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Guidance on financial resources to support CCP resolution and on the treatment of CCP equity in resolution

Consultative document

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Guidance on financial resources to support CCP resolution and on the treatment of CCP equity in resolution

Call for public comments

Central clearing of standardised over-the-counter (OTC) derivatives is a key pillar of the G20 Leaders' commitment to reform OTC derivatives markets in response to the global financial crisis. Central counterparties' (CCPs) criticality to the overall safety and soundness of the financial system means that authorities must take steps to ensure that CCPs do not themselves become a source of systemic risk and that any CCP can be successfully resolved without exposing taxpayers to loss.

The Financial Stability Board (FSB), the Committee on Payments and Market Infrastructures (CPMI) and the International Organization of Securities Commissions (IOSCO) have cooperated closely in developing their respective sets of standards and guidance for CCP recovery and resolution, paying particular attention to the interaction between CCP recovery and resolution to ensure consistency between their respective policies.[1]

The FSB *Key attributes of effective resolution regimes for financial institutions* ('Key Attributes')[2] and implementation guidance on financial market infrastructure (FMI) resolution in Appendix II-Annex 1 to the Key Attributes ('FMI Annex') set out a framework for FMI resolution, including for CCPs. The FSB *Guidance on central counterparty resolution and resolution planning*[3] ('FSB 2017 Guidance') provides guidance on implementing the Key Attributes and the FMI Annex for CCPs.[4] The FSB's resolution standards and guidance sit alongside the standards on resilience and recovery established in CPMI-IOSCO's *Principles for financial market infrastructures* ('PFMI') and its additional guidance.[5]

In the FSB 2017 Guidance, the FSB committed to conduct further work on financial resources to support CCP resolution and on the treatment of CCP equity in resolution. To ensure that any new guidance would be developed based on further analysis and experience gained in resolution planning, the FSB published a discussion paper *Financial*

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[1] *Chairs' report on the implementation of the joint workplan for strengthening the resilience, recovery and resolvability of central counterparties*, July 2017 (http://www.fsb.org/2017/07/chairs-report-on-the-implementation-of-the-joint-workplan-for-strengthening-the-resilience-recovery-and-resolvability-of-central-counterparties/).

[2] FSB, *Key attributes of effective resolution regimes for financial institutions*, October 2014 (www.fsb.org/2014/10/r_141015/).

[3] FSB, *Guidance on central counterparty resolution and resolution planning*, July 2017 (www.fsb.org/2017/07/guidance-on-central-counterparty-resolution-and-resolution-planning-2/).

[4] This CCP specific resolution framework is complemented by FSB, *Guidance on continuity of access to financial market infrastructures for a firm in resolution*, July 2017 (www.fsb.org/2017/07/guidance-on-continuity-of-access-to-financial-market-infrastructures-fmis-for-a-firm-in-resolution-2/).

[5] CPSS-IOSCO, *Principles for financial market infrastructures*, April 2012 (www.bis.org/cpmi/publ/d101.htm and www.iosco.org/library/pubdocs/pdf/IOSCOPD377-PFMI.pdf) and CPMI-IOSCO, *Recovery of financial market infrastructures*, October 2014, revised July 2017 (www.bis.org/cpmi/publ/d162.htm and www.iosco.org/library/pubdocs/pdf/IOSCOPD569.pdf), *Resilience of central counterparties (CCPs): further guidance on the PFMI*, July 2017 (www.bis.org/cpmi/publ/d163.htm and www.iosco.org/library/pubdocs/pdf/IOSCOPD568.pdf).

resources to support CCP resolution and the treatment of CCP equity in resolution[6] ('FSB 2018 Discussion Paper') for public consultation in November 2018. The paper set out considerations that may be relevant for authorities and crisis management groups (CMGs) with regard to evaluating whether existing financial resources and tools are adequate to implement the resolution strategy for individual CCPs and considerations that could guide authorities in developing possible approaches to the treatment of CCP equity in resolution.

This consultative document develops draft guidance based on the concepts included in the FSB 2018 Discussion Paper, taking into account the comments received in the public consultation and feedback from the resolution authorities of CCPs.

Part I provides draft guidance on assessing the adequacy of financial resources needed to absorb losses and to cover other costs in resolution.

Part II provides draft guidance on approaches to the treatment of CCP equity in resolution.

The FSB is inviting comments on this consultative document and the questions set out below. Responses should be sent to fsb@fsb.org by 31 July 2020. Responses will be published on the FSB's website unless respondents expressly request otherwise.

Financial resources for CCP resolution

Step 1: Scenarios

1. What are your views on the scenarios presented for evaluating existing tools and resources?
2. Are there additional considerations that should be included in the guidance?

Step 2: Evaluating existing resources and tools

3. Are the qualitative and quantitative considerations for evaluating existing resources and tools comprehensive and sufficiently clear?
4. Are there additional considerations that should be included in the evaluation?

Step 3: Assessing resolution costs

5. Are the considerations for analysing resolution costs comprehensive and sufficiently clear?
6. Are there any other resolution costs that should be addressed?

Step 4: Identifying gaps

7. What are your views on the considerations for resolution authorities when they identify gaps in resources and tools?
8. Are there additional considerations that should be included in the guidance?

6 FSB, *Financial resources to support CCP resolution and the treatment of CCP equity in resolution*, November 2018 (https://www.fsb.org/2018/11/financial-resources-to-support-ccp-resolution-and-the-treatment-of-ccp-equity-in-resolution/).

9. Are there any specific steps or approaches you would suggest that authorities consider as part of quantitative analyses?

Step 5: Evaluating means to address gaps

10. What are your views on the considerations for evaluating the availability, costs and benefits of potential means to address identified credit or liquidity gaps?
11. Are there additional suggestions for potential steps to address identified credit or liquidity gaps that should be included in the guidance?

Treatment of CCP equity in resolution

12. Are the considerations for addressing the treatment of CCP equity in resolution plans sufficiently clear?
13. Are there additional factors that resolution authorities should consider when evaluating the exposure of CCP equity to losses in resolution?
14. Are there additional mechanisms that could be used for adjusting the exposure of CCP equity to losses in resolution that should be included in the guidance?
15. Within the section on implementing policy for the treatment of CCP equity in resolution, are there additional items that the relevant home authorities should consider?
16. Would a statement in the resolvability assessment process on any limitations to equity bearing losses provide sufficient transparency for stakeholders? How could sufficient transparency be achieved?

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Introduction

Central clearing of standardised over-the-counter (OTC) derivatives is a key pillar of the G20 Leaders' commitment to reform OTC derivatives markets in response to the global financial crisis. Central counterparties' (CCPs) criticality to the overall safety and soundness of the financial system means that authorities must take steps to ensure that CCPs do not themselves become a source of systemic risk and that any CCP can be successfully resolved without exposing taxpayers to loss.

The Financial Stability Board (FSB), the Committee on Payments and Market Infrastructures (CPMI) and the International Organization of Securities Commissions (IOSCO) have cooperated closely in developing their respective sets of standards and guidance for CCP recovery and resolution, paying particular attention to the interaction between CCP recovery and resolution to ensure consistency of policies.[7]

The FSB *Key attributes of effective resolution regimes for financial institutions* ('Key Attributes')[8] and implementation guidance on financial market infrastructure (FMI) resolution in Appendix II-Annex 1 to the Key Attributes ('FMI Annex') set out a framework for FMI resolution, including for CCPs. The FSB *Guidance on central counterparty resolution and resolution planning*[9] ('FSB 2017 Guidance') provides guidance on implementing the Key Attributes and the FMI Annex for CCPs.[10] The FSB's resolution standards and guidance sit alongside the standards on resilience and recovery established in CPMI-IOSCO's *Principles for financial market infrastructures* ('PFMI') and its additional guidance.[11]

In the FSB 2017 Guidance, the FSB committed to conduct further work on financial resources to support CCP resolution and on the treatment of CCP equity in resolution. To ensure that any new guidance would be developed based on further analysis and experience gained in resolution planning, the FSB published a discussion paper *Financial resources to support CCP resolution and the treatment of CCP equity in resolution*[12] ('FSB 2018 Discussion Paper') for public consultation in November 2018. The paper set out considerations that may be relevant for

7 Chairs' report on the implementation of the joint workplan for strengthening the resilience, recovery and resolvability of central counterparties, July 2017 (http://www.fsb.org/2017/07/chairs-report-on-the-implementation-of-the-joint-workplan-for-strengthening-the-resilience-recovery-and-resolvability-of-central-counterparties/).

