prescriptive requirements for funds as to the circumstances in which LMTs should be deployed, as well as criteria governing their use. Such a framework and criteria should not be restricted to the tools mentioned in the preceding paragraph but should cover all types of LMT. This reflects the fact that some MMFs had such tools at their disposal during the COVID-19 market stress but chose not to use them. The regulatory framework should be more prescriptive, in particular by setting out the criteria and, where possible and appropriate, quantitative parameters according to which such tools should be deployed. The choice of which tool to use, the activation of the tool and the specific calibration of its deployment should be left to the discretion of the individual MMF manager, subject to the overall requirements and guidance of the framework. Further technical work is required to develop the criteria and, where appropriate, the quantitative parameters, and it is proposed that ESMA carry out this work. It is important to highlight that the possible quantitative parameters should not introduce new threshold effects.

2.4 Recommendation D – Enhancing monitoring and stress testing

The Recommendation aims to strengthen the ability of authorities to identify systemic risk emanating from MMFs. Individual MMF managers are not best placed to judge when levels of overall systemic risk are rising. As such, there needs to be a role for authorities in doing so where the MMF managers cannot. Enhancing the reporting to NCAs in normal and crisis times, allowing the information reported to be shared with Union bodies that have a financial stability mandate and completing the existing stress-testing framework with a system-wide perspective would make it possible to better identify rising systemic risk. These measures should dynamically improve authorities' understanding of the systemic risk posed by MMFs and allow for potential further mitigating policy actions to be adopted.

- **Enhanced reporting, data sharing and crisis arrangements:** At present, the frequency of the MMFR reporting is, at best, quarterly. This frequency should be increased to monthly for some of the most important indicators and parameters. The reporting should also be completed with more information on investors: MMFs should report the NAV held by investors according to both their domicile and category. Investors could be reported as belonging to one of the following categories: NFCs²⁶, banks, insurance corporations (ICs), other financial institutions (OFIs), pension funds (PFs), governments, MMFs, non-MMFs, IFs, households

²⁵ ESRB (2017).

²⁶ Including their sector activity, for example according to NACE.



(HHs) and others. This would provide more insight for supervisory and macroprudential authorities, who could then use this information in crisis scenarios to assess run risks and, in the medium term, provide useful information for the design of stress testing. Additionally, in a crisis scenario, even higher-frequency data, e.g. on daily fund flows, are allowed to be requested by NCAs. Harmonising such requests would increase their efficiency and support their use. These data should be shared with EU bodies that have a financial stability mandate. Reciprocally, central banks should also share data with NCAs to improve their monitoring capacity, although this is beyond the scope of this Recommendation.

- **Improved system-wide stress testing by authorities:** this proposed measure would subject EU MMFs to system-wide stress tests based on a common severe but plausible scenario. This would complement the existing stress-testing framework for individual MMFs where the ESRB and ESMA play a role in defining the stress test scenario and the parameters to be used by MMFs. This option could also feature reverse stress tests, where the objective is to measure the tipping point (in terms of redemptions, shocks to credit, liquidity or interest rate risk) above which MMFs would not be able to operate in an orderly manner. The objective is to enhance the ability of authorities to identify residual and emerging risks and vulnerabilities in MMFs and the markets in which they operate, including when such vulnerabilities may give rise to systemic risk.



3 Assessment

It is not possible to construct an empirically focused assessment of the costs and benefits of all the elements of this Recommendation. This is because some data are not available, and it would not be feasible to generate them before the individual measures within the Recommendation are implemented. As such, the assessment presented in this section is targeted at those areas where resilience can be enhanced the most by way of regulatory reforms.

The assessment is mainly based on a framework that estimates the impact of the different reforms on LVNAV MMFs, complemented by quantitative work on the feasibility of mandatory holdings of public debt assets and by qualitative elements. The framework put forward by Baes et al. (2021) is used to assess the effects of different reforms on the resilience of LVNAVs. In this framework, the resilience of MMFs is measured by the maximum amount of redemptions (R_{max}) a MMF can face without breaching one of its regulatory constraints (NAV collar of 20 basis points or WLA of 30%). Baes et al. (2021) show that R_{max} is a function of the initial holdings of WLAs ($T_{W,max}$), the liquidity of the underlying markets, as well as the parameters of the regulatory constraints (WLA requirements are represented by p_w and NAV collar by v). In a simplified case with two assets (WLA and non-WLA), assuming a constant price impact for each asset class, it is possible to derive the optimal value of R_{max} as a function of the different parameters:

$$R_{max} = \frac{(c_w - c_Y) \left((1 - p_w) T_{W,max} - p_w T_{Y,max} \right) + v (c_w T_{W,max} + c_Y T_{Y,max})}{1 + v - (1 - p_w) c_Y - p_w c_w}$$

The formula can then be used to estimate the impact of a change in regulatory parameters and of changes in the underlying liquidity of money markets on the resilience of LVNAV MMFs.

Regulatory parameters are directly given by the MMFR and shown in Table 2. The parameters for the underlying market liquidity of WLA and non-WLA are taken from the ESMA MMF stress test liquidity discount factors²⁷. Finally, the impact of reforms is estimated on two different MMFs: a low-WLA MMF, with initial WLA values of 35% of NAV, and a high-WLA MMF with initial values of 50%. Those values are calibrated based on a sample of 14 US dollar-denominated LVNAVs with €277 billion in NAV as at February 2020, using data from Crane. In the baseline, the low-WLA MMF can meet redemptions of up to 35% of NAV, compared with 42% for the high-WLA MMF. The impact of regulatory reforms is assessed by comparing the new R_{max} with this baseline value.

