Central counterparty resolution: How to assess and treat available financial resources

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Abbreviations used

RA	Resolution authority
bankCBCM	FSB Cross-Border Crisis Management Working Group for Banks
BCBS	Basel Committee on Banking Supervision
BIS	Bank for International Settlements
CCP	Central counterparty
CDS	Credit Default Swap
CMG	Crisis Management Group
CNMV	Comisión Nacional del Mercado de Valores (National Securities Market Commission)
CPMI	Committee on Payments and Market Infrastructures
OTC derivatives	Over-the-Counter derivatives
DL	Default losses
EMIR	European Market Infrastructure Regulation
ESMA	European Securities and Markets Authority
ESRB	European Systemic Risk Board
FDIC	Federal Deposit Insurance Corporation
FMI	Financial Market Infrastructure
fmiCBCM	FSB Cross-Border Crisis Management Working Group for FMIs
FSB	Financial Stability Board
G-SIB	Global Systemically Important Banks
G-SIFI	Global Systemically Important Financial Institutions
iCBCM	FSB Cross-Border Crisis Management Working Group for Insurers
IOSCO	International Organization of Securities Commissions
IRD	Interest Rate Derivative
NCWO	No Creditor Worse Off
NDL	Non-default losses
NCWOL	No Creditor Worse Off than in Liquidation
PFMI	Principles for Financial Market Infrastructures
PTU	Partial Tear-Up
R&R	Recovery and Resolution
ReSG	FSB Resolution Steering Group
SITG	Skin-In-The-Game
EU	European Union
VMGH	Variation Margin Gains Haircutting

The recent periods of market turmoil have demonstrated the benefits that central clearing brings for global financial stability. Progress in implementing the G20 regulatory reforms agreed after the 2008 financial crisis has encouraged the use of CCPs, as well as enhanced CCP resilience, recovery planning and resolvability.

However, the shift to central clearing has also further increased the systemic importance of CCPs. The international policy framework for CCPs needs to reflect the evolving role of central clearing in order to address risks to financial stability in an effective manner.[1]

1 Introduction

Central counterparties (CCPs), also known as clearing houses, are essential infrastructures for the overall safety and soundness of the financial system. Their increasing systemic importance and high level of interdependence with the rest of the financial system justify the authorities' taking measures to ensure that they do not become a source of systemic risk and that should a CCP fail, it can be resolved with no negative effect on financial stability and without exposing taxpayers to loss.

In response to the global financial crisis and in order to strengthen the soundness and resilience of the financial system, in October 2011, the Financial Stability Board (FSB) approved, among other measures, its Key Attributes of Effective Resolution Regimes for Financial Institutions, which establish the main elements of an effective resolution regime. These Key Attributes were updated in 2014 to extend their application to non-bank financial institutions such as systemically important market infrastructures, in particular CCPs.[2]

Although this document and subsequent reports are based on previous work carried out for the banking sector, they have been adapted to reflect the different risks and business profiles of CCPs. However, unlike the banking sector, the evaluation of the sufficiency and adequacy of the financial resources available to a CCP to address potential defaults, avoid bankruptcy and ensure the continuity of its critical functions is largely unexplored territory, since there have been very few cases in which losses incurred by a member have exceeded the resources held to cover them, and even fewer cases of bankruptcy of a CCP.

The latest development in this area is the FSB's recent publication of its *Guidance on financial resources to support CCP resolution and on the treatment of CCP equity in resolution*[3] (FSB 2020 Guidance).

The purpose of this Guidance is to help the resolution authorities apply the principles embodied in the Key Attributes from a practical standpoint, in order to

1 FSB (2020). *FSB releases guidance on CCP financial resources for resolution and announces further work*. 16 November.

2 FSB (2014). *Key Attributes of Effective Resolution Regimes for Financial Institutions*. October.

3 FSB (2020). *Guidance on financial resources to support CCP resolution and on the treatment of CCP equity in resolution*. 16 November.

establish the composition and amount of financial resources required to support the resolution of a CCP. However, as explained in Section 5 of this document, the Guidance itself envisages its being revised in the light of experience gained on application. Further, given the close link between resilience, recovery and resolution, the joint work programmes of the FSB, the Committee on Payments and Market Infrastructures (CPMI) and the International Organization of Securities Commissions (IOSCO) envisage the development of international policy on the use, composition and amount of financial resources in recovery and resolution to further strengthen the resilience and resolvability of CCPs.

This article presents and analyses the content of the FSB 2020 Guidance and puts its application into context with a review of the functions and the systemic importance of CCPs and their interaction with the banking sector, which justify strengthening the regulation of these infrastructures. Lastly, future challenges and work to be done in the field of policy and in the implementation and evaluation of the resilience and resolvability of CCPs are identified.

2 Role and systemic importance of CCPs in the financial system

The key role of CCPs in the financial system and their growing systemic importance have made these infrastructures "too big to fail". While unlikely, if the lines of defence of a CCP were to prove insufficient to deal with a crisis, a scheme would have to be available to ensure the continuity of its essential functions, preserving financial stability and without taxpayers to loss.