8 FSB, *Key attributes of effective resolution regimes for financial institutions*, October 2014 (www.fsb.org/2014/10/r_141015/).

9 FSB, *Guidance on central counterparty resolution and resolution planning*, July 2017 (www.fsb.org/2017/07/guidance-on-central-counterparty-resolution-and-resolution-planning-2/).

10 This CCP specific resolution framework is complemented by FSB, *Guidance on continuity of access to financial market infrastructures for a firm in resolution*, July 2017 (www.fsb.org/2017/07/guidance-on-continuity-of-access-to-financial-market-infrastructures-fmis-for-a-firm-in-resolution-2/).

11 CPSS-IOSCO, *Principles for financial market infrastructures*, April 2012 (www.bis.org/cpmi/publ/d101.htm and www.iosco.org/library/pubdocs/pdf/IOSCOPD377-PFMI.pdf) and CPMI-IOSCO, *Recovery of financial market infrastructures*, October 2014, revised July 2017 (www.bis.org/cpmi/publ/d162.htm and www.iosco.org/library/pubdocs/pdf/IOSCOPD569.pdf), *Resilience of central counterparties (CCPs): further guidance on the PFMI*, July 2017 (www.bis.org/cpmi/publ/d163.htm and www.iosco.org/library/pubdocs/pdf/IOSCOPD568.pdf).

12 FSB, *Financial resources to support CCP resolution and the treatment of CCP equity in resolution*, November 2018 (https://www.fsb.org/2018/11/financial-resources-to-support-ccp-resolution-and-the-treatment-of-ccp-equity-in-resolution/).

authorities and crisis management groups (CMGs) with regard to evaluating whether existing financial resources and tools are adequate to implement the resolution strategy for individual CCPs and considerations that could guide authorities in developing possible approaches to the treatment of CCP equity in resolution.

In order for a CCP to be successfully resolved, there must be adequate financial resources and tools to support the CCP's orderly resolution and to minimise adverse effects on financial stability. A lack of adequate resources or tools would likely prevent the resolution authority from achieving the resolution objectives and could lead to increased financial instability.

As part of resolution planning, resolution authorities[13] should assess the adequacy of existing resources and tools and the potential financial stability implications of their use. Although the FSB understands that there are and may continue to be analytical and operational challenges to effective quantitative analysis, it considers that quantitative analysis of potential resource needs in a reasonable range of resolution scenarios will enhance the resolution authority's understanding of available resolution options. The FSB encourages resolution authorities and other relevant authorities to continue discussing these matters within the CMGs and develop appropriate quantitative methodologies in order to make further progress.

Ensuring the availability of adequate resources and tools for resolution and understanding the potential for certain resources and tools to have an adverse effect on financial stability in a resolution scenario is important. Therefore, the FSB considers that additional guidance is necessary to support jurisdictions in determining whether there is a gap in the resources and tools available for resolution that must be addressed. To help make this determination, this guidance focuses on the assessment of the adequacy of financial resources and of the treatment of equity in the context of resolution.[14] Resolution authorities should conduct such assessment in cooperation with the CCP's oversight and/or supervisory authorities. For CCPs that are systemically important in more than one jurisdiction (SI>1 CCPs), such assessment should be reviewed and updated on an annual basis and the results of such review/update be discussed within the CMGs.

This guidance consists of two Parts. Part I sets forth guidance on assessing the adequacy of financial resources to absorb losses and to cover other costs in resolution and Part II sets forth guidance on approaches to the treatment of CCP equity in resolution. This guidance does not replace or supersede the Key Attributes, the FMI Annex or the FSB 2017 Guidance and does not cover every aspect of those documents. Existing guidance contained in those documents, even if not restated or referred to in this document, remains relevant to CCP resolution.

This guidance does not address wind-down plans of systemically important CCPs.

The FSB will consider in five years after the publication of the final guidance, in consultation with CPMI-IOSCO, whether further adjustments are needed to this guidance in light of market developments and resolution authorities' experience with using the guidance.

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13 In cooperation and/or coordination with supervisory and other relevant authorities and discussed within the CMGs (where established), as appropriate and as provided for in the Key Attributes and FSB 2017 Guidance.

14 References to the PFMI and other relevant CPMI-IOSCO documents are included when necessary to provide the appropriate context. However, this guidance is not intended to provide any interpretations on the content of the CPMI-IOSCO documents.

Part I: Assessing the adequacy of financial resources to support CCP resolution

In accordance with the FMI Annex and the FSB 2017 Guidance, the resolution authority of a systemically important CCP, in cooperation with the CCP's oversight and/or supervisory authorities, should develop and update regularly a resolution plan that addresses default and non-default loss scenarios and a combination of both.[15] The resolution authority should also conduct regular resolvability assessments to evaluate the feasibility and credibility of the resolution plan in coordination with the CCP's oversight and/or supervisory authorities.[16] For a SI>1 CCP, the resolution authority should discuss the resolution plan and resolvability assessment within the CMG.

In accordance with the FSB 2017 Guidance, the resolution authority should assess regularly, as part of its resolution planning, what financial resources and tools can reasonably be expected to be available to it at the time of a CCP's entry into resolution under the resolution regime and the CCP's rules and arrangements. Further, it should assess whether those resources and tools would be sufficient to achieve the resolution objectives in the case of both default and non-default losses and a combination of both. Sections 6 and 8 of the FSB 2017 Guidance provide a framework for that purpose.[17]

To further the objectives of the FSB 2017 Guidance, this guidance sets forth a five-step process for assessing the adequacy of financial resources and tools available to authorities to support the resolution of a CCP:

- <u>Step 1:</u> identifying hypothetical default and non-default loss scenarios (and a combination of them) that may lead to resolution;
- <u>Step 2:</u> conducting a qualitative and quantitative evaluation of existing resources and tools available in resolution;
- <u>Step 3:</u> assessing potential resolution costs;
- <u>Step 4:</u> comparing existing resources and tools to resolution costs and identifying any gaps; and
- <u>Step 5:</u> evaluating the availability, costs and benefits of potential means of addressing any identified gaps.

These steps are addressed in detail in Sections 1 through 5 below.

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[15] See the Annex for extracts from the FMI Annex and the FSB 2017 Guidance.

[16] Resolution authorities and CMGs should also coordinate closely with the relevant supervisory and oversight authorities and any supervisory colleges for CCPs, which may perform or may have performed assessments of the adequacy of financial resources in the context of recovery planning. Recovery planning is addressed by the PFMI, which establish standards for prefunded financial resources, including the size, role and availability of CCP equity to absorb losses. The PFMI call for comprehensive loss allocation arrangements for default losses and the CPMI-IOSCO report on *Recovery of financial market infrastructures* (CPMI-IOSCO Recovery Guidance) also calls for comprehensive loss allocation arrangements for non-default losses related to custody and investment risks.

[17] The FSB 2017 Guidance specifies that resolution planning should not rely on public solvency support and not create an expectation that such support will be available. The work on adequacy of resources and tools is designed to help ensure sufficient private sector resources to facilitate an orderly resolution and reduce the moral hazard associated with any expectation of public support (see Annex for excerpts from the FSB 2017 Guidance on temporary public funding.)

