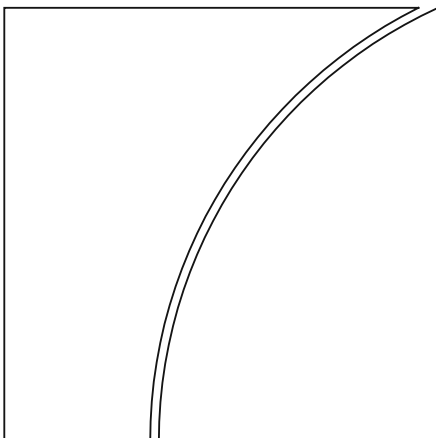


Basel Committee  
on Banking Supervision

Board of the  
International  
Organization of  
Securities Commissions



Streamlining variation  
margin processes and  
initial margin  
responsiveness of  
margin models in non-  
centrally cleared markets

January 2025



iosco

This publication is available on the BIS website ([www.bis.org](http://www.bis.org)) and the IOSCO website ([www.iosco.org](http://www.iosco.org)).

© *Bank for International Settlements and International Organization of Securities Commissions 2025. All rights reserved. Brief excerpts may be reproduced or translated provided the source is stated.*

ISBN 978-92-9259-826-6 (online)

# Contents

- Executive summary ..... 1
- Final recommendations in non-centrally cleared markets..... 3
  - A. Recommendations to streamline VM processes ..... 3
  - B. Recommendations to increase the IM responsiveness of margin models ..... 3
- 1. Introduction ..... 4
  - 1.1 Regulatory market context..... 4
- 2. Streamlining VM processes in non-centrally cleared markets..... 5
  - 2.1 Regulatory context..... 5
  - 2.2 Background on non-centrally cleared variation margin..... 5
    - 2.2.1 WGMR VM Requirements ..... 5
    - 2.2.2 Overview of the non-centrally cleared variation margin process ..... 6
  - 2.3 Industry outreach and consultation response..... 7
    - 2.3.1 No existing evidence indicating a need to amend the WGMR Framework..... 7
    - 2.3.2 Constraints on eligible VM collateral..... 7
    - 2.3.3 Automation and standardisation of VM processes..... 8
    - 2.3.4 Intraday non-centrally cleared VM calls..... 8
    - 2.3.5 Ongoing monitoring of acceptable VM collateral types ..... 8
  - 2.4 Recent market events and observations..... 9
    - 2.4.1 The Covid-19 period and subsequent “dash for cash” ..... 9
    - 2.4.2 The LDI stress period..... 9
    - 2.4.3 2022 commodity markets turmoil ..... 9
    - 2.4.4 Review of dispute data..... 10
  - 2.5 Key findings and policy recommendations ..... 10
    - Four policy recommendations to streamline non-centrally cleared variation margin processes. 10
- 3. Increasing the IM responsiveness of margin models in non-centrally cleared markets ..... 11
  - 3.1 The WGMR Framework..... 11
  - 3.2 ISDA SIMM ..... 12
    - 3.2.1 SIMM as a governance process for implementation in addition to being a model ..... 12
    - 3.2.2 The conceptual framework of SIMM as an internal model..... 12
    - 3.2.3 Parameterisation of the model using a calibration with a stress period..... 13
    - 3.2.4 Global coordination and governance..... 14
    - 3.2.5 Individual firm implementation ..... 15

3.2.6	Ongoing monitoring .....	15
3.2.7	Scope of monitoring coverage.....	16
3.2.8	Remediation.....	16
3.2.9	Documentation transparency .....	17
3.3	Improvements to SIMM responsiveness by supervised firms and ISDA following the Covid-19 crisis.....	17
3.3.1	Model recalibration – shortening the time lag by using more recent data .....	17
3.3.2	Delays in model recalibration – backtesting failures.....	18
3.3.3	Timeliness of applying SIMM shortfall remediation from high and material backtesting exceedances .....	19
3.3.4	Challenges to implementing these changes to SIMM.....	19
3.3.5	Operational difficulties .....	20
3.3.6	Regulatory constraints.....	20
3.3.7	Liquidity impact/market preparedness for semi-annual recalibration .....	20
3.4	Key findings.....	21
	Four recommendations to increase IM responsiveness of margin models in non-centrally cleared markets .....	22
4.	Conclusions .....	22

# BCBS-IOSCO WGMR report on streamlining variation margin processes and initial margin responsiveness of margin models in non-centrally cleared markets

## Executive summary

In September 2022, the Basel Committee on Banking Supervision (BCBS), the BIS Committee on Payments and Market Infrastructures (CPMI), and the International Organization of Securities Commissions (IOSCO) published the Review of Margining Practices<sup>1</sup> (the Phase 1 Report), which identified six areas of further work for potential international policy consideration (Phase 2). This report describes the further work that BCBS-IOSCO has carried out in two of these areas through the Working Group on Margining Requirements (WGMR). Pursuant to Recommendation 7.4 of the Phase 1 Report, the first part of this report assesses streamlining variation margin (VM) processes in non-centrally cleared markets. Pursuant to Recommendation 7.6, the second part examines initial margin (IM) responsiveness of margin models in non-centrally cleared markets.

With respect to streamlining VM processes in non-centrally cleared markets, Recommendation 7.4 proposed further international work to consider ways to foster market participants' preparedness for above-average VM calls through the efficient collection and distribution of VM as well as by other means.

In response to Recommendations 7.4 and 7.6 of the Phase 1 Report, the WGMR published a consultative report on 17 January 2024, informed by three outreach sessions organised jointly with the BCBS/CPMI/IOSCO Joint Working Group on Margin. An additional outreach session was conducted during the consultation period in March, with a broad group of industry participants. Written feedback was received on the consultative report from a small number of entities. The final report takes into account the feedback received and insights gathered from the outreach sessions.

The Phase 1 Report did not elaborate on possible issues related to non-centrally cleared VM processes, and no material problems related to VM processes were identified by the limited set of respondents during Phase 2 outreach sessions. BCBS-IOSCO therefore considers that any issues with VM were relatively localised. As such, BCBS-IOSCO has highlighted some industry practices that came to light through the outreach sessions which aim to improve and strengthen current VM processes. Therefore, firms are encouraged to address operational and legal challenges that could potentially inhibit the seamless exchange of margin and collateral calls during a period of stress. This includes consideration of more flexibility in accepting non-cash collateral for VM (within the set of permissible collateral types per the WGMR Framework and national regulations) in order to address one of the factors that exacerbated the "dash for cash" during recent periods of stress for non-bank counterparties. The proposed recommendations also encourage more widespread automation and standardisation of the margining operational processes and highlight the need for proper operational risk management, particularly when third-party service providers are used.

With respect to the IM responsiveness of margin models in non-centrally cleared markets, the Phase 1 report noted that non-centrally cleared markets experienced a smaller adjustment in IM requirements following the Covid-19 market shock than centrally cleared markets. However, this is likely to have been an intended consequence of the construction of the model used to determine IM, which is based, in part, on the modelling requirements specified in the BCBS-IOSCO framework that established

<sup>1</sup> See BCBS-CPMI-IOSCO, *Review of margin practices*, September 2022.

minimum standards for margin requirements for non-centrally cleared derivatives<sup>2</sup> (the WGMR Framework or BCBS-IOSCO standard) and the low responsiveness to volatility changes of the standardised model used for calculating required IM, namely the ISDA Standard Initial Margin Model (SIMM).<sup>3, 4</sup>

Following the publication of the Phase 1 Report, BCBS-IOSCO investigated the mechanisms to increase the responsiveness of the non-centrally cleared IM following a market shock. BCBS-IOSCO has observed that steps have been taken by firms subject to the WGMR Framework, in conjunction with ISDA, to improve the responsiveness of SIMM in general, and to any unanticipated increase in observed market volatility in particular.

As part of the Phase 2 work, a survey of supervisors confirmed that in almost all cases, firms use SIMM as the internal model for regulatory IM in accordance with the WGMR Framework. During the development of this report, supervisors stated that they focused on the mechanisms that firms using SIMM have agreed to implement to improve the responsiveness of SIMM over time and, in particular, after the Covid-19-driven market shock of 2020. These include shortening the recalibration time lag by using the most recently available data in developing a process to incorporate an interim or semiannual recalibration of SIMM delta risk weights should circumstances warrant; and decreasing the magnitude of bilateral SIMM shortfalls needing to be remediated, also shortening the time to complete the remediation process and to add additional IM.<sup>5, 6</sup>

As detailed in this report, the BCBS-IOSCO does not recommend any revisions to the WGMR Framework to improve the responsiveness of the SIMM to meet the required regulatory IM. The issues that the BCBS-IOSCO identified during the recent periods of extreme volatility, including the 2020 Covid-19 market shock, relate to the implementation of the WGMR Framework by the supervised firms rather than the standards of the WGMR Framework itself. Firms subject to the WGMR Framework that use SIMM should focus on being operationally ready to meet any update or change of the IM model processes to increase the responsiveness of SIMM IM to market shocks or other measures of model underperformance, such as increases in observed material backtesting exceedances.

