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Liquidity Preparedness for Margin and Collateral Calls

Final report

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Executive summary

This report sets out policy recommendations to enhance the liquidity preparedness of non-bank market participants for margin and collateral calls in centrally and non-centrally cleared derivatives and securities markets (including securities financing such as repo).

This work forms part of the FSB's work programme on enhancing the resilience of NBFIs. It follows up on the findings of the 2022 BCBS-CPMI-IOSCO review of margining practices, which recommended that the FSB undertake additional international work on enhancing liquidity preparedness of market participants and on regulatory data gaps, so that authorities can better monitor the NBFIs sector's liquidity preparedness.

The FSB has analysed recent incidents of liquidity stress – the March 2020 market turmoil, the Archegos failure in March 2021, the commodities markets turmoil in 2022, and the September 2022 issues experienced by many pooled liability-driven investment funds in the UK. The analysis was complemented by a survey of financial authorities and feedback from industry stakeholder outreach events. Together, these highlight the need for policy adjustments to deal with liquidity strains in the NBFIs sector arising from spikes in margin and collateral calls during times of market stress.

The findings suggest that whilst margin and collateral calls are a necessary protection against counterparty risk, they can also amplify the demand for liquidity by market participants if they are unexpected in times of stress and affect a large enough part of the market. The increase in such calls can impact market participants differently depending on the size of positions and level of liquidity preparedness. The FSB identified liquidity risk management and governance weaknesses of some market participants as key causes of their inadequate liquidity preparedness for margin and collateral calls.

The FSB's eight policy recommendations in this report cover liquidity risk management and governance, stress testing and scenario design, and collateral management practices of non-bank market participants, focussing on liquidity risks arising from spikes in margin and collateral calls, including under extreme but plausible stressed conditions. The policy recommendations cover both centrally and non-centrally cleared derivatives and securities markets and apply to a broad range of non-bank market participants that may face margin and collateral calls, including insurance companies, pension funds, hedge funds, other investment funds and family offices, and non-financial entities, such as commodities traders. The recommendations are intended to build on and complement rules and regulations for liquidity risk management and governance that already exist in many sectors and jurisdictions. The recommendations should be applied proportionately to the underlying risks of different non-bank market participants.

Recommendation 1 to 3: liquidity risk management practices and governance

Recommendation 1 sets out the need to include liquidity risk arising from exposures to spikes in margin and collateral calls in liquidity risk management and governance frameworks.

Recommendation 2 sets out the need to establish liquidity risk tolerances for margin and collateral calls as well as contingency funding plans to ensure liquidity needs can be met.

Recommendation 3 sets out the need for regular reviews of liquidity risk frameworks to ensure ongoing effectiveness in mitigating liquidity risk exposures to spikes in margin and collateral calls, including during times of stress.

Recommendations 4 and 5: liquidity stress testing and scenario design

Recommendation 4 sets out the need to conduct liquidity stress tests with respect to margin and collateral calls to identify the sources of liquidity strains and ensure the calibration of adequate, diverse and reliable sources of liquidity and collateral, consistent with the market participants' risk tolerance.

Recommendation 5 calls for liquidity stress tests to cover a range of extreme but plausible scenarios, including both backward-looking and hypothetical scenarios.

Recommendations 6 to 8: collateral management practices

Recommendation 6 sets out the need for resilient and effective operational processes and collateral management practices.

Recommendation 7 sets out the need for sufficient levels of cash and readily available and diverse liquid assets and collateral arrangements to meet margin and collateral calls.

Recommendation 8 sets out the need for active, transparent, and regular interactions with counterparties and third-party service providers in collateralised transactions.

1. Introduction

Whilst the post-global financial crisis regulatory reforms have greatly improved the safety and efficiency of derivatives markets by incentivising, and in some cases mandating, central clearing of derivatives, the 2022 BCBS-CPMI-IOSCO review of margining practices and recent reports on commodities markets stress provide additional evidence.^{1,2} This evidence supports the need for regulatory adjustments to deal with liquidity strains in the NBFIs sector arising from spikes in margin and collateral calls during market stress.

The BCBS-CPMI-IOSCO review found that variation margin (VM) calls in both centrally and non-centrally cleared markets in March 2020 were large and significantly higher than in February 2020. It also found that initial margin (IM) calls for centrally cleared markets increased significantly and varied substantially across and within asset classes, whilst IM remained relatively stable for non-centrally cleared derivatives markets. The substantial majority of market participants were able to meet margin calls in March 2020, but the increase in margin calls impacted market participants differently, depending on the size of their positions and level of liquidity preparedness. The FSB's NBFIs progress report notes that such a sudden increase in liquidity demand to meet margin and collateral calls can contribute to the transmission of stress to other parts of the financial system and the real economy.³

The BCBS-CPMI-IOSCO review recommended that the FSB undertake additional international work on enhancing the liquidity preparedness of market participants and on regulatory data gaps, so that authorities can better monitor the NBFIs sector's liquidity preparedness.

This report sets out steps to enhance the liquidity preparedness of non-bank market participants for margin and collateral calls in centrally and non-centrally cleared derivatives and securities markets.⁴ It forms part of the FSB's work programme on NBFIs.⁵

The report is organised as follows: Section 1 provides relevant background and an overview of the FSB's approach. Section 2 sets out the objectives and scope, an overview of the policy recommendations, the role of authorities and the approach to proportionality and materiality. Finally, Section 3 sets out the FSB policy recommendations with Section 3.1 focussed on recommendations for liquidity risk management practices and governance with respect to margin and collateral calls, Section 3.2 on recommendations for liquidity stress testing and scenario design, and Section 3.3 on recommendations for collateral management practices. Annex 1 provides an overview of existing rules and regulations. Annex 2 provides some examples of existing or in-train liquidity risk management rules and regulations relevant to margin and collateral calls. Annex 3 provides some illustrative examples.

Central counterparties (CCPs) and intermediaries can play an important role in helping their clients better prepare for spikes in margin and collateral calls by providing transparency on their margining practices. The FSB has liaised with the BCBS, CPMI and IOSCO on the policy

¹ BCBS, CPMI and IOSCO (2022), *Review of margining practices*, September.

² See FSB (2023b), *The Financial Stability Aspects of Commodities Markets*, February.

³ FSB (2021), *Enhancing the Resilience of Non-Bank Financial Intermediation: Progress report*, November.

⁴ Including securities financing such as repo.

⁵ See FSB (2023a).

measures that enhance counterparty risk management practices, which are a key element of market participants' liquidity preparedness. Following the 2022 review of margining practices, BCBS, CPMI and IOSCO have published three complementary reports:

- A BCBS-CPMI-IOSCO consultation report on increasing IM transparency and evaluating the responsiveness of IM models in centrally cleared markets.⁶ It includes ten policy proposals that aim to increase the resilience of the centrally cleared market ecosystem in times of market stress by improving participants' understanding of the calculation of centrally cleared IM and potential future margin requirements. Among other things, the report proposes that CCPs should provide additional public disclosures regarding their margin models, including a new standardised measure of margin responsiveness via Public Quantitative Disclosures, and make margin simulation tools available to clearing members and their clients.
- A BCBS-IOSCO consultation report on streamlining VM processes and the responsiveness of IM models in non-centrally cleared markets sets out eight recommendations to encourage the widespread implementation of good market practices that address challenges that could inhibit a seamless exchange of margin and collateral during times of stress.⁷
- A CPMI-IOSCO discussion paper on streamlining VM in centrally cleared markets proposes eight effective practices for VM operational processes and transparency of VM requirements and processes for CCPs and clearing members.⁸

1.1. Background

Recent FSB reports⁹ have highlighted that the functioning and resilience of the NBFIs ecosystem depends on the availability of liquidity and its effective intermediation under stressed market conditions. Certain activities and types of entities (so-called 'key amplifiers') are more likely to contribute to aggregate liquidity imbalances. Shocks can also be amplified due to the size and structural characteristics of such entities and their behaviour in stress. On the liquidity demand side, shocks manifest through unexpectedly large margin and collateral calls for derivatives and securities financing trades. This can give rise to asset fire sales by market participants seeking liquidity to cover these calls and the transmission of stress to other parts of the financial system and the real economy.

Derivatives and securities activities can expose market participants to margin and collateral calls. Participants actively involved in these trades include both financial entities (e.g. banks, investment funds, hedge funds, insurance companies, pension funds) and non-financial entities (e.g. commodities traders). The motivation for engaging in these activities varies, but typically involves increasing exposure to underlying assets, boosting returns, or managing exposures

⁶ See BCBS-CPMI-IOSCO (2024), *Transparency and responsiveness of initial margin in centrally cleared markets – Review and policy proposals*, January.

⁷ BCBS-IOSCO (2024), *Report on streamlining VM processes and IM responsiveness of margin models in non-centrally cleared markets*, January.

⁸ See CPMI-IOSCO (2024), *Streamlining variation margin in centrally cleared markets – examples of effective practices*, February.

