FSB FINANCIAL STABILITY BOARD

Assessment of the Effectiveness of the FSB's 2017 Recommendations on Liquidity Mismatch in Open-Ended Funds

14 December 2022

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Executive summary

In 2017, the FSB published Policy Recommendations to Address Structural Vulnerabilities from Asset Management Activities (the "FSB Recommendations"), including liquidity mismatch in open-ended funds (OEFs). The FSB Recommendations aimed to strengthen regulatory reporting and public disclosure to facilitate assessment of liquidity risk in OEFs; promote liquidity management at the OEF design phase and on an ongoing basis; widen the availability of liquidity management tools (LMTs) and their use in stressed conditions; and promote fund-level and system-wide stress testing. IOSCO operationalised most of the FSB Recommendations related to liquidity mismatch by issuing, in 2018, Recommendations for Liquidity Risk Management (LRM) for Collective Investment Schemes (the "IOSCO Recommendations").

The FSB agreed that once the implementation of the FSB Recommendations had progressed, it would assess whether they had been effective and report its findings to the G20. This assessment, which forms part of the FSB's work programme to enhance the resilience of non-bank financial intermediation (NBFI), took place in parallel with IOSCO's review of the implementation of its Recommendations. The assessment covered both the implementation and effectiveness of relevant FSB Recommendations.

Given the complementarities between individual FSB Recommendations, the FSB grouped the recommendations based on their intended outcomes and assessed their effectiveness in a holistic manner, using a broad range of information sources for its analysis. Due to methodological challenges and data limitations, the FSB exercised judgement in conducting the assessment and in formulating policy implications. The assessment recognised the economic functions and benefits of OEFs and took into account the diversity of the OEF sector, which means that there is no one-size-fits-all solution for all OEFs.

Findings

Authorities have made meaningful progress in implementing the 2017 FSB Recommendations. Nevertheless, lessons learnt since their publication, including during the March 2020 market turmoil, have produced new insights into liquidity management challenges in segments of the OEF sector. While the assessment suggests that the FSB Recommendations remain broadly appropriate, enhancing clarity and specificity on the policy outcomes the FSB Recommendations seek to achieve would make them more effective from a financial stability perspective.

Reducing structural liquidity mismatch

Many jurisdictions have high-level regulatory expectations on consistency between fund assets and investment strategies, and redemption terms and conditions, but there appear to be differences in the levels of specificity in these expectations across jurisdictions. Overall, the FSB's analysis of available data suggests that there has been no measurable reduction in the degree of structural liquidity mismatch since the FSB Recommendations were issued. As the OEF sector has grown in absolute terms, reflecting the increased importance of market-based finance, the potential impact of vulnerabilities that can arise from OEFs' structural liquidity mismatch has also grown.

Reducing shock amplification and transmission through the use of LMTs

Most jurisdictions permit OEF managers to implement a broad range of LMTs and available information suggests there has been a gradual increase in the inclusion of LMTs in OEF constitutional documents since the publication of the FSB Recommendations. The use of anti-dilution LMTs increased during the height of the COVID-19 shock in response to increased redemption requests, especially for corporate bond funds, but available evidence points to material variation in swing factors across corporate bond funds using swing pricing. There remains room for greater uptake of LMTs, in particular anti-dilution tools that are intended to pass on the cost of liquidity to redeeming shareholders in both normal and stressed market conditions. When LMTs are available, cost, competitive or reputational concerns, as well as operational hurdles, may have prevented OEF managers from including them in OEF constitutional documents or using them.

Enhancing regulatory reporting, data availability and public disclosure

Many jurisdictions enhanced their regulatory reporting requirements following publication of the FSB Recommendations, but there is variance in the scope, frequency and content of periodic reporting. In addition, many jurisdictions can collect more frequent ad hoc supervisory information from fund managers where necessary. These data are useful during market stress, but they are less suited to ex ante vulnerabilities monitoring. The FSB encountered challenges obtaining and analysing data to support its assessment of the effectiveness of the FSB Recommendations. This suggests that measuring and monitoring liquidity mismatch as well as evaluating the availability, use and effectiveness of LMTs for assessing vulnerabilities in OEFs continue to be challenging for authorities.

While all surveyed jurisdictions require disclosure of fund liquidity risk to investors, more could be done to enhance these. Market participants agree that it is important to ensure adequate disclosure on the availability and use of LMTs by OEFs to protect investors and to allow them to factor these into their decision making.

Ensuring adequacy of stress testing

Most surveyed jurisdictions require responsible entities to conduct ongoing liquidity assessments at fund level in different scenarios. Additionally, most jurisdictions have conducted some form of system-wide stress testing to capture the effects of collective selling by funds and other investors on the resilience of financial markets and the financial system more generally.

Policy implications and next steps

Based on this assessment, certain enhancements to the existing international recommendations and related guidance would significantly strengthen the current framework and OEF liquidity management practices, benefitting financial stability as well as investor protection. The FSB and IOSCO will carry out follow-up work based on the assessment's findings. This will involve revisions to the FSB and IOSCO Recommendations to address structural liquidity mismatch and promote greater inclusion and use of LMTs as well as to clarify the appropriate roles of fund managers and authorities in implementing these Recommendations; development of detailed

guidance on the design and use of LMTs; work to enhance the availability of OEF-related data for financial stability monitoring; and steps to promote the use of stress testing. Engagement with stakeholders, including through public consultation of the proposed revisions to the Recommendations and of the new guidance, will form a key part of this process.

First, a clearer and more specific articulation of the intended outcome of policies to reduce structural liquidity mismatch in OEFs would strengthen the FSB Recommendations' effectiveness. Specifically, FSB Recommendation 3 should be revised to provide greater clarity regarding the redemption terms that OEFs could offer to investors, based on the liquidity of their asset holdings. Funds that allocate a significant proportion of assets under management (AUM) (e.g. 30-50% or more) to assets that are illiquid even in normal market conditions would need to offer liquidity to investors less frequently than daily and/or require long notice/settlement periods to redeem shares. Funds mainly holding less liquid assets, or assets that are more vulnerable to illiquidity in stressed market conditions, may offer daily dealing, subject to fund managers being able to demonstrate to the authorities (in line with their supervisory approaches) that they can implement anti-dilution LMTs that pass on to redeeming investors the explicit and implicit costs of redemptions, including any significant market impact of sales. Alternatively, these funds would need to consider and use measures to reduce the frequency at which they offer liquidity to investors and/or implement longer notice or settlement periods, as appropriate. More broadly, all funds should continue to enhance their liquidity management practices, including by implementing anti-dilution LMTs as below.

Second, there is scope to strengthen the framework around LMTs at a global level, to mitigate potential first-mover advantage arising from structural liquidity mismatch in OEFs, ensure that investors bear the costs of liquidity associated with fund subscriptions and redemptions, and arrive at a more consistent approach to the use of LMTs by fund managers. The FSB Recommendations 4, 5 and 8 on LMTs should be strengthened to achieve: (i) greater inclusion in funds' constitutional documents of anti-dilution LMTs designed to pass on to redeeming investors the explicit and implicit costs of redemptions, including any significant market impact of asset sales to meet those redemptions; (ii) greater use, and consistency in use, of anti-dilution LMTs in both normal and stressed market conditions; and (iii) increased awareness among investors on the objectives and operation of anti-dilution LMTs.

To complement and further strengthen the LMT framework, the FSB also recommends that authorities require clearer public disclosures from fund managers on the LMTs available to each OEF they manage and on the use of these LMTs in normal and stressed market conditions. Moreover, the FSB recommends that managers enhance their engagement with investors so that investors can better understand these disclosures and incorporate them in investment decisions.

Third, closing identified data gaps would improve authorities' ability to monitor liquidity mismatch and its management from a financial stability perspective. Progressing this work will include a voluntary pilot programme among FSB member jurisdictions for examining how to improve data availability, including the cost and effort needed to expand data coverage and reporting; and prioritising data gaps to close in order to improve both central banks and securities regulators' ability to monitor key OEF vulnerabilities related to liquidity mismatch.

Finally, the FSB will consider further promoting the use of fund- and system-level stress testing. The FSB will also promote the sharing of experiences on the design and use of such stress tests to inform vulnerabilities assessments and policy development.

The FSB and IOSCO will monitor the progress made by member jurisdictions in implementing their respective revised Recommendations. This monitoring will be followed up, once implementation is sufficiently advanced, with an assessment of the effectiveness of jurisdictions' policy measures in addressing risks to financial stability from OEF liquidity mismatch.

1. Introduction

In 2017, the FSB published Policy Recommendations to Address Structural Vulnerabilities from Asset Management Activities (the "FSB Recommendations"), including liquidity mismatch in open-ended funds (OEFs).[1] As stated in the FSB Recommendations, a key structural vulnerability from asset management activities is a potential mismatch between the liquidity of fund investments and daily redemption of fund units in OEFs.

OEFs offer short-term (often daily) liquidity to their investors, notwithstanding that the liquidity of fund investments varies across different OEFs and over time for any particular fund. Some fund investors may overestimate the liquidity of the assets held by the funds in which they invest, and may not expect the additional cost or difficulty associated with funds exiting their positions or rebalancing their portfolios. As a result, in anticipation of large losses stemming from a quick deterioration in underlying market prices and the costs of selling portfolio assets, some investors may decide to make redemptions that are larger than if they were directly responsible for liquidating portfolio assets.

In the presence of liquidity mismatch, investors might have additional incentives to redeem shares if they anticipate that other fund investors will redeem shares and that remaining investors will bear the costs of those redemptions. To the extent that proper valuation or LMTs do not remove this expectation, a first-mover advantage may give rise to excess redemptions, especially in stressed market conditions. Funds' sale of portfolio assets to meet these excess redemptions could result in greater market volatility with the potential to result in negative spillovers.

To address these vulnerabilities from liquidity mismatch, the FSB Recommendations aimed to strengthen regulatory reporting and public disclosure to facilitate assessment of liquidity risk in OEFs; promote liquidity management both at the fund design phase and on an ongoing basis; widen the availability of LMTs and use of LMTs in stressed conditions; and promote fund-level and system-wide stress testing. IOSCO operationalised most of the FSB Recommendations related to liquidity risk management by issuing the IOSCO Recommendations in 2018,[2] supplemented with a set of related good practices as a reference guide.[3] The FSB agreed that once the implementation of the FSB Recommendations had progressed, the FSB would assess whether its recommendations had been effective and report its findings to the G20.

In March 2020, many OEFs experienced liquidity pressure and valuation challenges, facing large redemption requests and deteriorating market liquidity triggered by the flight to safety and 'dash for cash'. This was particularly true for corporate bond funds. Fund managers actively managed their liquidity and decided how best to meet investor redemptions using cash, selling portfolio assets, and deploying LMTs. OEFs holding corporate bonds, along with other market participants, sold assets into markets with deteriorating liquidity, and hence contributed to the selling pressure. Central bank intervention as well as government and regulatory action helped

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1 FSB (2017), *Policy Recommendations to Address Structural Vulnerabilities from Asset Management Activities*, January. The recommendations focused on four areas: liquidity mismatch, leverage, operational risk, and securities lending activities.

2 IOSCO (2018), *Recommendations for Liquidity Risk Management for Collective Investment Schemes: Final Report*, February.

3 IOSCO (2018), *Open-ended Fund Liquidity and Risk Management – Good Practices and Issues for Consideration*, February.

to stabilise and restore confidence in markets, reducing investor redemptions and selling pressure from OEFs and other market participants.

Building on the lessons of the March 2020 market turmoil, the FSB developed a comprehensive work programme to enhance the resilience of the NBFI sector. As part of that programme, the FSB undertook an assessment of the effectiveness of the FSB Recommendations on liquidity mismatch in OEFs from a financial stability perspective in light of recent experience.[4] This assessment took place in 2022, building on the findings of previous joint FSB-IOSCO work, which analysed liquidity risk and its management in OEFs during the March 2020 turmoil. The assessment ran in parallel to IOSCO's review of the implementation of the IOSCO Recommendations ("IOSCO LRM Review"), with both exercises conducted using a coordinated analytical framework.

This report presents the main findings and policy implications of the assessment. Section 2 describes the analytical approach used for this exercise. Sections 3-6 group the relevant FSB Recommendations into four areas (reducing structural liquidity mismatch; reducing shock amplification and transmission through the use of LMTs; enhancing regulatory reporting, data availability and public disclosure; and ensuring adequacy of stress testing) and describe their implementation status and the results of the analysis of their effectiveness. Based on these findings, Section 7 presents a set of policy implications, while Section 8 concludes with next steps by the FSB and IOSCO to enhance the existing international recommendations and related guidance to address liquidity mismatch in OEFs.

A key principle underpinning the FSB's approach to both the assessment and policy implications has been a recognition of the economic benefits and functions of OEFs as well as the diversity of the OEF sector. OEFs play an important role in reducing reliance on bank funding, diversifying sources of financing and access to investment, facilitating international flows of capital, and increasing competition in the financial system. The OEF sector is also very diverse, which means that there is no one-size-fits-all solution for all OEFs. In this context, the policy proposals aim to be both targeted and proportionate.

The annexes include source materials that the FSB used to complete its assessment and serve as background for this report. Annex 1 maps the 2017 FSB Recommendations to the corresponding 2018 IOSCO Recommendations. Annexes 2 and 3 summarise the findings of the IOSCO LRM Review and of the FSB survey on the implementation of its 2017 Recommendations, respectively. Annex 4 presents takeaways from the FSB-IOSCO stakeholder outreach on vulnerabilities from liquidity mismatch in OEFs and policies to address them. Annex 5 includes short case studies that document specific jurisdictions' approaches to implementing the FSB Recommendations or the corresponding IOSCO Recommendations. Annex 6 presents information collected on the availability and use of LMTs in FSB jurisdictions as part of the FSB's work on policies to address systemic risks in NBFI.

[4] Money market funds (MMFs) were not covered by the FSB Recommendations, so they are outside of the scope of this assessment. The FSB recently published policy proposals to enhance MMF resilience to address vulnerabilities exposed in the March 2020 market turmoil. See FSB (2021), Policy proposals to enhance MMF resilience, October. The assessment also did not consider the effectiveness of the FSB Recommendations on liquidity mismatch in exchange-traded funds (ETFs).

2. Background and approach

The assessment covered both the implementation and effectiveness of the relevant FSB Recommendations.

- *Implementation* refers to the extent to which authorities in FSB jurisdictions took actions consistent with the recommendations by, for example, issuing rules or guidance on fund-level stress testing or by reducing barriers to the use of LMTs.

- *Effectiveness* refers to the extent to which the FSB Recommendations collectively achieved the FSB's financial stability objectives, including whether they had any material unintended consequences.

As an initial step, the FSB mapped the mechanisms through which the FSB Recommendations aim to address financial stability risks stemming from liquidity mismatch in OEFs. This process highlighted interactions between different recommendations (e.g. between measures targeting structural liquidity mismatch and those related to the availability and use of LMTs) and justified a holistic approach to the assessment that accounts for interactions among recommendations.

The FSB also mapped the FSB Recommendations to the relevant IOSCO Recommendations (see Annex 1). This exercise allowed the FSB to rely on the LRM Review to take stock of the overall implementation status of each FSB Recommendation (for those FSB Recommendations covered by the IOSCO Recommendations).[5] This mapping also informed the development of a survey to gather information about the implementation of the FSB Recommendations not covered by the IOSCO Recommendations.[6]

Given the complementarities between FSB Recommendations, the FSB grouped the recommendations based on their intended outcomes (reducing structural liquidity mismatch; reducing shock amplification and transmission through the use of LMTs; enhancing regulatory reporting, data availability and public disclosure; and ensuring adequacy of stress testing) and assessed each group of recommendations.

The FSB drew on a broad range of sources to develop its analysis in its assessment of the effectiveness of the FSB Recommendations. These included:

- Relevant reports prepared under the FSB NBFI work programme[7] and previous joint FSB-IOSCO work on vulnerabilities from liquidity mismatch in OEFs.

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5 In the IOSCO LRM Review, 12 FSB jurisdictions (Australia, Brazil, Canada, China, France, Germany, Japan, India, Spain, Switzerland, United Kingdom and United States) as well as Ireland and Luxembourg were reviewed for the consistency of their regulatory frameworks with the IOSCO Recommendations. At the time IOSCO started the LRM Review, these 14 "participating jurisdictions" comprised approximately 92% of global AUM. In addition, 11 other FSB jurisdictions (Argentina, Hong Kong SAR, Indonesia, Italy, Korea, Mexico, Netherlands, Saudi Arabia, Singapore, South Africa and Türkiye) were subject to an implementation review which considered the status of the implementation of relevant legislative, regulatory and/or policy measures but did not assess the consistency of the adopted measures with the IOSCO Recommendations. The IOSCO LRM Review also analysed the effectiveness of implementation of the relevant IOSCO Recommendations through a broadly disseminated voluntary survey to market participants.

6 The FSB survey covered the 14 participating jurisdictions in the IOSCO LRM Review as well as Hong Kong SAR and Italy.

7 These were IOSCO's report on Corporate Bond Markets – Drivers of Liquidity During COVID-19 Induced Market Stresses, the FSB report on US Dollar Funding and Emerging Market Economy Vulnerabilities and the FSB report on Liquidity in Core Government Bond Markets.

- Survey information gathered by IOSCO (through the LRM Review) from market participants and authorities, to understand how the IOSCO Recommendations (and through them, the FSB Recommendations) had been implemented. As noted above, the FSB also conducted its own survey to complement IOSCO's survey.

- Data analyses, mainly relying on commercial data, to understand the degree of structural liquidity mismatch exhibited by different types of OEFs, and how structural liquidity mismatch has changed over time.

- Use of members' analyses of public and regulatory data to highlight trends in the inclusion of LMTs in OEF constitutional documents and on the use of LMTs in normal times and in periods of stress.

- Outreach with external stakeholders, organised jointly by the FSB and IOSCO on vulnerabilities from liquidity mismatch in OEFs and policies to address them (see Annex 4).

In certain cases, lack of data availability or usability constrained analysis of the effectiveness of the FSB Recommendations. For example:

- Information about the inclusion of LMTs in fund constitutional documents[8] is available publicly but industry-wide data has not been collected in a way that could be used for sector-wide analysis.

- Managers are generally not required to report the use or activation of LMTs to authorities (apart from suspension of redemptions).

- There is no readily available information on notice or settlement periods by funds that would enable a more comprehensive assessment of structural liquidity mismatch. Where OEFs are valued daily, but subject to a notice period, the FSB has been unable to distinguish these funds from those which seek to offer investors daily liquidity without restrictions.

- Fund portfolio data is generally available only at a monthly or quarterly frequency, making it difficult to observe how managers adjust portfolio holdings to maintain consistency between asset liquidity, investment strategies and redemption terms.

Notwithstanding these challenges, the aforementioned information sources taken together form the basis for the assessment in the report. The challenges posed by lack of data on portfolio holdings and LMTs for the purposes of this assessment are challenges that are likely shared by ongoing and future efforts to measure and monitor vulnerabilities. Sections 7 and 8 discuss a programme of further work to address this shortcoming.

Finally, many jurisdictions are in the early stages of implementing regulations or guidance based on the FSB Recommendations. As a result, not enough time has elapsed to judge the effects that such implementing measures had on vulnerabilities arising from structural liquidity mismatch

[8] These include fund prospectuses, other offering documents and other documents accessible to investors on an ex-ante basis before they make their investment decision.

in OEFs in these jurisdictions. Nevertheless, the FSB gathered sufficient information from jurisdictions that have made substantial progress on implementation to conduct its assessment.

3. Reducing structural liquidity mismatch

Structural liquidity mismatch can be summarised as the difference between the redemption terms that an OEF offers to investors and the amount of time it may take the OEF's manager to liquidate fund holdings in an orderly manner (e.g. without substantially increasing transaction costs and without substantially impacting prevailing market prices) to satisfy redemption requests.[9] Unmitigated structural liquidity mismatch may amplify shocks by driving ''excess" redemptions that require managers to engage in asset sales larger than in the absence of liquidity mismatch, especially in times of stress. Shock amplification can occur through different channels:

- Liquidity mismatch may produce a first-mover advantage at the fund level when redeeming investors do not bear the full cost of redemptions and these costs instead result in an externality imposed on investors that remain in the fund. A first-mover advantage can drive 'excess' redemptions, especially in times of stress, relative to what might have otherwise been the case.

- In the presence of liquidity mismatch, some investors may misunderstand the liquidity of the underlying assets held by OEFs, and may not expect the additional cost or difficulty associated with funds exiting their positions, especially in a stressed environment. If – due to structural liquidity mismatch at a fund level – investors do not internalise the costs of selling portfolio assets, they may be more likely to seek to exit their positions through OEF redemptions than they might have been if they held the same assets directly.

Excess redemptions, and associated asset sales to meet those redemptions, could contribute to greater market volatility and additional pressure on asset prices in times of stress. In turn, these dynamics can affect the functioning of core markets (including primary markets) in times of stress, depending on the concentration and/or scale of asset holdings by OEFs in particular markets, the size of OEF trades, and the behaviour of other investors in those markets or asset classes. This work has concentrated on measures and tools to address potential vulnerabilities stemming from an OEF's structure.[10] However, OEFs are only one part of a broader market eco-system. Recognition of this supports the holistic and proportionate approach to policy implications in Section 7.

The FSB Recommendations sought to reduce the likelihood of material liquidity mismatch arising from an OEF's structure by tying the liquidity of fund assets explicitly to the liquidity offered to fund investors. Specifically, FSB Recommendation 3 encourages authorities to have

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9 "Redemption terms" throughout this report refers to the frequency with which OEF investors may redeem shares and the time between a redemption request and when the investor expects to receive cash (including both notice and settlement periods). Redemption terms do not include the application of quantity- or price-based LMTs.

10 Competition for finite asset liquidity among different types of investors that hold overlapping portfolios has the potential to produce first mover advantage at a market-wide level. This form of first mover advantage is not the focus of this assessment, which has concentrated on potential vulnerabilities stemming from an OEF's structure. See, for example, Stahel (2022), *Strategic Complementarity among Investors with Overlapping Portfolios*.

requirements or guidance stating that funds' assets and investment strategies should be consistent with the terms and conditions governing redemptions of fund shares both at fund inception and on an ongoing basis (for new and existing funds, including under stress). IOSCO operationalised the FSB Recommendation 3 through several of its recommendations (1-4, 10 and 12). See Annex 1 for further details.