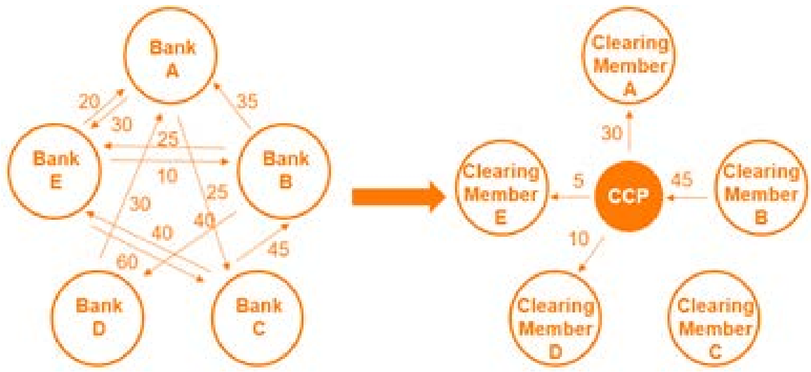
2.1 How a CCP works and how it interacts with banks

Registering a trade in a CCP gives rise to a purchase transaction and a sale transaction, for both of which the CCP is the counterparty. It is responsible for intermediating and ensuring compliance with the obligations of each party during the term of the contract or transaction. In the absence of default by either party, the CCP's open position is zero, known as a "matched book" (long positions are matched with equal and opposite short positions). Thus, the clearing house is neutral as regards market risk. In the event of default by a member, the clearing house would act immediately to return to a zero net position.

Further, as described in the PFMI (Principles for Financial Market Infrastructures), CCPs often require participants to provide collateral (through initial margins and other financial resources) to cover their current and potential future exposures. CCPs can also mutualise certain risks through mechanisms such as default funds.

In this way, through the multilateral netting of positions, collateralisation and the mutualisation of losses, CCPs reduce aggregate counterparty risk and help to lower risks and interconnections throughout the financial system, as shown in Illustration 1.

Bilateral clearing vs. central clearing ILLUSTRATION 1



This example shows how the involvement of the CCP reduces the number of transactions from 11 to 4. The total counterparty risk goes from 360 to 90. The net position of the CCP is zero, although it maintains an exposure of 45 and a further 3 of the opposite sign that adds up to the same amount.
Source: CNMV, based on data from the European Association of CCP Clearing Houses (EACH). *How does clearing work?*

This centralising function of counterparty risk management in financial markets means that CCPs present a high degree of interdependence with banks since the main banks are precisely the most important clearing members of CCPs. Banks are also critical service providers for CCPs, providing custody and settlement, liquidity and collateral services. In addition, banks can be shareholders.

This interaction acquires systemic importance as a consequence of obligatory central clearing, the principle of mutualising losses among the clearing members in the event of default and the high degree of interdependence with the rest of the financial system, which makes it a potential source of financial contagion. However, the nature of their systemic importance differs from that of the banks due to their different roles and how these roles give rise to different risk profiles.

While CCPs are risk managers, banks are primarily risk takers. In general, a bank can be said to be dedicated to the transformation of liquidity and maturities and, therefore, is exposed to the credit risk of its borrowers, as well as the liquidity risk that arises from the mismatch between its sources of financing and its assets.

While the systemic importance of CCPs stems largely from their central and essential role in the market in which they operate, whereas that of the banks generally stems from the size and complexity of their activities, the two are interdependent, which also means that CCPs are affected by bank risks and vice versa.[4]

Unlike banks, CCPs do not generally operate with leverage and do not issue debt. The equity of a CCP is rather small relative to its clearing volume. The banks' lines of defence are based on their own funds and on the issue of debt to absorb losses, while the lines of defence of a CCP are supported mainly by the resources of its

4 See Hughes, D. and Manning, M. (2015). "CCPs and Banks: Different Risks, Different Regulations". *RBA Bulletin*. December.

members (prefunded or committed), especially banks. As explained in Section 3.2 of this document, these prefunded resources may include: i) the initial margin[5] of the defaulting participant; ii) the contribution of said participant to the collective guarantee or the default guarantee fund;[6] iii) a portion of the CCP's equity, known as "skin in the game" (SITG) and iv) contributions from other participants to the collective guarantee or default guarantee fund. In addition, the operating rules of CCPs usually envisage the possibility that, if necessary, the central counterparty will require its members to contribute fresh funds to absorb losses and additional resources to replace the prefunded resources, so that it can continue its activity.

Given its function and structure, a CCP cannot generally be the initial trigger of stress, as a CCP will only transmit stress after the default of one or more of its participants or of an investment counterparty.

If in this situation the initial margin and default funds were to be eroded, the ability of the CCP to regain its financial strength would depend on the ability of its clearing members to absorb large and unexpected losses. This could be challenging in situations of severe market stress, when banks may be under credit and liquidity pressures from multiple sources, may lack the resources to contribute to the CCP's recovery, or may even be in resolution themselves, or end up in resolution as a result of a CCP crisis. Consequently, CCPs could become a channel of contagion for systemic risk, to the detriment of financial stability. Therefore, due consideration of the macroprudential implications is essential when assessing the recoverability and resolvability of a CCP.