⁹ See FSB (2022a), *Global Monitoring Report on Non-Bank financial intermediation*, December; FSB (2022), *Enhancing the Resilience of Non-Bank Financial Intermediation: Progress report*, November, and FSB (2023a).

through hedging strategies. The level of exposure varies within each sector, depending on the extent of the derivatives and securities activities undertaken. Additionally, the interconnectedness of the sectors means stress emanating from one sector with derivatives and securities exposure can propagate rapidly across the financial system.¹⁰

These activities often involve taking on leverage, which can be a source of financial vulnerabilities and act as a key amplifier of liquidity stress. If not properly managed, the build-up of leverage creates a vulnerability in the financial system that, when acted upon by a shock, amplifies stress and can lead to systemic disruption. Factors that could further amplify stress include: the amount and concentration of leverage,¹¹ its opaqueness,¹² volatile prices or valuations, market participants' inadequate risk management, and liquidity imbalances in leveraged non-bank investors and in markets they operate in.¹³

Recent episodes of market stress, including the March 2020 market turmoil, the Archegos failure in March 2021, the 2022 turmoil in certain commodities markets, and the September 2022 issues experienced by many pooled liability-driven investment (LDI) funds, underscore the importance of margin and collateral calls to financial stability. During these episodes the sudden increases in margin and collateral requirements were sometimes significant in scale and frequency, stretching some market participants' ability to manage the associated liquidity risks.

These events illustrate that whilst margin and collateral calls are a protection against counterparty risk, they can also amplify the demands for liquidity across markets and market participants if they are unexpected in times of stress and affect a large enough part of the market. The increase in margin and collateral calls can impact market participants differently depending on the size of their positions and level of liquidity preparedness. This highlights the need for market participants to be well prepared to meet these calls.

1.2. Analytical approach

The FSB analysed the causes of inadequate liquidity preparedness of some market participants to meet margin and collateral calls across centrally and non-centrally cleared markets using three analytical approaches. It drew on a case-study analysis of the four aforementioned episodes of liquidity stress, complemented by a survey of financial authorities.¹⁴ Additional insights were obtained from two cross-sectoral industry stakeholder outreach events in July 2023 and January 2024. These explored the relative importance of factors that affect market participants' liquidity preparedness for margin and collateral calls.

The survey was cross-sectoral, covering pension funds, insurance companies, and investment firms. In a few jurisdictions, other non-financial market participants (e.g. commodity traders and

¹⁰ FSB (2023c), *The Financial Stability Implications of Leverage in Non-Bank Financial Intermediation*, September.

¹¹ Especially in the context of current data gaps, which lead to challenges in estimating leverage or if leveraged positions are under-collateralised, as is the case with basis trades in US Treasury markets, often funded via repo markets at low or even zero margin/hairecuts.

¹² Leverage can be difficult to identify or measure by market participants or public authorities. In some cases, leverage is hidden because no data are available to assess its presence or magnitude. In other cases, leverage can be hidden because the data that are available are not sufficient or adequately used to assess vulnerabilities.

¹³ See FSB (2023c).

¹⁴ The survey was conducted in mid-2023 and received 19 responses from financial authorities, including SSBs.

family offices) were also included. The findings of the survey confirmed that the regulatory landscape for non-bank market participants varies significantly, both within specific sectors and across jurisdictions (see Annex 1). While, for example, Solvency II in the EU and UK has general requirements on insurance firms to assess and manage liquidity risk as part of their overall risk management framework, there are no specific rules related to margin and collateral calls. In the UK, insurance firms are expected to maintain sufficient liquidity to meet obligations, including potential margin and collateral calls, as part of a holistic liquidity risk management framework.¹⁵ By contrast, leveraged hedge funds face minimal directly applicable liquidity risk rules, if any, and commodities traders are not subject to the same set of liquidity requirements applicable to banks or other financial entities.

In some jurisdictions where regulations exist, they are mostly focused on the consideration of margin and collateral calls for a liquidity stress test or included as general margin rules. In addition, these rules can vary across specific sub-sectors (e.g. in the United States such laws exist in some sub-sectors but not all). Rules may also apply differently within a sector, depending on the size and importance of each institution (e.g. Canada's net cumulative cash flows oversight for systemically important institutions, Germany's proportionate approach for insurers, and the US additional reporting requirement for large traders).

At the two FSB outreach meetings, participants highlighted the importance of operational efficiencies in collateral management, stress testing, and governance. Participants highlighted the need to understand the availability and location of collateral and whether it remains liquid under stress, and the need to identify barriers to timely action. Related to this, a few participants emphasised the importance of preparing in advance for the eventuality of needing to access collateral transformation services under stress. Participants clarified that holding broadly defined liquid assets is not an issue, but transforming these assets into cash to cover margin calls may become an issue during periods of stress. This also highlighted the need to hold cash as opposed to other high-quality assets, as repo markets could freeze during stress.¹⁶

Participants raised the importance and challenges of stress testing and reverse-stress testing to understand and prepare for liquidity needs under stress, noting the relevance of considering concentration risk. Participants acknowledged that it would be in their interest to prepare for spikes in margin and collateral calls, as liquidating their assets at times of stress would be costly. On that basis, some participants noted that they conduct daily stress testing for various time horizons. Acknowledging the difficulties in fully preparing for unpredictable stress events and diversifying liquidity sources, some participants emphasised the usefulness of running reverse stress tests to examine their ability to withstand severe adverse scenarios. It was flagged that market participants need to ensure that they have their own efficient processes and governance around collateral management, but also consider their counterparties' processes and governance during times of stress. Participants also highlighted the need for a harmonised regulatory framework, citing challenges of having different regulators involved when needing to move collateral rapidly.

¹⁵ See PRA (2019), *Liquidity risk management for insurers*, Supervisory Statement (SS5/19), September.

¹⁶ The FSB's will undertake further work on the functioning and resilience of repo markets; see *FSB work program for 2024*.

Overall, the FSB identified weaknesses in liquidity risk management and governance for margin and collateral calls as a key cause of market participants' inadequate liquidity preparedness. Although the recent episodes raised issues that go beyond inadequate preparedness, the identified weaknesses hampered the anticipation of liquidity needs – whether due to insufficient understanding of the conditional demands on liquidity resources or a conscious decision to not secure contingent funding – and overlooked the impact of correlated behaviours during times of stress.¹⁷ For example:

- During March 2020, indirect evidence regarding the liquidation of money market fund (MMF) holdings and other assets by some institutional investors, as well as the large-scale unwinding of Treasuries positions by certain hedge funds, suggests that additional measures may need to be considered to further strengthen the ability of MMFs to respond to future liquidity stress situations.^{18, 19, 20, 21}
- The Archegos case revealed prime brokers' inadequate management of counterparty credit risks stemming from concentrated exposures and excessive leverage at Archegos and its prime broker counterparties, highlighting the importance of disclosure of positions that allows lenders and counterparties to price risk appropriately. It also revealed significant governance deficiencies.²²
- While there is limited information about the liquidity risk management practices of commodities traders and utility firms, the intense liquidity funding pressures on some of those entities during the 2022 commodities market turmoil suggests that some of these firms may not have been adequately prepared to deal with significant spikes in margin calls.²³
- The LDI case involved leveraged positions of LDI funds, combined in some cases with weaknesses in their risk management practices and those of their pension fund investors. Weaknesses related to lack of robustness of stress testing and insufficiency of liquidity resources and sources of liquidity used to meet margin and collateral calls. These were magnified in some instances by complex decision structures and governance processes at pension funds, which hindered the swift replenishment of LDI fund liquidity and consequently the ability of these funds to post collateral. This was

¹⁷ See ECB (2023), *Non-banks' liquidity preparedness and leverage: insights and policy implications from recent stress events*, *Financial Stability Review*, May.

¹⁸ See FSB (2022).

¹⁹ See FSB (2020), *Holistic Review of the March Market Turmoil*, November; and BCBS, CPMI and IOSCO (2022). For example, in a survey to analyse fund behaviour during the March 2020 turmoil, 71% of the European funds employing collateral arrangements did not envisage a shock on collateral in their liquidity risk assessment. See ESRB (2020), *Recommendation of the European Systemic Risk Board on liquidity risk in investment funds*, November.

²⁰ See ECB (2020), *Interconnectedness of derivatives markets and money market funds through insurance corporations and pension funds*, November; and ECB (2023), *Derivative margin calls: a new driver of MMF flows*, March.

²¹ See FSB (2020), and BCBS, CPMI and IOSCO (September 2022). For example, in a survey to analyse fund behaviour during the March 2020 turmoil, 71% of the European funds employing collateral arrangements did not envisage a shock on collateral in their liquidity risk assessment. See ESRB (2020), November.

²² See ESMA (2022), *Leverage and derivatives – the case of Archegos*, May.

²³ See FSB (2023d), *The Financial Stability Aspects of Commodities Markets*, February; and BCBS, CPMI and IOSCO (2023), *Margin dynamics in centrally cleared commodities markets in 2022*, May.

particularly a problem for pooled LDI funds due to operational lags and the large number of small investors.²⁴

Available evidence supports the need for non-bank market participants to enhance their liquidity risk management and governance to be better prepared for spikes in margin and collateral calls. This highlights the importance of robust liquidity stress-testing, planning for extreme but plausible scenarios, monitoring and managing concentrated and leveraged positions, effective collateral management practices to ensure collateral is operationally ready for use in times of stress, ensuring adequate levels of liquidity as well as diversified and reliable contingent funding sources, and efficient decision-making processes.

