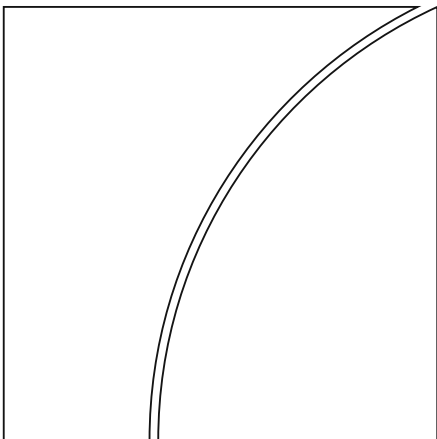


Basel Committee on
Banking Supervision
Committee on
Payments and Market
Infrastructures
Board of the International
Organization of Securities
Commissions



Consultative report

Transparency and
responsiveness of initial
margin in centrally cleared
markets – review and policy
proposals

January 2024



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Executive summary

In September 2022, the BCBS-CPMI-IOSCO Margin Group published the *Review of margining practices* ("the Phase 1 report"). Based on the analysis done by the group, and taking into account feedback from industry,¹ the report identified six areas for further policy work ("Phase 2"). As set out in the table below, responsibility for carrying out the Phase 2 work was allocated across a number of international groups, based on the expertise of group members. As noted in the table, the Margin Group has taken forward portions of two of the six themes: those related to additional transparency in centrally cleared markets and those focused on the level of responsiveness of cleared initial margin (IM) models.

Margining practices follow-up work

Table 1

Area	Centrally cleared markets	Non centrally cleared markets
Increasing transparency	BCBS-CPMI-IOSCO Margin Group	
Enhancing liquidity preparedness of market participants as well as liquidity disclosures	FSB – Standing Committee on Supervisory and Regulatory Cooperation – Working Group on Margin Preparedness	
Identifying data gaps in regulatory reporting	FSB – Standing Committee on Supervisory and Regulatory Cooperation – Working Group on Margin Preparedness	
Streamlining variation margin (VM) processes	CPMI-IOSCO Policy Standing Group	BCBS-IOSCO Working Group on Margin Requirements
Evaluating the responsiveness of IM models to market stresses	BCBS-CPMI-IOSCO Margin Group	BCBS-IOSCO Working Group on Margin Requirements

Drawing on the findings in this report, the BCBS, CPMI and IOSCO are consulting on 10 policy proposals (Table 2). Explanatory text further detailing these policy proposals and providing often necessary background context is set out in Section 4 of this report.

¹ "Phase 1" of the work consisted mainly of collecting quantitative and qualitative data across the major entity types most affected by centrally and non-centrally cleared margin dynamics. Four different surveys were conducted and supplemented by public information where possible. In October 2021, the BCBS, CPMI and IOSCO published the consultative report *Review of margining practices*. Written feedback was received from 33 entities or groups, inter alia, CCPs, clearing members, clients or industry associations representing these categories, as well as academic institutions, consultancies, authorities and individuals. In addition to the written feedback, BCBS, CPMI and IOSCO held a series of virtual stakeholder outreach sessions in November 2021.

Policy proposals addressing transparency and responsiveness of IM in centrally cleared markets

Table 2

Policy proposal	
1.	Margin simulation tools, commonly used by market participants to estimate margin requirements, should be made available by all CCPs to all clearing members (CMs) and their clients.
2.	Margin simulation tools should include, at a minimum, functionality allowing the following: <ul style="list-style-type: none"> a. The calculation of margin requirements under varying historical and hypothetical market conditions for current and hypothetical portfolios. b. The incorporation of add-on charges in addition to baseline (or “core”) initial margin. CCPs should ensure that margin simulation tools reflect all material components of the underlying quantitative methodologies.
3.	Where legally permissible, CCPs should make margin model documentation available to CMs at a level that can enable them to understand key aspects of the CCP’s margin model and its approach to risk management. This documentation should include the following: <ul style="list-style-type: none"> a. Explanations of the calibration of key model parameters, including any relevant components which affect the size and speed of margin requirement changes during periods of elevated stress. b. The logic, applicable thresholds and data used for the calculation of margin add-ons.
4.	CCPs should publicly disclose and describe the anti-procyclicality (APC) tools used in their model. CCPs should also publicly disclose and describe, at a high level, the model components that affect the level of model responsiveness.
5.	CCPs should provide additional breakdowns of margin-related data through the Public Quantitative Disclosures (PQDs) and report such data more frequently and with shorter reporting lags. All PQD data should be reported consistently and accurately.
6.	CCPs should disclose a new standardised measure of margin responsiveness, as designed by CPMI-IOSCO, alongside the associated changes in market conditions. This disclosure can be made through the PQDs.
7.	CCPs should identify and define an analytical and governance framework, appropriate to their business lines and risk profile, for assessing responsiveness within the broader context of margin coverage and cost, with the framework and parameter choices communicated to relevant authorities. The framework can be used by CCPs and relevant authorities to regularly monitor the performance of initial margin models and trigger the review of initial margin model parameters in case of need.
8.	Where CCPs make use of discretion (eg expert judgement) to override model margin requirements, CCPs should: <ul style="list-style-type: none"> a. Have in place clear governance procedures defining the triggers for the use of such discretion and undertake ex post reviews where such discretion has been applied. CCPs should clearly articulate and define the instances and areas where such overrides may be warranted (including clear definitions of the key decision-makers/who can perform overrides and the extent to which these adjustments are deemed permissible without, for example, requiring a material model change). It can similarly be important that the CCP establishes clear guidelines as well as processes which enable the CCP to identify and monitor the overridden risk variable or model output. b. Publicly disclose relevant information regarding the scenarios where discretion may be applied and the governance procedures used in the application of such discretion. CCPs should proactively share the governance procedures for the application of model overrides in full with relevant authorities. c. Publicly disclose, through additions to the PQDs, the aggregate size and duration of manual margin overrides, as compared with unadjusted IM requirements. The disclosure could be supported by a qualitative explanation of the reasons for the override.
9.	CMs should ensure their clients have sufficient understanding of their margin requirements, including the following: <ul style="list-style-type: none"> a. CMs should ensure their clients have sufficient understanding of CCP margin requirements. CMs should facilitate clients in accessing CCP-provided margin simulators. b. CMs should identify and define an analytical and governance framework, appropriate to their business lines and risk profile, for assessing margin responsiveness, alongside other key factors such as counterparty credit risk, when adjusting client margin requirements. c. CMs should provide sufficient transparency to their clients regarding the mechanism by which client add-ons are calculated. This should include documentation containing a detailed description of the calibration of any client add-ons (eg through the application of margin multipliers, buffers or internal margin models) and how the triggers or thresholds for their use are set. This understanding should be facilitated through the provision of CMs’ own simulators, where appropriate, or private disclosures of the margin requirements clients may be subject to under different scenarios.

-
- d. CMs should, without the need for a client request, inform the client with appropriate notice when they are adjusting their calibration of client margin add-ons, and should provide sufficient transparency to their clients when margin requirements have been adjusted relative to those set by the CCP.
 - e. CMs should disclose to their clients backward-looking information on the maximum, minimum and average differences between client margin requirements set by the CM and the margin requirements of the CCP over a defined period of time.
-
10. CMs should disclose additional metrics to the CCPs of which they are members on a quarterly basis with a one/two-month lag.
-

The remainder of this report is organised as follows: Section 1 provides background on this work; Section 2 describes the scope of the Phase 2 policy work on IM responsiveness and transparency in centrally cleared markets; Section 3 describes the evidence collected in both Phase 1 and Phase 2 of this work; and Section 4 sets out the policy proposals.

The BCBS, CPMI and IOSCO welcome comments and feedback on this report by 16 April 2024. Following consultation on the questions and issues raised in this consultative report, the relevant standard-setting bodies will consider how best to implement the proposals into their respective policy frameworks.

Questions for consultation

The BCBS, CPMI and IOSCO are inviting comments on this consultative report and the questions set out below. Comments should be sent to the BCBS Secretariat (baselcommittee@bis.org), the CPMI Secretariat (cpmi@bis.org) and the IOSCO Secretariat (margin@iosco.org) by 16 April 2024. Comments will be published on the BCBS, CPMI and IOSCO websites unless respondents expressly request otherwise.

A number of the questions below seek comment not just on the proposals included in the main text, but also guidance on whether there are alternatives, or adjustments, to the proposals which would achieve a similar goal but either reduce burdens or improve effectiveness. In cases where alternatives of this type may exist, please provide an overview of the alternative, the reasons why the alternative is better placed to satisfy the proposal motivations, and any supporting evidence to demonstrate these improvements. In addition to highlighting potential alternatives for proposals, please highlight cases where the proposal or alternative may be reasonable for a subset of relevant market participants but either overly burdensome or ineffective for others.

General questions

1. Collectively, if adopted, would the set of proposals likely result in increased transparency and a mitigation of destabilising changes in margin requirements in centrally cleared markets? Please identify within the set of proposals any which would be particularly beneficial and others which may be less beneficial (eg where the costs may substantially exceed the benefits). Please provide an explanation to your answer.
2. Are there any aspects of margining practices in centrally cleared markets that have not been adequately covered by the set of proposals and which could positively contribute to achieving the Margin Group's objectives?
3. Many of the proposals recommend that a market participant group (eg all CCPs, all CMs etc) be required to provide enhanced disclosure or adopt a new practice. Should the principle of proportionality, with requirements dependent on participant size or type, be used in determining how different firms apply the proposals? If so, in what ways? Please specify the proposal(s) in your response.

4. Are there cases in the proposals where there could be an effect on bilateral market margining? If so, what are the factors or instances that should be taken into consideration to ensure that proposals for cleared markets do not negatively affect dynamics within other markets?

Proposal-specific questions

5. Proposals 1 and 2 recommend that margin simulation tools be made available by all CCPs to all CMs and clients, with enhanced functionality.
 - a. Are there certain modes of access to CCP simulation tools which are less costly or more effective?
 - b. Are there any impediments to making simulators available to clients? To what extent could these impediments be mitigated or resolved, eg by changing the mode of providing access to tools, or how clients request access to tools? Does this depend on the format of CCP tool (eg the use of cloud technology, the use of APIs, etc)?
 - c. Are there any reasons why the proposed historical and hypothetical scenarios to be provided as part of the simulator tool suite should differ from the CCP's current set of extreme but plausible stress test scenarios? In addition, would there be additional value in allowing users to customise their own scenarios within the simulator tool? If so, what types of customisation would be of most value?
 - d. Are there any elements of the initial margin calculation (eg add-ons) which would be difficult to incorporate into a standardised simulation tool? If so, what are the relevant challenges?
6. Proposal 5 recommends a set of changes to the PQDs, further detailed in Table 5 of the report.
 - a. With reference to Table 5, would the proposed additional data breakdowns and increased frequency of reporting facilitate market participants' understanding of the margin system?
 - b. Would there be any challenges in providing the additional data breakdowns or higher reporting frequencies? If so, are there alternatives that would be equally effective? For instance, are there alternative modes of more frequent public disclosures that would achieve a similar goal but result in reduced burdens on CCPs?
 - c. Are there any additional amendments to the PQDs, beyond those set out in Table 5, that would help market participants and stakeholders understand or anticipate changes in margin requirements? What would this information be, and how could this information be effectively incorporated into the PQD framework? For instance, would there be value in including additional non-quantitative information in the PQDs related to margin changes?
 - d. Are there any examples of current public disclosures by one or more CCPs which could be used as a guide for improved transparency?
7. Please review the analytical annex detailing the proposed design of a margin responsiveness metric, as described in Proposal 6.
 - a. Is the proposed method for measuring margin responsiveness (ie a large call metric), alongside the associated change in volatility, an informative way of measuring responsiveness? If not, what alternative approach or methodology should be used, and why would that alternate approach better aid market participants in their liquidity planning?
 - b. For each parameter input for the responsiveness and volatility risk metrics, please select your preferred choice from the list below or provide an alternative option. Please provide an explanation and any supporting evidence for your choice.
 - i. Large call window: five or 20 days.

- ii. Observation period: one quarter or one year.
 - iii. Product vs portfolio reporting: Product, static portfolio or dynamic portfolio. If supporting product-level reporting, please provide information on which products should be reported by the CCPs. If supporting static and/or dynamic portfolio reporting, please provide information on how the portfolios should be determined and an explanation for how that one portfolio would be representative of clearing activity at the CCP.
 - iv. Volatility risk metric: Standard deviation or VaR (99%).
 - v. Volatility risk metric lookback period: 90 days or two years.
- c. Are there other parameters where calibration decisions are necessary for consistent disclosure of either margin responsiveness or market volatility?
- d. Do you foresee any challenges in the development and use of the proposed metric? For instance, are there challenges in applying a harmonised choice of parameter inputs across all CCPs and all products?
- 8. Proposal 7 recommends that CCPs identify and define an analytical framework for assessing margin responsiveness within the broader context of margin coverage and cost.
 - a. Are there other important balancing factors which should be taken into consideration when evaluating the performance of initial margin models?
 - b. What elements of the "trade-off" framework would most help regulators to better understand how a CCP balances between important risk management factors? In what ways would this framework be useful in identifying cases where a review of the model by the CCP and/or the authority would be beneficial?
- 9. Proposal 9 recommends a number of enhancements to CM-to-client transparency.
 - a. Are there aspects of the proposal that would be particularly valuable for clients, and are there aspects of the proposal that would be particularly challenging for CMs to meet?
 - b. Do CMs currently provide any form of simulation tool, in addition to the tools provided by CCPs? For those who currently do not, what is the feasibility of CMs developing such tools? What functionality would be of most use to clients in CM-designed simulators?
 - c. On the proposed quantitative disclosure described in 9e), do you have supportive or alternate views on the information that should be provided and the format in which the information should be disclosed?
 - d. Do you agree that CMs should adopt an analytical framework for measuring the responsiveness of initial margin requirements for their clients, similar in nature to the proposed framework for CCPs described in Proposal 7? If so, in what ways might that framework need to differ from that used by CCPs, and in what ways might this depend on the type of CM covered?
 - e. Do you foresee any barriers or challenges to CMs implementing the proposed disclosures, such as cost, negative effects on risk management, or any potential overlap with traditionally proprietary information?
- 10. Please review the list of example CM-to-CCP disclosures provided at the end of Section 4.3.2.
 - a. Would the information included in the proposed disclosures aid the CCP's own risk management processes? If not, is there alternative information which would be useful for CCPs to receive from members?

- b. Is any of the information included in the proposal description either redundant or duplicative of information already available to the CCP, and thus of minimal value? Does any of the information included in the proposed disclosures differ by institution type?
- c. Would collection of the information impinge upon current legal disclosure frameworks?
- d. Do any of the example disclosures potentially overlap with traditionally proprietary information?

1. Introduction

1.1 Background

1.1.1 March 2020 market turmoil

The Covid-19 market turmoil of March 2020 was the most significant test of the resilience of financial markets since the Great Financial Crisis (GFC) of 2007–09. Financial markets generally proved resilient, with no widespread concerns about counterparty credit risk. During the period of high market volatility in March 2020, large increases in aggregate margin requirements were seen in both centrally and non-centrally cleared markets. The Covid-19 pandemic and its market impact thus presented a real-world test of derivatives and securities markets' operations in the context of this episode's broader liquidity pressures.

An ad hoc group was established by the BCBS, CPMI and IOSCO ("the Margin Group") as part of the FSB's work programme on non-bank financial intermediation (NBFI) – to examine whether – and, if so, to what extent – March 2020 margin calls were unexpectedly large in centrally and non-centrally cleared derivatives and securities markets. The analysis encompassed both initial margin (IM) and variation margin (VM), as well as centrally and non-centrally cleared markets (including clearing member (CM)-client dynamics), transparency in margin practices, predictability of margin calls and market volatility. It also considered the preparedness of market participants to meet margin calls and the availability of each jurisdiction's regulatory data.

1.1.2 2022 elevated volatility in commodities markets

The Russia-Ukraine conflict in February 2022 resulted in a further period of elevated market volatility. Unlike in the 2020 event, market impacts were felt in a smaller set of derivatives products, primarily those relating to commodities such as energy and agricultural goods. In some of these markets, price moves were extreme, and the IM requirements imposed by CCPs increased rapidly in response.

The Margin Group examined this event as a further case study on how margining practices in centrally cleared markets respond to extreme bouts of market volatility. Its analysis was based on (i) a mainly qualitative international survey of 12 CCPs that clear commodities derivatives ("commodities CCPs") and (ii) a workshop, held jointly with the FSB, to gather the perspectives of end users of commodities derivatives, such as commodities trading houses. The findings were published in May 2023.²

The findings of this CCP survey generally supported the conclusions of the *Review of margining practices* in relation to current margining approaches across the international CCP population. The survey showed that, in general, the commodities CCPs surveyed have approaches that are designed to respond to elevated volatility and that can, if necessary, be adapted during stress events (for example, through the use of model overrides or the broader use of discretion). In addition, CCPs are sensitive to the stresses that margin can place on market participants, with many having measures which can help mitigate the procyclicality of margin calls, whether through hard or soft targets for maximum IM increases and/or through one or more anti-procyclicality tools embedded in the model; these tools, when used, are balanced with other important risk management factors, such as ensuring adequate coverage of counterparty credit risks through the economic cycle. The Phase 1 report found considerable variation in practices in this regard.

The end user workshop similarly reinforced various themes highlighted in the *Review of margining practices*; in particular, clients of CMs expressed concerns about the transparency and predictability of margin changes. These observations also complement the FSB report *The Financial Stability Aspects of*

² See BCBS-CPMI-IOSCO, *Margin dynamics in centrally cleared commodities markets in 2022*, May 2023 ("the commodities report"); available on the BIS website (www.bis.org/bcbs/publ/d550.htm) and the IOSCO website (www.iosco.org/library/pubdocs/pdf/IOSCOPD735.pdf).

*Commodities Markets*³ which, drawing on the same workshop evidence (as well as other data sources), highlighted the potential implications of the margin dynamics seen in 2022 for end users' hedging strategies and market behaviour.

The findings in these reports have helped inform the general policy development work, especially that in relation to evaluating the responsiveness of IM models and enhancing the transparency of margin requirements in centrally cleared markets.

1.2 Margining practices

"Margin" is the term used to describe cash and non-cash collateral collected to protect against current or future risk exposures resulting from market price changes or in the event of a counterparty default. Two main categories of margin, variation and initial margin, are used in both centrally and non-centrally cleared markets to cover different aspects of risk exposure.