IOSCO Recommendations 1-4 assessed in the IOSCO LRM Review look at the collective investment scheme (CIS) design process. Among the 14 participating jurisdictions assessed, which account for approximately 92% of global AUM, 12 were assessed to be fully consistent across all four recommendations. Only two of these jurisdictions did not appear to be fully consistent across all four recommendations. Among the other 11 FSB jurisdictions, there was a relatively high level of implementation for IOSCO Recommendation 1. However, the implementation of IOSCO Recommendations 2-4 was lacking in some of these jurisdictions. Further, based on the IOSCO market participants survey, IOSCO Recommendations 1-4 have been largely implemented.

IOSCO Recommendations 10 and 12 pertain to day-to-day liquidity management for CIS. For these two Recommendations, most of the participating jurisdictions were rated fully consistent with the exception of four jurisdictions. In a few of the other 11 FSB jurisdictions, implementation for Recommendations 10 and 12 was found lacking. Overall, based on the IOSCO market participants survey, IOSCO Recommendations 10 and 12 have been largely implemented.

According to the FSB implementation survey findings, all 16 surveyed jurisdictions have high-level regulatory requirements calling for fund managers to maintain consistency between OEF assets and investment strategies, and redemption terms and conditions. However, there appear to be differences in the levels of specificity in these requirements across jurisdictions.

Most jurisdictions have specific requirements (such as limits) on investing in illiquid assets. In addition, many jurisdictions provide detailed asset eligibility requirements or identify permissible assets to ensure that OEFs invest in liquid assets. Many jurisdictions require an OEF to maintain sufficient liquidity and/or determine an internal liquidity threshold corresponding to the fund's characteristics such as investment strategy, investor profile and redemption terms. A few jurisdictions have put in place specific measures to produce or maintain consistency between asset liquidity and redemption terms, including requirements for dealing frequencies that depend on the composition of an OEF's portfolio, or for the use of notice periods. However, guidance on dealing arrangements offered to investors appears to be high-level and principles-based. The FSB implementation survey identified good practices that a number of jurisdictions have put in place:

- Supervisory review of suitability of redemption terms and conditions to the investment strategy, asset classes, markets and target market during the authorisation process and review of the consistency of these factors on an ongoing basis.
- Specifying requirements for dealing terms for funds that invest in illiquid assets (e.g. longer dealing frequencies or notice periods).
- Including, as part of stress tests, simulation of a shortage of liquidity of the assets in the fund and atypical redemption requests, where appropriate.

The FSB sought to assess how different indicators of liquidity mismatch have evolved since the FSB Recommendations were adopted as well as the extent to which funds with exposures to less liquid assets had less frequent redemption terms than those with exposures to more liquid assets. For the purposes of this analysis, the FSB chose to broadly classify assets as "liquid", "less liquid" or "illiquid".

- "Liquid" assets are cash, certain listed equities, certain government bonds and certain other assets that can be readily converted into cash without meaningful market impact in normal and stressed market conditions.

- "Less liquid" assets are less liquid than the above "liquid assets" in normal times and include assets that are susceptible to illiquidity in times of stress (e.g. certain corporate bonds). Other types of assets may also be less liquid depending on the attributes of the market or jurisdiction.

- "Illiquid" assets are inherently illiquid in all circumstances, such as real estate and infrastructure assets. Other types of assets (e.g. private equity and non-traded loans) may also be illiquid depending on the attributes of the market or jurisdiction.

Measuring structural liquidity mismatch is challenging and involves comparing the redemption terms that a fund offers investors and the amount of time it may take the manager to liquidate fund holdings in an orderly manner to meet redemption requests. Detailed information about redemption terms that include parameters like dealing frequency, notice periods and settlement periods, are not generally available in a form that facilitates analysis. Moreover, while commercial databases like Lipper and Morningstar include security-level information, they do not include estimates of asset liquidity in normal times or in stress.

With these limitations and jurisdictional differences in mind, the FSB found that:

- On an absolute basis, OEFs have increased their holdings of less liquid and illiquid assets. The AUM of a broad sample of OEFs that invest in illiquid assets or in less liquid assets that can become illiquid under stress grew between 2015 and 2021. Estimates derived from Lipper data indicate that the growth in total net assets was particularly pronounced for the broader corporate bond fund and real estate fund segments, which grew by 57% and 53%, respectively, since 2015.

- OEFs, including those that invest in less liquid and illiquid assets, have generally continued to offer investors daily dealing (Graph 1, left panel). Review of Morningstar data suggests that across most asset classes, more than 90% of AUM is invested in daily dealing OEFs, a proportion that has remained roughly stable since 2016.[11] A notable exception is real estate. Based on Morningstar data, while the AUM of real estate OEFs grew by 73% between 2016 and 2021, the AUM of real estate OEFs that price daily (although these funds do not necessarily deal daily) only grew by 48% over

[11] As noted in Section 1, information about OEF dealing frequency is not readily available in a format that is suitable for analysis. For the purposes of its analysis, the FSB used pricing frequency (available as a data element in Morningstar) as a proxy for the (highest) dealing frequency that an OEF can offer. In other words: a fund that prices daily can offer subscriptions and redemptions at most daily.

the same time period.[12] This suggests, at least in relative terms, a shift towards real estate OEFs that have smaller liquidity mismatch.

- Overall, OEFs that predominantly hold less liquid and illiquid assets appear to have decreased their allocations to cash and advanced economy government bonds between 2016 and 2019, before increasing allocations in 2020 and 2021 (likely due to a combination of expectations of elevated redemptions and macro-financial uncertainty during the March 2020 'dash for cash' episode) (Graph 1, middle panel). Within fund types with higher levels of liquidity mismatch, like high-yield corporate bond funds and emerging market debt funds, there is variance in cash and advanced economy government bond holdings across funds. Based on Lipper data, high-yield corporate bond OEFs appear to have allocated less to cash and advanced economy government bonds at end-2021 then they had at end-2019 (Graph 1, right panel).

- From a cross-sectional perspective, funds with investment strategies that tilt towards holdings of less liquid assets tend to also maintain higher allocations to cash than funds exposed to more liquid instruments. Cross-sectional analysis of allocations to cash confirms that funds that predominantly invest in less liquid assets tend to allocate a higher proportion of AUM to cash. For example, based on Morningstar data, equity OEFs held between 1% and 3% of AUM in cash between 2016 and 2021. Over the same period, and using the same data source, corporate bond OEFs held between 4% and 7% of assets in cash and emerging market economy (EME) bond OEFs held between 7% and 9% in cash.[13]

- Academic research has also examined changes in overall structural liquidity mismatch. Based on information about fund AUM, net asset values (NAVs) and liquidation of portfolio assets, one paper finds that bond OEFs increased aggregate liquidity transformation between 2011 and 2017.[14] Another paper presents data that certain US fixed income OEFs reduced structural liquidity mismatch in response to regulatory changes following the Securities and Exchange Commission's (SEC) adoption of new fund liquidity requirements in 2017.[15] FSB analysis of balance sheet measures of fund-level liquidity transformation by fixed income OEFs in jurisdictions representing approximately 83% of total fixed income OEF assets suggests little overall change in liquidity transformation by these funds between 2018 and 2020.[16]

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12 Data from the UK suggests that AUM of real estate OEFs that provide daily dealing has declined since March 2020.

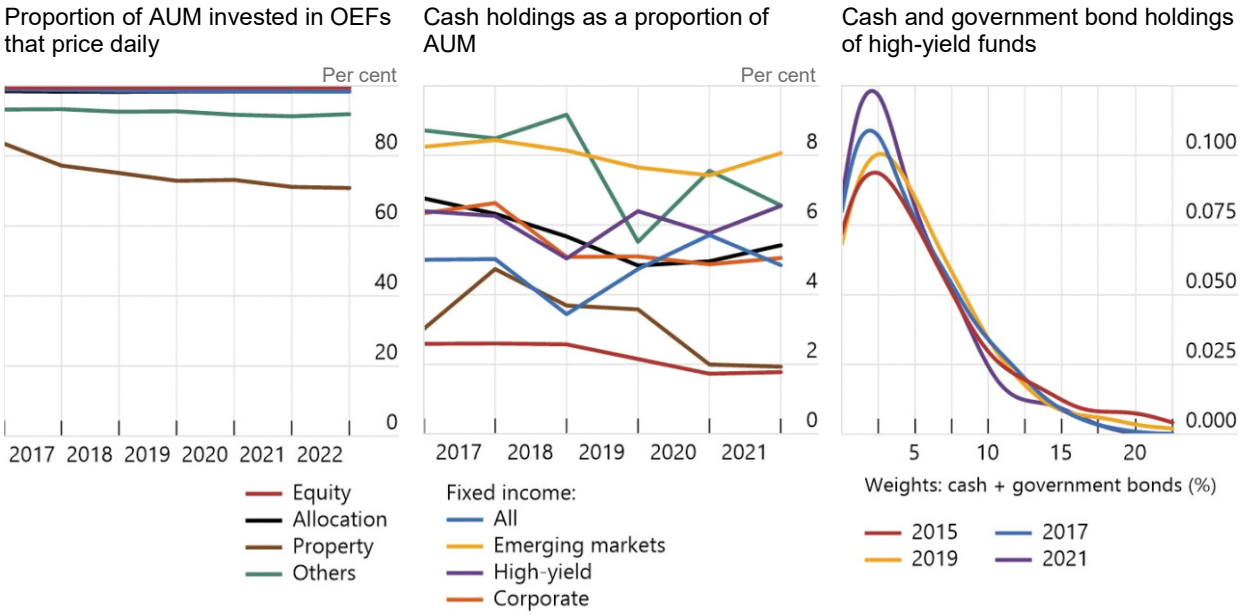
13 Funds that use derivatives may hold more cash than other funds, irrespective of their exposure to less liquid assets, to cover potential margin requests, and these estimates do not systematically adjust for derivatives exposures. Moreover, these estimates are sensitive to differences in commercial data sources, but the qualitative finding that OEFs with less liquid assets hold more cash is generally robust to these differences. Based on Lipper data, corporate bond funds held between 2% and 4% of assets in cash between 2016 and 2021 and EME bond OEFs held between 4% and 6% of AUM in cash over the same period.

14 Ma et al. (2022), *Bank debt versus mutual fund equity in liquidity provision*, Jacobs Levy Equity Management Center for Quantitative Financial Research Paper. The authors develop a "Liquidity Provision Index" and estimate the index for US bond OEFs. While fund-level liquidity provision remained generally stable between 2011 and 2017, the dollar amount of liquidity provision by OEFs increased substantially, with growth in OEF AUM.

15 Chakraborty et al. (2022), *The Consequences of Fund-level Liquidity Requirements*, available at SSRN. The authors analyse changes in asset allocations following the SEC's adoption of rule amendments in 2017, focusing on OEFs that are classified as high yield funds or bank loan funds, or that hold particularly illiquid corporate bonds ("treated funds"). The paper found that relative to other funds holding corporate bonds, treated funds increased their cash and government bond holdings and reduced allocations to securitised assets and to less liquid corporate bonds after the new rules became effective.

16 See FSB (2021), *Global Monitoring Report on Non-Bank Financial Intermediation 2021* (December).

Measures suggest no reduction in structural liquidity mismatch **Graph 1**



Sources: Eikon, Lipper, FSB calculations.

Taken together, these results suggest that there has been no measurable reduction in the degree of structural liquidity mismatch across the OEF sector, even though the analysis was subject to a number of limitations and assumptions that suggest the results should be interpreted cautiously. Moreover, as the OEF sector has grown in absolute terms, reflecting the increased importance of market-based finance, the potential impact of vulnerabilities that can arise from OEFs' structural liquidity mismatch has also grown. These developments have occurred against a backdrop of lower liquidity supply in certain asset markets in stressed conditions, which may affect the ability of markets to meet increased liquidity demand from OEFs and other investors.

4. Reducing shock amplification and transmission through use of liquidity management tools

Directly reducing the degree of structural liquidity mismatch is one means by which the FSB Recommendations seek to mitigate vulnerabilities arising from liquidity mismatch in OEFs. The recommendations also ask authorities to make LMTs available to funds, and to promote their use by funds to mitigate vulnerabilities that arise from structural liquidity mismatch, including in stressed conditions.

FSB Recommendations 4, 5 and 8 address the availability and use of LMTs. Recommendation 4 urges authorities to widen the availability of LMTs to OEFs and reduce barriers to the use of those tools. Recommendation 5 more specifically addresses the availability of tools to reduce first-mover advantage, such as swing pricing, redemption fees and other anti-dilution tools. Recommendation 8 suggests that authorities should provide guidance on the use of LMTs in stressed conditions and, where appropriate, also provide direction in extraordinary circumstances regarding OEFs' use of LMTs. IOSCO operationalised these FSB Recommendations through IOSCO Recommendations 16 and 17, although they focus less on guidance given by authorities in stressed conditions. See Annex 1 for further details.

To the extent that they are available and used, LMTs can help mitigate first-mover advantage or reduce liquidity mismatch through different channels (see Box 3). Specifically:

- If designed properly, price-based LMTs can reduce first-mover advantage dynamics at source, by allocating the full liquidity costs to redeeming investors, thereby reducing the incentive to redeem. By their nature they can be used in both normal and stressed market conditions.

- Quantity-based LMTs operate by reducing the liquidity obligations of OEFs through delaying/deferring payments to investors and, in practice, are a more exceptional form of intervention. While they slow down or prevent redemptions when activated, the expectation that an OEF may use such tools could exacerbate first-mover advantage dynamics to the extent they encourage investors to sell their OEF shares in anticipation of the activation of such tools.

4.1. Availability of LMTs

As per IOSCO Recommendation 17, responsible entities[17] should consider the implementation of additional LMTs. In the IOSCO LRM Review, 12 participating jurisdictions were rated fully consistent with Recommendation 17, and two were rated broadly consistent. The other 11 FSB jurisdictions had adopted domestic regulatory measures for this recommendation.

According to the FSB implementation survey findings and the FSB stocktake of policy tools to address systemic risks in NBFI (see Annex 6),[18] most jurisdictions permit managers to implement a broad range of LMTs, covering normal and stressed market conditions. Some tools are available in almost all jurisdictions, such as imposition of redemption fees and suspension of redemptions. Other tools are available in most, but not all jurisdictions. These include swing pricing, anti-dilution levies and redemption gates, as well as other less commonly used tools such as side pockets and redemptions in-kind.

The IOSCO LRM Review found that LMTs are available in all participating jurisdictions. These tools can be used with two different aims: to provide flexibility (in terms of time) to address redemptions[19] and to provide an anti-dilution effect by passing transaction costs to redeeming investors.[20] Except for the extraordinary LMTs (i.e. suspensions of redemptions), the availability of LMTs is not usually contemplated in domestic laws or regulations. Instead, either the relevant authorities give an implicit authorisation to their use by allowing them to be included in the fund's constitutional document and/or by providing guidance (through circulars, staff letters and guidelines) on their application.

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17 Responsible entities can be fund managers but also other entities. See Annex 2 for details.

18 As part of the stocktake, the FSB, in collaboration with IOSCO, gathered information on the availability and main features of LMTs for OEFs as well as the experience in their use to address systemic risks in NBFI. The LMTs covered in the stocktake were: redemption gates, suspension of redemptions, imposition of redemption fees or other redemption restrictions, side pockets, swing pricing, limits on investment in illiquid assets, liquidity buffers, limits on asset concentration and restrictions on maturity of portfolio assets. Authorities could also list and describe any other LMTs available in their jurisdiction for OEFs.

19 Examples of tools used for this purpose are notice periods, lengthening the settlement periods, gates, suspensions of redemptions and side-pockets.

20 Examples of tools used for this purpose are swing-pricing, redemption fees, anti-dilution levies and shifting valuations from mid to bid pricing.

The FSB implementation survey also identified some good practices that a number of jurisdictions have put in place to make LMTs available to managers, to clarify the availability of LMTs and to reduce legal risk for fund managers that wish to include LMTs in fund constitutional documents (see Box 1).

Box 1: Good practices by authorities on the use of LMTs

- Assessing potential liquidity risk of funds that plan to include LMTs and verifying the appropriateness of the planned LMTs (in both normal and stressed market conditions) based on the investment strategy and redemption obligations during the regulatory vetting process, and requesting enhancements of the list of potential LMTs where required.
- Engagement with investors to improve public understanding regarding the need of LMTs, their deployment and operation, and of the expected positive outcomes of their use.
- Requiring swing factors to be properly updated and calibrated with respect to the market at all times and providing guidance that swing pricing should be sufficiently flexible to accommodate adjustments to cope with circumstances where transaction prices differ substantially from valuations.
- Providing guidance on information that can be used to adjust swing prices, e.g. transaction prices and valuations for a representative sample of portfolio assets.
- Providing guidance on the factors that should be considered for the purposes of setting swing thresholds, including the size, frequency and volatility of historical net purchases or net redemptions during both normal and stressed periods; the fund's investment strategy and asset liquidity; the fund's holdings of cash, borrowing arrangements and other funding sources; and the transaction costs.
- Providing specific guidance on the use of LMTs in stressed conditions, such as March 2020, and providing regulatory forbearance (if needed) by allowing managers not to obtain authorisation to change the prospectus prior to incorporating swing pricing in fund documents.

4.2. Inclusion of LMTs in constitutional documents

Once an authority has taken steps to make LMTs available to funds under its jurisdiction, managers may choose whether or not to include LMTs in the constitutional documents of OEFs they manage. While information on inclusion of LMTs is publicly accessible in OEF constitutional documents, industry-wide data has not been collected on a consistent basis, across jurisdictions or over time, on the LMTs that managers have included. The FSB relied on existing data and analysis to assess the extent to which the likelihood that managers choose to include LMTs has changed over time. Available information suggests that, since the FSB Recommendations were introduced, the inclusion of LMTs in constitutional documents has gradually increased across OEFs. The LMTs most frequently included in constitutional documents are quantity-based LMTs, such as gates or suspensions. However, there remains room for greater uptake of LMTs by managers – particularly of those LMTs that are intended to pass on the cost of liquidity to redeeming shareholders.

In France, textual analysis of funds' prospectuses suggests that the inclusion of some LMTs has increased since end-2017. Research indicates that 14% of French funds (in terms of total net assets) have introduced at least one LMT (redemption gates, swing pricing, or anti-dilution

levies) in their prospectuses.[21] The tools most often cited are redemption gates (included by funds in the sample that represent 9% of total net assets) and, to a lesser extent, swing pricing (6% of total net assets). Inclusion of anti-dilution levies is marginal (2% of total net assets). These LMTs appear to be more prevalent in Undertakings for Collective Investment in Transferable Securities (UCITS) funds than in other OEFs. There has been an increase in the inclusion of swing pricing in recent years, especially for bond funds, and an increase in inclusion of redemption gates, across all OEFs.

In Ireland, regulatory reporting also points to a gradual increase in the inclusion of LMTs between 2018 and 2020 across different types of LMTs. This broad pattern holds even after controlling for differences in the sample of funds in 2018 and 2020, suggesting that the increase is not solely attributable to new funds that include a wide set of tools, but also existing funds widening the set of tools.[22]

In Luxembourg, regulatory data indicates that Luxembourg-domiciled UCITS have included multiple LMTs in their constitutional documents.[23] Based on data from the first half of 2020, nearly all (97%) of the funds included suspension of redemptions and 90% of them included redemption gates. About 65% of the funds included swing pricing and 17% included anti-dilution levies, whereas redemptions in-kind were only included by 10% of the funds.

In Germany, since March 2020, a broader range of OEFs, including UCITS and other OEFs, can choose to include redemption gates, notice periods and swing pricing in addition to previously-available LMTs such as redemption fees and suspension of redemptions. Following the publication of guidelines on the use of redemption gates by an industry and regulatory working group at the end of 2021, an increasing number of fund managers have begun to include gates in OEF constitutional documents. Swing pricing and notice periods, on the other hand, have so far been implemented only very rarely, with the exception of retail real estate OEFs, for which a notice period of 12 months was already prescribed prior to the publication of the FSB Recommendations.

The proportion of assets invested in funds that include in their constitutional documents price-based LMTs (e.g. swing pricing or anti-dilution levies) differs across jurisdictions (for example, 20% in France and around 82% in Luxembourg). Variation in the uptake of LMTs can be driven by a number of factors. Managers of OEFs may choose not to include or employ LMTs due to costs, competitive or reputational concerns. This underscores the importance of more detailed guidance from authorities encouraging the use of LMTs (see Section 7). Competitive concerns may arise due to the effect of the use of anti-dilution LMTs on performance measures or flows. For example, recent empirical work discussed at the FSB and IOSCO outreach suggests that funds that use swing pricing may experience higher return and flow volatility.[24] Nevertheless, some fund managers during the outreach suggested that in jurisdictions where swing pricing has

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21 See Darpeix et al. (2020), *Overview and inventory of French funds' liquidity management tools*; and Darpeix et al (2021), *Overview and inventory of French funds' liquidity management tools: Dynamic view since 2017 and update as at mid-2021*.

22 The regulatory reporting classification in the data collection does not include swing pricing separately, and it is likely most respondents include swing pricing as an anti-dilution tool.

23 See Lewrick et al. (2022), *An Assessment of Investment Funds' Liquidity Management Tools*.

24 See Fong et al. (2022), *Does Swing Pricing Reduce Investment Funds' Liquidity Risk in Times of Market Stress? – Evidence from the March-2020 Episode*, Hong Kong Institute for Monetary and Financial Research working paper.

been operational for longer (e.g. in the UK and Luxembourg), investors feel better protected and react in a positive manner towards the use of swing pricing.

4.3. Use of LMTs

The FSB assessed whether managers – particularly of funds with greater structural liquidity mismatch – were more likely to have made use of LMTs. However, with the exception of suspensions, data are not available on a consistent basis on the use of LMTs by managers in normal times or in times of stress. Managers do not consistently have to disclose or inform regulators when they activate or use an LMT (apart from suspensions). Lack of consistent data about the activation and use of LMTs is more pronounced than lack of data about the inclusion of LMTs in OEFs' constitutional documents. Therefore, most of the information available is based on ad hoc surveys of managers, especially during the COVID-19 shock, with many of these surveys focusing on corporate bond funds. Use of LMTs in normal market conditions has been explored in academic literature.[25] Information on the use of LMTs was also collected as part of the FSB's work on policy tools to address systemic risks in NBFI (see Annex 6).