Other factors also contributed to inadequate liquidity preparedness for margin and collateral calls. These factors – such as insufficient transparency of margining practices and concentrated risk exposures, unreliable liquidity provision by intermediaries, and inadequate depth of markets during stress – involve issues that go beyond individual market participants. Some of these factors are being addressed by other work by the FSB or the standard-setting bodies (SSBs).²⁵

Drawing on the findings of the FSB’s analysis and the above-referenced engagement with financial authorities and industry stakeholders, the high-level policy recommendations in this report focus on liquidity risk management and governance with respect to margin and collateral calls, covering (i) liquidity risk management practices and governance, (ii) liquidity stress testing and scenario design, and (iii) collateral management practices. In formulating its recommendations, the FSB has adopted a proportionate, risk-based approach, acknowledging that market participants’ exposures to, and transmission of, liquidity risks arising from spikes in margin and collateral calls may vary based on the complexity of business models, risk profiles (including concentration and leverage), structure and size of market participants, and interconnectedness.

2. Overview

2.1. Objective and scope

The overarching objective of the FSB’s work on liquidity preparedness for margin and collateral calls is to reduce excessive procyclical behaviour of market participants during times of market-wide stress. This will be achieved by enhancing market participants’ liquidity preparedness and by strengthening the ability of authorities to monitor and manage associated financial stability risks. The recommendations in this report aim to strengthen the overall resilience of the financial system by addressing these goals. Other internal FSB work to be carried out in 2024 will address the strengthening of authorities’ ability to monitor financial stability risks associated with inadequate liquidity preparedness for margin and collateral calls.

²⁴ See Bank of England (2023), *Staff paper: LDI minimum resilience - recommendation and explainer*, March; Sir Jon Cunliffe letter to Chair of the Treasury Select Committee (October 2022); and Bank of England, *Financial Policy Summary and Record* (March 2023).

²⁵ See BCBS-CPMI-IOSCO (2024), *Transparency and responsiveness of initial margin in centrally cleared markets – review and policy proposals*, January; and BCBS-IOSCO (2024), *Streamlining VM processes and IM responsiveness of margin models in non-centrally cleared markets*, January.

The scope of the policy recommendations covers both centrally and non-centrally cleared derivatives and securities markets. The policy recommendations take a holistic perspective, given the interconnectedness between participants within and across markets.

Market participants in scope of the recommendations cover a broad range of non-bank financial entities that may face margin and collateral calls, including insurance companies, pension funds, hedge funds, other investment funds, and family offices.

Financial institutions such as clearing members and intermediaries that clear derivatives and securities financing transactions with non-bank financial entities should also consider the FSB recommendations. By doing so, clearing members and intermediaries would integrate the assessment of their clients' liquidity risk management and overall liquidity preparedness into their due diligence and counterparty risk management practices.²⁶

Although non-financial entities such as commodities traders are not subject to the full range of supervisory oversight applicable to other financial market participants, they can also have material derivatives and securities exposures. Given the potential for significant liquidity risks from spikes in margin and collateral calls during times of market stress, these entities as well as their counterparties could benefit from the recommendations in this report as sound practices.

Commercial banks and financial market infrastructures (such as CCPs) are excluded from the scope of the policy recommendations. Their role in enhancing transparency and facilitating the liquidity preparedness of non-bank market participants in centrally cleared markets is addressed through the BCBS-CPMI-IOSCO margin work.²⁷ The FSB policy recommendations should be considered in conjunction with the SSB's policy work (see Section 1).

The policy recommendations of this report cover liquidity risk management and governance, stress testing and scenario design, and collateral management practices of non-bank market participants with a focus on mitigating the impact of spikes in margin and collateral calls. SSBs and many national authorities have already set out rules and guidance on liquidity risk management and governance of regulated financial institutions.²⁸ The recommendations in this report are intended to reinforce or complement existing rules and guidance to enhance market participants' liquidity preparedness for margin and collateral calls during times of market-wide stress and, in this way, contribute to mitigating the procyclical behaviour of market participants.

2.2. Summary of policy recommendations

The first area of focus concerns non-bank market participants' liquidity risk management practices and governance with respect to managing and mitigating exposures to spikes in margin and collateral calls. The three policy recommendations set out in Section 3.1 are:

²⁶ See policy proposal 9 in BCBS-CPMI-IOSCO (2024), *Transparency and responsiveness of initial margin in centrally cleared markets – review and policy proposals*, January; and effective practice 1 in BCBS-IOSCO (2024), *Streamlining VM processes and IM responsiveness of margin models in non-centrally cleared markets*, January.

²⁷ For example, policy proposals 1, 3 and 6 of BCBS-CPMI-IOSCO (2024) provide for additional public disclosures regarding CCP margin models and a new standardised measure of margin responsiveness. Additionally, effective practices 6, 7 and 8 in CPMI-IOSCO (2024) provide examples to enhance transparency on CCPs, their clearing members and clients regarding intra-day variation margin calls.

²⁸ See Annexes 1 and 2.

- Recommendation 1 sets out the need to include liquidity risk arising from exposures to spikes in margin and collateral calls in liquidity risk management and governance frameworks.
- Recommendation 2 sets out the need for establishing liquidity risk tolerances²⁹ for margin and collateral calls as well as contingency funding plans to ensure liquidity needs can be met.
- Recommendation 3 sets out the need for regular reviews of liquidity risk frameworks to ensure ongoing effectiveness in mitigating liquidity risk exposures to spikes in margin and collateral calls, including during times of stress.

The second area of focus relates to conducting liquidity stress testing and scenario design for margin and collateral calls during normal market conditions, as well as in extreme but plausible stressed market conditions. Section 3.2 sets out the following stress testing and design recommendations for non-bank market participants:

- Recommendation 4 sets out the need for conducting liquidity stress tests with respect to margin and collateral calls to identify the sources of liquidity strains and ensure the calibration of adequate, diverse, and reliable³⁰ sources of liquidity and collateral, consistent with market participants' risk tolerance.
- Recommendation 5 calls for liquidity stress tests to cover a range of extreme but plausible scenarios, including both backward-looking and hypothetical.

The third area of focus concentrates on ensuring sufficient collateral is available, as and when required. Section 3.3 sets out the following collateral management recommendations for non-bank market participants:

- Recommendation 6 sets out the need for resilient and effective operational processes and collateral management practices.
- Recommendation 7 sets out the need for sufficient levels of cash and readily available and diverse liquid assets and collateral arrangements to meet margin and collateral calls.
- Recommendation 8 sets out the need for active, transparent, and regular interactions with counterparties and third-party service providers in collateralised transactions.

Finally, non-bank market participants' overall liquidity risk management and governance frameworks – including operational processes and liquidity stress testing and collateral management practices – should be well-documented and convey all necessary information that

²⁹ In this report, liquidity risk tolerance refers to the level of liquidity risk a market participant can bear without compromising its margin and collateral obligations, considering routine operations and extreme market conditions. The tolerance should align with the participant's business objectives, strategic direction, and overall risk appetite, ensuring strong liquidity management in normal times to withstand prolonged stress. See BCBS (2008), *Principles of Sound Liquidity Risk Management and Supervision*, September.

³⁰ Uncommitted credit lines cannot be considered as reliable during periods of market stress.

relevant authorities may request to review in the exercise of their oversight and supervisory functions.

Annex 2 provides some examples of existing or in-train liquidity risk management rules and regulations relevant to margin and collateral calls. Annex 3 provides some illustrative examples for the policy recommendations, which can serve as helpful guidance.

2.3. Role of SSBs and authorities

The FSB's policy recommendations are intended to complement or reinforce, rather than substitute, existing international standards and domestic liquidity risk management rules that may apply to certain types of non-bank entities and sectors, both within and across jurisdictions. By necessity, the recommendations are high-level due to their cross-sectoral nature. They may not apply in the same way to each category of market participant, depending on the relevant regulatory framework. Similarly, sector-specific regulations and frameworks may already provide some ways of meeting the recommendations.

As the FSB policy recommendations are high-level, they may need to be further specified. It is for the relevant SSBs to review and, as appropriate, further specify requirements for their sector based on the FSB recommendations. This is particularly relevant for market participants that face clients or counterparties with limited directly applicable liquidity risk rules, such as commodities traders. FSB recommendations should also be considered by financial institutions clearing derivatives and securities financing transactions when assessing the liquidity preparedness of their clients and counterparties (see Section 2.1).³¹ To the extent the relevant SSBs' standards and guidance are assessed to be not yet consistent with the FSB recommendations, the relevant SSBs should reflect on the need to revise their respective standards and guidance or consider introducing new standards and guidance, as necessary. Where appropriate, this should include an assessment of the materiality and scope of the application of the policy recommendations. The SSBs will report back to the FSB on their assessment of their existing standards and recommendations and their plans to address any gaps.

Financial authorities have a key role in promoting the recommendations for their specific sectors and for their regulated non-bank financial institutions within their jurisdictions to support them in enhancing their liquidity preparedness. They should reflect on the need to revise their respective existing standards and guidance or introduce new standards and guidance, as deemed necessary, taking into account that financial authorities do not directly supervise all non-bank market participants and are not expected to do so. This should include the materiality and scope of the application of the policy recommendations, as appropriate.