²⁷ The liquidity discount factors for WLAs correspond to the average impact for three-month sovereign bonds in the ESMA stress test (ranging from 0.05% for France to 0.47% for Italy) and to the discount of A-rated bonds with a residual maturity between three and six months for CP and CDs for non-WLAs (which is approximately 0.6%; see ESMA (2021a)).



Table 2

Parameters used in the baseline scenario

Parameter	Value
WLA requirement p_w	30%
NAV deviation ν	20 bps
Liquidity discount of WLA c_w	0.998
Liquidity discount of non-WLA c_Y	0.995
High-WLA MMF: initial holdings of WLA $T_{W,max}$	50%
High-WLA MMF: initial holdings of non-WLA $T_{Y,max}$	50%
Low-WLA MMF: initial holdings of WLA $T_{W,max}$	35%
Low-WLA MMF: initial holdings of non-WLA $T_{Y,max}$	65%

Recommendation A

The assessment focuses on the impact of removing the stable NAV feature of LVNAV MMFs.

The Recommendation does not request that the LVNAV category be removed altogether. Instead, it focuses on the main feature of LVNAV MMFs that may pose a concern from a financial stability point of view (i.e. the stable NAV) and proposes increasing the liquidity requirements for LVNAV MMFs. There are several reasons to believe that this would minimise the impact on the economic functions played by LVNAV MMFs (i.e. the impact on the amount of funding they provide to NFCs and their attractiveness to investors that use them as low-risk and low-volatility cash management vehicles).

1. It leaves it up to the market to assess whether there is still sufficient demand for LVNAV MMFs following the removal of the stable NAV. A number of industry representatives have indicated that they could see a business case for a product with relatively low risk and low volatility.²⁸ Increasing the liquidity requirements allows for such a product.
2. In the United States, regulators set out a requirement for non-government (“prime”) and tax-exempt MMFs sold to institutional investors to have variable NAVs after the global financial crisis. During the events in March 2020, US prime MMFs for institutional investors (which can only offer variable NAV) experienced similar redemption patterns to those seen in EU-domiciled USD LVNAVs (see, for example, FSB (2021b), p.18). The composition of US MMFs shifted significantly after the reform: assets in prime MMFs fell from USD 2.1 trillion in August 2008 to USD 800 billion in February 2020. During the same period, government MMF assets grew from about USD 900 billion to USD 2.7 trillion. The conclusion could therefore be drawn that from an investor point of view, making the NAV of LVNAVs fluctuate may not significantly affect the amounts invested in the whole MMF sector but may have an impact on the distribution of investment between sectors/asset classes.

²⁸ See FSB (2021a).

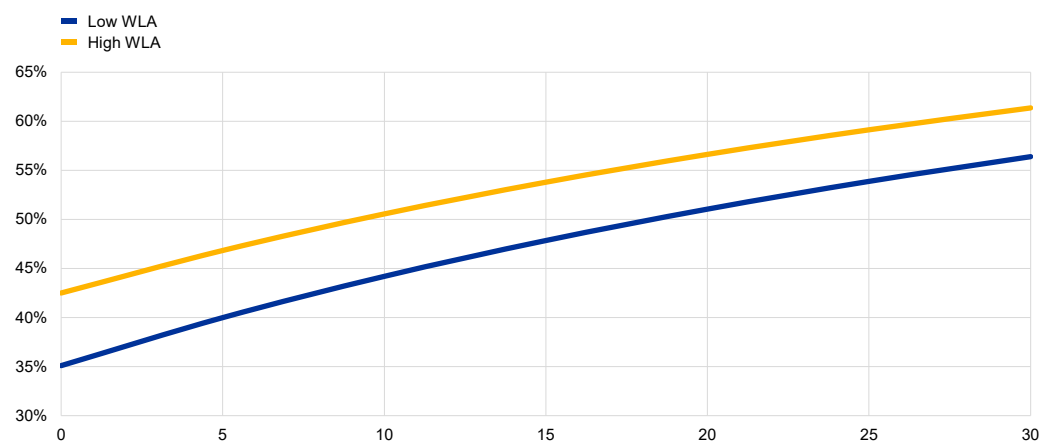


3. In practice, the situation in the EU is different given the small number of public debt-focused MMFs denominated in euro and pounds sterling, and therefore one might expect that fewer investors would turn to PDCNAV MMFs. On the contrary, the higher share of public debt assets held by LVNAV MMFs would help to create a product that would meet the expectations of investors and prevent them from having to reallocate their funds elsewhere.
4. In terms of financing NFCs, LVNAV MMFs mostly provide funding to banks, and since NFC CPs usually provide a higher yield than bank CDs, there would be a market incentive for LVNAV MMFs (as there is for VNAV MMFs) to continue to provide funding to EU NFCs.

Beyond these qualitative elements, the model can assess the impact of an increase in the NAV deviation, which, at infinity, corresponds to making the NAV fluctuating. Mechanically, the effect is substantial since it relaxes the NAV constraint for LVNAVs. However, it can lead to potential unintended consequences if done in isolation. First, it might reinforce investors' expectations that LVNAVs are more stable than they actually are. Second, since almost all LVNAVs have AAmmf ratings from CRAs, the methodology used by CRAs can exert an additional constraint on the NAV deviation irrespective of regulatory reforms: for some CRAs, the NAV deviation of an AAmmf LVNAV cannot be larger than 25 basis points. Finally, the model shows that at the limit, if LVNAVs were to move to a floating NAV, then the NAV constraint would vanish and MMFs would remain subject only to the WLA constraint.