4.3.1. Use of LMTs in stressed market conditions

In their responses to the FSB implementation survey, all authorities stated that they have provided guidance on the use of LMTs in stressed conditions. However, there are substantial differences in the content and granularity of such guidance across jurisdictions. Guidance takes different forms ranging from case-by-case approaches targeted at specific stress events to issuance of more general self-regulatory or regulatory guidance. In most jurisdictions, authorities also have the power to direct, instruct or guide OEF managers to suspend redemptions. The FSB identified good practices for guidance on the use of LMTs in stressed conditions (see Box 1).[26]

The use of LMTs increased during the height of the COVID-19 shock in response to increased redemption requests, especially for corporate bond funds. In the UK, a survey of corporate bond funds showed that fund managers intensified their use of LMTs during the March stress period in light of increased redemptions.[27] UK funds had access to a wide range of LMTs, but predominantly used swing pricing. Funds also managed their liquidity by holding a higher share of cash and non-cash liquid assets (mainly MMF units and UK government bonds). ESMA's survey of a sample of corporate bond funds and real estate funds (with total NAV of around €2.3 trillion) pointed to increased use of LMTs by corporate bond OEFs during March 2020 in light of their liquidity and valuation challenges.[28]

In March 2020, corporate bond OEFs mainly increased the use of anti-dilution LMTs, rather than quantity-based LMTs (e.g. suspensions or gating). ESMA's analysis pointed to increased use of tools that pass on costs to redeeming investors as the most commonly used LMT during the

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25 See, for example, Jin et al. (2022), *Swing pricing and fragility in open-end mutual funds*, The Review of Financial Studies, 35(1), 1-50. The authors find that in a sample of 224 actively managed corporate bond OEFs 15% of funds switched to swing pricing between 2006 and 2016, and by the end of 2016, 82% of the funds in their sample used some form of alternative pricing.

26 See also Annex 5 for a case study on the guidance issued by the Hong Kong Securities and Futures Commission during the March 2020 market stress.

27 Bank of England and UK Financial Conduct Authority (2021), *Liquidity management in UK open-ended funds*, March.

28 European Securities Markets Authority (2020), *Report on the ESRB Recommendation on Liquidity Risks in Funds*, November.

COVID-19 shock by corporate bond funds. During February and March 2020, in a sample of 541 corporate bond funds, six funds (managed by four management companies) suspended redemptions due to the combination of valuation uncertainties and significant outflows. The use of swing pricing was more widespread (138 funds in total). In Luxembourg, analysis also showed similar findings based on regulatory reporting covering a sample of 1,915 funds.[29] During the first half of 2020, seven funds suspended redemptions, and none reported the use of gates. By contrast, 43% of the funds in the Luxembourg sample used swing pricing and 4% applied anti-dilution levies, up from 36% and 3% as compared to the preceding half-year period.

In the UK and in the EU, based on limited survey data covering corporate bond funds that used swing pricing, swing factors generally increased during the COVID-19 shock. Increasing swing factors to pass on costs to redeeming investors is consistent with the intended use of these tools in the face of high redemptions or a reduction in market liquidity. Nevertheless, UK survey data and responses to an ESMA-coordinated survey of EU funds highlighted wide variation in the swing factors applied across corporate bond funds during the COVID-19 shock.[30] Previous FSB-IOSCO work noted that part of the variation in swing factors may be due to the fact that establishing swing factors requires a degree of judgement and internal expertise to determine the correct degree to which to adjust fund NAV, especially during times of stress.

Based on more detailed data from the UK, part of the variation in swing factors likely reflected different experiences of funds themselves (e.g. size of redemptions and/or liquidity of underlying assets), but part of the variation was also due to different approaches taken by managers in the choice and calibration of swing factors. All managers reported using bid-ask spreads in their swing factor calculation. In doing so, fund managers relied mainly on current or historical bid-ask spreads of the underlying securities. Fund managers, however, used bid-ask spreads in different ways for their swing price calculations. Managers of some funds looked at spreads at a portfolio level, whereas others considered them at an asset class or security level. Participants in a May 2021 FSB-IOSCO workshop noted that up-to-date security prices were an important input to the estimation of swing factors, and obtaining reliable pricing information during the March 2020 market turmoil was difficult.

Even when available, bid-ask spreads do not necessarily capture all explicit and implicit transaction costs.[31] Orders that are large relative to market depth can impact market prices. As a result, the market impact of asset sales to meet redemptions is an implicit cost that can dilute the claims of remaining shareholders unless these costs are incorporated in anti-dilution LMTs. Based on analysis of UK funds, a minority of fund managers explicitly considered market impact in their swing factors. More generally, UK analysis suggests that swing pricing, as applied by corporate bond OEFs during the March 2020 market turmoil, may not fully reflect the cost of sales to meet redemptions, nor the price uncertainty of the underlying bonds.[32]

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29 Lewrick et al. (2022) op. cit.

30 See, for example, Bank of England and UK Financial Conduct Authority (2021) op. cit., Chart 10.

31 See, for example, CFA Institute (2022), *Trading Costs and Electronic Markets* ("Transaction costs include explicit costs and implicit costs. Explicit costs are the direct costs of trading. They include broker commissions, transaction taxes, stamp duties, and exchange fees. Implicit costs include indirect costs, such as the impact of the trade on the price received. The bid-ask spread, market impact, delay, and unfilled trades all contribute to implicit trading costs.")

32 Bank of England and UK Financial Conduct Authority (2021) op. cit.

Some jurisdictions provide guidance on the factors that managers should consider in implementing swing pricing, although the factors to consider vary somewhat across jurisdictions. Determinants of swing factors featured in guidance include actual/estimated transaction costs, bid-ask spreads, taxes, settlement costs, brokerage fees, and costs associated with borrowing to satisfy redemptions. Good practices for swing pricing design and calibration are presented in Box 1.

In certain jurisdictions, such as the United States, high costs and operational hurdles continue to challenge inclusion and use of certain LMTs by managers, despite their availability. For example, in some jurisdictions, intermediaries generally do not communicate fund flows to funds until after the fund has calculated the NAV, meaning that OEF managers determine the NAV before knowing inflows and outflows. This makes calculation of swing factors particularly challenging and may discourage the use of swing pricing.[33]

4.3.2. Effects of swing pricing and other anti-dilution LMTs in normal and stressed market conditions

Empirical analysis has attempted to assess the effects of anti-dilution LMTs (in particular, swing pricing) on outflows and first-mover advantage (and, as a corollary, on 'excess' outflows) and suggests that swing pricing and other price-based LMTs can effectively dampen outflows. These analyses are all based on existing implementations of anti-dilution LMTs which, as discussed in Section 7, could be improved.

Earlier research suggests that swing pricing dampens outflows in reaction to weak fund performance but has a limited effect during stress episodes.[34] One paper presenting analysis of UK OEFs finds that swing pricing significantly reduced first-mover advantage and outflows for these funds in times of stress.[35] The paper finds that funds that hold less liquid assets use swing pricing to a greater degree during periods of low liquidity or high market stress.

More recent research suggests that price-based tools were effective in reducing outflows from funds with high structural liquidity mismatch in March 2020. Analysis of Irish-domiciled funds in March 2020 shows that funds that included redemption fees or anti-dilution levies in their prospectuses experienced lower outflows in March 2020, relative to funds that do not employ fees or levies, but do have tools such as redemption gates, suspensions, or redemptions in-kind in their prospectuses.[36]

Recent academic work has also pointed to potential positive spillovers associated with the use of swing pricing and other tools that allocate the cost of redemptions to redeeming investors, provided these tools are properly calibrated.[37]

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33 See, for example, Kashyap et al, *What is swing pricing?*, Brookings Institution (3 August 2021).

34 Lewrick and Schanz (2017), *Is the price right? Swing pricing and investor redemptions*.

35 Jin et al. (2022) op. cit.

36 Dunne et al. (2022), *Financial fragility in open-ended mutual funds: the role of liquidity management tools*.

37 Ma et al. (2022) op. cit. The authors use a calibration exercise to demonstrate how OEFs that use swing pricing can provide more liquidity to the broader economy.

5. Enhancing regulatory reporting, data availability and public disclosure

5.1. Regulatory reporting

Regulatory reporting provides authorities with data to measure and monitor liquidity mismatch and attendant financial stability risks. FSB Recommendation 1 covers regulatory reporting, which is not addressed by a specific IOSCO Recommendation. Recommendation 1 urges authorities to collect information on the liquidity profile of OEFs in their jurisdiction proportionate to the risks OEFs may pose from a financial stability perspective, and to enhance existing reporting requirements to ensure their adequacy and sufficient granularity and frequency of reporting.

Many jurisdictions enhanced their reporting requirements in the years following publication of the FSB Recommendations. Based on the FSB implementation survey, all but one of the 16 jurisdictions require periodic reporting on the liquidity profile of at least some types of OEFs. However, there is variance in the scope, frequency and content of such reporting. For example, UCITS funds are not subject to common reporting requirements in EU member countries. Some jurisdictions also apply proportionality thresholds that exempt smaller OEFs from reporting. The implementation survey identified examples of good reporting practices that a number of jurisdictions have put in place:[38]

- Requiring OEFs to report data on the liquidity profile of fund assets (the percentage of a fund's portfolio that can be sold within predefined time periods) and the liquidity offered to investors (the percentage of shares outstanding that investors can redeem over the same predefined time periods taking into account redemption terms, such as gates and notice periods, as applicable).

- Requiring OEFs to report on a daily basis the amount of liquid assets held.

- Requiring reporting within one business day: (i) if more than 15% of the fund's net assets are, or become, illiquid investments, and following this event, when the level of a fund's illiquid investments falls to or below 15% of net assets; or (ii) if a fund's assets that are highly liquid investments fall below its set highly liquid investment minimum for more than seven consecutive calendar days.

- Requiring reporting of suspensions of redemptions and periodic reporting of the availability and use of LMTs (redemption gates, swing pricing, anti-dilution levies, temporary suspensions and the use of borrowing) as part of liquidity risk reporting (e.g. on a half-yearly basis).

While most jurisdictions require monthly or quarterly reporting on individual portfolio holdings, the reporting frequency can be longer (up to annual) in some cases, depending also on the fund type and the specific reporting requirement. In most jurisdictions, funds must submit regulatory

[38] See also Annex 5 for a case study on the regulatory reporting requirements for OEFs in Spain.

reporting within one or two months of the end of a reporting period. In two jurisdictions, reports must be submitted within 10 days of the end of a reporting period.

The implementation survey identified examples of jurisdictions' use of regulatory data to better understand fund investments, monitor industry trends, identify funds that may face liquidity issues, as well as identify new and emerging vulnerabilities. Several authorities use analytical tools to measure liquidity risk and monitor fund investments.

In addition, authorities perform cross-sectional analysis of OEFs with similar strategies to identify outliers. Two authorities use daily information about fund liquidity to identify funds that face liquidity strain. In one jurisdiction, managers of such funds are required to take immediate remedial actions to address the liquidity mismatch (usually by applying a LMT included in the OEF's constitutional documents or by adjusting the OEF's liquidity profile through asset sales or deferring asset purchases). Similarly, another authority uses information about fund liquidity to urge funds that face large redemptions and have weak internal controls to make liquidity arrangements.

Authorities in all 16 jurisdictions can also collect ad hoc supervisory information from fund managers more frequently, and in some cases daily. Some jurisdictions used this power during the COVID-19 crisis by requiring ad hoc reporting of funds' flows and other liquidity risk information or requesting depositaries to enhance their monitoring activities and to report to the authorities, as necessary. More recently, this power has been used in connection with Russia's invasion of Ukraine. When data are required to be reported on an ad hoc basis more frequently (e.g. daily), reports are due within one or two business days.

Several jurisdictions can impose early warning or ad hoc reporting requirements on funds that breach thresholds related to liquidity mismatch, and one can impose daily reporting requirements on such funds. These ad hoc reporting requirements are implemented for various reasons across jurisdictions, with some jurisdictions citing large redemptions as a reasonable trigger for ad hoc reporting.

While useful ex interim, ad hoc reporting requirements and high frequency reporting requirements triggered by changes in a fund's liquidity position are less suited to ex ante vulnerabilities monitoring prior to the realisation of a shock.

However, in the course of its assessment, the FSB encountered challenges obtaining and analysing data to systematically measure trends in structural liquidity mismatch and in the adoption and use of LMTs. This suggests that if these challenges are not sufficiently addressed, measuring and monitoring liquidity mismatch and evaluating the availability, use and effectiveness of LMTs for the purpose of assessing vulnerabilities in OEFs will continue to be a challenging task for some authorities, including those seeking to conduct cross-jurisdictional analyses.

5.2. Public disclosure

FSB Recommendation 2 covers investor disclosure requirements and asks authorities to determine the degree to which OEFs should provide additional disclosures to investors on fund liquidity risk, proportionate to the liquidity risks funds may pose from a financial stability

perspective, and to ensure that disclosures are of sufficient quality and frequency. Recommendation 2 also calls for IOSCO to review its existing guidance and, as appropriate, enhance it. IOSCO operationalised FSB Recommendation 2 through its recommendation 7. See Annex 1 for further details.

Based on the IOSCO LRM review, out of the 14 participating jurisdictions nine were fully consistent with IOSCO Recommendation 7, and five were broadly consistent

- All participating jurisdictions rated as fully consistent have explicit regulatory requirements on disclosure, covering elements such as a summary of the process for mitigating liquidity risk; tools or measures that might impact redemption rights, dealing frequency and how to buy/sell shares; the actual or projected asset portfolio/asset classes which the fund is currently invested in or is expected to invest in; and the general approach to managing liquidity demands from a higher level of redemption requests.

- Five participating jurisdictions were rated broadly consistent with IOSCO Recommendation 7. In these jurisdictions, while regulatory frameworks clearly require disclosure relating to liquidity risk, more could be done to enhance these.

In the course of the FSB-IOSCO outreach, participants specifically discussed how disclosures about swing pricing can enhance the effectiveness of swing pricing as investors are able to factor the use of swing pricing into their investment decisions. Some OEF managers, however, emphasised the need to limit disclosure of swing pricing parameters to reduce the likelihood that investors attempt to front-run a swung NAV.

The above points to the importance of ensuring adequate investor disclosure in relation to the availability and use of LMTs by OEFs (see Section 7).

6. Ensuring adequacy of stress testing

6.1. Fund level stress testing

FSB Recommendation 6 covers fund level stress testing. It urges authorities to require and/or provide guidance on stress testing at the level of individual OEFs to support liquidity risk management and mitigate financial stability risk. Stress test results may inform asset allocation and fund design to help manage structural liquidity mismatch. Results may also help managers develop contingency plans that allow them to effectively manage liquidity in stressed conditions. IOSCO operationalised FSB Recommendation 6 through its recommendation 14. See Annex 1 for further details.

Based on the IOSCO LRM Review, ten participating jurisdictions were fully consistent with IOSCO Recommendation 14, three were broadly consistent and one was partly consistent.

- A majority of the participating jurisdictions appear to require that responsible entities conduct ongoing liquidity assessments in different scenarios (e.g. normal, backward or forward looking in addition to stressed). All of these participating jurisdictions provide guidance for determining appropriate parameters (e.g. appropriate for the size,

investment strategy, underlying assets and investor profile of the CIS, taking into account other relevant market and regulatory factors).

- The three broadly consistent jurisdictions do not explicitly require or address the different scenarios that should be considered for testing.
- The one partly consistent jurisdiction does not provide sufficient guidance for determining appropriate parameters for ongoing liquidity assessments.

6.2. System-wide stress testing

FSB Recommendation 9 asks authorities to consider system-wide stress testing that could potentially capture effects of collective selling by funds and other investors on the resilience of financial markets and the financial system more generally. There is no corresponding IOSCO Recommendation. Based on the responses to the FSB implementation survey, ten jurisdictions have conducted system-wide stress testing in line with FSB Recommendation 9. Three jurisdictions report that they have considered conducting such stress testing but have generally used other means to monitor and supervise the fund sector, including:

- Monitoring of major indicators (e.g. fund-level investments and margin financing);
- Monitoring of the status and progress of stress testing and evaluating the stress tests conducted by the relevant regulated entities; and
- Targeted data analyses to gain insight into funds' liquidity risk management practices, trends relevant across funds with similar strategies, and new and emerging risks.

7. Conclusions and policy implications

Authorities have made meaningful progress since the 2017 FSB Recommendations, including through the issuance of IOSCO Recommendations and good practices, as well as revisions to local regulatory frameworks. Nevertheless, recent experience, including during the March 2020 market turmoil, has produced new insights into liquidity management challenges in some segments of the OEF sector – particularly during periods of market-wide stress. The FSB assesses that authorities can take further steps to address vulnerabilities by reducing the underlying liquidity mismatch and promoting the inclusion and use of LMTs to limit transmission and amplification of shocks, and has agreed to carry out related future policy work with IOSCO.

Overall, the findings of this assessment suggest that the FSB Recommendations remain broadly appropriate, but the recommendations would be made more effective by enhancing clarity and specificity on the policy outcomes they seek to achieve. This conclusion reflects lessons learnt since the publication of the 2017 FSB Recommendations and a greater understanding of potential vulnerabilities arising from liquidity mismatch in segments of the OEF sector which point to areas where the 2017 FSB Recommendations could be strengthened from a financial stability perspective. The findings of this assessment suggest that revisions to a subset of the 2017 FSB Recommendations would strengthen their effectiveness.

There are multiple ways to address vulnerabilities stemming from structural liquidity mismatch. One set of measures would aim to reduce structural mismatch by increasing the liquidity of funds' assets and/or by reducing the liquidity funds offer to their investors (e.g. by introducing notice periods or reducing redemption frequencies). Another set of measures would aim to mitigate the financial stability impact of liquidity mismatch by addressing the channels through which liquidity mismatch in OEFs can amplify and propagate shocks. For example, price-based LMTs – implemented effectively – can help reduce first-mover advantage at fund level. Given the diversity of the sector, the FSB proposes an approach that varies depending on the liquidity of funds' asset holdings and focuses mainly on measures to reduce the liquidity offered to OEF investors (e.g. longer notice periods, less frequent dealing) and measures to allocate the cost of liquidity to redeeming investors (i.e. anti-dilution LMTs).

As noted above, recognition of the economic benefits and functions of OEFs as well as the diversity of the OEF sector has been a key principle underpinning this assessment. The policy implications discussed below, therefore, point to the need to achieve proportionate policy outcomes, in the sense that they aim to address identified vulnerabilities without unduly reducing OEFs' ability to perform their core economic functions.

The remainder of this section sets out the policy implications of the assessment and the policy outcomes that revisions to the FSB Recommendations as well as additional policy work would seek to achieve. These policy enhancements would constitute a targeted set of measures that, once implemented, would represent a significant strengthening of the current framework and liquidity management practices among OEF managers. These changes would have benefits for financial stability as well as investor protection. The main findings and policy implications of the assessment have been included in the FSB's NBFI progress report submitted to the G20.[39]

While the policy intent is set out in the proposals, formulating specific revisions to the 2017 FSB Recommendations and developing more detailed guidance around the use of LMTs will require additional work, including engagement with industry and public consultation. The agreed further policy work to achieve the desired policy outcomes based on this assessment is contained in Section 8.

7.1. Reducing structural liquidity mismatch

The 2017 FSB Recommendations sought to promote greater consistency between OEF redemption terms and underlying asset liquidity, with the overall objective of reducing vulnerabilities that can arise from structural liquidity mismatch (Recommendation 3). Recommendation 3 is relatively high-level in its articulation, leaving significant scope for interpretation by both authorities and fund managers. Based on the FSB's assessment, providing greater clarity and specificity on Recommendation 3's intended policy outcomes would strengthen the recommendation's effectiveness and should reduce liquidity mismatch.

Providing greater clarity through revisions to Recommendation 3 would not imply a 'one-size-fits-all' approach across all OEFs or all jurisdictions. There is significant variation in the types of assets and investment strategies that OEFs adopt. In addition, the FSB believes that OEF

[39] FSB (2022), *Enhancing the Resilience of Non-Bank Financial Intermediation: Progress report*, November.

managers are best placed to manage the liquidity of their portfolios. However, to achieve consistent outcomes across fund types, OEF managers should exercise this responsibility within an overall regulatory framework set and supervised by authorities.

A revised Recommendation 3 would aim to provide greater clarity on the redemption terms that OEFs could offer to investors based on the liquidity of their asset holdings. Specifically, it would seek to achieve the following outcomes:[40]

- For funds that mainly invest in assets that are liquid in both normal and stressed periods (e.g. certain listed equities, certain government bonds and certain other assets that can be readily converted into cash without meaningful market impact in normal and stressed market conditions), daily dealing would remain appropriate. Such funds would continue to be subject to liquidity management requirements in both normal and stressed periods. The managers of those funds should continue to enhance their liquidity management practices where appropriate, including by implementing LMTs that pass on to redeeming investors the explicit and implicit costs of selling assets, including any significant market impact of sales.

- Funds that allocate a significant proportion of AUM (e.g. 30-50% or more)[41] to assets that are illiquid even in normal market conditions (e.g. real estate or infrastructure assets) should create and redeem shares at lower frequency than daily and/or require long notice or settlement periods.[42]

- For funds that mainly invest in assets that are less liquid in normal times (relative to certain listed equities and certain government bonds) and are susceptible to illiquidity in times of stress (e.g. certain corporate bonds):

  (i) Offering daily dealing to fund investors (without notice and/or settlement periods) may remain appropriate, subject to fund managers being able to demonstrate to the authorities (in line with their supervisory approaches) that they can implement anti-dilution LMTs that pass on to redeeming investors the explicit and implicit costs of selling assets in both normal and stressed market conditions. Implementation of these anti-dilution LMTs would need to be consistent with guidance from authorities as outlined in Section 7.2, including being able to incorporate any significant market impact of asset sales.

  (ii) Alternatively, or if funds in this category do not meet the recommendation in (i), funds would need to consider and use measures to reduce the liquidity offered to fund investors (e.g. by reducing redemption frequency or by implementing longer notice or settlement periods), as considered appropriate by authorities.

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40 The relevant details would be determined by further work (see Section 8).

41 A detailed specification and relevant qualitative factors to be taken into account will be determined by further work, also to ensure compatibility with different regulatory frameworks across jurisdictions.

42 In an OEF that implements a notice period, redeeming investors receive the value of shares sold based on the fund's NAV at the end of the notice period. By contrast, in an OEF that implements a settlement period, redeeming investors receive the value of shares sold based on the fund's NAV on the redemption date but payment is deferred until the end of the settlement period. Notice (settlement) periods expose redeeming (remaining) investors to the market risk of shares to be redeemed.