The FSB and relevant SSBs will monitor the progress made by member jurisdictions in implementing the recommendations. This monitoring may 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 the liquidity preparedness of non-bank

³¹ As stated in Section 2.1 of this report, commercial banks and financial market infrastructures (such as CCPs) are excluded from the scope of the policy recommendations.

market participants for margin and collateral calls in centrally and non-centrally cleared derivatives and securities markets.

2.4. Proportionality and materiality

Non-bank market participants represent a broad range of sectors, and their liquidity risk management needs and practices differ widely. The high-level recommendations in this report should be applied proportionately to the underlying risks of different non-bank market participants, considering factors such as their exposure to derivatives and securities activities (including securities financing activities), size, international footprint, organisational structure, business model, risk profile (including the market participant's leverage and exposure to concentrated positions), degree of interconnectedness with other market participants, and role in the global financial system (including systemic considerations), as well as the potential impact of idiosyncratic and system-wide risk events.

The focus of these policy recommendations is on the identification and mitigation of non-bank market participants' liquidity risks due to material exposures to spikes in margin and collateral calls during times of stress. The assessment of the materiality of exposures to spikes in margin and collateral calls during times of market turmoil should consider, for example, the potential impact on the liquidity needs of non-bank market participants, which could threaten their financial viability or financial stability.

The SSBs and national authorities may further specify proportionality and materiality requirements for their respective sectors.

3. FSB policy recommendations

As set out in Section 2, the cross-sectoral policy recommendations in this section build on rules and regulations for liquidity risk management and governance that already exist in many sectors and jurisdictions. The recommendations complement such rules and regulations by focussing on liquidity risks arising from spikes in margin and collateral calls, including under extreme but plausible stressed conditions. This should include the identification, measurement, monitoring, control, and internal reporting of such exposures, putting in place triggers for timely mitigating actions, as well as establishing effective governance practices.³²

The recommendations are targeted at non-bank market participants (hereafter referred to as "market participants"), as defined in Section 2.1, that are active in derivatives and securities markets and have exposures to margin and collateral calls. As set out in Section 2.4, the recommendations in this section should be applied proportionately to the underlying liquidity risks arising from material exposures to spikes in margin and collateral calls, especially during times of market-wide stress.

Annex 3 contains illustrative examples which can serve as helpful guidance for the application of the recommendations.

³² See FSB (2013), *Principles for an effective risk management framework*, November.

3.1. Liquidity risk management practices and governance ³³

Existing rules and regulations cite a number of fundamental components of robust liquidity risk frameworks, which include the need for a liquidity risk strategy, a clearly defined liquidity risk tolerance, metrics and tools to measure liquidity risks, systems and controls to monitor and report liquidity risks, liquidity stress-testing and scenario analysis, and clear allocation of responsibilities. Where existing regulations include requirements for liquidity risk management practices and governance, these recommendations should complement, rather than substitute, those requirements.

Recommendation 1: Market participants should incorporate the assessment of liquidity risks arising from margin and collateral calls in their liquidity risk management and governance frameworks.

Market participants should include in their liquidity risk management and governance frameworks the processes and systems necessary for timely mitigation of liquidity risks arising from margin and collateral calls.³⁴ Such frameworks should allocate clear responsibilities to address liquidity risks arising from spikes in margin and collateral calls to ensure effective and timely decision-making by senior management, boards or corresponding governing body.

Market participants should assess the materiality of the liquidity risk that may arise from margined and collateralised transactions and the channels and interconnections that could impact their business during times of stressed market conditions. Market participants should consider their risk profile and idiosyncratic vulnerabilities, as well as their role in the financial system to assess the materiality of liquidity risk propagating from margined and collateralised transactions under extreme but plausible stressed conditions.

Liquidity risk management systems and processes should be well-documented and identify quantitative metrics and tools for measuring the key drivers of margin/collateral liquidity risk and serving as early warning indicators. These processes should include an approach for comprehensively projecting cash flows over an appropriate set of time horizons, taking into account concentrated and leveraged positions, and scenarios of extreme but plausible spikes in margin and collateral calls alongside other draws on liquidity (e.g. due to investor redemptions or counterparties not rolling over short-term financing). Where liquidity is primarily obtained by selling collateral, these projections should include the analysis of the composition of readily available liquidity and the liquidation costs of any non-cash collateral at the relevant point in time. Market participants should also establish any operational, legal, or other governance arrangements necessary for the liquidation of collateral to meet liquidity needs such as margin calls in a timely manner (see Recommendations 6 and 8 below).

Such liquidity risk management systems and processes should be commensurate with the market participant's role in the financial system (e.g. its size, international footprint, and activity

³³ The recommendations in this sub-section apply to non-bank market participants active in derivatives and securities markets with exposures to margin and collateral calls and should be applied proportionately to the underlying liquidity risks arising from material exposures to spikes in margin and collateral calls (see Section 2.1. and Section 2.4. for further details).

³⁴ For example, alternative investment fund managers and investment funds regulated by the AIFM and UCITS Directives in the EU, as well as the retained versions of both directives in the UK, could incorporate these processes and systems into their existing liquidity management and risk assessment practices.

in the derivatives and securities markets in which it operates) and complexity of its activities, its organisational structure and business model, as well as its liquidity risk profile, leverage, and exposure to concentrated positions. They should also, to the maximum extent possible, take into consideration the degree of interconnectedness with other market participants (see Section 2.4) and how their counterparties may respond, particularly in stressed market conditions.

Liquidity risk governance frameworks should clearly define both decision-making processes and how early warning indicators of stress related to margin and collateral calls are addressed, and by whom. Market participants should ensure that they can meet margin and collateral calls even when multiple stakeholders, such as advisors, trustees, company management, and fund managers, are involved in the decision-making process. The involvement of these stakeholders should not impair market participants' ability to meet margin and collateral calls.

Recommendation 2: Market participants should define their tolerance for liquidity risk arising from margin and collateral calls and establish contingency funding plans to ensure that liquidity needs arising from these calls can be met, including under extreme but plausible stressed conditions.

Market participants should establish a clearly articulated liquidity risk tolerance that includes liquidity risk arising from margin and collateral calls, which is appropriate for their business model and investment strategy and their role in the financial system (e.g. market participant's size, international footprint, and activity in the derivatives and securities markets in which it operates).³⁵

A market participant's liquidity risk tolerance should identify the duration and the scale of liquidity stress arising from margin and collateral calls it is willing to withstand, including under scenarios of extreme but plausible stress. For example, the liquidity risk tolerance statement should define timescales over which identified risks could be expected to materialise and a minimum level of readily available liquidity that the market participant intends to hold relative to projected liquidity needs within the time horizons. The liquidity risk tolerance should be validated and reviewed (at least annually and following episodes of stress, unless otherwise agreed with their supervisors) by the market participant's senior management, board, or corresponding governing body. The liquidity risk tolerance should assess the circumstances in which the market participant's relative composition of centrally and non-centrally cleared positions might change and the consequences this could have for its risk profile.

Market participants should establish contingency funding plans that appropriately address the material elevation of liquidity risk due to spikes in margin and collateral calls implied by stress testing outcomes (see Recommendation 4 below). For example, there should be a well-documented contingency process for unwinding leveraged exposures if warranted, such as in scenarios where the market participant identifies a material risk of not meeting its margin calls. Contingency funding plans should set out strategies to address liquidity shortfalls in extreme but plausible stress scenarios and ensure that any third-party liquidity sources relied upon will continue to provide the required liquidity during emergency situations. To the maximum extent possible, they should consider how their counterparties may respond and assess the resilience

³⁵ See FSB (2013).

of short-term funding markets during stressed market conditions. Contingency funding plans should be regularly assessed (at least once a year and following episodes of stress) and factored into the market participants' liquidity risk management and governance processes.

The design and the implementation of effective contingency funding plans that integrate liquidity risk considerations stemming from margin and collateral calls are especially important for market participants whose business models involve a structural liquidity mismatch, such as some types of investment funds.³⁶

Recommendation 3: Market participants should regularly review and update their liquidity risk framework to ensure that liquidity risks arising from margin and collateral calls are robustly managed and mitigated, particularly under extreme but plausible stress scenarios.

Market participants should regularly review and adapt their liquidity risk management framework, including the level and diversification of liquid assets, in a forward-looking fashion to ensure that any significant changes in market conditions or their business model, risk tolerance, or investment strategy that could lead to material changes in margin and collateral calls are properly addressed.

Market participants should regularly monitor market depth, liquidity, and concentration of their portfolio positions. They should also take into consideration, to the maximum extent possible, how their counterparties may respond, in particular in stressed market conditions. They should incorporate the assessment of associated risks into their liquidity risk management strategy, stress testing, and calibration of liquidity levels, where applicable. As available information varies across asset classes and transparency of certain market positions can be limited, it is important that market participants actively seek information, or consider alternative means of accessing data, to close any data gaps to improve their liquidity risk management (e.g. data on volumes of OTC derivatives transactions reported to trade repositories).

Market participants should have in place appropriate systems to convey in a timely manner any updated information relevant to their decision-making to senior management or the board, as well as to competent authorities, where required. Any major change in the participant's liquidity risk framework should be subject to approval of senior management, board, or corresponding governing body.