The newly modified ISDA processes are still in the early stages of implementation. It will therefore be important for supervisors to monitor whether the changes under way to more frequently recalibrate SIMM and increase the responsiveness of the bilateral SIMM shortfall remediation protocol are enough to make SIMM sufficiently responsive to extreme market shocks in accordance with the BCBS-IOSCO standard. This will require monitoring how effective semiannual recalibration is at reducing backtesting exceedances or how effective the updated bilateral SIMM shortfall remediation protocol is at dealing swiftly with material excessive exceedances without unduly increasing SIMM's operational complexity and

<sup>2</sup> See BCBS-IOSCO, *Margin requirements for non-centrally cleared derivatives*, March 2015.

<sup>3</sup> See eg ISDA, *SIMM Methodology*, version 2.6, September 2023.

<sup>4</sup> This has also been noted publicly by certain supervisors. In June 2022, the UK's PRA wrote to firms following a review of the use of ISDA SIMM's model, concluding that existing SIMM governance process for updating SIMM or bilateral remediation might not be adequate to ensure timely action is taken to remediate model underperformance. See Bank of England, "Letter from Duncan Mackinnon, David Bailey, and Nathanaël Benjamin 'PRA's review of the use of the SIMM model: conclusions'", June 2022.

<sup>5</sup> Bilateral SIMM shortfall remediation is a defined term in the ISDA SIMM Governance Framework. In general, it is the minimum amount of additional IM required necessary for a bilateral portfolio to meet the regulatory IM standards following a material backtesting exceedance. The WGMR notes that this is an important element of the responsiveness of the SIMM model implementation to unanticipated market shocks or misspecification of the model for an individual firm's portfolios with counterparties. During the Covid-19 crisis, a marked increase in the number and magnitude of red backtesting exceedances were observed by individual firms and reported to supervisors and to ISDA. Improvements in this important element of risk mitigation will be discussed further in this report since it is a crucial part of each firm's implementation of SIMM.

<sup>6</sup> These changes should also reduce the number and magnitude of backtesting exceedances observed during the Covid-19 crisis. See BCBS-CPMI-IOSCO, *Review of margin practices*, September 2022, Section 3.3.

procyclicality. This monitoring will have to be performed inter alia, in the context of the overall task of supervisors assessing the IM models used by supervised entities.

## Final recommendations in non-centrally cleared markets

### A. Recommendations to streamline VM processes

1. Generally, as dealer banks and other market intermediaries conduct their regular due diligence and establish the boundaries that will govern their trading relationship, they should address the operational and legal challenges that could potentially inhibit a seamless exchange of margin and collateral calls during a period of stress.
2. With the intent to mitigate liquidity issues and a subsequent “dash for cash” during periods of stress, firms should consider providing flexibility in bilaterally agreed acceptable collateral, from within the set of permissible collateral types per the WGMR Framework and national regulations and doing so with appropriate haircuts.
3. Firms should consider the advantages of standardisation and automation of their non-centrally cleared margin processes to reduce frictions and the possibility of operational delays or failures. Depending on the firm’s trading profile, these improvements may facilitate collateral utilisation within firms, especially in stress periods.
4. Firms should consider whether the utilisation of third-party services would be helpful in their efforts to improve non-centrally cleared VM processes, weighing their own firms’ capabilities and the need for proper risk management of outsourced services.

### B. Recommendations to increase the IM responsiveness of margin models

5. Firms should have appropriate processes to calculate IM according to the WGMR Framework and to provide information to ISDA and their supervisors as required under applicable supervisory guidance or expectations and the ISDA SIMM Governance Framework. Firms should conduct periodic backtesting of the SIMM model, recording exceedances and the resulting shortfalls, as well as the firm’s appropriate responses, to reduce the frequency or the level of exceedances, including informing supervisors, ISDA and counterparties.
6. Firms should be operationally prepared to identify and remediate bilateral SIMM shortfalls in a timely manner in accordance with applicable supervisory guidance or requirements, internal governance procedures and the ISDA SIMM Governance Framework.
7. Firms should be operationally ready to incorporate off-cycle and in the future semiannual recalibration of SIMM delta risk weights as appropriate.
8. Firms should have appropriate arrangements to have or source sufficient liquidity to meet unanticipated changes in IM driven by off-cycle or semiannual recalibration of SIMM, bilateral SIMM shortfall remediation or any other draws on liquidity associated with regulatory IM.

# 1. Introduction

## 1.1 Regulatory market context

Recent market stress periods have provided real-world tests of financial markets' resilience. In large part, the introduction of the revised BCBS-IOSCO standard for margin requirements for non-centrally cleared derivatives (WGMR Framework)<sup>7</sup> in April 2020 has proven successful in reducing counterparty risk by increasing collateralisation of non-cleared derivatives.

However, when the post-GFC reforms were agreed to, it was recognised that increasing collateralisation, while decreasing counterparty risk, could increase liquidity risk. As requirements were formulated, different measures were introduced to mitigate this side effect. To ensure that the resulting margin requirements in both cleared and non-centrally cleared markets perform as intended, regulatory authorities, therefore, undertook to evaluate how markets performed during the Covid-19 period and the "dash for cash" episode. To facilitate this review, an international working group coordinated through BCBS, CPMI, and IOSCO was established to investigate the issues that arose during the stress periods.

In September 2022 the Report on Review of Margining Practices (the Phase 1 Report) was published and identified six areas for further policy work (Phase 2). The policy work in response to these recommendations is being carried out by the BCBS-CPMI-IOSCO Joint Working Group on Margin (JWGM), the CPMI-IOSCO Policy Standing Group (PSG), the BCBS-IOSCO Working Group on Margin Requirements (WGMR) and the Financial Stability Board (FSB) Working Group on Margin Preparedness (WGMP).

The Phase 1 Report concluded that while markets proved resilient during the Covid-19 period, large increases in margin requirements were experienced as well. This observation led to Recommendation 7.4 of the Phase 1 Report which sets out the need for a follow-up examination of ways to streamline variation margin (VM) processes in both centrally cleared and non-centrally cleared markets.

The Phase 1 Report also noted that non-centrally cleared markets experienced a smaller adjustment in margin requirements than centrally cleared markets, due primarily to model construction and the low responsiveness of their models to volatility changes. In the light of this observation Recommendation 7.6 (Evaluating the responsiveness of non-centrally cleared IM models to market stresses) proposed further work on the timeliness of mechanisms for taking into account stress periods in the calibration of internal models and the timely remediation of IM shortfalls and the level of disclosure regarding the performance of non-centrally cleared IM models.

Because of a lack of data and information on the non-centrally cleared markets gathered during the development of the Phase 1 Report, an outreach process to obtain more information was established jointly between the WGMR and the JWGM. To inform the recommendations in this report, the JWGM, PSG and the WGMR hosted three outreach sessions with intermediaries/clearing members, end users/clients, and collateral service providers. Through the Phase 2 outreach sessions the WGMR gathered information from market participants to understand how the market can be best prepared for above-average VM calls through the efficient collection and distribution of VM in non-centrally cleared markets.

The WGMR sought to determine which aspects of non-centrally cleared VM and IM processes did not work smoothly or where the system may have experienced material issues. In addition to the Covid-19 pandemic and related March 2020 "dash for cash", more recent stress events, such as the March 2021 collapse of the Archegos family office (private investment fund), the commodities market turmoil in 2022, and the use of liability-driven investment (LDI) strategies by UK pension funds in September 2022 were also considered by the WGMR in developing the findings in this report.

<sup>7</sup> See BCBS-IOSCO, *Margin requirements for non-centrally cleared derivatives*, April 2020.



The WGMR published a consultative report on 17 January 2024, and held an outreach session in March with a broad group of industry participants on the recommendations. Written feedback was received on the consultative report from a small number of entities. The sections below have been amended to address feedback received and insights gathered from the outreach sessions.

## 2. Streamlining VM processes in non-centrally cleared markets

### 2.1 Regulatory context

Recommendation 7.4 of the Phase 1 Report set out the need to examine ways to streamline VM processes in both centrally cleared and non-centrally cleared markets. The work the WGMR carried out pursuant to this recommendation focused on four specific areas in non-centrally cleared markets:

1. general system and operational aspects of non-centrally cleared VM processes, including the identification of areas where frictions were experienced in recent market crises;
2. possible shortages of collateral in peak volatility situations and general wrong-way risk;
3. concentration in third-party service (collateral) providers; and
4. transparency and dispute resolution.

### 2.2 Background on non-centrally cleared variation margin

#### 2.2.1 WGMR VM Requirements

Variation margin (VM) represents the exchange of funds to collateralise current exposures due to changes in the market prices of derivatives.<sup>8</sup> In non-centrally cleared derivatives markets, VM can be paid (settled) or posted (collateralised). Guidance in key principle 4 of the WGMR Framework regarding the type of assets eligible to cover VM is left up to national jurisdictions and states that assets collected as collateral, both as VM and IM, should be highly liquid and should, after accounting for an appropriate haircut, be able to hold their value in a time of financial stress. By marking an open position to current market prices, changes in the fair market values of a position can be determined through comparison with a previous market-derived mark, or a profit and loss calculation.

