FSB FINANCIAL STABILITY BOARD

Financial Resources and Tools for Central Counterparty Resolution

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Executive summary

Effective resolution regimes for systemically important central counterparties (CCPs) and the availability of adequate resources and tools for CCP resolution remain critical for financial stability and ensuring confidence in the financial system. Progress in implementing the G20 regulatory reforms agreed after the 2008-09 financial crisis, including the central clearing mandate, has increased the systemic importance of CCPs. While material advances have been achieved to enhance the resilience and recovery of CCPs, it is necessary also to ensure that adequate liquidity, loss-absorbing, and recapitalisation resources and tools are available in resolution to maintain the continuity of critical functions should resolution become necessary.

The Financial Stability Board (FSB) first published guidance on CCP Resolution and Resolution Planning in 2017 and, recognising that further work was needed on the adequacy of CCP financial resources and the treatment of CCP equity in resolution, also published additional guidance in 2020. At that time, the FSB announced a commitment to conduct further work on CCP financial resources with the Committee on Payments and Market Infrastructures (CPMI) and the International Organization of Securities Commissions (IOSCO), within their respective committees. Over the course of 2020-2021, the FSB, CPMI and IOSCO held joint workshops with the Basel Committee on Banking Supervision (BCBS) on the potential financial stability impact of CCP recovery and resolution. In March 2022, the FSB, CPMI and IOSCO published a joint report on CCP Financial Resources for Recovery and Resolution. Following the publication of the joint report, the FSB decided in April 2022 to undertake further qualitative work on financial resources and tools for systemically important CCP resolution and to publish a consultation report in 2023.

As part of the work, the FSB conducted a qualitative analysis of a set of financial resources and tools and identified four parameters and six key analytical dimensions based on the relevant considerations for financial resources set out in the FSB Key Attributes of Effective Resolution Regimes for Financial Institutions (Key Attributes or KAs) and accompanying guidance on CCP resolution to support CCP resolution objectives.

The four parameters are: (A) provide sufficient loss absorption, CCP recapitalisation options, and liquidity to give resolution authorities a reasonable opportunity to achieve a successful resolution in default loss (DL) and non-default loss (NDL) scenarios; (B) be reliable and readily available to achieve one or more of the above purposes in resolution; (C) mitigate potential adverse effects on financial stability; and (D) align incentives across recovery and resolution and achieve outcomes in resolution consistent with the Key Attributes, including by ensuring CCP equity remains in a first-loss position and by preserving incentives for market participants to participate in recovery and central clearing.

The four parameters are further detailed in six analytical dimensions (one or two for each parameter) related to the ability of each resource and tool to achieve the relevant considerations for financial resources set out in the Key Attributes and accompanying guidance on CCP resolution. The analytical dimensions are: (i) purpose and usability; (ii) timeliness and performance risk; (iii) legal and operational considerations; (iv) impact on financial stability; (v) costs - magnitude and allocation; and (vi) impact on CCPs' business models and clearing participant incentives.

The analysis demonstrated that, in general, (i) resources and tools carry different strengths and weaknesses and may be more or less appropriate in specific resolution scenarios; (ii) no resource or tool, by itself, would be able to satisfy all aspects of the resolution resource parameters without some negative effect on financial stability or other drawbacks; (iii) resources and tools are likely to vary in their effect on financial stability; and (iv) access by the resolution authority to a combination of complementary resources and tools may be advantageous in meeting the objective of achieving a successful resolution. The analysis also showed that, based on how they are designed, certain resources and tools have relative benefits and drawbacks when evaluated against the identified parameters and analytical dimensions.

Based on the analysis, a toolbox approach has been identified as an effective means to support resolution objectives. In a toolbox approach, resolution authorities should have ready access to a combination of resources and tools from the toolbox as options to use in resolution (a "resolution toolbox"). The resolution toolbox comprises a) a set of resolution-specific resources and tools available for resolution and b) if available, financial resources from access to non-exhausted recovery tools.

This approach enables authorities to flexibly select which resources and tools to implement in their jurisdiction, as needed, to complement the resources and tools already available. It also provides authorities the opportunity to consider the associated costs and benefits of each option to CCPs, clearing members and indirect participants, and to the broader market. Regimes with access to a combination of resources and tools will benefit from this optionality that will mitigate the risk that stems from reliance on any one resource or tool. In addition, a combination of resources and tools might achieve the desired benefits in resolution, while lessening the less desirable consequences associated with certain resources and tools.

The FSB has developed means for promoting implementation of the toolbox approach as a global standard for financial resolution resources and tools for CCP resolution where the CCP is systemically important. The standard has two expectations. First, home resolution authorities for systemically important CCPs should have access to a set of resolution-specific resources and tools to meet the objectives for financial resources and tools to support resolution, in addition to the use of recovery resources and tools where these are available to the resolution authority. Second, jurisdictions in scope of the standard should make transparent their approach to calibrating one or more of the resolution-specific resources in the resolution toolbox.

In accordance with Annex 1 (Resolution of Financial Market Infrastructures (FMIs)) of the Key Attributes (FMI Annex), resolution authorities should have a) specific legal authority to use non-exhausted resources and tools that are available to the CCP in recovery; and b) the power to intervene before recovery resources have been exhausted. In addition, resolution authorities with the necessary practical capabilities to intervene while recovery resources are still available may consider those expected additional financial resources when choosing which resolution-specific resources and tools to include in a toolbox, the specification of those tools, and their calibration; however, jurisdictions should not rely solely on resources or tools designated for recovery and should establish a resolution toolbox in line with the standard set out above.

Implementation of the toolbox approach will be achieved through amendments to the FMI Annex of the Key Attributes and the 2020 Guidance on Financial Resources to Support CCP Resolution and on the Treatment of CCP Equity in Resolution (2020 Guidance). The new standard for resolution-specific financial resources and tools underpins the 5-step approach in the 2020

Guidance, through which the assessment of the adequacy of resolution resources will be conducted.

The FSB will monitor implementation for CCPs that are systemically important in more than one jurisdiction (SI>1 CCPs) through the FSB's established regular Resolvability Assessment Process (RAP) and Crisis Management Group (CMG) monitoring. The findings will be aggregated and published in the FSB's annual resolution report.

1. Introduction and background

Effective resolution regimes for systemically important CCPs and the availability of adequate resources and tools for CCP resolution remain critical for financial stability and ensuring confidence in the financial system. Progress in implementing the G20 regulatory reforms agreed after the 2008-09 financial crisis, including the central clearing mandate, has increased the systemic importance of CCPs.

While material advances have been achieved to enhance the resilience and recovery of CCPs, it is also necessary to ensure that adequate liquidity, loss-absorbing, and recapitalisation resources and tools are available in resolution to maintain the continuity of critical functions should resolution become necessary. Unless resources and tools have been reserved for resolution, or the resolution authority can initiate resolution at a time when suitable recovery resources and tools are still available for resolution, there may not be sufficient resources and tools available to support an orderly resolution of the CCP without material adverse impact on financial stability.

Depending on the legal authority and operational capability of the resolution authority[1] to step in before all recovery resources and tools have been exhausted, resources and tools available for recovery may also be available for resolution. However, some of these resources and tools may have knock-on effects and potentially material adverse impacts on financial stability. As a result, even if available to the CCP or to the resolution authority, the use of these resources and tools might be destabilising or inappropriate in certain circumstances. Therefore, resolution authorities that anticipate having access to CCP recovery resources and tools in resolution must consider the extent, nature, and timing of use of additional resolution resources and tools necessary in order to avoid or mitigate these financial stability impacts. Further, consistent with the 2017 Guidance on Central Counterparty Resolution and Resolution Planning (2017 Guidance), resolution authorities, supervisory authorities, and other relevant authorities should cooperate and communicate effectively in recovery to enable the resolution authority to act in a timely manner.[2]

The FSB Key Attributes and the 2017 Guidance stress the importance of effective CCP resolution planning and the availability of effective mechanisms to resolve CCPs so that authorities are not constrained to rely on public ownership or bail-out to resolve a CCP.[3] 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. Accordingly, a lack of adequate resources or tools would likely prevent the resolution authority from achieving the resolution objectives and could increase financial instability.