3.2. Liquidity stress testing and scenario design

Stress testing is a fundamental component of a risk management framework. It can improve a market participant's understanding of its preparedness for liquidity needs due to spikes in margin and collateral calls in stressed market conditions, taking into consideration any concentrated and leveraged positions. This section sets out recommendations for liquidity stress/scenario testing in normal market conditions, as well as in extreme but plausible stressed market conditions resulting from general market-wide turbulence, idiosyncratic difficulties, or combinations of both. Running such liquidity stress tests should enhance the available data at

³⁶ FSB (2023), *Revised Policy Recommendations to Address Structural Vulnerabilities from Liquidity Mismatch in Open-Ended Funds* - Financial Stability Board, December.

entity level, work as a disciplining device, and help strengthen market participants' risk management functions and contingency planning.³⁷

These recommendations should be considered in the context of relevant regulatory frameworks, where applicable. Where existing regulations include requirements for liquidity stress testing for margin and collateral calls, these recommendations should complement, rather than substitute for, those requirements. For market participants that are not subject to mandatory stress testing regulations or requirements on the details of stress tests, this section is intended to promote practices to implement or improve the quality and utility of their liquidity stress tests.

Recommendation 4: Market participants should conduct liquidity stress tests to identify sources of potential liquidity strains caused by margin and collateral calls, and to ensure a level of resilience consistent with their established liquidity risk tolerance. The stress test results should be used to calibrate adequate, diverse, and reliable sources of liquidity and collateral arrangements.

Where applicable, liquidity risk stress testing methodology should include scenarios that use historical data as well as hypothetical forward-looking stress scenarios and reverse stress testing. Authorities should consider the appropriateness of providing guidance regarding such scenarios, subject to materiality and proportionality criteria (see Section 2.4), to ensure that systemic considerations are sufficiently captured.

The range of stress scenarios market participants should consider includes: (i) the potential impact of idiosyncratic, market-wide, and combined shocks leading to margin and collateral calls; and (ii) the actions of counterparties and other market participants experiencing liquidity stresses that could adversely affect the market participant, for instance by selling similar securities to those that the market participant may rely on for liquidity or face margin calls in respect of.

Well-documented liquidity stress testing practices should convey all necessary information that relevant authorities may request for review in the exercise of their oversight and supervisory functions. Stress-testing can generate critical information on risk exposures that market participants may share with their counterparties, where deemed appropriate, to facilitate counterparties' risk management. Stress tests should be conducted at the individual entity (e.g. fund) level, each of which may be exposed to different sources of liquidity risk. Depending on the organisational structure of the market participant, and if appropriate, additional stress tests should also be conducted at an aggregate level (e.g. based on collective exposure of all entities (funds) managed by the same market participant).

Where liquidity stress testing results in material findings or exceeds tolerances, the outcome should be used to calibrate liquidity levels and collateral arrangements and inform: (i) the adequacy of levels of liquidity resources, including liquid assets, as well as (ii) the diversification of funding sources and collateral arrangements to ensure adequate and reliable sources of liquidity that suit the organisational structure of the market participant.

³⁷ An entity refers to a specific business unit or legal structure within a larger organisation, such as an individual fund. In contrast, a firm denotes the overall business organisation or company, encompassing all its operations and managed entities.

The level and diversification of liquid assets should be calibrated to the results of liquidity stress testing, especially when material levels of potential liquidity strains are identified.³⁸ Market participants should hold adequate stock and composition of liquid assets to meet liquidity needs, both in normal times and times of extreme stress. The quantity and composition of liquid assets should be sufficient to meet margin and collateral calls as they fall due in each applicable currency and should be consistent with the market participant's business model and liquidity risk tolerance (see Recommendation 2). The calibration of liquid assets held should take into account each entity's role in the financial system, including factors such as size, international footprint, and activity in the affected markets. Additionally, it should consider the complexity of the entity's activities, organisational structure, business model, liquidity risk profile, and leverage. Furthermore, it should also consider the diversity, marketability and liquidity of assets, funding mismatches (e.g. due to rollover risk or redemptions), the eligibility of assets under any existing Credit Support Annexes (CSAs), and the reliability of contingent funding plans.

Recommendation 5: Robust stress testing should analyse a range of extreme but plausible liquidity stresses caused by changes in margin and collateral calls, as well as market participants' overall liquidity position.

In their approach to liquidity stress testing, market participants should estimate the increase in IM requirements and haircuts under extreme but plausible stress scenarios, including separate estimates for types of exposures, such as centrally cleared derivatives, securities exposures, and bilateral (non-centrally cleared) derivatives. Estimates for centrally cleared derivatives and securities exposures should incorporate available information from CCPs and clearing members, including historical margin increases during stress, for the firm's relevant asset classes and currencies. Estimates for non-centrally cleared derivatives and secured financing exposures should incorporate the mechanics of CSAs, and any associated margin lock agreements with counterparties, as well as the existence of, and conditions for, credit deterioration triggers and/or termination events, where relevant.

Scenario analysis and liquidity stress testing, either backward-looking and historically based, or forward-looking hypothetical, should consider idiosyncratic and system-wide sources of stress, or a combination thereof, as well as specific risks arising from concentrated and leveraged positions. They should also be informed by authority guidance on scenario design and methodology, such as assumptions around liquidity of assets they would need to sell to meet liquidity demands under stress. Parameters for historical stress scenarios typically include: (a) confidence level, (b) time horizon, and (c) lookback period.³⁹ This component of the analysis should capture demand for liquidity due to margin calls. The stress testing analysis should consider both cash in-flows (sources) and cash out-flows (uses) on a currency-by-currency basis, over the chosen stress horizon.

Finally, market participants should conduct, where applicable, liquidation cost analysis in respect of the proportion of the portfolio expected to be hedged, liquidated, or unwound as a result of the relevant stress scenario, for example to meet immediate liquidity demands, rebuild liquidity

³⁸ Unless market participants liquid assets are predominantly held as cash.

³⁹ The lookback period should cover at least [10] years in the historical stress scenarios, where possible. See BIS-IOSCO (2016), *Implementation monitoring of PFMI: Level 3 assessment – Report on the financial risk management and recovery practices of 10 derivatives CCPs*, August.

resources, or bring risk exposures back within liquidity risk tolerance. This analysis should consider the size of risk exposures (particularly concentrated exposures) relative to market liquidity, assuming stressed market conditions, and estimate the losses incurred and the amount of cash that would be generated from liquidation. When determining the portion of a portfolio expected to be liquidated, market participants should consider the resulting liquidity profile of the post-liquidation portfolio, particularly when liquidating only the most liquid assets rather than a pro-rata cross-section of the portfolio.

Market participants should also consider whether they participate in crowded strategies or concentrated market segments and are therefore more prone to liquidating the same assets at the same time as other market participants (see Recommendation 6). Where this is the case, they should, to the extent possible given the available data, incorporate an estimate for the incremental market impact and liquidation costs, based, for example, on reduced market depth and wider bid-ask spreads associated with extreme stressed conditions.

3.3. Collateral management practices

Recommendation 6: Market participants should have resilient and effective operational processes and collateral management practices.

Market participants' cash and collateral management systems should be operational and subject to frequent review (at least annually and after a stress event, unless otherwise agreed with their supervisors). These should be commensurate with the size, nature, and complexity of the market participant's transactions, in order to ensure they are well-designed, operationally resilient, and continue to meet expectations. These reviews should include exercises to test market participants' operational capabilities to meet high cash and collateral calls under stress, including on an intraday basis. Such testing should ensure collateral identified for margining purposes is unencumbered, and accessible in the required timeframe. Review protocols and procedures should be available and, to the extent possible, test trades should be incorporated. If collateral is sourced through re-hypothecated transactions, prudent safeguards should be considered. Ideally, back-up cash and collateral service providers should also be regularly tested.

Market participants should have a clear understanding of which counterparties can require intraday margin calls, which kinds of exposures and circumstances can lead to such calls, and whether the calls can be recurrent or ad-hoc.

Market participants should have active, transparent, and regular bilateral interactions with their counterparties and with third-party providers of collateral management services. They should have a well-documented assessment of the reliability of their service providers' operational processes and capacities to face stress situations. This should include testing in concert with the stress testing set out under Recommendations 4 and 5.

Market participants should consider the advantages of standardisation and automation of their collateral management processes to reduce frictions and the possibility of operational delays or failures in collateral use, especially during stress periods.

Market participants should have clear dispute mechanisms in place and a system to track and manage outstanding collateral disputes.

When considering the pro-cyclical nature of margining and collateralisation mechanics, market participants should evaluate the appropriate level and quality of the collateral posted in excess of IM requirements in non-stress times.

Recommendation 7: Market participants should maintain sufficient levels of cash and readily available as well as diverse liquid assets and establish appropriate collateral arrangements to meet margin and collateral calls.

Collateral should be held in sufficient quantity, after taking account of potential haircuts, and be pre-positioned at the appropriate entities to be operationally ready for use during times of stress. Market participants should build up, maintain and consistently monitor readily available liquidity to ensure a sufficient quantity of collateral is positioned to ensure they can meet margin and collateral calls in the required timeframe and likely value.