1.2.1 Variation margin

Variation margin represents funds that are collected and distributed in order to extinguish current exposures resulting from changes in market prices that have already occurred. In derivatives markets, VM is typically collected and paid out in cash.⁴ VM is calculated and called regularly by marking open positions to market. This process involves establishing a fair market price for a given position, calculating whether each position has made a loss (or a profit) and paying (or receiving, for derivatives positions) VM sums to (or from) the CCP or bilateral counterparty. VM payments are typically made at least once daily but can be made more frequently on an intraday (ITD) basis. As the Phase 1 report indicated, gross VM calls were higher on an absolute scale than IM during February-April 2020 (Phase 1 report, p 14, Figure 8).

1.2.2 Initial margin

Initial margin (IM) is collected to cover potential changes in the value of each participant's position – the potential future exposure (PFE) – over an appropriate closeout period in the event that the participant holding the position defaults. IM typically comprises a "core" IM component, which is associated with market risk, and "add-ons", which represent margin designed to cover other risks (eg liquidity or concentration risk). Typically, it is possible to satisfy IM requirements with a mix of cash or non-cash collateral, with the non-cash portion often consisting of highly liquid assets such as sovereign bonds. As the Phase 1 report indicated, IM increased substantially during February-April 2020 (Phase 1 report, p 12, Figure 5), with the use of APC measures and other tools helping to dampen IM responses relative to market volatility (id p 18 et seq).

1.2.3 Role of a CCP

For centrally cleared transactions, a CCP interposes itself between counterparties to a trade, becoming the buyer to every seller and the seller to every buyer and thereby ensuring the performance of open contracts. CCPs have a broad set of tools for managing risk, processing default events and assuring their continued operation during times of market stress.

Post-GFC, reforms explicitly sought to increase the role of CCPs by mandating and incentivising central clearing of over-the-counter (OTC) derivatives activity, and – by design – these reforms have greatly increased the systemic importance of CCPs.⁵ The reforms included work on enhancing the robustness of

³ See Financial Stability Board, *The financial stability aspects of commodities markets*, February 2023; available on the FSB website (www.fsb.org/wp-content/uploads/P200223-2.pdf).

⁴ Given the short settlement cycle, securities CCPs often collect VM but do not pay it out, as final settlement is at the trade execution price rather than the current market value. Instead, any VM collected is returned as part of the settlement process.

⁵ See BCBS-CPMI-FSB-IOSCO, *Incentives to centrally clear over-the-counter (OTC) derivatives*, November 2018.

CCPs, most notably through the CPMI and IOSCO's publication in 2012 of the Principles for Financial Market Infrastructures (PFMI). The PFMI were also the subject of further work, with the publication in 2017 of additional guidance on the principles and key considerations in the PFMI regarding financial risk management for CCPs ("the CCP resilience guidance").⁶

Although the tendency of IM (and other risk-sensitive protections) to increase as volatility increases is expected and typical, the PFMI state that to the extent practicable and prudent, CCPs' initial margin models should limit the need for destabilising, procyclical changes.⁷ The PFMI also include guidance on how CCPs should manage the procyclicality of their margin arrangements.⁸ The CCP resilience guidance expands on this, stating that a CCP "should develop appropriate methods or tools for mitigating the potential for destabilising, procyclical changes arising from its margin system".^{9,10}

In response, CCPs have developed various approaches to mitigating the risk of procyclicality in their margin models. Some CCPs use explicit APC controls and frameworks, with some jurisdictions mandating the use of APC measures. Other CCPs do not use explicit tools but, in other ways, have implicitly built measures of or controls on procyclicality into their models or risk management policies.¹¹ Some CCPs use discretion as an APC tool through various margin overrides (eg a precautionary increase in IM before an expected stress period, such as an upcoming election or vote, in order to mitigate liquidity demand when the stress period actually occurs).

2. Scope of the work

2.1 Evaluating the responsiveness of centrally cleared IM models to market stresses

The work on IM responsiveness in centrally cleared markets has sought to better understand CCP margin models' responsiveness to volatility and other market stresses, including the effects of this responsiveness; with this understanding, the group has worked to identify appropriate ways to analyse, compare and set baseline expectations for procyclicality. It has also examined clearing members' practices when setting IM requirements for clients, as well as the transparency of these practices. This work has included analysis of how to effectively mitigate procyclicality, as well as how to balance this mitigation against the potential

⁶ See CPMI-IOSCO, *Resilience of central counterparties (CCPs): Further guidance on the PFMI – Final report*, July 2017, available on the BIS website (www.bis.org/cpmi/publ/d163.htm) and the IOSCO website (www.iosco.org/library/pubdocs/pdf/IOSCOPD539.pdf).

⁷ See CPSS-IOSCO, *Principles for financial market infrastructures*, April 2012, Principle 6, Key Consideration 4 (CPSS-IOSCO (2012a)).

⁸ Paragraph 3.6.10 of CPSS-IOSCO (2012a, p 53) states that a CCP "should appropriately address procyclicality in its margin arrangements. In this context, procyclicality typically refers to changes in risk-management practices that are positively correlated with market, business, or credit cycle fluctuations and that may cause or exacerbate financial instability."

⁹ Paragraph 5.2.43 of CPMI-IOSCO (2017). Further, Paragraph 3.6.10 of CPSS-IOSCO (2012, p53) states "...in a period of rising price volatility or credit risk of participants, a CCP may require additional IM for a given portfolio beyond the amount required by the current margin model", and) also states: "To the extent practicable and prudent, a CCP should adopt forward-looking and relatively stable and conservative margin requirements that are specifically designed to limit the need for destabilising, procyclical changes."

¹⁰ See CPSS-IOSCO (2012a, p 54). See also CPMI-IOSCO (2017, pp 7–8), which includes further guidance on procyclical changes, including the requirement to conduct periodic assessment of any destabilising, procyclical changes. The PFMI also state that an FMI (such as a CCP) should define stable and conservative collateral haircuts, calibrated to include periods of stressed market conditions. The PFMI provide that a CCP's margin system component be designed to ensure that margin levels are "commensurate with the risks and particular attributes of each product, portfolio, and market" served by the CCP (CPMI-IOSCO (2017, paragraph 5.1.2, p 27)).

¹¹ For example, through the use of volatility-averaging techniques, the selection of lookback periods for volatility scaling, and other model calibration exercises.

trade-offs with other goals of centrally cleared margin systems, such as appropriate coverage levels and the cost of required collateral across the business cycle. This work has included:

1. conducting a stocktake of margin model governance processes with respect to model review, model recalibration and the use of discretion;
2. considering tools for analysing, comparing and setting baseline expectations for procyclicality in various settings for both CCPs and CMs, using an “outcomes-based” approach rather than a “prescriptive-based” approach (eg informative baseline expectations and not universal hard thresholds for procyclicality measures); and
3. reviewing both CCP and CM margin model characteristics associated with market risk and other margin features that might contribute materially to margin responsiveness; this review included the consideration of margin add-ons.

Based on the above, potential policy recommendations were evaluated for the following areas:

1. additional guidance/recommendations for CCP and CM governance processes;
2. additional disclosures or information/tools provided by CCPs and CMs to relevant authorities and other stakeholders; and
3. recommendations to better understand and measure the responsiveness of margin models and evaluate the effectiveness of a given anti-procyclical tool (mindful of the heterogeneous nature of CCP products and markets) for both CCPs and CMs.

2.2 Increasing the transparency of IM requirements in centrally cleared markets

The work on the transparency of IM requirements in centrally cleared markets¹² has considered potential policy proposals and/or recommendations across a set of perspectives, including transparency to the public, to relevant authorities and/or to specific participant categories (including clients, CMs, third-party providers and other relevant stakeholders). It has considered:

1. the provision by CCPs of improved forward-looking tools for CMs and clients to enhance understanding;
2. enhanced disclosure by CCPs of backward-looking model performance indicators;
3. the quality and content of relevant existing disclosures on model performance indicators, eg existing PQD data fields on margin models and breaches/coverage, to identify the most effective extensions;
4. enhanced disclosure by CCPs of model design choices; and
5. the role that CMs can play in facilitating transparency for their clients in how they choose to pass through CCP demands, as well as factors behind any discretion used in CM-determined margin add-ons.

3. Evidence collected

3.1 Phase 1 findings relevant to responsiveness and transparency

In Phase 1 of this work, the Margin Group conducted four detailed surveys: (i) a survey of CCPs; (ii) a survey of CMs/broker-dealers (“the intermediaries survey”); (iii) a survey of other market participants active in

¹² It should be noted that here the primary focus of the work has been on derivatives markets.

global cleared and non-centrally cleared derivative and securities markets ("the client survey"); and (iv) a survey of/data collection from relevant authorities ("the authorities survey"). The Margin Group also held three industry roundtables with representatives from different client sectors. While the coverage of responses to the CCP survey gives a reasonable indication of the overall market, responses to the intermediaries, client and authorities surveys represent only a sample of market participants or jurisdictions.

The analysis in the Phase 1 report was subject to a formal consultation, which included written feedback and a series of virtual stakeholder outreach sessions.¹³

3.1.1 Drivers of IM calls and assessing the responsiveness of IM models

The Margin Group's Phase 1 analysis investigated the drivers of IM calls during the early Covid period. The overall increase in IM requirements was driven by a number of factors, including trading activity, changes in volatility, and models reacting to market stress. Though differences in margin responses across asset classes could be explained largely by differences in volatility in the underlying products in those asset classes, the scale of the response to volatility also depended on model design choices, including how conservative margin requirements were in less volatile times. Accordingly, in order to assess the responsiveness of IM models, the Phase 1 report assessed changes in CCPs' margin rates and changes in IM levels in Q1 2020, and compared those changes against a corresponding measure of volatility.¹⁴ The analysis represented an initial "proof of concept" quantitative assessment of IM responsiveness and, accordingly, Phase 2 work explored how such an assessment could be refined and used more widely by relevant authorities and market participants.

3.1.2 CCPs' approaches to anti-procyclicality

Many CCPs reported in the Phase 1 survey that they have no formal APC framework, though many of those same CCPs stated that they do use measures they consider to be APC-related tools; a number of the respondents are required to include at least one explicit APC measure in their margin model framework. The majority of CCPs reported using at least one APC tool in their margin models, thus sometimes exceeding regulatory requirements. Similarly, the commodities report highlighted that CCPs are sensitive to the stresses that margin can place on market participants, with many having measures which can help mitigate the procyclicality of margin calls. However, there are varying approaches to CCPs' internal monitoring of margin responsiveness. Approximately 40% of CCPs surveyed in Phase 1 reported establishing an internal "risk appetite for APC", typically expressed as an upper bound for increases in IM over a time period measured in days. Some – but not all – of the CCPs surveyed for the commodities report noted having similar hard or soft internal targets for maximum IM increases. Phase 2 work further explored the approaches CCPs take to assessing the responsiveness of their own models and assessed the potential benefits of CCPs defining and, where appropriate, disclosing governance frameworks for assessing responsiveness and the use of specific APC tools.

3.1.3 Transparency of margining practices

The Phase 1 report highlighted the importance of intermediary and client preparedness for potential IM calls, with this preparedness aided by CCPs sharing analytical tools and data that allow CMs and clients to estimate potential margin needs. The Phase 1 report noted the important role that margin calculators or simulators can play in aiding market participants. Roughly 76% of the CCPs surveyed in Phase 1 indicated

¹³ A summary of the feedback is available on the BIS website (www.bis.org/bcbs/publ/d537_feedback.pdf) and the IOSCO website (www.iosco.org/library/pubdocs/pdf/IOSCOPD714-feedback-statement.pdf). Where respondents did not expressly request otherwise, the written comments are available on the BIS website (www.bis.org/bcbs/publ/comments/d526/overview.htm) and the IOSCO website (www.iosco.org/publications/?subsection=public_comment_letters).

¹⁴ In the Phase 1 analysis, volatility in the largest single risk factor (or a group of highly correlated risk factors), as identified by the relevant CCPs, was used as the relevant measure of volatility.

that they made margin simulators available to their CMs and, in many cases, to clients. Responses did show that the functionality of these simulators varied, and both CMs and clients noted a desire for enhanced tools to facilitate estimates of potential future margin requirements.

Less than half of surveyed intermediaries (46%) indicated that they had the data and tools available to estimate CCP margin calls before they were issued to CMs. Beyond margin simulators, intermediaries pointed to other issues regarding material gaps in the data and information needed to perform accurate estimations of CCP margin call amounts. These issues included a lack of disclosure related to the specific parameters that CCPs use to calculate IM and the ways in which CCPs can use discretion to change parameters. Accordingly, Phase 2 work has explored potential ways in which margin simulators might be enhanced, as well as where further disclosures or information-sharing from CCPs may be beneficial for intermediaries and clients.

The commodities report additionally identified the important role that CMs play both in facilitating client understanding of CCP margin requirements (through information-sharing) and in their ability to adjust margin requirements when passing on CCP margin to clients (eg through the use of margin multipliers). The commodities report noted that there was clear scope for improving client understanding of margin multiplier dynamics, including additional transparency related to their use and the factors used to assign them. With that in mind, Phase 2 has explored in greater detail the extent to which CMs adjust client margin, as well as the determinants behind such adjustments.

3.2 Further information collected

To complement the information collected in Phase 1, the Margin Group has:

- *held virtual stakeholder outreach sessions with CMs and clients*,¹⁵ organised jointly with the BCBS-IOSCO Working Group on Margin Requirements, which is taking forward further policy work on margin in non-centrally cleared markets (the relevant excerpts of the agendas for these outreach sessions are set out in Annex B);
- *conducted a survey of CCPs* jointly with the CPMI-IOSCO Policy Standing Group, which is taking forward further policy work on streamlining variation margin in centrally cleared markets (the relevant excerpts of the Phase 2 CCP survey are set out in Annex C. Responses were received from 28 CCPs, with global representation across all major asset classes); and
- *held meetings with relevant industry groups*, including CCP associations (ie CCP Global, formerly known as CCP12, and; the European Association of CCP Clearing Houses), the World Federation of Exchanges (WFE) and the Futures Industry Association (FIA).

3.2.1 PQDs and other forms of disclosure

Phase 2 work explored, in greater detail than Phase 1, the specific information-sharing channels used by CCPs to disseminate information to CMs and clients. As one example of that, Phase 2 explored potential amendments and enhancements to the PQDs.

CCPs were asked for views on the existing PQDs. Here, 32% of respondents reported that they could not identify any fields that lacked clarity or could be improved, while half of respondents highlighted elements that could benefit from further clarity. Sections 6 (Margin) and 4 (Credit risk) were the sections most frequently reported as those that would benefit from further clarity. Focusing on Section 6 (Margin), the majority of CCPs called for more precise guidance on the description of IM models in the PQD framework. Additionally, a small number of CCPs noted that guidance on reporting backtesting results could be improved.

¹⁵ An additional outreach session was held with collateral service providers, but this focused on variation margin practices in non-centrally cleared markets and therefore is outside the scope of this report.

Most respondents did not identify any fields that they thought were missing from the existing PQDs, though examples identified by CCPs included (i) additional detail in backtesting results; (ii) additional information in Section 4.1.1 on how CCPs size the default fund; (iii) disclosure of some items at product level, including a suggestion of product-level disclosure to assess product-level procyclicality; and (iv) qualitative descriptions of APC frameworks at CCPs. Only a small number of respondent CCPs identified fields that should be removed from the existing PQDs, and a similarly small number suggested that some or all data fields should be reported more frequently and/or with a shorter data lag in order to aid market participants.

Outside of the PQDs, the Phase 2 work investigated, more broadly, the disclosures made available to different types of stakeholders, as summarised in the below table.

Current disclosures by CCPs

Percentage of CCPs

Table 3

	The CCP's primary regulator	Clearing members	Clients	Other relevant stakeholders
CCP's approach to assessing and limiting procyclicality of margin requirements	96%	85%	78%	63%
Calibration of any deployed anti-procyclicality tools	89%	56%	48%	26%
CCP's policy/process for overriding the output of the margin model	74%	44%	41%	33%
Margin model methodology (ie documentation of the full quantitative model to enable replication)	100%	74%	56%	48%
Triggers for ad hoc reviews of margin models or APC tools	89%	44%	33%	30%
Results of regularly scheduled and ad hoc reviews of margin models or APC tools (including any need for remediation)	85%	33%	15%	11%
Stress test scenario suite	93%	59%	44%	30%

Source: Phase 2 CCP survey.

Unsurprisingly, regulators were the entities to which CCPs most consistently disclosed information; parallel to this, CMs generally received more – and more detailed – information than clients. Some CCPs do not interact directly with clients; therefore, while reported disclosure to clients is quite low for some items (eg just 15% for the results of regularly scheduled and ad hoc reviews of margin models), this may not fully represent information shared with end users, given that other entities (such as a client's CM) may provide the relevant disclosure on behalf of the CCP. Several CCPs noted that documentation related to their margin models and other information is available on public websites.

All respondent CCPs consider current disclosures to be sufficient, with 41% noting a concern regarding "over-disclosure". Some CCPs expressed concerns that detailed disclosure of model design may lead to full replication/reverse engineering of the margin model, leading to "portfolio window-dressing" which may undermine the risk management incentives of central clearing. Some CCPs also reported concern regarding the disclosure of discretionary/internal processes not captured in the margin model. A small number of respondent CCPs cited a lack of demand from clients and/or regulators for further disclosures. Many CCPs observed that the level of disclosure of their margin methodology was often proportionate to the expertise of the audience, with the logic being that the level of granularity should be proportionate to the degree of technical knowledge of the audience.

3.2.2 Margin simulation tools

Phase 2 work built on the Phase 1 analysis of margin simulators to better understand the current accessibility and functionality of margin simulators provided by CCPs. Of the respondent CCPs, 82% stated that they provide margin simulation tools to other entities. Of the 18% of CCPs that do not provide such tools, the majority noted a lack of demand by potential users and/or no regulation mandating the provision of such tools as the primary reasons for not providing simulators.

In terms of accessibility, all CCPs providing margin simulators provided access to CMs, with the majority (68%) also providing access to clients. Just under half of the surveyed CCPs reported also providing their simulators to the public. The vast majority do not charge CMs, clients or the public for access and use of their tool.

CCP margin simulation tools

Number of CCPs

Table 4

	Does the CCP provide a margin simulation tool for this type of entity?		Does the CCP charge an additional amount for the entity type to access and use this tool?			Number of registered users	CCPs providing information on use
	Yes	No	Yes	No	NA		
CCP's regulators/supervisors	11	11					
Clearing member regulators/supervisors	11	11					
Regulators/supervisors of clearing members' clients	10	12					
Clearing members	22	0	4	18	0	8206	4
Clients	15	7	2	13	7	3618	1
Third-party service providers	13	9	1	12	9	25	1
The public	10	12	1	8	13	0	0

Source: Phase 2 CCP survey.