Chart 2
Impact of increasing the collar range

(maximum level of redemptions as a percentage)



Source: European Securities and Markets Authority (ESMA) calculations.

Note: Maximum level of redemptions for a LVNAV MMF as a function of the increase in the NAV collar (as a percentage).



Recommendation B

The assessment looks at the separate and combined effects of (i) increasing the liquidity requirements based on WLA, (ii) allowing MMFs to hold fewer liquid assets than required and (iii) requiring more liquid holdings via public debt.

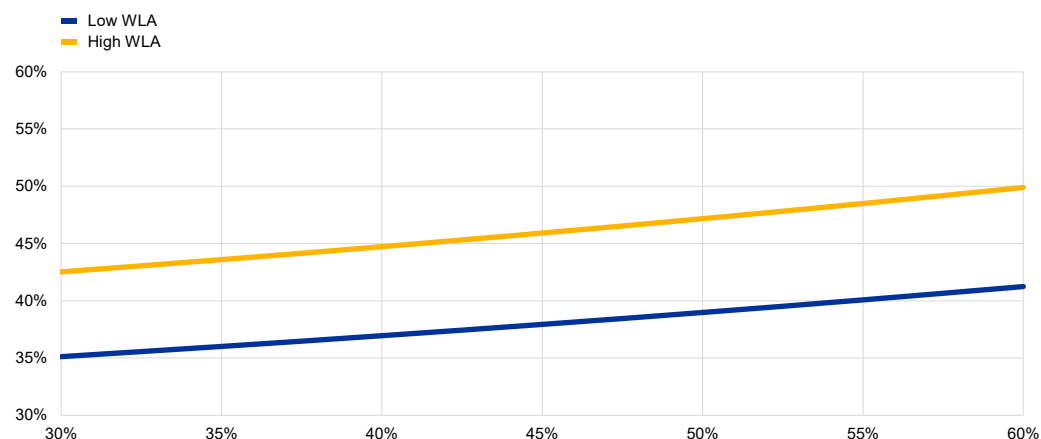
Increasing WLA requirements

Increasing liquidity requirements p_w has a limited impact on R_{max} : if WLAs are raised by 10%, R_{max} increases by around 2% for each MMF. MMFs are more liquid (as their initial holdings of WLAs increase by the additional requirement) but their “excess buffers” compared with the requirements are smaller in relative terms.

Chart 3

Impact of increasing the WLA

(maximum level of redemptions as a percentage)



Source: European Securities and Markets Authority (ESMA) calculations.

Note: Maximum level of redemptions for a LVNAV MMF as a function of the weekly maturing assets requirements (as a percentage).

Allowing MMFs to hold fewer liquid assets than required

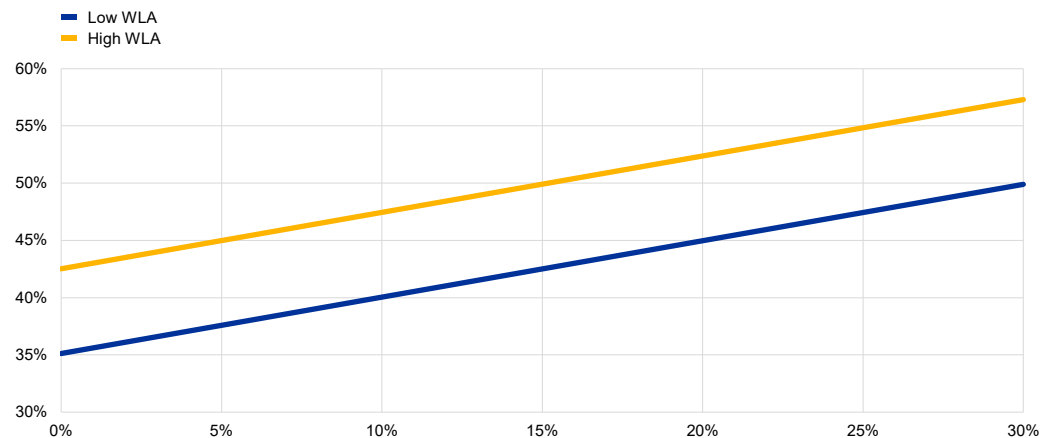
In the set-up used, the effect of the proposed reform can be assessed by estimating the impact on R_{max} of changes to the WLA constraint. In the model, this amounts to first increasing p_w and $T_{W,max}$ by the same amount and then reducing p_w to its baseline value when the buffer is released. This measure has a relatively high impact on the resilience of MMFs: the release of a countercyclical liquidity buffer of 10 percentage points increases R_{max} by 5 points for both MMFs. This outcome is driven by the fact that the release of the countercyclical liquidity buffer immediately improves the liquidity profile of the fund.



Chart 4

Impact of allowing MMFs to use their WLA

(maximum level of redemptions as a percentage)



Source: European Securities and Markets Authority (ESMA) calculations.

Note: Maximum level of redemptions for a LVNAV MMF as a function of the percentage of WLA they can use.