In 2021-2022, the FSB undertook, jointly with CPMI and IOSCO, an analysis of CCP financial resources for recovery and resolution for default loss (DL) and non-default loss (NDL)

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1 Consistent with Key Attribute 2.1 of the FSB Key Attributes, references in this report to 'resolution authority' include references to more than one authority where two or more authorities are responsible for exercising resolution powers under the resolution regime.

2 See Section 3 of the 2017 Guidance.

3 See Section 6 of the 2017 Guidance.

scenarios.[4] The findings from that analysis were published in March 2022 and concluded that, although there were sufficient pre-funded and recovery resources available at the participating CCPs to cover losses in certain scenarios, there was merit in continuing work on resolution-specific financial resources and tools for CCP resolution.[5]

To conduct the work on resolution, the FSB analysed, in consultation with CPMI-IOSCO, the benefits and limitations of potential financial resources and tools for CCP resolution and compared them to resolution-specific financial resources and tools that were identified in the 2017 Guidance. This analysis was included in the 2023 consultation report on Financial Resources and Tools for CCP Resolution.[6] This report summarises the final analysis and presents the "toolbox approach" for resolution resources and tools alongside means for implementation and monitoring.

Section 2 outlines the objectives for CCP resolution resources and tools to frame the analysis.

Section 3 describes the set of resolution resources and tools that were identified and analysed, including a high-level discussion of potential design choices and options for those resources and tools.

Section 4 summarises the components of the analysis and its findings across the resources and tools.

Section 5 sets out a framework for resources and tools that should be available to the resolution authority in a CCP resolution and means for implementation and monitoring.

2. Objectives for CCP resolution resources and tools

The objectives of CCP resolution are financial stability and the continuity of critical CCP functions without exposing taxpayers to loss. Resolution planning should maintain incentives for CCPs, clearing members and market participants to centrally clear and to engage constructively in efforts to achieve a successful default management or recovery and to reduce the likelihood of resolution. The resolution framework does not aim at promoting resolution over recovery, but rather provides further resilience to the system in the event that the CCP's recovery arrangements prove inadequate, or where their use might undermine financial stability.

To achieve these objectives, the resolution authority should have access to financial resources and tools in resolution that meet the parameters below. These four parameters were identified based on the relevant considerations for financial resources set out in the Key Attributes and accompanying guidance on CCP resolution:[7]

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4 See also Cover note to the CPMI-IOSCO Report on central counterparty practices to address non-default losses as well as CPMI-IOSCO ongoing work on FMIs' practices for NDLs, including an assessment of the implementation of Principle 15 on general business risk and related principles.

5 FSB-CPMI-IOSCO (2022), *Central Counterparty Financial Resources for Recovery and Resolution*, March.

6 FSB (2023), *Financial Resources and Tools for Central Counterparty Resolution: Consultation Report,* September.

7 See also Section 2 of the FSB Guidance on Financial Resources to Support CCP Resolution and on the Treatment of CCP Equity in Resolution (2020 Guidance).

A. Provide sufficient loss absorption, CCP recapitalisation options and liquidity to give resolution authorities a reasonable opportunity to achieve a successful resolution in DL and NDL scenarios;

B. Be reliable and readily available in resolution;

C. Mitigate potential adverse effects on financial stability; and

D. Align incentives across recovery and resolution and achieve outcomes in resolution consistent with the Key Attributes, including by ensuring CCP equity remains in a first-loss position and by preserving incentives for market participants to participate in recovery and central clearing.

3. Scope of analysis on resolution resources and tools

This analysis covers only financial resources and tools that are able to absorb losses, support recapitalisation, or provide liquidity in resolution. On that basis, seven financial resources and tools for CCP resolution were identified for further analysis. Further resolution tools, such as a bridge tool, sale of business, and partial tear-up, remain relevant to support resolution but were not considered in the analysis as they are not financial in nature and do not provide direct sources of loss absorbency, recapitalisation or liquidity. The financial resources and tools are described below to form the basis for the analysis in Section 4. The descriptions are intended to be high-level summaries of each resource and tool, including a description of some of the potential design choices of each resource and tool to underpin the analysis. The FSB may review and augment this list from time to time, as appropriate, as jurisdictions may have or develop further resources and tools not covered in this report that would help achieve resolution objectives and that the FSB may choose to consider for inclusion.

i. **Bail-in bonds** are subordinated debt or unsecured debt ranking junior to other liabilities issued by a CCP (or its parent) to recapitalise the CCP (through conversion into equity) and/or absorb losses in resolution. A CCP would issue bail-in debt in BAU periods for use in a potential resolution scenario. Bail-in bonds for use exclusively in resolution would allow a resolution authority to subordinate these unsecured, junior liabilities of a CCP upon the CCP's entry into resolution and to convert those liabilities into equity or other ownership interests in the CCP or in a successor entity. If necessary, the bail-in bond documentation would include subordination terms or conversion terms under the relevant legal regime.

   To address liquidity needs in resolution, there could be an additional requirement for CCPs to hold the proceeds of the debt issuance in high quality liquid form accessible only in resolution. To mitigate excessive strain on clearing participants and potential adverse effects on financial stability, quantitative limitations could be applied to investors. Alternatively, regulatory capital treatment for holdings of the bail-in bonds could be considered to disincentivise clearing participant and affiliate holdings.[8]

[8] See, for example, the treatment prescribed in the Basel Committee on Banking Supervision's total loss-absorbing capacity *(TLAC) holdings standard* for G-SIBs.

ii. **Resolution funds** are dedicated pre-funded resources, which can be called upon in resolution by a participating resolution authority in the fund and can vary in scope and membership. A resolution fund could be either national or supranational. A supranational fund's governance structure and design would involve input from all the resolution authorities that would be eligible to draw upon its resources.

Covered CCPs and/or clearing participants relevant to such CCPs would contribute funding in BAU. Contribution amounts and contributing entities would be based on predetermined criteria. The operation of a resolution fund would be independent of any individual CCP and would be managed by a public sector entity using established governance, much like how pre-funded deposit insurance or bank resolution funds are managed.

iii. **Resolution-specific insurance** is a contract in which an insurer agrees to provide to the resolution authority or the CCP coverage for specified risks so that financial resources are available in a resolution of a CCP. Potential insurers may be financial companies that are not significant participants of the CCP. Resolution-specific insurance policies would be prepared and evaluated under insurance law in the jurisdiction and include contractual terms that allow discretion by insurance providers in general. The terms of the insurance would vary based on the policy and could be structured to address specified risks in resolution.

iv. **Resolution-specific third-party contractual support** would represent contingent resources provided by a third party available to the resolution authority (or the CCP in resolution). These financial resources would be specified in the contractual documentation and could be structured to address specified risks in resolution.

The contractual provisions would vary based on the type of third party providing the contractual support (e.g. a bank or insurance company), the form of the instrument (e.g. a letter of credit, a performance bond or an advance payment guarantee), national law, the relationship to the CCP (unrelated to the CCP or intra-group), and needs for the financial resource in resolution. In most cases, the provider of such resource would identify the resolution authority (or the CCP in resolution) as the beneficiary of the contractual support.

