

ESMA TRV Risk Analysis

Stress testing MMFs in the EU – First evidence from fund reporting



ESMA Report on Trends, Risks and Vulnerabilities Risk Analysis

© European Securities and Markets Authority, Paris, 2023. All rights reserved. Brief excerpts may be reproduced or translated provided the source is cited adequately. The reporting period for this Report is 1 January 2021 to 30 June 2021, unless otherwise indicated. Legal reference for this Report: Regulation (EU) No. 1095/2010 of the European Parliament and of the Council of 24 November 2010 establishing a European Supervisory Authority (European Securities and Markets Authority), amending Decision No 716/2009/EC and repealing Commission Decision 2009/77/EC, Article 32 'Assessment of market developments, including stress tests', '1. The Authority shall monitor and assess market developments in the area of its competence and, where necessary, inform the European Supervisory Authority (European Banking Authority), and the European Supervisory Authority (European Insurance and Occupational Pensions Authority), the European Systemic Risk Board, and the European Parliament, the Council and the Commission about the relevant micro-prudential trends, potential risks and vulnerabilities. The Authority shall include in its assessments an analysis of the markets in which financial market participants operate and an assessment of the impact of potential market developments on such financial market participants.' The information contained in this publication, including text, charts and data, exclusively serves analytical purposes. It does not provide forecasts or investment advice, nor does it prejudice, preclude or influence in any way past, existing or future regulatory or supervisory obligations by market participants.

The charts and analyses in this report are, fully or in part, based on data not proprietary to ESMA, including from commercial data providers and public authorities. ESMA uses these data in good faith and does not take responsibility for their accuracy or completeness. ESMA is committed to constantly improving its data sources and reserves the right to alter data sources at any time. The third-party data used in this publication may be subject to provider-specific disclaimers, especially regarding their ownership, their reuse by non-customers and, in particular, their accuracy, completeness or timeliness, and the provider's liability related thereto. Please consult the websites of the individual data providers, whose names are given throughout this report, for more details on these disclaimers. Where third-party data are used to create a chart or table or to undertake an analysis, the third party is identified and credited as the source. In each case, ESMA is cited by default as a source, reflecting any data management or cleaning, processing, matching, analytical, editorial or other adjustments to raw data undertaken.

ISBN 978-92-95202-84-9, DOI 10.2856/426558, EK-04-23-465-EN-N

European Securities and Markets Authority (ESMA)
Risk Analysis and Economics Department
201-203 Rue de Bercy
FR-75012 Paris
risk.analysis@esma.europa.eu

ESMA - 201-203 rue de Bercy - CS 80910 - 75589 Paris Cedex 12 - France - www.esma.europa.eu

Financial Stability

Stress testing MMFs in the EU – First evidence from fund reporting

Contact: Jean-baptiste.haquin@esma.europa.eu¹

Summary

Money market funds (MMFs) are investment funds that invest essentially in money market instruments issued by banks, governments or corporates. They especially serve as short-term liquidity providers to banks, and as cash management vehicles for institutional investors and large corporates, which use them as an alternative to bank deposits. As such, MMFs play a systemically important role as they interconnect money markets, banks and institutional investors. Therefore, any disruption affecting the MMFs may impact various parts of the financial system, potentially with negative implications for financial stability. To help assess and manage the related risks, the EU's MMF Regulation (MMFR) of 2017 introduced requirements in terms of stress testing. The Regulation requires MMFs to put in place sound stress testing processes as part of their internal risk management. In addition, they are required to assess the impact of common risk parameters and report the results to their national authorities and ESMA. The methods and scenarios for these stress tests are provided by ESMA in the form of Guidelines which are updated annually, according to an adverse scenario designed by the European Systemic Risk Board (ESRB) in cooperation with the European Central bank (ECB).

This article presents the results of the stress tests, as per the methodology and parameters included in the ESMA Guidelines implemented in 2021. The scenario draws lessons from the stress episode affecting MMFs in March 2020 in the context of a deep, but non-lasting, global recession caused by the COVID-19 pandemic. The results show that both liquidity and credit risks could have a detrimental impact on MMFs, with concerns regarding the capacity of LVNAV funds in particular to maintain their stable value. Finally, despite a calibration reflecting the intensity of the March 2020 stress episode, the different redemption and macro scenarios show the capacity of MMFs to meet redemption requests. This first evidence will inform future enhancements of the MMF stress testing framework, scheduled in 2023.

¹ This article was written by Jean-Baptiste Haquin and Matteo Cotella.

Introduction

MMFs are investment funds that invest essentially in money market instruments issued by banks, governments or large corporates. Therefore, they are important short-term liquidity providers in the money market, especially bank funding. Contrary to other investment funds, some MMFs offer a redemption at par called Constant Net Asset Value (CNAV). CNAV MMFs are necessarily short-term, as by regulation their residual maturity must not exceed 397 days. By contrast, MMFs valuing share prices at market value are called Variable Net Asset Value (VNAV) MMFs. VNAV MMFs have less investment constraints than CNAVs and can be short-term or hold securities with longer maturities.