In the wake of the GFC, the BCBS and IOSCO developed the WGMR Framework. For non-centrally cleared transactions, each party must exchange VM directly with its counterparties bilaterally. For jurisdictions that had adopted requirements under the WGMR Framework by the time of the events that are the focus of this report, all transactions covered under the WGMR Framework were already exchanging VM, that is, VM was not subject to the same phase-in as IM.

The WGMR Framework addresses derivatives dealers, banks, managed and investment funds, and systemically important non-financial entities.<sup>9</sup>

<sup>8</sup> The WGMR Framework states in element 3 that VM margin protects the transacting parties from the current exposure that has already been incurred by one of the parties from changes in the mark-to-market value of the contract after the transaction has been executed. The amount of variation margin reflects the size of this current exposure. It depends on the mark-to-market value of the derivatives at any point in time and can therefore change over time. See BCBS-IOSCO, *ibid*.

<sup>9</sup> The WGMR Framework states in element 2 that the BCBS and IOSCO believe that the margin requirements need not apply to non-centrally cleared derivatives to which non-financial entities that are not systemically important are a party, given that (i) such transactions are viewed as posing little or no systemic risk and (ii) such transactions are exempted from central clearing mandates under most national regimes. See BCBS-IOSCO, *ibid*.

## 2.2.2 Overview of the non-centrally cleared variation margin process

Effective counterparty risk management begins with the various processes that need to be undertaken when initiating a new counterparty relationship. These processes include a compliance review, know-your-customer (KYC) information-sharing, the establishment of master agreements, credit support annexes and/or credit support deeds, custodian control agreements, eligible collateral schedules, and standing settlement instructions, amongst other important procedural documents.

The exchange of variation margin between counterparties involves the following key steps:

1. valuation of the outstanding portfolio of trades between counterparties at the agreed close time;
2. issuing of (or receipt of) the relevant call for variation margin, representing the relevant profit (or loss) on the portfolio since the last call;
3. review and reconciliation of any VM calls, or initiation of any disputes; and
4. initiating transfer of VM, either directly, or via a custodian.

To participate in the margin exchange process effectively, it is important to have close to real-time updates for the various required VM systems. The timeliness of updates, along with properly validated data, robust valuation processes and appropriate governance systems for ensuring mutual understanding of counterparty exposure are critical to ensuring these systems will produce reliable results leading to mutually agreed-upon required valuation (RQV) amounts for collateral exchange. Firms should also be cognisant of the robustness of their systems, ensuring they will perform in periods of stress as well as business-as-usual periods. This includes ensuring backup procedures are in place, and alternative arrangements are available when failures do occur.

Traditionally there have been two frameworks for custodian arrangements: triparty and third-party. Triparty arrangements include services beyond those of standard third-party arrangements, which only provide settlement, segregation and reporting services. Triparty services can additionally include ensuring collateral eligibility, monitoring of concentration limits, applying haircuts, collateral valuation, optimisation of collateral use, substitutions, and automation of collateral movement. Hybrid models have been offered recently, providing a middle ground between these two traditional model types. Firms will need to conduct internal cost assessments to determine whether services can be conducted in-house, or whether a third-party provides a better alternative. Whichever arrangement of collateral management is chosen, firms themselves remain accountable for the terms agreed upon with their counterparties and are responsible for any necessary enhancements to their risk control frameworks to ensure sound and comprehensive risk management practices and compliance with regulatory requirements.

Lastly, it is important to note the increased use of proactive dispute mitigation programmes with accompanying policies and procedures laying out thresholds and corresponding escalation measures, which provide for clearer determination through dispute attribution, as opposed to programmes that are reactive in nature.

ISDA has published several comprehensive documents on suggested best operational practices for topics such as OTC derivative collateral,<sup>10</sup> portfolio reconciliation for credit risk mitigation,<sup>11</sup> and triparty/third-party collateral processes.<sup>12</sup> These documents should be referenced for greater detail.

<sup>10</sup> See ISDA, *Suggested operational practices for the OTC derivatives collateral process*, November 2022.

<sup>11</sup> See ISDA, *Portfolio reconciliation, dispute management and reporting suggested operational practice*, September 2023.

<sup>12</sup> See ISDA, *Suggested operational practices for settlement, release, and updates and reporting of triparty and third party segregated collateral*, November 2022.

## 2.3 Industry outreach and consultation response

To complement the information collected in Phase 1 by the JWGM, the WGMR held virtual stakeholder outreach sessions with intermediaries/clearing members, end users/clients, and third-party service providers. These sessions were organised jointly with the JWGM, which is separately taking forward further policy work on margin in centrally cleared markets.

Findings from the outreach were in many ways in line with the survey results gathered during the Phase 1 Report. While some market participants faced large and unexpected non-centrally cleared VM calls, outreach responses indicated that this did not appear to be widespread or persistent. The survey findings from the Phase 1 Report also showed how large VM calls experienced by clients and intermediaries were heterogeneous in terms of the liquidity strain faced by counterparties.<sup>13, 14</sup> Nonetheless this report seeks to identify good practices to ensure readiness for large increases in non-centrally cleared VM calls in stressed market situations.

On 17 January 2024, the BCBS and IOSCO published the consultative report on *Streamlining VM processes and IM responsiveness of margin models in non-centrally cleared markets*. Written feedback was received from a small number of entities and in addition, the WGMR held an outreach session in March 2024 with a broad group of industry participants.

The sections below have been amended to address feedback received and insights gathered from the outreach sessions.

### 2.3.1 No existing evidence indicating a need to amend the WGMR Framework

Throughout the outreach process, market participants did not identify a need to amend the WGMR Framework with respect to VM. Certain aspects of the WGMR Framework were highlighted when considering a misalignment of acceptable collateral types between jurisdictions, and these misalignments are discussed below. However, these issues are related to jurisdiction-specific implementation and do not affect the WGMR Framework as a whole.

### 2.3.2 Constraints on eligible VM collateral

During the consultation process, some commenters advocated for expansion of eligible collateral for VM in non-centrally cleared markets. However, no anecdotal evidence has been provided to support this request and a material shortage of collateral was not identified during recent periods of higher market volatility and the associated higher VM calls with respect to non-centrally cleared derivatives. The outreach sessions found that dealer banks' balance sheet capacity is likely a binding constraint when considering collateral types; it has been reported that dealer banks typically prefer cash for VM collateral. It can be acknowledged that certain collateral types may be costly to accept. However, the acceptance of more diversified collateral types for VM, among the set of already permitted assets and subject to appropriate haircuts, could potentially prevent even more costly consequences, and provide relief in these instances, as buy-side firms like pension funds, hedge funds and insurance companies often hold securities but have little cash.

During the outreach sessions, panellist responses specifically noted similar concerns about UK pension funds applying liability-driven investment (LDI) strategies, as elaborated further below. It is likely

<sup>13</sup> One should note that VM calls between intermediaries and clients for transactions intended to be cleared are being covered by the JWGM work. The WGMR VM workstream focuses only on non-cleared derivatives transactions.

<sup>14</sup> It is likely that entities or assets excluded or exempted from the WGMR Framework (eg commercial entities or entities trading "spot" or "cash" transactions below thresholds established by regulation) might not have shared their experiences. One concern is that some of the plausibly most affected firms, such as "Phase 6" or energy trading firms, would fall under this category. However, members believe most of the results listed here would still broadly hold.

these funds and their counterparties had not contractually established or were not prepared for the use of a diverse set of alternative collateral to manage potentially large and volatile VM requirements. This includes concerns associated with wrong-way risk (a situation involving a feedback loop between the value of collateral and the value of underlying risk). However, increased flexibility on the part of dealer banks regarding the acceptance of non-cash collateral for VM payments may come at a cost when considering balance sheet constraints and various operational impacts, such as uncertainty regarding collateral to be received, and the ability to re-use it immediately.

Some commenters noted the potentially high cost of fully and promptly amending contractual relationships. However, the benefits of such a review may exceed these drawbacks if a targeted and gradual approach is taken to review the contractual relationships, enabling the acceptance of non-cash collateral for VM payments.

### 2.3.3 Automation and standardisation of VM processes

Industry efforts are under way to standardise and automate processes surrounding the exchange of VM in non-centrally cleared markets. Issues raised during the outreach session included lack of automation, especially for mid-sized and smaller firms; increased operational pressure during volatility periods due to insufficient automation; and the existing need to improve standardisation across the industry for collateral processes. These industry-led efforts are aimed at taking a more holistic approach, both within firms and across counterparty networks to reduce friction within the system.

Automation and standardisation are largely intended to address concerns with increasingly complex collateral schedules and collateral types used for non-centrally cleared VM processes. The use of third-party service providers with specific expertise in automation and standardisation of VM exchanges and collateral management was noted as an alternative solution to these concerns for firms that lack the resources to develop in-house solutions to these issues.