Where the provider of the third-party contractual support is an entity unrelated to the CCP, this entity would generally expect to be reimbursed for amounts provided to the resolution authority or the CCP in resolution. The obligation to provide contractual support could be an unfunded commitment of the provider of funds or could be reserved and ring-fenced ahead of time.

v. **Resolution cash calls** are contractual or statutory provisions that enable the resolution authority to make one or more cash calls on the clearing participants up to a predetermined amount of funds once the CCP is placed in resolution. If cash calls for resolution are accompanied by compensation for participants, such compensation could for example be structured as equity in a newly re-established CCP.

These provisions are separate, and in addition to, a CCP's contractual right to use cash calls in recovery, if any.

vi. **Statutory or contractual variation margin gains haircutting (VMGH) for resolution** is a means for specifying that the resolution authority has an independent (de novo) right to delay, reduce, or cancel variation margin payments in resolution. This right is separate, and in addition to, a CCP's contractual right to use VMGH in recovery, if any. To mitigate potential financial stability impacts, its use may be subject to safeguards regarding the financial impact on clearing participants. VMGH should be compatible with netting provisions as "qualifying master netting agreements" to account for the effects of regulatory capital costs to clearing members.

vii. **Equity** write-down refers to the resolution authority's power to use existing CCP owners' equity in the CCP to absorb losses in a first loss position in resolution.[9]

In accordance with the FMI Annex of the Key Attributes, resolution authorities should have a) specific legal authority to use non-exhausted tools and resources that are available to the CCP in recovery, and b) the power to intervene before recovery resources have been exhausted.[10] In addition, resolution authorities with the necessary practical capabilities to intervene while recovery resources are still available may consider those expected additional financial resources when choosing which resolution-specific resources and tools to include in a toolbox, the specification of those tools, and their calibration; however, jurisdictions should not rely solely on resources or tools designated for recovery and should establish a resolution toolbox that meets the standard described in Section 4 for CCP resolution resources and tools.

In addition to the resources mentioned above, the FSB also reflected on the application of the funding provisions in the Key Attributes. In particular, regarding the use of temporary public funding, Key Attribute 6.3 refers to "resolution funds or a funding mechanism with ex post recovery from the industry of the costs of providing temporary financing to facilitate the resolution" of an entity. In addition, Key Attribute 6.4 provides that, in order to minimise the risk of moral hazard, in any provision of public funding the authorities must determine that, among other matters, the provision of temporary funding is necessary to foster financial stability and that this option will best achieve the objectives of an orderly resolution. Moreover, Key Attribute 6.4 provides that temporary funding should only be used when private sources have been exhausted or cannot achieve the objectives of an orderly resolution and that the use of temporary public funding also necessitates allocation of losses to equity holders and of residual costs to creditors or the industry through ex-post assessments or other mechanisms. Strong cost recovery powers are important to ensure funding is temporary and moral hazard around its usage is reduced. Consistent with the 2017 Guidance, any public funding provided by the authorities should be relied on only as a last resort.

4. Qualitative analysis

The FSB conducted a qualitative analysis of the selected financial resources and tools across six key dimensions (analytical dimensions). These key dimensions support the parameters for

9 The FSB 2020 Guidance describes the mechanisms for adjusting the treatment of equity in resolution; the form analysed for the purposes of the toolbox comprises a full or partial write-down.

10 FMI Annex of the Key Attributes, paragraphs 4.1(v), 4.4 and 4.9(i).

resolution resources and tools discussed in Section 2 which in turn support the objectives for a CCP resolution.

In general, the analytical dimensions can be mapped to the resolution resource parameters, as shown below. Section 4.1 summarises the scope of each analytical dimension with examples on how the analytical dimension would be relevant to one or more of the resolution resource parameters and resources or tools. Section 4.2 discusses each resource or tool and how well, under certain design choices, it measures up against the resolution resource parameters.

Resolution resource parameters	Analytical dimensions
(A): Provide sufficient loss absorption, CCP recapitalisation options, and liquidity, to give resolution authorities a reasonable opportunity to achieve a successful resolution in DL and NDL scenarios.	Dimension 1: Purpose and usability
(B): Be reliable and readily available in resolution.	Dimension 2: Timeliness and performance risk
	Dimension 3: Legal and operational considerations
(C): Mitigate potential adverse effects on financial stability.	Dimension 4: Impact on financial stability
(D): Align incentives across recovery and resolution and achieve outcomes in resolution consistent with the Key Attributes, including by ensuring CCP equity remains in a first-loss position and by preserving incentives for market participants to participate in recovery and central clearing.	Dimension 5: Costs - Magnitude and allocation
	Dimension 6: Impact on CCPs' business models and clearing participant incentives

4.1. Analytical dimension analysis

Dimension 1: Purpose and usability

The Dimension 1 analysis considered how well each resource or tool would meet resolution resource parameter (A), that is to say, could the resource or tool meet the resolution objectives by providing sufficient resources for loss absorption, and/or, if needed, recapitalisation options and liquidity in a CCP resolution to give resolution authorities a reasonable opportunity to achieve a successful resolution in either a DL or NDL scenario?

- **Loss absorption** analysed the resource's ability to absorb losses in a DL or NDL scenario.

- **Recapitalisation** analysed the resource's ability to restore the regulatory capital requirement of a CCP, as required in the jurisdiction.[11]

- **Liquidity** analysed whether the resource would enable the resolution authority to continue to perform the critical functions of the CCP, by paying in a timely manner all obligations of the CCP. Certain resources, if used for liquidity purposes, should be repaid to the provider or reimbursed over time.

- **Usability** analysed (i) whether the resource is available in both DL and NDL scenarios (or only in one type of scenario); and (ii) whether the amount (dollar value) of the resource is capable of being sized ex ante, including how the resource can be calibrated to cover the anticipated needs in resolution.

Dimension 2: Timeliness and performance risk and Dimension 3: Legal and operational considerations

The Dimension 2 analysis and the Dimension 3 analysis considered how each resource or tool would meet resolution resource parameter (B), that is to say, could the resource or tool be reliable and readily available to meet its purpose in resolution?

- **Timeliness** analysed whether a resource or tool would be readily available in resolution for the purpose for which it is intended.

- **Performance risk** analysed the ability of the resolution authority to rely on the expected amount of the resource to be available in resolution, including where doing so requires the cooperation of a third party that may be unwilling or unable to cooperate.

- **Legal considerations for implementation** analysed whether there are potential legal risks or legal impediments to the ability of the resolution authority to access the resource or use the tool at the time of resolution. These may differ based on the relevant jurisdiction's applicable legal regime.

- **Legal considerations for the No Creditor Worse Off (NCWO) safeguard** analysed the implications of the NCWO safeguard and whether considerations of local insolvency law and the NCWO safeguard could impact the resolution authority's decision to use a particular resolution resource or tool or the resolution authority's costs if it uses a particular resolution resource or tool.

- **Operational considerations** analysed whether there are governance or other operational concerns that would make the resource or tool difficult to establish, maintain, or access.

[11] Section 6 of the 2017 Guidance notes that the resolution authority would need to "replenish resources in line with regulatory requirements within an appropriate timeframe."

Dimension 4: Impact on financial stability

The Dimension 4 analysis considered how each resource or tool would meet resolution resource parameter (C), that is to say, could the resource be used without creating material adverse effects for financial stability?