MMFs also serve as cash management vehicles for institutional investors and corporates which use them as an alternative to bank deposits that can be in principle withdrawn at any time. As such, MMFs play a systemically important roles as they interconnect money markets, banks and institutional investors. As a consequence, any disruption affecting the MMF market has effects across various parts of the financial system, with potential implications for financial stability.

The Global Financial Crisis highlighted some vulnerabilities and especially the difficulty for CNAVs to maintain liquidity and stability in face of investor “runs”, thus posing a risk of contagion. At the time, central bank intervention was required to allow their clients to redeem their assets at par. Eventually, the Financial Stability Board classified MMFs as “shadow-banking entities” involved in credit intermediation, maturity and liquidity transformation².

The MMF Regulation (MMFR)³ implemented in July 2018 aims at addressing MMF vulnerabilities and preventing risks of contagion. It restricts the use of a constant NAV to funds investing in government debt, cash, and reverse repurchase agreements secured with government debt, and introduces a new category of funds called Low-Volatility NAV (LVNAV), combining characteristics of CNAV and VNAV MMFs. LVNAVs are short-term MMFs that invest mainly in private securities (commercial paper or certificate of deposits) like VNAVs and are allowed to use amortised cost accounting like CNAVs. When their mark-to-market NAV deviates by more than 20bps from the constant NAV, LVNAVs have to convert to VNAVs (Article 33(2) of the MMFR).⁴

The MMFR also introduced a requirement in terms of stress testing: Article 28 of the Regulation particularly requires ESMA to develop Guidelines on stress testing and to update them annually. Since 2019, this update is based on an adverse scenario developed with the European Systemic Risk Board (ESRB) in cooperation with the European Central bank (ECB)⁵. The objective of this article is to present an analytic perspective of the 2021 implementation of the ESMA MMF stress test Guidelines.

The EU MMF market

At the end of 2021, the EU MMF sector managed assets worth EUR 1.44tn, almost entirely by funds domiciled in Ireland, France and Luxembourg, as highlighted in the ESMA Market Report⁶ (Chart 1). LVNAV MMFs accounted for 46% of the total assets, followed by VNAV MMFs (42%) and CNAV MMFs (12%). MMFs domiciled in France were all VNAV, and most of them were

² [Policy framework for strengthening oversight and regulation of shadow banking entities](#), FSB, 2013.

³ Regulation (EU) 2017/1131 of the European Parliament and of the Council of 14 June 2017 on money market funds <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32017R1131>

⁴ MMFR is currently under review and the ESMA and ESRB have submitted their views on potential reforms,

including the removal of the 20 bps threshold: [ESMA opinion on the review of MMFR](#) and [ESRB Recommendation on reform of MMFs](#)

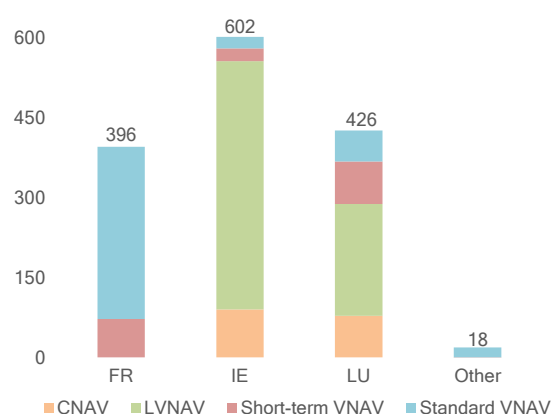
⁵ [Adverse scenario for the ESMA money market fund stress-testing guidelines in 2020 \(europa.eu\)](#)

⁶ [ESMA50-165-2391 ESMA Market Report on EU MMF market 2023 \(europa.eu\)](#)

denominated in EUR. MMFs in Luxembourg and Ireland were mainly CNAVs and LVNAVs and a majority of them were denominated in non-EU currencies such as USD and GBP.

Chart 1

Total assets of EU MMFs end-2021 Assets concentrated in three main jurisdictions



Note: MMF assets by regulatory type and domicile, end of 2021, in EUR bn.
Sources: MMFR database, NCAs, ESMA.

EU MMFs primarily fund credit institutions, which represented 60% of their assets between March 2020 and June 2022. However, investment policies differ according to the type of MMF:

- CNAVs invest the vast majority of their portfolio in US government bonds (53% of their assets in 2022) and (reverse) repos (33%).
- LVNAVs invest in bank deposits and money market instruments issued by credit institutions, which in 2022 represented 70% of their portfolio, mostly in GBP and USD.
- VNAVs had 47% of their assets in money market instruments issued by credit institutions and 16% in bank deposits, mainly in EUR.