In terms of functionality, only 14% of respondents providing margin simulation tools featured any forward-looking functionality enabling users to estimate or calculate margin requirements for historical or hypothetical stressed market scenarios. All 14% who reported providing the tools gave users the ability to define their own hypothetical future market scenarios by adjusting specific risk factors (eg shifts in price/risk factor curves, shifts in implied volatility inputs) in the estimation of margin requirements.

Of the CCPs that responded that they provide a margin simulation tool to other entities, all reported that their simulators cover core IM requirements, while 57% also include add-ons within their tool. Of the CCPs that incorporate add-ons into their tool, 85% reported covering concentration and liquidity add-ons, with a further 46% incorporating delivery/settlement add-ons.

Surveyed CCPs were asked for their views on the potential challenges to increasing the functionality of current margin simulation tools. The 86% of CCPs providing simulators without forward-looking functionality noted the cost, or burden, of creating and maintaining these tools and a lack of demand by potential users as the primary reasons for not providing such functionality. More generally, CCPs highlighted development, implementation and maintenance costs as the key challenges to increasing the depth/functionality of their margin simulation tools. Noting the potential implementation costs, many CCPs highlighted that the value of augmenting existing simulation tools with additional functionalities would have to be significant enough to warrant their development, implementation and maintenance. Some CCPs pointed to challenges due to application/software requirements and difficulties

in developing, validating and maintaining this software. A few CCPs noted that the lack of user implementation capabilities reduced the potential value of rolling out new functionality.

There was concern among a small number of CCPs that such tools would limit a CCP’s ability to respond to a crisis, as CCP judgement/discretion would result in different margin outputs compared with the ex ante estimates provided by a simulator tool. Similarly, a small number argued that the provision of such tools could even lead to inadequate provision of liquidity by misleading intermediaries and clients in the event that the simulator tool misstated potential margin requirements.

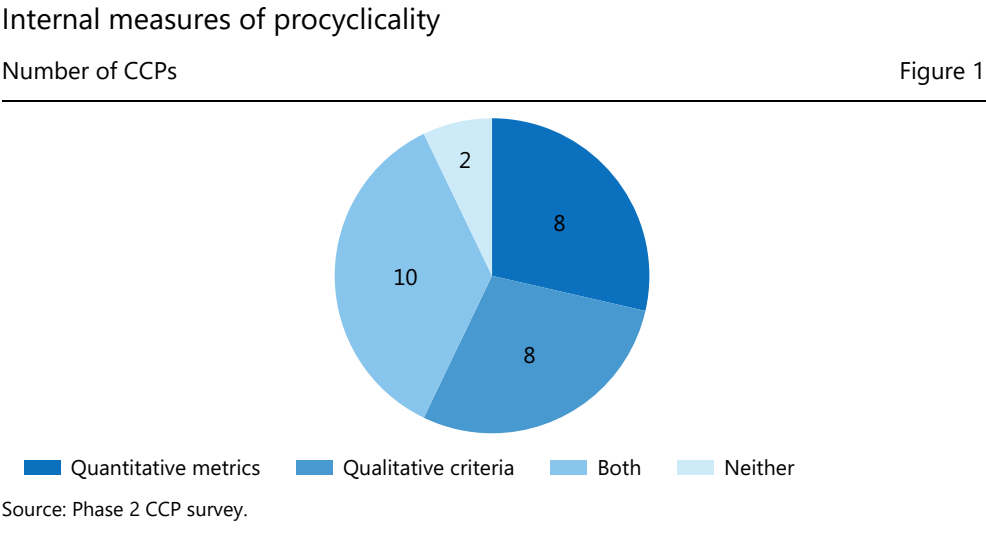
Taken together, there is a trade-off, and therefore a balance to be struck, between enhancing margin simulator tools to meet the stated demands or desires of CMs and clients (as articulated in Phase 1 and the subsequent Phase 2 outreach sessions) and the cost of developing such enhancements.

Switching to the users’ perspective, the Phase 2 roundtables with CMs and clients emphasised the benefits of simulation tools that enable participants to take a forward-looking view and anticipate IM requirements under varying historical and hypothetical market conditions. Poll results from the industry roundtables indicated that the top three most important types of scenario parameter input files that CMs and clients would like a margin simulator to process are:

- historical market conditions from a user-specified date;
- live data feeds reflecting current market prices; and
- customised stress test scenarios/risk factor shock parameter files designed by the CCP (in the case of CMs) and by the user (in the case of clients).

3.2.3 CCPs’ approaches to the measurement of margin responsiveness and related governance frameworks

Nearly all of the 28 CCPs responding to the Phase 2 survey reported using quantitative metrics and/or qualitative criteria to measure the procyclicality of their margin models.



The quantitative metrics CCPs use are generally similar in nature, analysing the change in margins (often a peak-to-trough measure) over a pre-defined period. However, parallel to this, there is much less consistency in the time horizon used in such measures. Some CCPs use multiple metrics, analysing changes in margins over both a short-term and long-term horizon.

The qualitative criteria CCPs reported using is varied, though many CCPs make use of feedback from CMs in their analysis of margin procyclicality. Other notable criteria used were comparisons with

coincident market conditions and CCP expert judgement, ie CCPs take a view on current and potential future market conditions when determining the appropriateness of margin procyclicality and model performance.

The vast majority of CCPs used either self-defined quantitative metrics or qualitative criteria or both in determining whether to undertake a model review or recalibration. Over three quarters of the CCPs reporting the use of quantitative metrics of procyclicality said that those metrics directly fed into model reviews and/or recalibration. More often than not, the metrics are applied as soft thresholds, ie where margins change by a greater amount than the threshold, this could trigger a model review or recalibration. Most CCPs use quantitative metrics in conjunction with qualitative criteria to determine whether to undertake a model review or recalibration in order to ensure that an assessment of procyclicality is placed in the relevant context.

CCPs were asked to report how they balance between procyclicality and other factors, such as margin coverage and average margin costs, when (i) designing their initial margin model(s) and APC tools and (ii) reviewing and/or recalibrating their initial margin model(s). The majority of CCPs reported prioritising margin coverage (often subject to a regulatory requirement) when balancing between the different factors. Principally, CCPs reported designing initial margin models and assessing model performance against the objective of ensuring the model provides appropriate coverage and safety, before subsequently assessing margin procyclicality (and other factors such as margin cost). A small number of CCPs reported giving equal weight to margin coverage, procyclicality and average margin levels, though they were in the minority. Many CCPs reported using a suite of different metrics and criteria in their analysis of model performance, each assessing different aspects including coverage and procyclicality, with many reporting the use of backtesting results for various aspects of model performance.

The general prioritisation of margin coverage by CCPs is not surprising given the priority placed on coverage within the PFMI. Practices reported by CCPs highlight the range of approaches to measuring and assessing margin responsiveness within model performance, and therefore, the potential scope for providing further discussion on how CCPs (and other market participants) can analyse and assess margin procyclicality within the wider context of overall model performance.

3.2.4 CCPs' use of discretion to override modelled margin requirements

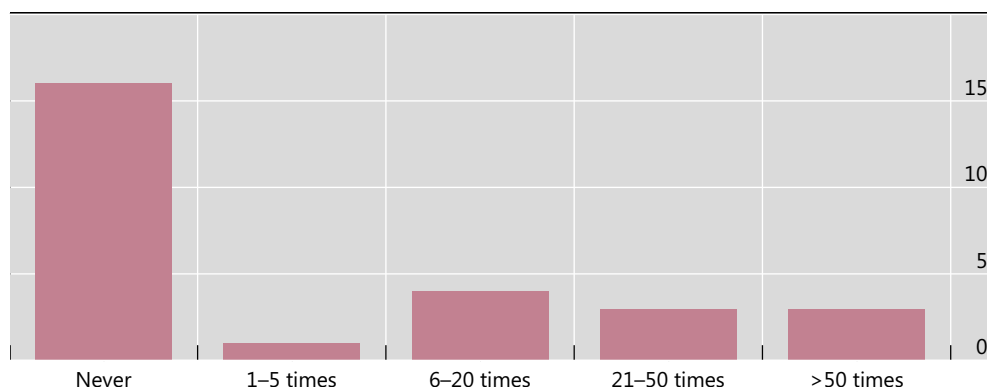
CCPs can apply discretion in setting margin requirements for clearing participants. Phase 1 data highlighted that some market participants face challenges in understanding margin requirements when CCPs apply discretion by either changing model parameters or overriding modelled margin requirements. The Phase 2 CCP survey looked to better understand the extent to which CCPs apply discretion and the underlying processes and procedures that CCPs have in place for using such discretion.

Forty-two per cent of surveyed CCPs reported overriding their margin model since 2020. The number of days on which CCPs reported overriding their model varies substantially from CCP to CCP, as summarised in Figure 2 below.

IM model overrides since 2020

Number of CCPs

Figure 2



Source: Phase 2 CCP survey.

Around 68% of surveyed CCPs reported having a process in place for determining when to override their IM model, resulting in margin requirements different from those that would have been set by the model. Generally, the approach reported by CCPs involves an initial/ongoing assessment of model performance (eg backtesting to assess whether the model is calling for appropriate levels of margin to meet coverage requirements). Where a concern with model performance is identified (eg under-margining), a decision would be escalated to the CCP's senior management (chief risk officer, board of directors, risk committee or similar senior governance level were noted) to determine whether model outputs should be adjusted. Of those CCPs reporting having a process in place, only a small number reported having a specific trigger that would lead to a margin override. Generally, decisions to adjust model outputs are based on expert judgement and take place in exceptional circumstances, and therefore cannot be determined by a pre-defined trigger.

When a decision is taken to manually adjust margin requirements, CCPs communicate the decision in a variety of ways. CCPs contact CMs directly where the members' requirements are subject to an override. Decisions are also often communicated to members via notices. Some CCPs also reported making such decisions public through notices and press releases. Of those CCPs that reported having a process in place for overriding their model, 32% said that they shared their process publicly.

Phase 2 outreach reiterated the challenges market participants can face in understanding margin requirements where CCPs have overridden their margin model. The Phase 2 survey indicated that CCPs generally have processes in place for adjusting model requirements, though the extent to which these processes are shared with relevant market participants and the way margin overrides are communicated to clearing participants varies across CCPs. Accordingly, Phase 2 work has explored the extent to which information relating to CCP discretion can and should be shared with relevant authorities and market participants, taking note of the important balance between information-sharing and maintaining CCPs' ability to use discretion, where necessary.

3.2.5 The role of clearing members

During industry outreach, clients noted that their understanding of the triggers and calibration of the difference in requirements required by their CM relative to CCP requirements was inadequate and often called or adjusted at short notice, resulting in a limited reaction time to meet add-on margin calls. This challenge often came paired with a lack of understanding of the calculation itself, making accurate forward liquidity planning more difficult. Further complicating client understanding is the practice by some CMs of providing clients holding portfolios at a number of CCPs with one overall margin call total for a given currency, thus making it more challenging to attribute margin changes to any one CCP or set of CCPs.

Representatives of CMs explained the factors behind their decisions to apply add-ons to requirements calculated by CCPs. It was noted that additional margin amounts (such as multipliers or buffers) are often charged to clients according to their counterparty credit quality, portfolio size, asset composition and level of market liquidity. In other – though rarer – cases, the reason was not specifically client-related and arose more generally around concerns about CCP margin adequacy relative to anticipated market conditions (ie the CM's view of the risk of a given position or portfolio versus the CCP's estimated risk). Any additional margin CMs charged to clients was typically calculated either using a margin multiplier or through the use of a bespoke in-house system that often embeds credit and market scenario elements. Some CMs also noted that an alternative approach used was to impose limits on the level of exposure a client can take on or to set thresholds at which add-on requirements kick in.

These descriptions by CMs align with feedback received during outreach with end user clients, who suggested that CMs apply margin add-ons for three main reasons: (i) intraday funding risks and costs (resulting in the application of buffers); (ii) credit risk concerns related to the end client (resulting in the application of margin multipliers); and (iii) CCPs charging what the CM considers to be an insufficient level of margin.¹⁶ Clients also noted that where they are using a single CM to clear positions across multiple CCPs, the CM may not always provide a breakdown of initial margin requirements by CCP, further complicating their understanding of the composition of their total requirement.

Overall, Phase 2 industry outreach, supported by findings in the commodities report, emphasised the important role CMs can play in facilitating client understanding of margin requirements and therefore the importance of CMs to client transparency.

4. Policy proposals for consultation

Building on existing standards and guidance, the Margin Group has developed proposals designed to increase the resilience of the centrally cleared market ecosystem in times of market stress.

Much of the current regulatory, supervisory and oversight framework for CCPs is guided by the CPMI-IOSCO's PFMI, which provide a set of international standards designed to ensure that the infrastructure supporting global financial markets is robust and, among other things, well placed to withstand even extreme financial shocks. The PFMI, together with the CPSS-IOSCO's 2012 report, *Disclosure framework and Assessment methodology*,^{17,18} the CPMI-IOSCO's 2015 report, *Public quantitative disclosure standards for central counterparties*,¹⁹ and the 2017 report *Resilience of central counterparties (CCPs): Further guidance on the PFMI*²⁰ (the CCP Resilience Guidance), stand as the main existing international guidance within which the Margin Group's work operates.

The Margin Group's proposals, as drafted below, primarily seek to aid market participants and regulators' understanding of margin responsiveness through increased transparency. This, in turn, should help to mitigate the potential that changes in margin requirements in response to market conditions lead to destabilising or disruptive effects on participants or additional markets. Enhanced information-sharing

¹⁶ Individual add-ons may, in some cases, not be applied as a result of competition between clearing members.

¹⁷ See CPSS-IOSCO, *Principles for financial market infrastructures: Disclosure framework and Assessment methodology*, December 2012 (CPSS-IOSCO (2012b)); available on the BIS website (www.bis.org/cpmi/publ/d106.htm) and the IOSCO website (www.iosco.org/library/pubdocs/pdf/IOSCOPD396.pdf).

¹⁸ In June 2014, the central bank Governors of the Global Economy Meeting (GEM) endorsed a new mandate and charter for the Committee on Payment and Settlement Systems (CPSS). The GEM also decided to rename the CPSS as the Committee on Payments and Market Infrastructures (CPMI).

¹⁹ See CPMI-IOSCO, *Public quantitative disclosure standards for central counterparties*, February 2015; available on the BIS website (www.bis.org/cpmi/publ/d125.html) and the IOSCO website (www.iosco.org/library/pubdocs/pdf/IOSCOPD475.pdf).

²⁰ See CPMI-IOSCO (2017).

related to margin responsiveness should (i) assist market participants in preparing for potential liquidity demands arising from margin requirements; (ii) facilitate either external (regulators) or internal (CCP) oversight to better understand and assess margin model performance; and (iii) aid CCPs and CMs in building, where possible, standardised approaches that include quantitative-based principles and processes for monitoring and managing margin responsiveness.

The following set of proposals presents the combined outputs of the Margin Group's work on cleared IM responsiveness and transparency. The proposals are structured around already existing communication channels in the financial system that may be enhanced through the sharing of additional information on margin responsiveness and related model characteristics. Each proposal is placed within the context of relevant existing guidance and highlights where guidance would need to be amended to implement the proposals.

4.1 CCP transparency

4.1.1 Margin simulators

Policy proposals

Proposal 1: Margin simulation tools, commonly used by market participants to estimate margin requirements, should be made available by all CCPs to all CMs and their clients.

Proposal 2: Margin simulation tools should include, at a minimum, functionality allowing the following:

- a. The calculation of margin requirements under varying historical and hypothetical market conditions for current and hypothetical portfolios.
- b. The incorporation of add-on charges in addition to baseline (or "core") initial margin.

CCPs should ensure that margin simulation tools reflect all material components of the underlying quantitative methodologies.

Objective and rationale

Most CCPs provide margin simulation tools to participants in their market, allowing users to calculate and understand, ex ante, the margin requirements for their portfolios due to either changes in the portfolio itself or changes in market conditions. The use of these tools can in some cases influence trading strategies and choices related to the selection of clearing venue or exchange, as participants are better able to understand the potential future liquidity needs associated with a given choice. However, the degree of availability of these tools to participants varies, as does their functionality. For example, some simulator tools only cover core IM requirements for current market conditions and so do not include calculations for IM margin add-ons or for hypothetical or historical stressed market conditions.²¹

The provision of IM simulation tools with forward-looking functionality and the inclusion of add-ons could aid participants' understanding of the total liquidity demands they may incur when clearing a portfolio at a CCP and enable both CMs and clients to understand how a given model may respond to a broad set of market scenarios. This additional information can help participants better plan for stressed liquidity needs, thus helping to mitigate the potential negative effects of unpredictability and procyclicality.

The group proposes that forward-looking functionality should include estimates of changes in IM due to changes in market conditions (as well as changes in portfolio, though this is more commonly

²¹ This observation is based on the information collection in Phase 2 and highlighted in earlier sections, including the CCP survey and the roundtables with CMs and clients.

already part of current margin simulator functionality). This would allow users to estimate IM requirements under market conditions that would mirror periods where liquidity preparedness is most important, ie those that represent stressed market conditions.

At a minimum, the historical scenarios should include those that either (i) resulted in the highest aggregate VM call; (ii) are included in the set of historical stress tests that the CCP uses to calibrate its own default fund; or (iii) represent the largest change in IM rate over a relevant period (such as the associated margin period of risk (MPOR)) for the major products cleared by the CCP.

In terms of simulating IM requirements under hypothetical scenarios, the group has identified two options:

1. CCPs should provide forward-looking IM simulator tools that can be used to calculate IM requirements under CCP-defined hypothetical scenarios that are based on the hypothetical stress tests that the CCP uses to calibrate its default fund; or
2. CCPs should provide forward-looking IM simulator tools that allow users to specify market scenarios (which could include hypothetical scenarios) by entering their own inputs into parameter fields/templates that have been defined and provided by the CCP.

As the number of potential market scenarios under the first option is limited and would be, at least partly, based on the CCP's own scenario set, this option may have the benefit of being cheaper for CCPs to implement and maintain. However, a CCP's hypothetical stress test scenarios may omit examples of extreme but plausible market shocks of interest to market participants and relevant authorities. Therefore, the Margin Group is seeking feedback on the alternative option where users are able to define their own market scenarios to better align with their own expectations of future stress periods. Depending on the circumstances, either option may be appropriate to address the objectives of Proposals 1 and 2 above.