Market participants should maintain sufficient available cash or reliable sources of liquidity to meet cash-only margin calls with a high degree of certainty in both normal and stressed market conditions, as identified in stress-testing. This should be done in the called currency, time zone, and location of delivery, in line with their liquidity risk tolerance. To the extent margin calls can be met with non-cash collateral,⁴⁰ market participants should maintain sufficient and diverse available collateral to meet such margin calls with a high degree of certainty in normal and stressed market conditions as identified in stress-testing. Collateral that market participants hold for the purpose of meeting unexpectedly high margin calls should have limited exposure to liquidity, credit, and market risks, unless they are eligible under an existing CSA. In such case, the mechanics of the CSA should nevertheless inform the estimation of derivatives and secured financing exposures as set out under Recommendation 5.

Market participants should assess the benefit of diversification in their collateral management (e.g. in terms of individual issuer, issuer type, and asset type).

When liquidity is expected to be obtained primarily by selling securities, market participants should ensure that the liquid assets they hold and the collateral they provide do not exhibit a significant correlation with the value of their collateralised portfolio in a way that would undermine the effectiveness of the protection against future liquidity demands.

Market participants should incorporate appropriate haircuts on collateral, both because of idiosyncratic and system-wide considerations from stress scenarios.

A market participant's readily available liquidity may be supplemented by committed credit lines, other reliable sources, and collateral transformation arrangements to meet unexpected margin calls under extreme but plausible market stress, without adversely affecting the market participant's daily operations. For example, market participants should consider the potential for optimising counterparty arrangements (e.g. ISDA CSAs) to be able to deliver non-cash collateral to meet margin and collateral calls, if economically rational and commercially viable.

⁴⁰ This recommendation should be considered jointly with Recommendation 2 of the BCBS-IOSCO consultation report on streamlining VM processes and the responsiveness of IM models in non-centrally cleared markets. It encourages firms to consider providing flexibility in bilaterally acceptable collateral during periods of stress, within the set of permissible collateral types per the WGMR Framework and national regulations, and to do so with appropriate haircuts.

Recommendation 8: Market participants should have active, transparent, and regular interactions with their counterparties and third-party service providers in collateralised transactions to ensure adequate operational resilience with respect to spikes in margin and collateral calls under stressed conditions.

Market participants' bilateral interactions with clearing members, broker-dealers, intermediaries, and other counterparties in collateralised transactions should include a regular (at least annually and post-stress events) evaluation of the materiality of the liquidity risk that may arise through margined and collateralised transactions during extreme but plausible stress events. This should take into consideration, to the maximum extent possible, how the counterparty risk management practices of market participants' counterparties may respond during times of market stress. Market participants that maintain less conservative practices and/or fail to provide information transparently, in line with industry standard, may find that their counterparties recalibrate IM models and add-on policies. For example, this could lead to changes in the frequency and level of margin and collateral calls or modifications in the types of collateral accepted and the haircuts applied.

Market participants should consider whether the use of third-party service providers would be helpful in their collateral management, weighing their own capabilities and the need for proper risk management of such services. Where market participants use third-party service providers, their liquidity risk management and governance frameworks should incorporate the operational risks (e.g. inadequate resourcing for heightened manual processing during a stress event) inherent to using third-party services. This is to ensure adequate operational resilience with respect to spikes in margin and collateral calls under stressed conditions.

Annex 1: Overview of existing liquidity rules and regulations

Jurisdiction	Regulator	Liquidity regulations	Inclusion of margin provisions?
Canada	OSFI	OSFI published guidance for pension funds and insurance companies on managing margin requirements and liquidity risk for derivatives.	✓
	Self-regulatory body and provincial securities administrators	These regulators published or are in the process of issuing liquidity rules for asset managers and securities dealers .	
	Federal regulations	Federally regulated institutions are subject to margin (E-22) and derivatives sound practice (B-7) guidance, which establish guidelines for insurers and pensions on addressing margin and derivatives-related liquidity risk.	
Hong Kong	Insurance Authority	Published guideline on Enterprise Risk Management which covers liquidity management for insurance companies.	
	Securities and Futures Commission	Published guidelines on liquidity management for asset managers.	
India	Securities and Exchange Board (SEBI)	SEBI has a margin framework.	
Japan	Financial Services Agency (FSA)	FSA published guidance on liquidity management and governance practices for non-bank market participants.	✗
	Investment Trust Association	MMFs are required to submit contingency plans and report cash ratio on a daily basis.	
EU	EU Institutions, European Insurance and Occupational Pensions Authority (EIOPA), European Securities and Markets Authority (ESMA)	The Solvency II Directive sets out general rules on liquidity risk management for insurance companies . The current Solvency 2 review aims to strengthen the liquidity risk management of EU insurers by introducing a new requirement to draft and regularly update a liquidity risk management plan, taking into account the principle of proportionality, and to develop and keep up to date a set of liquidity risk indicators. The IORP II Directive lays out general rules for pension funds on risk management in accordance with the “prudent person” principle. Alternative investment fund managers , Undertakings for Collective	

		Investment in Transferable Securities and money market funds are also required under respective EU directives to comply with liquidity risk management systems. Alternative investment funds are specifically required to regularly conduct stress tests, under normal and exceptional liquidity conditions, which cover margin calls.	
Germany	BaFin	The Solvency II Directive sets out general rules on liquidity risk management for large insurance companies, but smaller insurers and pensions are under Solvency I.	
Spain		The European Commission's September 2021 proposal to review the Solvency II Directive included several articles to reinforce such practices for insurance companies . National law does not lay down any additional requirement to the Solvency II framework concerning liquidity preparedness for margin and collateral call; and no regulation for pension funds for margin and collateral calls.	✗
Switzerland	FINMA	FINMA Circular sets out requirements of liquidity risk management for insurance companies but without specific reference to liquidity preparedness for margin and collateral calls.	✗
United Kingdom	BoE-PRA/FCA/TPR	UK Solvency II sets out general rules on liquidity risk management for insurance companies . Guidance makes specific reference to liquidity preparedness for margin and collateral calls from different sources of liquidity risk. Although the TPR does not set specific requirements on IM and VM, it has issued guidance that leveraged LDI funds should hold sufficient liquidity to remain resilient to a 250 bps (plus an additional operational buffer) increase in interest rates. FCA issued a statement, setting expectations for asset managers of LDI funds to take appropriate actions in terms of liquidity buffers to withstand severe but plausible stresses to meet margin and collateral calls. Alternative investment funds are required to regularly conduct stress tests, under normal and exceptional liquidity conditions, which cover margin calls, as per the adoption of AIMFD in UK legislation.	✓
United States	Securities and Exchange	SEC adopted liquidity risk management requirements as well as amendments to	

Commission (SEC), Commodity Futures Trading Commission (CFTC)	<p>existing rules and forms to enhance transparency and modernise reporting requirements for mutual funds and other open-end management investment companies, including exchange-traded funds (ETFs); and capital and margin rules for broker dealers and security-based swap dealers.</p> <p>CFTC Rule Proposal for Operational Resilience Framework (“ORF”): In December 2023, the CFTC proposed to require that futures commission merchants (i.e. a futures broker), and CFTC-regulated swap dealers establish, document, implement, and maintain an ORF reasonably designed to identify, monitor, manage, and assess risks relating to information and technology security, third-party relationships, and emergencies or other significant disruptions to normal business operations. Commitment of Trader Reports for firms holding above a certain threshold of certain derivatives.</p> <p>Form PF includes periodic reporting of many aspects of certain private funds’ investment exposures, liquidity profiles borrowing, counterparty credit risks and collateral, and exposures to centrally and non-centrally cleared derivatives, among other things. Amendments to Form PF were adopted in 2024 to improve insights and data quality, and these amendments will become effective in early 2025. Form PF also requires timely reporting on significant margin and default events that occur at qualifying hedge funds advised by large hedge fund advisers or at their counterparties.</p>
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Annex 2: Relevant liquidity risk management rules and regulations

Whilst there are no comprehensive rules and regulations with respect to liquidity risks arising due to margin and collateral calls, there are some regulations which apply to certain sectors and can serve as helpful guidance for other non-bank market participants more broadly. These are listed below.

Recommendation 1

In the UK, a supervisory statement by the Prudential Regulation Authority (PRA) sets expectations concerning the liquidity risk management framework for insurance companies.⁴¹ The statement is addressed to all UK Solvency II firms and covers areas like the development and maintenance of proper policies, systems, controls and processes, identification of material liquidity risk drivers, as well as identifying their materiality. Other areas include the design and undertaking of forward-looking scenario analysis and stress testing programmes, considerations for the inclusion of highly liquid assets in the liquidity buffer, use of quantitative metrics and tools for measuring and monitoring liquidity risk drivers, and effective contingency planning.⁴²

In the EU co-legislators have recently reached a provisional agreement on the Solvency II review. This includes provisions strengthening liquidity risk management planning to ensure the ability of insurers to settle financial obligations towards policyholders, including under stressed conditions. For example, under the new rules, insurers would have to develop liquidity risk indicators to monitor their liquidity risk.