- Funds with an allocation to assets in different liquidity buckets that do not fit clearly into any of the prior three categories (for instance, a fund that has a mixed asset allocation) should adopt a prudent approach when determining which of these three treatments to apply to such funds. Managers of such OEFs should be able to demonstrate to authorities (in line with their supervisory approaches) that their determinations are appropriate and should review them periodically, particularly in the event of significant changes in asset allocation or market conditions.

    - Managers should make this determination taking into account (i) the extent to which the liquidity characteristics of portfolio assets are more difficult to assess, market contingent, or portfolio assets are difficult to value in stressed conditions; and (ii) the extent to which the liquidity characteristics of the portfolio can create a potential incentive for investors to redeem early and, in doing so, disadvantage other investors.

    - Accordingly, managers would be expected to consider the nature of the liquidity risk of the OEF's entire portfolio as a whole, the distribution of the asset types (i.e. the proportion of the OEF's AUM allocated to assets falling in different liquidity buckets) and asset liquidity in normal and stressed market conditions. This would include analysis of portfolio-level liquidity measures as well as analysis of the distribution of asset-level liquidity measures for OEF holdings – for instance, the proportion of an OEF's AUM allocated to assets falling in different liquidity "buckets".

    - Further, as set out in Section 7.2, there is a role for strengthening adoption and use of anti-dilution LMTs for all funds, especially those with exposures to less liquid assets.

Box 2 explains why the approach proposed by the FSB focuses primarily on measures to reduce the liquidity offered to OEF investors (e.g. notice periods, less frequent dealing) and measures to allocate the cost of liquidity to redeeming investors (i.e. anti-dilution LMTs). It also outlines considerations around the role of minimum asset holdings.

Box 2: The role of minimum liquid asset holdings

There are multiple ways to address vulnerabilities stemming from structural liquidity mismatch. The FSB's focus is primarily on measures to reduce the liquidity offered to OEF investors (e.g. longer notice periods, less frequent dealing) and measures to allocate the cost of liquidity to redeeming investors (i.e. anti-dilution LMTs). As part of its assessment, the FSB also considered the role of liquid asset holdings in reducing structural liquidity mismatch, and the extent to which requiring funds to allocate a minimum proportion of AUM to liquid assets could increase OEF resilience.

Increasing liquid asset holdings has the potential to reduce structural liquidity mismatch at the portfolio level by increasing the average liquidity of an OEF's holdings. Fund managers recognise that liquid asset holdings play an important role in liquidity management and are well positioned to determine the appropriate level of liquid asset holdings for each OEF they manage. As discussed above, for example, fund types that are more exposed to less liquid assets typically hold more cash. The 2018 IOSCO Recommendations already expect managers to determine appropriate liquidity thresholds which are proportionate to an OEF's redemption obligations and liabilities. Moreover, academic research supports the idea that some OEF managers adjust cash allocations to limit the impact that fund flows would otherwise have on underlying asset markets if OEFs transact directly in portfolio securities.[43]

A requirement to hold a minimum level of liquid assets could complement other elements of a regulatory framework to address vulnerabilities arising from structural liquidity mismatch in OEFs. As discussed elsewhere in this report, for example, it may be difficult to calibrate price-based LMTs to fully pass on the cost of redemptions to redeeming investors in practice, especially if pricing information is less accurate or not readily available in stressed market conditions. Therefore, in principle, liquidity buffers could complement other tools by reducing the need for OEFs to rely on less liquid assets to meet liquidity demands in times of stress.

However, in some settings, regulatory requirements to hold a minimum level of cash or other liquid assets may have unintended consequences, for example, if breaching regulatory thresholds is associated with restrictions on investors' ability to redeem shares. Such requirements may prompt investors to react to stress in a more pro-cyclical manner to avoid the consequences of a fund's crossing those thresholds, and can exacerbate vulnerabilities arising from structural liquidity mismatch.[44] In response, managers may have to sell more assets than otherwise needed to replenish the reduced cash holdings. Minimum cash levels could also result in "cash drag" that deviates fund holdings from investors' desired asset allocation.

The FSB is not proposing to include minimum regulatory requirements for liquid asset holdings across the OEF sector at this time. Authorities can explore whether such requirements could be designed to be countercyclical and avoid encouraging pre-emptive runs.

7.2. Reducing shock amplification and transmission through use of LMTs

This assessment has confirmed the importance of ensuring that a broad set of LMTs is available to managers and used in normal and stressed market conditions by all OEFs, as part of robust liquidity management practices. Based on its findings, the FSB believes there is scope to strengthen the framework around LMTs at a global level, to mitigate potential first-mover advantage arising from structural liquidity mismatch in OEFs, ensure that investors bear the

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43 See Chernenko and Sunderam (2020), Do fire sales create externalities?, Journal of Financial Economics, 135(3), 602-628. The authors show that OEFs with stronger incentives to internalise their price impact accommodate inflows and outflows by adjusting their cash buffers instead of trading in portfolio securities. This result is consistent with such funds using "horizontal" rather than "vertical" slicing to meet redemptions.

44 See, for example, FSB (2021), *Policy proposals to enhance MMF resilience*, October.

costs of liquidity associated with fund subscriptions and redemptions, and arrive at a more consistent approach to the use of LMTs by managers. These aims could be achieved by amending Recommendations 4, 5 and 8 and supported by guidance from authorities on the inclusion of LMTs in constitutional documents[45] and on the use of LMTs, with a particular focus on anti-dilution LMTs (see Box 3).

The FSB Recommendations could be strengthened to achieve the following outcomes:

- Greater inclusion in OEF constitutional documents of anti-dilution LMTs designed to pass on to redeeming investors the explicit and implicit costs of redemptions, including any significant market impact of asset sales to meet those redemptions. Authorities should ensure that OEFs include tools that can effectively impose on redeeming investors the explicit and implicit costs of redemptions, regardless of whether these costs are reflected in the NAV received by shareholders (e.g. swing pricing) or as a charge imposed on subscriptions or redemptions (e.g. anti-dilution levies).

- Greater use of, and greater consistency in the use of, anti-dilution LMTs (beyond their availability and inclusion in OEF constitutional documents). The intended outcome would be to ensure that such LMTs are (i) considered and used in both normal and stressed market conditions; and (ii) account for both explicit and implicit costs of redemptions, including any significant market impact of asset sales. This would put fund shareholders in a similar economic position to investors that opt to invest directly in portfolio securities. Achieving this outcome may require reducing operational or other barriers that prevent the use of such tools.

- Enhanced awareness among investors on the objectives and operation of anti-dilution LMTs. Better communication to fund investors around the design and use of LMTs would enable investors to better incorporate the cost of liquidity into their investment decisions.

The approach outlined above should be complemented with more detailed international guidance on the design and use of LMTs. Such guidance would not need to prescribe a specific calibration of LMTs. Rather it should prescribe the expected framework for the use and oversight of these tools by fund boards or depositories. Guidance on the design of anti-dilution LMTs should identify the factors for managers to consider in employing anti-dilution LMTs to impose on redeeming investors the explicit and implicit costs of redemptions, including any significant market impact of sales. Guidance on the use of tools should encourage greater use of, and greater consistency in the use of, anti-dilution LMTs by managers in both normal and stressed market conditions, including to avoid threshold effects. Such guidance should also emphasise the importance of robust valuation practices to support estimation of costs of liquidity and calibration of anti-dilution LMTs.

The development of this more detailed guidance should be informed by input from market participants to sufficiently address any barriers presented by operational challenges, market structure and practice and, to the extent relevant, any legal or regulatory hurdles. Development

[45] See footnote 8 for examples of OEF constitutional documents.

of such guidance should also explore how to mitigate the disincentives (e.g. costs, reputational and competitive concerns) that may shape inclusion and use of LMTs.

Box 3: Price-based and quantity-based LMTs

LMTs activated by managers in response to increased redemptions can be broadly classified into two categories: tools that operate by limiting the quantity of liquidity available to redeeming investors, i.e. via a 'quantity' channel (such as suspensions or redemption gates) and those that operate by increasing the cost of liquidity available to redeeming investors, i.e. via a 'price' channel (such as swing pricing, fees or levies). These different types of tools serve different purposes. This box explains why the FSB has placed particular emphasis on strengthening the operation of price-based LMTs.

There are specific features of price-based LMTs that potentially make them a particularly useful tool for addressing some of the amplification channels stemming from liquidity mismatch. First, calibrated properly, price-based LMTs can mitigate first-mover advantage at its source, by ensuring that remaining investors do not bear the explicit or implicit costs of redemptions by redeeming investors. Second, price-based LMTs are more likely to be used both in normal and stressed market conditions. 'Normalising' the use of LMTs can enhance their effectiveness, by guarding against stigma effects and making it more likely that they are employed, both in good times and in bad.

More broadly, a key element of the policy discussions has been the balance between policy measures that aim to strengthen resilience of the funds sector ex ante and those that deal with 'excess' redemptions/'excess' asset sales ex post. From that perspective:

- Quantity-based LMTs have typically been activated in response to increased redemptions as ex post measures designed to target the effects of excess redemptions and excess asset sales. Exclusive reliance on such ex post tools can entail unintended consequences. For example, investor expectations that an OEF will use quantity-based LMTs may add to excess redemptions in times of stress, if investors seek to front run potential restrictions on redemptions.
- By contrast, measures to reduce structural liquidity mismatch (e.g. lowering redemption frequency or lengthening notice/settlement periods) are ex ante measures that reduce the likelihood of excess redemptions/excess asset sales in the first instance.
- Price-based LMTs share some of the features of ex ante measures. If operationalised effectively, they can strengthen resilience ex ante by reducing redemptions that might otherwise stem from first-mover advantage and, through that channel, associated excess asset sales. Moreover, if investors understand how these tools operate and expect them to be used, they are more likely to incorporate the cost of liquidity into their investment decisions.

Realising the benefits of price-based LMTs requires calibrating these tools to pass on to redeeming investors the explicit and implicit cost of liquidity, including any significant market impact of asset sales to meet redemptions. Calibrating price-based LMTs to fully reflect these costs can be challenging. Most existing implementations of these tools leave room for improvement, and there remains uncertainty around how well these tools can be calibrated in practice. For this reason, the FSB is recommending further work to produce more detailed guidance on the design and operationalisation of price-based LMTs.

Quantity-based LMTs continue to have a role to play in certain circumstances. For example, operationalisation of price-based LMTs can be particularly challenging when there is very limited market liquidity or when pricing information is not available. So, quantity-based LMTs are complementary to price-based LMTs, especially in extraordinary circumstances, when OEF assets cannot be valued at an appropriate level of precision.

7.3. Enhancing regulatory reporting, data availability and public disclosure

One important objective of regulatory reporting on OEFs is to improve authorities' ability to monitor liquidity mismatch and its management from a financial stability perspective, in ways that would also maintain and enhance investor protection. More detailed and consistent reporting requirements across jurisdictions could support this objective by yielding more usable data for analysis of structural liquidity mismatch. Notable gaps identified in this assessment include information about dealing frequency, notice periods, settlement periods, and investor characteristics. Further, greater availability of data on the use of LMTs could enhance risk monitoring and the effectiveness of policy responses.

Given the complexity of addressing these challenges, the FSB, working with IOSCO, will conduct further work to seek to close identified data gaps for the purposes of financial stability monitoring. This would include determining the benefits of additional data, examining the cost and effort needed to expand data coverage and reporting, and prioritising data gaps to close to improve both central banks and securities regulators' ability to monitor key OEF vulnerabilities.

A voluntary pilot programme in significant OEF jurisdictions would inform more detailed recommendations to close data gaps. Such a programme would seek to share experiences and best practices regarding regulatory reporting requirements, as well as technical knowledge/lessons learned regarding the collection, storage, sharing and analysis of the data reported. Participating members would share the outcome of this work, to establish more clearly which priority data gaps to fill and outline the results of practical efforts to close those gaps over time that may be helpful in informing future work.

Cross-border data sharing is also an important issue for further consideration. In many instances, the domicile of a manager, a fund and location(s) where the fund invests and where the investors reside are different. While acknowledging jurisdictional differences (including on reporting coverage, format and data confidentiality), greater consistency in reporting (especially for key items including, for example, the use of standard identifiers for underlying securities, issuers and counterparties, such as International Securities Identification Numbers (ISINs) and Legal Entity Identifiers (LEIs)) would enable better sharing of usable data across borders, which would be beneficial in monitoring risks throughout the global financial system.

Finally, the FSB recommends that authorities require clearer public disclosures from fund managers on the LMTs available to each fund they manage and on the use of these LMTs in normal and stressed market conditions. The FSB also recommends that managers enhance their engagement with investors so that investors can better understand these disclosures and incorporate them in investment decisions.

7.4. Ensuring adequacy of stress testing

The FSB will promote the use of fund- and system-level stress testing by authorities. The FSB will also promote the sharing of experiences among authorities on the design and use of such stress tests to inform vulnerabilities assessments and policy development.

8. Next steps

The FSB and IOSCO will carry out follow-up policy work to enhance the effectiveness of the FSB recommendations.

Based on the findings and policy implications of the FSB's assessment of the effectiveness of the FSB Recommendations, the FSB and IOSCO will take the following steps:

- Revisions to the FSB Recommendations to address structural liquidity mismatch and promote greater inclusion and use of LMTs as well as to clarify the appropriate roles of fund managers and authorities in implementing these recommendations (timeline: consultative report in mid-2023; revised FSB Recommendation(s) in late 2023.)

    - The FSB, in consultation with IOSCO, will undertake targeted revisions to FSB Recommendation 3 to achieve the policy outcomes outlined in Section 7 of this report. This work will include (i) further developing the "bucketing" approach outlined in Section 7.1; (ii) considering factors managers and authorities should have regard to when determining which assets are "liquid", "less liquid", and "illiquid"; (iii) considering how to identify funds that "mainly invest" in an asset class versus those that allocate a "significant proportion" of AUM to an asset class, as well as instances where funds may not be easily classifiable into one of the three "buckets"; and (iv) determining factors managers and authorities should have regard to when considering the appropriateness of redemption terms (including notice and settlement periods) for funds as outlined in Section 7.1.

    - The FSB, in consultation with IOSCO, will undertake targeted revisions to FSB Recommendations 4, 5 and 8 to achieve the policy outcomes outlined in Section 7. This would seek to promote greater inclusion of anti-dilution LMTs (such as swing pricing and ADLs) aimed at passing on the explicit and implicit costs of redemptions (including any significant market impact of asset sales) to redeeming investors in OEF constitutional documents. Revisions would also aim to encourage greater use, and greater consistency in the use, of these tools in normal and stressed market conditions, including to avoid any threshold effects.

- Operationalisation of the revised FSB Recommendations through amendments to IOSCO 2018 Recommendations and supporting good practices (timeline: to be determined – following the revisions to the FSB Recommendations.)

- Development of detailed IOSCO guidance on LMTs to complement the revised FSB Recommendations (timeline: consultative report in mid-2023; final guidance in late 2023.)

    - IOSCO, in consultation with the FSB, will develop detailed guidance on the design and use of LMTs by funds and oversight of LMTs by fund boards or depositories. This work would include identifying the factors that managers should consider in employing anti-dilution LMTs to impose the explicit and implicit costs of redemptions on redeeming investors in both normal and stressed market conditions. The work would be informed by targeted outreach to market participants to gain a better

understanding of how LMTs are currently designed and assess existing operational or regulatory hurdles that prevent effective use of LMTs. The guidance would be designed with a view to overcoming these hurdles.

- Enhancement of the availability of OEF-related data for financial stability monitoring. (timeline: voluntary pilot programme, including cost-benefit assessment, and reporting findings to the FSB's Standing Committee on Supervisory and Regulatory Cooperation in H2 2023; follow-up work to close data gaps in 2024.)

    - The FSB, in consultation with IOSCO, will seek to close identified data gaps relating to OEF liquidity mismatch, the use of LMTs, and attendant financial stability risks. This will include a voluntary pilot programme among member jurisdictions for examining how to improve data availability and usability, including the cost and effort needed to expand data coverage and reporting; and prioritising data gaps to close in order to improve both central banks and securities regulators' ability to monitor key OEF vulnerabilities related to liquidity mismatch.

- Promotion of the use of stress testing. (timeline: FSB-IOSCO workshop in late 2023/early 2024.)

    - The FSB and IOSCO will promote the sharing of experiences among authorities on the design and use of fund- and system-level stress tests to support OEF liquidity risk management and inform vulnerabilities assessments and policy development.

The FSB and IOSCO will monitor the progress made by member jurisdictions in implementing their respective revised Recommendations. This monitoring will be followed up, once implementation is sufficiently advanced, with an assessment of the effectiveness of jurisdictions' policy measures in addressing risks to financial stability from OEF liquidity mismatch.

Annex 1: Mapping of FSB 2017 recommendations to IOSCO 2018 recommendations

FSB Recommendation	IOSCO Recommendation[46]
Lack of information and transparency	
Recommendation 1: Authorities should collect information on the liquidity profile of open-ended funds in their jurisdiction proportionate to the risks they may pose from a financial stability perspective. They should review existing reporting requirements and enhance them as appropriate to ensure that they are adequate, and that required reporting is sufficiently granular and frequent.	N/A
Recommendation 2: Authorities should review existing investor disclosure requirements and determine the degree to which additional disclosures should be provided by open-ended funds to investors regarding fund liquidity risk, proportionate to the liquidity risks funds may pose from a financial stability perspective. Authorities should enhance existing investor disclosure requirements as appropriate to ensure that the required disclosures are of sufficient quality and frequency. In this regard, IOSCO should review its existing guidance and, as appropriate, enhance it.	Recommendation 7: The responsible entity should ensure that liquidity risk and its liquidity risk management process are effectively disclosed to investors and prospective investors
Gaps in liquidity management both at the design phase and on an ongoing basis	
Recommendation 3: In order to reduce the likelihood of material liquidity mismatches arising from an open-ended fund's structure, authorities should have requirements or guidance stating that funds' assets and investment strategies should be consistent with the terms and conditions governing fund unit redemptions both at fund inception and on an ongoing basis (for new and existing funds), taking into account the expected liquidity of the assets and investor behaviour during normal and stressed market conditions. In this regard, IOSCO should review its existing guidance and, as appropriate, enhance it.	Recommendation 1: The responsible entity should draw up an effective liquidity risk management process, compliant with local jurisdictional liquidity requirements Recommendation 2: The responsible entity should set appropriate liquidity thresholds which are proportionate to the redemption obligations and liabilities of the CIS Recommendation 3: The responsible entity should carefully determine a suitable dealing frequency for units in the CIS Recommendation 4: The responsible entity should ensure that the CIS' dealing (subscription and redemption) arrangements are appropriate for its investment strategy and underlying assets

[46] In addition, IOSCO prepared detailed supporting guidance and good practices to explain what is expected when jurisdictions implement the IOSCO Recommendations.

	throughout the entire product life cycle, starting at the product design phase Recommendation 10: The responsible entity should regularly assess the liquidity of the assets held in the portfolio Recommendation 12: The liquidity risk management process should facilitate the ability of the responsible entity to identify an emerging liquidity shortage before it occurs.
Recommendation 4: Where appropriate, authorities should widen the availability of liquidity risk management tools to open-ended funds, and reduce barriers to the use of those tools, to increase the likelihood that redemptions are met even under stressed market conditions. In this regard, IOSCO should review its existing guidance and, as appropriate, enhance it.	Recommendation 17: The responsible entity should consider the implementation of additional liquidity management tools to the extent allowed by local law and regulation, in order to protect investors from unfair treatment, amongst other things, or prevent the CIS from diverging significantly from its investment strategy. Recommendation 16: The responsible entity should put in place and periodically test contingency plans with an aim to ensure that any applicable liquidity management tools can be used where necessary, and if being activated, can be exercised in a prompt and orderly manner.
Recommendation 5: Authorities should make liquidity risk management tools available to open-ended funds to reduce first mover advantage, where it may exist. Such tools may include swing pricing, redemption fees and other anti-dilution methods. In this regard, IOSCO should review its existing guidance and, as appropriate, enhance it.	Recommendation 17: The responsible entity should consider the implementation of additional liquidity management tools to the extent allowed by local law and regulation, in order to protect investors from unfair treatment, amongst other things, or prevent the CIS from diverging significantly from its investment strategy.
Recommendation 6: Authorities should require and/or provide guidance on stress testing at the level of individual open-ended funds to support liquidity risk management to mitigate financial stability risk. The requirements and/or guidance should address the need for stress testing and how it could be done. In this regard, IOSCO should review its existing guidance and, as appropriate, enhance it.	Recommendation 14: The responsible entity should conduct ongoing liquidity assessments in different scenarios, which could include fund level stress testing, in line with regulatory guidance.
Adequacy of liquidity risk management tools to deal with exceptional circumstances	
Recommendation 7: Authorities should promote (through regulatory requirements or guidance) clear decision-making processes for open-ended funds' use of exceptional liquidity risk management tools, and the processes should be made transparent to investors and the relevant authorities. In this regard, IOSCO should review its existing guidance and, as appropriate, enhance it.	Recommendation 16: The responsible entity should put in place and periodically test contingency plans with an aim to ensure that any applicable liquidity management tools can be used where necessary, and if being activated, can be exercised in a prompt and orderly manner. Recommendation 17: The responsible entity should consider the implementation of additional liquidity management tools to the extent allowed

	by local law and regulation, in order to protect investors from unfair treatment, amongst other things, or prevent the CIS from diverging significantly from its investment strategy. Recommendation 7: The responsible entity should ensure that liquidity risk and its liquidity risk management process are effectively disclosed to investors and prospective investors.
Recommendation 8: While asset managers have the primary responsibility to exercise exceptional liquidity risk management tools regarding the open-ended funds they manage, authorities should provide guidance on their use in stressed conditions. Where jurisdictions consider it appropriate, authorities should also provide direction in extraordinary circumstances regarding open-ended funds' use of such liquidity risk management tools, taking into account the costs and benefits of such action from a financial stability perspective. In this regard, IOSCO should review its existing guidance and, as appropriate, enhance it.	Recommendation 16: The responsible entity should put in place and periodically test contingency plans with an aim to ensure that any applicable liquidity management tools can be used where necessary, and if being activated, can be exercised in a prompt and orderly manner. Recommendation 17: The responsible entity should consider the implementation of additional liquidity management tools to the extent allowed by local law and regulation, in order to protect investors from unfair treatment, amongst other things, or prevent the CIS from diverging significantly from its investment strategy.
Additional market liquidity considerations	
Recommendation 9: Where relevant, authorities should give consideration to system-wide stress testing that could potentially capture effects of collective selling by funds and other investors on the resilience of financial markets and the financial system more generally.	N/A

Annex 2: Summary of the findings of the IOSCO review on the implementation of its 2018 recommendations

This summary sets out the results and observations of the IOSCO thematic review (LRM Review) of the extent to which participating IOSCO member jurisdictions have implemented regulatory measures regarding the key IOSCO Recommendations (LRM Report).[47] The Review helped to monitor whether IOSCO members have put in place appropriate regulatory requirements for LRM processes to be set up by entities responsible for the overall operations of open-ended CIS[48] (Responsible Entities or REs),[49] and conduct appropriate oversight of REs' LRM processes, in both normal and stressed market conditions. Money market funds and exchange-traded funds were excluded from the scope of funds/CIS covered by the LRM Review due to their unique characteristics.