- **Pre-funded vs. unfunded/committed** analysed whether a resolution resource or tool would be pre-funded or unfunded prior to a resolution event and the resulting implications. In relative terms, prefunded resources would have lower negative impacts on financial stability since the resources were obtained prior to a stress event. Generally, unfunded financial resources and tools would have a greater likelihood of negative impact on financial stability, including the potential to increase knock-on effects and contagion risk. However, use of pre-funded tools can in some cases also carry financial stability risk, as this use (for example, the bail-in of a bail-in bond issued by a CCP) will crystallise a loss to third parties, who may already be under stress as a result of wider market conditions. The magnitude of the impact from the use of pre-funded or non-prefunded tools would vary depending on the amount of the resource/tool used and relative to the resources of the impacted market participants, as well as whether they are used in an idiosyncratic or systemic stress scenario. Moreover, unfunded tools that are known and capped in advance, may have less of a destabilising effect because impacted market participants have the ability to plan for their potential commitments to the CCP or resolution authority.

- **Predictability** analysed whether the providers of a resource can measure, manage and control exposures relating to the provision of the resource.

- **Provider** analysed the identity of the source of the resolution resource or tool and the implications of the identity of the source on maintaining financial stability, should the resource or tool be called on in resolution. The analysis also considered how the existence of the resource or tool would alter the risks that a CCP presents to the financial system.

Dimension 5: Costs and dimension 6: Impact on CCP's business models and clearing participant incentives

The Dimension 5 analysis and the Dimension 6 analysis considered how each resource or tool would meet resolution resource parameter (D), that is to say, what are the costs both in terms of relative magnitude and allocation among the parties (e.g. CCPs, clearing members, equity holders). Could the resource or tool be designed to align incentives across recovery and resolution and achieve outcomes in resolution consistent with the Key Attributes, including by ensuring CCP equity remains in a first-loss position and by preserving incentives for market participants to participate in recovery and central clearing?

- **Costs** analysed the projected financial burden of providing the resource or tool and on whom the burden falls. As the cost magnitude of a resource increases, it could increase the cost of central clearing. In general, prefunded resources that are predictable and come with potentially smaller impacts to financial stability have higher BAU costs.

- **Impact on CCPs' business models** analysed how the costs or loss allocation associated with a resource or tool affects the risk management and operations or the financial standing of the CCP. Different CCPs have different business models and the impact of the cost of a resource or tool should be viewed in the context of the business model and whether the provision of a resource raises the cost of central clearing to the point at which that cost exceeds the user's incentive to centrally clear or could lead to business decisions that could change the risk profile of the CCPs.

- **Impact on clearing participant incentives in default management and recovery** analysed whether the existence of a resource, and the associated loss allocation, materially alters the incentives of the CCPs, the clearing participants, or the financial markets to support default management or recovery actions of a CCP. It also considered the potential impact on clearing participants' incentives to carefully monitor their exposures to the CCP.

4.2. Dimension analysis and comparison of resources and tools

The analysis considered each analytical dimension of a resource. The analysis did not attempt to rank-order the relative value of each resource or tool that supports the resolution objectives. This section highlights the more important features or drawbacks that would influence further consideration. The resources and tools could include variations in design based on factors such as the specific legal regime and characteristics of the CCPs.

Bail-in bonds

Bail-in bonds could be structured to satisfy the resolution resource parameters, but some challenges exist (i.e., parameters (B) and (D)).

A. Bail-in bonds would be reserved for resolution and prefunded. Under those parameters, they would provide recapitalisation options and/or loss absorption, would be available for DLs and NDLs, and could provide liquidity to maintain critical functions if proceeds are held by the CCP in high-quality liquid assets accessible only in resolution.[12] Bail-in bonds would be sized ex ante. As a drawback, the cost of issuing bail-in bonds in amounts sufficient to be feasible for resolution as a standalone resource may be too large to be supported by the CCP business.

B. Bail-in bonds would be available in a timely manner, in an amount that is certain, and have low performance risk in resolution, with appropriate structure and advance planning. They would be viable to implement for use in resolution from an operational perspective. Bail-in bonds would rely on the internal treasury functions that in many cases manage other liquidity resources, including: lines of credit, swap, and repo arrangements. In addition, if the proceeds of the bail-in bonds are required to be safely invested for liquidity purposes, CCPs may need to adapt internal capabilities to segregate and invest funds on behalf of clearing participants to manage these

[12] Depending on the way bail-in bonds are structured—which would be informed by, among other things, a jurisdiction's legal regime—proceeds could be held in resolution-specific accounts that could be accessed only in resolution.

proceeds. As a drawback, legal and operational challenges, as well as procedural constraints, could impede the timeliness of bail-in bonds if not structured and planned for properly. Bail-in bonds may also require changes to the legal regime in some jurisdictions, including with respect to investments at the CCP.

C. As a prefunded tool, bail-in bonds could be structured to minimise adverse financial stability impacts and would have a high degree of predictability. Their effect on financial stability, such as potential pro-cyclical impact and contagion risk, may depend on the composition of the bondholders and the materiality of the exposures to the bonds (e.g. regulatory treatment of holdings for certain bondholders could be considered).

D. The use of bail-in bonds could allocate losses or costs to a broader set of investors, thereby reducing impact on existing CCP participants and procyclicality during periods of stress. Moreover, costs of maintaining bail-in bonds, which would fall to the CCP, are payable in BAU and would not require large amounts of resources during periods of stress. As a drawback, bail-in bonds would likely increase BAU costs of centrally cleared products, including through the requirement for the CCP to adapt their existing capacities to support bail-in bonds.[13] Also, material holding of bail-in bonds by clearing members, other users of the CCP, or other leveraged financial institutions could serve to amplify financial stability risk in the event they are bailed in. The magnitude of the cost would vary depending on the amount of bail-in bonds issued, the risk-free cost of capital, and the investor's estimation of the probability that the CCP could enter resolution. The earlier the bonds are used in the loss allocation cascade, the more expensive they likely will be. Increased fees may reduce incentives to centrally clear products for which clearing is voluntary, but would not be expected to impact market participant's willingness to centrally clear products for which clearing is mandatory. The costs would be reduced depending on the investments that could be made of the proceeds of the bonds. To the extent that those proceeds could only be invested in high-quality liquid assets, which would enhance use for liquidity, the reduction in costs would be less. At the same time, these dedicated resolution resources could improve market confidence in the resolution authority's ability to execute resolution. The availability of bail-in bonds may reduce clearing members' willingness to participate in non-contractually obligated recovery measures since there is an external layer of tail-risk protection, but would not be expected to impact clearing member's incentives to observe contractual obligations under CCP rules.

Resolution fund

A resolution fund could be structured to satisfy the resolution resource parameters but some challenges exist, including implementation (i.e. parameter (B)).

A. A resolution fund would be reserved for resolution and would be prefunded, and could provide both loss absorption and liquidity, and be available for DLs and NDLs. Further,

[13] The costs and business impact of bail-in bond issuance would vary based on design choices. In this analysis of potential CCP resolution resources, the proceeds of bail-in bonds would be available only for resolution and would be prefunded. Therefore, the costs and business impact would be different than for example in bank resolution, where the proceeds of loss-absorbing capacity instruments issued by the bank are generally also available as business-as-usual working capital.

a resolution fund is unique in that its use would have no immediate impact on a private sector entity at the time of resolution. Whether a resolution fund ought to be used for recapitalisation would be determined at the fund's establishment. A resolution fund would be a pooled resource and could potentially be sized to cover large losses or high liquidity needs more efficiently than a CCP-specific resource. A resolution fund could be sized ex ante.

B. A resolution fund would be available in a timely manner, in an amount that is certain, and have low performance risk in resolution once established (with funding accumulated) with appropriate governance mechanisms. A resolution fund would require a well-developed governance and legal framework that supports timely distribution of funds. As a drawback, the creation and implementation of a resolution fund would be complex and involve resolving legal implementation issues under local law (and private and public international law in the case of a supranational fund). Challenges would include multiple operational/procedural considerations on matters of scope of coverage, accumulation of funds, investment, and determining when the fund pays out and how the fund should be replenished.