Making portfolios more liquid by requiring MMFs to hold public debt

One element of the ESRB Recommendation consists in making MMF portfolios more liquid by requiring MMFs to hold short-term sovereign debt. This effect is estimated by increasing the liquidity discount factor for WLA in the model (i.e. reducing the losses resulting from the difference between the selling price and the face value).²⁹ This reform has a significant effect: improving the liquidity discount c_w by 0.1 percentage point for WLAs would result in a rise in R_{max} of 2.5 percentage points for the low-WLA MMFs and around 6 percentage points for the high-WLA funds.

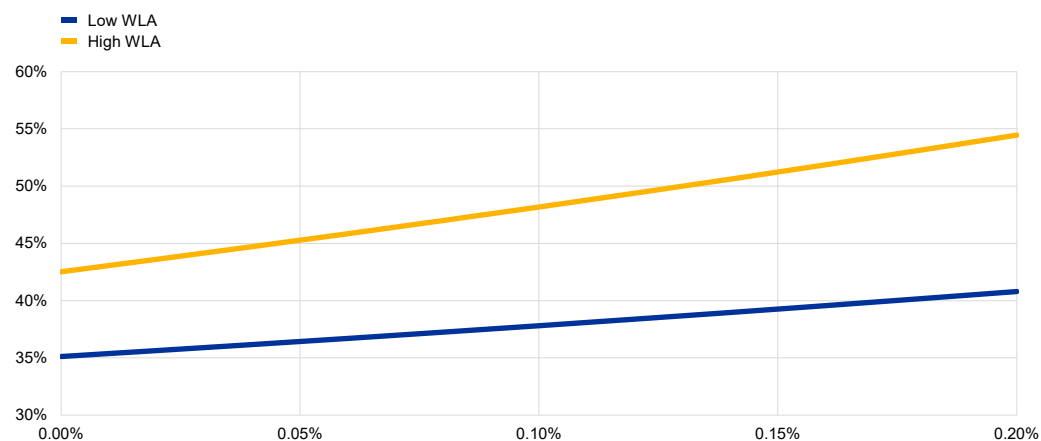
²⁹ In the model, the improvement in the liquidity of MMF assets can also reflect reforms in underlying money markets that result in a reduction of the liquidity discount.



Chart 5

Impact of requiring MMFs to hold public debt assets

(maximum level of redemptions as a percentage)



Source: European Securities and Markets Authority (ESMA) calculations.

Note: Maximum level of redemptions for a LVNAV MMF as a function of the liquidity discount factor of WLA.

The appendix to this report provides specific elements for the proposal to require MMFs to hold public debt assets.

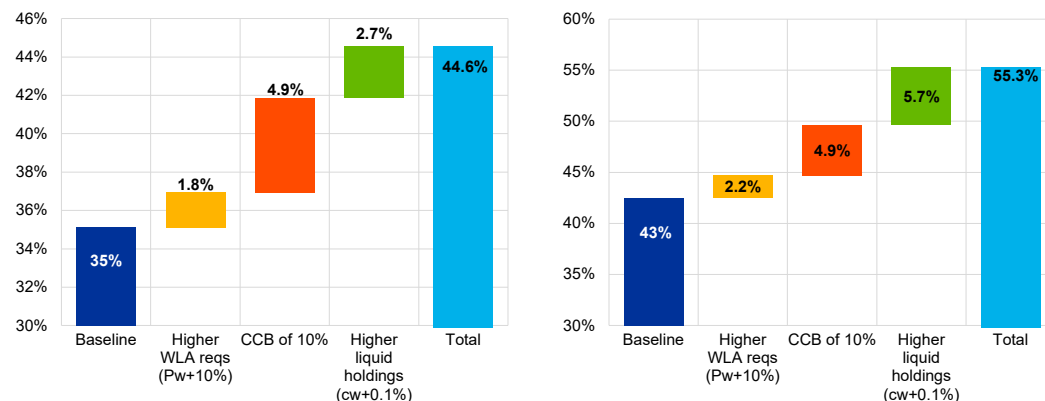
Combination of options

The model could also be used to assess the impact of a combination of options. To illustrate this, we assume that (i) WLA requirements are increased in normal times ($p_w = 40\%$), (ii) a 10 percentage point countercyclical buffer is used and (iii) MMFs are required to hold a share of their WLA in very liquid assets (c_w increases by 0.1%). The figures below show the impact of such a reform on the resilience of MMFs. For the low-WLA MMF, the maximum amount of redemptions would increase by close to 10 percentage points to 45%. Looking at the increase by sub-component, the increase in WLA would improve R_{max} by around 2 percentage points, the use of the 10 percentage point countercyclical buffer would improve R_{max} by 5 percentage points, and the improvement in liquidity would increase R_{max} by close to 3 percentage points, resulting in an overall improvement of R_{max} of 10 percentage points. For the high-WLA MMF, the maximum amount of redemptions would increase by more than 12 percentage points to 55%.



Chart 6
Impact of the combination of reforms

(maximum level of redemptions as a percentage)



Source: European Securities and Markets Authority (ESMA) calculations.

Note: Maximum level of redemptions for a “low-WLA” and a “high-WLA” LVNAV MMF after a combination of reforms. CCB stands for countercyclical capital buffer.

Recommendation C

The impact of this recommendation is typically difficult to estimate without data on the use of LMTs by MMFs, but a comparison with other types of funds provides some indications.