MMFs under stress – the March 2020 episode

The COVID-19 related market stress of March 2020 highlighted MMF vulnerabilities. During the ‘dash for cash’ episode, investors globally sought cash, in particular to meet margin calls and to build cash buffers due to the risk adverse environment. Some investment funds, in particular some EU MMFs, faced heightened redemption requests. At the same time, liquidity deteriorated quickly in the commercial paper market both in the EU and the US. Indeed, bank issuers, who usually play the role of market makers in those markets, were unwilling to buy back their own paper from MMFs, thus increasing liquidity pressures.

As a consequence, those MMFs had to sell assets in an illiquid market to meet the redemption demands, which resulted in significant deviations of the mark-to-market NAV. For LVNAVs especially, it meant getting close to the 20bps limit set in the regulation. This rule is aimed at limiting the risk of first-mover advantage, in cases when the first redeeming investor expects to have shares repaid at a book price which is higher than the fair value. But in that situation, it put pressure on managers who were willing to avoid such conversion, as they may be concerned that first mover sales could trigger further redemptions.

In the concrete case of the March 2020 stress, the MMF sector was eventually resilient, and outflows stabilised in early April 2020. No LVNAV had to convert to VNAV, and no EU MMFs had to introduce redemption fees or gates, nor suspend redemptions during the market turmoil. But the event was also short-lived thanks to public interventions, including purchase programmes of commercial papers put in place by the Federal Reserve in the US and the ECB in the Euro area. Given the liquidity issues at the time, a number of policy questions at the EU⁷⁸ and international

⁷ [ESMA proposes reforms to improve resilience of Money Market Funds \(europa.eu\)](https://www.esma.europa.eu/press-rel/12442/2022)

⁸ [ESRB recommends increasing the resilience of money market funds](https://www.esrb.europa.eu/en/press-rel/2020/04/01)

levels⁹ have been raised regarding the resilience of MMFs in stress market conditions and are still under consideration.

Any policy implications notwithstanding, fund stress testing plays a pivotal role for fund risk management from a public policy perspective in *ex ante* identifying and measuring the resilience of funds exposed to such risks both at the individual fund and at the sector levels. Indeed, stress among MMFs can have an impact on the wider financial system, given their strong degree of interconnectedness. As already said, MMFs are often used by institutional investors and corporates as a cash management tool similar to deposits and a suspension in one MMF may trigger redemptions in other MMFs, with wider consequences on the short-term financing of the banking sector.

EU MMF stress test requirements

ESMA MMF Stress Test Guidelines

The MMFR requires managers of MMFs to conduct regular stress tests as part of their risk management framework and regulatory disclosure. Funds must put in place sound stress testing processes, including identifying stress events, or future changes in economic conditions, and assess the impacts these different scenarios may have on the NAV and/or liquidity of the MMF.

In order to enhance the relevance and comparability of stress tests by MMFs, ESMA has developed Guidelines to be included in the stress tests that managers of MMFs are required to conduct (Article 28 MMFR)¹⁰. The Guidelines include common reference parameters considering the following hypothetical risk factors:

- liquidity changes of the assets held in the portfolio of the MMF;
- credit risk, including credit events and rating events;
- changes in interest and exchange rates;
- redemptions;
- spread changes of indexes to which interest rates of portfolio securities are tied; and
- macro-economic shocks.

Each year, the ESRB in collaboration with the ECB design an adverse scenario to be included in the annual revision of the MMF stress testing Guidelines. MMFs subsequently conduct their stress tests at entity level according to the new parameters. This process is similar to the other adverse scenarios designed by the ESRB for the ESAs (Textbox 1). To enable regulators and supervisors to assess the resilience of national and EU MMF markets, the MMF managers need to provide the outcomes of their stress tests to the relevant national authorities and to ESMA.

This article presents the results of MMF stress tests reported to NCAs and ESMA at the end of 2021, on a sample of 367 funds (77% of all EU-domiciled MMFs).

⁹ [Policy proposals to enhance MMF resilience \(fsb.org\)](https://www.fsb.org/policy-proposals-to-enhance-mmfr-resilience/)

¹⁰ [Guidelines on stress test scenarios under the MMF Regulation](https://www.esma.europa.eu/press-material/press-conferences-and-news/guidelines-on-stress-test-scenarios-under-the-mmfr-regulation)

Textbox 1

MMFs in the EU stress testing framework

The ESRB, in cooperation with the ECB, designed its first scenario for an MMF stress test in April 2019 (and has updated it on an annual basis since then). This was a common scenario for ESMA and EIOPA, with more emphasis on short term maturities for MMFs (between 1 month and 2 years) and on long term maturities for institutions for occupational retirement provision (IORPs).

The ESRB provides scenarios for the stress testing exercises of all the European Supervisory Authorities (ESAs): ESMA (MMFs and CCPs), EBA (banks) and EIOPA (insurance and IORPs). In terms of implementation, these exercises of the ESAs are "bottom-up exercises" where the authorities provide the scenarios to the supervised entities, which perform the calculation and report the results to authorities.