In terms of incorporating add-ons into margin simulator tools, the Margin Group defines add-on charges as components of a CCP's overall margin requirement that are typically calculated to supplement statistical models representing anticipated price changes (ie core IM).²² In the context of margin simulators, the expectation is that the simulator would incorporate the effect of add-on charges that are related only to the position being margined (eg market liquidity risk, wrong-way risk or correlation risk, position concentration, portfolio composition, participant concentration, momentum or volatility metrics, and activity or utilisation metrics), but would not necessarily incorporate add-ons that are related to the market participant (eg related to a CCP's credit assessment of the participant).

The Margin Group notes that there will be implementation and maintenance costs associated with the proposed provision and enhancement of margin simulation tools and therefore asks for consultation respondents to share views on whether the margin simulator proposals would be better applied to a subset of CCPs and, if so, how that subset should be best defined. This will help to inform the right balance between the benefits of increased availability and functionality of margin simulators and the associated increased costs to CCPs. The Margin Group similarly seeks comment on whether this balance is dependent on analytical or data technology used by the CCP (eg cloud technology, APIs) and how adjustments may be necessary depending on this technology framework.

Related to potential implementation challenges is the distribution of margin simulation tools to both clearing members and clients. Unlike in the case of members, which are known in full by the CCPs, it

²² Paragraph 5.2.12 of the CCP resilience guidance defines add-ons as follows: "As a general matter, add-on charges can be understood as components of a CCP's overall margin requirement that are typically calculated to supplement statistical models. These add-on charges may include additional charges based on market liquidity risk, wrong-way risk or correlation risk, position concentration, portfolio composition, participant concentration, momentum or volatility metrics, and activity or utilisation metrics. Furthermore, add-on charges can address risks that may be more challenging to model accurately, or are not readily discernible in the price histories of the products cleared. As a result, add-on charges may utilise a more qualitative approach or be calculated in an intentionally conservative fashion."

may be the case that CCPs are not able to know the full list of clients who make use of their clearing services (through the intermediation of a member). Still, we believe that the availability and use of simulation tools would be of value to many, if not all, of the CCP client base as they engage in their own liquidity preparations. Given this, the Margin Group is seeking comment on the most effective way of ensuring that clients who have a desire or need for the tool have access to it, perhaps by request or through an available API.

It is important for market participants to understand that margin simulators can only provide an estimate of potential future market requirements. Margin simulator tools cannot predict market events, and any forward-looking functionality may generate outputs which differ from actual margin requirements on future dates. Additionally, and as noted within Proposal 8, CCPs maintain the ability to override modelled margin rates where appropriate and, accordingly, in such circumstances, estimates of margin requirements produced by a simulation tool may differ from actual margin requirements. Margin simulators are therefore a useful tool for facilitating market participant preparedness for potential changes in margin requirements, but should be considered in context and alongside other communication channels or quantitative tools.

In order to ensure that the outputs of margin simulator tools provide an indication of what margin requirements would be under specific historical or hypothetical market scenarios to a sufficient degree of accuracy, the Margin Group is proposing that these tools be kept up to date with the CCP's current margin methodology (ie there should be minimal lag between a CCP making amendments to its margin model and those amendments being reflected in its margin simulation tool).

Existing guidance and potential enhancements

Margin simulators are not expressly detailed within guidance for CCPs, but are a mechanism CCPs have used to meet key transparency requirements within the PFMI and associated guidance.

The PFMI emphasise the importance of transparency as a way of helping to ensure that relevant information is provided to participants, authorities and the public in order to inform sound decision-making and foster confidence. In particular, Principle 23 covers the disclosure of rules, key procedures and market data and specifies that, among other things, an FMI "should provide sufficient information to enable participants to have an accurate understanding of the risks, fees, and other material costs they incur by participating in the FMI". Key Consideration 2 of this Principle goes on to elaborate that "an FMI should disclose clear descriptions of the system's design and operations, as well as the FMI's and participants' rights and obligations, so that participants can assess the risks they would incur by participating in the FMI".

Building on this, the CCP resilience guidance states that the CCP should provide sufficient information "to support the replicability of margin requirements (including, to the extent practicable, add-on charges) such that participants can understand how the margin model behaves and how their individual margin requirements can change over time and under changing market conditions".²³

The Margin Group also notes the importance of market participants using the information that is provided to them. The explanatory notes to Principle 23 detail that "participants bear primary responsibility for understanding the rules, procedures, and risks of participating in an FMI as well as the risks they may incur when the FMI has links with other FMIs". Further, paragraph 2.2.15 of the CCP resilience guidance notes that "the board should also ensure that the CCP conducts regular and rigorous due diligence of its participants' understanding of, and their ability to predict and manage, potential changes in margin... This due diligence helps ensure that participants understand and have taken the necessary steps to be prepared to meet such requirements..." In line with the guidance, the Margin Group highlights that it is important for the users of information to engage with and understand the information they receive. Such

²³ See paragraph 2.2.23 of CPMI-IOSCO (2017).

engagement is necessary to ensure that increased transparency can effectively inform sound decision-making and foster confidence.

Where the proposals are endorsed, the CCP resilience guidance would be enhanced through express reference to margin simulation tools and to reflect that CCPs should make such tools available to all users. Details on the functionality could be set out at a high level within the guidance and would likely benefit from supplementary detail provided within a best practice document.

4.1.2 Qualitative disclosures to participants

Policy proposals

Proposal 3: Where legally permissible, CCPs should make margin model documentation available to CMs at a level that can enable them to understand key aspects of the CCP's margin model and its approach to risk management. This documentation should include the following:

- a. Explanations of the calibration of key model parameters, including any relevant components which affect the size and speed of margin requirement changes during periods of elevated stress.
- b. The logic, applicable thresholds and data used for the calculation of margin add-ons.

Proposal 4: CCPs should publicly disclose and describe the anti-procyclicality (APC) tools used in their model. CCPs should also publicly disclose and describe, at a high level, the model components that affect the level of model responsiveness.

Objective and rationale

Qualitative information shared with market participants by CCPs can often represent the broadest information set related to the CCP's model and risk management policies, covering a wide range of information with varied formats and stakeholders at different levels of sophistication. In part because of this, CCPs regularly disclose their policies and procedures through publicly available rulebooks and operating procedures, or often make more detailed policies and risk information, including information about model components and parameters, available specifically to clearing participants. In addition, clearing participants can also directly contact CCPs or participate in members-only forums to ask bespoke questions in order to fill in more detailed information gaps.

While there is a clear rationale for CCPs having autonomy over the form and detail of the information disclosed to participants, given the wide variety of models and the similarly wide variety of cleared markets, overly heterogeneous sets of information can lead to challenges in understanding liquidity needs. This is particularly true during periods of stress, when the importance of and need for detailed information, especially related to the interactions between portfolio, market conditions and margin, are highest. In the context of understanding model responsiveness and performance, feedback from clearing participants in Phase 1 demonstrated a demand for greater levels of information relating to model design choices (and the rationale for those choices); when and how add-ons are applied; the approach to anti-procyclicality and how it interacts with changing market conditions; the circumstances in which a CCP may apply discretion to change its margin levels; and the scope for providing notice of such changes, differentiating between business as usual and periods of elevated market stress. Though the results of some of these factors, such as model choices and add-ons, are often visible through the use of the simulators discussed above, qualitative information about, for instance, the rationales behind choices and the ways in which these choices interact within a given model should enhance CM and client understanding of the calculations shown within the simulator.

Phase 2 outreach provided further evidence of demand for transparency related to the drivers of margin increases, with CMs requesting additional information on the data used to calibrate CCP margin models and clients suggesting that allowing some elements of CCPs' margin models to be replicated

within their internal tools would in turn aid the liquidity preparedness of market participants. In some of these areas, there may be legal and other impediments to the sharing of certain information related to margin model design choices by CCPs (we are seeking comments on better understanding where these impediments may be strongest or most burdensome); with this in mind, there are benefits to market participants, CCPs and relevant authorities working together to facilitate increased information-sharing, where permissible and feasible.

We realise that it is often the case that the same level of granularity of information may not be necessary for different audiences. In general, and as noted above, members, who have direct exposure to the CCPs, may receive more detailed information about model components and calibrations than do other market participants or the public at large. Given these differences, our proposal highlights the value of publicly providing information on the tools and components of a model which have effects on margin responsiveness (eg explicit APC measures) at a more descriptive level; the Margin Group seeks comment on the levels of detail appropriate for these distinct audiences, as well as the costs associated with certain forms of disclosure.

The objectives of the group's proposals in this space are not to mandate a specific form/template of communication, but to broadly increase the level and detail of information, primarily related to margin responsiveness, that is shared with relevant stakeholders.

Existing guidance and potential enhancements

PFMI Principle 23 emphasises the need to provide sufficient information to enable participants to assess the risks they face. This includes the following:

- An FMI should adopt clear and comprehensive rules and procedures that are fully disclosed to participants. Relevant rules and key procedures should also be publicly disclosed.²⁴
- An FMI should disclose clear descriptions of the system's design and operations, as well as the FMI and participants' rights and obligations, so that participants can assess the risks they would incur by participating in the FMI.²⁵
- An FMI should provide all necessary and appropriate documentation and training to facilitate participants' understanding of the FMI's rules and procedures and the risks they face from participating in the FMI.²⁶

The PFMI also state that CCP IM models should, among other things and to the extent practicable and prudent, limit the need for destabilising, procyclical changes.²⁷

The CCP resilience guidance further elaborates that sufficiently detailed, accurate, reliable and timely information on the CCP's margin system and stress testing framework should be provided to participants and other relevant stakeholders to permit them to understand, provide effective feedback on and, where necessary, challenge the elements of the CCP's approach, methodologies, parameters, assumptions, scenarios and model performance. In particular this includes:

- sufficiently granular details on the CCP's margin system to support its participants' ability to understand, assess and provide feedback on the predictability of margin requirements, including the likelihood of large or unexpected margin calls in times of market stress; and

²⁴ See Principle 23, Key Consideration 1 of CPSS-IOSCO (2012a).

²⁵ See Principle 23, Key Consideration 2 of CPSS-IOSCO (2012a).

²⁶ See Principle 23, Key Consideration 3 of CPSS-IOSCO (2012a).

²⁷ See Principle 6, Key Consideration 3 of CPSS-IOSCO (2012a).

- the CCP's approach to add-on charges, as well as its approach to assessing and limiting destabilising, procyclical changes of all financial resources collected, including the supporting rationale for these approaches.²⁸

Where the proposals are endorsed, the CCP resilience guidance would be updated to reflect that CCPs should share relevant margin model documentation and information relating to their APC tools with relevant market participants, as detailed in Proposals 3 and 4.

4.1.3 Public quantitative disclosures

Policy proposals

Proposal 5: CCPs should provide additional breakdowns of margin-related data through the PQDs and report such data more frequently and with shorter reporting lags. All PQD data should be reported consistently and accurately.

Objective and rationale

The PQDs are a vitally important information source, aiding a wide range of market participants and the public in understanding CCP margining practices. Acknowledging this high value, Phase 2 outreach has identified that there is scope to enhance the data currently reported within the PQDs, as well as introduce new data fields detailing margin responsiveness.

On PQD enhancements, feedback suggested that market participants would benefit from:

- more granular reporting of some margin data fields/information (eg important components of IM requirements);
- more timely disclosures, which may be especially helpful during periods where market conditions are changing at an elevated rate (eg stressed periods);²⁹ and
- further harmonisation and clarification, for example, possibly through the use of a more standardised file format.

To that end, the Margin Group proposes two general enhancements to the PQDs (Proposal 5): (i) an increase in the detail of current PQD fields; and (ii) an increase in the frequency and a decrease in the lag of reporting.

The first category, the increased detail of current PQD fields, would be introduced to improve public transparency regarding (i) shifts in IM component requirements; (ii) CCPs' IM coverage; and (iii) the overall liquidity demands from CCP VM and IM calls. The Margin Group notes that this first category may require the development of standardised definitions (eg of core IM) and seeks comment on appropriate standardisation.

The second category, an increase in the frequency (currently quarterly) and a decrease in the lag (currently two months) of reporting, is potentially a substantial shift from current practice. A large number of CCPs already do provide a significant amount of information on a daily basis, with a one-business day reporting lag, including product-level margins, open interest and volume information, and, to members, their own IM and VM requirements. These existing disclosures provide a precedent for both public and targeted information dissemination at a daily frequency; the novelty in the proposal would be an expansion of these already existing practices to some portion of the PQDs. With current practices in mind,

²⁸ See paragraph 2.2.22 of CPMI-IOSCO (2017).

²⁹ Current information shared by CCPs with the public is not restricted just to the quarterly disclosures. Other data transparency efforts by CCPs, such as the publication of contract-level margin requirements, are often carried out on a daily basis on individual CCP websites. However, there is some variance in how these margin rates are publicly shared, as well as in the ability of market participants to understand the factors behind changes in margin levels.

the group seeks comment on where more frequent disclosures would either be especially beneficial to the marketplace or especially costly in terms of either generating or publishing them. In addition to this, we seek comment on whether certain formats of these disclosures would be more straightforward, without materially affecting the value or usability of the information.

The indicative list of proposed changes to the PQDs is set out in Table 5.

Potential changes to existing margin-related PQDs

Table 5

Disclosure	Additional breakdown	New frequency
Initial margin		
6.1 Total initial margin required	Core IM and margin add-ons	Daily with a one-business day reporting lag ^a
6.2 Total initial margin held	–	Daily with a one-business day reporting lag ^a
6.5 Results of backtesting of initial margin	Product-level testing results	Monthly, with a one-week lag
Margin calls		
6.6 Total variation margin paid to the CCP by participants each business day	Currency	Daily with a one-business day reporting lag ^{a,b}
6.8 Aggregate initial margin call on any given business day over the period	–	Daily with a one-business day reporting lag ^a

^a For example, end-of-day margin requirements calculated Monday evening and due Tuesday morning would be publicly reported Wednesday via PQD. In other words, the reporting lag applies one business day after the margin calls are due, not when the margin calls are calculated and disseminated to clearing members. ^b Providing daily data means that CCPs would no longer need to provide the average and maximum over a quarter.

Existing guidance and potential enhancements

The PQDs are set out in the 2015 CPMI-IOSCO report *Public quantitative disclosure standards for central counterparties*³⁰ and have benefited from a standard data template coordinated by CCP Global (a global association of CCPs). CCPs currently publish PQD data on a quarterly basis, with a one- to two-month reporting lag.

The PQDs were developed by CPMI-IOSCO with the aim of setting expectations for the minimum public quantitative disclosures expected of CCPs under Principle 23, Key Consideration 5 of the PFMI. Were Proposal 5 to be endorsed, the amendments and additions to the PQDs would be reflected in the *Public quantitative disclosure standards for central counterparties*, specifically within Section 6 (which focuses on qualitative and quantitative information regarding margin).

The exact manner and timing in which these PQD enhancements could be implemented will be informed by consultation responses, keeping in mind the extent to which the enhancements represent more or less significant overhauls of existing practices. Where enhancements represent a smaller change, for example, the introduction of a new data field, these may be implemented directly within the existing PQDs. However, where enhancements represent a more substantive shift in practice, for example, increased frequency of reporting, it may be determined by CPMI-IOSCO that a wider review of the PQDs is necessary. For instance, a more significant review could consider how to improve data reliability and quality; this may be achieved by suggesting that CCP Global enhance its existing reporting template to facilitate reporting in a standardised, machine-readable format with enforceable data types, formats, enumerated values and easier-to-implement automated data quality logic checks. Subject to consultation responses, the Margin Group may recommend that CPMI-IOSCO undertake a more wholesale review of the PQDs following completion of the Phase 2 margin work.

³⁰ See CPMI-IOSCO (2015).

4.1.4 Measuring and publicly disclosing margin responsiveness

Policy proposals

Proposal 6: CCPs should disclose a new standardised measure of margin responsiveness, as designed by CPMI-IOSCO, alongside the associated changes in market conditions. This disclosure can be made through the PQDs.

Objective and rationale

The Margin Group proposes the development of a novel measure of margin responsiveness, publicly disclosed through the PQDs, alongside measures of the associated changes in market conditions. This is with a view to facilitating a primarily retrospective review of margin response to stress conditions. Annex A contains details of the proposed measure, and consultation respondents are asked to review the Annex to facilitate responses to the consultation questions.

It has already been noted that market participants often work to anticipate future liquidity demands to ensure that they are adequately prepared for bouts of market volatility that, absent preparation, could cause liquidity stress. Measures related to the size (and speed) of margin model reactions during periods of high volatility can be a good indicator of the upper tail of liquidity demands arising from margin requirement changes during periods of stress. Accordingly, to aid with preparation and with comparisons across time and markets, there is value in providing a standardised measure of margin responsiveness.

It is important to note that IM is designed to react to market conditions, dependent on the characteristics of a given model, and providing data on isolated margin changes (without associated volatility or price information) would not directly aid with extrapolating future demands under distinct stress conditions. Therefore, the informativeness of measures of responsiveness is often dependent on a pairing with market condition data during the period of interest.

With the value of that context in mind, the Margin Group proposes that CCPs disclose, via the PQDs, a measure of the relative change in IM alongside the relative change in volatility over the same period – in its simplest form:

$$\Delta \text{ Initial Margin in \% vs } \Delta \text{ Volatility in \%}$$

In order to help ensure standardisation, the measure needs to be clearly defined, with specific guidance for all relevant parameters, such that CCPs can report the data in a consistent manner. Annex A.1 sets out further details of this proposed measure. In addition, the Margin Group has provided an analysis of the impact of various parameter choices (Annex A.5), which sets out the proposed measure in more detail, and requests views from consultation respondents on the measure's parameter inputs (eg whether the measure should be reported at single contract and/or at portfolio level). In addition to these potential new quantitative fields described in Annex A, the Margin Group seeks comment on whether there is value in additional qualitative information that could provide contextual information about the reasons and drivers for a given margin shift. For instance, other factors that can lead to changes in margin rates (eg price changes) may also be useful to include in public disclosures. These other factors may be partially accommodated through a field in the PQDs for optional qualitative information to provide additional context or background information related to the quantitative metrics.

Existing guidance and potential enhancements

In a similar vein to the enhancements set out under Proposal 5, the proposed addition of a margin responsiveness disclosure within the PQDs would be reflected in the *Public quantitative disclosure standards for central counterparties*, specifically within Part 6 (which focuses on qualitative and quantitative information regarding margin).