1. Step 1: Identifying hypothetical default and non-default loss scenarios (and a combination of them) that may lead to resolution

The resolution authority, in cooperation with the CCP's oversight and/or supervisory authorities, should consider a reasonable range of default loss scenarios, non-default loss scenarios and a combination of both in its resolution planning. When doing so, the resolution authority should recognise that the circumstances leading to a CCP resolution are likely to be beyond the extreme but plausible market conditions for which a CCP should hold sufficient prefunded financial resources.

1.1. Hypothetical default loss scenarios

Although CCPs should have in place comprehensive loss allocation arrangements for default losses consistent with the PFMI, these arrangements might fail and an orderly wind-down of the service may not be appropriate in the prevailing market conditions, leading to resolution. To prepare for this risk, the resolution authority should consider in its resolution planning at least the following hypothetical default loss scenarios:

(i) **The CCP does not have sufficient resources and tools for a successful recovery as called for by the PFMI.** In this scenario, a CCP has not fully addressed liquidity shortfalls or established loss allocation arrangements that fully address uncovered credit losses. As a result, recovery resources and tools are insufficient to absorb losses and replenish financial resources to minimum regulatory requirements.

(ii) **The CCP's loss allocation arrangements set out in the recovery plan do not operate as intended.** As a result, the planned resources or tools are not, or not sufficiently, available at the time of recovery.

(iii) **Multiple clearing members do not meet their obligations under the CCP's recovery actions.** If the group of non-performing clearing members is sufficiently large or if their failure to meet obligations leads to a general loss of confidence in the CCP, the CCP may become unable to continue operations.

(iv) **The relevant authorities determine that resolution should be initiated before some of the arrangements or tools under the CCP's recovery plan are applied.** In this scenario, the relevant authorities have determined that applying recovery arrangements or tools in the prevailing market conditions may threaten financial stability and/or the continuity of critical functions.

1.2. Hypothetical non-default loss scenarios

In accordance with the PFMI, CCPs should address non-default risks in their recovery planning.[18] In an extreme case, however, a CCP's resources and tools might not be sufficient to fully cover potential non-default losses and a wind-down of the CCP could pose financial stability risks in the prevailing market conditions because of a failure to maintain the CCP's

[18] The PFMI also state that a CCP should hold sufficient liquid net assets funded by equity (with a minimum of six months of current operating expenses) to cover potential general business losses and to ensure a recovery or orderly wind-down.

critical functions. To prepare for this risk, the resolution authority should consider in its resolution planning at least the following hypothetical non-default loss risks:

- **Investment risks.** Losses on investments of initial margin or default fund assets could arise for example if an investment counterparty fails. A CCP may need to bear such losses if the loss allocation tools foreseen in the CCP's rules do not cover them. Losses could also **occur** from the investment of a CCP's own financial resources. Investment losses could materialise suddenly.
- **Failure of a custodian, depository, a payment or settlement bank, a securities settlement system or other entity providing similar services.** As a result of such failure, the CCP could lose timely access to its assets or become unable to transform non-cash collateral or investments into cash. This could cause liquidity and/or solvency challenges to a CCP, depending on the nature or consequences of the failure and the time it takes to regain access to the assets.
- **Operational risk events.** Financial losses or liquidity challenges could result from a range of operational failures, such as human error, information technology failure, fraud, cyber incident, or non-performance of vendors or service providers. A CCP can incur operational losses directly (primary losses) or due to the legal actions taken by others affected by the event (secondary losses). Operational risk events can happen suddenly, but certain losses, particularly secondary losses can take years to fully materialise.
- **Legal risks.** Crystallisation of legal risks, including legal, regulatory or contractual penalties could lead to significant losses or uncertainty for the CCP and can take a long time to materialise fully.

The CPMI-IOSCO report on *Recovery of financial market infrastructures* (CPMI-IOSCO Recovery Guidance) calls for a CCP to have comprehensive loss allocation arrangements for custody and investment losses the CCP incurs as a result of its clearing and settlement activity. Other standards apply with respect to other non-default losses.[19] CCP equity would need to absorb any unallocated loss arising from the materialisation of general business risk. In an extreme case, it is possible that a CCP's recovery plan is not sufficient to fully cover potential non-default losses, orderly wind-down of the service may not be appropriate, and resolution may be called for. To prepare for this risk, the resolution authority should consider in its resolution planning at least the following hypothetical non-default loss scenarios:

(i) **The CCP does not have sufficient financial resources or tools to cover non-default losses.** In this scenario, the non-default losses would be larger than the CCP's capital and contingent resources (e.g. insurance, parental guarantees). Alternatively, in a scenario where the CCP's clearing members would also be required to bear losses, the

[19] According to the CPMI-IOSCO Recovery Guidance, an FMI needs to have sufficient liquid net assets funded by equity to implement its plan to recover from an extraordinary one-off loss or recurring losses from general business risk or to conduct an orderly wind-down of its critical operations. It also needs to have a viable plan to raise new equity capital in circumstances where the FMI's equity capital is used to address such losses. While these arrangements mitigate risk, there may still be situations where these risks could potentially lead to resolution.

aggregate resources available would be insufficient to cover the losses and/or to replenish capital back to the required minimum.

(ii) **The CCP's arrangements to cover (specific) non-default losses set out in the recovery plan cannot be used or do not operate as intended.** As a result, the planned resources or tools are not, or not sufficiently, available at the time of recovery.

(iii) **The CCP's clearing members do not meet their obligations under the CCP's recovery actions.** In this scenario, clearing members do not meet the applicable loss allocation or replenishment obligations.

(iv) **The CCP's shareholders do not support the CCP's recovery actions.** In this scenario, the CCP's parent company or other shareholders do not cover the CCP's non-default losses that are not allocated elsewhere and/or are unwilling to recapitalise the CCP, irrespective of whether there is a contractual commitment, parental guarantee, or similar arrangement to provide financial resources or not.

(v) **The relevant authorities determine that resolution should be initiated before some of the recovery arrangements or tools are applied or the CCP is wound down.** In this scenario, the CCP's recovery and wind-down arrangements are consistent with the PFMI, but the relevant authorities have determined that applying them in the prevailing market conditions may threaten financial stability and/or the continuity of critical functions.

2. Step 2: Conducting a qualitative and quantitative evaluation of existing resources and tools available in resolution

The resolution authority should conduct a qualitative and quantitative evaluation of the existing financial resources and tools in the various scenarios identified above to assess whether the CCP has sufficient resources to facilitate an orderly resolution. The objective would be to evaluate for each scenario: (i) the availability of existing resources, including resources available to cover relevant costs; (ii) the ability to rely on particular tools to create resources; and (iii) the potential that the use of these resources or tools would have an adverse effect on financial stability.

Although the FSB understands that there are and may continue to be analytical and operational challenges to effective quantitative analysis, it considers that quantitative analysis of potential resource needs in a reasonable range of resolution scenarios will enhance the resolution authority's understanding of available resolution options.