Commenters pointed out that concentration of service providers may introduce operational risks. This is why it is important that the recourse to third-party service providers comes along an in-depth due diligence process and sound risk management of the external relationship. While some commenters noted the potentially high cost of fully and promptly implementing the recommendations, others noted positive returns through lower future costs and risk reduction benefits that can be obtained from the targeted implementation.

### 2.3.4 Intraday non-centrally cleared VM calls

Recommendation 7.4 of the Phase 1 Report stated that particular attention should be given to an examination of intraday VM calls. However, unlike cleared markets, non-centrally cleared VM is generally not intraday. A daily end-of-day process typically includes pricing sources (and timing), affirmation, reconciliation and confirmation that are contractually agreed upon on a bilateral basis. The lack of intraday collection for VM for non-centrally cleared derivatives trades differentiates from circumstances experienced in the most extreme cases during recent market events, where certain liquidity burdens on market participants or clients in centrally cleared markets can be attributed to intraday collections of VM.

### 2.3.5 Ongoing monitoring of acceptable VM collateral types

It was noted within the outreach session and in public comments that certain jurisdictional differences in the eligibility criteria for VM collateral exist. These differences should be monitored on an ongoing basis to ensure the current standard does not become a binding constraint for VM on bilateral margin calls, especially on cross-border transactions between EU and US entities.

## 2.4 Recent market events and observations

This section draws on earlier analysis conducted by other Phase 2 groups, including the JWGM and WGMP, and provides a high-level summary of recent market stresses and regulatory intervention that were considered in developing this report.

### 2.4.1 The Covid-19 period and subsequent “dash for cash”

The “dash for cash” describes the weeks in mid-March 2020 when even the safest and most highly liquid assets such as government bonds experienced large price declines.<sup>15</sup> During the Covid-19 pandemic, markets experienced significant price falls as a result of falling business activity worldwide, and the ensuing volatility and market stress led to heightened liquidity demands. While these large margin increases were attributable to a strengthening of the financial system through the implementation of measures including margining to minimise counterparty risk after the GFC, these strengthened requirements also led to liquidity strains during these market stress.

A host of measures (including monetary, fiscal, as well as other measures) were undertaken by central banks and public authorities to alleviate the market stress associated with the Covid-19 stress period, and, as such, ensured a faster recovery and a shallower period of stress.

### 2.4.2 The LDI stress period

The unprecedented and disorderly rise in gilt yields in late September 2022 caused a material drop in the net asset value (NAV) of LDI funds used by defined benefit (DB) pension funds to hedge their pension liabilities. These funds were also hit with large margin and collateral calls on their repo and derivative positions as a result of rising interest rates. These margin calls, as well as the increase in leverage as NAVs fell, forced funds to sell gilts to de-lever and raise cash, to improve their balance sheet position. The resulting one-way selling pressure on gilt markets instigated a negative feedback loop of lower prices, additional margin calls and further gilt sales, ultimately culminating in dysfunction in long-dated gilt markets. The Bank of England stepped in, in line with its objective to protect UK financial stability, with a temporary and targeted intervention to restore gilt market functioning, buying time for LDI funds to improve their resilience. This intervention took the form of a brief window of targeted gilt purchases. These purchases were unwound promptly once orderly market functioning had resumed and LDI funds/balance sheet positions had improved.<sup>16</sup>

### 2.4.3 The 2022 commodity markets turmoil

The 2022 commodity markets turmoil again has been considered in detail by other regulators.<sup>17, 18</sup> Commodity markets possess certain particular features that can make them especially susceptible to geopolitical shocks and macroeconomic uncertainty – including the rigid requirements for their use and production and distribution systems that are susceptible to a host of possible disruptions. In various markets – including natural gas and nickel throughout 2022 – market participants faced severe increases in cleared margins as a result of geopolitical events. Commodity firms often possess less liquid collateral (eg future production) and held insufficient readily available liquidity to provide at short notice to their counterparties and clearing intermediaries. Ultimately, this led to banks having to extend

<sup>15</sup> See FSB, *Holistic review of the March market turmoil*, November 2020.

<sup>16</sup> See Bank of England, *Financial Stability Report*, December 2022, Chapter 5.

<sup>17</sup> See FSB, *The financial stability aspects of commodities markets*, February 2023.

<sup>18</sup> See IOSCO, *Principles for the regulation and supervision of commodity derivatives markets*, January 2023.

additional credit to these firms, and in some cases to authorities stepping in to remediate issues faced by these commodity firms.

#### 2.4.4 Review of dispute data

Defaults would be a clear indication of issues with VM but were generally not observed. As an alternative indicator, valuation disputes between counterparties could be evidence of potential deficiencies in VM processes.

Analyses of quarterly summary reports covering US-regulated swap dealers<sup>19</sup> for over five years, which have closely tracked the frequency, size and duration of VM disputes above USD 20 million, show that disputes generally represent less than 2% of the approximately 30,000 portfolios, even during periods of stress, and that disputes are generally resolved within the reporting quarter, with remarkably few exceptions. Further analysis suggests VM disputes correlate highly with market volatility metrics, which is consistent with observations shared in outreach sessions by market participants.

The experiences in other jurisdictions, whether they receive reports on margin disputes, or gathered anecdotal evidence, generally tend to confirm the observations from the United States; that is, valuation disputes did increase during the periods of stress, but the frequency, size and duration did not rise to a material level of concern.

Good practices described in the outreach sessions also suggest that dispute resolutions among counterparties primarily concern VM valuation issues, rather than the sets of allowable collateral to be used in settling VM calls, due to collateral schedules being clearly established in legal documents. While the use of disputes as strategic delays is possible, the practice is anecdotally very uncommon and generally repudiated by market participants.

## 2.5 Key findings and policy recommendations

Given that there were no indications of material problems related to VM processes in non-centrally cleared derivatives markets in the Phase 1 Report and during the outreach sessions, and given that WGMR members reported only isolated (ie not persistent or widespread) problems, this report concludes that any issues were relatively localised. The recommendations of this report are therefore to highlight practices which align with existing recommendations in the WGMR Framework which market participants should be encouraged, in a proportionate manner, to improve, strengthen and generally streamline VM processes. These recommendations follow from the discussions held in the outreach sessions and address specific frictions observed during recent market stress events. The recommendations attempt to address good practices in planning for contingencies related to constraints on allowable collateral and a dependency of some market participants on bespoke, and manual or outdated operational processes.

The BCBS-IOSCO efforts in ongoing monitoring of the implementation of the standard will continue; this may provide an opportunity to obtain additional information, given the insightful but limited feedback received from the industry.

### Four policy recommendations to streamline non-centrally cleared variation margin processes

1. Generally, as dealer banks and other market intermediaries conduct their regular due diligence and establish the boundaries that will govern their trading relationship, they should address the

<sup>19</sup> Commodity Futures Trading Commission (CFTC) Regulation 23.502(c) requires Swap Dealers (SDs) and Major Swap Participants (MSPs) to promptly notify the Commission of any swap valuation dispute that exceeds \$20 million (or equivalent amount in another currency) within three business days where the counterparty is an SD or MSP, and within five business days for all others.

- operational and legal challenges that could potentially inhibit a seamless exchange of margin and collateral calls during a period of stress.
2. With the intent to mitigate liquidity issues and a subsequent “dash for cash” during periods of stress, firms should consider providing flexibility in bilaterally agreed acceptable collateral, from within the set of permissible collateral types per the WGMR Framework and national regulations and doing so with appropriate haircuts.
  3. Firms should consider the advantages of standardisation and automation of their non-centrally cleared margin processes to reduce frictions and the possibility of operational delays or failures. Depending on the firm’s trading profile, these improvements may facilitate collateral utilisation within firms, especially in stress periods.
  4. Firms should consider whether the utilisation of third-party services would be helpful in their efforts to improve non-centrally cleared VM processes, weighing their own firms’ capabilities and the need for proper risk management of outsourced services.

### 3. Increasing the IM responsiveness of margin models in non-centrally cleared markets

#### 3.1 The WGMR Framework

The WGMR Framework establishes the basic elements and specifications for the calculation of regulatory IM. Regulatory IM needs to be sufficient to protect the counterparty, assuming that it takes 10 business days to close out the positions with a defaulting counterparty and re-contract with another viable counterparty. Therefore, the WGMR Framework states that the margin period of risk (MPOR) is 10 days. This is on the assumption that the variation margin is exchanged daily between the counterparties. To calculate IM using an initial margin model, a counterparty needs to calculate the potential future exposure (PFE) of the portfolio with the counterparty using parameters laid out in the WGMR Framework.