Research on non-MMF investment funds suggests that swing pricing can help investment funds retain their investor capital during periods of high market stress.³⁰ In addition to reducing redemption levels, the use of swing pricing can also reduce and potentially eliminate first-mover advantage during times of market stress³¹ and can reduce the costs of liquidation by reducing the incentive for investors to redeem earlier.³² By contrast, swing pricing has been noted to result in difficulty attracting new investor capital outside crisis periods. Some investors may fear that they might be charged in excess of the true liquidation cost of the assets. In addition, dilution adjustments can increase a fund’s tracking error. These factors might make it more difficult to attract new investors.³³ While swing pricing might not always be the most appropriate tool for MMFs, the same conclusions apply to the use of anti-dilution levies or liquidity fees.

Recommendation D

The impact of the measures proposed in Recommendation D is difficult to estimate in quantitative terms. However, measures that improve the reporting and stress-testing frameworks should allow authorities to better anticipate the impact of systemic stresses.

³⁰ See Jin et al. (2019a).

³¹ See Jin et al. (2019b).

³² See Capponi et al. (2018).

³³ See Jin et al. (2019a).



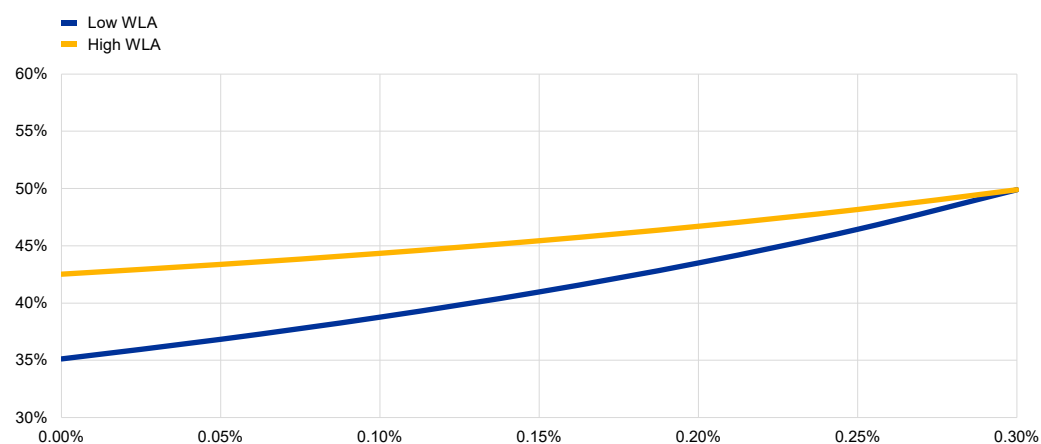
Improving short-term private debt securities markets

Beyond the measures proposed in the ESRB Recommendation, it is also possible to estimate the impact of an improvement in the liquidity of the underlying markets thanks to the model. Reducing the price impact of sales of non-WLAs has also a significant impact on the resilience of MMFs, especially for low-WLA MMFs. A 0.1% increase in c_Y would improve R_{max} by 4pp (low-WLA) and 2pp (high-WLA).

Chart 7

Impact of improving the liquidity in private money markets

(maximum level of redemptions as a percentage)



Source: European Securities and Markets Authority (ESMA) calculations.

Note: Maximum level of redemptions for a LVNAV MMF as a function of the liquidity discount factor of non-WLA.



Appendix: Assessment of the impact of MMFs holding public debt assets

This appendix provides parts of an assessment of how higher public debt holdings could improve MMF resilience, as well as their potential impact on the availability of short-term public debt and MMF yields. The quantitative analysis is based on Grill et al. (2022a).

Ascertaining empirically the precise levels of public debt holdings required to withstand future shocks is inherently complex and relates to (i) the nature of any future shock; (ii) the prevailing market dynamics at the time; and (iii) the nature of any fiscal, monetary or macroprudential intervention in the financial system by public authorities globally, at the EU level and nationally within the EU. As such, the analysis as outlined in this appendix needs to be combined with expert judgement on the likely behaviour of MMF managers, investors and wider markets when determining the differing levels of public debt requirements. In order to assess the impact on MMF resilience, the outflows observed during the outbreak of the COVID-19 pandemic are benchmarked against different amounts and compositions of liquid assets that would be available to meet these outflows, including public debt. Further analysis considers whether sufficient short-term public debt would in fact be available in the event of increased demand from MMFs. It also considers potential costs in terms of a possible reduction in MMF yields and the reduction in private debt funding by MMFs.

As outlined below, using empirical analysis to determine the precise level of public debt that private MMFs should hold is inherently complex. In practice, MMF managers would like to rely on a combination of the different sources of liquidity within their portfolio, e.g. WLA and DLA, as well as public debt, to meet a prolonged period of stressed liquidity conditions and heightened investor redemptions. Therefore, quantitative analysis can only ever be one source of insight when contemplating the role that public debt holdings might play in assisting private debt-focused MMFs in crisis scenarios.

It is always necessary to exercise judgement when assessing the precise levels of public debt requirements. This is because of the natural limitations on empirical analysis in this area. The experience and expertise of public authorities will also be needed to make this assessment, and it will be necessary to draw not only on the events of March 2020 but also on previous instances of stress, for instance the global financial crisis of 2007/08 and the experience of MMFs at that time.

Notwithstanding some of the difficulties outlined, it can be said with a degree of confidence that public debt assets are generally more liquid and less volatile than private debt assets.