4.2 Governance and review of margin models

4.2.1 Framework for assessing model performance and taking appropriate action

Policy proposals

Proposal 7: CCPs should identify and define an analytical and governance framework, appropriate to their business lines and risk profile, for assessing responsiveness within the broader context of margin coverage and cost, with the framework and parameter choices communicated to relevant authorities. The framework can be used by CCPs and relevant authorities to regularly monitor the performance of initial margin models and trigger the review of initial margin model parameters in case of need.

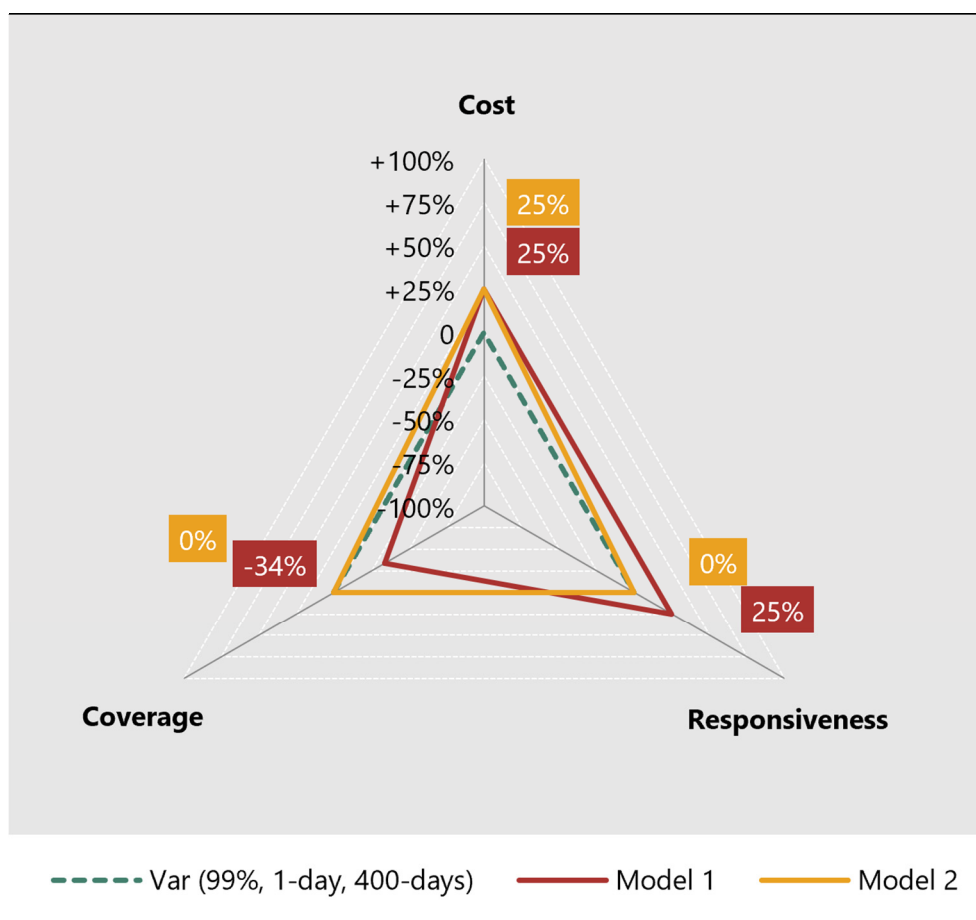
Objective and rationale

When assessing model performance and analysing model dynamics, CCPs and relevant authorities should consider the appropriate balance of key margin factors, such as margin coverage, cost and responsiveness, in a holistic way. It would be reductive to assess overall model performance by isolating one aspect of performance, such as margin responsiveness, monitoring that factor alone, and determining the success or failure of a given model using that single dimension. Instead, a full assessment would, for example, assess and balance (i) the level of margin coverage; (ii) the average margin cost; and (iii) a measure of margin responsiveness, all computed over the same lookback period, ideally covering a spectrum of market conditions.³¹

The resulting framework, which is likely to depend on both the product mix cleared by the CCP and the mix of member portfolios, would aim to assist relevant authorities and CCPs in understanding (i) how a model is designed to react to changing market conditions/portfolios and, in comparison, how it actually reacts; and (ii) the effectiveness of a given APC tool or set of interacting tools.

Figure 3 provides a graphical depiction of one potential quantification of the three dimensions highlighted above for a few different (hypothetical) models. The figure shows the performance of two models across the three factors, as well as a comparison with a VaR-style model with the given calibrated coverage and lookback periods. Through similar versions of analysis, tailored to their own product and portfolio mix, CCPs and relevant authorities can potentially evaluate how decreasing the level of responsiveness could have a negative impact on margin coverage (ie an increase in the number of breaches) and/or on margin cost (eg a higher level of margin called to cover the same risk). Analysis of this type could highlight the sensitivity of the model along each of these dimensions, as well as how these sensitivities may increase or decrease depending on a specific set of market conditions.

³¹ In undertaking such an assessment, it is important to note that coverage levels are often subject to regulatory requirements, while responsiveness and cost may not always have explicit targets. While responsiveness may not have explicit targets, a number of CCPs are subject to a requirement to incorporate at least one APC-style tool.



Source: European Securities and Markets Authority (ESMA).

Within such a framework, the Margin Group proposes that CCPs should use quantitative measures of responsiveness, as well as potentially other major factors, to inform appropriate governance responses to significant changes – or anticipated changes – in margin requirements. For instance, CCPs could monitor a large call measure of responsiveness on an ongoing basis and identify a pre-defined threshold of responsiveness that could trigger a review of the margin model. This review could then analyse the breach event within the broader context of the additional dimensions of interest, aiding with understanding whether the responsiveness trigger was paired with desirable or undesirable outcomes related to cost or coverage. By identifying, ex ante, anticipated levels of responsiveness within the wider context of coverage and cost, a CCP can ensure appropriate action is taken, when needed, in response to significant volatility or significant unexpected shifts in margin. Appropriate responsive actions, relative to these triggers, could include reviewing model design and determining that a given element or set of elements of the model were the primary drivers of the shifts, and the CCP could recalibrate its model, remaining sensitive to how the recalibration would affect the balance between the framework dimensions. Of course, any review of this type would need to be done within the context of broader model goals and requirements, but the fundamental goal is the ability of CCPs to monitor margin responsiveness in the context of wider model performance.

Existing guidance and potential enhancements

There is a significant amount of existing guidance on CCP governance and appropriate ways in which to monitor and assess margin model performance. This proposal would not replace that guidance.

PFMI Principle 2: Governance states that “an FMI should have governance arrangements that are clear and transparent, promote the safety and efficiency of the FMI, and support the stability of the broader financial system, other relevant public interest considerations, and the objectives of relevant stakeholders”. The Key Considerations associated with this principle provide further detail, including Key Consideration 7, which states that “an FMI should have governance arrangements that are clear and transparent, promote the safety and efficiency of the FMI, and support the stability of the broader financial system, other relevant public interest considerations, and the objectives of relevant stakeholders”.

The CCP resilience guidance further elaborates on how appropriate governance arrangements can limit destabilising, procyclical changes. It emphasises that the board should have ultimate responsibility to assess and limit – to the extent practicable and prudent – destabilising, procyclical changes in, among other things, initial margin. The board’s approach should be clearly defined, justified and documented with clear roles and responsibilities established for management and the board. Furthermore, the CCP resilience guidance states that the approach should be reviewed and approved by the board at least annually, supported by analysis performed by management and in consultation with participants, linked CCPs and other relevant stakeholders.³² The CCP resilience guidance also describes what could constitute a comprehensive disclosure and feedback mechanism for soliciting views from direct participants, indirect participants and other relevant stakeholders to inform the board’s decision-making regarding the CCP’s risk management framework.³³ Though governance frameworks will be discussed more immediately below, any governance framework is likely aided by the use of well defined, clear principles and metrics, guiding the decision-making process. The framework described above is, in part, aimed at providing this quantitative guidance.

In terms of how a CCP analyses and monitors its margin model performance, the CCP resilience guidance describes how sensitivity analysis can be used to assess the responsiveness of margin system parameters. The CCP resilience guidance specifies that a CCP should conduct a sensitivity analysis at least monthly, and more frequently where appropriate. As an example, the guidance suggests that a CCP could review the procyclical properties of the margin system by simulating how it would respond to a sharp increase in market volatility.³⁴ In particular, the CCP resilience guidance states that a CCP should evaluate the appropriateness of procyclicality-limiting tools (anti-procyclicality tools or APC) in its margin models and develop clearly articulated frameworks for assessing, disclosing and addressing this particular risk.³⁵

However, both the PFMI³⁶ and the CCP resilience guidance³⁷ acknowledge that there is a trade-off when seeking to limit procyclicality, specifically that “procedures designed to limit the need for procyclical changes may create additional costs for a CCP and its participants in periods of low market volatility and/or no market stress, but these procedures may also result in additional protection and potentially less costly and disruptive adjustments in periods of high market volatility”. Therefore, the CCP resilience guidance states that, in considering such trade-offs, CCPs should take a practicable and prudent approach that is “appropriately designed to target outcomes that result in additional protection and potentially less costly and disruptive adjustments in periods of high market volatility and/or market stress”.

Furthermore, the PFMI clearly specify that limiting the need for destabilising, procyclical changes is secondary (ie to the extent practicable and prudent) to generating margin requirements sufficient to cover a CCP’s potential future exposure.³⁸

³² See paragraph 2.2.13 of CPMI-IOSCO (2017).

³³ See paragraphs 2.2.18–2.2.27 of CPMI-IOSCO (2017).

³⁴ See paragraph 5.2.35 of CPMI-IOSCO (2017).

³⁵ See paragraph 5.2.37 of CPMI-IOSCO (2017).

³⁶ See paragraph 3.6.10 of CPSS-IOSCO (2012a).

³⁷ See paragraph 5.2.38 of CPMI-IOSCO (2017).

³⁸ See Principle 6, Key Consideration 3 of CPSS-IOSCO (2012a).

Accordingly, were Proposal 7 to be endorsed, the CCP resilience guidance would only need a minor enhancement to more explicitly set out how a CCP's assessment of its margin model performance might directly link to governance triggers for model review and/or recalibration, as opposed to a wholesale rewrite for how a CCP should assess model performance.

Relatedly, the CCP resilience guidance also speaks to the possible use of quantitative metrics to evaluate the procyclical properties of a CCP's margin model. As an example, the CCP resilience guidance describes examining procyclicality through regular sensitivity testing and review metrics, such as the variability of margin and peak-to-trough ratios or instances of sudden material increases in margin. It also notes that relevant metrics could also be based upon an ex ante range of tolerances determined by the CCP's governance process that specifies acceptable large changes in the amount of resources collected from participants.³⁹ This guidance could similarly be slightly strengthened to more directly suggest that CCPs should use quantitative measures of procyclicality (potentially building off the metrics developed under Proposal 6) to assess the procyclicality of their margin model.

4.2.2 Governance and review of margin models where CCPs apply discretion

Policy proposals

Proposal 8: Where CCPs make use of discretion (eg expert judgement) to override model margin requirements, CCPs should:

- a. Have in place clear governance procedures defining the triggers for the use of such discretion and undertake ex post reviews where such discretion has been applied. CCPs should clearly articulate and define the instances and areas where such overrides may be warranted (including clear definitions of the key decision-makers/who can perform overrides and the extent to which these adjustments are deemed permissible without, for example, requiring a material model change). It can similarly be important that the CCP establishes clear guidelines as well as processes which enable the CCP to identify and monitor the overridden risk variable or model output.
- b. Publicly disclose relevant information regarding the scenarios where discretion may be applied and the governance procedures used in the application of such discretion. CCPs should proactively share the governance procedures for the application of model overrides in full with relevant authorities.
- c. Publicly disclose, through additions to the PQDs, the aggregate size and duration of manual margin overrides, as compared with unadjusted IM requirements. The disclosure could be supported by a qualitative explanation of the reasons for the override.

Objective and rationale

During the March 2020 "dash for cash" and the 2022 period of commodities market volatility, authorities observed a number of CCPs applying manual margin overrides. These overrides included adjustments of parameters such as the scan range, volatility floor, margin period of risk and confidence interval. CCPs cite a number of reasons for this use of discretion: (i) ensuring adequate risk coverage; (ii) enhancing the stability of margin requirements with the aim of limiting the size and speed of IM increases; (iii) improving the match between margin and market liquidity conditions; (iv) anticipating risks that had not yet resulted in a market response; and (v) incorporating feedback from users.

While this discretion is valuable and necessary, in some circumstances it inevitably leads to a reduced understanding of the interactions between market conditions, margin responsiveness and model performance for both market participants and relevant authorities. Where CCPs manually adjust margin requirements such that margin deviates materially from disclosed model outputs, in-the-moment market participant understanding of responsiveness can fall, with potential negative impacts on the effectiveness

³⁹ See paragraph 5.2.42 of CPMI-IOSCO (2017).

of prior liquidity preparations by members and clients. Though relatively rare, there have been cases where market participants received no prior warning of model overrides and minimal ex post explanation for why such override was necessary. There has also been variance in the level and nature of formalised governance processes underpinning how and when expert judgement might be applied to deviate from model margin requirements. Further, model overrides are not always the subject of ex post standard reviews by either the CCP or the relevant authorities.

This proposal seeks to provide additional transparency around the CCP's use of discretion while preserving the CCP's ability to deal with unexpected circumstances. As with other proposals, this one highlights the potential value of this information for a wide set of participants and individuals, but also the potential need for differing levels of disclosure depending on the audience (eg relevant regulator vs clearing member vs public). The Margin Group is seeking comment, among other things, regarding the optimal level of disclosures related to discretion use and governance across these different audiences.

Existing guidance and potential enhancements

The guidance set out within PFMI Principle 2 and the CCP resilience guidance apply equally for scenarios where CCPs apply judgement to override their margin model. Accordingly, CCPs should have governance arrangements that are clear and transparent, including in scenarios where they apply discretion.

Notably, the existing guidance does not make reference to the scenario where a CCP applies a manual margin override and therefore, were Proposal 8 to be endorsed, the CCP resilience guidance could be enhanced through additional clarifying text that the governance and model review expectations apply equally to scenarios where CCPs apply discretion.

4.3 CM transparency

4.3.1 CM-to-client transparency⁴⁰

Policy proposals

Proposal 9: CMs should ensure their clients have sufficient understanding of their margin requirements, including the following:

- a. CMs should ensure their clients have sufficient understanding of CCP margin requirements. CMs should facilitate clients in accessing CCP-provided margin simulators.
- b. CMs should identify and define an analytical and governance framework, appropriate to their business lines and risk profile, for assessing margin responsiveness, alongside other key factors such as counterparty credit risk, when adjusting client margin requirements.
- c. CMs should provide sufficient transparency to their clients regarding the mechanism by which client add-ons are calculated. This should include documentation containing a detailed description of the calibration of any client add-ons (eg through the application of margin multipliers, buffers or internal margin models) and how the triggers or thresholds for their use are set. This understanding should be facilitated through the provision of CMs' own simulators, where appropriate, or private disclosures of the margin requirements clients may be subject to under different scenarios.
- d. CMs should, without the need for a client request, inform the client with appropriate notice when they are adjusting their calibration of client margin add-ons, and should provide sufficient

⁴⁰ For the avoidance of doubt, all proposals suggesting detailed disclosure and/or increased transparency relate only to centrally cleared markets and are not intended to have direct implications for activity in non-centrally cleared markets. Where CM decisions on eg client margin multipliers are informed by activity in both centrally and non-centrally cleared markets, documentation should note that interaction but need not provide detail on the specifics that pertain to non-centrally cleared markets.

transparency to their clients when margin requirements have been adjusted relative to those set by the CCP.

- e. CMs should disclose to their clients backward-looking information on the maximum, minimum and average differences between client margin requirements set by the CM and the margin requirements of the CCP over a defined period of time.

Objective and rationale

CMs play a crucial role in centrally cleared markets, among other things by providing clients access to cleared markets and CCPs by way of their intermediation. An end user will generally not have a direct relationship with a CCP but instead rely on one or more CMs (also referred to as clearing brokers) to clear their transactions through the relevant CCP(s). Typically, CMs are liable for all margin requirements the CCP places on clients' positions and thus must cover any margin calls their clients fail to meet within the applicable time frame. CMs generally manage their clients' portfolios and risk by directly passing on the CCP's margin requirements to their clients; however, many retain the ability to require a different amount of IM for their clients' positions than that required by the CCP (eg CMs can charge greater IM from their clients through the application of, for example, margin multipliers). These add-ons or multipliers can often be dependent on the credit quality of the client, any associated positions the client is holding that are known to the member, or the underlying cost of liquidity for the member itself.

As a result of this operating model, with clients principally (and sometimes only) interacting with their CMs and CMs setting the ultimate margin requirement for clients, CMs play an important role both in facilitating transparency in centrally cleared markets and in affecting the overall responsiveness of margin in centrally cleared markets.

To ensure the Margin Group's proposals capture the full life cycle and full set of drivers of the margin requirements CCPs set for clients, it is necessary to expect similarly high standards of transparency and the same rigour in terms of assessing the responsiveness of margin from CMs as that demonstrated by CCPs. With this noted, the Margin Group recognises that the modes by which margin add-ons are calculated can differ significantly from CCPs' own models (eg the CM identifies an appropriate multiplier and applies that to the CCP-calculated margin); there are equally important distinctions in the ways in which information is communicated or the ways in which decisions are made. Because of these differences, though the need for a similar level of transparency is important, the methods of achieving this transparency are likely to differ between the CCP and the CM levels. The Margin Group has tried to acknowledge these distinctions, both explicitly and implicitly, in the proposal.

The group proposes that CMs should not just ensure their clients have sufficient understanding of CCP margin requirements (possibly through sharing CCP-provided information or by supplementing this with their own analysis or expertise), but should also provide sufficient transparency to clients regarding the mechanism by which client margins are established in cases where this level differs from that set by the CCP, as well as how and when this margin is called from the client. With this transparency, the client should be able to understand (i) the CCP's own methodology and how this affects the client portfolio; and (ii) the triggers and calibration of any additional margin requirements charged by their CM above those set by the CCP. This transparency would include disclosing to the client, with appropriate notice where possible, when the member is planning to make any adjustments to the level – or method of calibration – of its own margin requirements for that client relative to the margin requirement set by the CCP. CMs could provide this greater level of transparency for clients through either the use of private disclosures or the provision of their own margin simulator tools, where appropriate, on top of the CCPs' simulator tools.