Under the WGMR Framework, the required IM should reflect an extreme but plausible estimate of an increase in the value of the portfolio that is consistent with a one-tailed 99% confidence interval over a 10-day horizon and should be based on historical data that incorporate a period of significant financial stress.<sup>20</sup> In addition, there are limits on the amount of diversification that the model may incorporate. With the exception of foreign exchange and interest rates, all other instruments with underlying assets based on credit, equities and commodities need to have the IM calculated without incorporating any cross-asset category diversification benefits. Moreover, each broad asset class should have its own period of stress. The identified period must cover a historical period not exceeding five years.

This, in essence, requires that the IM be calculated by individual asset category and then summed across asset categories. If an IM model is not used, the framework provides for the use of a standardised schedule of PFEs by asset category.<sup>21</sup>

The WGMR Framework includes requirements for firms to meet supervisory expectations before using an internal model (which may be developed internally or supplied by a vendor) to calculate the required IM. In general, the authorities responsible for authorising the use of internal models developed

<sup>20</sup> See Requirement 3.1 in the WGMR Framework.

<sup>21</sup> See the standardised initial margin schedule of the WGMR Framework.

standards for firm-level model implementation that followed traditional supervisory expectations for regulatory capital or other purposes such as net liquidity.

## 3.2 ISDA SIMM

### 3.2.1 SIMM as a governance process for implementation in addition to being a model

SIMM is a standardised model that cannot be updated continuously to reflect current market conditions and still be used for daily IM calculation by a large number of users. However, as a standardised model, it may still be used to conservatively capture most of the observed market volatility and allow firms to have a large number of trades in a portfolio with a given counterparty that are reconciled daily. To deal with situations where sufficient market volatility is not captured, a framework was developed and agreed to by the firms using SIMM under the ISDA SIMM Governance Framework ("Governance Framework"). This governance and operational system has been refined by firms and ISDA over time to address many of the shortcomings of SIMM as a standardised model as described in various governance documents.<sup>22</sup>

Under the Governance Framework, firms provide data to ISDA so that it can annually recalibrate model parameters and backtest the future production versions of SIMM, which can then be used by all SIMM users to help avoid reconciliation problems. Once the model is being used by firms to calculate IM, firms need to monitor the performance of SIMM including performing backtesting as described in the Governance Framework.<sup>23</sup>

Under the Governance Framework, firms using SIMM have agreed to promptly address backtesting exceedances above a particular frequency and magnitude. First, if material backtesting exceedances occur, the amount of IM between the counterparties should be increased within a specific period of time. This procedure is called "bilateral SIMM shortfall remediation". Second, firms need to periodically provide supervisors and ISDA with information on the backtesting exceedances and the root cause of the exceedances, so potentially widespread problems with the production version of SIMM may be addressed in future versions.

In this way, SIMM is not just a model but a set of procedures that are designed to allow the largest number of users and portfolios to be covered by SIMM as a standardised model but still generate an amount of IM to meet regulatory expectations in a timely manner. The improvements made in the responsiveness of SIMM have targeted changes to those procedures and not only the model.

### 3.2.2 The conceptual framework of SIMM as an internal model

SIMM has its conceptual roots in the Standardised Approach for the revised BCBS market risk capital requirement framework (ie FRTB-SA).<sup>24</sup> Similar to the FRTB-SA, the SIMM uses risk factor sensitivities of instrument prices to market risk factors calculated by firms as inputs. These inputs are aggregated through a nested variance-covariance matrix using a standard set of risk weights and correlations to determine the amount of IM.

A number of modifications were made to this basic modelling structure in the development of SIMM to fit the WGMR Framework and make the calculation straightforward and repeatable for users. This

<sup>22</sup> See ISDA SIMM Governance Framework, July 2016 and periodic updates to the framework or monitoring framework.

<sup>23</sup> An important element of the overall Governance Framework is that firms using SIMM may participate in the ISDA SIMM Governance Forum where firms discuss potential modifications to SIMM, changes to definitions and standards or other issues associated with the use of SIMM.

<sup>24</sup> See BCBS, *Minimum capital requirements for market risk*, January 2016. Also see BCBS, *Minimum capital requirements for market risk*, January 2019.



is because SIMM is intended as a standard industry margin model<sup>25</sup> to be used by a large number of firms to calculate IM daily. Importantly, the risk weights and correlations used in SIMM are annually recalibrated by ISDA. Delta risk weights are updated off-cycle if certain criteria are met. In the future, a semiannual recalibration of the delta risk weights will take place.

SIMM relies on risk factor sensitivities spanning the following risk classes:

- interest rate risk;
- credit spread risk (qualifying);
- credit spread risk (non-qualifying);
- equity risk;
- commodity Risk; and
- foreign exchange (FX) risk.<sup>26</sup>

The SIMM model documentation<sup>27</sup> includes a description of IM calculations including capturing delta, vega and curvature risks.

SIMM uses a risk-based product class segregation of the portfolio and adheres to limited requirements of diversification, hedging and risk offsets that may be recognised within the risk-based product classes, but not across product classes as prescribed in the WGMR Framework.

### 3.2.3 Parameterisation of the model using a calibration with a stress period

As required under the WGMR Framework, the risk weights of SIMM are defined as the 99th percentile of the 10-day market move of the respective risk factors. The calibration of each bucket is based on a set of representative instruments and includes a period of observed market stress. For the risk weight calibration of SIMM, 10-day overlapping returns are considered. Parameters are calibrated to the MPOR of 10 days without scaling.

Before the market events considered in this report, the SIMM stress period consisted of a one-year continuous time period representing the most volatile time window, based on representative risk factors for each risk class. This was determined by sliding a one-year volatility (of the 10-day overlapping return) window from 2 January 2008 through December of each subsequent year with the financial stress event identified at the risk class level.

<b>Calibration of stress periods – SIMM</b>	<b>Table 1</b>
Interest rates	16 April 2008–15 April 2009
Credit spread (qualifying)	23 August 2008–22 August 2009
Credit spread (non-qualifying)	1 November 2008–31 October 2009
Equity	17 August 2008–16 August 2009
Commodity	14 August 2008–13 August 2009
Foreign exchange	4 June 2008–3 June 2009

<sup>25</sup> Standardisation is needed to reduce the number of margin disputes that would be inevitable if each counterparty used its own internal model.

<sup>26</sup> The initial margin amount is derived from the simple summation of the calculated delta margin, vega margin, curvature margin and the base correlation margin (only present in the credit (qualifying) risk class) within each risk class.

<sup>27</sup> See eg ISDA, *SIMM Methodology*, version 2.6 (September 2023).

The daily time series data in the identified stress period are equally time-weighted. The risk weight for the individual instrument is specified as the maximum of the absolute values of the extreme 1-tailed percentiles in two directions. We note that prior to Covid-19 these stress periods continued to be used and were one of the drivers of the overall calibration of the SIMM. Post-Covid-19, a new method for selecting the stress periods by quarters has been implemented.

### 3.2.4 Global coordination and governance

SIMM needs to be implemented and operated by firms within a global regulatory context. Firms that have selected SIMM are required to ensure that SIMM calculations are robust enough to margin portfolios in accordance with regulatory standards and that remediation and tracking of uncovered risks are applied properly. The focus of implementation has been on:

1. Global SIMM governance and development – coordinating developments and standards around SIMM across firm participants, service providers and regulators.
2. Firm-level portfolio monitoring – monitoring risk coverage at the counterparty level at each firm and remediating associated risk coverage shortfalls of SIMM.

Since 2016, the ISDA SIMM Governance Framework<sup>28</sup> has been part of the agreement to monitor the performance of SIMM by users.

As required by the WGMR Framework, annual recalibrations use data that include a period of financial stress to derive parameters that meet a 99% confidence of the 10-day cover standard. ISDA is also responsible for the annual review of SIMM's methodology. This review addresses reported shortfalls and reconciliation issues, developments in the financial markets and changing market conditions, advances in modelling technology, changes to risk factor definitions, scope expansion to include additional risk factors and model simplification.

SIMM users escalate margin shortfalls (either from backtesting or reconciliation difficulties), quarterly to ISDA. Users report the SIMM shortfalls that exceed established threshold amounts (to keep the total amount of reported exceedances manageable), user-created analysis of shortfall causes, and overview of reconciliation-related disputes. ISDA utilises this information to assess whether recalibration or methodology enhancements are necessary. If the scope of SIMM is expanded to incorporate additional risk factors or if material changes to the SIMM methodology are implemented, ISDA notifies regulators 60 days prior to the effective date of these changes.

As stated in the ISDA SIMM Governance Framework, "global non-cleared margin rules require monitoring and assessment of controls, validation, and operational process and procedures surrounding margin models".<sup>29</sup> These rules require the continuous monitoring of deficiencies identified at the portfolio level in SIMM. Therefore, SIMM users are required to have the infrastructure in place to address margin shortfall risk through the provision of additional margin or tracking of uncovered exposures. ISDA requires portfolio monitoring (of portfolios with SIMM margin that exceeds the portfolio monitoring threshold requirement as defined by ISDA), a quarterly ISDA review (which covers shortfalls that breach the reporting threshold as defined by ISDA, during that specific quarter), and remediation (users are required to remediate a portfolio when it exceeds the remediation threshold as defined by ISDA).<sup>30</sup>

<sup>28</sup> See ISDA *SIMM Governance Framework*, July 2016 and periodic updates to the framework or monitoring.