2.2 Simultaneous application of bank and CCP resolution regimes

In principle, a CCP should be able to withstand the simultaneous failure of the two clearing members to which it has the largest exposure.[7] Consequently, it can be assumed that if a CCP were to enter into resolution due to default-related losses, this would mean that several of its biggest clearing members are in serious trouble. Likewise, it is reasonable to assume that these large clearing members – often Global

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5 The Initial Margin is defined in the PFMI as collateral that is collected to cover potential changes in the value of each participant's position, i.e. potential future exposure, over the appropriate close-out period in the event that the participant defaults.

6 The guarantee or default guarantee fund is a prefunded default mechanism.

7 Principle 4 of the PFMI (Credit Risk) states the following: "(…). An FMI should maintain sufficient financial resources to cover its credit exposure to each participant fully with a high degree of confidence. In addition, a CCP that is involved in activities with a more-complex risk profile or that is systemically important in multiple jurisdictions should maintain additional financial resources sufficient to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the two participants and their affiliates that would potentially cause the largest aggregate credit exposure to the CCP in extreme but plausible market conditions". In line with the above, Article 42, paragraph 3, of the EMIR Regulation establishes the following: "The default fund shall at least enable the CCP to withstand, under extreme but plausible market conditions, the default of the clearing member to which it has the largest exposures or of the second and third largest clearing members, if the sum of their exposures is larger".

Systemically Important Financial Institutions (G-SIFIs) – will not fail either, but will instead enter into resolution.[8]

Hence, in the unlikely event of the resolution of a CCP, the bank and CCP resolution regimes will be applied simultaneously. This situation makes it advisable for the resolution authorities for the two processes to be different for reasons of effectiveness (due to the difficulty of simultaneously managing two highly complex resolution processes), efficiency (to optimise the available capacity of each of the authorities) and to prevent any potential conflict of interests in reaching the resolution objectives and in the exercise of their different functions concerning the CCP and its members.

In the resolution of a bank, the objectives are to maintain the key functions of the bank, normally related to its intermediation activity between depositors and borrowers, and to the protection of depositors, and the funds and assets of its customers. In the resolution of a CCP, the primary objectives are to ensure the continuity of its key functions, as a guarantor of the fulfilment of the obligations under the contracts in which it is involved. In both cases, the aim is to prevent any negative effect on financial stability and protect public funds.

The regulation and supervision of CCPs correspond to the securities markets, although, since there is a strong connection with both the banking sector and central banks, the rules ensure close coordination and cooperation, which also occurs at the level of the standard setters.

In the European Union, CCP resolution is not addressed under the Banking Union and the Single Resolution Mechanism, the competence to decide on and manage such resolution resting with the authorities of the Member States. The main reason is that the cost of the resolution, in the event that public aid is required, falls to the Member State, and no single system has yet been set up at the level of the European Union.

The probable simultaneous application of CCP and bank resolution regimes, however, reinforces the need for close coordination and cooperation among the authorities. In the European Union, this collaboration is ensured by the CCP R&R Regulation,[9] since it stipulates that both resolution authorities and the supervisors of the banks that are members of the CCP will participate in the resolution college[10] as voting members.

8 The agreements adopted by the G20 in the wake of the 2008 global financial crisis to address risks to the global financial system from systemically important financial institutions, deemed "too big to fail" include the adoption of effective resolution regimes that allow the bankruptcy of these entities to be managed in an orderly manner that limits the general impact on economic activity and without exposing taxpayers to loss. These bank resolution regimes have been implemented in FSB jurisdictions for the last ten years.

9 Regulation (EU) 2021/23 of the European Parliament and of the Council of 16 December 2020, on a framework for the recovery and resolution of central counterparties and amending Regulations (EU) No. 1095/2010, (EU) No. 648/2012, (EU) No. 600/2014, (EU) No. 806/2014 and (EU) 2015/2365 and Directives 2002/47/EC, 2004/25/EC, 2007/36/EC, 2014/59/EU and (EU) 2017/1132 (for further information, see Exhibit 1).

10 The CCP R&R Regulation provides a framework for close coordination between the authorities involved in any resolution of a CCP, through the Resolution Colleges. This ensures that resolution measures are

Participation in the resolution college is aimed, *inter alia*, at ensuring that information is shared and that the CCP plan measures do not disrupt the plans of the member banks, at considering the banks' loss-absorbing capacity and the resulting risk of contagion and, in short, at contributing to assessing the implications on financial stability of the resolution measures envisaged for the CCP.

The CCP R&R Regulation also recognises ESMA as the European authority of reference for CCP resolution. ESMA will create a permanent resolution committee (ESMA ResCo) with coordination and regulatory development functions similar to those currently performed by the EBA. The CCP resolution authorities will form part of ESMA ResCo as voting members, while the banking resolution and supervision authorities, including the EBA itself, will take part as observers.

In short, given that both bank and CCP resolution regimes can be activated simultaneously, and taking into account the complex interactions between banks and CCPs, the resolution regulations for both aim to factor in the consequences of the resolution of credit institutions on CCPs, and vice versa.

On the one hand, ensuring close cooperation between the authorities involved, providing tools and principles to ensure the effectiveness, proportionality and due consideration of the interested parties, in addition to financial stability and fiscal resources. And on the other, ensuring that resolution measures are applied in a balanced and proportionate manner, avoiding, as far as possible, the destruction of value and procyclical and disruptive effects.