Further, and reflecting the role CMs can play in adjusting margin requirements for clients, it is important that CMs be mindful of the potential impact they can have on the overall responsiveness of margin requirements in centrally cleared markets. Many of the considerations CCPs should take into account in setting margin requirements, such as the balance between costs, coverage and responsiveness,

should equally apply to CMs in cases where they charge clients margin levels that differ from purely a CCP pass-through or when the timing of their calls differs from that of the CCP's calls. Specifically, it is important that CMs account for responsiveness, alongside other key factors such as counterparty credit risk ("margin coverage" in the CCP space) and margin costs, when adjusting client margin requirements. Accordingly, the analytical and governance framework detailed in Section 4.2 can broadly also be adopted by CMs, in a manner appropriately adjusted for the distinct risk management decisions of the CM. These adjustments may not differ just between CCPs and CMs, but perhaps even from CM to CM depending on the relevant market (eg some CCPs charge client margins on a net basis, while others charge on a gross basis, potentially affecting the levels and methods of calculating CM add-ons). The Margin Group seeks comment on the appropriate means of taking these distinctions into consideration, as well as ways in which these distinctions may result in an additional burden of cost for individual CMs or clients.

Existing guidance and potential enhancements

There are no existing standards or guidance that specifically address margin-related disclosures by CMs. There are existing disclosure requirements for banks, but these requirements are broader than margin and do not apply to non-bank CMs.

4.3.2 CM-to-CCP transparency

Policy proposals

Proposal 10: CMs should disclose additional metrics to the CCPs of which they are members on a quarterly basis with a [one/two]-month lag.

Objective and rationale

In response to the consultation on the *Review of margining practices*, CCPs called for "further transparency from CMs".^{41 42} CCPs are directly exposed to CMs (and indirectly their clients) by way of the positions posted by members at their institution; CMs may also provide additional services to CCPs such as custodial services, repo lines or other liquidity provisioning. Disclosures from CMs would enable CCPs to appraise more effectively the nature of the cleared exposures their members are taking within the context of other correlated exposures held by the member. With this information, CCPs may be able to better adjust any exposure limits or better understand the impact of their own margin calls within the broader set of liquidity demands on that institution. The feedback received suggested that such disclosures might include a few areas of information: (i) the number and name of the CCPs to which the CM is directly connected; (ii) the total default fund contributions required and deposited across all CCPs, split by collateral type; (iii) additional details about the size of cleared and uncleared exposures in asset classes related to the CM's own exposures; and (iv) maximum and average margin calls as a percentage of total liquid assets and percentage of total reserves at central banks. Phase 1 work included an analysis of these latter metrics and found that although, generally, these ratios tended to be low for a large portion of surveyed members, there was variance in levels both across institutions and across time as periods of stress increased and abated.

The Margin Group recognises that some of this information is already public in the same or equivalent form. For instance, a number of CCPs publish a list of their members, and so the list of CCPs of which an entity is a member may be partially derivable from existing information. However, it is also the case that this information can often be public in a wide variety of formats, and the level of granularity can differ from CCP to CCP. Similarly, information on liquidity demands across time is included in banking

⁴¹ As an example of these disclosure requests, CCP Global proposed a disclosure process parallel to the current CCP PQDs, entitled MPPQDs (Market Participant Public Quantitative Disclosures).

⁴² See BCBS-CPMI-IOSCO (2022), *Review of margining practices – Thematic summary of feedback*, available on the BIS and IOSCO websites. See also footnote 13 above.

institutions' Pillar 3 reports (among other public documents). These reports provide information on both liquidity resources and liquidity calls, not just for the cleared exposures of a given banking institution, but for all other market exposures that entity may have. This set of information may already provide a CCP with a window into the liquidity demands that members have faced or will face under stressed market conditions. However, a number of current CCP members are not banking institutions and therefore are not automatically subject to a similar set of liquidity disclosures. Because of this, there is currently a diversity of available information regarding liquidity resources and calls across key institutions. The proposal aims to provide a means for more standardised information and disclosures for the broader clearing-related demands potentially faced by a CCP's CMs.

In response, the Margin Group proposes that CMs disclose additional metrics to CCPs. A few metrics that may be included in these disclosures are listed below. The Margin Group is seeking comment on whether certain elements of the below list (or beyond) may be especially helpful for a CCP in its own risk management procedures or in deciding on an optimal distribution of liquidity resources. As part of this, the group seeks comment on areas where, as highlighted above, information is already being collected and therefore would represent a redundant mandate, where collected information differs by institution type or where information collection may impinge upon current legal disclosure frameworks.

- List of memberships of other CCPs
- Total IM deposited across all CCPs, split by collateral type
- Total IM required across all CCPs, split by gross and net customer margining, if applicable
- % of total IM required by Top 1, Top 2 and Top 3 CCPs (depending on number of connections), as a peak and average over the quarter – determined based on initial margin required per CCP
- Maximum and average aggregate IM call on any given business day across all CCPs over the quarter
- Maximum and average total VM paid on any given business day across all CCPs over the quarter
- Total default fund deposited across all CCPs, split by collateral type
- Total default fund required across all CCPs
- % of total default fund required by Top 1, Top 2 and Top 3 CCPs (depending on number of connections) – determined based on default fund required per CCP
- Total non-prefunded resources committed across all CCPs (eg powers of assessment/cash calls)

Annex A: Analytical annex on new PQD metrics related to responsiveness and volatility

As outlined at a high level in Section 4, the Margin Group proposes to introduce a set of reporting lines in the PQDs for CCPs to disclose a measure of margin responsiveness alongside a measure of the associated volatility.

A.1 Defining a measure of margin responsiveness and associated volatility

The Margin Group analysed several metrics currently used by CCPs and detailed in the associated research literature. This analysis identified the so-called large call measure as both informative and straightforward, aiding the practical estimation of responsiveness and liquidity needs within a given period of time. The large call measure is defined as the largest increase in margin over n days, where n is the large call window parameter. The largest of these n -day large calls over some observation window would then be reported by CCPs in the PQDs.

Expressed as a formula, the CCP would disclose Δ Initial Margin in % as:

$$LC_t(m) = \max_{d,w} [(m_{t-w} - m_{t-w-d}) / m_{t-w-d}] \forall \{1 \leq d \leq n, 0 \leq w \leq W\} \quad [1]$$

where m_t is the IM on day t , the observation period W is the time period over which large calls in IM are observed, and the large call at day t is the maximum relative IM increase within n days that has been observed between $t - W - n$ and t .

The paired measure of changes in volatility (Δ Volatility in %) should be computed using the same formula adopted for the change in initial margin, but restricted to the interval around the time at which the $LC_t(m)$ is at its maximum (to help ensure a causal relationship between the margin change and the associated volatility change). So, if t_* is the end date identified for the largest call in initial margin, the paired measure of changes in volatility should be computed as:

$$LC_{t_*}(v) = \max_{d,w} [(v_{t_*-w} - v_{t_*-w-d}) / v_{t_*-w-d}] \forall \{1 \leq d \leq n, -W_d \leq w \leq W_d\}$$

with W_d equal to 10 days.

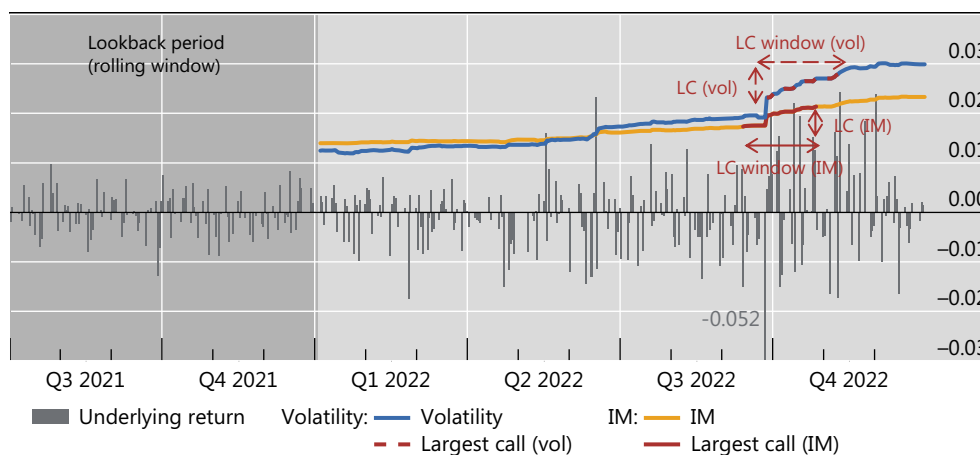
The equation allows for some flexibility in the exact time period used for the volatility risk metric, given that there may be a lag or lead between changes in volatility and associated changes in margin levels. For the paired measure of changes in volatility, the Margin Group considered two main approaches broadly adopted by market participants in their own liquidity estimations: (1) standard deviation and (2) value-at-risk (VaR) with a 99% level of confidence of the contract/portfolio daily returns. The Margin Group seeks comment on the relative value of (1) and (2). In order to aid understanding of the drivers of margin changes, the volatility risk metric would also be disclosed alongside as a large call-related measure.

To aid understanding of the dynamics of and relationship between these metrics, the two associated measures are illustrated graphically below on a single risk factor (Figures A.1 and A.2).

Illustration of key terms used in measures of responsiveness and volatility: GBP/USD

In percentage points

Figure A.1

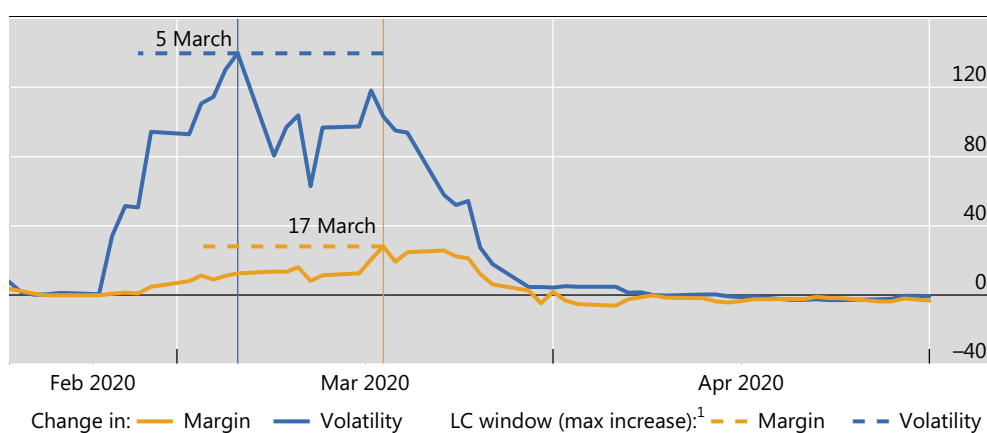


Source: Margin Group.

Illustration of key terms used in measures of responsiveness and volatility: SPX 500 product

In per cent

Figure A.2



¹ Noting the lag between the date of max per cent increase in volatility (5 March) and the date of max per cent increase in margin (17 March).

Source: Margin Group.

For each element of these disclosures, there are parameter choices which can affect the calculated output. For example, the large call metric is applicable to a number of levels of margin calculation (eg the inclusion or exclusion of add-ons in some cases), as well as a number of observation periods, while the measure of changes in volatility is often dependent on the time period used to calibrate the measure (the lookback period). The Margin Group intends to consult on the majority of the individual parameter choices in order to ascertain which combination will provide the greatest information to end users and what is computationally possible for CCPs to provide in regular disclosures.

A.2 Parameter inputs to the measure of margin responsiveness

The measure of margin responsiveness should detail a change in a CCP's margin requirements over a predetermined period of time and at an appropriate reporting level in order to be informative to market participants. As discussed in A.1, the Margin Group proposes to use a large call measure of margin change. There are three parameter inputs to be defined for the measure of margin responsiveness:

1. large call time window, or the time period over which we measure the increase in margin requirements;
2. observation period, or the time period over which large calls in IM are observed; and
3. how the measure is applied, i.e. whether it is applied to single products, a synthetic/static portfolio and/or real/dynamic portfolios.

A.3 Parameter inputs to the measure of associated volatility

The measure of associated volatility should provide an indication of the level of price changes through the same period that is being measured for the change in margin. Providing an indication of the associated price volatility can better inform market participants on the factors driving changes in margin. There are five parameter inputs to be defined for the measure of associated volatility:

1. large call time window – for consistency and to ensure the measure of associated volatility is comparable to the measure of responsiveness, the volatility risk metric would use the same time window as that used for the responsiveness metric;
2. observation period, which would be consistent with that used for the IM metric;
3. product vs portfolio, for which the volatility risk metric would need to be applied at the same level as that used for the IM metric;
4. volatility risk metric, which the Margin Group will need to define, picking between value-at-risk and standard deviation; and
5. lookback period – the Margin Group will need to define the time period used to calibrate the volatility risk metric.

A.4 Parameter choices

In determining the right parameter inputs, the Margin Group needs to balance the value of additional measures of responsiveness against the risk of over proliferation of data, as well as potential reporting burdens on CCPs. With that in mind, where possible, the final measure of responsiveness should limit the parameter inputs to one, or a maximum of two, different formulations. For example, ideally the measure should have one defined observation period, with one or perhaps two large call windows.

A.4.1 Length of the large call window

The measure could use either a relatively short window (eg five days) or it could use a longer window (eg 20 days).

A shorter window captures potential sudden spikes in liquidity demand and is consistent with the portfolio liquidation period used by most CCPs, while a longer window captures liquidity needs over a more sustained period of stress and is consistent with liquidity measures used for other financial institutions (eg the Liquidity Coverage Ratio).

A.4.2 Length of the observation period

The measure could use a short observation period, looking at changes in margin and associated volatility over the recent past, eg the previous three months. Alternatively, the measure could use a longer observation period, eg providing information on the largest IM call and largest volatility spike observed in the past year.

A short observation period provides information on margin responsiveness to recent changes in market conditions, and over time multiple years of this disclosure would build up a time series of changes in margin responsiveness. A longer observation period provides information about liquidity demands over the cycle, providing firms with a sense of peak liquidity stress.

A.4.3 Product vs portfolio

The measure could be disclosed at the individual product level, for either hypothetical static portfolio(s) (ie portfolio composition does not change over the reporting period) or dynamic portfolio(s) (ie an actual CM's portfolio where the composition of the portfolio changes as a result of new trades being placed through the reporting period).

A disclosure at the key product level enables the public to understand which specific contracts are most affected by IM increases and potentially map this to their own exposures, but this does not allow for the potential for portfolio offsets in the margining process.

A static portfolio makes it possible to identify the effects of both individual contract margin rates and portfolio offsets but comes at a greater computational cost for CCPs. Relevant authorities or CCPs would have to define a methodology for creating a static portfolio for the disclosure – where CCPs determine their own methodology, it would have to be reviewed and approved by the relevant authorities – and CCPs would then have to construct the static portfolio for each reporting period. The data may also be more challenging for users to understand and apply to their own positions, given the portfolio may not be representative of their own positions.

A dynamic portfolio may be easier to compute than a static portfolio and incorporates margin offsets unlike the product-level disclosure, but the results would be distorted by changes in portfolio composition over time. This could lead to a substantial overestimation of margin responsiveness, given that the change in margin would be affected by portfolio changes as well as the design of the CCP's margin model.

A.4.4 Volatility risk metric – VaR vs standard deviation

The risk metric used to measure the associated volatility over the observation period could be either a percentile metric (eg 99th percentile), which captures tail events (ie VaR), or it could be a simple standard deviation, which captures a range of market moves.

Standard deviation is easy to compute and widely known and understood by the public. As a measure of the spread of data, changes in standard deviation may not align with event-driven shifts in margin requirements, as it may take longer to reflect changes in market conditions. VaR may better account for extreme shocks and tail events which margin models aim to address, but may exhibit extended periods of no change followed by sudden jumps in response to individual market events, creating instability in the disclosed metric. Additionally, many CCPs use VaR-based models, and this metric may be incorrectly viewed as an authorities-endorsed "benchmark" model.

A.4.5 Volatility risk metric lookback period

The time period used to calibrate the volatility risk metric (the lookback period) could be either a relatively short window (eg 90 days), which provides information about recent market changes and will be more responsive, or it could be a longer window (eg two years), which provides information about what CMs could expect from less recent stress events and provides a more complete set of market events. This

decision may also be affected by the choice of the volatility risk metric; a standard deviation with a long lookback period is unlikely to change significantly over the length of the large call window.

The full set of parameter inputs and potential choices are summarised in Table A.1.

Parameter inputs and potential choices

Table A.1

Parameter choices		Description	Options
Responsiveness measure	Large call window	The time period over which we measure increase in margin	1. A relatively short window, eg one day or five days, consistent with short term liquidity needs 2. A longer window, eg 5 or 20 days, consistent with liquidity measures used elsewhere (eg Liquidity Coverage Ratio)
	Observation period	The time period over which large calls in IM are observed	1. A recent period, eg the largest IM call in the past quarter 2. A longer period, eg the largest IM call observed in the past one year
	Product vs portfolio	The risk metric could be applied at single product level or to synthetic or real portfolios where multiple contracts could net each other	1. Product 2. Static portfolio (ie portfolio whose composition does not change over time, eg real portfolio at a certain date or a synthetic portfolio) 3. Dynamic portfolio (ie real CM portfolio whose composition changes based on new trades or repositioning)
Volatility risk metric	VaR or Vol	The risk metric applied to measure volatility	1. A percentile metric (eg 99th percentile), which captures tail events (VaR) 2. Standard deviation, which captures a range of market moves (Vol)
	Lookback period	The time period used to calibrate the volatility risk measure	1. A relatively short window (eg 90 days), which provides information about recent market changes and will be more responsive 2. A longer window (eg two years), which provides information about what CMs could expect from less recent stress events; it will be less responsive
	Large call window	The time period over which we measure increase in volatility	N/A – needs to be consistent with what is used for the IM metric; see above
	Observation period	The time period over which large calls in volatility are observed	N/A – needs to be consistent with what is used for the IM metric; see above
	Product vs portfolio		N/A – needs to be consistent with what is used for the IM metric; see above

A.5 Analysis of the impact of different parameter choices

The workstream on the responsiveness of IM in centrally cleared markets performed analyses to understand the functioning of the proposed metrics and the impact of margin model parameter choices on the measure of IM responsiveness. A summary of this analysis is set out below to assist consultation respondents in providing views on the proposed measure and potential parameter inputs to the measure.