However, there is a difference between MMF stress tests and the other stress testing exercises of the ESAs:

- EBA stress tests are exercises conducted every 2 years, whose methodology is reviewed for the occasion. For each institution, the results are assessed and challenged by competent authorities in line with a quality assurance process and descriptive statistics on the main risk parameters as provided by the EBA. The results of the stress test feed into the Supervisory Review and Evaluation Process (SREP) for each participating institution, and allow competent authorities to assess institutions' ability to meet applicable minimum and additional own funds requirements under the common downturn scenarios and assumptions.
- MMF stress tests, in contrast, are part of the regular regulatory reporting. Managers must include the adverse scenario in their internal models in addition to their own internal scenarios. While the adverse scenario is generally updated on an annual basis, MMF report the results on a quarterly or annual basis to authorities (depending of their size). The MMFR foresees that where the stress test reveals any vulnerability of the MMF, the manager of an MMF shall draw up an extensive report with the results of the stress testing and a proposed action plan.
- Similarly to the bank stress tests, MMF stress tests aim to ensure the consistency of the results through a common methodology, but the quality insurance process is part of the broader reporting quality assurance process. Comparability is further ensured by the fact that, due to their regulatory constraints in terms of eligible assets, liquidity and maturity, MMFs are more similar than banks are.

In the case of the 2021 implementation of ESMA Guidelines and MMF stress tests, the scenario provided by the ESRB in September 2020¹¹

reflected the risks prevalent at that time, i.e. a context of deep global recession¹². The scenario calibration especially simulated widespread defaults in the private sector, a difficult macroeconomic environment for financial institutions, a re-emergence of sovereign financing risk and debt sustainability concerns, and instability and pockets of illiquidity in financial markets. Prior to that, ESMA had updated the calibration of the redemption scenario to reflect the extreme events observed during the March 2020 stress.¹³ A summary of the calibration is available in the Appendix.

In terms of severity, the probability of the shocks provided by the ESRB was below 1% over the horizon of one quarter and the shocks were one-off, instantaneous and permanent. The calibration should however be interpreted in the context of the adverse scenario: since credit spreads were more likely to increase than interest rates in a context of depression, the resulting credit risk scenario was relatively more severe than the interest rate risk scenario.

Liquidity risk

The adverse scenario assumed a widening of bid-ask spreads, especially in countries with less deep and liquid sovereign and corporate bond markets. Bid-ask spreads were then transformed into discount factors, with the indicative level of detail:

- For each relevant security (i.e. corporate and government bonds), the discount factors had to be applied to the bid prices used for the valuation of the fund observed in an active market at the time of the reporting, according to their type and maturity, to derive an adjusted bid price.
- The manager of the MMF estimated the impact of the potential losses by valuing the investment portfolio at the derived adjusted

¹¹ [Adverse scenario for ESMA stress testing Guidelines in 2020.](#)

¹² [ESMA, "Final Report: Guidelines on stress test scenarios under the MMF Regulation". 16 December 2020.](#)

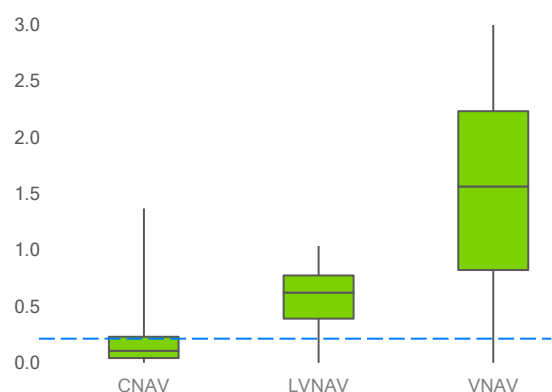
¹³ [ESMA updates guidelines on stress tests for money market funds \(europa.eu\)](#)

bid price, to determine the stressed NAV and reported the impact as a percentage of the reporting NAV.

Chart 2

Liquidity risk stress test

Impact above conversion threshold for LVNAVs



Note: MMF ST impact in % of NAV, by quartile. The blue line represents a 20 basis points threshold.
Sources: MMFR database, ESMA.

The impact of the liquidity stress test was significant for VNAV funds, with a median impact of 1.57% NAV. The distribution of the impacts across VNAVs (Chart 2) shows that 25% of the VNAV funds lost less than 0.82% of their NAV while the 25% most impacted funds lost more than 2.24%. Individual VNAVs lost up to 3% NAV in two jurisdictions.

In contrast, the stress had very little impact on CNAV funds. 75% of CNAVs lost less than 0.23% NAV with no consequence on their ability to redeem at par, and the stress was negligible for half of them (median 0.11% NAV). This reflects the fact that they invest primarily in US sovereign debt, which is normally less exposed to liquidity risk. This holds for nearly all CNAV funds although very few funds would still deviate from their NAV by more than 50 bps, and hence unable to maintain their NAV at par value.