The resolution authority should consider at least the following key points when evaluating the existing resources and tools:

- challenges in the design of the resolution framework, such as legal constraints, operational caps or limitations on the resolution authority's powers domestically or on a cross-border basis;
- implications arising from the specific types of products cleared, arrangements for loss-sharing or segmentation across different clearing services, and CCP ownership structures on the availability of the various potential loss absorbing resources in resolution;

- the likely speed of crystallisation of a particular scenario; the timing of the specific related resource needs may have an impact on the tools and actions available to the resolution authority;
- execution risks, including the risk that a resource is not available, or a tool cannot be used as intended or in a timely manner. This should include consideration of:
  - the steps that need to be taken to ensure that clearing members and the relevant authorities understand and are prepared to bear the financial burdens and operational implications of the use of all of the tools in the CCP's rules and the resolution framework;
  - the steps that need to be taken to ensure that information is available to clearing members' clients to assist them in getting a clear understanding of the financial effects of the use of all the tools in the CCP's rules and circumstances in which losses could be passed onto them instead of being absorbed by the clearing members. To the extent feasible, the resolution authority should consider how the use of these tools may affect clients during extreme market conditions and what impact this would have on the decision to use these tools; and
  - the CCP's ability to obtain liquidity in the identified scenarios.
- the potential for adverse effects on financial stability that may render the resource or tool unusable or unavailable in resolution;
- the need to avoid any reliance on voluntary measures, non-binding commitments or non-automatic coverage during resolution;
- implications of the 'no creditor worse off than in liquidation' (NCWOL) safeguard and the potential for related compensation claims;
- the potential impact on stakeholders' (including clearing members') incentives to support recovery or resolution;
- the options available to participants to choose alternative CCPs, and the effects of any central clearing mandates;
- the feasibility and credibility[20] of achieving the resolution objective of maintaining continuity of critical functions; and
- the need to avoid exposing taxpayers to loss.

The resolution authority should coordinate closely with the relevant oversight and/or supervisory authorities for the CCP, which may perform, or may have performed, assessments of the adequacy of financial resources in the context of recovery planning. Coordination may include discussing such assessments in CMG meetings and other bilateral or multilateral discussions.

[20] A financial institution is "resolvable" if it is feasible and credible for the resolution authorities to resolve it in a way that protects systemically important functions without severe systemic disruption and without exposing taxpayers to loss. For resolution to be feasible, the resolution authority should have the necessary legal powers - and the practical capacity to apply them - to ensure the continuity of functions critical to the economy. For resolution to be credible, the application of those resolution tools should not itself give rise to unacceptably adverse broader consequences for the financial system and the real economy. See FSB Key Attributes, Annex I-3: Resolvability Assessments.

The resolution authority should combine any quantitative analysis with an assessment of whether the CCP has fully implemented the resources and tools called for by existing resilience and recovery standards, which may be based on assessments of implementation made by the relevant oversight and/or supervisory authorities of the CCP. To the extent it finds that the CCP has not implemented resources and tools called for by the existing standards, the resolution authority should coordinate with the relevant supervisory and/or oversight authorities.

In conducting quantitative analyses, the resolution authority may consider:

- Differentiating the amount of resources available for resolution according to the nature of the underlying resources and tools (e.g. prefunded, committed or uncommitted);
- Developing metrics for fully recognising or discounting different types of resources based on the level of confidence about whether they are likely to be available in a comprehensive and timely manner; and
- Coordinating with the oversight and/or supervisory authorities of clearing members notably in the context of assessing the potential performance risk and/or financial stability implications of enforcing certain recovery and resolution tools.

Supervisory stress testing for extreme market scenarios and/or reverse stress testing could also inform the resolution authority's quantitative analyses of existing and potentially available financial resources for resolution.

2.1. Default loss scenarios

When a resolution authority evaluates available resources and potential use of tools for default loss scenarios, it should consider, at a minimum, the following additional points.

2.1.1. Cash calls

(i) Understand how cash calls work under the CCP's rules, including when and how they can be used and the governance processes around the use of cash calls;

(ii) Evaluate constraints on the use of cash calls in accordance with the CCP's rules;

(iii) Determine performance risks under the CCP's rules and mitigants to non-performance; and

(iv) Evaluate the potential financial stability implications of cash calls, including the likelihood and impact of cash calls by a single CCP as well as, to the extent the resolution authority has access to sufficient information, concurrent cash calls by multiple CCPs that could be affected by the same or simultaneous event(s).

2.1.2. Replenishment of minimum resources

(i) Analyse arrangements by which the default fund, the prefunded CCP equity dedicated to cover default losses as part of the default waterfall and other minimum financial resources required for continued authorisation would be replenished, including the viability, reliability and timeliness of such arrangements;

(ii) Evaluate any potential constraints with respect to the replenishment of minimum resources; and

(iii) Evaluate potential market and financial stability implications associated with using such replenishment arrangements.

2.1.3. Variation margin gains haircutting (VMGH)

(i) Understand how VMGH works under the CCP's rules, including when and how VMGH can be used and the governance processes around the use of VMGH;

(ii) Evaluate constraints on the use of VMGH in accordance with the CCP's rules; and

(iii) Evaluate potential market and financial stability implications associated with using VMGH.

2.1.4. Full tear up, partial tear up or other position allocation/matched book tools

(i) Understand how the tools to return the CCP to a matched book work under the CCP's rules, including when and how they can be used and the governance processes around the use of such tools;

(ii) Evaluate constraints on the use of matched book tools in accordance with the CCP's rules, including the timing, scope and method of determining the price of tear up; and

(iii) Understand the potential impact of the use of these tools on financial stability, continuity of critical functions, netting sets, and linked FMIs.

2.1.5. CCP equity and other financial resources from the CCP or its affiliates

(i) Understand the availability of prefunded CCP equity dedicated to cover losses as part of the default waterfall, and when it can be used; and

(ii) Understand the availability of any additional financial resources (including from the CCP or its parent or affiliates) beyond prefunded CCP equity dedicated to cover losses as part of the default waterfall, the amount of such additional resources, and how and when they can be used to cover losses or replenish CCP equity.

2.1.6. Statutory powers of the resolution authority

(i) Understand statutory powers available to the resolution authority to allocate losses, enforce recapitalisation, use emergency powers, seek restitution from the CCP, its shareholders, affiliates, management or control persons and, where applicable, cover the costs of resolution;

(ii) Understand conditions governing the use of such powers, the potential financial stability implications of the use of such powers, and the interaction of the statutory powers with the CCP's rules; and

(iii) Evaluate NCWOL implications with respect to the use of such statutory powers.

2.2. Non-default loss scenarios

When a resolution authority evaluates available resources and potential use of tools for non-default loss scenarios, it should consider, at a minimum, the following additional points:

2.2.1. Insurance coverage and other third-party resources supporting operational continuity

(i) Analyse the availability and scope of coverage of insurance policies to cover various types of non-default risks, and/or other third-party resources, such as committed liquidity and credit lines or economically similar arrangements, that could support the operational continuity of the CCP; and

(ii) Evaluate the limitations and performance risk associated with using insurance or other third-party resources, including timing mismatches, coverage limitations and other exclusions.

2.2.2. CCP equity and other financial resources from the CCP or its affiliates

(i) Understand the availability of CCP equity to cover different types of non-default losses;

(ii) Understand the availability of any additional financial resources (including from the CCP or its parent or affiliates), the amount of such additional resources, and how and when they can be used to cover losses or replenish CCP equity.

2.2.3. Allocation of losses to clearing members

(i) Understand the scope and terms of any contractual arrangements for allocating non-default losses to clearing members;

(ii) Consider financial caps and legal or operational constraints for allocating non-default losses to clearing members, and how any cap compares to possible non-default loss amount;

(iii) Evaluate the risk of clearing members failing to meet calls and mitigants to this; and

(iv) Analyse the potential impact on affected clearing members and, to the extent feasible, their clients; and the extent to which this could raise financial stability concerns.

2.2.4. Allocation of losses to creditors in resolution

(i) Consider the extent of the resolution authority's legal powers to impose losses on the CCP's creditors;

(ii) Consider the extent of the resolution authority's legal powers to convert creditor claims into equity to recapitalise the CCP;

(iii) Understand the insolvency hierarchy of the CCP's creditors, its relationship to the CCP's loss allocation arrangements, the counterfactual in case of insolvency and the identification of any types of creditors that may be difficult to apply losses to without risk to the resolution objectives; and

(iv) Evaluate the application of the NCWOL safeguard and the extent to which there are any concerns if losses are not allocated equally to creditors ranking pari passu with others.