The LRM Report includes 17 recommendations. In this context, the LRM Review looked at five recommendations related to the CIS design process (Recommendations 1, 2, 3, 4 and 7); three recommendations on day-to-day liquidity management (Recommendations 10, 12 and 14); and two recommendations on liquidity contingency planning (Recommendations 16 and 17). These ten recommendations from the LRM Report (Recommendations) form the basis for the LRM Review.

A review team representing ten IOSCO member jurisdictions[50] and the IOSCO Secretariat (Review Team or RT) developed and applied a methodology with three components: (i) an assessment of 14 IOSCO members' regulatory frameworks for consistency with the IOSCO Recommendations; (ii) an assessment of 11 other IOSCO member jurisdictions for implementation of the IOSCO Recommendations; and (iii) an implementation effectiveness analysis of how Responsible Entities operated in practice.

For the first component, 14 IOSCO member jurisdictions (Participating Jurisdictions),[51] comprising over 92% of global AUM, completed a detailed survey describing their LRM requirements in place as of December 2021 (the Review Date). The review of Participating Jurisdictions is a Level 2 assessment, meaning an assessment of whether Participating Jurisdictions have in place regulatory frameworks that are consistent with the Recommendations as of the Review Date. The Review Team assessed and rated the Participating Jurisdictions' responses for consistency of their implemented regulatory frameworks with the LRM Recommendations by analysing the applicable legislation, rules and guidance.

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47 IOSCO (2022), *Thematic Review on Liquidity Risk Management Recommendations, Final Report*, November.

48 The LRM Report defines an open-ended CIS as a registered/authorised/public CIS which provides redemption rights to its investors from its assets, based on the net asset value of the CIS, on a regular periodic basis during its lifetime - in many cases on a daily basis, although this can be less frequently.

49 The RE may or may not be the CIS itself. It could, for example, be a corporate parent of the affiliate, a self-regulatory organisation, or an affiliate of an authority.

50 The ten IOSCO member jurisdictions represented on the RT were: Brazil, France, Hong Kong, Italy, Japan, the Netherlands, Spain, United Kingdom, and United States (both Commodity Futures Trading Commission and US Securities and Exchange Commission).

51 The fourteen Participating Jurisdictions were Australia, Brazil, Canada, China, France, Germany, India, Ireland, Japan, Luxembourg, Spain, Switzerland, United Kingdom, and the United States.

For the second component of the LRM Review, an additional set of 11 IOSCO members (Additional Jurisdictions) completed the same survey, including a self-assessment of whether relevant domestic regulatory measures have been adopted in their respective jurisdictions as of the Review Date (Jurisdictions' Survey).[52] While the Additional Jurisdictions responded to the same Jurisdictions' Survey, the review focused on whether relevant domestic regulatory measures have been adopted ("Level 1 assessment"), but they were not scored on consistency with the IOSCO Recommendations. Rather, the assessment was limited to whether they have completed the process of adopting relevant domestic regulatory measures.

Because of the differences in the review approaches, the ratings for Participating Jurisdictions and Additional Jurisdictions are not comparable.

For the third component of the LRM Review, the Review Team analysed the effectiveness of implementation of the LRM Recommendations through a broadly disseminated, voluntary survey to market participants (Market Participants Survey).[53] Seventy-six entities responded to the Market Participants Survey, including REs[54] operating primarily in seventeen jurisdictions. The responding REs consist of (i) ten global REs who operate global funds with substantial AUM at or near, and some over, $1USD trillion (hereinafter Large Global REs) and (ii) REs with large AUM relative to their region and/or jurisdiction, as well as a few REs with relatively smaller AUM and REs from emerging markets (hereinafter Medium and Small REs). The Review Team also received responses from a few industry associations.

The Market Participants Survey was specifically designed to collect from Responsible Entities both (i) information on their adoption and practical implementation of the Recommendations as of the Review Date as well as (ii) specific targeted information on their LRM practices and experiences during the March 2020 market turmoil.

Key observations from the LRM Review include, among others, the following:

- Seven of the 14 Participating Jurisdictions are Fully Consistent with all ten Recommendations. While some gaps or shortcomings of different degrees of materiality were observed in the other Participating Jurisdictions for one or more of the Recommendations, all fourteen Participating Jurisdictions are at least Partly Consistent with all ten Recommendations.

Box 1 summarises the jurisdictional ratings for Participating Jurisdictions on consistency with the Recommendations.

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52 The eleven Additional Jurisdictions were Argentina, Hong Kong, Indonesia, Italy, Korea, Mexico, The Netherlands, Saudi Arabia, Singapore, South Africa, and Turkey. The Additional Jurisdictions are also all members of the Financial Stability Board.

53 See IOSCO website.

54 For simplicity, responding entities to the Market Participants Survey are referred to as REs. For many larger REs, the responding entity may operate several funds/CIS, but for some smaller respondents, the RE is in fact also the fund/CIS.

Box A1 – Participating Jurisdictions

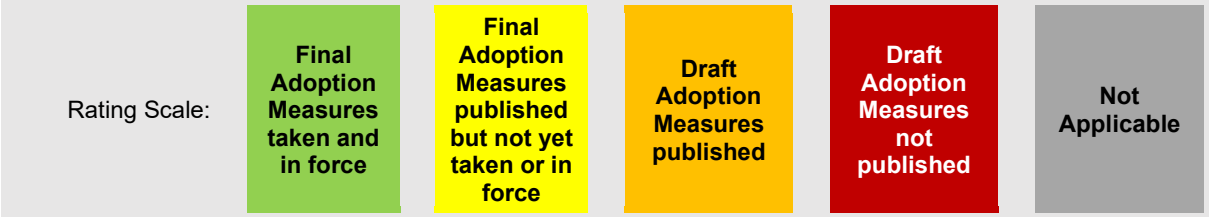
Rating Scale: Fully Consistent | Broadly Consistent | Partly Consistent | Not Consistent | Not Applicable

Jurisdiction	Design Phase					Day-to-day Operation			Contingency Planning	
	Rec.1	Rec.2	Rec.3	Rec.4	Rec.7	Rec.10	Rec.12	Rec.14	Rec.16	Rec.17
Australia										
Brazil										
Canada[55]										
China										
France										
Germany										
India										
Ireland										
Japan										
Luxembourg										
Spain										
Switzerland										
United Kingdom										
United States										

- Four of the 11 Additional Jurisdictions received a rating for all ten Recommendations of Final Adoption Measures taken and in force. Five other Additional Jurisdictions were rated for some of the ten Recommendations as Final Adoption Measures taken and in force or Draft Adoption Measures published. The remaining two Additional Jurisdictions received a rating of Draft Adoption Measures not published for almost all Recommendations, indicating that no published steps have been taken to implement most of the Recommendations.

55 Joint response by Ontario Securities Commission (OSC)/Quebec Autorité de Marchés Financiers (AMF).

Box A2– Additional Jurisdictions



Jurisdiction	Design Phase					Day-to-day Operation			Contingency Planning	
	Rec.1	Rec.2	Rec.3	Rec.4	Rec.7	Rec.10	Rec.12	Rec.14	Rec.16	Rec.17
Argentina										
Hong Kong										
Indonesia										
Italy										
Korea										
Mexico										
Netherlands										
Saudi Arabia										
Singapore										
South Africa										
Turkey										

- Across the ten Recommendations, overall there was broad consistency in Participating Jurisdictions with each of the Recommendations. For Additional Jurisdictions, there was a relatively high level of implementation for Recommendations 1 and 17. However, the implementation of other Recommendations is lacking in some Additional Jurisdictions.

(Recommendation 1). 13 Participating Jurisdictions are Fully Consistent with Recommendation 1, and one is Broadly Consistent. Nine Additional Jurisdictions have Final Adoption Measures taken and in force or Draft Adoption Measures published.

(Recommendation 2). All 14 Participating Jurisdictions are Fully Consistent with Recommendation 2. Six Additional Jurisdictions have Final Adoption Measures taken and in force.

(Recommendation 3). 13 Participating Jurisdictions are Fully Consistent with Recommendation 3, and one is Partly Consistent. Six Additional Jurisdictions have Final Adoption Measures taken and in force.

(Recommendation 4). 12 Participating Jurisdictions are Fully Consistent with Recommendation 4, and two are Broadly Consistent. Five Additional Jurisdictions have Final Adoption Measures taken and in force.

(Recommendation 7). Nine Participating Jurisdictions are Fully Consistent with Recommendation 7, and five are Broadly Consistent. Six Additional Jurisdictions have Final Adoption Measures taken and in force.

(Recommendation 10). 11 Participating Jurisdictions are Fully Consistent with Recommendation 10, two are Broadly Consistent, and one is Partly Consistent. Seven Additional Jurisdictions have Final Adoption Measures taken and in force or Draft Adoption Measures published.

(Recommendation 12). Ten Participating Jurisdictions are Fully Consistent with Recommendation 12, three are Broadly Consistent, and one is Partly Consistent. Four Additional Jurisdictions have Final Adoption Measures taken and in force.

(Recommendation 14). Ten Participating Jurisdictions are Fully Consistent with Recommendation 14, three are Broadly Consistent and one is Partly Consistent. Six Additional Jurisdictions have Final Adoption Measures taken and in force or Draft Adoption Measures published.

(Recommendation 16). 12 Participating Jurisdictions are Fully Consistent with Recommendation 16, one is Broadly Consistent and one is Partly Consistent. Four Additional Jurisdictions have Final Adoption Measures taken and in force.

(Recommendation 17). 12 Participating Jurisdictions are Fully Consistent with Recommendation 17, and two are Broadly Consistent. All eleven Additional Jurisdictions have Final Adoption Measures taken and in force.

Market Participants Survey

Overall, based on the Market Participants Survey, the Recommendations have been largely implemented. The LRM Review also identified certain trends and challenges to implementation. Key observations in the analysis of the Market Participants Survey responses include:

- The responses of both Large Global REs and Medium and Small REs showed high levels of consistency across all ten Recommendations.
- The Large Global REs described practices that were consistent with implementation of all ten Recommendations.

For all REs, the responses reflected implementation of the ten Recommendations; the average observed implementation for a given RE, across all Recommendations, was over 93%.

Annex 3: Summary of the findings of the FSB survey on the implementation of its 2017 Recommendations

Questions on Recommendation 1

Authorities should collect information on the liquidity profile of open-ended funds in their jurisdiction proportionate to the risks they may pose from a financial stability perspective. They should review existing reporting requirements and enhance them as appropriate to ensure that they are adequate, and that required reporting is sufficiently granular and frequent.

1. *What changes to the reporting regime have been introduced since the publication of the 2017 FSB Recommendations?*

Most of the surveyed jurisdictions have introduced new periodic reporting requirements after the publication of the 2017 FSB Recommendations. In particular, six jurisdictions: (Canada, Hong Kong, India, Ireland, Switzerland and US) have put in place new periodic reporting obligations regarding liquidity profile of OEFs. Collected data refers, with different degrees of granularity and frequency, to the liquidity of fund positions and the amount of flows.

In the US, several reporting obligations have come into force since 2018.[56] Form N-PORT requires information about the monthly portfolio holdings in a structured data format. That includes a fund's complete portfolio holdings and additional information that will facilitate risk analysis and oversight; for example, information regarding the liquidity of fund positions and flow information to help identify funds that may be at risk of experiencing liquidity stress due to increased redemptions. The form also includes certain risk metric calculations that measure a fund's exposure and sensitivity to changing market conditions, such as changes in asset prices, interest rates, or credit spreads. Form N-CEN requires annual reporting in a structured data format on the provision of financial support, lines of credit, interfund lending and borrowing, change in valuation methods, and NAV error corrections. Finally, Form N-RN requires funds to file with the SEC if certain liquidity events occur.[57]

As for the EU jurisdictions (France, Germany, Ireland, Italy, Luxembourg, Spain), the European Commission has recently adopted a draft proposal to introduce a new periodic reporting regime for Undertakings for Collective Investment in Transferable Securities (UCITS) funds in line with the Alternative Investment Fund Managers Directive (AIFMD) one. Subject to the approval and entering into effect of this revision, all OEFs will be subject to a comprehensive reporting obligation that includes, among other, information on each OEF's portfolio liquidity profile and investor liquidity profile.

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56 Form N-PORT had a scaled implementation schedule. Larger fund groups (net assets of $1 billion or more) had a compliance date of 1 June 2018 with first reports on Form N-PORT in 2019. Smaller funds had dates in 2020 for a first report on Form N-PORT. Form N-CEN had a 1 December 2018 compliance date, while Form N-RN (formerly "N-LIQUID") had initial effective dates of December 2018 and June 2019 depending on fund size.

57 A fund must file Form N-RN within one business day if one of three liquidity events occur: (1) the level of a fund's illiquid investments exceeds 15% of its NAV; (2) the level of a fund's illiquid investment falls to or below 15% of NAV (following the event of 1 above); or (3) highly illiquid investments that are assets fall below its set highly liquid investment minimum for more than seven consecutive calendar days.

Four jurisdictions did not introduce any changes to their periodic reporting regime following the publication of the 2017 FSB Recommendations. One of them (Brazil) already had in place a reporting regime that covered all the data needed to monitor OEF liquidity risk. Another jurisdiction (UK) had a partial reporting regime that covers one type of OEFs (alternative investment funds (AIFs)) which is complemented with ad hoc reporting requirements when deemed necessary.

2. *What information do authorities collect on the liquidity profile of open-ended funds (both fund assets and redemption terms)? Please provide a general description and specify the content of the reporting requirements on: (i) funds' liquidity risk and management; (ii) liquidity of portfolio and individual portfolio holdings; (iii) valuation procedures; and (iv) contingent sources of funding.*

All but one jurisdiction (Australia) require periodic reporting on the liquidity profile of funds. In the EU and UK frameworks, the reporting regime only applies to AIFs (and, for the UK, UCITS funds that can use leverage). While the EU is expected to extend the AIFMD reporting regime to UCITS funds, some EU jurisdictions (Ireland, Luxembourg, Spain) have already one in place that also contains information related to liquidity risks of UCITS funds. Some authorities also mentioned half-yearly and yearly financial reports as a source of liquidity-related information. Jurisdictions may also rely on third party providers, even though the data may be incomplete.

In addition, all authorities (including Australia) can collect any information from fund managers in the course of their supervision duty on an ad hoc basis. Some jurisdictions have used this power during the COVID crisis by putting in place ad hoc reporting on funds' flows and on other liquidity risk information (e.g. use of LMTs). This power has also been used in the connection of Russia's invasion of Ukraine.

Most jurisdictions require funds to report comprehensive information on the composition of each fund's portfolio on a regular basis, generally monthly (Brazil, France, Luxembourg, Spain, US) or quarterly (other EU jurisdictions, Switzerland) but also fortnightly (for India's debt funds) and semi-annually (Japan).

In the EU framework, India, UK and US, periodic reporting includes information on the portfolio liquidity profile (as a percentage of the fund's portfolio that can be sold within predefined time periods) and the investor liquidity profile (as a percentage of fund shares that can be redeemed by investors within the same time periods, taking into consideration redemption dates, notice periods and gates where available). These metrics are typically classified per time bucket (such as 0-1 day, 2-7 days, etc.). In the EU framework, the reporting also includes information on investor composition and concentration, leverage and the results of liquidity stress testing (for which ESMA Guidelines were published in 2020).

In the US, the SEC also collects information on redemption procedures (e.g. how the fund typically meets redemptions depending on market conditions), restrictions on redemptions (if any, including lines of credit, interfund lending / borrowing or the ability to redeem in-kind) and a summary of principal risks (including liquidity risk). Funds can also provide investors empirical data metrics of the fund's liquidity profile such as bid-ask spreads, portfolio turnover, shareholder concentration and their effect on the fund's liquidity risk management.

While Australia does not collect information on the liquidity profile of OEFs as part of a regular structured data collection exercise, ASIC may get liquidity related information if it requests it as part of its surveillance activities.

The availability of LMTs is generally described in the legal documentation of the fund, which has then to be kept updated during the fund's life. The suspension of redemptions of funds generally has to be reported to the relevant authority (as well as side pockets in the EU). In addition, some jurisdictions (Hong Kong, Ireland) require fund managers or a sample of them (Luxembourg) to notify when a fund experiences daily net redemptions greater than 3% to 5% of their NAV or greater than 5% to 10% over the previous 5 working days. Such notification also includes information regarding which actions have been taken to meet those redemptions (e.g. waterfall sale of assets, pro rata sale of assets, use of available cash, mix) and whether LMTs have been activated (e.g. gates, swing pricing, redemption in kind, borrowing, anti-dilution levies).

In most jurisdictions, funds are required to report daily redemptions and subscriptions on a regular basis. In Brazil and India, funds also have to report daily the amount of liquid assets in the portfolio (using a self-regulatory classification standard in Brazil and a regulatory classification in India). In Brazil this information is compared with the calculated cash outflows within the fund's dealing frequency to detect funds that face liquidity issues, so that the manager is demanded to immediately adjust the liquidity mismatch (usually, by applying a LMT available in the bylaws or by adjusting the fund's liquidity profile). In India, managers have to file a daily exception report of valuation that contains debt securities which trade at outlier prices (i.e. beyond certain thresholds specified by valuation agencies based on the valuation of a given debt security). In the US, funds are required to report to the SEC when more than 15% of the fund's net assets have become illiquid investments (and when the percentage falls back or below 15%) or when the highly liquid investment ratio falls below its highly liquid investment minimum for more than 7 consecutive calendar days. In China, fund managers provide information on the composition and liquidity of portfolio assets, investment strategy, subscriptions and redemptions, and investor structure.

In most jurisdictions, information on the valuation procedure and risk management is part of the authorisation process and should be kept updated. In Brazil, funds must follow IFRS standards (i.e. marked-to-market whenever possible, fair value otherwise). In India, mutual funds are mandated to disclose their credit evaluation policy for the investments in debt securities, based on Guidelines issued by SEBI. Japan provides an extensive description of the valuation procedures that managers should follow for each type of assets. In Switzerland, the valuation of CIS is governed by the law (Article 88 of CISA) and by Guidelines published by the Asset Management Association (which includes the handling of valuation errors); if a valuation issue event happens, the ensuing activation of an LMT (if any) would have to be reported to the relevant authority upon activation. In Spain, OEF valuation, accounting and calculation of net asset value are also governed by rules set in two CNMV Circulars. In China, fund managers must provide information on the valuation method and situations when valuation is suspended.

On contingent funding, the national frameworks are very diverse. In the EU jurisdictions and UK, UCITS funds can temporarily borrow up to 10% of their NAV. In Ireland, all funds have to report quarterly information on, inter alia, securities lending/borrowing activities, loans and deposits and other assets/liabilities. In Luxembourg, funds subject to the dedicated UCITS reporting (a sample of UCITS funds) have to provide information on the actual use of borrowing and

securities financing transactions. In Brazil, direct loans are not allowed but some operations with cash impact are allowed as (i) reverse repos and (ii) asset loans through an exchange for the purpose of short selling operations. In Hong Kong, funds are required to report contingent source of funding on an annual basis as well as to report the year-end aggregate value of cash borrowings. In India, mutual funds can borrow up to 20% of the NAV for no more than six months. Funds have to report the amount, rate and source of funding and to disclose borrowings, if any, above 10% of the net assets in their half-yearly financial report. In Switzerland, only the committed contingent source of funding is reported. In Japan, no reporting on contingent source of funding is requested, but the amount of borrowing (or the maximum limit) is disclosed in the investment trust agreement. In China, the fund manager is required to formulate specific and feasible response plans for the liquidity risks identified in the stress test, including but not limited to: the trigger scenario of the plan, emergency procedures and liquidity risks identified in the stress test measures, the source of emergency funds, the responsibilities and rights of the board of directors, management and various departments of the company.

3. *What is the reporting frequency and time allowed to complete submission?*

Reporting frequency varies from daily (Brazil, China, Hong Kong, India) to weekly (China, Hong Kong), monthly (Brazil, China, Spain), quarterly (EU, Hong Kong, Switzerland, US), semi-annual (EU, Japan, UK), to annual (Canada, EU, Hong Kong), with different reporting frequencies in some jurisdictions depending on fund size and other characteristics. The time allowed to complete a submission varies between 1 business day and 4 months after the end of the specific reporting period.

Many jurisdictions also have early warning or ad hoc reporting requirements (China, EU, Hong Kong) that can also trigger daily reporting requirements (Luxembourg). These ad hoc reporting requirements are implemented for various reasons across jurisdictions, with some jurisdictions citing large redemptions, the activation of LMTs, or general crisis monitoring purposes.

4. *Which managers/OEFs are subject to the reporting requirements?*

Outside the EU, jurisdictions reported that requirements apply to practically all OEFs that are authorised, registered or domiciled in the jurisdiction or to the funds managed by an asset management company registered in the jurisdiction.

In the EU, the OEF universe is split between OEFs covered under the AIFMD and those covered under the UCITS Directive. All OEFs under the AIFMD have regular liquidity reporting requirements, although they are subject to proportionality thresholds. Some EU national regulators maintain separate reporting requirements for UCITS funds (e.g. Ireland, Luxembourg, Spain) on a larger sample basis.

5. *Are any proportionality thresholds applied to reporting (yes/no)?*

Around 2/3rds of respondents reported that they apply proportionality thresholds that exclude certain OEFs from at least some of the reporting requirements (Canada, EU jurisdictions, Hong Kong, Switzerland, UK).