In comparison, the adverse scenario had more implications for LVNAV funds. 88% of LVNAVS

reported an impact above 0.20% and therefore would have breached the regulatory collar of 20 bps (represented by a blue line on Chart 2). For those funds, this would imply a switch from the amortised cost valuation method to mark-to-market valuation. While this mechanism is provided for in the legal framework, it can create undesirable incentives: the ESRB noted in its Recommendation¹⁴ that, due to the use of amortised cost, this collar provides a first mover advantage to investors, as they can redeem their units at an NAV that does not reflect the market valuation of certain assets. In addition, ESMA noted in its opinion on MMFR review that, when faced with redemptions, LVNAVs are subject to a trade-off, related to the regulatory requirements they need to comply with: either sell liquid assets to maintain their NAV at the risk of breaching the weekly liquid assets (WLA) requirement or sell less liquid assets to maintain the WLA at the risk of breaching the NAV collar. Finally, 88% of the LVNAVS switching to mark-to-market in the stress test is a scenario yet unseen in reality and whose consequences are difficult to measure. Assuming a worst-case scenario where all funds switch at the same time, with no portfolio reallocation, this could have had the potential to trigger a run from LVNAVS with potential wider implications.

This explains why both ESMA and the ESRB considered that the ability for LVNAVS to use amortised cost should be removed.

Credit risk

The adverse scenario assumed that countries' fiscal positions would continue to deteriorate as a result of the prolonged health crisis and the extension of public support programmes. Concerns about the sustainability of public debt in some countries would trigger a sharp increase in risk premiums and a widening of credit spreads worldwide. Similarly, spreads would increase for corporate bonds against the backdrop of widespread defaults in the private sector.

¹⁴ [ESRB Recommendation on reform of money market funds](#)

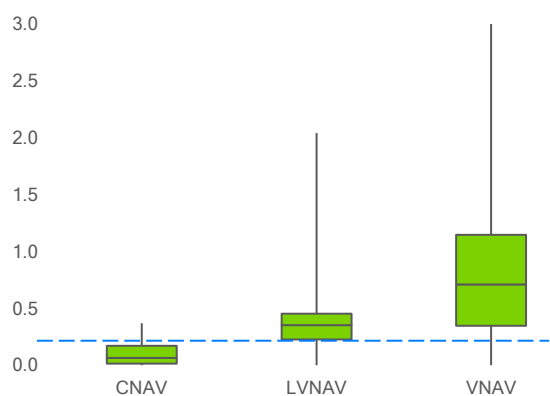
In concrete terms, the scenario translated into a rise in sovereign spreads of 85 bps for one-year government debt on average in the EU, and more than 200 bps for the most impacted countries. The shock was more important for corporate bonds, with a rise in spreads across maturities of 221 bps for non-financial corporates and 295 bps for financial corporates investment grade.

MMF managers then measured the impact of the shocks and reported the results to the NCAs and ESMA:

- The change in spreads affected the value of the securities according to their duration.
- MMF managers had to reprice all securities and measure the impact on NAV.

Chart 3

Credit risk stress test Confirms the risk of conversion for LVNAVs



Note: MMF ST impact in % of NAV, by quartile. The blue line represents a 20 basis points threshold.
Sources: MMFR database, ESMA.

The impact of the credit stress test was significant for VNAV funds, with a median impact of 0.71% NAV. The distribution of the impacts across VNAVs (Chart 3) shows that the 25% of most impacted funds lost more than 1.15%. At the individual level, the scenario revealed that some funds were particularly exposed to credit risk,

with individual VNAVs losing up to 3% NAV in two jurisdictions.

In contrast, the stress had very little impact on CNAV funds, with 75% of the funds losing less than 0.17% NAV and half of the funds losing less than 0.06%. This reflects the fact that they are primarily exposed to US sovereign debt with a short maturity, which is less prone to credit risk, as reflected in the scenario. According to the results of the stress test, no CNAV fund would have had to trade below its par value.

Again, the adverse scenario had more implications for LVNAV funds: 83% of LVNAV funds reported an impact above 0.20% and therefore would have breached the regulatory collar of 20 bps (represented by a blue line on Chart 3).