While this will not be applicable to all types of public/private debt assets or in all states of the world, the general assumption is that the inclusion of public debt holdings will enhance the resilience of private debt-focused MMFs to future liquidity shocks. Naturally, this increased resilience is expected to bring costs for individual MMFs in the form of yield effects. There will also be a cost to the wider markets, as a mandatory public debt requirement will create additional demand for public debt assets, which will have an impact on existing investors. The precise nature of these costs will



differ from MMF to MMF and from public debt market to public debt market. It is not possible to give a precise, global estimate of the costs at this point.

Any analysis of this sort is open to different interpretations. This is to be expected. As per Recital (13) of the ESRB Recommendation, such a calibration exercise should be subject to periodic review and testing. It may be that over time and as MMF, investor, market and sovereign dynamics evolve, the proposed range of public debt holdings may need to be revised.

Data used

The analysis underlying Chart A uses fund-level data from Crane, which includes data on weekly maturing assets, portfolio holdings and the different regulatory types of MMF among other variables. The sample from Crane covers the majority of euro area MMFs' total assets, while VNAV funds are under-represented, especially given that French standard VNAV MMFs are not available in Crane.³⁴ To make clear the distinction between WLA and public debt, WLA refers to assets that mature within one week (including WLA beyond the required levels), plus up to 17.5% of public debt assets with a residual maturity of up to 190 days for LVNAVs, in line with the MMFR. Public debt includes all public debt assets that are not counted towards WLA. Chart B uses securities holdings statistics (SHS) data on outstanding amounts of public debt holdings. To compute the increase in public debt holdings under the different scenarios, total assets of the euro-denominated MMF sector are measured using a combination of Banque de France data for French MMFs and Lipper data for non-French MMFs. This allows for 100% coverage of this sector. As Chart C requires microdata at the MMF type level, Crane data are used instead of Lipper data for non-French MMFs, while Banque de France and SHS data are used for French MMFs. This provides coverage of around 80% of the euro-denominated MMF sector.

Reference point: outflows observed during the outbreak of the COVID-19 pandemic

To assess the impact of higher public debt holdings on MMF resilience, the outflows observed during the outbreak of the COVID-19 pandemic are compared with liquid assets that can be used to meet these outflows. The analysis provides information on the levels of public debt that MMFs should hold to be able meet a large amount of redemptions, such as that observed during the pandemic-related turmoil in March 2020. It is assumed that outflows can be met with either weekly maturing assets or public debt, i.e. taking into account the actual holdings of WLA and public debt, as well as hypothetical increases in the holdings of public debt assets. For the purpose of this analysis, it is assumed that both WLA and public debt assets are liquid, which might not always be the case. That is why the analysis considers different assumptions as to how MMFs could meet the outflows. Specifically, the share of MMFs able to meet the outflows is calculated under three different assumptions. First, it is assumed that MMFs meet 70% of their redemptions by using public debt and 30% by using their weekly maturing assets; second, that MMFs meet 50% of their redemptions by public debt and 50% by weekly maturing assets; and

³⁴ See Capotă et al. (2021) for a description of the dataset used.