C. As a prefunded tool, a resolution fund could avoid an impact on financial stability in the event that it is used and would have a high degree of predictability. Moreover, costs of funding resolution funds which would fall to CCPs and/or clearing participants would be borne in BAU, and – with funding accumulated – would not require large amounts of resources from the private sector during periods of stress. As a drawback, depending on creation and implementation decisions, it may take some time to build up the resolution fund.

D. A resolution fund could be structured to allocate costs proportionately among the CCPs and clearing participants. The resolution fund could increase the costs of central clearing. However, the costs of funding the resolution fund could be lower than other prefunded tools at each individual CCP, if the design results in sharing the costs across multiple CCPs and/or clearing participants. While the impacts on incentives may vary based on the design of the resolution fund, the availability of a resolution fund may reduce clearing members' willingness to participate in voluntary recovery measures since there is an external layer of tail-risk protection, but would not be expected to impact clearing member's incentives to observe contractual obligations under CCP rules. At the same time, a resolution fund could improve market confidence in the resolution authority's ability to execute resolution. As a drawback, if implemented at the local level, a resolution fund may create cross-border competitive disparities among CCPs. In addition, a resolution fund may raise incentive concerns about risk management among CCPs or reduce clearing members' and clearing participants' pressure on CCPs to strengthen risk management and recovery tools, since there is an external layer of tail-risk protection.

Resolution-specific insurance and third-party contractual support

Insurance and third-party contractual support are distinct tools, and as such were analysed separately. However, they have very similar features and drawbacks when considered against the analytical dimensions and are therefore described together here. Both could be structured

to satisfy most resolution resource parameters but, depending on their design, they have the potential of lacking timeliness and legal and operational certainty (i.e. parameters (B) and (C)).

A. Insurance proceeds and third-party contractual support would be available in resolution and could provide both loss absorption, recapitalisation, and, in the case of third-party support, liquidity. Insurance and third-party support could be sized ex ante. As a drawback, it may not be possible to have insurance or third-party contractual support in amounts sufficient to be credible for resolution. Depending on the agreement, they could be available for DLs and NDLs.

B. Generally, these resources' timeliness highly depends on the clarity of the contractual provisions and their performance depends on the strength of the provider. In practice, insurance proceeds could not be relied upon as timely. The timeliness of contractual third-party resources would depend on design choices with regard to pre-conditions for payment, timeliness, and obligators. These resources would be dependent on the terms of contract which may raise procedural issues and matters of contract interpretation. These resources may also be governed by applicable and specialised law which may affect enforceability of the contracts. In addition, they are likely to be subject to multiple conditions, or defences to draws, which may affect performance risk. From an operational perspective, the insurance claims administration process could present additional challenges.

C. Insurance proceeds and contractual third-party support amounts would not impact clearing participants when drawn. They could contribute to solvency strain on insurers and third-party contractual support providers if large pay-outs are due. Alternatively, insurance and third-party contractual support could reduce contagion risk by allocating losses to market sectors that may not be affected by financial market stresses to the same degree.

D. Insurance and third-party contractual support could increase the costs of central clearing and/or reduce profitability of a CCP. In the case of insurance, CCPs would need to pay insurance premiums in BAU and certain types of third-party contractual support providers may also require periodic payments. In addition, in the event that third party contractual support is used in resolution, it may need to be repaid. The cost of maintaining these resources would be BAU expenses, payable over time. Costs associated with insurance and third-party support would depend on how the markets evaluate both the covered risks and the CCP resolution risks.

Resolution cash calls

Resolution cash calls could be structured to satisfy most resolution resource parameters. In a systemic crisis scenario, cash calls might have financial stability impacts (i.e., parameter (C)). The ability of clearing members to predict and prepare for the potential use of resolution cash calls may provide some mitigation to these concerns.

A. Resolution cash calls would be available for resolution, could apply to DLs and NDLs, and could provide both loss absorption and liquidity. In certain jurisdictions, it may be possible to use resolution cash calls for recapitalisation. Resolution authorities should consider how resolution cash calls can be sized so that they remain measurable,

manageable and predictable. Jurisdictions, with support of the resolution authorities, should also make the requirements transparent to help clearing members understand their potential obligations and be adequately prepared to meet them. As a drawback, the amounts of resolution cash calls may not be sufficient on their own to cover the full amount of losses.

B. Resolution cash calls would be available in a timely manner in an amount that is certain, have low performance risk in resolution and would be straightforward to implement from a legal perspective. They would be relatively easy to implement from an operational perspective as they rely on existing CCP capabilities developed for use in recovery.

C. Resolution cash calls could allocate costs to clearing participants. They may occur at a time when participants may already be under stress generally and because they may have already contributed funding in recovery. However, because resolution cash calls are capped, and the amounts are calibrated in line with the participants' default fund requirements based on the risk they bring to the CCP, clearing participants would be able to determine their potential obligations in advance, which could mitigate the impact.

D. Resolution cash calls would not impact CCPs' business models. The inclusion of a resolution cash call would not seem to negatively impact the clearing participants' incentives to support recovery and the default management process.

Statutory or contractual VMGH for resolution

Statutory or contractual VMGH for resolution could be structured to satisfy some resolution resource parameters but some challenges exist (i.e. parameters (A) and (C)).

A. VMGH can provide loss absorption and liquidity and might apply to DLs and NDLs. In certain jurisdictions, it may be possible to use resolution VMGH for recapitalisation. VMGH is more usable in DL scenarios where it can be used to absorb losses associated with clearing member defaults and reduce liquidity needs. However, it may be difficult to determine whether VMGH should be used for, or is sufficient to cover, NDL scenarios. Because the amount of resolution VMGH that would be available for use is difficult to estimate prior to resolution, as it is market-based, the resolution authority may not be able to precisely identify the appropriate amount for resolution planning.

B. VMGH would be timely and would be relatively easy to implement from an operational perspective as it relies on existing CCP capabilities developed for use in recovery. Performance risk is considered low.

C. VMGH allocates costs to clearing participants that experience mark-to-market gains on their positions, which avoids allocating costs to clearing participants with mark-to-market losses; however, the allocation could occur at a time when they may already be under stress.

D. VMGH would not impact CCPs' business models. VMGH in DL scenarios could incentivise clearing participants to participate actively in default management auctions or reduce exposure to the CCP by closing out their positions. VMGH in NDL scenarios could impact clearing participants' incentives to centrally clear, given that allocating

NDLs to clearing participants that lack influence on the CCP's general business risk management practices could be considered inappropriate.

Equity in a first-loss position in resolution

Equity write-down could satisfy some resolution resource parameters but drawbacks exist, including whether it would remain available in sufficient amounts after recovery (i.e. parameters (A) and (B)).

A. Writing down equity amounts that remain in resolution would provide some prefunded resources and would apply to both DLs and NDLs. Writing down equity could provide loss absorption (to the extent equity was not already used in recovery).[14] In some jurisdictions, actions in resolution that expose CCP equity to larger losses than in liquidation under the insolvency regime applicable in the jurisdiction could, based on the treatment received under the counterfactual, enable equity holders to raise NCWO claims. Equity would not provide liquidity unless the funds are reserved and held in highly liquid assets. In addition, equity may be subject to dilution or write-down (partially or fully) in recovery, which may affect its usability or mean it is not available in resolution. In addition, the amount of equity typically held by a CCP is relatively small.

B. Writing down equity would be timely and would have low performance risk and limited operational constraints, if the CCP can segregate and hold the funds in highly liquid assets. As a downside, the size of CCP equity resources is relatively small, and the use of equity may require changes to the legal/regulatory regime in some jurisdictions.

C. Writing down equity would have no significant impact on financial stability, but the effects could depend on factors including total capitalisation and the composition of equity holders.