In order to investigate the responsiveness of margin models and their sensitivity to model parameters, the following setup/analysis was devised.

The exercise consisted of examining large calls in IM and volatility across the following risk factors, which were selected to span a range of asset classes and markets:

Selected asset classes			Table A.2		
Asset class	Risk factor	Code	Asset class	Risk factor	Code
FX	CAD-USD FX rate	CAD	Rates	10yr US government bond yield	USD10YR
FX	GBP-USD FX rate	GBP	Rates	1yr US government bond yield	USD01YR
FX	JPY-USD FX rate	JPY	Rates	10yr German government bond yield	EUR10YR
Equity	Nasdaq index	NAS	Rates	1yr German government bond yield	EUR01YR
Corporate bond	BofA US corporate bond index	BAM	Rates	10yr UK government bond yield	GBP10YR
Commodity	Brent crude price	OIL	Rates	1yr UK government bond yield	GBP01YR
Commodity	Gold price	GOLD	Rates	10yr Japan government bond yield	JPY10YR
Commodity	Dutch natural gas price	TTF	Rates	1yr Japan government bond yield	JPY01YR

In the first step, one-day logarithmic returns were calculated on the FX, equity, corporate bond and commodity risk factors, as were one-day absolute returns on the interest rate risk factors.⁴³

In the second step, the initial margin $IM(t)$ on each risk factor's returns on day t was computed using the following simple model:⁴⁴

- $IM_{EWMA}(t)$ is the 99% expected shortfall of historical returns, weighted using the exponentially weighted moving average volatility, with $\lambda = 0.98$.
- $IM_{stable}(t)$ is the 95th percentile of the value of $IM_{EWMA}(t)$ over the long term.
- $IM(t) = 75\% \times IM_{EWMA}(t) + 25\% \times IM_{stable}(t)$.

In parallel, a volatility risk metric $v(t)$ was computed, using both standard deviation and the 99th percentile. The calculations were performed using both a 100- and a 500-day lookback period.

Finally, large call metrics for $IM(t)$ and $v(t)$ over a 30-day period (ie a 30-day large call window) were computed over the three months from 3 Oct 2022 to 30 Dec 2022 (ie a three-month observation window).⁴⁵ The scatter plots below show the largest calls for $IM(t)$ and $v(t)$, where each point corresponds to a single risk factor, labelled according to the table above. Each chart shows a different set of parameters for the volatility risk metric, as indicated in the caption.

⁴³ The use of absolute returns for interest rates and logarithmic returns for other products corresponds to the approach often used in financial risk models but should not be interpreted as an endorsement of this or any other methodology.

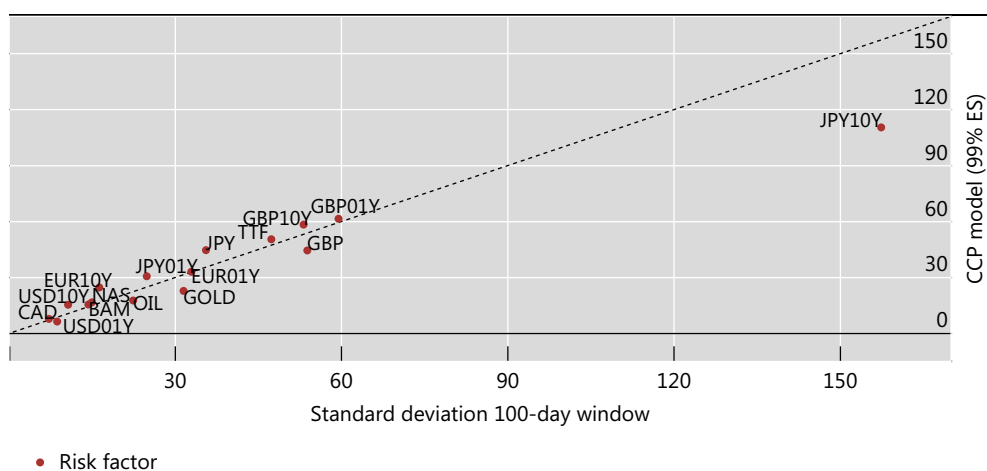
⁴⁴ While this setup is intended to mimic IM models used in practice, it should not be regarded as an endorsement of this or any other IM modelling approach.

⁴⁵ Due to time constraints, the assumption of $w_d = 10$ concept of "looking around" the spike in vol was not implemented. Results remain valid despite this simplification in this particular IM simulation setting.

Large calls – October 2022 to December 2022

% change in initial margin (vertical axis) vs % change in volatility
(horizontal axis)

Figure A.3

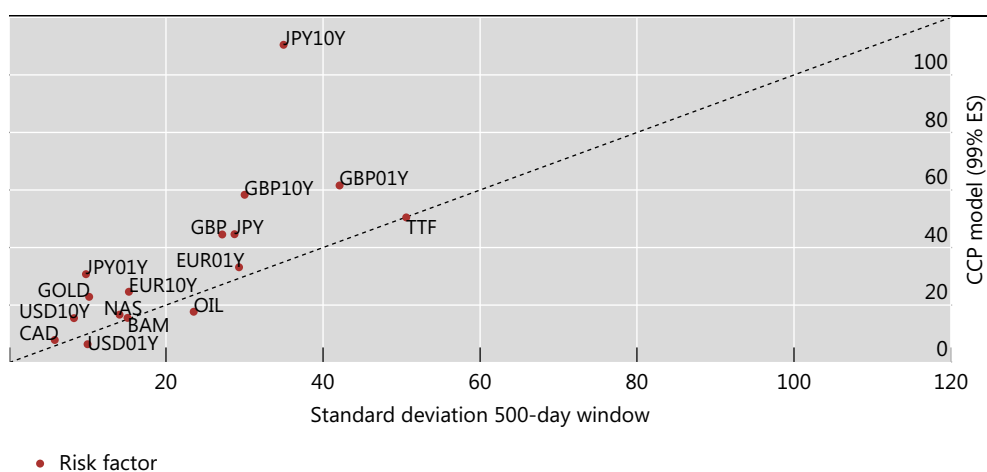


Source: Margin Group.

Large calls – October 2022 to December 2022

% change in initial margin (vertical axis) vs % change in volatility
(horizontal axis)

Figure A.4

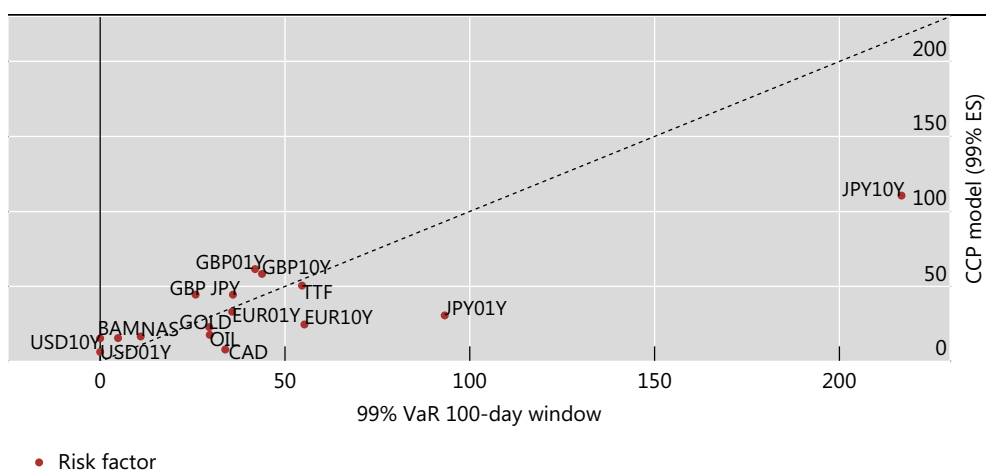


Source: Margin Group.

Large calls – October 2022 to December 2022

% change in initial margin (vertical axis) vs % change in volatility
(horizontal axis)

Figure A.5

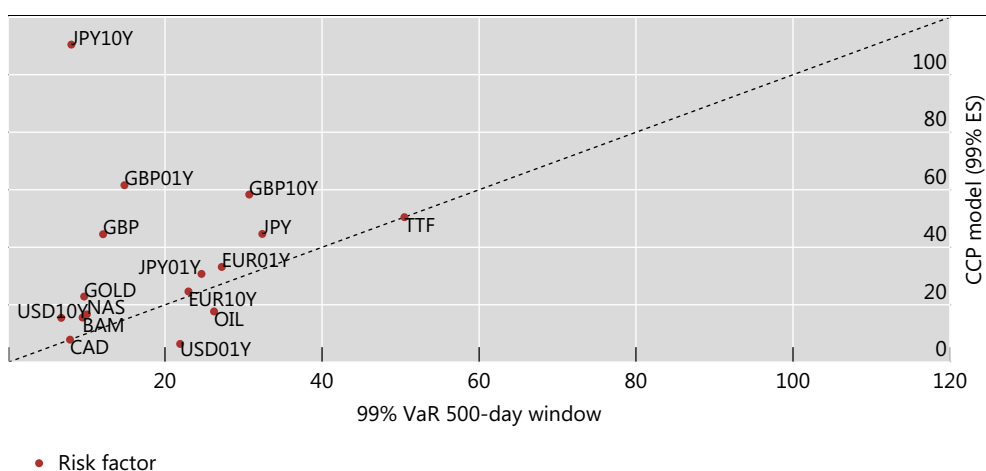


Source: Margin Group.

Large calls – October 2022 to December 2022

% change in initial margin (vertical axis) vs % change in volatility
(horizontal axis)

Figure A.6



Source: Margin Group.

The location of each point in the above figures indicates how reactive the IM model described above is when compared with the chosen volatility risk metric. Where points are above the dashed line, this indicates that the IM model was more reactive than the volatility measure, while points beneath the line indicate that the IM model was less reactive.

The charts show the influence of the parameters of the volatility risk metric:

- Where a relatively short lookback window is used for the volatility risk metric (eg Figure 1, with a 100-day lookback window), the volatility risk metric is more responsive, and hence more points fall below the dashed line. Conversely, a longer lookback period (eg Figure 2, with a 500-day lookback window) makes the volatility risk metric much less responsive, and so more points fall above the line. Thus, choosing a shorter lookback window will make the IM model appear less

responsive in comparison, especially in those cases where volatility peaks are outside the chosen lookback period.

- Switching from a standard deviation-based metric of volatility (Figures 1 and 2) to a percentile metric (Figures 3 and 4) magnifies this effect: using a short lookback window and a percentile metric can generate jumps in volatility of over 200%, while with a long lookback period the increase is much smaller. This indicates that a percentile metric can be less stable than the standard deviation, especially when a short lookback period is adopted.

This analysis points at the potential usefulness of metrics in sizing and contextualising changes in IM and highlights the relevance and impact of the underlying parameter choices. Consequently, market participants are encouraged to provide input on this consultation (see Questions for consultation).

A.6 Review of margin procyclicality metrics

This table summarises the various margin procyclicality metrics proposed in the literature.

Table A.3
Margin procyclicality metrics

Source	Metric	Description	Formula	Further details
"An investigation into the procyclicality of risk-based initial margin models" (Murphy et al (2014)); "A CBA of APC: analysing approaches to procyclicality reduction in CCP initial margin models" (Murphy and Vause (2021))	peak-to-trough (PT)	"...ratio of the maximum initial margin required for a constant portfolio to the minimum margin required over a fixed observation period" (2014, p 6) "We define PT procyclicality as the difference between the 99.7 th percentile and the 0.3 rd percentile of IM requirements." (2021, p 21)	$PT = \frac{m_T^{99.7}}{m_T^{0.3}}$	"The peak-to-trough measure captures the variation of margin over the observation period. Thus, for instance if one were interested in the total margin that a large CCP were to require from its clearing members – perhaps because one was interested in the sufficiency of collateral available to meet those requirements (Committee on the Global Financial System (2013)) – then this measure would serve to estimate how much higher requirements might go." (2014, p 7)
"An investigation into the procyclicality of risk-based initial margin models" (Murphy et al (2014)); "A CBA	n-day procyclicality measure; large call (LC)	"...largest increase in margin over an n -day period for a constant typical portfolio over a fixed observation period" (2014, p 7) "This illustrates an important definitional issue: the largest n -day call is the largest increase	$LC_t = \max_{w,W} (m_t - w - m_{t-w}) \quad \forall \{0 \leq W \leq 20, 1 \leq w \leq W\}$ "The LC measure up to T is the 99.7 th percentile of $\{LC_t t < T\}$." (2021, p 20).	"For instance, if the derivative user had a portfolio with a PT measure of 2, it may have to liquidate up to 50% of that portfolio in stressed market conditions (assuming an otherwise unchanged financial position and that no extra liquidity was available)." (2021, pp 5–6) "The n -day measures capture the amount of extra margin that market participants would need to fund on a short-term basis, and hence they measure an important aspect of the liquidity risk of collateral measures. Thus for instance market participants often estimate their liquidity outflows on a 30-day basis, so the likely worst 30-day increase in

of APC: analysing approaches to procyclicality reduction in CCP initial margin models" (Murphy and Vause (2021))	in margin in any <i>n</i> -day period, whether it spans the whole period or not." (2014, p 7)		margin is a useful measure in this context." (2014, p 8)
"An investigation into the procyclicality of risk-based initial margin models" (Murphy et al (2014))	n-day stressed procyclicality measure	"...largest increase in margin over an <i>n</i> -day period for a constant portfolio over a fixed observation period, restricted to those subperiods where volatility is elevated" (2014, p 7)	"It might be argued that short-term increases in margin are of most concern from a financial stability perspective when conditions are already stressed. The stressed <i>n</i> -day measures capture this." (2014, p 8)
<i>Resilience of central counterparties (CCPs): Further guidance on the PFM</i> (BCBS-CPMI-IOSCO (2017))	Instances of sudden material margin increases	"Obviously a clear definition of 'elevated' is required: our suggestion of 90-day sample volatility in excess of the average long-term level plus one standard deviation is one possible choice." (2014, p 7)	
<i>Consultation Paper – Review of RTS No 153/2013 with respect to procyclicality of margin</i> (ESMA (2022))	Margin changes (short-term)	"Also, a CCP could examine procyclicality through regular sensitivity testing and review metrics, such as the variability of margin and peak-to-trough ratios or instances of sudden material increases in margin." (paragraph 5.2.42, p 36) "...margin changes over a defined short period (eg one-day margin changes)" (p 14)	Short-term stability

<i>Consultation Paper – Review of RTS No 153/2013 with respect to procyclicality of margin</i> (ESMA (2022))	Standard deviation	"...the standard deviation of such margin changes over a defined short period (eg one-day margin changes)" (p 14)	Short-term stability
<i>Consultation Paper – Review of RTS No 153/2013 with respect to procyclicality of margin</i> (ESMA (2022))	Margin changes (long-term)	"...margin changes calculated over a defined longer period" (p 14)	Long-term stability
<i>Review of margin practices</i> (BCBS-CPMI-IOSCO (2022))	Asset price volatility compared with changes in CCP static portfolio initial margin (p 24)	Change of static portfolio IM (%) versus change in volatility (%) (Figure 15, p 24)	Proxy volatilities (eg VIX, SRVIX, VVIX, etc) (pp 23, 48)
<i>Review of margin practices</i> (BCBS-CPMI-IOSCO (2022))	Asset price volatility compared with changes in CCP margin rates (p 24)	Change in margin rate (%) versus change in volatility (%) (Figure 15, p 24)	Proxy volatilities (eg VIX, SRVIX, VVIX, etc) (pp 23, 48)
"Part 8: Forward looking margin simulations into periods of stress" ()	Maximum relative margin increase	<p>"This is a short-term procyclicality metric and can be regarded as the largest margin call that would have been issued by Eurex Clearing during an n-day time window." (Eurex website)</p> $\text{Short-term APC}_{t,x}^{\text{Long/Short}} := \max_{\tau \in [t-x, t]} \left(\max_{x \in [0, n]} \left(\frac{\text{MRIM}_T^{\text{Long/Short}}}{\text{MRIM}_{T-x}^{\text{Long/Short}}} - 1 \right) \right), x \in \{1y, 3y\}$	

<p>"Part 8: Forward looking margin simulations into periods of stress" (Eurex (2022))</p>	<p>Peak-to-trough</p>	<p>"This is a long-term procyclicality metric and can be viewed as the long-term funding uncertainty due to changes in margin requirements resulting from model procyclicality." (Eurex website).</p>	$\text{Long-term APC}_{t,X}^{\text{Long/Short}} = \frac{\max_{r \in \{t-X, t\}} (MRIM_t^{\text{Long/Short}})}{\min_{r \in \{t-X, t\}} (MRIM_t^{\text{Long/Short}})} \cdot X \in \{1Y, 3Y\}$
<p>"Investigating initial margin procyclicality and corrective tools using EMIR data" (Cominetta et al (2019))</p>	<p>20-day average increase</p>	<p>"...measure that provides the average of the top 10% increases of margins in 20 trading days" (ECB website)</p>	<p>"The unrestricted VaR model also shows a 20-day average increase of 0.16. Hence, in the months where the largest 20% jumps take place, the sample portfolio experiences a 16% increase in the IM." (ECB website)</p>
<p><i>Financial Stability Review – May 2016</i> (ECB (2016))</p>	<p>Correlation</p>	<p>"...examine[s] the tendency of margins to co-move with the cycle – ie the coincidence of high margins with periods of high volatility, low liquidity and deleveraging (and vice versa)" (p 114)</p>	<p>"Baseline margins increase in response to higher volatility of portfolio returns in the wake of the global financial crisis in mid-2007 and increase more steeply when the crisis intensified in late 2008. Conversely, baseline margins decrease again when financial conditions improved in early 2010. When we regress the baseline margins on the volatility/liquidity cycle, we obtain a coefficient of –0.17, confirming a negative correlation of the margin with the cycle, ie margins go up when volatility is high and liquidity is low." (p 116)</p>
<p>"Persistence and procyclicality in margin requirements"</p>	<p>Net increase over n periods (p 5711)</p>	<p>"The correlation of margins with the volatility regime (proxied by the ECB's composite indicator of systemic stress (CISS) equity market sub-index) and with the liquidity cycle (proxied by the ECB's financial market liquidity indicator (FMLI) foreign exchange, equity and bond markets sub-index) is calculated." (p 114)</p>	$M_{p,t+n} - M_{p,t}$

(Glasserman
and Wu (2018))

"Persistence
and
procyclicality in
margin
requirements"
(Glasserman
and Wu (2018))

Source: A Odabasoglu and H Rodrigo, "Margin procyclicality metrics design for central clearing counterparties," *Bank of Canada Staff Discussion Paper*, forthcoming.

$$\sum_{i=1}^n M_{p,t+i-1}$$

Annex B: Excerpts of virtual stakeholder outreach agendas

These excerpts focus on the content that is relevant to the work on responsiveness and transparency of IM in centrally cleared markets.