6. *If yes, what are they?*

Proportionality thresholds (in NAV) vary from CAD$ 10 million in Canada up to CHF 500 million in Switzerland (applicable to the annual direct reporting to FINMA).[58] For EU jurisdictions, the AIFMD framework requires less detailed reporting by funds with less than EUR 500 million AuM for unleveraged AIFs, or less than EUR 100 million for leveraged AIFs. In Hong Kong, large redemption reporting is triggered if the daily or cumulative weekly net redemptions exceed a threshold (as a % of the NAV of the fund) and there are no thresholds for other liquidity related reporting requirements. Similar thresholds/rules apply for ad hoc reporting or UCITS reporting as mentioned already under question 2 (e.g. in Luxembourg).

7. *What is the coverage of reporting, in terms of the AuM of the industry at national/regional level? If possible, please provide an estimate of coverage as of 31 December 2021.*

Jurisdictions without proportionality requirements reported 100% coverage of all OEFs, while jurisdictions outside the EU with proportionality requirements reported a low of 77%.

Many EU authorities only reported coverage for OEFs covered by the AIFMD, so the coverage for the entire OEF universe is not clear in all cases. France noted in its response that, because it does not have a reporting requirement for OEFs that are UCITS funds, its coverage is only around 50%. In contrast, Spain has a reporting requirement for UCITS funds and reported 100% coverage. In Luxembourg, around 82% of UCITS funds are subject to the full UCITS risk reporting (in terms of total net assets), while 100% of the AIFs are subject to reporting requirements.

8. *How do authorities use the liquidity information collected in conducting their monitoring or risk assessment?*

In the EU jurisdictions, the AIFM must report the investor and portfolio liquidity profiles which provide an assessment of the liquidity of a fund on the liability and asset side respectively. The portfolio liquidity profile shows which percentage of the AIF portfolio can be sold within predefined time periods. The investor liquidity profile indicates which percentage of fund shares can be redeemed by investors within the same time periods taking into consideration redemption dates, notice periods and gates where available. The AIFM also reports the results of the liquidity stress testing.

In addition to what is set out at EU level, EU member jurisdictions use the liquidity information in conducting their own risk assessment. In France the AIFMD reporting is analysed on a quarterly basis by the supervisory team and used to monitor the leverage used by AIFs. In Germany the authorities receive reports (currently with a weekly frequency, at times it was also daily) from the companies on funds with strong outflows (i.e. redemptions accounting for at least 30% of NAV in a week) and on funds in the most critical category of liquidity risk management. In four jurisdictions (Ireland, Italy, Luxembourg and Spain) the liquidity information is utilised in risk monitoring and risk assessments. Additionally, authorities in Italy run stress test exercises in line with ESMA stress simulation (STRESI) and carry out stress tests where an adverse scenario on margin call is considered, while Luxembourg also uses liquidity information collected in its internal annual liquidity stress testing program as well as for dedicated analytical (public) reports.

[58] However, no threshold applies to the quarterly reporting to the Swiss National Bank, also available to FINMA.

The authorities in two jurisdictions (Brazil and Canada) use liquidity information to assess whether the liquid assets in portfolios are sufficient to correspond to the cash demands against funds. In another four jurisdictions (Hong Kong, Japan, Switzerland, and UK) the authorities monitor and assess the liquidity risk of funds based on the data collected together with other supervisory information to identify abnormalities, breaches and outliers. In China the authorities use the information to focus on funds that face large redemptions and have weak internal controls over liquidity and urge them to make liquidity arrangements. In India authorities use daily data in respect of Open Ended Debt Schemes to develop early warning indicators, to gain an understanding of borrowings by the Scheme and liquidity profile of the scheme to meet redemptions, if any. In the US the authorities have developed various analytical tools to use industry data related to liquidity, including data collected from registrants on Form N-PORT and Form N-RN. Using Form N-PORT data, staff monitor trends to better understand fund investments, industry trends, and new and emerging risks.

Questions on Recommendation 3

In order to reduce the likelihood of material liquidity mismatches arising from an open-ended fund's structure, authorities should have requirements or guidance stating that funds' assets and investment strategies should be consistent with the terms and conditions governing fund unit redemptions both at fund inception and on an ongoing basis (for new and existing funds), taking into account the expected liquidity of the assets and investor behaviour during normal and stressed market conditions. In this regard, IOSCO should review its existing guidance and, as appropriate, enhance it.

9. *Are there regulatory requirements for consistency between fund assets/investment strategies and redemption terms and conditions (yes/no)?*

All respondents indicated that they have regulatory requirements or guidance for consistency between fund assets and investment strategies, and redemption terms and conditions.

10. *If yes, please briefly describe their content, particularly the manner in which they address stressed vs. normal market conditions (including setting dealing terms, notice periods, settlement periods, etc).*

All jurisdictions have in their regulatory requirements or guidance the general principle that an OEF's redemption policy must be consistent with its liquidity profile. This general principle is supplemented by specific requirements with differing degrees of detail in the different jurisdictions.

These rules are accompanied by requirements aimed at limiting counterparty default and liquidity risk such as rules on borrowing limits (e.g. up to 10% of NAV for UCITS), diversification and concentration.

Specific requirements can be largely categorised as:

(i) those relating to the product design stage

(ii) obligations on management companies.

In respect of (i), jurisdictions provide high level guidance requiring funds to set dealing arrangements that are appropriate across the entire life cycle of the fund, taking into account a number of factors such as the fund objectives, liquidity of the assets and the expected redemption demands, including factors such as investor and issuer concentration.

Some jurisdictions require funds only to invest in liquid assets or to hold only a specified and small percentage of illiquid assets (e.g. 10% for EU UCITS funds and Canada, 15% for Hong Kong). In many cases, these go further to provide detailed asset eligibility requirements or permissible assets which are aimed at ensuring that OEFs invest in liquid assets (e.g. EU).

Permissible assets include listed transferable securities, money market instruments, exchange traded derivatives and bank deposits that are repayable on demand or mature in no more than 12 months. Ireland reported that for these funds, there are requirements for minimum dealing frequencies, as UCITS funds must provide at least fortnightly redemptions (though in practice many UCITS funds permit daily or weekly redemptions).

Some jurisdictions, such as France, Germany, Hong Kong and UK, have introduced fund categories that allow a greater proportion of illiquid assets to be held, subject to additional liquidity management standards and consideration of redemption terms.

Few jurisdictions provide specific guidance on what these redemption terms should be, with the exception of four jurisdictions (France, Germany, Hong Kong and Italy), which responded that there are specific requirements for OEFs that have illiquid assets.

In respect of (ii), all jurisdictions impose obligations or expectations on management companies to have appropriate liquidity risk management. Management companies are expected to monitor and assess the alignment of the investment strategy, liquidity profile and redemption policies of OEFs on an ongoing basis. This includes the conduct of pre-investment due diligence.

Most jurisdictions (Australia, Brazil, China, France, Germany, Hong Kong, Ireland, India, Italy, Japan, Luxembourg, Spain, Switzerland and UK) require or expect stress testing under normal and exceptional liquidity conditions, to be conducted regularly or on a frequency that is appropriate to the nature of the OEF. Under the EU regulatory framework, liquidity stress tests must be performed by the management company for all its investments. This is required at the level of the single instrument (i.e. an analysis of the volume and turnover, supply and demand determining the price, the marketability of the assets, number of intermediaries on the market to buy/sell the asset) as well as on the portfolio level. The test should take into account the investor base and subscription/redemption flows. The UK also requires fund managers to consider reverse stress testing.

Additionally, India prescribes two liquidity ratios (one for meeting redemptions based on 95 percentile of historical redemptions and another for meeting the remaining 5 percentile of historical redemptions) that funds are obliged to maintain, based on historical and stressed redemption scenarios.

Most jurisdictions (Australia, Brazil, China, France, Germany, Hong Kong, India, Ireland, Italy, Japan, Luxembourg, Spain, Switzerland, US) allow temporary restrictions of redemptions where there are large redemption requests from investors, although these are sometimes limited to where there are market rather than idiosyncratic stresses.

Questions on Recommendation 4

Where appropriate, authorities should widen the availability of liquidity risk management tools to open-ended funds, and reduce barriers to the use of those tools, to increase the likelihood that redemptions are met even under stressed market conditions. In this regard, IOSCO should review its existing guidance and, as appropriate, enhance it.

11. *Have the authorities widened the availability of liquidity risk management tools for OEFs since the publication of the 2017 FSB Recommendations (yes/no)?*

13 out of 16 jurisdictions responded yes (excluding Australia, Hong Kong and Ireland). These jurisdictions have widened the availability of liquidity risk management tools for OEFs since the publication of the 2017 FSB Recommendations.

Australia, Hong Kong and Ireland already permitted the use of a wide range of LMTs prior to 2017, provided that the possibility for their use is covered in the OEF constitutional documents.

12. *If yes, how the availability of such tools has been widened?*

Most of the jurisdictions have widened the availability of liquidity risk management tools to OEFs and reduced barriers to the use of those tools to increase the likelihood that redemptions are met even under stressed market conditions. Further, in certain jurisdictions such as Canada and India, borrowing beyond the permitted regulatory limits up to a certain extent were permitted by the authority(ies) in order to carry out orderly liquidation of fixed income securities.

A few respondents (France and Spain amongst others) had already enabled a wide variety of LMTs for their regulated entities and have further widened the availability of tools. The LMTs enabled after the 2017 FSB Recommendations by France, Germany and Spain are:

(i) France: notice period, suspension of subscriptions and in-kind redemption.

(ii) Germany: redemption gates, notice periods and swing pricing.

(iii) Spain: swing pricing, imposing a minimum investment in highly liquid assets in all or some of the funds, more flexibility to asset managers in applying notice periods.

In the UK, the authorities have established a specific fund category, the Long-Term Asset Fund, to enable investment in less liquid assets in an OEF structure. Hence, funds in the said fund category are permitted to use a wider range of LMTs (such as infrequent dealing, long notice periods, redemption gates, liquidity caps and side pockets) than retail funds.

Canada, India and Japan were receptive to regulated entities enabling certain LMTs which did form part of regulatory stipulations

(i) CSA (Canada) has permitted borrowing to carry out orderly liquidation of fixed income securities.

(ii) SEBI (India) has permitted borrowing beyond regulatory limits with prior approval of SEBI.

(iii) JITA (Japan) has noted that if there are tools which are not currently available under the existing laws and regulations, JITA rules or due to other reasons, but they are effective in protecting the interest of investors, investment managers are encouraged to consult JITA and JITA will consider the way forward with other members.

In Brazil, India and Japan, authorities permitted a wide range of LMTs after the 2017 FSB Recommendations for use by fund managers.

(i) In Brazil, the authorities issued a notice to market participants to clarify that redemption gates, redemptions in kind, side pocketing, amongst other LMTs were permitted. Following this, one third of fixed income funds lengthened their redemption terms from daily dealing to require a 1 to 5 day redemption delay.

(ii) In India, swing pricing, mandatory liquid assets to be held by debt OEFs, redemption fees (exit load), side pocketing (segregated portfolio), amongst other LMTs were permitted.

(iii) In Japan, periodic review of the liquidity risk management process was required, while expectations were put in place that responsible entities consider additional LMTs (including anti-dilution LMTs) as appropriate.

Switzerland has explicitly regulated the ability to use gating and developed model terms for OEFs on the use of LMTs.

Amendments to permit swing pricing by funds other than MMFs came into effect in the US in 2018.

In Luxembourg, where a wide variety of LMTs has been available for OEFs for a long time, the CSSF has provided tailored guidance via FAQs on the specifics of swing pricing in the context of the COVID-19 crisis, as well as on the possibility of side pockets for UCITS in the current Ukraine crisis via dedicated FAQs.

13. *Are there barriers to the use of liquidity management tools (yes/no)?*

Ten respondents (Australia, Brazil, France, Germany, Ireland, Italy, Luxembourg, Spain, Switzerland, US) said that there are barriers to the use of LMTs, five (Canada, China, Hong Kong, India, Japan) said there were no barriers to their use and one (UK) said the question was not applicable.

14. *If yes, what measures have authorities taken to reduce these barriers or to encourage the use of liquidity management tools?*

However, respondents appear to have interpreted question 13 differently. All allow for the use of LMTs which are subject to an array of rules and/or guidance as well as disclosure requirements.

Those responding that there are no barriers did so on the basis that they have rules and/or guidance in relation to the use of LRM tools and their disclosure which means there are no barriers to their use, i.e., that their use is facilitated by those rules and guidance.

Those who responded that there are barriers did so on the basis that the rules and/or guidance put limits on the use of LMTs to ensure their proper functioning, and/ or said that further or clearer guidance would be beneficial to foster the further use of LMTs. Some respondents also cited asset managers' reluctance to employ LMTs as a barrier because of reputational or competition concerns.

The jurisdiction responding 'not applicable' (UK) did so on the basis that the rules and guidance in place for LMTs meant the question is irrelevant.

15. *To what extent have these tools been used in stressed market conditions?*

Many funds made increasing use of LMTs during the COVID stress starting in March 2020. These include France, Hong Kong, Japan, Spain, UK and US. For other jurisdictions, such as Brazil, China, India, and Switzerland, LMTs have not been used much as these jurisdictions were either not being impacted by recent stresses or they already had certain LMTs in place, such as mandatory liquid assets to be held in liquid funds.

In the case of Germany, LMTs have only recently been permitted by the German Capital Investment Code, so the systems were not in place to enable their use during the early stages of the pandemic. Italy had not observed increasing use of LMTs, which may have been due to competitive or reputational barriers to their use.

France provided guidance on the use of LMTs in March 2020, reminding fund managers that the AMF favours the use of swing pricing and anti-dilution levies during periods of low liquidity and that AMF authorisation was not required for including swing pricing in the prospectus, although it does need to be disclosed.

The availability of tools and whether they are exceptional or not, differed across jurisdictions. The most common tools used were anti-dilution tools (such as swing pricing and anti-dilution levies) and limits or suspension of redemptions, with side pockets and lines of credit being used in a smaller number of countries. Tools were mainly activated due to a shortage of liquidity and/or valuation issues of the fund.

In some cases, the activation of LMTs has to be disclosed to investors (according to the provisions on the disclosure document). However, the activation of tools does not need to be notified to regulators (subject to type of tools used and the national legal framework) in many countries.

Jurisdictions generally require notification in case of suspension (France and Spain also require notification of side pockets). On the other hand, notification of the use of anti-dilution tools is not generally required.

In several jurisdictions where swing pricing was available, it has been widely used across the industry, especially in stressed situations (e.g. Hong Kong, Ireland, Luxembourg and UK). A CSSF working paper concluded that LMTs were more likely to be used in March 2020 than at calmer times. In Ireland, survey data indicated that 25% of corporate bond funds activated swing pricing and 27% anti-dilution levies between 17 February and 31 March 2020. In the UK, survey data indicated that 82% of corporate bond funds with the option to use swing pricing did so in Q1-Q2 2020 (about 50% of all corporate bond funds).

In other jurisdictions, such as France, Spain and Switzerland, swing pricing was used on an occasional basis, partly due to funds in these countries experiencing more limited liquidity pressures. By contrast, although it is permitted, no fund in the US reported using swing pricing. In Japan, the use of swing pricing has not been observed in practice. In India, swing pricing has been introduced only recently.

Other anti-dilution tools (redemption fees, anti-dilution levies) were also used in a few jurisdictions. In Japan, anti-dilution fees, redemption fees and restrictions on redemptions were widely used.

Temporary borrowing facilities were available in four jurisdictions (Canada, Hong Kong, India and US) to meet outflows or margin calls and were used by a limited number of funds during the "dash for cash". In the US, just under 10% of OEFs made use of a line of credit in fiscal years that ended before, during and after March 2020, with the amount of funds accessing their line of credit slightly elevated for fiscal years that include March 2020. Canada issued a temporary exemption order to permit funds to carry out additional short-term borrowing to enable fixed income holdings to be liquidated in a timely manner.

Four jurisdictions (France, Hong Kong, Ireland and Luxembourg) mentioned that fund suspensions had been used in a limited number of cases where funds came under particular stress due to valuation/liquidity issues. For instance, in the Russia-Ukraine crisis a number of funds in France, Hong Kong, Ireland, and Luxembourg with large Russian exposures were forced to suspend, while other funds with a smaller exposure to Russia could remain open by applying fair valuation adjustments (e.g. by applying appropriate haircuts to the affected assets, that could go up to 100%).

Four jurisdictions (France, Hong Kong, India and Spain) stated that side pockets were permitted and had been used in stressed environments. Redemption deferrals and in-kind redemptions were also employed in a few jurisdictions.

16. *Have you observed any unintended consequences from the use of liquidity risk management tools (yes/no)?*

Respondents universally reported no (or did not respond to the question), with one exception discussed below.

17. *If yes, what have they been?*

One jurisdiction (India) responded that mandating liquidity buffers may impact the returns of funds. However, this was not based on any empirical study.

Questions on Recommendation 5

Authorities should make liquidity risk management tools available to open-ended funds to reduce first-mover advantage, where it may exist. Such tools may include swing pricing, redemption fees and other anti-dilution methods. In this regard, IOSCO should review its existing guidance and, as appropriate, enhance it.

18. *What regulatory measures / changes since the publication of the 2017 FSB Recommendations were made to ensure investors bear the full cost of redeeming?*

Many jurisdictions (Australia, Canada, France, Hong Kong, Ireland, Japan, Luxembourg, Spain, Switzerland, UK, US) already had regulatory requirements or guidance in place before the publication of 2017 Recommendations to ensure investors bear the cost of redeeming.

- Nine jurisdictions (Canada, France, Hong Kong, Ireland, Japan, Luxembourg. Switzerland, UK and US) allowed anti-dilution tools (e.g. swing pricing, anti-dilution levies, redemption fees and/or redemption in-kind) to allocate the cost of redemptions to redeeming investors before 2017.

- Spain encouraged changing valuation from mid to bid prices when a fund faces significant redemptions long before 2017.

Among these jurisdictions, some have further enhanced their regulatory measures subsequent to the publication of 2017 FSB Recommendations.

- France, Spain[59] and the US broadened the LMTs available to allow fund managers to allocate redemption costs to redeeming investors.

- Hong Kong, Ireland, Spain and the UK reminded fund managers during market stresses to have effective liquidity risk management in place and to use LMTs appropriately to properly allocate redemption costs (such as transaction costs for liquidation of assets) to redeeming investors.

- Hong Kong and Luxembourg provided tailored guidance via FAQs on the specifics of swing pricing and/or the possibility of side pockets in response to market stresses.

- Canada and Spain published guidance on effective liquidity risk management and the use of LMTs. Canada also encouraged fund managers to apply for exemptive relief on the use of other anti-dilution tools (which are not specifically provided for or allowed under the legislation) as needed.

- The Investment Trusts Association, Japan (JITA) published its response to public comments, which includes guidance on the use of anti-dilution levies and LMTs to ensure investors bear the estimated transaction costs in connection with their purchase or redemption.

Hong Kong also noted that, during the March 2020 market stress, fund managers introduced changes to ensure redeeming investors bear the redemption costs (including the introduction of anti-dilution measures as additional LMTs, reduction of the triggering threshold for application of swing pricing, increase in the frequency of reviewing swing factors and increase in the level of swing factors applied).

[59] Spain broadened the antidilution tools by allowing swing pricing mechanisms, however other anti-dilution tools had been permitted long before 2017.

Four jurisdictions introduced measures to ensure investors bear the cost of redeeming after the publication of 2017 Recommendations.

- Germany and India introduced swing pricing.
- Brazil provided guidance on the use of anti-dilution levy as a LMT to attribute the transaction costs associated with an investment/redemption to investors. It is also evaluating the possibility of introducing swing pricing in the regulatory framework.
- China published guidance to clarify the available LMTs (including anti-dilution tools such as redemption fees and swing pricing) to prevent first-mover advantage.

At EU level, the regulatory framework on the use of LMTs is currently under review via the ongoing AIFMD/UCITS review.

19. *Are anti-dilution tools permitted in your jurisdiction (yes/no)?*

Anti-dilution tools are permitted in all jurisdictions with one exception (Italy). In the case of Canada, their actual application would be subject to the approval of an exemptive relief by the competent authority upon the request of an asset manager.

20. *If yes, how do you define anti-dilution?*

The adoption of a formal definition of the term anti-dilution in the law or in OEF regulations is not a common practice. However, protecting fund investors' interests against potential dilution is a universally accepted and long adopted practice under the regulatory principles of fair treatment and acting in the best interest of investors by the managers. Therefore, the lack of a formal definition should not be confused with an absence of anti-dilution obligations in the regulations and does not necessarily represent a barrier to the use of tools available for that purpose.

In fact, essentially all jurisdictions (except for Italy) permit the use of anti-dilution methods. Jurisdictions typically describe anti-dilution mechanisms as charges borne by incoming or outgoing investors on subscriptions or redemptions, respectively, to offset the dealing costs of buying or selling assets of the fund aiming to preserve the net asset value per unit or share for existing investors. The charges must be operationalised by the manager according to the terms and conditions governing the fund.

The UK has adopted of a formal definition of the term dilution: "the amount of dealing costs incurred, or expected to be incurred, by or for the account of a single-priced authorised fund to the extent that these costs may reasonably be expected to result, or have resulted, from the acquisition or disposal of investments by or for the account of the single-priced authorised fund as a consequence (whether or not immediate) of the increase or decrease in the cash resources of the single-priced authorised fund resulting from the issue or cancellation of units over a period."

Additionally, the term 'dealing costs' is understood to "include both the costs of dealing in an investment, professional fees incurred, or expected to be incurred, in relation to the acquisition or disposal of an immovable and, where there is a spread between the buying and selling prices of the investment, the indirect cost resulting from the differences between those prices."

The above definition is comprehensive enough to encompass several aspects that managers must consider for the operationalisation of methods such as swing pricing and anti-dilution levies. For instance, the language employed includes the fact that, at the time of charge, costs may be those reasonably expected by the manager. The definition of dealing costs explicitly states that professional fees (e.g. broker commissions) and the spread between the buying and selling prices must be included in the computation. Thus, such definition clearly includes the spread, which is a relevant cost to be considered for the potential reduction of first-mover advantages.

It is relevant, though, that it was not possible to assert whether all anti-dilution definitions employed fully considered the market impact of trades. No definitions refer explicitly to the market impact of the trade, which is another potential consideration in relation to first-mover advantage. However, some elements of market impact may be captured in dealing costs, brokerage fees and other adjustments which are referred to in the definitions. Spain mentioned that the use of swing pricing is sufficiently flexible to be able to apply additional adjustments, if necessary, to reflect exceptional market situations where transaction prices differ significantly from the valuation prices. Luxembourg CSSF's FAQ's on the swing pricing mechanism refer to market impact as one component of the swing pricing factor, which determines the anti-dilution compensation.