2.3 Systemic importance of CCPs. Volumes, interconnections and concentration

Recent periods of turbulence in the financial markets due to the crisis caused by the COVID-19 pandemic have corroborated the benefits of central clearing for global financial stability.[11] Progress in implementing the reforms agreed by the G20 in response to the global financial crisis that began in 2008 has encouraged the use of CCPs and improved their resilience, recoverability and resolvability.

However, CCPs have also gained systemic importance with the shift to the obligation to centrally clear standardised OTC derivatives contracts.[12] This function has turned CCPs into risk nodes and interconnections in their own right, while their importance in Europe and globally has increased considerably, especially in the field of interest rate derivatives (IRD) and credit default swaps (CDS).

According to the OTC derivatives statistics published by the Bank for International Settlements (BIS), a large proportion of the US$607 trillion worth of outstanding

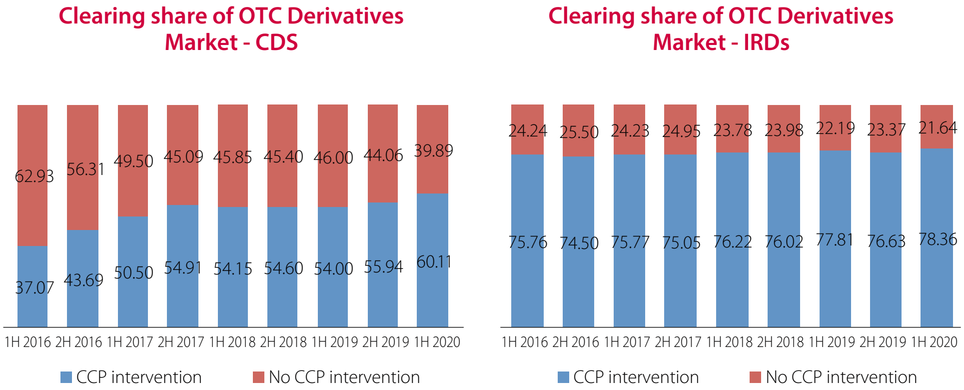
applied consistently, taking into account the impact on the affected stakeholders and financial stability.

11 See FSB report (2020). *Holistic Review of the March Market Turmoil*. 17 November.

12 At the Pittsburgh summit on 26 September 2009, the G20 leaders agreed, among other measures to strengthen the international financial regulatory system, that by the end of 2012 all standardised OTC derivatives contracts should be cleared through a CCP and that OTC derivatives contracts should be reported to trade repositories.

derivatives contracts worldwide are cleared through CCPs, 16 of which are located in the European Union. As shown in Figure 1, at the end of the first half of 2020, more than 60% of CDS and almost 80% of IRDs were centrally cleared.

Growth of central clearing FIGURE 1



Source: CNMV, and BIS (2020). *OTC derivatives outstanding* (Table D5.1 - D5.2).

The role of banks in the central clearing process takes on particular relevance in the case of Global Systemically Important Banks (G-SIBs). In fact, the more systemic the bank, the greater the number of CCPs of which it is a member. Therefore, central clearing can be considered a highly interconnected and concentrated process, as shown in Figure 2.

To more clearly understand and illustrate these relationships, the FSB, together with the CPMI, IOSCO and BCBS have analysed the interdependencies[13] among clearing houses, clearing members and other financial service providers, confirming that a failure in one of the core elements of a network would probably have significant consequences for the rest of its components. The results of this analysis, published in 2018, corroborate the following:

– Prefunded financial resources (initial margins and default fund) are concentrated in a small number of CCPs.

– Exposures to CCPs are concentrated in a small number of institutions.

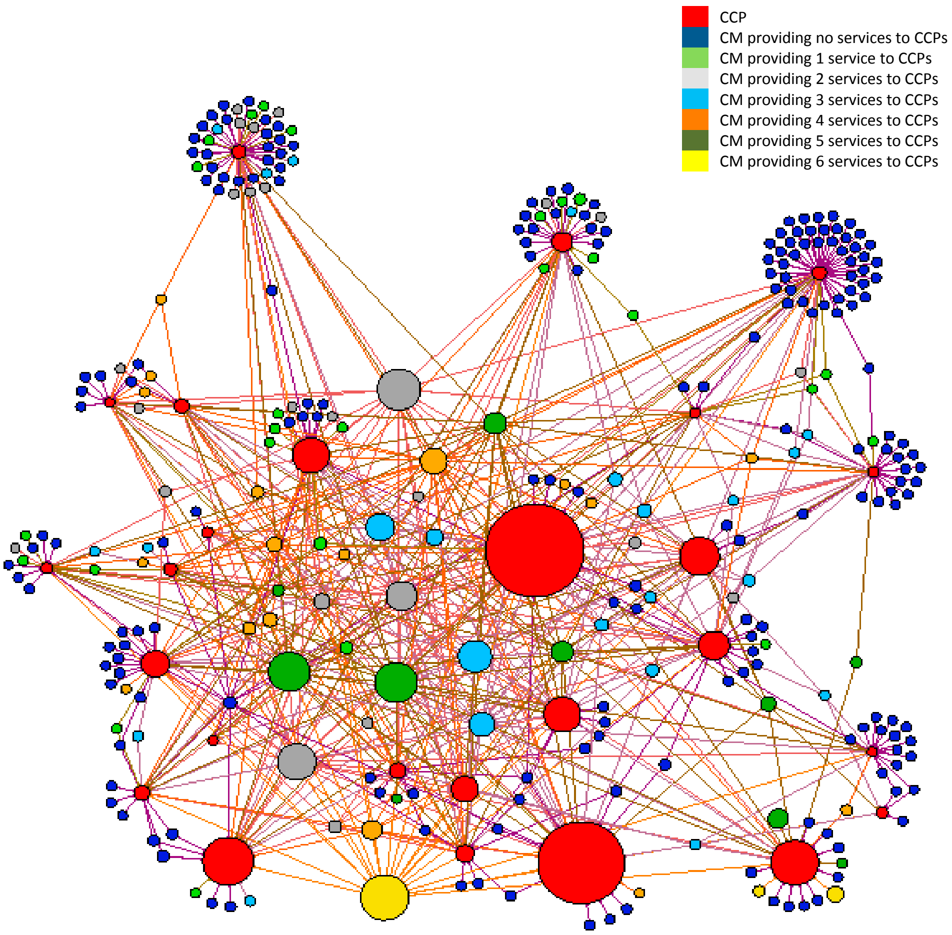
– A small number of institutions tend to dominate the provision of all the critical services required by CCPs.