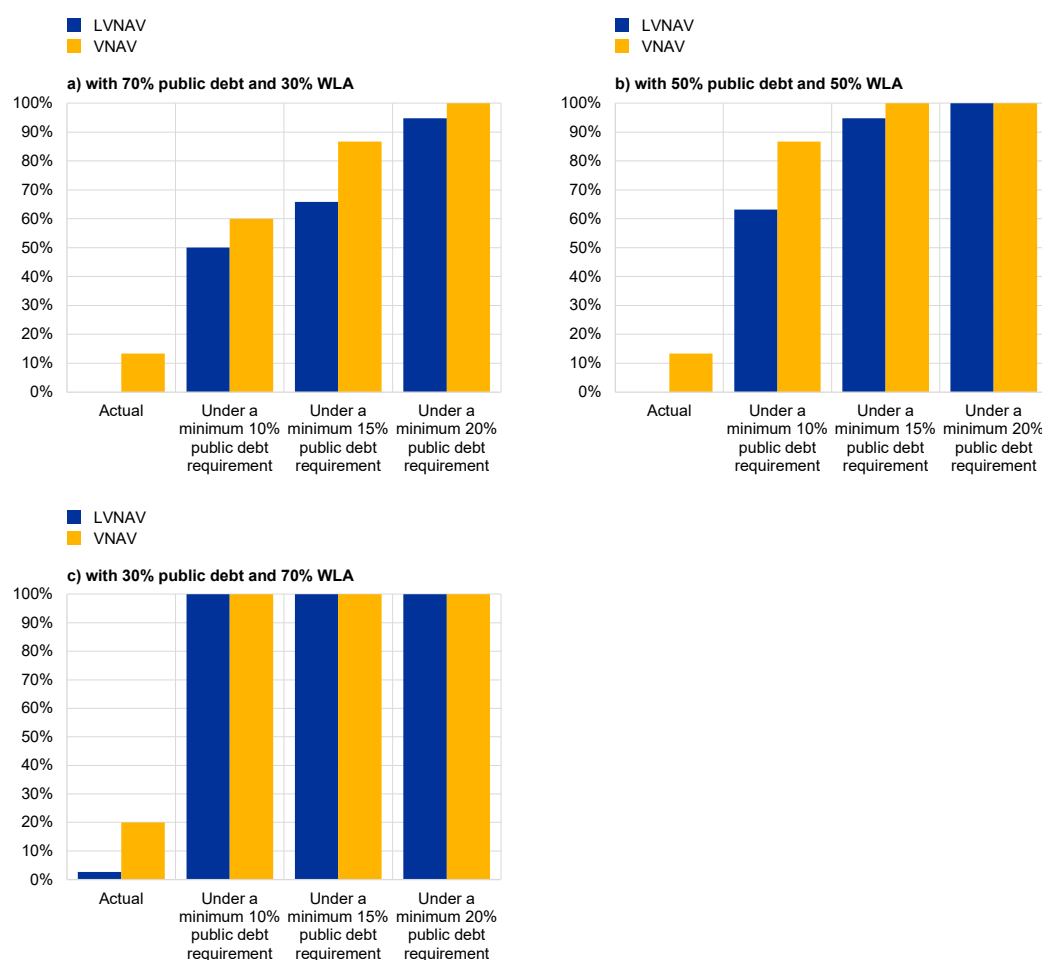


third, that MMFs meet 30% of their redemptions by public debt and 70% by their weekly maturing assets. For most funds, a relatively low share of public debt assets represents the main constraint on meeting outflows with the assumed mix of public debt and weekly maturing assets. By increasing the share of public debt holdings, this constraint is relaxed, and more funds can meet the outflows under the three assumptions. The relatively high share of funds that are able to meet the outflows, especially in Panels b) and c) of Chart A, rests on the assumption that there are no constraints on the usability of public debt and weekly maturing assets. However, the experience in March 2020 showed that MMFs cannot always – or are not always willing to – use their liquid assets, and therefore actual levels of resilience may be lower than the analysis suggests. Other measures in the ESRB Recommendation should help increase the use of liquid assets (in particular Recommendations B(2), B(3) and B(4)).

Chart A

Share of MMFs able to meet the March 2020 outflows under different assumptions

(as a percentage)



Sources: Crane Data and ECB calculations.

Notes: Panel a shows the share of MMFs that would have been able to meet 30% of their March 2020 largest weekly outflows with WLA and the remaining 70% with public debt. Panel b shows the share of MMFs that would have been able to meet 50% of their March 2020 largest weekly outflows with WLA and the remaining 50% with public debt. Panel c shows the share of MMFs



that would have been able to meet 70% of their March 2020 largest weekly outflows with WLA and the remaining 30% with public debt. Both WLA and public debt need to be available in sufficient amounts to meet outflows by liquidating a particular mix of assets. No constraints are imposed on the usability of WLA or public debt. To avoid the double-counting of public debt holdings, the amount of public debt that is used to meet the outflows does not include public debt instruments that are held within the WLA. Additional loss absorption capacity results from an increase of public debt holdings outside WLA to 10%, 15% or 20%, while WLA is assumed to remain at pre-existing actual levels.

Availability of public debt

To assess the footprint of MMFs in the short-term public debt market, the expected increase in demand for such assets is compared with the amounts outstanding. The outstanding amount of euro-denominated short-term public debt appears sufficient to absorb the expected increased demand resulting from higher public debt holdings. First, one can look at the amount of public debt securities with a residual maturity below one year that were short-term at issuance, and hence would always be considered eligible money market instruments for short-term MMFs. MMFs currently hold 12% of the securities on the left-hand side. Under a 10% requirement this would increase to around 23%. Alongside this, one can also look at public debt securities with a residual maturity below one year that were initially long-term, although these might be less liquid (as they are usually held for buy and hold purposes), MMFs can also use these to meet the requirement, which would reduce their footprint in the left bar on the right-hand side of Chart B. It is also important to note that banks currently hold the highest share of securities issued with a maturity below one year. In principle, if a part of banks' holdings were to perform a stabilising (residual buyer) function in sovereign debt markets, then the issue of crowding-out would be less pronounced.³⁵

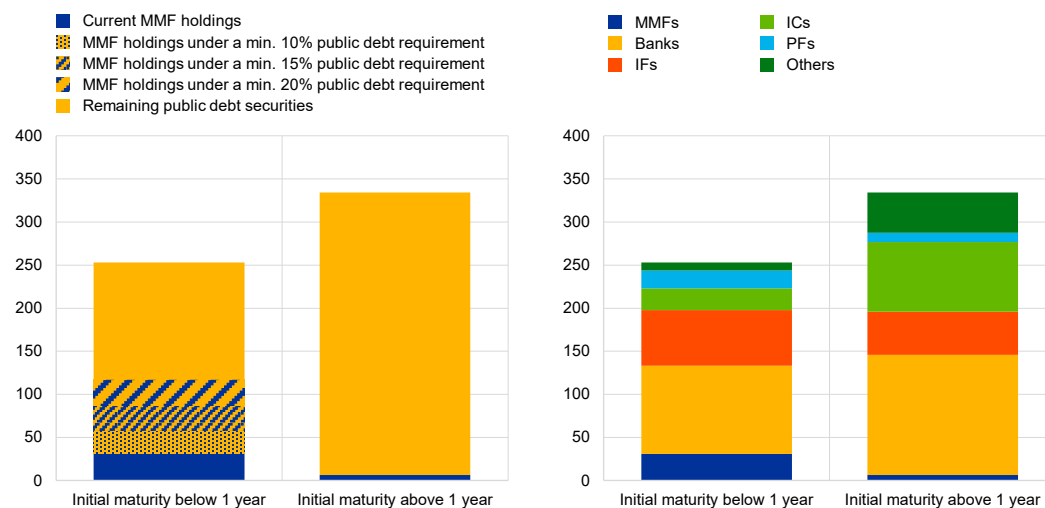
³⁵ It is generally accepted that banks have incentives (e.g. moral suasion, or support for their funding conditions or the valuation of their sovereign debt portfolio) to act as a residual buyer of sovereign debt to help stabilise markets.