D. Writing down equity would allocate losses to the CCP's owners. In addition, writing down equity could better align incentives of CCP equity holders and clearing participants in resolution and would also result in alignment with the FSB Key Attributes principle that equity holders would bear losses first.

The qualitative analysis in this section demonstrates that, in general, (i) resources and tools carry different strengths and weaknesses and may be more or less appropriate in a specific resolution scenario; (ii) no resource or tool by itself would be able to satisfy all aspects of the resolution resource parameters without some drawbacks; (iii) resources and tools vary in their effect on financial stability; and (iv) access to a combination of complementary resources and tools may be advantageous. The analysis also shows that certain resources and tools emerge as having relative benefits and challenges when evaluated against specific analytical dimensions and parameters, based on how they are designed. The resources and tools described in Section 3 and analysed in Section 4.2 could include variations in design based on factors such as the

[14] As discussed in the 2020 Guidance, CCPs typically expose a limited portion of CCP equity to DLs, while allocating the remaining losses to clearing members. CCP equity currently bears NDLs in many CCPs. However, some CCPs have arrangements that allocate portions of NDLs, particularly those arising from investment or custody risks, to clearing members. Accordingly, not all NDLs may be covered by a CCP's own financial resources.

specific legal regime, characteristics of the CCP, and the existing resolution resources and tools already available in the jurisdiction.

As part of the work, the FSB considered whether any one parameter or analytical dimension was more important than the other parameters or analytical dimensions in helping resolution authorities achieve the objectives of resolution. However, after due consideration, the FSB determined that none of the parameters and their underlying analytical dimensions could be prioritised over others and instead all are essential in establishing an effective set of resolution resources and tools capable of addressing the various scenarios that could lead to resolution.

4.3. Implications of different compositions of resources and tools

The previous sections demonstrate that access to a combination of resources and tools is necessary to achieve the resolution resource parameters, as no single resource or tool satisfies all objectives. In addition, a combination of resources and tools provides resolution authorities with flexibility to apply those resources and tools, selectively or in combination, based on the circumstances and market conditions at the time, as well as in the context of each jurisdiction's legal regime and covered CCPs.

Section 4.3 considers the set of resolution-specific resources and tools in the context of supporting the four resolution resource parameters. It begins by considering the dimensions and characteristics necessary to support orderly resolution (parameters A-C). It then considers the implications of a set of resolution-specific resources and tools, through illustrative examples, with regard to achieving outcomes in resolution consistent with the Key Attributes, including by ensuring equity remains in a first-loss position and by preserving incentives for participants to participate in recovery and central clearing (parameter D).

Support orderly resolution: Parameters A-C address the dimensions and characteristics to support an orderly resolution. The set of resolution resources and tools, taken together, will need to address liquidity, recapitalisation, and loss absorption, and they should be readily available. The impact on financial stability from the use of these resources and tools should be considered and will depend on the circumstances at the time, in the context of both idiosyncratic and systemic crisis market conditions. The toolbox should be effective under a variety of resolution scenarios and allow flexibility for the differences in products cleared and profiles across CCPs, the circumstances that led to DLs or NDLs (e.g. cyberattacks, failures in the CCP service providers, etc.), and the concentration of participants across CCPs. The toolbox should also address resolution needs for DLs, NDLs, and a combination of both during idiosyncratic and systemic crisis events. The previous sections also noted that the legal ability and operational capacity of the resolution authority to intervene and use recovery resources and tools in resolution could affect the choice and specification of resolution-specific tools.

Implications of resolution toolbox composition: Parameter D addresses the implications of the resolution toolbox on the CCP as a going concern and on clearing members and market participants. The composition of the resolution toolbox should align incentives across recovery and resolution and consider outcomes with regard to the magnitude and allocation of costs to CCPs, clearing members, and market participants. As all tools come with costs – realised in some combination during BAU, recovery, or resolution – the resolution toolbox will need to address cost allocation, timing, and impact as part of composition. The choice of tools should

also support incentives for market participants to cooperate in default management and recovery.

Section 4.3 also considers how resources and tools can complement each other as a means to understand the implications of different toolbox compositions in meeting each resolution resource parameter and dimension. In aggregate, this analysis will inform the overall composition of the resolution resource toolbox.

Parameter A: Provide sufficient loss absorption, CCP recapitalisation options, and liquidity, to give resolution authorities a reasonable opportunity to achieve a successful resolution in both DL and NDL scenarios

Dimension: Purpose

The resolution toolbox should include resolution-specific resources and tools that are able, in the aggregate, to address resource needs for liquidity, loss absorption, and recapitalisation (as required) of the CCP. For example, a toolbox that includes resolution resources and tools to provide liquidity, but not loss absorption, should be complemented with other resources and tools to provide loss absorption.

With regard to liquidity, a resolution cash call, VMGH, resolution fund proceeds, third-party contractual support (dependent on pre-conditions for payment, timeliness), and bail-in bond proceeds (if these are required to be reserved, as noted in Section 4.2.) would provide liquidity. Resources and tools that provide liquidity may also be needed most immediately, given the potential for a short runway to resolution and the need for continuity of critical services to the market. Timeliness is discussed in more detail below. The most reliable resources and tools to address liquidity shortfalls would be pre-arranged from highly reliable sources or already pre-funded. Reliability and performance risk are discussed in more detail below. As described in Section 4.2, resolution-specific insurance and equity have potential challenges in providing liquidity and bail-in bonds may be similarly limited, if proceeds are not held in high-quality liquid assets.

With regard to loss absorption, resources and tools that can be structured to absorb losses include resolution cash calls, resolution VMGH, a resolution fund, bail-in bonds, third-party contractual support, resolution-specific insurance, and equity in a first-loss position.

Scenario-specific considerations may also apply when selecting, designing and using resolution resources or tools for DLs and NDLs. For resolution scenarios driven by DLs, particular consideration may be given to the systemic nature of the event, where the default of one or more clearing members will have likely occurred in or resulted in stressed market conditions. Consistent with the analysis in section 4.2, for liquidity provision, appropriate resolution resources and tools in a DL scenario could include bail-in bond proceeds if required to be reserved for resolution, resolution fund proceeds, third-party contractual support and, under certain safeguards regarding financial impact on clearing members, resolution cash calls and VMGH. Similarly, for loss absorption, appropriate resolution resources and tools in a DL scenario could include resolution fund proceeds, bail-in bonds, third-party contractual support, resolution-specific insurance, equity, resolution cash calls and, under certain safeguards regarding financial impact on clearing members, VMGH. While resolution-specific insurance may be suitable for

resolution scenarios driven by both DLs and NDLs, it has been most commonly considered for NDL events.

For resolution scenarios driven by NDLs, the event may be more idiosyncratic in nature, primarily resulting from a failure at the CCP. Hence, the considerations for determining which resources or tools may be appropriate will likely be different than for that of DL-driven resolution. Consistent with the analysis in section 4.2, for liquidity provision, appropriate resolution resources and tools in an NDL scenario could include bail-in bond proceeds if required to be reserved for resolution, resolution fund proceeds, third-party contractual support, and resolution cash calls and, under certain safeguards regarding financial impact on clearing members, VMGH. Similarly, for loss absorption, appropriate resolution resources and tools in an NDL scenario could include resolution fund proceeds, bail-in bonds, third party contractual support, resolution specific insurance, resolution cash call and equity, as well as under certain safeguards regarding financial impact on clearing members, VMGH. While VMGH may be suitable for resolution scenarios driven by both DLs and NDLs, resolution authorities may face particular difficulties in sizing these resources for NDL events.