B.1 Outreach to intermediaries/CMs

16 May 2023, 13:00–16:00 CEST

Transparency in centrally cleared markets

Moderators: Roy Cheruvelil and Rehim Kilic (Margin Group Transparency workstream co-leads)

Objective: This session will discuss transparency in centrally cleared markets with the aim of investigating ways to improve disclosure to the public and/or to specific participant categories (including clients, CMs, third-party providers and other relevant stakeholders).

Issues for discussion:

Margin simulation tools

1. What tools do you use to estimate CCP margin requirements on your current or anticipated portfolios (eg in-house, third-party or CCP-provided tools)? Does the use or value of the tools change as market conditions change?
2. What not yet commonly provided tools or tool capabilities would be of greatest help when estimating liquidity needs?

CM-to-client tools/disclosures

3. Do you usually provide clients with a tool to help them estimate margin requirements on their current or anticipated portfolios, including your own add-ons? Does any shared tool disaggregate the margin requirements between those set by the CCP and those added by you?
 - I. Do you have a sense about how commonly tools/information are used by CCP participants? Does this differ by asset class or by participant type?

Other forms of CCP disclosures

4. In addition to simulators or other quantitative tools, what CCP disclosures do you use to aid with your liquidity preparation? Does this generally include public documents like PQDs and/or less broadly shared CCP information such as quantitative or qualitative information on the margin model itself?
5. Of the information shared with you, what have you found most helpful when anticipating future margin calls?

Responsiveness of initial margin models in centrally cleared markets

Moderators: Oliver Hutengs and Francesco Vacirca (Margin Group IM Responsiveness workstream co-leads)

Objective: This session will discuss the role of CMs/intermediaries in setting initial margin requirements for clients for centrally cleared contracts.

Issues for discussion:

Client clearing services and initial margin requirements

1. Do you generally set centrally cleared initial margin requirements for clients higher than CCP (or regulator) minimum initial margin requirements?
 - I. If so, to what extent?
 - II. Does the magnitude of the difference vary through time (eg in stressed vs non-stressed periods) and by asset class?
2. How do you determine centrally cleared initial margin requirements for clients?
 - I. What are the key considerations that determine whether client margin requirements are set above CCP minimum requirements? Is APC a factor?
 - II. Is the setting of client margin requirements a mechanical process, or do you apply discretion when setting margin requirements? If so, what are some of the most common causes for the use of discretion, and who exercises this discretion?
 - III. Where discretion is used, what form of ex post review is done to better understand why discretion was needed?
3. What information do you provide to your clients about how and why you assign add-ons/multipliers on top of the CCP requirements?
4. Since January 2020, have you implemented material changes in how you calculate and/or charge client initial margin requirements? What factors can trigger a review or recalibration of client initial margin requirements, and who decides how these changes will be implemented?

B.2 Outreach to end users/clients

Transparency in centrally cleared markets

Moderators: Roy Cheruvilil and Rehim Kilic (Margin Group Transparency workstream co-leads)

Objective: This session will discuss transparency in centrally cleared markets with the aim of investigating ways to improve disclosure to the public and/or to specific participant categories (including clients, CMs, third-party providers and other relevant stakeholders).

Issues for discussion:

Margin simulation tools

1. What tools do you use to estimate CCP margin requirements on your current or anticipated portfolios (eg in-house, third-party or CCP-provided tools)? Does the use or value of the tools change as market conditions change?
2. Do the tools disaggregate margin requirements between those set by the CCP and any margin adjustments set by the CMs?
3. What not yet commonly provided tools or tool capabilities would be of greatest help in estimating liquidity needs?

Transparency of CM margin adjustments/multipliers

4. Does your CM disclose information to you about how and why it assigns margin add-ons/multipliers? If yes:
 - a. What information does it usually disclose?
 - b. Would further disclosures be useful in aiding your liquidity preparedness?

Other forms of disclosures

5. In addition to simulators or other quantitative tools, what CCP and/or CM disclosures do you use to aid with your liquidity preparation? Of the information shared with you, what have you found most helpful when anticipating future margin calls?
6. Do you think that disclosures provided by your CMs regarding cleared margins should be more standardised? If so, what standardised information would be most useful to you when preparing for liquidity demands?

Annex C: Excerpt of CCP survey

This excerpt focuses on the content that is relevant to the work on responsiveness and transparency of IM in centrally cleared markets.

A. General questions

1. Name of CCP legal entity: [Free text]
2. Survey contact details
 - I. Name: [Free text]
 - II. Email address: [Free text]
3. Please report the total aggregate cleared initial margin requirement (in USD equivalent) as of 31 December 2022 across all CCP services.
 - I. For house accounts: [Free text]
 - II. For client accounts [Free text]
4. Please select the asset classes for which the CCP offered clearing services in 2022. *Please select all that apply.*
 - ☐ FX derivatives
 - ☐ OTC Interest Rate Swaps
 - ☐ OTC Credit
 - ☐ Exchange Traded derivatives
 - ☐ Commodities derivatives
 - ☐ Equity (cash)
 - ☐ Debt securities (cash)
 - ☐ Repo and securities lending
5. Profile of direct CMs as of 31 December 2022. *Please complete the table.*

Number of direct CMs		[Integer]
<i>of which the approximate proportion that are</i>	Non-bank financial intermediaries	[Integer <=100]
	Foreign entities	[Integer <=100]
	Providing client clearing services	[Integer <=100]

6. Please provide any comments or clarifications you might have on the answers provided in Part A (General questions) of the survey. [Free text]

B. Transparency in centrally cleared markets

Margin simulation tools

7. Does the CCP provide a margin simulation tool(s) to other entities? [Yes/No]

If no:

I. Which one of the following best describes the reason why no such margin simulation tool is provided? *Please select all that apply.*

- ☐ No such request/demand by potential users (for example, availability of risk factor parameter files (or other disclosures) enables potential users to effectively and independently simulate and conduct margin simulation themselves and hence no such tools are required to be provided by the CCP).
- ☐ Technical implementation challenges at the CCP
- ☐ Lack of user implementation capabilities
- ☐ Current regulations do not mandate that the CCP provide such tools
- ☐ Too burdensome/costly for the CCP to create and maintain
- ☐ Other (please briefly explain) [Free text]

If yes:

II. Please describe the availability and extent of use of margin simulation tools provided by the CCP *Please complete the table below for each type of entity.*

Type of entity	Does CCP provide a margin simulation tool to this type of entity?	If so, does the CCP charge additional amount for the entity type to access and use the tool?	Number of registered users	If available, the proportion of registered users who regularly access the system
All entities			[Integer]	[Integer; <=100]
CMs	[Yes/No]	[Yes/No/NA]	[Integer]	[Integer; <=100]
Clients	[Yes/No]	[Yes/No/NA]	[Integer]	[Integer; <=100]
Third party service providers	[Yes/No]	[Yes/No/NA]	[Integer]	[Integer; <=100]
CCP's regulators/supervisors	[Yes/No]			
CM regulators/supervisors	[Yes/No]			
Regulators/supervisors of clients of CMs	[Yes/No]			
The public	[Yes/No]	[Yes/No/NA]	[Integer]	[Integer; <=100]

III. Does the CCP provide margin simulation tools that feature any forward-looking functionality enabling users to estimate/calculate margin requirements for historical or hypothetical stressed market scenarios (eg volatility increases/shifts or an x% price/risk factor shock across the curve)? [Yes/No/NA]

If no:

i. Which of the following describes the reason why no such functionality is provided. *Please select all that apply.*

- ☐ No such request/demand by potential users (for example, availability of risk factor parameter files (or other disclosures) enables potential users to effectively and independently simulate and conduct margin simulation themselves and hence no such tools are required to be provided by the CCP).
- ☐ Technical implementation challenges at the CCP
- ☐ Lack of user implementation capabilities
- ☐ Current regulations do not mandate that the CCP provide such functionality
- ☐ Too burdensome/costly for the CCP to create and maintain
- ☐ Others (please briefly explain) [Free text]

If yes:

ii. Please describe the nature of that forward-looking functionality. *Please select all that apply.*

- ☐ The CCP provides users the ability to apply historically observed market stress events to their portfolios
- ☐ The CCP provides a set of hypothetical future market scenarios which users can apply to their portfolios
- ☐ The CCP provides the ability for users to define their own hypothetical future market scenarios (eg through their own choice of applicable time period, volatility increases/shifts or an x% price/risk factor shock across the curve)
- ☐ Other (please briefly explain) [Free text]

iii. If the CCP provides a margin simulation tool with forward-looking functionality that allows users to define their own market scenarios, which of the following risk factor adjustments are accepted by the tool to estimate/calculate margin requirements for hypothetical market conditions? *Please select all that apply.*

- ☐ N/A – no such functionality/tool provided
- ☐ Parallel percentage shifts in price/risk factor curves
- ☐ Parallel absolute (non-percentage) shifts in price/risk factor curves
- ☐ Non-parallel percentage shifts in price/risk factor curves
- ☐ Non-parallel absolute (non-percentage) shifts in price/risk factor curves
- ☐ Percentage shifts in implied volatility inputs/curves/surfaces
- ☐ Absolute (non-percentage) shifts in implied volatility inputs/curves/surfaces
- ☐ Historical market conditions from a user-specified date
- ☐ Live data feeds reflecting current market prices
- ☐ Customised stress test scenarios/risk factor shock parameter files designed by the CCP

- ☐ Customised stress test scenarios/risk factor shock parameter files designed by the user
 - ☐ Other (*please briefly explain*) [Free text]
- IV. What funding requirements does your margin simulation tool cover? *Please select all that apply.*
- ☐ N/A – no such functionality/tool provided
 - ☐ Core IM
 - ☐ Margin add-ons
 - ☐ Variation margin
 - ☐ Other default resources requirements, (eg default fund contributions)
- i. If the CCP selected 'margin add-ons' please provide further details on the types of add-ons covered. *Please select all that apply.*
- ☐ Credit
 - ☐ Liquidity
 - ☐ Concentration
 - ☐ Jump to default
 - ☐ Wrong way risk
 - ☐ Delivery/Settlement
 - ☐ Other (*please briefly explain*) [Free text]
- V. Please indicate top three specific costs/challenges the CCP would face if it increased the depth/functionality of current margin simulation tools.
- Most important: [Free text]
- Second most important: [Free text]
- Third most important: [Free text]

Public quantitative disclosures and other forms of disclosure

8. Considering the existing disclosure expectations in relation to Principle 6 of the PFMI (Margin), from a CCP perspective please:
- I. Identify any fields in the existing PQDs that lack clarity, are confusing, or need additional descriptions to be more useful by CMs and/or clients. [Free text]
 - II. Identify any fields that are missing from the existing PQDs that should be added, and why they would be useful to CMs and/or clients [Free text]
 - III. Identify any fields that should be removed from the existing PQDs, and why [Free text]
 - IV. Identify any field that the CCP suggests should shift to a different publication schedule [Free text]
 - V. Please indicate what disclosures are made available to different types of stakeholders:

	The CCP's primary regulator	CMs	Clients	Other relevant stakeholders (eg linked FMIs such as cross-margin partners,

				payment processors, or post trade risk reduction firms)	
					Please describe any other stakeholders to whom the information is disclosed.
CCP's approach to assessing and limiting procyclicality of margin requirements	[Disclosed / Not disclosed]	[Disclosed / Not disclosed]	[Disclosed / Not disclosed]	[Disclosed / Not disclosed]	[Free text]
Calibration of any deployed anti-procyclicality (APC) tools	[Disclosed / Not disclosed]	[Disclosed / Not disclosed]	[Disclosed / Not disclosed]	[Disclosed / Not disclosed]	[Free text]
CCP's policy / process for overriding the output of the margin model	[Disclosed / Not disclosed]	[Disclosed / Not disclosed]	[Disclosed / Not disclosed]	[Disclosed / Not disclosed]	[Free text]
Margin model methodology (ie the full quantitative model to enable replication)	[Disclosed / Not disclosed]	[Disclosed / Not disclosed]	[Disclosed / Not disclosed]	[Disclosed / Not disclosed]	[Free text]
Triggers for ad hoc reviews of margin models or APC tools	[Disclosed / Not disclosed]	[Disclosed / Not disclosed]	[Disclosed / Not disclosed]	[Disclosed / Not disclosed]	[Free text]
Results of regularly scheduled and ad hoc reviews of margin models or APC tools (including	[Disclosed / Not disclosed]	[Disclosed / Not disclosed]	[Disclosed / Not disclosed]	[Disclosed / Not disclosed]	[Free text]

any need for remediation)					
Stress test scenario suite	[Disclosed / Not disclosed]	[Disclosed / Not disclosed]	[Disclosed / Not disclosed]	[Disclosed / Not disclosed]	[Free text]

- VI. To the extent that information is not disclosed, please list the top issues or concerns the CCP might anticipate with wider disclosure than its current practice. [Free text]
9. Where the CCP operates multiple clearing services, if not already set out in your responses to the questions in Part B (Transparency in centrally cleared markets), please describe any differences relevant to transparency across the different clearing services the CCP operates. Please provide any additional comments or clarifications you might have on the answers provided in Part B of the survey. [Free text]

C. Responsiveness of initial margin models in centrally cleared markets

Measuring/monitoring and model review/recalibration in relation to procyclicality

The JWGM would like to better understand whether CCPs use quantitative metrics (eg % change in IM over a pre-defined period, peak-to-trough ratios) and/or qualitative criteria (eg clearing participant feedback) to monitor and/or evaluate the procyclical effects of the margin requirements they set for clearing participants. Moreover, the group would like to better understand whether CCPs review or recalibrate their margin models as a result of identified procyclicality in their margin requirements; and whether such reviews / recalibrations are triggered by the use of quantitative metrics (eg explicit hard or soft thresholds) and/or qualitative criteria (eg the CCP board's / risk committee's holistic assessment of the performance of the margin model).

10. Does the CCP use quantitative metrics to measure the procyclicality of its initial margin model(s)? [Yes / No].
- If yes:
- I. Please describe the quantitative metrics the CCP uses (eg peak-to-trough measures, maximum calls over pre-specified time periods). [Free text]
 - II. Does the CCP use these quantitative metrics to determine whether to undertake a model review or recalibration (eg through setting hard or soft thresholds with the metrics)? *Please describe.* [Free text]
 - III. Does the CCP use these quantitative metrics for other purposes? *Please describe.* [Free text]
11. Does the CCP use qualitative criteria to measure the procyclicality of its initial margin model(s)? [Yes / No].
- If yes:
- I. Please describe the qualitative criteria the CCP uses (eg feedback from CMs). [Free text]
 - II. Does the CCP use the criteria to determine whether to undertake a model review or recalibration? *Please describe.* [Free text]
 - III. Does the CCP use the qualitative criteria for other purposes? *Please describe.* [Free text]
12. How does the CCP balance between factors such as margin coverage, procyclicality levels, and average margin level, when (i) designing its initial margin model(s) and APC tools and (ii) when reviewing and/or recalibrating its initial margin model(s)? [Free text]

13. Please provide any further detail not already included regarding decisions related to the review or recalibration of the initial margin model(s). For example, please describe any discretion that can be applied, who exercises this discretion, and, to the extent not already covered, the factors that are considered in the exercise of such discretion. If there are material differences across asset classes, please indicate. [Free text]
14. Does the CCP include a review of margin model procyclicality in its regular sensitivity analysis, eg by simulating how margin models may respond to a sharp increase in market volatility? [Yes/No]
If yes:
 - I. Please describe how the sensitivity analysis is performed and which margin parameters are included in the analysis. [Free text]
 - II. What are the major changes, if any, in policies or procedures relative to the above, since the beginning of 2020. [Free text]

Discretionary overrides of modelled margin requirements

CCPs can apply discretion in setting margin requirements for clearing participants. For example, actual market events may fall outside of modelled stress scenarios, which could warrant action from the CCP to manually adjust margin requirements (higher or lower) away from levels set by the CCP's margin model. The JWGM would like to better understand the extent to which CCPs apply discretion in this way and the processes that underpin that decision making.

15. Does the CCP have processes or procedures for determining when to override the initial margin model, leaving actual margin requirements different from those set by the margin model? [Yes/No].
If yes:
 - I. Please briefly describe these processes and procedures. [Free text]
 - II. Please specify any triggers that lead to an override or manual adjustment. [Free text]
 - III. Is the policy / process for overriding the output of the margin model documented and shared with clearing market participants? [Yes/No]
If yes:
 - i. Please provide the link(s) to any public documentation. [Free text]
 - IV. When a decision is taken to override/manually adjust the output of the margin model, when and how is this communicated to clearing participants? [Free text]
16. What are the major changes, if any, since January 2020, to the processes or procedures for determining when to override the initial margin model. [Free text]
17. Since 2020, has the CCP overridden the initial margin model? [Yes/No]
If yes:
 - I. On (approximately) how many days? [Integer]
 - II. Please provide the top three largest differences (in relative terms) between model requirements and actually charged margin. *Please complete the table.*

	Asset class	Product	Relative difference	Absolute difference	Proportion	Rationale
	(eg commodities,	(eg futures,	difference between model	between model requirements and actually charged	of IM impacted over total IM	for adjustment

	equities, interest rates)	options, swaps) If product level data is not available, please report using the easiest format and note this reporting difference in free text. Otherwise, leave blank.	requirements and actually charged margin, ie (Actual – Model)/Model	margin, ie (Actual – Model)		for the asset class, ie (Actual/Total IM)	
				<i>Please specify the currency (eg USD, GBP)</i>	Value		
Largest	[Free text]	[Free text]	[Integer <=100]	[Text]	[Integer]	[Integer <=100]	[Free text]
Second largest	[Free text]	[Free text]	[Integer <=100]	[Text]	[Integer]	[Integer <=100]	[Free text]
Third largest	[Free text]	[Free text]	[Integer <=100]	[Text]	[Integer]	[Integer <=100]	[Free text]

18. Where the CCP operates multiple clearing services, if not already set out in your responses to the questions in Part C (Responsiveness of initial margin models in centrally cleared markets), please describe any differences relevant to the responsiveness of initial margin models across the different clearing services the CCP operates. Please provide any additional comments or clarifications you might have on the answers provided in Part C of the survey. [Free text]