<sup>29</sup> See ISDA, *SIMM Governance Framework*, July 2022.

<sup>30</sup> See ISDA, *SIMM Enhanced Monitoring Proposal*, 2019.

### 3.2.5 Individual firm implementation

While global SIMM governance controls the overall content of SIMM, individual supervised firms also need to have an internal governance process to implement SIMM or any other internal or vendor-supplied model. In addition, these firms also may be required to receive authorisation from national supervisors to use the SIMM or other model to calculate regulatory IM.

This internal governance generally takes the form of an oversight committee with the authority to approve the use of the model and periodically evaluate its performance. While most jurisdictions have guidance or supervisory requirements for the review of the model by the supervisors, firms are responsible for their own implementation of the model. In the case of SIMM, many analysts view SIMM as analogous to a vendor-supplied model given that there is standardisation in the calculation basis for SIMM for similar trades once individual firms provide their internally generated inputs. As a standardised calculation engine, SIMM provides users with a common and transparent method to calculate daily IM and thus avoid, to the extent possible, disputes over the required regulatory IM amount to be collected by each firm.

For an individual firm's implementation of SIMM, sensitivities need to be independently supplied according to the prescribed architecture of SIMM. In most cases, these sensitivities are provided by the individual firm's proprietary front office (FO) pricing models. Recently, third-party vendors are beginning to provide sensitivities for firms that do not have FO models or have chosen not to incur the expense of translating their FO sensitivities to the mapping architecture required for SIMM. Each of these steps of translating existing FO sensitivities (that, for example, may have different tenors) must be developed by the model owner. These steps are subject to the review of the second line of defence, the model validation unit. Finally, the firm's internal audit reviews the model implementation process including governance, validation, and ongoing monitoring to assure senior management and the board of directors that the firm is meeting internal model implementation requirements and supervisory expectations.

### 3.2.6 Ongoing monitoring

In the context of firm-level portfolio monitoring and risk remediation, SIMM users are required to perform two exercises in order to monitor SIMM's ongoing performance:

- (a) comparison of actual portfolio-level PnL shifts (a dynamic, daily backtest); and
- (b) 1 + 3 standard (static backtest) based on the stress period and the last 12 quarters at the time of the backtest (this is not performed daily but usually monthly).<sup>31</sup>

During the dynamic backtest, the Basel traffic light test is applied based on the number of instances in which the actual PnL breaches the SIMM level. The thresholds for these tests are published by ISDA. Under ISDA framework documents, the comparison of actual portfolio-level PnL shifts is utilised in order to uncover the effect of specific risk factors not sufficiently covered by SIMM on a particular portfolio.

For each portfolio, SIMM is also expected to cover risk to a 10-day 99% risk level consistent with the "1+3 standard". Similar to the comparison of actual portfolio-level PnL shifts using the dynamic backtest, appropriate Basel traffic light tests are applied. During quarterly reviews, SIMM users are additionally required to identify and communicate cases where SIMM does not cover 99% risk over the 1+3 timeframe horizon.

<sup>31</sup> A detailed description of how to perform each of these backtests is outside of the scope of this report but each has benefits to the ongoing monitoring of the performance of SIMM. Briefly, dynamic backtesting uses daily PnL matched against the SIMM IM after scaling down the 10-day SIMM MPOR to a one-day SIMM estimate (note that one-day SIMM is available from ISDA as well) and then counting the number of exceedances over a relatively short look-back window (usually 250 trading days or one year). Static (1+3) backtesting uses a portfolio frozen at a point in time and looks at SIMM IM over that 1+3 time period window and compares it with 10-day overlapping hypothetical PnL over the same 1 + 3 time period.

In addition to being used to gauge SIMM's ongoing performance, under ISDA SIMM Governance Framework documents, the static backtest is also used for bilateral SIMM shortfall remediation (described later in subsection 3.2.8 of this report). If an instance occurs where the result of the Basel traffic light test is "red", the shortfall amount (and the amount of additional IM needed) is defined as the least amount of additional IM that would be necessary to achieve a "green" result from the test.<sup>32</sup>

### 3.2.7 Scope of monitoring coverage

The backtesting of portfolios between counterparties is an onerous process, one that smaller industry participants may have difficulty conducting across a large number of portfolios. Even for large firms with substantial infrastructure, the resources involved around backtesting a large number of complex portfolios have proven difficult. Taking these concerns into account, the following pre-Covid-19 monitoring thresholds were applied:

- Firms would conduct monitoring only on those portfolios with aggregate SIMM margin of over EUR 50 million.
- Remediation should occur when the shortfall within a bilateral portfolio exceeds the greater of EUR 50 million and 15% of the portfolio SIMM value. This threshold addresses the total uncovered risk within a given portfolio. Note that issues concerning portfolio trade or risk reconciliation are not a basis for remediation. Any required remediation should be identified after reconciliation of positions and risk.

### 3.2.8 Remediation

Once the IM is estimated, counterparties need to determine the amount of risk coverage shortfall and take measures to correct the shortfall. The counterparties may agree to apply a margin adjustment (additional margin) sufficient to cover the uncovered portion of risk by the computed IM. This may be through:

- Applying a multiplier to SIMM – a multiplier greater than 1.0 at the aggregate portfolio, risk factor, or product class margin level. The multiplier is applied to the SIMM (or other) approach applied by both counterparties;
- Applying a fixed add-on amount – a fixed amount is applied to cover the uncovered portion of risk;
- Applying a dynamic add-on amount – a dynamic amount as a function of risk factor and risk type;
- Use of regulatory grids – trades causing exceptions are taken out of risk-based SIMM margining and are subject to notional percentage-based margin tables as per regulatory rules. The trades that will be excluded from the SIMM calculation will constitute a standalone sub-portfolio for application of the Standardised Schedule.
- In choosing amongst these approaches, a firm could identify the risk factor that caused exceptions. If the risk factor is directly covered by SIMM, then a multiplier may be applied.
- Outside of the SIMM remediation process, in many cases firms will instead unwind transactions that are causing these shortfalls or other causes of disputes.

<sup>32</sup> In order to provide for international coordination of the bilateral SIMM shortfall remediation process, supervisors have traditionally deferred to the ISDA SIMM Governance Framework to outline standards that were operationally feasible by SIMM users. As part of the ongoing dialogue between supervisors, supervised firms and ISDA, expectations surrounding the exact specification for bilateral SIMM shortfall remediation are an important part of the annual or quarterly review and now, the off-cycle recalibration of SIMM. The WGMR notes that additional backtesting tools are being developed and proposed for regulatory purposes. See eg the discussion on Margin Average Shortfall (MAS) in European Banking Authority, *Draft regulatory technical standards on initial margin model validation*, July 2023.

### 3.2.9 Documentation transparency

ISDA publishes the SIMM calibration and other model specification documents annually (and now for the off-cycle recalibration) and these documents provide market participants with the ability to replicate the model. In addition, ISDA provides the supervisors and firms licensed to use SIMM with a set of documents that describes the model, its calibration, backtesting and the other components needed to implement SIMM. In most jurisdictions, firms must have internal processes that meet sound practice requirements before an internal or vendor-supplied model may be used by the firm.

Commenters indicated that as recognised in the report, SIMM is appropriately transparent. In general, the details on the SIMM model and the governance documents are publicly available. More detailed information on model performance are available to SIMM users and regulatory authorities. WGMR members continue to engage with ISDA to refine certain elements of documentation transparency in response to regulatory feedback.

## 3.3 Improvements to SIMM responsiveness by supervised firms and ISDA following the Covid-19 crisis

As noted in the Phase 1 Report,<sup>33</sup> surveyed firms using SIMM had substantially more backtesting exceedances using SIMM in March 2020 (with a rate of exceedance over 5% and an average exceedance level of over \$100 million) than in February 2020 (with less than a 1% rate of exceedance and an average exceedance amount of less than \$5 million). The average rate of exceedance moderated in April 2020 to under 2%, as did the amount of the average exceedance to under \$20 million.

According to ISDA, some of the exceedances required assessment of bilateral SIMM shortfall remediation. Some of these SIMM shortfalls were remediated by the firms involved by increasing the amount of IM in order to decrease the exceedance rate. The SIMM shortfalls that were subject to remediation assessment were related to equity bucket risk weights, equity correlations between buckets and credit non-qualifying CMBX credit indexes.

A number of areas have been identified that might explain the lower responsiveness of non-cleared initial margining when the SIMM model is used, as observed during the Covid-19 crisis. This includes: (i) delays to model recalibration; (ii) the lag between backtesting exceedances and remediation actions; (iii) the use (or lack) of bilateral remediation between specific counterparties; (iv) operational difficulties in model updates; (v) regulatory constraints; and (vi) liquidity impact / market preparedness for semiannual recalibration. This section sets out the ongoing discussions between supervisors, supervised firms and ISDA regarding the approach to improving the responsiveness of non-centrally cleared IM models, and the potential impacts of the semiannual recalibration of SIMM.