– Clearing members and their group entities are also major providers of other critical services required by CCPs and may maintain different kinds of relationships with multiple CCPs simultaneously.

13 FSB, CPMI, IOSCO and BCBS (2018). *Analysis of Central Clearing Interdependencies*.

Figure 2 provides a global overview of the network of relationships among clearing members and CCPs[14] and illustrates the high degree of interconnectedness among the largest and most important clearing members, and between these entities and the CCPs in which they participate or to which they provide critical services. Most of these institutions are global systemic banks.

Relationships between CCPs and service provider members FIGURE 2



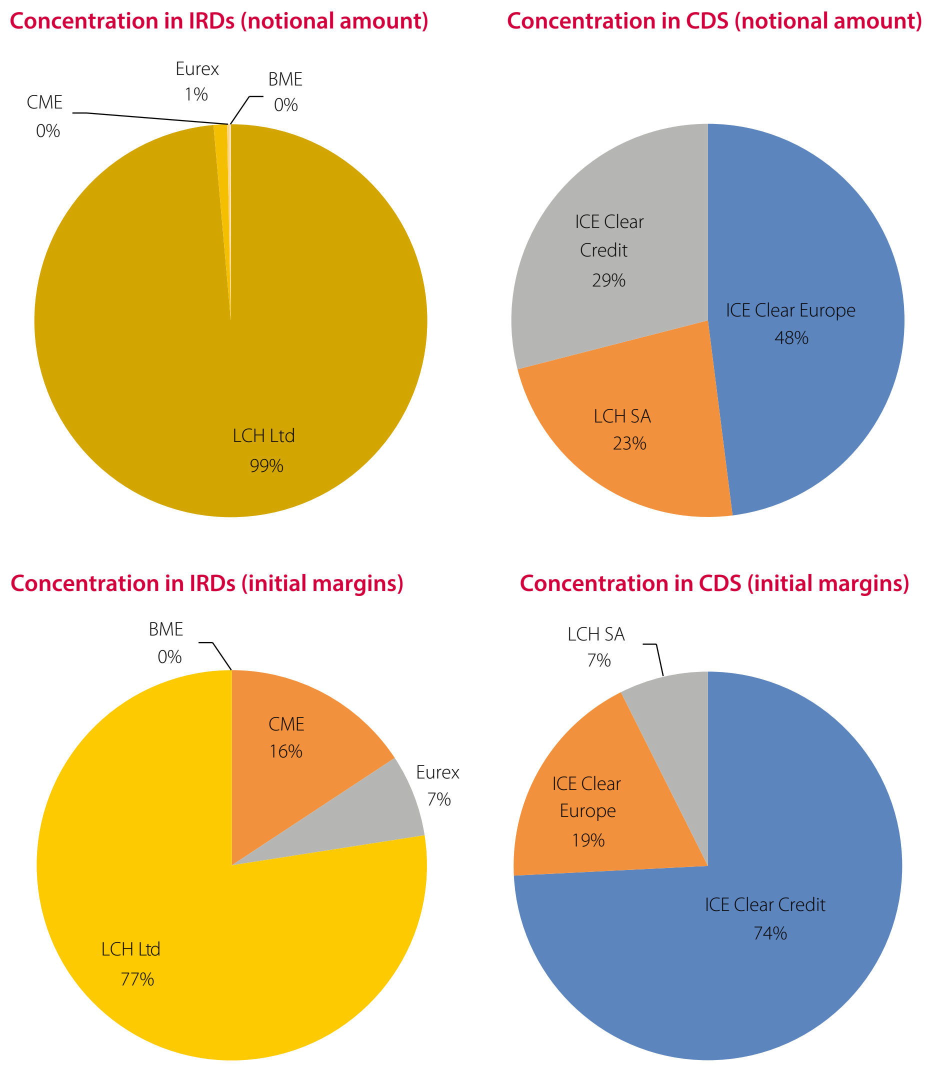
Source: Image taken from FSB, CPMI, IOSCO and BCBS (2018). *Analysis of Central Clearing Interdependencies*, p. 12.