2.2.5. Statutory powers of the resolution authority

(i) Understand any statutory powers available to the resolution authority to allocate losses, enforce recapitalisation, collect insurance proceeds, obtain third-party resources, use emergency powers, or seek restitution from the CCP, its shareholders, affiliates, management or control persons;

(ii) Understand conditions governing the use of such powers, the financial stability implications of the use of such powers, and the interaction of statutory powers with the CCP's rules; and

(iii) Evaluate NCWOL implications with respect to the use of such statutory powers.

3. Step 3: Assessing potential resolution costs

In this step, the resolution authority should conduct a qualitative and quantitative assessment of the different types of costs that could arise in the resolution of a CCP in the various scenarios identified in Step 1. Such costs include both losses and costs that must be covered by available resources. They would be influenced by the organisational structure of, and the types of products cleared by, the CCP, and would generally include:

- the potential amount of the CCP's losses and the costs of replenishing its financial resources;
- operational costs of the CCP, including:
  - the costs of maintaining the continuity of the CCP's critical functions;
  - any extraordinary costs incurred by the CCP during resolution; and
- the administrative costs of the resolution authority.

The resolution authority's consideration of potential resolution costs should include assessing:

- the size of resolution costs associated with the potential resolution strategy or strategies;
- the time frame when resolution costs need to be met in the short and longer term; and
- who will bear the different types of costs, how costs not fully covered by use of resolution tools may ultimately be recoverable, and from whom.

In quantifying the potential amount of a CCP's non-default losses, the resolution authority should consider all relevant scenarios and factors, including, but not limited to, the following:

(i) For investment losses: the potential cost should be assumed to equal at least the entire principal of an investment or the total amount invested with a counterparty, less the fire-sale value of any security received from the counterparty, rather than the value of the investment derived by using a mark-to-market or other valuation methodology.

(ii) For losses due to the failure of a custodian, depository or payment bank: the potential cost should be estimated in two ways, as the average and maximum amounts held at each custodian or depository, or processed by each payment bank, together with appropriate assumptions on the amounts that could be recovered over time.

(iii) For operational risk events: the potential cost should be estimated taking into account:

(a) previous investment costs or current estimates of replacement costs for property and equipment;

(b) relevant examples from similar businesses that have suffered severe operational risk loss events;

(c) estimates of legal liabilities to participants or others; and

(d) estimates of regulatory fines or other judgements.

(iv) For legal risks: for each particular tool in a CCP's rules, the maximum potential cost should be estimated as the amount that such tool would have provided to the CCP, if a legal challenge has removed the possibility of using such tool. If legal risk has crystallised through the CCP incurring a cost (potentially in the form of a requirement to pay damages or a regulatory fine), the assessment of potential losses could take into account examples from similar businesses that have experienced a crystallisation of significant legal risk of a form relevant to the CCP.

When assessing the costs of supporting the operational continuity of the CCP's critical functions, the resolution authority should consider that the need to cover such costs may last for several weeks or months, while the resolution authority implements the resolution strategy and until the CCP can exit from resolution.

The extraordinary costs incurred by the CCP during resolution and the resolution authority's administrative costs, such as management, legal or accounting costs, may also last for several months, depending on the resolution strategy used. There may also be some additional costs following resolution (including potential NCWOL compensation).

4. Step 4: Comparing existing resources and tools to resolution costs and identifying any gaps

Taking into account the resolution scenarios identified in Step 1, the resolution authority should compare the resolution costs assessed in Step 3 to the resources and tools analysed in Step 2 and identify any potential shortfalls or gaps that could cause resources to be inadequate to achieve the resolution objective. This analysis should consider at least the following points:

(i) availability and sufficiency of existing resources and tools to cover the types of costs they are intended for, in a manner that mitigates the impact on financial stability;

(ii) availability and sufficiency of existing resources and tools to cover other types of costs, given the chosen resolution strategy and the degree to which resources may have been used in recovery;

(iii) the types and amount of costs, if any, that are not covered by existing resources and tools;

(iv) the time horizon for executing the resolution strategy and the manner for paying resolution costs, based on the estimates of the availability and sufficiency of resources and tools;

(v) the additional information or analysis that would be useful to determine any need for additional resources or tools;

(vi) the types and amount of additional resources and tools, if any, that would be needed in the identified cases;

(vii) the fact that, while some CCP liabilities may effectively be deferred or allocated to unsecured or undersecured creditors in resolution (for instance via write-downs), operational costs necessary to maintain the CCP's critical functions must be paid in full; and

(viii) potential consequences if existing resources and tools are not adequate to achieve the resolution objectives across a range of resolution scenarios, such as negative impacts on financial stability.

The resolution authority should recognise that the lack of an identified gap does not preclude the potential for such a gap to exist.

5. Step 5: Evaluating the availability, costs and benefits of potential means of addressing any identified gaps

To the extent any shortfalls or gaps between existing resources and tools and resolution costs are identified in Step 4, the resolution authority should consider at least the following points:

- whether additional tools or resources may be necessary to support resolution;
- what options exist for addressing any identified gaps;
- the costs, benefits and likely unintended consequences of each option;
- how to involve the relevant oversight and/or supervisory authorities to close the potential gaps;
- the financial stability implications of each option; and
- whether the resolution strategy could be adjusted to optimise the use of available financial resources, either as a standalone option to address any identified gap or in addition to requiring additional financial resources.

The resolution authority should also consider the potential implications of requiring any additional resources or tools, including at least the following points:

5.1. Nature of additional financial resources

(i) what would be the nature of the additional financial resources or tools needed to implement potential resolution strategies and address any gaps identified;

(ii) what are the possible methodologies for quantifying any additional resource needs and demonstrating that they are appropriate and proportionate;

(iii) would the additional financial resources or tools be reserved for resolution or would they also be available in recovery; and

(iv) how would additional financial resources be funded.

5.2. Additional cash calls

(i) whether the resolution authority has the power to issue additional cash calls that are not contemplated by the CCP's rules;

(ii) if applicable, how can the possibility of additional cash calls reserved for resolution be implemented and made transparent to clearing members;

(iii) what governance or control arrangements should apply to additional cash calls;

(iv) how can additional cash calls be sized so that they remain measureable, manageable and predictable;

(v) how can there be assurance that clearing members are adequately prepared to meet the additional cash calls;

(vi) whether the resolution authority should be able to apply additional cash calls for both loss absorbency and recapitalisation; and

(vii) whether additional cash calls would have any NCWOL implications.

5.3. Write down/bail-in powers

(i) whether a write-down or bail-in power is available to the resolution authority;

(ii) whether write-down or bail-in could provide additional loss absorbing and recapitalisation capacity, and if so:

(a) what (if any) liabilities would be available for write-down or bail-in;

(b) what (if any) impediments to the write-down or bail-in of the identified liabilities could arise;

(c) what effects could bail-in have if used for recapitalisation;

(d) what effects bail-in/write-down could have on the CCP's collateral mix and liquidity.

(iii) whether non-bankruptcy remote initial margin would be available and, if so, would the resolution authority have the power to write it down; and

(iv) whether there are any NCWOL considerations.

5.4. Interaction with recovery and business as usual impact on the CCP

(i) how additional financial resource requirements could affect the ongoing business model of the CCP;

(ii) whether additional financial resource requirements could result in increased costs of central clearing (such as through increased charges and fees for clearing members and other users) and the extent to which they could be a disincentive to centrally clear;

(iii) whether any additional resources or tools could be available for use only in resolution and, if so, under which conditions (e.g. established by law or statute, regulation, or foreseen contractually in the CCP's rules) or whether they could be integrated in the

CCP’s financial waterfall. This evaluation, conducted in cooperation with the relevant oversight and/or supervisory authorities, should also include:

(a) the impact on incentives for risk management, default management and recovery;

(b) the NCWOL implications of reserving financial resources or tools only for resolution compared to recovery, including the risks of compensation claims on the resolution authority, differences between resolution and the applicable ordinary insolvency regime/liquidation, and the treatment of the CCP’s rules in liquidation;

(c) ability to mitigate any NCWOL concerns; and

(d) whether the resolution authority (or any oversight, supervisory or other relevant authority) has the power to effect or require changes to the CCP’s rules.