In addition to the credit stress the Guidelines require the managers of MMFs to simulate the default of their two main exposures (including deposits, repos and derivatives) considered at the group level (all entities from the group being in default). The purpose of this additional stress is to capture concentration and counterparty risk, particularly for exposures that are not impacted by the credit spread shock. The impact of this scenario is significant for all MMF types, with a median impact of 4.34% and 4.80% for LVNAV and VNAV, respectively. But it is particularly material for CNAV, with a median impact of 28.72%, up to 40.28% NAV. While this scenario is extreme (in some cases implying the default of sovereign issuers), it highlights the high concentration of CNAV portfolio, with half of the 20 largest CNAVs exposed to only two issuers (generally US).¹⁵

Interest-rate and exchange-rates risks

Debt instruments in MMF portfolio are subject to interest rate and exchange risks. Regarding interest rates, the Guidelines differentiate between risks related to hypothetical movements of interest rates and the widening or narrowing of

¹⁵ Such concentration is permitted by way of derogation in the case of money market instruments issued or guaranteed by sovereign, agency or European

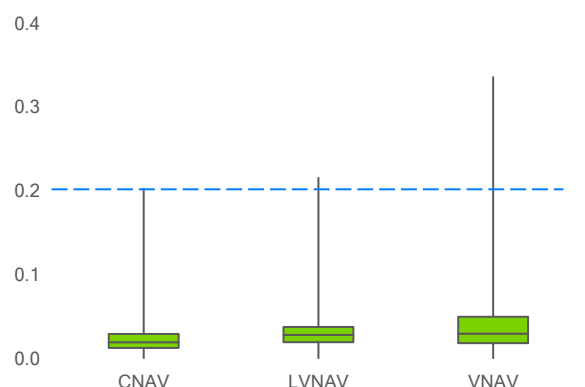
supranational, across at least 6 issues by the same issuer.

indices to which interest rates of securities are tied. However, the scenarios presented in the Guidelines do not differ as of today.

In the real-life context of a deep recession in 2020 and partial rebound in 2021, the adverse scenario assumed small shocks on the risk-free rates but more accentuated on the short end of the yield curve (+25 bps in 1-month EUR). This shock was severe but plausible, yet below the shock observed at the onset of the March 2020 stress in absolute terms (+120 bps in the US market). As a consequence, the impact of interest rate stress test was mild across MMFs, with a median impact of 0.03% NAV for VNAVs, the MMF category which is the most exposed to interest rate risk (Chart 4).

Chart 4

Interest rate stress test Very low impact across MMFs categories



Note: MMF ST impact in % of NAV, by quartile. The blue line represents a 20 basis points threshold.
Sources: MMF database, ESMA.

In comparison, the latest adverse scenario assumes an upward trend of risk-free rates on account of a rise in inflation rates and inflation expectations that is more protracted than anticipated¹⁶. While the results of this scenario are not yet known, we expect them to confirm the resilience of MMFs to interest rate shocks despite the increased severity. Indeed, as shown in ESMA Market Report, MMFs have reduced their

exposure to interest rate changes as reflected by the reduction of the weighted average maturity (WAM) of their portfolio in 1H22. The WAM declined on average, from 38 days to 23 for CNAVs, 45 days to 27 for LVNAVs, 47 days to 30 for short-term VNAVs, and 81 days to 57 for standard VNAVs. It shows that managers are able to reduce their interest rate exposure when increases are predictable. That being said, unexpected extreme events can remain challenging for MMFs, as illustrated by the stress in the UK Gilt market in September 2022. This warrants attention from both managers and supervisors.

Regarding exchange rates, risks depend on the denomination of the fund, i.e. Euro or non-Euro. Therefore, two different scenarios (Euro appreciation and Euro depreciation) are proposed. However, stress test results do not seem to indicate a particular exposure to foreign-exchange risk, as assets and liabilities are generally labelled in the same currency.

Redemption of MMF fund shares

MMFs may face redemption pressures challenging their ability to redeem holdings at the request of investors in a short period of time. The Guidelines measure fund ability to meet redemption requests in two ways:

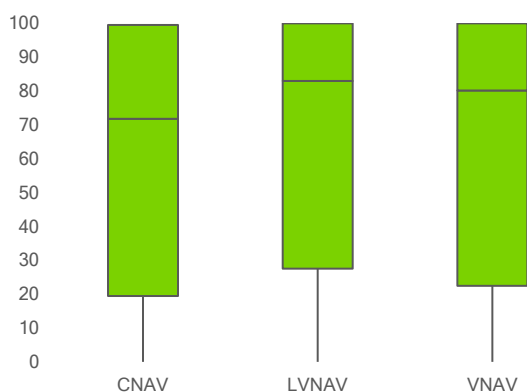
- **Reverse liquidity stress test:** Assuming that the manager of the MMF wants to keep its strategy unchanged to ensure a fair treatment of all investors, the Guidelines require to produce a self-assessment on the maximum size of outflows the fund can face in one week without distorting portfolio allocation (especially asset class, geographical allocation and sectoral allocation). This assessment should also consider the capacity to comply with the weekly liquid assets requirements specified in Article 24(1) of the MMF Regulation;
- **Weekly liquidity stress test:** Stressed weekly outflows are compared with available weekly

¹⁶ [Adverse scenario for ESMA stress testing Guidelines in 2022.](#)

liquid assets, considered as the sum of highly liquid assets and weekly maturing assets.