For undertakings for collective investment in transferable securities (UCITS) and alternative investment fund managers (AIFMs), the European Parliament and the Council have recently agreed on the review of the AIFM and UCITS Directives. As part of this review, it has been agreed to introduce a harmonised set of liquidity management tools (LMTs), requiring fund managers to select at least two LMTs from a list, which could be activated when appropriate. The list includes redemption gates, notice periods, redemption fees, swing/dual pricing, anti-dilution levies, and redemptions-in-kind. These liquidity provisions will also impact the requirements applicable to MMFs to some extent. In addition, fund managers will be able, in exceptional circumstances, to suspend subscriptions and redemptions and to activate side pockets (after having duly notified the competent authorities). The new rules are expected to be published in March and implemented by 2026.

The FSB is revising its liquidity mismatch 2017 recommendations for Open-Ended-Funds (OEFs), which combined with the new IOSCO guidance on anti-dilution LMTs, aims to strengthen liquidity management by OEF managers compared to current practices.⁴³

The International Association of Insurance Supervisors (IAIS) issues the Insurance Core Principles (ICPs) where two of the standards – ICP 16.8 and ICP 16.9 – specifically address liquidity risk management and governance. These standards and their guidance outline the

⁴¹ See Bank of England (2019), *Liquidity risk management for insurers*, Supervisory Statement (SS5/19), September.

⁴² Ibid.

⁴³ See FSB (2023e), *Addressing structural vulnerabilities from liquidity mismatch in Open-Ended-Funds*, July.

essential elements for managing liquidity risk and establishing appropriate governance mechanisms within insurance companies. They encompass aspects such as liquidity risk assessment, stress testing, contingency planning, and the governance structure necessary to oversee liquidity risk management effectively.

Furthermore, the IAIS has issued a Common Framework for the Supervision of Internationally Active Insurance Groups (ComFrame), which establishes supervisory standards focusing on the effective group-wide supervision of internationally active insurance groups (IAIGs). Specifically, the standards within ComFrame that cover liquidity are ComFrame 16.9.a, 16.9.b, 16.9.c, and 16.9.d. These standards and their guidance provide detailed direction on liquidity risk management for IAIGs, outlining detailed requirements related to liquidity risk assessment and governance practices to address liquidity challenges effectively. Risks associated with potential margin and collateral calls from derivatives or other transactions are notably explicitly referenced in the guidance related to supervisor decision to require more detailed liquidity management processes (16.9.4).

In the US, advisers to large (“qualifying”) hedge funds must report these funds’ investor, financing and portfolio liquidity profiles quarterly through Form PF, which was adopted in 2012 and amended in both 2023 and 2024.

Recommendation 2

In the U.S., the SEC adopted, among other things, rule 22e-4 (or the “Liquidity Rule”) under the Investment Company Act of 1940, which requires each registered open-end investment company, including open-end ETFs, to adopt and implement a written liquidity risk management program that is designed to assess and manage a fund’s liquidity risk, including consideration of potential liquidity demands from margin or collateral calls⁴⁴. Registered investment companies report their liquidity profiles periodically to the SEC by filing Form N-PORT and are required to file a timely report with the SEC (“N-RN”) if illiquid assets exceed the maximum level under the Liquidity Rule, or if Highly Liquid Investments are less than the minimum level established by the Investment Company.

CFTC rules require futures commission merchants and swap dealers to take a comprehensive approach to risk management, including, but not limited to, liquidity risk management.

⁴⁴ See Investment Company Liquidity Risk Management Programs, Investment Company Act Release No. 32315 (Oct. 13, 2016). The rule excludes MMFs from all requirements of this rule and ETFs that qualify as “in-kind ETFs” from certain requirements. In conjunction with this Liquidity Rule, the SEC adopted amendments to certain rules and forms, to modernize the reporting of information by registered investment companies. Investment Company Reporting Modernization, Investment Company Act Release No. 32314 (Oct. 13, 2016). In addition, the SEC adopted reporting enhancements for registered investment companies on Form N-PORT to provide the Commission and investors with more timely information. See Form N-PORT and Form N-CEN Reporting; Guidance on Open-End Fund Liquidity Risk Management Programs, Investment Company Act Release No. 35308 (Aug. 28, 2024).

Recommendation 4

The Bank of England's Financial Policy Committee (FPC) issued recommendations on steady-state minimum levels of resilience for LDI funds, including on design and calibration.⁴⁵ The FPC's recommended stress testing approach considers the potential impact of both idiosyncratic and market-wide shocks. A baseline level of resilience captures the idiosyncratic risks of assets held by LDI funds, possibly calibrated according to the baseline price volatility of CCP IM models. At the same time, a systemic level of resilience aims to ensure that all LDI funds can absorb a severe but plausible historical stress over the period needed for recapitalisation still avoid forced asset sales. These combined resilience levels aim to enable LDI funds to avoid forced deleveraging and negative feedback loops, whilst continuing to operate, meeting margin and collateral calls and remaining resilient to idiosyncratic risks throughout.

Similarly, the Hong Kong Insurance Authority (IA) issued the Guideline on Enterprise Risk Management (ERM), stipulating the insurers' ERM framework should ensure liquidity adequacy under current and plausible stress scenarios, covering liquidity stress testing and maintenance of a portfolio of unencumbered high quality liquid assets (liquidity buffer).

The IAIS' ComFrame standards outline detailed requirements related to stress testing and contingency planning to address liquidity challenges effectively. Risks associated with potential margin and collateral calls from derivatives or other transactions are notably explicitly referenced in the guidance related to liquidity stress testing (16.9.a.5).

In addition to the standard-setting work, the IAIS also monitors key risks and trends and the build-up of potential systemic risk in the global insurance sector, notably through its Global Monitoring Exercise (GME). As part of the GME, last year the IAIS adopted specific metrics to monitor liquidity risk, following several public consultations. The liquidity metrics serve as a tool to facilitate the IAIS' monitoring of the global insurance sector's liquidity risk and for the IAIS to assess insurers' liquidity exposure from a macroprudential perspective, which may be critical as insurers have been exposed to liquidity shortfalls in previous crises. These liquidity metrics consist, among others, of an Insurance Liquidity Ratio (ILR), which is a ratio between the liquidity sources and liquidity needs taking into account the asset and liability side of the insurance business, as well as of a cash-flow projection ratio both under baseline and under stress. This ratio is calculated for a time horizon of 1, 3 and 12 months. The ILR takes into account eligible cash VM.⁴⁶ In the cashflow projection approach IM and VM received and paid are considered.

In the EU, and the UK the AIFM Directive Level 2 regulation requires alternative investment funds to regularly conduct stress tests under normal and exceptional liquidity conditions, in order

⁴⁵ See Bank of England (2023), *Bank staff paper: LDI minimum resilience - recommendation and explainer*, March. The Pensions Regulator (TPR) published guidance regarding steps that trustees should take to manage risks when using leveraged liability driven investments; see TPR (2023), *Using leveraged liability-driven investment*, April. The UK Financial Conduct Authority published guidance for LDI managers setting out expectations for risk management, stress testing and client communication; see FCA (2023), *FCA sets out recommendations for LDI managers*. Guidance was also issued by the Commission de Surveillance du Secteur Financier (CSSF) and the Central Bank of Ireland; see CSSF and CBI (2022), *Letter to managers of Liability driven Investment Funds*, November.

⁴⁶ An insurer's liquidity needs are decreased by any cash payments already made to counterparties on affected derivative contracts. These cash payments would be offset from derivative liabilities to the extent that this value was not otherwise included in the ILR's numerator. Similarly, any cash collateral received from counterparties in derivative transactions could be a source of liquidity for the insurer and should be offset from derivative liabilities, if not otherwise included in the numerator.

to assess the liquidity risk of each AIF under their management.⁴⁷ The stress tests should cover market risks and any resulting impact, including on margin calls, collateral requirements, or credit line.

Recommendation 5

The Japan Financial Services Agency (FSA) revised the rules for investment funds in the Ordinance for Enforcement of the Act on Investment Trust and Investment Corporations that requires the implementation of stress testing to investment trust or companies under the development of liquidity risk management systems.

Recommendation 6

The Canadian Office of the Superintendent of Financial Institutions (OSFI) has specified a number of guidelines that support liquidity preparedness and set out margin requirements for derivatives, and that apply to federally regulated insurers. A number of these guidelines set out expectations for prudential risk and collateral management, including around margin.

Recommendation 7

The BCBS-IOSCO standardised haircut schedule sets minimum haircuts for collateral as defined in Annex B of the BCBS-IOSCO standard on margin requirements for non-centrally cleared derivatives.⁴⁸

⁴⁷ In the EU, this refers to the AIFM Directive Level 2 Regulation (Commission Delegated Regulation (EU) No 231/2013). In the UK, this refers to the retained EU law version of the AIFM Directive Level 2 Regulation.

⁴⁸ BCBS-IOSCO (2020), *Margin requirements for non-centrally cleared derivatives*, April.

Annex 3: Illustrative examples

The examples below can serve as helpful guidance on the application of each recommendation.

Recommendation 1: Market participants should incorporate the assessment of liquidity risks arising from margin and collateral calls in their liquidity risk management and governance frameworks.