### 3.3.1 Model recalibration – shortening the time lag by using more recent data

In previous versions of SIMM, there was a considerable lag in the data used for calibration prior to the model going into production. While calibration of the model includes data spanning the time period since 2008, simply put, from 2015 to 2019, the overall calibration of SIMM was heavily influenced by the stress events of 2008–09 since the WGMR Framework calls for the inclusion of a stress event in the calibration of an internal model. End-of-year calibration is done primarily to allow for a single production version of SIMM to be used by market participants after the necessary calibration by ISDA, backtesting and other goodness of fit tests. Annual calibration was done in order to avoid multiple versions of the model causing disputes in the calculation of IM. Additionally, supervisors require an individual firm to perform a sizeable amount of due diligence to review and validate an internal or vendor supplied model before it may be

<sup>33</sup> See BCBS-CPMI-IOSCO, *Review of margin practices*, September 2022, Section 3.3.

used for regulatory purposes. ISDA produces much of the documentation and data needed for firms to follow internal processes for these reviews. However, sound supervisory practice requires each firm to determine the appropriateness of SIMM for its own portfolios with its own counterparties. These tests and the necessary changes to information systems used in updating of the model take time to implement.

Pre-Covid-19, this annual recalibration was based on data from December of the previous year. For example, for the December 2020 production version of SIMM used throughout 2021, the most recent data would be year-end 2019; in effect, data are up to 24 months out of date. Any recent stresses might only be reflected in the model calibration as much as 24 months after they occurred. As noted, the supervised firms and ISDA argued this delay reflects the time required by the governance process, firms' internal processes, and possible regulatory lead time required for making changes to the models.

The market experienced a significant increase in volatility in the first half of 2020 as the result of the Covid-19 pandemic. This increased volatility was particularly high in equities in the first half of 2020. In some cases, the lag in the data (using end of year 2019 following a long period of economic quiescence and low volatility) resulted in a decrease in certain risk weights when the recent volatility would have indicated an increase or a least a non-reduction in risk weights. This change was included in the production version of SIMM for use in 2021. To partly remedy the situation, following discussions with supervisors, supervised firms and ISDA agreed in 2021 not to decrease risk weights if a period of volatility had occurred following the date of the data used for annual recalibration and the finalisation of the production version of SIMM for use in the following year. This floor on risk weights was implemented for the 2022 production version of SIMM.

In 2023, following the publication of the Phase 1 Report in October 2021 and as part of the continuing discussions with supervisors, the ISDA SIMM Governance Committee has developed a new process for performing recalibration outside of the usual annual cycle (ie off-cycle recalibration). The new SIMM process includes triggers for performing off-cycle recalibration. These triggers assess whether there has been new recent market stress, and whether they are material.<sup>34</sup> These are checked quarterly. The off-cycle recalibration would only recalibrate main delta risk weights driven by new material recent market stress that could lead to significant under-margining of portfolios as calculated by SIMM. Other risk weights (eg vega and base correlation) and the correlations would continue to be updated through the annual full recalibration cycle only. A version of SIMM (SIMM 2.5A) with this off-cycle recalibration was implemented on 15 July 2023.

Recently, supervised firms and ISDA have agreed to a non-conditional semiannual recalibration of the SIMM delta risk weights that will be implemented beginning in 2025.

### 3.3.2 Delays in model recalibration – backtesting failures

The off-cycle recalibration also includes recalibration due to increased market volatility resulting in material backtesting exceedances being reported to ISDA and further reported in the ISDA SIMM Quarterly Monitoring Report to SIMM users and supervisors.<sup>35</sup> A higher number of backtesting exceedances may occur because SIMM is missing risk factors from the model, or because of specific volatility in some risk factors, even if there is not a general market-wide stress. ISDA is proposing to consider incorporating the missing risk factors that lead to significant failures into the model, where it is practical to do so.<sup>36</sup>

<sup>34</sup> As defined by SIMM documentation, the process checks if the issue caused by low risk weights is systemic (affecting a minimum number of participating groups) and material (minimum number of "red" portfolios and other relevant materiality threshold defined based on IM shortfall amount).

<sup>35</sup> The ISDA SIMM Quarterly Monitoring Report is a confidential document.

<sup>36</sup> As defined by ISDA documentation, an issue is considered significant where the backtesting exceedances is systemic (occurs across the industry), persistent (occurs more than one occasion) and material (has a significant size and impact).

Incorporating changes resulting from backtesting exceedances into the off-cycle recalibration would improve model responsiveness in response to a high number of backtesting exceedances.

### 3.3.3 Timeliness of applying SIMM shortfall remediation from high and material backtesting exceedances

SIMM cannot be both a perfect fit and responsive to the many thousands of users, each with a specific set of portfolios. As such, counterparties must overlay the SIMM model with counterparty-specific risk mitigation. As noted above, where backtesting exceedances are not considered widespread, but instead driven by a firm's specific portfolio, the SIMM governance process requires counterparties to remediate this "SIMM shortfall" bilaterally. This is done either through applying add-ons or a multiplier to SIMM to increase the overall amount of IM. The specifics of the SIMM shortfall remediation process are somewhat detailed. However, the firms that use SIMM have agreed to use this process, or something similar, in order to meet the 10-day 99th percentile amount of IM required under the WGMR Framework.

The bilateral SIMM shortfall remediation timelines were previously set at 60 business days after the time when backtesting results first identified the issue. This timeline is mainly driven by the operational complexities associated with the remediation process.<sup>37</sup> As part of the response to the post Covid-19 backtesting exceedance spike and continued dialogue with supervised firms and their regulators, the ISDA SIMM Governance Committee has updated the timelines to have firms complete the bilateral SIMM shortfall remediation process in 40 business days. This includes requiring firms to notify their counterparty of the issue within 20 business days from the testing date, following which counterparties would need to agree on the issue and complete the remediation actions. This increases the pressure on the internal governance processes related to SIMM and in particular the operational systems to meet this shorter timeline.

In addition to shortening the remediation timelines, ISDA has lowered the bilateral remediation thresholds (remediation is now required for IM shortfalls greater than EUR 25 million and greater than 15% of collected IM for red backtesting exceptions, down from the previous thresholds of greater than EUR 50 million and greater than 15% of collected IM for red backtesting exceptions).

By agreeing to both of these modifications for firms using SIMM, there is increased responsiveness of the overall amount of IM among counterparties. This increased responsiveness may be driven by backtesting exceedances due to miscalibration of SIMM (or goodness of fit for an individual firm's portfolio) or as the result of widespread or localised market shocks or omitted risk factors.

### 3.3.4 Challenges to implementing these changes to SIMM

Notwithstanding these and possibly other improvements made on the responsiveness of SIMM to market volatility, there remain challenges to implementing more frequent recalibration of SIMM. The challenges are not limited to firms using third-party models (eg SIMM) but many also apply to firms using their own internal IM models. However, the WGMR also notes it is relatively more challenging to manage risks from third-party-developed models where model recalibration is driven by and needs to be agreed to with a large number of firms rather than through unilateral changes to a particular firms' implementation.

<sup>37</sup> This process is time-consuming and operationally intensive and involves some of the following steps that are likely not automated. First, verifying that the backtesting exceedance is driven by model not operational problems such as missing sensitivities or trade population mismatches between the SIMM IM time series and the PnL time series. Notifying and matching the exceedance to the counterparty's experience (including the SIMM IM and PnL time series). Finally, agreeing on how to add the additional IM to remediate the shortfall.

### 3.3.5 Operational difficulties

The ISDA SIMM Governance Committee is responsible for improvements and interim recalibration of SIMM. This group relies on firm-level monitoring and reporting into ISDA. However, firms also need to undertake their own internal testing and approval process to use a revised version of SIMM and may also need to report to their supervisors before making changes. This is in addition to their existing practices for the current annual recalibration cycle. As such, firms could face additional operational challenges as they would need to possibly undertake separate steps for implementing interim recalibration as well as annual recalibration using limited human resources. To avoid operational complications, it is potentially better to have a model that is improved by industry-wide inputs than one adjusted by a single firm or bilaterally. But such updates will necessarily have to be accompanied by a rigorous governance process across those firms using the model.

### 3.3.6 Regulatory constraints

One potential barrier indicated by the ISDA SIMM Governance Committee for implementing more frequent recalibration relates to regulatory constraints. Specifically, some supervisors may require a 60-day notification period for making any changes to the model or its parameters. Firms are also required to ensure their internal model validation groups and other stakeholders make a formal assessment of any change to the SIMM model and its parameters prior to implementation. The ISDA Governance Committee notes that supervisory relief on these requirements would allow a timelier recalibration of models to be put into production. In particular, having a 30-day notification period to supervisors would allow ISDA to fully implement a permanent semiannual recalibration of SIMM as proposed for 2025.<sup>38</sup>

### 3.3.7 Liquidity impact/market preparedness for semiannual recalibration

More frequent recalibration of SIMM could lead to higher volatility in IM. This could lead to higher IM calls from counterparties at shorter notice. However, we can distinguish between the causes of model recalibration. One may be driven by a recent stress event, where the impact is likely to be more widespread and in turn result in higher demands on liquidity. In the other case, the recalibration may instead be driven by backtesting failures in particular asset classes or risk factors, in which case any impact on IM might be more related to particular products or markets.