A study published by the BIS[15] corroborates the observation that as OTC derivatives clearing has grown, it has become increasingly concentrated in a smaller number of CCPs. This trend is clear in the case of CDS and even more so for interest rate derivatives (IRDs). For example, for transactions in euros, ICE Clear Europe has a clearing share of 48% of CDS and LCH SwapClear has a share of over 98% in IRD transactions in euros (Figure 3).

14 In the figure, the CCPs are represented in red and the differently-coloured nodes are the members that also provide various services. The size of the CCP nodes represents an approximation of the clearing house's credit risk exposure to all its clearing members. The size of the clearing member node is a measure of the total prefunded financial resources that the member has deposited or contributed among all CCPs to which it belongs, so that these nodes represent its exposures to CCPs.

15 Faruqui, U., Huang, W. and Takáts, E. (2018). "Clearing risks in OTC derivatives markets: the CCP-bank nexus". *BIS Quarterly Review*. December.

Concentration by CCP in the OTC derivatives market in euros FIGURE 3



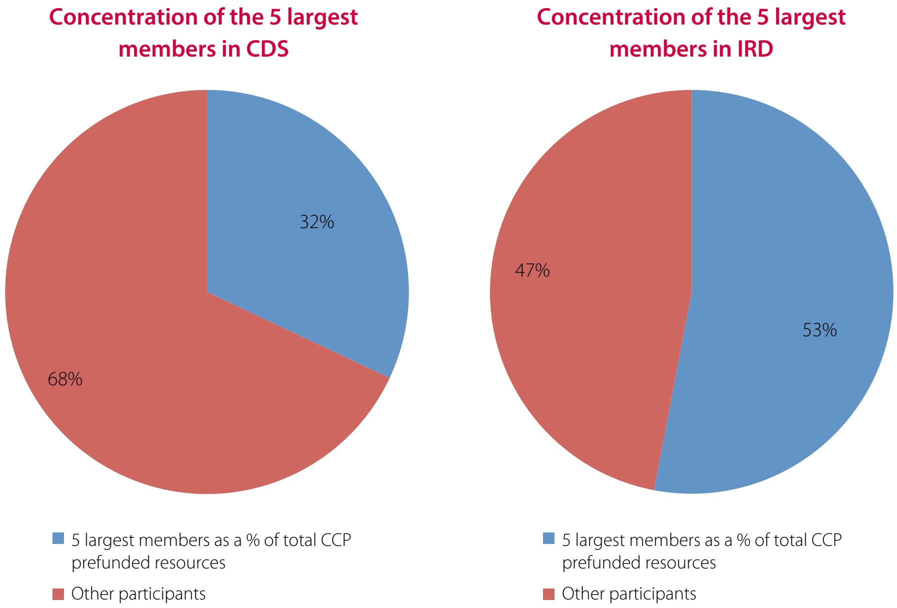
Source: Khwaja, A. (2019). "2018 CCP Market Share Statistics". Clarus Financial Technology. EACH - Public Quantitative Disclosure of CCPs. Available at:https://www.eachccp.eu/cpmi-iosco-public-quantitative-disclosure/ and https://www.cmegroup.com/clearing/cpmi-iosco-reporting.html.

In terms of the initial margin (although this is not a commonly used parameter to measure market share), LCH would have a 77% share in IRDs and ICE Clear Credit a share of 74% in CDS. Measured in terms of notional amount, however, LCH Swap Clear would have a share of close to 100%.

This work also shows that a small group of systemically important institutions (all banks) contribute half of the prefunded resources in CDS and a third in IRDs to CCPs on a global level (Figure 4). This is because it is cheaper for banks to participate in a limited number of CCPs and because of the efficiency of multilateral clearing between different counterparties, which reduces the total margin amount. Thus, the lower the number of CCPs through which a bank operates, the lower the associated collateral and capital requirements.

Concentration of prefunded resources of CCPs by clearing member

FIGURE 4



Source: CNMV, and Faruqui, Huang and Takáts (2018). (*Op. cit.*).

At the European level, ESMA has analysed the concentration of clearing member margins in CCPs[16] and concludes that although the level of concentration in the five largest members is low on average, there is great disparity among CCPs in the European Union, and some of these have a large concentration in a small number of members, which may have significant implications for financial stability.

The ESRB for its part has established a series of indicators to monitor the evolution and trends in central clearing in the European Union from a macroprudential standpoint.[17]

In summary, the growth in the global clearing of OTC derivatives has made this activity highly systemic and characterised by a high level of interconnectedness and concentration in banks and CCPs alike. This occurs, among other reasons, because the main clearing members operate simultaneously through several CCPs (while the CCP is unaware of the resources committed in other CCPs) and normally provide custody, settlement or financing services that are important to the continuity of the basic functions of the CCP. Therefore, the behaviour and risks of banks and CCPs are closely related.[18]

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16 ESMA (2020). *EU Derivatives Markets. Annual Statistical Report 2020*, p. 43.