(iv) whether the overall analysis affects or changes the potential resolution strategies, and if so, how; and

(v) whether certain resolution strategies might be costlier than others to implement.

Unaddressed gaps could prevent the resolution authority from achieving the resolution objectives and thereby propagate financial instability, or alternatively risk exposing taxpayers to losses, which would be contrary to the objectives of an effective resolution regime. Therefore, based on its analysis, the resolution authority, in cooperation with other relevant authorities, should consider the steps to be taken to address such gaps, in particular the following points:

(i) to what extent additional resources and tools are necessary to cover the identified shortfall in financial resources available for resolution;

(ii) to what extent the identified additional resources and tools could address liquidity needs in resolution;

(iii) how to weigh any differences in the impact on financial stability of the alternative means of addressing any gaps; and

(iv) whether any gaps could be addressed through changes to the CCP’s rules or governance documents or changes to the applicable legal or regulatory regime.

Part II: Treatment of CCP equity in resolution

The Key Attributes, the FMI Annex and the FSB 2017 Guidance set out general principles on the allocation of losses in resolution and on the NCWOL safeguard (see Annex). One of the objectives of an effective resolution regime is to provide mechanisms enabling shareholders and creditors to absorb losses in a manner that respects the hierarchy of claims in liquidation. Consistent with the Key Attributes, this includes the principles that in resolution CCP equity should absorb losses first, that CCP equity should be fully loss-absorbing, and that resolution authorities should have powers to write down (fully or partially) CCP equity.[21]

However, the Key Attributes also include a safeguard for creditors as a right of compensation where they do not receive at a minimum what they would have received in liquidation of the CCP under the applicable insolvency regime (NCWOL safeguard). The FMI Annex provides that, for the purpose of determining NCWOL for participants, the assessment of losses should assume the full application of the CCP's rules and procedures for loss allocation. The FSB 2017 Guidance provides that the assessment of whether participants, equity holders and creditors have been made worse off than in liquidation should assume, in accordance with applicable insolvency law, the full application of the CCP's rules and arrangements and any other contractual agreements.[22]

Consistent with the PFMI, a CCP should have in place comprehensive loss allocation arrangements for default losses. These arrangements typically allocate the majority of default losses to clearing members through cash calls or equivalent measures with predefined limits. Losses beyond such limits are often allocated to clearing members (and, in some cases, clients) through tools (such as VMGH), which are expected to be comprehensive but which also have financial effects that are less predictable in advance.

Therefore, very often only the prefunded CCP equity dedicated to cover default losses as part of the default waterfall is exposed to default losses under the CCP's rules. This prefunded portion of equity is normally positioned after the defaulting clearing member's resources have been used and before additional default losses are allocated to other clearing members.[23] The portion of CCP equity exposed to default losses is often limited to this amount, thereby allocating remaining losses to clearing members and other participants rather than CCP equity.

In general, CCP equity bears non-default losses. However, some CCPs have arrangements that allocate portions of non-default losses - particularly those arising from investment or custody risks - to clearing members. Accordingly, not all non-default losses may be covered by a CCP's own financial resources.

Thus, actions in resolution that expose CCP equity to larger default or non-default losses than in liquidation under the applicable insolvency regime could, based on the relevant counterfactual, enable equity holders to raise NCWOL claims. This may be inconsistent with

[21] Key Attributes paragraph 5.1; FSB 2017 Guidance paragraph 4.1; Key Attributes, FMI Annex paragraph 4.9(iii).

[22] Key Attributes paragraph 5.2, FMI Annex paragraph 6.1; FSB 2017 Guidance Section 5. The FSB 2017 Guidance (paragraph 5.5) also provides that, for the default losses counterfactual, the resolution authority should assume a full tear up of contracts at the time of resolution.

[23] The supervisory and/or oversight authorities acknowledge that this portion is not calibrated with a view to constituting a significant amount of loss absorbing resources. Rather, it is calibrated to provide confidence in the risk management incentives of the CCP.

the other Key Attributes principle that equity should be fully loss absorbing in resolution. This may also raise moral hazard concerns by allowing equity holders to maintain their equity interest in a CCP post resolution while participants are made to bear losses.

Sections 6 through 8 of this guidance provide a framework for the resolution authorities to assess the treatment of CCP equity in resolution.

6. Addressing the treatment of CCP equity in resolution plans

The resolution authority should assess the impact that any limits on the amount of CCP equity exposed to losses have on its ability to take appropriate action to achieve the treatment of CCP equity set out in the Key Attributes, FMI Annex and the FSB 2017 Guidance. Based on its analysis, the resolution authority, in cooperation with the CCP's oversight and/or supervisory authorities, may decide to adjust the exposure of CCP equity to losses (see section 7 below) or consider additional options to address the identified limitations (see section 8 below).

When the resolution authority develops resolution plans and strategies, it should fully understand for each default and non-default loss scenario and the combination of both:

- the treatment of equity under existing recovery arrangements, taking into account the ownership structure of the CCP;
- the extent to which equity would be exposed to losses in liquidation under the applicable insolvency regime, based on the relevant counterfactual; and
- the NCWOL safeguard, including the treatment of equity in liquidation.

When the resolution authority develops resolution plans and strategies, it should also consider at least the following:

- the point in time or the position in the default loss waterfall for equity to bear losses;
- potential challenges and constraints to CCP equity bearing losses in resolution in excess of the amounts contemplated by the CCP's rules or other contractual loss allocation arrangements; and
- any other factors that may affect its assessment of whether the treatment of CCP equity in resolution is appropriate and consistent with the Key Attributes, FMI Annex and the FSB 2017 Guidance.

In evaluating the timing and sequencing of imposing losses on CCP equity beyond those provided under the CCP's rules and other contractual loss allocation arrangements, the resolution authority should consider at least the following:

- incentives for stakeholders, particularly clearing members, to support recovery;
- the need to maintain an appropriate balance between flexibility for the resolution authority and certainty and predictability for participants;
- implications for the application of the NCWOL safeguard;

- potential NCWOL claims by shareholders[24] and assessment of any possible options to attenuate or solve any identified NCWOL obstacle;
- financial stability implications; and
- the law of the jurisdiction, including insolvency law, and the rules of the CCP and available powers to impose losses on equity in resolution.

7. Mechanisms for adjusting the treatment of CCP equity in resolution

As part of its resolution planning, a resolution authority should consider and incorporate in the resolution strategy possible mechanisms for adjusting the exposure of CCP equity to losses in resolution to achieve the treatment of CCP equity set out in the Key Attributes, FMI Annex and the FSB 2017 Guidance and to provide adequate resources for an orderly resolution. Possible adjustment mechanisms currently available in the Key Attributes, FMI Annex and the FSB 2017 Guidance include:

(i) **Exposure of some or all of the CCP equity to losses via modification of the contractual loss allocation arrangements**. The contractual loss allocation arrangements could be modified to expose the entire CCP equity (or a larger portion of it than is currently available) to losses in resolution, in one or more tranches. However, as the depletion of CCP equity below the minimum regulatory requirements would require the CCP to raise capital to continue to be able to provide its critical clearing services, the resolution authority should account for this in its planning.[25]

(ii) **Full or partial write down of CCP equity.** The resolution authority could fully or partially write down CCP equity to allocate remaining losses after default management and recovery measures have taken place. However, as the depletion of CCP equity below the minimum regulatory requirements would require the CCP to raise capital to remain a going concern, the resolution authority should account for this in its planning.