21. *If yes, what anti-dilution tools (e.g. swing pricing, redemption fees) are permitted?*

Swing pricing and redemption fees are the most broadly permitted anti-dilution tools: 13 out of the 16 assessed jurisdictions allow swing pricing (Australia, China, France, Germany, Hong Kong, India, Ireland, Japan, Luxembourg, Spain, Switzerland, UK and US), and 14 out of 16 jurisdictions (Australia, Brazil, China, France, Germany, Hong Kong, India, Ireland, Japan, Luxembourg, Spain, Switzerland, UK and US) allow redemption fees/anti-dilution levies. However, the concepts of liquidity fee and anti-dilution levy may not be understood exactly in the same way by all jurisdictions.

In India, a swing pricing mechanism can be used on a discretionary basis in normal times, however it becomes mandatory for highly risky schemes during times of market turmoil.

In the UK, a dual price for OEF units is permitted. By using this approach, a higher price is required from investors subscribing the fund than the price to be paid to investors redeeming the units.

Spain allows the valuation of fund holdings to move from "mid" to "bid" (asset buying) prices when the OEF faces net outflows and, conversely, valuation may switch from "mid" to "ask" (asset selling) prices when an OEF faces net inflows.

22. *If yes, do you provide guidance on the use of anti-dilution tools and on the factors that should be included in the calculation of anti-dilution factors (yes/no)?*

11 jurisdictions (Australia, China, France, Hong Kong, India, Japan, Luxembourg, Spain, Switzerland, UK, US) responded yes, and five (Brazil, Canada, Germany, Ireland, Italy) no.

23. *If guidance is provided, what is its content (e.g. what is included in the swing price/liquidity fee and to what extent are managers required to take into account the full cost of redemption, including market impact as well as bid-ask spread and dealing costs)?*

Jurisdictions provide guidance on the application of swing pricing and other anti-dilution tools. Most have a variety of potential tools available, the most common of which are swing pricing and redemption fees. Most guidance focuses on the calculation of swing factors/fees and the governance around these.

- The guidance is mostly general, with the specifics left to funds themselves to determine. The most common guidance is for funds to make sure to properly allocate the redemption costs to ensure that all investors are treated fairly.

- In terms of swing pricing, most allow for funds to choose between applying a partial swing (where the price adjustment takes place when a certain level of net redemptions is reached) or a full swing (where the price adjustment takes place for a net flow of any size). In India, guidance now includes a compulsory change to full swing during market dislocation for high-risk open-ended debt schemes.

- Some jurisdictions give guidance as to the factors that should be considered, including: actual/estimated transaction costs, bid-ask spreads and taxes, settlement costs, brokerage fees and costs associated with borrowing to satisfy redemptions. Spain adds that these factors should be properly updated and calibrated with respect to the market at all times.

- In addition to the costs of trading, the US described further factors that should be considered for setting a swing threshold, including the size, frequency and volatility of historical net purchases or redemptions during normal and stressed periods; the fund's investment strategy and liquidity; the fund's holdings of cash; and borrowing arrangements and other funding sources.

- Further guidance provided in some jurisdictions relates to the governance funds should employ, including: that the swing factor should be subject to ongoing review; that it should take into account the result of liquidity risk assessment and stress testing; and that it should account for changing market conditions. Some guidance is provided on the process, for example ensuring that there are objective requirements for its application, and that there is sufficient personnel and a responsible person for taking the decisions. Many also provide guidance around disclosure of the application of swing pricing, including the maximum swing factor that may be applied. Luxembourg also includes that an indication of the components underlying the swing factor should be provided in the prospectus, including examples.

- Some guidance applies specifically to times of market stress. In Spain, guidance is for swing pricing to remain flexible to cope with exceptional circumstances, defined as where transaction prices are significantly different from valuation prices. Where this is the case, there is guidance as to the information that can be used to estimate the correct swing factor, including using a representative sample of assets, which in the case of fixed income instruments may be done by type of asset and in the case of equities, based on information from transactions carried out or observed in the market for similar volumes. In Luxembourg, the CSSF provided specific guidance on the use of swing pricing during the COVID-19 crisis (e.g. possibilities of increasing the applied swing factor up to / beyond the maximum swing factor laid down in the fund prospectus), which was later integrated in the previously existing swing pricing guidance.

24. *If anti-dilution tools are not used in your jurisdiction, what are the reasons fund managers do not resort to these tools? Do you think that there are any operational, or other type, of barriers to their use?*

Nearly all (15 out of 16) jurisdictions (except Italy) responded that they permit anti-dilution tools (ADTs) in their jurisdictions. While the six EU jurisdictions identified potential competition and reputational harm as possible barriers at EU level to the use of at least some of the LMTs by fund managers, four of them responded that ADTs were used in their jurisdictions (except for Italy and Germany where such tools were either unavailable or only introduced recently). India, while allowing for ADTs, also identified competition and reputational harm as possible reasons in the case of discretionary swing pricing which is applicable during normal times and not stressed times. While the SEC described a wide array of ADTs that may be used by US funds, it identified operational and logistical challenges to the deployment of swing pricing as well as redemption fees and in-kind redemptions. Finally, Canada posited that the lack of widespread availability of many ADTs may explain why they are not prevalent in their jurisdiction. Similarly, Brazil said that ADTs are not widely used as the liquidity profile of assets generally held by Brazilian funds in their portfolios is highly liquid.

25. *Please describe any action(s) authorities have taken to facilitate the use of these tools by fund managers (e.g., by providing additional guidance, either for normal or stressed market circumstances)?*

14 authorities responded that they have taken some form of action to facilitate the use of anti-dilution tools in times of market stress. Some noted that these interventions related to issues that are equally important during normal market conditions, for example, the ongoing fair treatment of all shareholders or unitholders in funds.

Two jurisdictions (Germany and Italy) did not reply and it is not clear whether they expect any of their other responses to address this question, as some others have explicitly done.

- Authorities have published a range of material explaining or reminding responsible entities of their duties in relation to managing liquidity and monitoring redemptions (e.g. Australia, Brazil, Canada, France, Hong Kong, Ireland, Japan, Luxembourg, Spain and UK).

- They have also allowed exemptions and reliefs from their requirements under some circumstances, for example, the USA in relation to borrowing.

- Where some LMTs such as swing pricing are not available, authorities are considering permitting their use, for example France, which will allow their use in funds that have not included them in their prospectuses.

- Others, such as Canada, have made it clear that what is sometimes called exemptive relief may be available to allow managers to use anti-dilution tools that would otherwise not be provided for.

- Some authorities (e.g. Hong Kong) have allowed wider use of anti-dilution measures than otherwise would have been provided for, such as increasing swing factors.

Questions on Recommendation 8

While asset managers have the primary responsibility to exercise exceptional liquidity risk management tools regarding the open-ended funds they manage, authorities should provide guidance on their use in stressed conditions. Where jurisdictions consider it appropriate, authorities should also provide direction in extraordinary circumstances regarding open-ended funds' use of such liquidity risk management tools, taking into account the costs and benefits of such action from a financial stability perspective. In this regard, IOSCO should review its existing guidance and, as appropriate, enhance it.

26. *Have the authorities provided guidance on the use of exceptional liquidity risk management tools in stressed conditions (yes/no)?*

All 16 countries responded yes.

27. *If yes, please describe the main content of the guidance.*

At an EU level, guidance was provided with the inclusion of some general provisions in the ESMA Guidelines on Liquidity Stress Testing for UCITS and AIFs. According to the ESMA Guidelines on Liquidity Stress Testing (LST) for UCITS and AIFs, the outcome of LST should assist a manager in preparing a fund for a crisis and in its broader contingency planning. In Luxembourg, the authorities have twice provided guidance on LMTs in stressed market conditions: guidance to market participants on swing pricing during COVID-19 and FAQ guidance on the application of LMTs including the possibility to segregate assets via side-pockets, especially for UCITS, during the Ukraine crisis.

In other jurisdictions, different approaches for providing guidance under exceptional circumstances have been applied:

- In two jurisdictions (Brazil and UK), responsible entities were provided with guidance on the use of LMTs in stressed market conditions to deal with liquidity constraints in the wake of market volatility and disruption. In the UK, for instance, fund managers implemented suspensions and other LMTs during times of stress (Brexit). On the basis of this experience, further guidance has since been provided to support appropriate use of LMTs for funds investing in inherently illiquid assets.

- In Canada, a fund manager may introduce LMTs to aid in the ongoing liquidity management of the fund during times of market stress or during a confluence of market forces, subject to the consideration of certain overarching principles.

- In India, authorities permit borrowing up to 20% of AUM if a mutual fund is not able to meet redemptions by liquidating its portfolio.

- In Hong Kong, the authority has encouraged and provided specific guidance on the use of anti-dilution tools during market stress and facilitated the increase of swing factors during March 2020 via the publication of FAQs. The authority has also provided specific guidance on the use of exceptional tools (such as side pockets) in response to market events on a case-by-case basis where appropriate.

- In Switzerland, the self-regulatory association has released three circulars on the use of LMTs during stressed market conditions.

- In the US, authorities have advised that during stressed conditions a fund could use its cash and cash equivalents to meet some redemption requests without significant dilution of remaining investors' interests. Additionally, the authorities have provided guidance on borrowing and other funding arrangements that could assist a fund in meeting redemption requests in certain cases.

28. *In extraordinary circumstances, do the authorities have the power to direct (or otherwise instruct or guide) managers of open-ended funds to use liquidity risk management tools? (yes/no)?*

13 jurisdictions replied yes, three replied no (Australia, China, India).

29. *If yes, please provide details on the nature of the power.*

Most respondents indicate that the authority can instruct/enforce suspension of redemptions or further subscriptions if it is in the public interest or in the interest of existing unitholders. In one case this power concerns only suspension of redemptions (Brazil). In one case (Spain), this power concerns several LMTs: suspensions of redemptions, minimum holdings of liquid assets and notice periods. In Germany, the authority has in addition to the power of imposing suspension of redemptions/subscriptions, orders to take action to mitigate material adverse effect from markets developments and on the financial markets. In Ireland, the authority has an additional power to issue certain specific directions, including the suspension of a financial service or the making of payments.

Japan provides only administrative guidance, recommendations and advice to asset managers to take certain actions, however this is accomplished through voluntary cooperation. Luxembourg can provide guidance on the use of LMTs, in addition to the authorities' power to suspend redemptions/subscriptions.

Hong Kong indicates the authority can make enquiries and inspections and, if necessary, require asset manager to take actions (for instance activating LMTs).

In Canada, authorities have the power to issue discretionary exemptive relief that would allow funds to use liquidity risk management tools or enhance the functioning of existing tools.

30. *Has that power been used (yes/no)?*

Only four (Canada, France, Hong Kong, US) out of 16 jurisdictions surveyed reported to have used that power in the past.

31. *If yes, how did the authority take into account the costs and benefits of such action from a financial stability perspective?*

In the few events that the use of the power to direct (or otherwise instruct or guide) OEF managers to use LMTs were reported, not enough details were provided on how a quantitative or qualitative cost-benefit analysis was carried on from a financial stability standpoint.

Canada reported that it had used such powers in the recent Covid-19 event, where the related costs and benefits were considered from the perspective of financial stability. The needs of market participants in a period of emergency were also considered.

The other jurisdictions indicated that public interest, protection of security holders and financial stability aspects (linked to the size of the funds, the situation in the underlying markets, the number of investors involved, among others) were taken into account when using this power.

Questions on Recommendation 9

Where relevant, authorities should give consideration to system-wide stress testing that could potentially capture effects of collective selling by funds and other investors on the resilience of financial markets and the financial system more generally.

32. *Have authorities conducted system-wide stress testing to capture the effects of collective selling by funds and other investors on the resilience of financial markets and the financial system more generally (yes/no)?*

Ten countries responded yes (Brazil, Canada, China, France, Germany, Ireland, Italy, Luxembourg, Spain, UK) and six countries responded no (Australia, Hong Kong, India, Japan, Switzerland and US).

33. *If yes, what assumptions (quantitative and/or qualitative) have you taken into account? For instance, please give details (where relevant) of the scope of market participants included; assumptions regarding collective selling behaviours; reactions of other investors to investment fund selling; etc.*

At the EU level, ESMA has conducted stress simulation for investment funds (see 2019 ESMA economic report ESMA50-164-2458). The report presents the stress testing simulation framework (STRESI) developed by ESMA which plans to use it as a regular monitoring tool to identify risk in the EU fund industry.

In addition to what is set out at the EU level, some EU jurisdictions have implemented their own system-wide stress testing. In Luxembourg the authorities have had a yearly system-wide liquidity stress testing program for investment funds since 2018. In two jurisdictions (Ireland and Italy), the authorities have undertaken work in this area by developing a stress-testing framework for investment funds and have worked in conjunction with colleagues in Europe on this area. In Spain the authority has designed its own stress testing framework for its OEF sector. The authority carries out macro stress test exercises every six months.

In Brazil, the supervisory team runs a stress test on a selected sample of funds to verify if they are able to face the projected scenario. In Canada, the investment funds stress test model developed and used by the Bank of Canada assesses the implications of shocks on funds' performance and associated asset sales and their implications for liquidity in the corporate bond market to gain a better understanding of funds' sale behaviour on fixed-income market liquidity. In China, the scenario assumption of stress testing can adopt the historical scenario method, the hypothetical scenario method or a combination of the two. The historical scenario method refers to simulating major risk events or the worst scenario in history, and the hypothetical scenario method refers to simulating the extreme adverse conditions that can be predicted in the future

based on empirical judgment or quantitative models. The assumed risk factors include the degree of decline of the stock market, the investor redemptions, etc. In the UK, authorities have attempted to simulate the system-wide effects of collective selling by funds and other investors. The authorities assume that fund investors redeem their shares procyclically in response to fund losses, with the strength of the procyclicality varying by fund strategy.

34. *If yes, do authorities have plans to continue to refine the system-wide stress testing methodology (yes/no)?*

All the ten countries that already conduct stress testing plan to continue to refine their system-wide stress testing methodology.

35. *If yes, how?*

At the EU level, authorities have plans to refine the system-wide stress testing methodology to take into account second round effects (pressure on asset prices, further redemptions and asset sales) and contagion to other financial institutions that the collective selling of assets by funds and other institutional investors may generate. In Ireland, the framework can be extended with the introduction of non-linear or stochastic functions with regards to the redemptions, asset sales, price impact, and investor sensitivity to fund returns; the exogenous shock can also be applied to market prices, rather than redemptions and the framework can be extended to include other features such as more macroprudential policy tools. In Spain, further improvements on the connection between funds' behaviour and financial markets under stressed conditions are desirable. They also consider that it would be very interesting to gather more evidence on how managers actually sell their assets when facing turmoil markets.

In Luxembourg the framework has been continuously improved over the last years and tends to stabilise having been completed with a second-round redemption effects model (including a price impact estimation). Brazil is regularly considering the nature of the prescribed exercises, given that they are always subject to refinements according to the circumstances. The UK has begun broadening the framework along a number of dimensions. For example, corporate bonds will be just one type of assets held by investors in their portfolios, so shocks in one asset market could spill over to other asset markets through portfolio rebalancing and other mechanisms. Additionally, the funding of asset portfolios will be modelled in a richer way. In China, the authorities plan to explore the combination of dynamic and static pressure test, and to analyse the possible chain reaction caused by the change of different factors.

36. *If no system-wide stress testing has been conducted, have authorities considered it (yes/no)?*

Out of the six jurisdictions that have not conducted system-wide stress testing, three (Hong Kong, Switzerland and US) have considered it. Three jurisdictions (Australia, India and Japan) have not done system-wide stress testing and have not considered such work.

37. *If yes, please describe the outcome of the considerations and the reasons for not conducting systemwide stress testing for (open-ended) funds?*

While the three jurisdictions have not conducted system-wide stress testing, they have considered the feasibility of doing so and have generally used other means to closely monitor

and supervise the fund sector. In Hong Kong the authorities have conducted various stress tests for the banking, securities and futures sectors. In addition, the authorities in that jurisdiction also monitor major indicators that are relevant to risk developments in their respective sectors. In Switzerland, the authorities closely monitor the status and progress of stress testing and evaluate the stress tests conducted by the relevant regulated entities, which are required by regulation. In the US, authorities determined that while it was not possible to conduct system-wide stress testing in an efficient manner, they focus on targeted data-driven analyses to gain better insight into funds' liquidity risk management practices, trends relevant across funds with similar strategies, and new and emerging risks (this work also informs broader reviews conducted by the US Financial Stability Oversight Council).

Examples of indicators that the authorities look at include credit-to-GDP ratio, M2-to-GDP ratio, interest rates, fund-level investments, margin financing, industry trends, and new and emerging risks.

Annex 4: Takeaways from the June 2022 FSB-IOSCO stakeholder outreach

Day 1: Vulnerabilities associated with structural liquidity mismatch

Session 1: The materiality of liquidity mismatch in driving excess sales

The first session featured two papers which consider first-mover advantage in funds and the market more generally. The first compares evidence of first-mover advantage in mutual funds and in separately managed accounts (SMAs).[60] The second paper compares evidence of first-mover advantage in loan mutual funds and first-mover advantage in high-yield bond funds, and secondary market pricing of underlying assets.[61]

Papers and discussants

- There is evidence that a first-mover advantage arises at the asset class level in stressed market conditions, as a result of competition among investors holding overlapping portfolios for finite market liquidity. This form of first-mover advantage could generate asset sales that are observationally similar to evidence of first-mover advantage in OEFs attributed to structural liquidity mismatch, which could be an important driver of outflows during stress.

- A concave flow-performance relationship exists in OEFs, particularly those that invest in less liquid assets. This relationship becomes more pronounced when market liquidity is lower or portfolio assets are less liquid. This observation may be explained by first-mover advantage among mutual funds investors who understand that redeeming investors share a pool of liquidity with, and can externalise transaction costs (and, notably, market-impact costs,) on remaining shareholders.

- A concave flow-performance also exists in separately managed accounts (SMAs). This relationship also becomes more pronounced when market liquidity is lower or portfolio assets are less liquid. This observation may be explained by the existence of an asset-class first-mover advantage among investors that hold overlapping portfolios and who compete over a shared pool of limited market liquidity.

- The author estimated average flow-performance sensitivity in fixed income-focused SMAs using a framework similar to that used in prior work estimating flow-performance sensitivity in corporate bond OEFs,[62] and found coefficients of similar magnitude.

- Evidence of first-mover advantage at the asset class level suggests that policies to enhance market resilience should address all market participants, and it will be important to consider market resilience more widely to ensure unintended

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60 Stahel (2022), Strategic Complementarity among Investors with Overlapping Portfolios, available at SSRN.

61 Emin et al. (2021), How Fragile Are Loan Mutual Funds?, available at SSRN.

62 Goldstein et al. (2017), Investor flows and fragility in corporate bond funds, Journal of Financial Economics, 126(3), 592-613.

consequences are avoided. While first-mover advantage at the asset-class level, may operate simultaneously, first-mover advantage arising specifically in OEFs should not be discounted.

- Despite holding bank loans, which are generally believed to be less liquid assets, loan funds appear to exhibit less fragility than high-yield corporate bond funds. Moreover, the discount-to-NAV of bank loan ETFs was smaller than the discount-to-NAV of high-yield corporate bond ETFs during the sample period, suggesting that the cost of arbitrage in the loan market is less than the cost of arbitrage in the high-yield bond market. This may be due to the presence of collateralised loan obligations (CLOs) that act as marginal buyers of bank loans that loan funds sell to meet redemptions.

- Liquidity in loan markets comprises trading liquidity and settlement time.

  - Trading liquidity may be *higher* for bank loans than for high yield bonds because the lack of post-trade transparency (in the US, TRACE) means that bank loan traders face a lower risk of adverse selection.

  - Settlement times are higher in loan markets, despite a move towards greater electronification. However, loan funds have liquidity lines in place to bridge settlement gaps.

General discussion

- Both notions of strategic complementarity rely on assumptions about investor rationality and sophistication: strategic complementarity may arise among SMA investors who form beliefs about the propensity of other market participants to sell common holdings, or may arise among OEF investors who form beliefs about the propensity of other investors in the same OEF to sell shares.

- Mitigating financial stability risks arising from market disruptions, requires action on multiple fronts. In addition, policies intended to enhance liquidity supply in stress could be effective in reducing the likelihood that first-mover advantage leads to market dysfunction, regardless of the source of first-mover advantage. However, policies that seek to reduce liquidity demand by OEFs in stress would need to be complemented by other measures if other market participants, such as SMAs, continue to compete for an inelastic supply of market liquidity.

- Notions of financial stability and conduct concerns are closely intertwined. Investors may generate excess sales when they attempt to benefit from guarantees of liquidity in all market conditions. Managers should be obliged, as fiduciaries, to communicate to their clients that liquidity may be more costly in stress.

Session 2: Spillovers to underlying markets and transmission to the real economy

The second session considered spillovers to underlying markets and transmission to the real economy. One paper explores new ways of estimating the impact of asset sales on underlying markets and among, other things, examines which types of market participants tend to affect

market prices through their trading behaviour.[63] Another paper considered liquidity suppliers – and the extent to which insurers supplied liquidity to mutual funds selling assets.[64]

Papers and discussants

- Assets sales in general, and fire sales, in particular, are important in the wake of structural changes in credit intermediation since the 1980s, when the source of funding for non-financial corporates began to shift from bank loans to bonds. Dealers played an important role as liquidity suppliers. After 2008, corporate bond funds grew more quickly and dealer liquidity provision slowed, increasing the risk of liquidity imbalances.

- Forced sales of bonds by distressed investors ("fire sales") can have a significant impact on bond prices. This is particularly true for corporate bonds (relative to government bonds,) and in times of stress. Preliminary analysis suggests there is less price impact associated with sales by asset managers.

- One way of indirectly measuring the amount of pressure an investor experiences to sell a particular bond that is unrelated to news about the bond's fundamentals, is to compute the investor's net sales of unrelated bonds. Including issuer-week fixed effects further adjusts for news related to a particular issuer.

    - However, this method of empirically identifying price impacts from fire sales implicitly assumes that investors respond to shocks in similar ways. This may not be true, particularly if investors are sophisticated and specialise in their bond investments.

- The price impact associated with fire sales across all investors was larger during the dash-for-cash. This was mostly driven by corporate bonds. Sales by asset managers including, but not limited to, OEF managers, appear to have a *positive* price impact in general.