17 In addition to the indicators that the ESRB includes in its risk panel, the working document Alfranseder, E., Fiedor, P., Lapschies, S., Orszaghova, L., Sobolewski, P. (2018). *Indicators for the monitoring of central counterparties in the EU*. ESRB Occasional Paper Series, No. 14, March, offers a complete overview of the appropriate indicators for monitoring the systemic risk inherent in CCPs and makes some proposals to improve the quality of the information available for compiling these indicators.

18 Domanski, D., Gambacorta, L. and Picillo, C. (2015) "Central clearing: trends and current issues". *BIS Quarterly Review*. December, discusses the multiple links between banks and central clearing that can help

3 Strengthening the resilience and resolvability of CCPs

As the systemic importance of CCPs and their pivotal role in the financial system have increased, the authorities have made significant efforts to make them more resilient. In particular, a strict risk management policy has been implemented, along with rigorous stress tests, and measures have been introduced to reduce the procyclicality of margins.

In parallel, capital requirements have been imposed on members to ensure that banks' capital and liquidity cover the risks associated with their exposure to CCPs.[19] Transparency has been improved and supervision and cooperation between the authorities involved have been strengthened, both at national and cross-border level. More recently, the foundations of an effective resolution system have been laid.

3.1 Principles and regulation on resilience, recovery and resolution

The CPMI-IOSCO Principles for Financial Market Infrastructures (PFMI)[20] published in 2012 represent a milestone in the regulation of CCPs, together with the revision of the FSB Key Attributes[21] in 2014 to adapt them to market infrastructures. In 2017, as a result of the joint work of the FSB, CPMI, IOSCO and BCBS:

– CPMI and IOSCO established additional guidance on PFMIs in relation to the resilience of CCPs,[22] in particular on governance, credit and liquidity stress tests and CCP contributions to losses with their own financial resources.

– CPMI and IOSCO also updated their 2014 guidance on the recovery of financial market infrastructures[23] to provide clarification on the operability of recovery plans, losses unrelated to member default, and transparency in regard to recovery tools and their application.

– The FSB published its guidance on CCP resolution planning, which provides direction on the implementation of the Key Attributes, discusses the use of loss allocation tools, the development of resolution plans and the formation of crisis management groups (CMGs) for CCPs considered systemically important in more than one jurisdiction.[24]

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amplify systemic risks and concludes on the need to improve the understanding of the implications of these for the financial system under normal and stressed conditions.

19 Capital requirements for bank exposures to CCPs can be found in BCBS (2019). *Capital requirements for bank exposures to CCP*.

20 CPMI-IOSCO (2012). *Principles for financial market infrastructures.* April.

21 FSB (2014). (*Op. cit.*)

22 CPMI-IOSCO (2017). *Resilience of central counterparties (CCPs): further guidance on the PFMI*. July.

23 CPMI-IOSCO (2017). *Recovery of financial market infrastructures.* July (revision of the same document of October 2014).

24 FSB (2017). *Guidance on central counterparty resolution and resolution planning*. July.

More recently, and as a continuation of the work to improve the capacity of a CCP to effectively manage the default of its members and, consequently, improve its resilience, the CPMI-IOSCO has published a document on aspects to consider in auctions[25] of positions of defaulting members, in order to help improve these processes.[26]

In the European Union, the regulation of CCPs and the obligation to centrally clear OTC derivatives are included in Regulation (EU) 648/2012 (EMIR),[27] based on the PFMI. In 2019, this Regulation was amended to strengthen the supervision of CCPs from third countries with systemic importance in the European Union.[28]

To date, not all jurisdictions with systemic CCPs have a recovery and resolution regime for these institutions. According to the latest resolution report published by the FSB, only six of the ten jurisdictions that have systemic CCPs have approved a specific regulation.[29]

In the European Union, this Regulation was recently approved under the CCP R&R Regulation, a synthesis of which is presented in Exhibit 1.

3.2 CCP lines of defence. Use of the default waterfall

Under the PFMI, systemically important CCPs must have a sound, comprehensive and appropriate risk management system for the continuous operation of their critical services, while offering incentives to participants, shareholders, clients and other stakeholders to take part in this system and carry out their functions properly. To guard against circumstances in which the resources and tools available to a normal CCP are not sufficient, there must be recovery and resolution plans containing additional measures at the disposal of the CCP and its resolution authorities.

Illustration 2 shows the financial resources for addressing defaults in each of the phases.[30]

25 These auctions can be used by CCPs to transfer positions from a defaulting participant to a non-defaulting participant, allowing the CCP to restore its matched book.

26 CPMI-IOSCO (2020). *Central counterparty default management auctions – Issues for consideration*. June.

27 Regulation (EU) No. 648/2012 of the European Parliament and of the Council of 4 July 2012 on OTC derivatives, central counterparties and trade repositories.