The reverse liquidity stress test showed a large dispersion within each category, which also reflected the self-assessment nature of this stress scenario and potentially inconsistent interpretation of the Guidelines. As shown on Chart 5, more than 25% of fund managers in each category reported that they would be able to reimburse 100% of their investors without breaching any regulatory requirement while ensuring the fair treatment of investors. Half of the managers still considered that they would be able to reimburse more than 72%, 83% and 80% of investors in CNAV, LVNAV and VNAV funds respectively. On the other hand, 25% of the managers considered that they would be able to reimburse less than 20%, 28% and 22% of their investor in CNAV, LVNAV and VNAV funds respectively, before breaching regulatory requirements.

chart 5
Reverse liquidity stress test
Large dispersion of redemption capacities



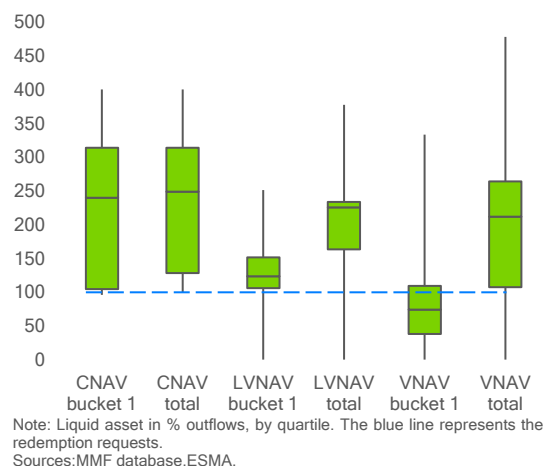
Note: Maximum outflows in % of NAV, by quartile.
Sources:MMF database,ESMA.

The weekly liquidity stress test measures the capability of MMFs to meet redemption requests over a 1-week horizon. The stressed outflows have been calibrated by ESMA based on commercial data on a period including March 2020, where MMFs received massive outflows as part of the dash-for-cash episode. The assumption is that retail investors are more stable

than professional investors, and thus to apply a smaller shock to them (30% for retail investors compared to 40% for professional investors).

For each MMF category, Chart 6 presents two results: their capacity to meet the redemption requests with cash, maturing assets and short-term sovereign debt (referred to as “bucket 1” assets in the Guidelines) and their capacity to meet redemption requests with their “total” weekly liquid assets, including bucket 1 and other instruments that can be liquidated in 5 days. The results showed that nearly all CNAVs and most LVNAVs would be able to meet 100% of the redemption requests (represented by a blue line) with bucket 1 assets. In contrast, 62% of the VNAV funds did not have enough bucket 1 assets to put in front of stressed outflows. However, when looking at the total weekly liquid assets 79% of the VNAV funds would be able to honour the requests.

Chart 6
Weekly liquidity stress test
Good resilience overall



Note: Liquid asset in % outflows, by quartile. The blue line represents the redemption requests.
Sources:MMF database,ESMA.

In addition, MMFs have to simulate a last scenario assessing potential redemptions by their two main investors. The impact of the stress is measured according to the weekly liquidity stress test methodology. It shows a limited concentration of MMF investors, with all CNAVs and the vast majority of LVNAVs able to meet redemption requests with their first bucket. Even in the case of VNAVs, nearly half of the funds have enough bucket 1 assets to meet the

redemption requests. This reflects the relatively low concentration of MMF ownership: funds that are majority owned by five or fewer investors represent 18% of CNAVs in terms of size, 32% of VNAVs and 10% of LVNAVs.

Macro systemic shock

The macro systemic shock intends to simulate adverse macro-economic developments or major events that affected the economy as a whole in the past, such as the Lehman Brothers bankruptcy. In the Guidelines, managers of MMFs assess the combined impact of the different risk factors of the adverse scenario, including the redemption shock.

In terms of losses, the results of the macro systemic shock show an impact representing 0.09% of the NAV for CNAVs, 0.34% for LVNAVs and 1.05% for VNAVs¹⁷. Similarly to the liquidity and credit stress tests, most LVNAVs would exceed the 20 bps threshold.

The redemption shock works in the same way as the weekly liquidity stress test described above, with outflows representing between 30% and 40% depending on the investor base (retail or professional). However, this time the outflows follow an initial market shock, which tends to improve the results. Indeed, the most liquid assets are also the less impacted by the market shock (typically highly liquid sovereign bonds) and, conversely, the less liquid assets are generally the most impacted. Therefore, the proportion of highly liquid assets in the portfolio tends to increase after the market shock, thus improving the liquidity position of some funds. Eventually results were close to the redemption stress test, with most CNAVs and LVNAVs above the threshold, both with bucket 1 assets and total liquid assets. Similarly, VNAV funds generally did not have enough liquid assets in bucket 1 to meet the redemption requests but were able to do so when considering all liquid assets.