With regard to recapitalisation of the CCP in resolution, resolution funds, bail-in bonds, resolution-specific insurance, and third-party contractual support serve as options in both DL and NDL scenarios. In certain jurisdictions, it may be possible for resolution cash calls and resolution VMGH to be structured to recapitalise the firm in resolution. Recapitalisation may be slightly less time sensitive than loss absorption or liquidity, depending upon the existing supervisory standards for a CCP's regulatory financial resource requirements.

Dimension: Usability

The resolution toolbox should include resources and tools to absorb losses (both DLs and NDLs), to recapitalise (where required) and to address liquidity shortfalls in a composition that allows the resolution authority to size in advance the amounts that can be relied upon to be available in resolution. As such, the resolution toolbox should include one or more resources or tools that can be sized ex ante and calibrated in advance. The ability to size resources in advance helps jurisdictions understand usability of the resolution resources across resolution scenarios and therefore identify the best composition of resources and tools. Options that can be sized ex-ante include bail-in bonds, resolution fund, resolution-specific insurance, third-party contractual support, and resolution cash calls.

Parameter B: Be reliable and readily available in resolution

Dimension: Timeliness and performance risk

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. The resolution toolbox should include resources or tools that will be available to the resolution authority in a timely manner. Bail-in bonds, a resolution fund, a resolution cash call, resolution VMGH, and equity could each be structured to be available at or very near entry into resolution. As mentioned above, liquidity needs are expected to be immediate, and therefore the resolution toolbox should include one or more liquidity resources that would be available upon entry into resolution. These liquidity

specific resources include a resolution fund, resolution cash call, resolution VMGH, third-party contractual support (dependant on pre-conditions for payment, timeliness), or bail-in bond proceeds if these are required to be reserved for resolution.

The resolution toolbox should also ensure there is loss absorption and the ability to replenish regulatory capital in resolution. As some resources and tools have heightened performance risk, to the extent they are included in the toolbox they should be augmented with resources and tools that are more certain to perform.

Dimension: Legal and operational considerations

Similarly, in order to be reliable, resources and tools should have minimal legal and operational risks. Resources and tools identified as having minimal legal and operational risks (once established) include resolution cash call and resolution VMGH. These tools/resources could potentially complement others that may be subject to legal or operational risk.

Parameter C: Mitigate potential adverse effects on financial stability

Dimension: Impact on financial stability

Understanding if and how particular resources and tools could have an adverse effect on financial stability in a CCP resolution scenario is important. The resolution toolbox should include a combination of resources and tools such that the resolution authority can apply them without a material adverse effect on financial stability and in a way that contributes to the resolution regime's objectives. As discussed in Section 4.2, resources and tools that are measurable and manageable in advance and that spread costs among providers are less likely to present risks to financial stability. In a systemic crisis scenario, the resolution authority should consider the potential financial stability impacts of the use of resources, such as resolution cash calls, during a period when clearing members may be experiencing liquidity stress. Similarly, the resolution authority should evaluate potential financial impacts of the use of VMGH during such periods, including the potential for procyclical effects. As noted above, the ability of clearing members to predict and prepare for the potential use of resolution cash calls and VMGH by resolution authorities may provide some mitigation to these concerns.

To enhance as much as possible the understanding of the potential system-wide effects of the use of resolution tools, it is critical to consider the specific design features of individual financial resources and tools and, notably, their size and funding base, which in turn are likely to depend on how they are used. These considerations are also important to be able to assess the potential magnitude and reach of any knock-on effects.

To a greater or lesser extent, each tool may have financial stability effects. Thus, in determining the combination of resources and tools to include in the toolbox, it is important to consider the potential effects of cumulative application and potential mitigants.

Parameter D: Align incentives across recovery and resolution and achieve outcomes in resolution consistent with the Key Attributes, including by ensuring CCP equity remains

in a first-loss position and by preserving incentives for market participants to participate in recovery and central clearing

Dimension: Magnitude and allocation of costs

The costs associated with individual resources and tools differ, as does the allocation of those costs between CCPs and clearing participants. Those cost and burden implications, which largely depend on the purpose and degree of use, are considerations for the overall composition of the resolution toolbox. For example, balance along some dimensions may be achieved by combining the use of unfunded resources (that are less costly during BAU) with resources that are more reliable (but more costly during BAU) based on an assessment of their relative benefits, or addressing gaps through resource or tool design.

Dimension: Impact on CCPs' business models and clearing participant incentives

The composition of a resolution toolbox should also align incentives between recovery and resolution. The choice of tools should seek to avoid risks to the financial system, including risks that may arise from strains on entities providing the resources, or undermining incentives to support risk management, default management, recovery or resolution.

For example, the potential application of resolution VMGH may incentivise clearing members to support non-contractually obligated recovery measures (though neither recovery nor resolution can rely upon voluntary measures).

5. Framework for resolution resources and tools

5.1. A toolbox approach

For a systemically important 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. Conversely, a lack of adequate financial resources or tools would likely prevent the resolution authority from achieving the resolution objectives.

Unless resources and tools have been reserved for resolution, or the resolution authority can initiate resolution at a time when suitable recovery resources and tools are still available for resolution, there may not be sufficient resources and tools available to support an orderly resolution of the CCP without material adverse impact on financial stability. It may therefore be inappropriate to solely rely on resources that are designated for recovery, even if theoretically some of those resources may remain at the time resolution becomes necessary.[15] Moreover, certain later stage recovery resources could have potentially adverse impacts on financial stability in certain scenarios and therefore may not be attractive resources to be used by the resolution authority in specific circumstances. It is therefore important to have a range of

[15] This does not present a judgment regarding the use of recovery resources in resolution, generally or in any particular jurisdiction.

resolution-specific resources and tools available to support resolution, particularly to avoid a situation where if recovery fails then resolution also fails.

Based on the analysis described in Section 4, a toolbox approach is an effective means to support resolution objectives. A resolution toolbox comprises a) a set of resolution-specific resources or tools with characteristics that are able to meet the resolution resource parameters (as described in Section 2) and dimensions (as described in Section 4.1); and b) if available, financial resources from access to non-exhausted recovery tools. Through the resolution toolbox, resolution authorities should have access to a combination of the resources or tools to use in resolution.

A toolbox approach provides flexibility to authorities to tailor appropriate resolution-specific resources and tools for their jurisdiction and their CCPs, by taking into account the costs and benefits of each option, and to complement the resources and tools already available in their jurisdiction or through expectations for non-exhausted recovery resources and tools. No specific single tool, or set of tools, is necessarily required to ensure a toolbox meets the parameters and dimensions.

A toolbox approach does not prescribe a specific quantum expected to be available for resolution. Rather, each jurisdiction will be responsible for establishing an approach to calibrating one or more of the resolution-specific resources and tools from the toolbox that can be relied upon for resolution. Regimes with access to a combination of resources and tools would benefit from optionality that would mitigate the risk that stems from reliance on any one resource or tool. In addition, access to a combination of resources and tools might achieve the desired benefits in resolution while mitigating the less desirable consequences associated with certain resources and tools in given circumstances.

5.2. Contents of the resolution toolbox

As noted above, the resolution toolbox comprises a) a set of resolution-specific resources and tools available for resolution and b) if available, financial resources from access to non-exhausted recovery tools.

The selection of resolution-specific resources and tools in the toolbox for each jurisdiction should, in aggregate, meet the parameters and dimensions. Diversity within the toolbox gives optionality to the resolution authority to address a variety of circumstances in resolution.

The legal ability and operational capacity of the resolution authority to intervene while recovery resources and tools are available, and to use those recovery resources and tools in resolution, could affect that jurisdiction’s choice, specification, and calibration of the resolution-specific resources and tools in its toolbox.