(iii) **Transfer of critical CCP operations (assets and certain liabilities) to a bridge entity and placing the remnant CCP into liquidation/receivership.** The resolution authority could expose CCP equity to losses by transferring all of the CCP's remaining open positions and related collateral or parts of them to another CCP or a bridge entity and then winding down the residual CCP.

(iv) **Dilution of existing ownership by raising new capital through conversion or issuance of new shares.** Existing equity holders' ownership and equity value may

[24] As noted above, CCPs' arrangements typically limit the losses borne by the CCP (and thus by its shareholders) to a specified amount and determine a specific sequence. In accordance with the FMI Annex, the NCWOL safeguard should assume the full application of the CCP's rules and procedures for loss allocation. Therefore, depending on the creditor hierarchy established by the local insolvency law (and how that law interacts with the CCP's rules and the legal framework provided for the resolution authority), shareholders may have a NCWOL compensation claim for any losses imposed on equity in resolution before the loss and position allocation tools available under the CCP's recovery arrangements are exhausted. As explained in section 6, this would be inconsistent with another Key Attribute principle that equity should be fully loss absorbing in resolution and could introduce moral hazard. In addition, it could represent a risk to public funds in some jurisdictions. NCWOL claims risk may not apply to non-default losses if the CCP's rules and arrangements do not limit the extent to which equity is exposed to losses.

[25] If positioned at specific stages of the waterfall and implemented prior to resolution actually occurring, such increased exposure to losses could potentially occur in both recovery and resolution. In the case of default losses, it would be inconsistent with the PFMI for a CCP not to have loss-allocation arrangements that would enable the CCP to maintain its minimum regulatory capital requirements throughout the recovery process.

become diluted as a result of raising new capital. The resolution authority's actions could include the issuance of new shares, rights, options or deliverable warrants; the conversion of any debt instruments or other eligible liabilities into equity; or the compensation of clearing members through the issuance of new shares in exchange for them bearing more losses than required under the CCP's rules and arrangements.

The FSB 2017 Guidance states that the resolution authority should have the power to compensate clearing members that contribute financial resources to a resolution in excess of their obligations under the CCP's rules and arrangements, in both default and non-default loss scenarios. Before exercising such power, the resolution authority should consider at least the following:

- whether it could compensate clearing members by providing shares in the CCP in return for any cash call or VMGH that is applied beyond the arrangements set out in the CCP's rules, and what the value of such compensation would be;
- whether issuing shares in the CCP in return for a (resolution) cash call or VMGH could pose legal or practical challenges to clearing members or indirectly to their clients; and
- how equity compensation would affect the allocation of any recoveries the CCP would make from the defaulter's estate.

The resolution authority, in cooperation with the CCP's oversight and/or supervisory authorities, should also evaluate whether it should require that the CCP's rules enable clearing members to claim reimbursement from the CCP for any financial resources contributed in resolution that exceed the amount provided for in the CCP's recovery arrangements.[26] As a result, those subject to such additional haircuts or cash calls would have a corresponding claim against the CCP that would rank ahead of equity.

8. Implementing policy for the treatment of CCP equity in resolution

Based on the analysis undertaken in accordance with the previous sections, the relevant home authorities should address the challenges relating to CCP equity fully bearing losses in resolution. This may include, where possible, that home authorities having the relevant powers and authority require that CCPs modify their capital structures, rules or other governance documents in a manner that subordinates shareholders to other creditors or sets out the point at which equity absorbs losses in legally enforceable terms. This may also include identifying or proposing potential changes to laws, regulations or powers of the relevant supervisory, oversight or resolution authorities that would enable achieving the resolution objectives or limit the potential for NCWOL claims.

If the jurisdiction's framework does not incorporate such changes, the relevant home authorities may need to accept any limitations on CCP equity fully bearing losses and include a statement in the resolvability assessment process on their rationale for accepting such limitations (which may include a lack of legal authority). The relevant home authorities may also need to identify available alternative measures to achieve as similar an economic outcome as possible in a reasonable range of resolution scenarios to support an orderly resolution.

[26] This consideration should take into account the need to incentivise clearing members' contribution to the CCP's default management process and recovery arrangements.

When evaluating the benefits and drawbacks of changes to the treatment of CCP equity, the relevant home authorities should evaluate and justify whether an adjustment to ensure equity fully bears losses in resolution (particularly in default loss scenarios) would be appropriate in light of the following:

(i) **Impact on CCP management incentives.** The relevant home authorities should evaluate whether incentives for sound risk management are being created by an appropriate amount of equity being exposed to losses, taking into account both CCPs' incentives to maximise shareholders' profits and to pursue sound risk management to reduce the risk of reputational loss.

(ii) **Impact on stakeholder incentives to support recovery and avoid resolution.** The relevant home authorities should consider the interactions among the local insolvency law, the resolution powers and the CCP's rules to evaluate whether options for adjusting the treatment of equity in resolution could affect incentives to support recovery.

(iii) **Impact on clients.** The relevant home authorities should consider the indirect effect the options for the treatment of equity in resolution may have on clients, who generally have fewer opportunities to influence the risk profile of the CCP and its risk management. In addition, the resolution authority should understand the options available to participants to choose alternative CCPs, and the effects of any central clearing mandates.

(iv) **Impact on continuity of critical services following resolution.** The relevant home authorities should consider how an ownership change would affect the provision of critical services to the CCP and whether resolution resilient service contracts would be needed ex ante to ensure continued provision of such services in resolution.

(v) **Impact on different business models and legal structures of CCPs.** For CCPs that are operationally integrated within an exchange or infrastructure group, the relevant home authorities should consider the effect on other group entities, which could include trading platforms, central securities depositories and other CCPs.

Annex 1: Excerpts from the Key Attributes and FSB 2017 Guidance relevant to financial resources to support CCP resolution

FMI Annex 11.4: "Resolution authorities for an FMI should, in cooperation with the FMI's oversight or supervisory authorities (where distinct from the resolution authority), develop resolution strategies and operational plans to facilitate the effective resolution of the FMI in a way that ensures continuity of the critical functions carried out by the FMI."

FMI Annex 11.4: "In the case of an FMI that is systemically important in more than one jurisdiction, the resolution strategy and plan should be developed by the home authority of the FMI and coordinated within the FMI's CMG or equivalent arrangements."

Appropriately prudent assumptions about the financial resources that may be required to achieve the resolution objectives (FSB 2017 Guidance Section 6): "As part of resolution planning, the resolution authority should make appropriately prudent assumptions about the financial resources that may be required to achieve the resolution objectives and the resources that it expects to remain available under the CCP's rules and arrangements at the time of entry into resolution to: (i) address uncovered losses; (ii) replenish resources in line with regulatory requirements within an appropriate timeframe; (iii) meet costs associated with maintaining and operating the critical functions of the CCP until exit from resolution, including the costs for critical dependencies such as service-level agreements, third-party service providers, or other key dependencies; and (iv) meet temporary liquidity needs."

Regular assessments as part of resolution planning (FSB 2017 Guidance Section 6.1): "As part of resolution planning, the resolution authority should assess regularly what financial resources and tools can reasonably be expected to be available to it under the resolution regime and the CCP's rules and arrangements at the time of entry into resolution, and whether those resources would be sufficient to achieve the resolution objectives in the case of both default and non-default losses."

Assessments of resources for default loss scenarios (FSB 2017 Guidance Section 6.2): "For default losses, the resolution authority should consider the following aspects in its assessment: (i) the risk characteristics, complexity and pricing uncertainties of the products cleared, and the related potential inaccuracy in initial and variation margin calculations; (ii) the size, structure and liquidity of the underlying market in stressed conditions; (iii) the number of clearing member defaults that would be covered by available prefunded and committed resources under extreme but plausible conditions; (iv) the availability, and potential impact on affected participants, of tools such as partial tear up and variation margin gains haircutting; and (v) the credibility of unfunded arrangements in meeting the CCP's potential needs."