Conclusion

Recent episodes of financial market turmoil, be it the Covid-19 stress in 2020, the Russian invasion of Ukraine in 2022 and the subsequent energy crisis, or lately the March 2023 failure of several US banks, have demonstrated once more that financial institutions should be resilient to weather extreme developments. This is particularly relevant for MMFs, considering their business model as well as their interconnecting role in the financial system at large. Stress tests are a key tool to assess entity-level stress resilience on an ex-ante basis and help identify vulnerabilities that can be mitigated before reality strikes.

The objective of Article 28 of the MMF Regulation is to promote sound stress testing process as part of MMF's regular risk management, and to assess the resilience of funds in severe but plausible scenarios designed by supervisors.

The lessons from 2021 MMF stress tests reported at the end of 2021 are as follows:

- The liquidity stress test and the credit stress test had a significant negative impact on VNAVs and LVNAVs. In absolute terms VNAVs were the most affected, with a median impact of 1.57% in the liquidity scenario. However, more than 80% of LVNAVs would need to switch to variable NAV in both scenarios, potentially leading to disorderly asset liquidations. In contrast CNAVs appeared to be relatively insensitive to credit risk and liquidity risk, but more exposed to the default of large exposures.
- The impact of the interest rate scenario was generally benign. While the scenario was not extreme in comparison with the recent interest rate surge, MMFs managers have also demonstrated since 2021 their capacity to reduce their sensitivity to interest rates as a rise was becoming more likely. Regarding the foreign exchange scenario, results were generally not meaningful.

¹⁷ Out of the 367 funds whose results are included in this article, only 131 funds are included in the assessment

of the macro systemic scenario due to data quality issues.

- The redemption stress tests showed a great capacity of CNAV and LVNAV funds to meet redemption requests, especially with highly liquid assets. In comparison most VNAVs would need to use assets with a lower degree of liquidity, and 21% of funds may still face challenges to meet the redemption requests. In addition, the self-assessment provided by managers reflected a certain confidence (but also a huge dispersion) in their capacity to face significant outflows without distorting portfolio allocation while still remaining compliant with all regulatory requirements.
- The macro systemic stress test confirmed these results, with a good capacity to meet redemption requests but a more significant impact on VNAVs and LVNAVs.

The results generally indicate a good resilience of the industry to most market factors. They also highlight the relative proximity of the LVNAV 20 bps threshold. Although the risk of breaching the threshold has not yet materialised during real-

life stress events (including the COVID-19 related stress), this supports the concerns expressed in both ESMA's opinion and ESRB Recommendation regarding the ability for LVNAVs to use amortised cost.

Finally, ESMA is currently reviewing the methodology of the stress testing Guidelines in light of these results. ESMA recently consulted¹⁸ on two aspects of the Guidelines. First, the liquidity stress test should be revised to better take into account the interaction between liquidity and redemption pressures, as illustrated during the March 2020 stress. Other improvement may include the simulation by ESMA of the spillovers to the financial system in the macro systemic scenario, thus capturing financial stability risks beyond the individual fund level. ESMA aims to include the revised methodology in the MMF stress test Guidelines in 2023.

¹⁸ [ESMA34-49-496 2022 CP MMF ST Methodology](#)

Appendix

Summary of the calibration

| Risk factors | | | Calibration | | |
|-----------------------|---|------------------------|-------------|------------|----------------|
| Scenario | Parameter | | | | |
| | | <i>bps</i> | 1M | 6M | 1Y |
| Interest rates | Interest rates swap | EA | +25 | +11 | +14 |
| | | UK | +15 | +19 | +26 |
| | | US | +14 | +19 | +24 |
| | | <i>bps</i> | 3M | 1Y | 2Y |
| Credit | Government bond spreads (by maturity) | EU | +54 | +85 | +103 |
| | | UK | +24 | +35 | +43 |
| | | US | +48 | +70 | +84 |
| | | | <i>bps</i> | NFC | Covered |
| | Corporate bond spreads (by issuer type) | IG | +221 | +272 | +309 |
| | | HY | +351 | +432 | +545 |
| | | | | | |
| Exchange rates | Exchange rates (appreciation and depreciation of the EUR) | % | USD | GBP | CHF |
| | | EUR+ | +25 | +11 | +4 |
| | | EUR- | -17 | -7 | -4 |
| Liquidity | Liquidity discount | % | 3M | 6M | 1Y |
| | | Other sovereign | 0.37 | 0.55 | 0.79 |
| | | Corporate (IG) | 1.16 | 1.70 | 3.37 |
| Redemption | Net outflows | % | | | |
| | | Professional investors | 40 | | |
| | | Retail investors | 30 | | |

Note: **IG** = Investment Grade, **HY** = High Yield, **NFC** = Non-Financial Corporations, **FIN** = Financial Corporations, **Covered** = Financial Covered. The calibration of the shock to indexes to which interest rates of portfolio securities are tied is identical to the interest rate scenario. The calibration of the Macro systemic shock is the combination of all the risk factors, including the redemption stress test.