The seven resolution-specific resources and tools listed below were analysed as potential components of a resolution toolbox, and based on different attributes and design choices, showed potential strengths and weaknesses in meeting the parameters and dimensions. Each of the resources and tools merits consideration for potential inclusion in a toolbox without obliging resolution authorities to select them all for their own toolbox (presented in the order of the analysis in Section 4.2).

- Bail-in bonds
- Resolution funds (regional/national/supranational)
- Resolution-specific insurance
- Resolution-specific third-party contractual support
- Resolution cash calls
- Statutory or contractual VMGH for resolution
- Equity in a first-loss position in resolution

Temporary public funding for liquidity, consistent with the provisions in KA 6 (Funding of firms in resolution) and the 2017 Guidance, should be relied on only as a last resort.

5.3. Implementation of the standard

Key Attributes - FMI Annex

The FSB has developed means for promoting implementation of the resolution-specific toolbox approach as a global standard in order to advance the objectives for financial resources to support resolution. The standard has two expectations. First, it establishes an expectation that resolution authorities of systemically important CCPs have access to a set of resolution-specific resources and tools that meet the objectives for financial resources and tools described in Section 2 of this document. This is in addition to the use of recovery resources and tools where these are available to the resolution authority, in accordance with the FMI Annex of the Key Attributes. Second, it establishes an expectation that home jurisdictions make transparent their approach to calibrating one or more of the resolution-specific resources and tools in the toolbox. Disclosures will be in a general form, not a precise amount or specific to an individual CCP, and will serve as an expected amount of resources or tools that can be relied upon for resolution.[16] For example, disclosing the resource or tool calibration (e.g. underlying methodology) in a regulatory publication or similar text, would be sufficient.

In accordance with the FMI Annex of the Key Attributes, resolution authorities should have a) specific legal authority to use non-exhausted resources and tools that are available to the CCP in recovery, and b) the power to intervene before recovery resources have been exhausted.[17] In addition, resolution authorities with the necessary practical capabilities to intervene while recovery resources are still available may consider those expected additional financial resources when choosing which resolution-specific resources and tools to include in a toolbox, the specification of those tools, and their calibration; however, jurisdictions should not rely solely on

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16 For example, in the EU, resolution cash calls are limited to two times the clearing member's default fund contribution for both DLs and NDLs. The UK resolution cash call is two times a clearing member's contribution to a relevant default fund for DLs and three times a clearing member's contribution to all prefunded default funds for NDLs.

17 FMI Annex of the Key Attributes, paragraphs 4.1(v), 4.4 and 4.9(i).

resources or tools designated for recovery and should establish a resolution toolbox in line with the standard set out above.

The standard discussed above will be adopted by adding the following text within the FMI Annex to the Key Attributes, at the end of Section 4 on resolution powers:

"Resources to support orderly CCP resolution

4.19 Resolution authorities for systemically important CCPs should have access to a set of resolution-specific resources and tools available for resolution and, if available in accordance with paragraph 4.20, financial resources from access to non-exhausted recovery tools (collectively, the "resolution toolbox"). The set of resolution-specific resources and tools should 1) be loss absorbing, provide recapitalisation options, and provide liquidity to give resolution authorities a reasonable opportunity to achieve a successful resolution in default loss and non-default loss scenarios; 2) be reliable and readily available in resolution; 3) mitigate potential adverse effects on financial stability; and 4) achieve outcomes in resolution consistent with the Key Attributes and in a manner mindful of the NCWO safeguard, by ensuring equity remains in a first-loss position and by preserving incentives for clearing participants to participate in recovery and central clearing.

4.20 In accordance with the FMI Annex of the Key Attributes, resolution authorities should have a) specific legal authority to use non-exhausted resources and tools that are available to the CCP in recovery, and b) the power to intervene before recovery resources have been exhausted (see paragraphs 4.1(v), 4.4, 4.9(i)). In addition, resolution authorities with the necessary practical capabilities to intervene while recovery resources are still available may consider those expected additional financial resources when choosing which resolution-specific resources and tools to include in their resolution toolbox, the specification of those tools, and their calibration; however, jurisdictions should not rely solely on resources or tools designated for recovery and should establish a resolution toolbox in line with the standard set out above.

4.21 The set of resolution-specific resources and tools should, in aggregate, meet the following dimensions to support the objectives as stated in 4.19 of this Annex:

- Purpose and usability: provide resources and tools that are sufficient for loss absorption, liquidity, and, if needed, recapitalisation in resolution to give resolution authorities a reasonable opportunity to achieve a successful resolution;
- Timeliness and performance risk: include resources and tools that would be reliable and readily available in resolution for the purpose for which they are intended;
- Legal and operational considerations: include resources and tools without significant legal, operational or governance impediments (in a manner mindful of the NCWO safeguard) to the ability of the resolution authority to access the resource at the time of resolution;
- Impact on financial stability: include resources and tools that are predictable and can be used without creating material adverse effects on financial stability;

- Costs: provide options to manage relative costs of the resources and tools with respect to the magnitude and allocation among the parties; and

- Impact on CCP's business models and clearing participant incentives: preserve incentives across recovery and resolution by ensuring CCP equity appropriately remains in a first-loss position and by preserving incentives for market participants to participate in recovery and central clearing.

4.22 The composition of the resolution toolbox should include a combination of resolution-specific resources and tools from the following list (presented in alphabetical order):

- Bail-in bonds

- Equity in a first-loss position in resolution

- Resolution cash calls

- Resolution funds (regional/national/supranational)

- Resolution-specific insurance

- Resolution-specific third-party contractual support

- Statutory or contractual VMGH for resolution

The FSB may review and augment this list from time to time, as appropriate, as jurisdictions may have or develop further resources and tools not covered in this report that help achieve resolution objectives and that the FSB may consider for inclusion.

4.23 Jurisdictions should determine and make transparent their approach to calibrating one or more resolution-specific resources and tools in the resolution toolbox, for both default losses and non-default losses, which will serve as an expected amount of resolution-specific resources and tools that can be relied upon for resolution. Disclosures could be in a general form, not a precise or CCP-specific amount. Disclosing the resource or tool calibration (e.g. underlying methodology) in a regulatory publication or similar text, would be sufficient for transparency purposes."

2020 Guidance

The FSB has also developed means for including the toolbox expectations for resolution resources through incorporation in the FSB 2020 Guidance.

Going forward, the assessment of the adequacy of resources should be conducted in the context of the resource standard as set out in the KAs. Specifically, the expectations for the toolbox underpin the 5-step analysis, which authorities use on an ongoing basis to assess the adequacy of resolution resources and tools under certain scenarios and at specific CCPs and could influence choices around quantum and calibration. The introductory paragraph of "Step 2: Conducting a qualitative and quantitative evaluation of existing resources and tools available in resolution" will be amended to read (new text is bolded):

"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 and tools to facilitate an orderly resolution. ***This analysis includes whether the resolution authority has access to a set of resolution-specific resources and tools consistent with KA FMI Annex 4.19-4.23****."*

5.4. Ongoing monitoring

The FSB will monitor the implementation of the standard for SI>1 CCPs, including on tool selection and calibration approaches, through its established CMG monitoring and RAP questionnaires. The CMG monitoring and RAP questionnaires complement each other and help monitor resolution planning and resolvability assessment progress made by the resolution authorities and provide insight into the related CMG discussions for SI>1 CCPs. The results of these monitoring efforts are aggregated and published in the FSB's annual resolution report. Both the CMG and the RAP questionnaire responses are submitted to the FSB on a regular basis and provide transparency around the home authorities' progress in convening relevant authorities for cross-border resolution discussions, establishing information sharing agreements, and assessing firms' resolvability. Together, CMG monitoring and the RAP will provide transparency on the implementation progress of the resolution toolbox for SI>1 CCPs on an ongoing basis.