- Another dimension to consider when assessing the potential for spillovers to arise as a result of liquidity mismatch in OEFs, is liquidity supply. Corporate bond mutual funds have accelerated in growth, but liquidity provision by dealers has not. If other investor types step in to absorb sales from OEFs, they may ameliorate spillovers from OEF asset sales.

- Insurers buy some of the HY bonds sold by "de-risking" mutual funds. Noting the effect is strongest after large expansions in dealer's balance sheets and disappears if market risk is high. Insurers earn risk-adjusted returns on bonds bought (vs. those sold). These patterns point to "fair-weather" liquidity provision by insurers. In addition:

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63 Bidder et al. (2022), Smoke without fire? Reassessing empirical evidence of fire sales.

64 Aramonte and Mano (2022), *Insurance companies as liquidity providers: The case of corporate-bond mutual funds*, available at SSRN.

- Insurers tend to absorb more bond sales when dealers are capacity-constrained, but absorb fewer bond sales when they experience shocks to their own balance sheets, such as in periods immediately following natural disasters.

- Trades with de-risking mutual funds tend to be more profitable for insurers than trades with non-de-risking mutual funds.

- Understanding drivers of liquidity provisions complements analysis of liquidity demand by OEFs. Liquidity providers may step in at different times and have different characteristics.

- Markets can evolve to accommodate temporary (and predictable) increases in liquidity demand. One such example is index reconstitution, where the costs of liquidity provision have decreased over time as the composition of market participants who provide liquidity has changed.

General discussion

- Insurers tend to withhold purchases from mutual funds in periods of high stress, and appear to avoid bonds that are close to the investment grade/high-yield threshold (due to higher regulatory capital requirements).

- Because it is difficult to base policy on assumptions about how liquidity suppliers might behave in stress, there is still value in policy measures designed to reduce liquidity demand in stress, notwithstanding evidence that other market participants (e.g. insurers, CLOs) are willing to absorb asset sales by OEFs.

- Secondary market trade in ETF shares can reduce demand for liquidity in secondary markets. Moreover, unlike OEFs, which must interact with the market when investors subscribe or redeem shares, subscriptions and net redemptions of ETF shares can be performed in-kind with Authorised Participants. There was little evidence of ETF primary market activity resulting in sizable bond sales.

- Market liquidity in stress very different from market liquidity in normal times; while bond markets function well in normal times, they may become dysfunctional in stress.

- OEFs may have sold higher quality assets to buy under-priced assets in stress.

Day 2: Addressing vulnerabilities

Session 3: Liquidity management practices and tools

Papers included in the third session focused on OEF liquidity management and liquidity management tools. One paper examines the impact of fund liquidity requirements on portfolio holdings and on asset prices.[65] The other paper analyses OEFs' propensity to insure investors

[65] Chakraborty et al. (2022), The Consequences of Fund-level Liquidity Requirements, available at SSRN.

against idiosyncratic liquidity shocks (which the authors define as "liquidity provision") and argues that swing pricing can increase such liquidity provision by allowing for more illiquid asset holdings by OEFs.[66]

Papers and discussants

- An underlying objective of requiring funds to hold liquid assets is to avoid runs. However, liquidity requirements can induce sales of illiquid assets to meet minimum liquid asset requirements.
- Although not a perfect analogy, the SEC liquidity requirements are similar in spirit to Basel III capital requirements in that they include minimum thresholds. A key difference, however, is that the Basel III framework includes a dynamic countercyclical component, that is absent in SEC rules.
    - This has implications for financial stability and investor protection. A static requirement to hold liquid assets (even if the minimum level of liquid assets is chosen by the fund board) may discourage funds from supplying liquidity in periods of stress and force funds that predominantly hold illiquid assets to deviate from investment objectives.
- Following SEC implementation of liquidity management requirements, funds that hold less liquid securities increased their holdings of cash and government securities and decreased their holdings of less liquid securities. These funds also had lower holdings of less liquid securities during times of elevated uncertainty or fund outflows.
- Post-implementation, funds shifted their corporate bond holdings towards shorter-maturity, rated, investment-grade debt. There is evidence of unintended consequences in the distressed debt markets. High-yield issuers may have faced a higher cost of capital and mutual funds reduced their holdings of less liquid assets.
- In response to aggregate shocks, post-implementation, funds subject to the liquidity requirements tended to increase their holdings of government securities and decrease their holdings of corporate securities in a procyclical fashion. This suggests that liquidity requirements might be enhanced by including a countercyclical component to OEFs' liquid/illiquid asset thresholds designed to make liquidity buffers usable in stress.
- There are also alternative mechanisms available to maintain the liquidity of fund portfolios and allocate liquidity costs in a neutral way, such as in-kind redemptions. Moreover, exchange-traded funds (ETFs) provide a pricing mechanism that can internalise liquidity externalities.
- Bond funds provide a substantial amount of liquidity to the rest of the economy – 20% of that provided by traditional commercial banks. The gap between liquidity provided by banks and liquidity provided by bond funds has been shrinking over time and there is

[66] Ma et al (2020), Bank debt versus mutual fund equity in liquidity provision, Jacobs Levy Equity Management Center for Quantitative Financial Research Paper.

some evidence linking this observation to quantitative easing and the liquidity coverage ratio.

- Liquidity provision is fragile when intermediaries (banks and funds) are exposed to the risk of runs. Funds can provide liquidity without the risk of runs if funds' net asset values fully incorporate the cost of investor redemptions. Swing pricing is one tool that funds can use to incorporate the cost of investor redemptions in fund NAVs.

- Swing pricing can affect fund liquidity provision through two channels. On the one hand, swing pricing may directly reduce fund NAVs, reducing the amount of liquidity funds provide to investors. On the other hand, the equilibrium response of funds that incorporate swing pricing may improve liquidity provision to market and issuers ex-ante. This is because funds that expect to face smaller outflows as a result of swing pricing are more likely to hold less liquid assets.

    - Which of these two effects dominate for a given fund depends on the liquidity of fund holdings and the size of the fund's liquid asset buffer. Funds that hold liquid assets with smaller buffers are less likely to substantially increase liquidity provision after adopting swing pricing than funds that hold illiquid assets and maintain larger buffers.

General discussion

- Banks and asset managers differ in business model. Deposits sit on banks' balance sheets, whereas asset managers act in an agency capacity. Further, the NAVs that asset managers publish are not firm prices, they are purely indicative, and investors should understand that the actual price at which shares are redeemed depends on market conditions.

- To avoid the potential for front-running adjustments to NAV, swing pricing should be used without conditioning use on flows exceeding predetermined swing thresholds (full swing pricing). Use of swing thresholds, if known, may encourage investors to redeem early and induce runs.

- Alternatives to swing prices could have similar effects on outflows so long as they prohibit redeeming investors from imposing externalities on remaining investors. Fixed redemption fees are unlikely to be effective in reducing runs so long as investors believe that the fixed fee is less than the cost a redeeming investor imposes on the fund. A dynamic redemption fee, however, could be designed to be economically equivalent to a swing price.

Session 4: Swing pricing

The final session focused on a specific liquidity management tool: swing pricing. One paper focused on French OEFs and compares the portfolios and flows of OEFs that include swing

pricing in fund prospectuses to funds that do not.[67] A second paper looks at the experience of OEFs in March 2020, comparing OEFs that used swing pricing to OEFs domiciled in jurisdictions where swing pricing is not available and OEFs that are eligible to use swing pricing but do not disclose use of swing pricing.[68]

Papers and discussants

- Among French funds, implementation of swing pricing accelerated between the start of 2018 and end of 2020, with a total increase from 3.4% of funds to 8.1% of funds. Funds that implement swing pricing tend to have higher liquidity mismatch and invest in assets with wide bid-ask spreads.

- The ability to use swing pricing is not the same as using swing pricing. In a sample of Luxembourg funds, while 60% of funds can use swing pricing, only 40% actually do.

- There is evidence that implementation of swing pricing produces a "stigma effect" by signalling to investors that a fund has high liquidity risk. Moreover, funds that implement swing pricing appear to experience lower flows in stress periods. However, this finding may be confounded by an increase in the share of funds implementing swing pricing during the sample period or by self-selection of short-term investors into funds that do not use swing pricing.

- Looking separately at outflows and inflows, funds that implement swing pricing with constraints (i.e. swing thresholds and caps on swing factors) experience higher outflows in stress than funds that implement swing pricing without constraints. However, both groups of funds experience lower inflows in stress periods. This could be due to upward adjustments to NAV by funds experiencing inflows.

- The rationales of having constraints on swing pricing are (i) difficulty of calibrating the swing factor to reflect the true transaction costs; (ii) investor protection; and (iii) operational costs and risks. These factors may reflect trade-offs against higher effectiveness of swing pricing should it be unconstrained.

- A macroprudential perspective on implementation and design of swing pricing may be helpful, but such an approach would be difficult in practice because a fund's swing price designed to meet macroprudential aims would have to incorporate information about expected selling by other funds that hold similar assets.

- Evidence from a broader sample of OEFs that used swing pricing and matched samples of (i) OEFs domiciled in jurisdictions where swing pricing is not available and (ii) OEFs that are eligible to use swing pricing but do not disclose use of swing pricing, suggests that swing pricing significantly mitigated outflows in March 2020, and that swing pricing was more effective when its use was disclosed.

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67 Baena and Garcia (2022), Swing pricing and investment funds' financial stability during the Covid-19 crisis.

68 Fong et al. (2022), Does Swing Pricing Reduce Investment Funds' Liquidity Risk in Times of Market Stress? – Evidence from the March-2020 Episode, Hong Kong Institute for Monetary and Financial Research working paper.

- However, use of swing pricing may have unintended consequences through two different channels. First, there is evidence that use of swing pricing can increase return volatility and flow volatility. Second, funds that use swing pricing may increase leverage to increase potential return and lessen the potential reduction in inflows in normal times, making these funds more vulnerable in stress.

General discussion

- OEFs limit disclosure of swing pricing parameters to reduce the likelihood that investors attempt to front-run a swung NAV.
- Some funds that used swing pricing observed that in March 2020 some swing factors were similar in magnitude to discounts of ETFs investing in comparable underlying assets.
- One of the benefits of swing pricing over other types of tools is that swing pricing can be used continuously, without major threshold effects.

Annex 5: Case studies

Guidance given in Hong Kong during March 2020 severe market stress

The Investment Products Division of the Securities and Futures Commission (SFC) issued a circular letter directed to all management companies, trustees and custodians of SFC-authorised funds and added a Q&A section in a document called Frequently Asked Questions on Post Authorization Compliance Issues of SFC-authorized Unit Trusts and Mutual Funds.

The guidance made it clear to fund managers that increasing the swing factor to be applied on the net asset value (NAV) beyond the maximum swing factor disclosed in the funds' offering documents would not require prior SFC approval due to the extreme volatility in local and international markets relating to the COVID-19 outbreak, under the following conditions:

- The decision to revise the swing factor under the fund's swing pricing mechanism must be duly justified (including a robust methodology that provides an accurate calculation of the NAV which is representative of the prevailing market conditions) and is in the best interests of investors, following a robust internal governance process supported by proper records/documentation.

- The fund managers/the fund must notify existing and new investors (and, to the extent applicable, properly inform distributors of the fund) that a swing factor which exceeds the limit disclosed in the offering document may be used before applying the revised swing factor.

- The fund managers must be able to demonstrate and justify that the swing factor applied at any time was representative of the prevailing market conditions and was in the best interests of investors; and

- The revision and use of the revised swing factor is permitted under the fund's constitutive documents and complies with the applicable laws and regulatory requirements imposed by their home regulators.

This guidance enabled fund managers to more easily impose, with immediate effect, swing factors that were large enough to reflect the increase in costs of liquidating fund assets to meet redemptions in stressed market conditions. The same guidance also applied to increases in the anti-dilution levies. The guidance sought to avoid first-mover advantages by appropriate transparency, information and investor awareness and thus has potential financial stability benefits. Furthermore, the language employed in the guidance emphasised the importance of providing managers with sufficient flexibility to respond to the extreme market situation so that the funds could be managed in the best interests of redeeming and remaining investors.

In the months of March and April 2020, the SFC observed that 16 fund management groups notified investors that they might apply temporarily swing factors above the maximum disclosed in the offering documents under the extreme market conditions and increased redemption requests. This involved around 500 SFC-authorised funds of different types (including money market, bond, mixed, equity and index funds).

Regulatory reporting requirements for OEFs in Spain

In Spain, two different layers of reporting obligations apply to OEFs.

- On the EU level, the Alternative Investment Managers Directive (AIFMD) imposes a comprehensive reporting framework to Alternative Investment Funds (AIFs), which contains, inter alia, information on the main portfolio holdings and liquidity profiles of the asset and liability sides. The portfolio liquidity profile shows which percentage of the AIF portfolio can be sold within predefined time periods. The investor liquidity profile indicates which percentage of fund shares can be redeemed by investors within the same time periods, taking into consideration redemption dates, notice periods and gates where available.

- On the domestic level, a national reporting obligation was introduced by a CNMV Circular requiring all open-ended funds (both UCITS funds and AIFs) to electronically submit monthly information, to be filed in several templates within the following month. These templates contain, inter alia:

  - A complete fund portfolio, detailing every individual holding (by ISIN code), the amount purchased and sold during the month, the amount of titles held at the last day of the month and its valuation.

  - Derivatives information: detailed investments with identification of each instrument, movements during the month, individual valuation according to mark to market or mark to model values, counterparties, nominal value, delta, duration and net exposure calculated according to the commitment method in most of the UCITS.

  - Daily subscriptions and redemptions, net asset value and number of units issued and redeemed.

Annex 6: Availability and use of LMTs for OEFs across FSB jurisdictions[69]

The tables below are high-level summaries of the information collected on the availability and use of LMTs for OEFs. The following notes apply to these tables.

- MMFs are not included in the tables since they were outside the scope of this stocktake.
- An empty cell means that no information was received from that jurisdiction on the availability or use of a specific tool.
- A positive response on the availability of a particular tool does not require the jurisdiction's regulatory framework to specifically mention it as long as it is at available to the manager to use (e.g. based on general regulatory requirements).
- "Yes for all" means that the tool is available or used by all the entities in scope, while "Yes for some" means that the tool is available (Table 1) or used (Table 2) only by a subset of OEFs. For instance, in certain EU countries some LMTs are only available for AIFs and not for UCITS funds. In Australia, the availability of LMTs must be determined in the fund constitution.[70]
- Table 2 on the use of each tool is based on the information available to responding authorities. In most jurisdictions, fund managers are not obliged to report the use of most of the tools to relevant authorities, so the information has been provided on a best-efforts basis.
- "Alternative" means that the specific tool is not available but that another tool (or regulatory/supervisory approach) aiming at a similar outcome is available. For instance, Italy reports that while swing pricing is not available, the asset manager has the right to determine the redemption price according to methods other than ordinary ones, where this is necessary to ensure equal treatment of all participants in the fund.

69 The FSB's stocktake of policies to address systemic risks in NBFI was conducted separately from this assessment as part of the FSB's work on policy tools to address systemic risk in NBFI.

70 In some cases (e.g. China and the United States), jurisdictions' responses also include tools applicable to ETFs.

Table 1: Availability of LMTs for OEFs

Jurisdictions	Redemption gates	Suspension of redemptions	Imposition of redemption fees or other redemption restrictions	Side pockets	Swing pricing	Limits on investments in illiquid assets	Liquidity buffers	Limits on asset concentration	Restrictions on maturity of portfolio assets
Argentina	Yes for all	Yes for all	Yes for all	Not for any	Not for any	Not for any	Not for any	Yes for all	Not for any
Australia	Yes for some	Yes for some	Yes for some	Yes for some	Yes for some	Yes for some	Alternative	Alternative	Not for any
Brazil	Yes for all	Yes for all	Yes for all	Yes for all	Not for any	Alternative	Not for any	Yes for all	Not for any
Canada	Not for any	Yes for all	Yes for all	Not for any	Not for any	Yes for all		Yes for all	Not for any
China	Yes for all	Yes for all	Yes for some	Yes for some	Yes for some	Yes for all	Yes for all	Yes for some	Yes for some
France	Yes for all	Yes for all	Yes for all	Yes for all	Yes for all	Yes for some	Not for any	Yes for all	Not for any
Germany	Yes for all	Yes for all	Yes for all	Not for any	Yes for some	Alternative	Yes for all	Yes for all	Not for any
Hong Kong	Yes for all	Yes for all	Yes for all	Yes for all	Yes for all	Yes for all	Yes for all	Yes for all	Yes for all
India	Yes for all	Yes for all	Yes for all	Yes for all	Yes for all	Yes for all	Yes for all		Yes for all
Indonesia	Yes for all	Yes for all	Yes for all	Not for any	Not for any	Yes for all	Yes for all	Yes for all	Yes for all
Italy	Alternative	Yes for all	Yes for all	Alternative	Alternative	Yes for all	Alternative	Yes for all	Not for any
Japan	Yes for all	Yes for all	Yes for all	Not for any	Not for any	Yes for all	Not for any	Yes for all	Not for any
Korea	Not for any	Yes for all	Not for any	Yes for all	Not for any	Yes for all	Not for any	Yes for some	Not for any
Mexico	Yes for all	Yes for all	Yes for all	Yes for all	Yes for all	Not for any	Not for any	Yes for all	Not for any
Netherlands	Yes for all	Yes for all	Yes for all	Yes for all	Yes for all	Yes for some	Not for any	Yes for some	Not for any
Saudi Arabia	Yes for all	Yes for all	Yes for all	Not for any	Not for any	Yes for all	Yes for all	Yes for all	Yes for all
Singapore	Yes for all	Yes for all	Yes for all	Yes for all	Yes for all	Yes for some	Not for any	Yes for all	Yes for all
South Africa	Yes for all	Yes for all	Yes for all	Not for any	Not for any	Yes for all	Yes for some	Yes for all	Yes for some
Spain	Yes for some	Yes for all	Yes for all	Yes for all	Yes for all	Yes for some	Yes for some	Yes for some	Not for any
Switzerland	Yes for all	Yes for all	Yes for all	Yes for all	Yes for all	Yes for all	Alternative	Yes for all	Alternative
Türkiye	Yes for some	Yes for all	Yes for some	Yes for all	Not for any	Yes for some	Yes for some	Yes for all	Not for any
UK	Alternative	Yes for all	Yes for some	Not for any	Yes for some	Yes for some	Alternative	Yes for some	
US	Not for any	Yes for all	Yes for all	Yes for some	Yes for some	Yes for all	Yes for all	Yes for all	Yes for all

Table 2: Use of LMTs for OEFs

Jurisdictions	Redemption gates	Suspension of redemptions	Imposition of redemption fees or other redemption restrictions	Side pockets	Swing pricing	Limits on investments in illiquid assets	Liquidity buffers	Limits on asset concentration	Restrictions on maturity of portfolio assets
Argentina		Yes for all	Not for any						
Australia	Yes for some	Yes for some	Yes for some		Yes for some				
Brazil	Yes for all	Yes for all	Yes for all	Yes for all		Yes for all		Yes for all	
Canada		Yes for some	Yes for some			Yes for all		Yes for all	Yes for all
China	Yes for all	Not for any	Yes for some	Not for any	Not for any	Yes for all	Yes for all	Yes for all	Yes for some
France	Yes for all	Yes for all	Yes for all	Yes for all	Yes for all	Yes for some			
Germany	Not for any	Yes for all	Yes for all		Not for any	Yes for all	Yes for all	Yes for all	
Hong Kong	Yes for some	Yes for some	Yes for some	Yes for some	Yes for some	Yes for all	Yes for all	Yes for all	Yes for all
India					Yes for all		Yes for all		
Indonesia	Yes for all	Yes for all	Yes for all				Not for any	Yes for all	Yes for all
Italy	Yes for some	Not for any	Yes for all	Yes for some		Yes for all	Yes for all	Yes for all	
Japan		Yes for all	Yes for all			Yes for all		Yes for all	
Korea		Yes for all		Yes for all		Yes for all	Not for any	Yes for some	Not for any
Mexico			Yes for all		Yes for all				
Netherlands	Yes for all	Yes for all	Yes for all	Not for any	Yes for all	Yes for some		Yes for some	
Saudi Arabia	Yes for all	Yes for all	Yes for all	Not for any	Not for any	Yes for all	Yes for all	Yes for all	Yes for all
Singapore	Yes for all	Yes for all	Yes for all	Yes for all	Yes for all	Yes for some		Yes for all	Yes for some
South Africa	Yes for all	Yes for all	Yes for all	Yes for all		Yes for all	Yes for some	Yes for some	Yes for some
Spain		Not for any	Yes for all	Yes for some	Yes for some	Yes for some	Yes for some	Yes for some	Not for any
Switzerland	Yes for some	Yes for all	Yes for all	Not for any	Yes for some	Yes for all	Yes for all	Yes for all	Yes for all
Türkiye	Yes for some	Not for any	Yes for some	Yes for some		Yes for all	Yes for some	Yes for all	
UK	Yes for some	Yes for all	Yes for some	Not for any	Yes for some	Yes for some	Yes for all	Yes for some	
US	Not for any	Yes for some	Yes for some	Yes for some	Not for any	Yes for some	Yes for some	Yes for some	

Abbreviations

AIF	Alternative Investment Fund
AIFM	Alternative Investment Fund Manager
AIFMD	Alternative Investment Fund Manager Directive
AMF	Autorité des marchés financiers (France)
ASIC	Australian Securities and Investments Commission
AUM	Assets under Management
BoE	Bank of England
CIS	Collective Investment Scheme
CNMV	Comisión Nacional del Mercado de Valores (Spain)
CSSF	Commission de Surveillance du Secteur Financier (Luxembourg)
EME	Emerging Market Economy
ESMA	European Securities and Markets Authority
ETF	Exchange-Traded Fund
EU	European Union
FINMA	Swiss Financial Market Supervisory Authority
FSB	Financial Stability Board
HY	High yield
IFRS	International Financial Reporting Standards
IOSCO	International Organization of Securities Commissions
ISIN	International Securities Identification Number
JITA	The Investment Trusts Association, Japan
LEI	Legal Entity Identifier
LMT	Liquidity Management Tool
LRM	Liquidity Risk Management
LST	Liquidity Stress Testing
MMF	Money Market Fund
NAV	Net Asset Value
NBFI	Non-bank financial intermediation
OEF	Open-ended fund
SEBI	Securities and Exchange Board of India
SEC	US Securities and Exchange Commission
SFC	Hong Kong Securities and Futures Commission
TRACE	Trade Reporting and Compliance Engine
UCITS	Undertakings for Collective Investment in Transferrable Securities