A non-bank market participant with large or rapidly growing positions in centrally and non-centrally cleared derivatives and securities financing markets puts in place a comprehensive risk management system. The system has the capability to re-value its full set of traded instruments across all asset classes and product types, assessing liquidity spikes that may arise from margined and collateralised transactions according to a flexible set of market inputs and/or scenario parameters. The market participant employs sufficiently experienced senior risk management personnel to define, document, and calibrate a comprehensive set of key risk metrics, along with flags and limits that trigger alerts when breached, including escalation to senior management to ensure timely mitigating actions when appropriate. Risk management staff also design and implement a series of extreme but plausible market scenarios to stress-test their ability to meet liquidity demands by projecting cash flows arising from margin calls, redemptions, and maturing financings over appropriate time horizons. Cash flow projections utilise available market data to assess the liquidity of the different exposures in each asset class and product type, taking account of their size, concentration, and the behaviour of other market participants (e.g. “crowdedness”).

Recommendation 2: Market participants should define their tolerance for liquidity risk arising from margin and collateral calls and establish contingency funding plans to ensure that liquidity needs arising from these calls can be met, including under extreme but plausible stressed conditions.

The market participant’s senior management, board, or corresponding governing body establishes a liquidity risk tolerance, with minimum liquid asset thresholds calibrated to targets for maximum stress loss, annualised volatility and/or Value-at-Risk (VaR) over a specified period. The market participant ensures that liquidity stress test results for each of its entities remain within its stated risk tolerance and that it maintains adequate liquidity resources to meet the projected outflows under stress for each of its entities, including contingencies for increased IMs, inability to rollover repo financing and/or the potential to trigger an Additional Termination Event under ISDA agreements related to the use of derivatives and securities financings. Further, contingency plans are put in place for each of its entities that trigger risk reduction and margin optimisation actions when its liquid resources approach or fall below critical thresholds. These plans include exiting non-core liquid investment strategies, terming out secured financings and drawing down available funding capacity under margin-lock agreements with its prime brokers, where relevant.

Recommendation 3: Market participants should regularly review and update their liquidity risk framework to ensure that liquidity risks arising from margin and collateral calls are robustly managed and mitigated, particularly under extreme but plausible stress scenarios.

On an annual basis or following an episode of stress, like the Covid shock or the outbreak of Russia's invasion of Ukraine, the non-bank market participant reviews its liquidity risk management framework to assess the impact of increased market volatility and reduced market liquidity on the liquidity requirements of each of its entities. Given higher volatilities drive increased Value-at-Risk levels and reduced market liquidity leads to higher potential liquidation costs, the market participant's senior management, board, or corresponding governing body increases the target for unencumbered cash for each of its entities to ensure that it has ample liquidity to meet potential uplifts to IMs from CCPs and bilateral counterparties. It individually reviews its portfolios for more concentrated exposures that could be more costly to exit under stressed market conditions and incorporates estimates of these higher costs into its stress testing and contingency planning. The market participant's senior management, board, or corresponding governing body continues to monitor market liquidity and concentration and takes into consideration, to the maximum extent possible, the risk management practices of their counterparties, to update its assessment of associated risks. In addition, the market participant ensures that its existing financing arrangements remain available and considers whether it needs to pre-position liquidity or take steps to secure incremental liquidity sources to safeguard against unexpected withdrawal of capacity.

Recommendation 4: Market participants should conduct liquidity stress tests to identify sources of potential liquidity strains caused by margin and collateral calls, and to ensure a level of resilience consistent with their established liquidity risk tolerance. The stress test results should be used to calibrate adequate, diverse, and reliable sources of liquidity and collateral arrangements.

A non-bank market participant managing a complex portfolio with large derivatives and securities financing positions establishes sophisticated stress testing systems and protocols so that it can conduct regular analysis on its ability to meet liquidity needs and remain within risk tolerance under extreme but plausible scenarios. This stress testing encompasses a combination of backward-looking statistically driven simulations (e.g. VaR methods), forward-looking hypothetical stress scenarios aligned to the current view of the market participant's senior management, board, or corresponding governing body regarding market risks and considering guidance from authorities in regard to such scenarios where applicable, and reverse stress testing methods to gauge the extent of potential losses over a series of time horizons, ranging for example from one day to two weeks.

The non-bank market participant also uses available data from trading venues, trade repositories, and other public disclosures, combined with market intelligence, to identify and factor in the impact of any concentrated exposures or "crowded" strategies on potential loss projections. The market participant then compares these potential losses with its risk tolerance and calibrates the amount and type of liquid assets that it needs to hold to ensure it can meet its projected cash outflows under the relevant scenarios, including due to a sudden surge in margin and collateral calls. This includes avoiding correlation between the value of its liquid assets and its losses (i.e. wrong-way risk), aligning the currency of its assets with its projected requirements, and ensuring the assets can be accessed and liquidated within the projected time horizons.

Calibrating the levels and diversification of liquidity sources for margin and collateral calls is particularly relevant for market participants that operate with a structural liquidity mismatch, such

as some types of investment funds. These should be calibrated based on a comprehensive scenario analysis, taking into account both the liquidity needs from margin and collateral calls as well from redemption requests.

Recommendation 5: Robust stress testing should analyse a range of extreme but plausible liquidity stresses caused by changes in margin and collateral calls, as well as market participants' overall liquidity position.

A non-bank market participant that is active in derivatives and securities financing undertakes granular stress testing of the potential liquidity requirements under extreme but plausible scenarios by estimating potential increases in variation and IM requirements, as well as expected liquidation costs. The market participant uses market risk stress scenarios (see Recommendation 4) to gauge potential portfolio-level losses and therefore VM requirements, but also estimates potential increases in its IM and haircut requirements by asset class and product type using available data supplied by CCPs and prime brokers. In doing so, it considers the breakdown between cleared and bilateral exposures, and particularly the terms of each bilateral financing agreement (e.g. ISDA, GMRA, etc), including eligible collateral types and any margin-lock features or Additional Termination Events. Similarly, to capture the second-order effects of its own subsequent risk reduction activities, it estimates the additional price impact (and therefore VM requirement) and portfolio-level losses arising from rebalancing and/or re-establishing liquidity following the stress event. In doing so, the market participant factors in the anticipated liquidity of the portfolio under stress, taking account of any concentrated exposures or "crowded" strategies, and considers the effects of exiting both (i) the most liquid assets first and (ii) a pro-rata, or "vertical" slice of the portfolio.

Recommendation 6: Market participants should have resilient and effective operational processes and collateral management practices.

A market participant active in derivatives and securities financing markets ensures that it has the necessary systems and controls in place to (i) anticipate the magnitude and destination of daily (and intraday, where relevant) margin calls in close to real-time, (ii) compare and agree these amounts with counterparties, (iii) track the status and location of unencumbered and pledged collateral, and (iv) enable delivery and receipt of collateral (including cash) within the necessary intra-day cut-off times for each CCP/counterparty. Where an entity relies on third parties to deliver relevant information or undertake specific functions, the market participant obtains clear commitments in respect of the timeliness and capacity of the services provided. These arrangements are reviewed annually (or when necessitated by changing circumstances), together with periodic testing to ensure that each internal process and external service provider is operationally resilient under simulated stress conditions (e.g. exceptionally high volume of high-value collateral transfers).

Recommendation 7: Market participants should maintain sufficient levels of cash and readily available as well as diverse liquid assets and establish appropriate collateral arrangements to meet margin and collateral calls.

A market participant calibrates the amount of liquid resources it requires to ensure it can meet its liquidity needs in extreme but plausible scenarios (as well as any relevant regulatory

resilience standards) and carefully considers the diversification of this collateral between cash and non-cash instruments, according to the contractual arrangements under its derivative and repo transactions. The market participant adjusts the valuation of certain liquid assets (e.g. government bonds) to account for correlation between their value and the size of margin calls that it could face, as well as the potential impact of selling pressure from other market participants under stressed conditions. It also ensures that any non-cash collateral is unencumbered, clearly identified within its collateral management systems, and held within custodial accounts from which it can be delivered to counterparties within the necessary timeframe for meeting margin or collateral calls. To protect against unexpected collateral shortfalls due to, for example, operational delays, the market participant's senior management, board, or corresponding governing body negotiates in advance the right to deliver additional types of non-standard collateral (e.g. corporate bonds) under their bilateral trading agreements with certain counterparties.

Recommendation 8: Market participants should have active, transparent, and regular interactions with their counterparties and third-party service providers in collateralised transactions to ensure adequate operational resilience with respect to spikes in margin and collateral calls under stressed conditions.

A market participant conducts quarterly reviews with each of its prime brokers and largest counterparties that encompass discussions on the terms and availability of credit capacity and expectations for how this might change under stress. The market participant seeks transparency from its counterparties on how IMs on bilateral transactions may adjust in response to extreme but plausible stress scenarios, how concentration and liquidity add-ons are applied, and when intraday margin calls may be required. Similar conversations with third-party service providers aim to gain assurance that they have resilient systems, sufficient human resources, and overall capacity. This is in order to continue delivering timely quality services under stressed conditions when volumes are likely to surge, especially where manual processing is required. The non-bank market participant also develops realistic fall-back procedures to protect against the failure of each individual service provider, including maintaining internal capabilities and/or contracting with back-up providers where commercially viable.