Chart B

Share of euro area government debt held by MMFs under different scenarios and public debt holdings

(EUR billions)



Sources: Securities holdings statistics, Banque de France, Lipper and ECB calculations.

Notes: The chart above shows MMF holdings of euro area government debt (euro-denominated) with a residual maturity below one year and an investment grade rating. The shaded part on the left-hand side shows the increase in euro-denominated MMFs under different holding assumptions (10, 15 or 20 percentage points). To compute the prospective holdings, we calculate the total size of the euro-denominated sector using a combination of Banque de France and Lipper data. The right-hand side shows the breakdown of holdings by sector.

Impact on yields and funding to NFCs and banks

The impact on yields and funding to NFCs and banks will depend on how MMFs rebalance their portfolios to hold more public debt, which is difficult to predict.

An increase in the holding of public debt would be likely to reduce the MMFs' investment in private debt securities. However, it is unclear whether MMFs will reduce their bank CDs or their NFC CP. The current lower return of bank CDs relative to NFC CP of around 20 basis points may suggest that MMFs would have an incentive to rebalance mainly via bank debt. That said, bank CDs might be more liquid than NFC CP, especially during a crisis, when banks might agree more easily to buying back their paper. During March 2020, MMFs reduced their exposures to banks, causing significant disruptions in bank unsecured funding markets as reflected in EURIBOR rates, which required central bank interventions. While MMF funding of banks may be important in providing liquidity in normal times, this funding might act as an amplification channel during crises. It is possible that MMFs would hold fewer bank CDs if they were to increase their public debt holdings, given that public debt assets might complement the liquidity of MMF portfolios. Chart C shows the change in the returns of an MMF's underlying portfolio under different public debt holding scenarios, assuming that MMFs would increase their holding of public debt assets by reducing their holdings of bank and NFC securities in proportion to their size. The impact of public debt holdings, ranging from 10% to

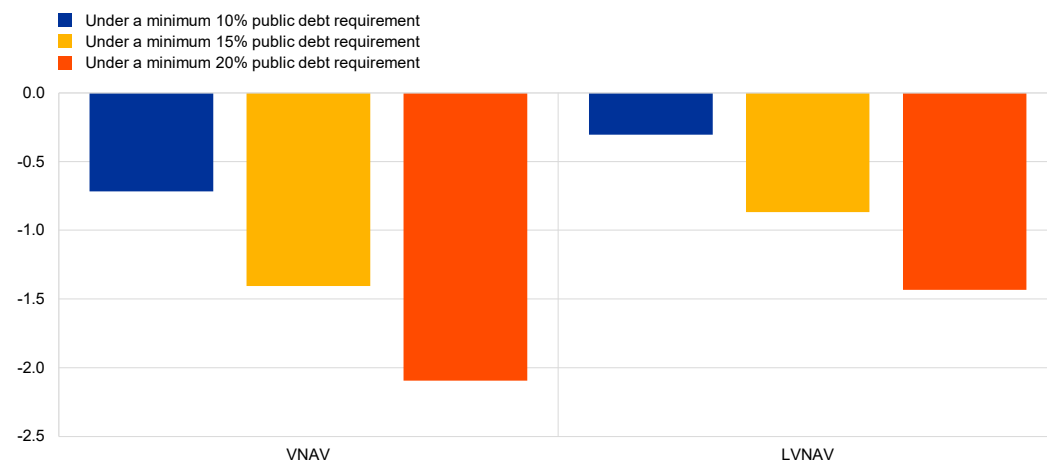


20% on the yields of the underlying assets of MMF's portfolio, would range from 0.65 basis points to 2.1 basis points for euro-denominated short-term VNAVs.³⁶

Chart C

Average reduction in MMF yields under different scenarios, assuming that MMFs will reduce their bank CD holdings

(in basis points)



Sources: Securities holdings statistics, ECB Statistical Data Warehouse, Banque de France, Crane and ECB calculations.

Notes: The chart above shows the estimated impact of a public debt requirement on the yields of the underlying portfolio assets of euro-denominated MMFs, using the average difference over the previous year in euro area yields on government, bank and NFC short-term securities. The effect is larger for VNAVs because they have a lower current holding of public debt and a higher share of NFC funding in their portfolio. We estimate the current public debt holdings by MMF type using a combination of Crane and Banque de France data, covering therefore around 80% of euro-denominated MMF sector.

Ultimately, the impact on investors and hence on funding provided by MMFs might not only be driven by yields. Indeed, the different measures proposed in the ESRB Recommendation would increase the resilience of MMFs to shocks. Investors would have to balance, on the one hand, the decrease in yields and, on the other hand, the higher resilience of MMFs.

³⁶ The impact on MMF yields equates to the differences in yields across assets which are being replaced, multiplied by changes in the portfolio share of these assets. This calculation assumes that MMFs replace the assets in full with bank and NFC debt. It uses the one-year average spread between three-month euro area government debt and bank CDs and NFC (NEU) CP, which we estimate at 10 basis points between government and banks and 29 basis points between government and NFCs. The impact on the overall return of the underlying portfolio is therefore a simple calculation, which involves multiplying (the difference in weighted yields between private and public debt) by (the change in the share of public debt in the portfolio). A 10 percentage point increase therefore equates to around a 1.5 basis point reduction in yields.



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