Assessments of resources for all types of loss (FSB 2017 Guidance Section 6.3): "[F]or all types of loss, the resolution authority should assess the substitutability of the CCP in the markets it serves, the credibility of any additional arrangements, such as insurance agreements or parental guarantees, that may be available to address uncovered credit losses."

Provision and recovery of temporary funding (FSB 2017 Guidance Section 6): "Resolution planning should not rely on public solvency support and not create an expectation that such support will be available.

In jurisdictions where temporary public funding arrangements are available for CCP resolution, any public funding provided by the authorities should be relied on only as a last resort, be limited in time, and be recoverable over an appropriate time period from the assets of the CCP (including any claims against defaulting counterparties' estates or recoveries thereon), its participants or other participants in the financial system more widely.

In determining the amounts to be recovered, the resolution authority should take into consideration the amounts that CCP participants would otherwise have been required to contribute under the CCP's rules and arrangements and in resolution, had temporary public funds not been provided by the authorities, and, if appropriate, the costs of providing those funds.

Any recoveries by the CCP from the estate of a defaulting counterparty (including defaulting clearing members) should first be used to pay back temporary public funds. If the recoveries from the estate of the defaulter(s) exceed the amount of funding provided by authorities, the excess should be treated in accordance with the CCP's rules and arrangements or otherwise be redistributed to CCP equity holders, clearing participants and/or other participants in the financial system more widely who contributed to the loss allocation arrangements of the CCP.

Arrangements for the recovery of temporary public funding should be publicly disclosed as appropriate. Where appropriate they should be written into the legal framework and the CCP's rules and arrangements in order to help provide clarity and transparency regarding how authorities would recover funds and to provide a legal basis to collect from both domestic and foreign participants of the CCP."

Addressing default and non-defaults losses (FSB 2017 Guidance Section 7.1): "The resolution authority should develop and update regularly resolution plans that address resolution scenarios with default losses and non-default losses and a combination of both, distinguishing between different types of non-default loss where relevant."

Resolvability assessments and addressing impediments to resolvability (FSB 2017 Guidance Section 8): "The oversight, supervisory or resolution authorities for CCPs should [...] be able to require the CCP to arrange for additional financial resources if that would be deemed necessary to achieve effective resolution. […] As part of the resolvability assessments, resolution authorities should, in coordination with the CCP's oversight or supervisory authorities, carry out periodic crisis management exercises and assess the adequacy of financial resources and of any funding arrangements and accordingly adopt measures to improve the resolvability of the CCP and adjust the resolution plans, where necessary."

Establishment of a CMG (FSB 2017 Guidance Section 9): "For CCPs that are systemically important in more than one jurisdiction, the home resolution authority should establish a Crisis Management Group (CMG) to coordinate the resolution planning and resolvability assessments."

Annex 2: Excerpts from the Key Attributes and FSB 2017 Guidance relevant to treatment of CCP equity in resolution.

Key Attribute 1.2: "Financial market infrastructures ("FMIs") should be subject to resolution regimes that apply the objectives and provisions of the Key Attributes in a manner as appropriate to FMIs and their critical role in financial markets. The choice of resolution powers should be guided by the need to maintain continuity of critical FMI functions."

Key Attribute 5.1: "Resolution powers should be exercised in a way that respects the hierarchy of claims while providing flexibility to depart from the general principle of equal (pari passu) treatment of creditors of the same class, with transparency about the reasons for such departures, if necessary to contain the potential systemic impact of a firm's failure or to maximise the value for the benefit of all creditors as a whole. In particular, equity should absorb losses first, and no loss should be imposed on senior debt holders until subordinated debt (including all regulatory capital instruments) has been written-off entirely (whether or not that loss-absorption through write-down is accompanied by conversion to equity)."

Key Attribute 5.2: "Creditors should have a right to compensation where they do not receive at a minimum what they would have received in a liquidation of the firm under the applicable insolvency regime ("no creditor worse off than in liquidation" safeguard)."

FMI Annex 4.9: "Subject to the relevant safeguards set out in paragraph 4.11 and in KA 5 (as elaborated in paragraph 6.1) resolution authorities should have powers to:

(i) enforce any existing and outstanding contractual obligations of the FMI's participants to meet cash calls or make further contributions to a guarantee or default fund, or any other rules and procedures of the FMI for loss allocation (including for the repayment of liquidity providers) where they have not been already applied exhaustively by the FMI prior to the entry of the FMI into resolution;

(ii) enforce any existing and outstanding obligations of the FMI's participants pursuant to the rules and procedures of the FMI to accept allocations of the positions of a defaulting participant;

(iii) write down (fully or partially) equity of the FMI;

(iv) write down and/or convert to equity ("bail in") unsecured debt of the FMI in a manner that respects the hierarchy of claims under the applicable insolvency regime;

(v) reduce the value of any gains payable by the FMI to participants (for example, by variation margin hair-cutting);

(vi) terminate ("tear up") or close out contracts."

FMI Annex 6.1: "For the purposes of determining whether a participant is worse off as a result of resolution measures than in liquidation (application of the "no creditor worse off safeguard" set out in KA 5.2), the assessment of the losses that would have been incurred and the recoveries that would have been made by FMI participants if the FMI had been subject to liquidation should assume the full application of the FMI's rules and procedures for loss allocation."

Allocating losses to equity holders in resolution (FSB 2017 Guidance Section 4): "Existing owners' equity in the CCP should absorb losses in resolution, to the extent not already written down upon enforcement of the CCP's rules and contractual arrangements. The power to write down equity of the CCP in resolution should be set out in the legal framework and, where needed, reflected in the CCP's rules and arrangements, and its constitutive arrangements (e.g. articles of incorporation)."

Default losses (FSB 2017 Guidance Section 4.1): "In resolution, equity should be fully loss absorbing. It should be clear and transparent at which point in resolution any remaining equity would be written down, for example, no later than at the point at which prefunded and committed financial resources such as cash calls in recovery available under the CCP's rules and arrangements would have been exhausted."

Non-default losses (FSB 2017 Guidance Section 4.2): "In resolution, equity should absorb non-default losses no later than at the point at which any applicable loss allocation arrangements available under the CCP's rules and arrangements for non-default losses have been exhausted. Moreover, equity should be written down before losses are allocated to creditors in accordance with the creditor hierarchy under the applicable legal framework."

Concurrent default and non-default losses (FSB 2017 Guidance Section 4.3): "If both default and non-default losses occur concurrently, the losses attributable to each distinct cause should be allocated separately, in accordance with the applicable loss allocation rules and arrangements for default losses and non-default losses."

Alternative approaches to loss allocation (FSB 2017 Guidance Section 4.4): "Resolution authorities may consider alternative approaches to allocating losses to existing equity holders and recapitalising the CCP, such as writing down the equity and selling new equity in the CCP. The approach chosen may vary depending on the structure of the CCP (for example, single or multi-service), the value of the clearing service in which the default has taken place relative to the equity of the CCP, and constraints under applicable law."

No creditor worse off safeguard (FSB 2017 Guidance Section 5): "CCP participants (if and to the extent that the resolution authority departs in resolution from the loss allocation under the CCP's rules and arrangements), equity holders and creditors should have a right to compensation where they do not receive in resolution at a minimum what they would have received if, instead of resolution, the CCP had been liquidated under the applicable insolvency law ("no creditor worse off than in liquidation" (NCWOL) safeguard).

For the purposes of determining whether a participant, equity holder or creditor is worse off as a result of resolution measures than in liquidation of the CCP under applicable insolvency law, the assessment of the losses that would have been incurred or the recoveries that would have been made if the CCP had been subject to liquidation should assume the full application of the CCP's rules and arrangements for loss allocation.

The counterfactual underlying the NCWOL safeguard should be clear and transparent for both default and non-default loss scenarios."