Commenters expressed support for the semiannual recalibration of SIMM as an effective way to improve the IM responsiveness of SIMM. However, some commenters noted that firms, including the smaller firms, will expend significant efforts to implement the semiannual calibration cycle. There were concerns expressed by some groups with possibly more frequent recalibrations (eg quarterly) as introducing operational complications and possibly procyclicality and stresses for liquidity planning. These groups also expressed support for a fixed recalibration cycle to avoid surprise changes driven by a conditional recalibration (eg newly identified stress events). Whatever the approach to model calibration that is adopted, these commenters asked regulators to maintain an approach to model calibration that is industry-wide and consistent across jurisdictions so as to avoid one-off modifications to SIMM. WGMR members continue to express support for a semiannual recalibration of SIMM provided that the requisite due diligence of recalibration and model testing by ISDA and firms meets supervisory and regulatory expectations.

<sup>38</sup> The WGMR notes that some jurisdictions are in the process of reviewing and probably modifying their regulatory framework to allow for a 30-day notification period so that semiannual recalibration may be operationally feasible for their supervised firms using SIMM.



### *Case study: energy markets*

The energy markets, and the commodity markets more generally, suffered a large shock in 2022, in part due to the uncertainty over gas supplies. In the centrally cleared derivative markets, the increase in price volatility resulted in large margin calls from central counterparties. The non-centrally cleared markets did not immediately reflect the volatility in margin calls calculated through SIMM over the same period. Therefore, SIMM resulted in a materially high number of backtesting exceedances over this period. The production version of SIMM eventually reflected the shocks in its recalibrated risk weights almost a year later after the backtesting exceedances were observed. There was a large, but expected, spike in IM calls following the updates.<sup>39</sup> It should be noted that the increase in the risk weights was publicly announced months prior to the updated version of SIMM going into production.

This case study illustrated a time lag in identification of model underperformance and model remediation following increased market volatility. This could potentially leave multiple firms exposed to unaccounted higher counterparty credit risk and therefore systemically under-margined for a certain period unless bilateral SIMM shortfall remediation actions are taken in the interim.

SIMM is calibrated to a time series that includes a stress period. While the minimum annual cycle might not be frequent enough to capture a recent market stress event, SIMM is set conservatively through incorporation of stress periods in the calibration as prescribed in the WGMR Framework. This prevents the models being excessively procyclical. However, when recent events are more volatile than the stress period, this will be at the expense of less coverage of risk. Material market fluctuations might not be appropriately and timely covered in the calibration as illustrated in the shock to the energy market. Rather, there was a large increase in IM produced by SIMM by the time the recent market event was incorporated into the production version of SIMM. This was particularly true for smaller counterparties that tended to trade primarily in one affected asset class and had portfolios that tended to be one-way (or not hedged with similar instruments as would a dealer portfolio).<sup>40</sup> This meant firms that were counterparties to these smaller counterparties were first under-margined and exposed to the higher counterparty credit risk until the model was updated, followed by a large increase in margin calls when volatility had since reduced. However, this report has also highlighted several operational and liquidity issues resulting from more frequent recalibration of SIMM.

Based on the updates proposed and adopted by the ISDA SIMM Governance Committee, the WGMR notes the shortened timelines in addressing material widespread model issues through model recalibration to improve model responsiveness. However, the WGMR notes that the changes to the threshold and timeliness of bilateral SIMM shortfall remediation have not been fully embedded into practice. Firms need to be diligent in being operationally prepared to meet these changed standards.

## 3.4 Key findings

Supervisors confirmed that in almost all cases SIMM is used for regulatory IM as an internal model in accordance with the WGMR Framework. In developing this report, supervisors focused on the mechanisms that have been proposed or implemented by supervised firms and ISDA to improve the responsiveness of SIMM to market shocks. These changes are part of an ongoing dialogue between supervisors asking for improvements to SIMM with supervised firms and ISDA since the initial implementations of the model in

<sup>39</sup> Risk weights for risk classes linked to the European energy markets in SIMM increased by more than 80% from the prior production version of SIMM.

<sup>40</sup> SIMM is a portfolio-based model and is calibrated as such and backtested primarily by well diversified dealer firms. It should be noted that a part of the conservativeness of the total amount of IM generated using SIMM under the WGMR Framework is the requirement to add the amount of IM from each product class without any diversification benefits across product classes. For smaller counterparties or undiversified counterparties with portfolios concentrated in one product class this inherent conservativeness is lost.

2016 and 2017. This report also includes supervisory recommendations to firms on improved operational and liquidity readiness to effectively implement these changes.

As detailed in this report, the WGMR does not deem it necessary to revise the WGMR Framework to improve the responsiveness of the SIMM to meet the required regulatory IM; the issues identified during the recent periods of extreme volatility, including the 2020 Covid-19 market shock do not raise concerns around the WGMR Framework itself but rather its implementation by the supervised firms. Firms subject to the WGMR Framework that use SIMM should focus on being operationally ready to meet the newly updated ISDA processes to increase the responsiveness of non-centrally cleared IM to market shocks or other measures of model underperformance such as increases in observed material backtesting exceedances.

Since the newly modified ISDA processes are still in the early stage of implementation, it will be important for supervisors to monitor whether the developments under way to more frequently recalibrate SIMM and increase the responsiveness of the bilateral SIMM shortfall remediation protocol are enough to make SIMM sufficiently responsive to extreme market shocks. This will require monitoring of how effective semiannual recalibration is at reducing backtesting exceedances or how effective the updated bilateral SIMM shortfall remediation protocol is at dealing swiftly with material excessive exceedances without unduly increasing SIMM's operational complexity and procyclicality.

#### Four recommendations to increase IM responsiveness of margin models in non-centrally cleared markets

1. Firms should have appropriate processes to calculate IM according to the WGMR Framework and to provide information to ISDA and their supervisors as required under applicable supervisory guidance or expectations and the ISDA SIMM Governance Framework. Firms should conduct periodic backtesting of the SIMM model, recording exceedances and the resulting shortfalls, as well as the firm's appropriate responses to reduce the frequency or the level of exceedances, including informing supervisors, ISDA and counterparties.
2. Firms should be operationally prepared to identify and remediate bilateral SIMM shortfalls in a timely manner in accordance with applicable supervisory guidance or requirements, internal governance procedures and the ISDA SIMM Governance Framework.
3. Firms should be prepared to incorporate off-cycle and in the future semiannual recalibration of SIMM delta risk weights as appropriate.
4. Firms should have appropriate arrangements to have or source sufficient liquidity to meet unanticipated changes in IM driven by off-cycle or semiannual recalibration of SIMM, bilateral SIMM shortfall remediation or any other draws on liquidity associated with regulatory IM.

## 4. Conclusions

The Phase 1 Report identified six areas for further policy analysis and allocated work on two of these to the WGMR. The WGMR was asked to look at streamlining VM processes in non-centrally cleared markets (Recommendation 7.4) and to evaluate the IM responsiveness of margin models in non-centrally cleared markets (Recommendation 7.6).

This report sets out the findings of the WGMR and concludes that, in both areas, the issues that arose relate more to the implementation of the framework. Therefore, no policy changes to the BCBS-IOSCO standard are proposed. The report nonetheless sets out eight recommendations to encourage the widespread implementation of good market practices and to highlight a couple of points of attention to be addressed.

The proposed recommendations on streamlining VM encourage firms to address the operational and legal challenges that could potentially inhibit a seamless exchange of margin and collateral calls during a period of stress. This includes consideration for more flexibility in accepting non-cash collateral for VM within the set of permissible collateral types under the WGMR Framework and domestic regulations. This addresses one of the factors that exacerbated the “dash for cash” during recent periods of stress for non-bank counterparties. The recommendations also encourage more widespread automation and standardisation of the margining operational processes and highlight the need for proper operational risk management, particularly when third-party service providers are used.

On the IM responsiveness of margin models, the report encourages the smooth implementation by market participants of the recent ISDA initiatives to increase the responsiveness of the bilateral SIMM shortfall remediation protocol and recalibrate the SIMM model more often. Supervisors should then monitor whether the developments under way are sufficient to make SIMM responsive enough to extreme market shocks.

Some commenters noted that IM requirements for non-centrally cleared products remained relatively stable during the stress period, indicating that IM for uncleared products did not drive changes to market practice over the period. These commenters viewed this as a strength, not a weakness, of SIMM as the industry standard model. These commenters agreed with the general recommendations to improve IM responsiveness and indicated support for not amending the current WGMR framework.