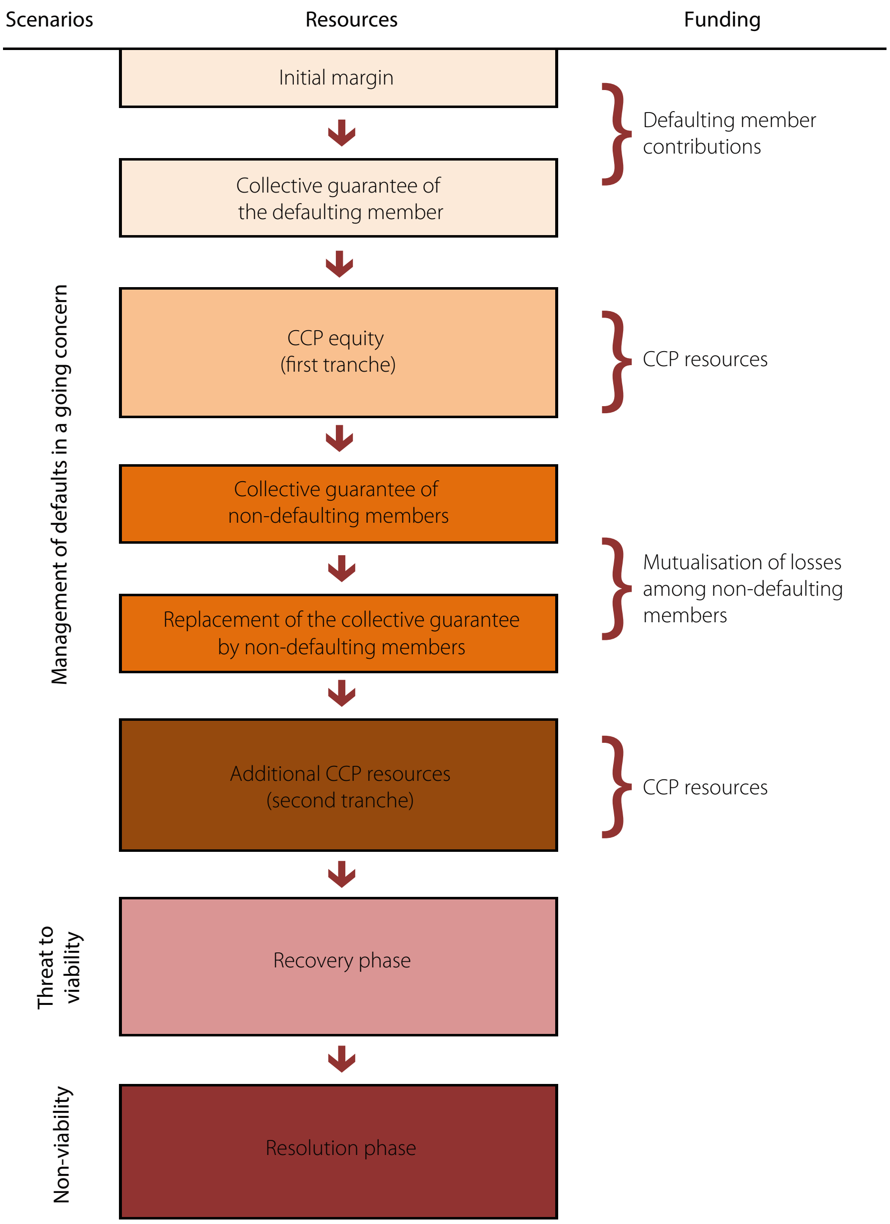
28 Regulation (EU) 2019/2099 of the European Parliament and of the Council of 23 October 2019 amending Regulation (EU) No. 648/2012 as regards the procedures and authorities involved for the authorisation of CCPs and requirements for the recognition of third-country CCPs.

29 FSB (2020) *2020 Resolution Report. November.*

30 According to the PFMI, the management of defaults by a CCP must include, among other things, mechanisms that allow the positions of defaulting members to be managed and closed, and any collateral realised in a prudent and orderly manner. This process may involve hedging open positions, funding collateral so that positions can be closed over time, auctioning defaulting members' positions, or assigning the open positions to other non-defaulting members.

CCP resources to address defaults

ILLUSTRATION 2



Source: CNMV.

3.2.1 Risk management as a going concern

Central clearing is based on the principle that CCPs always have a matched book and on the mutualisation of losses in the event of default that cannot be covered by the collateral posted by their members to cover the potential risk of their positions. Thus, the main lines of defence to offset losses due to counterparty risk are the resources contributed by the clearing members, the initial margin, the contributions to the default fund, and possible further contributions from the members, in addition to the part of the CCP's equity or "skin in the game" (SITG). These resources make up what is known as a "default waterfall".

Thus, if a member defaults, the CCP will unwind its positions, normally auctioning these off among the other members, and cover the remaining loss with the initial margins of the defaulting member and its contribution to the default fund. If necessary, the CCP will use part of its capital and, ultimately, resort to the contributions made to the default fund by the remaining members.[31]

While clearing members provide significant prefunded resources to CCPs to reduce the risks arising from potential default, this line of defence may be insufficient to deal with extreme situations.

3.2.2 Recovery

For this reason, and as part of the risk management process, CCPs must draw up an effective recovery plan for extreme circumstances that could threaten their viability and financial soundness, which would allow them to continue providing critical services if these circumstances were to arise.

The recovery plan must address extreme conditions that may lead to uncovered losses, liquidity shortfalls or insufficient capital, as well as any structural weaknesses. The recovery plan should also deal with the need to replenish prefunded financial resources and liquidity arrangements so that the CCP can remain viable as a going concern and continue to provide critical services.

To do this, the CCP must consider a series of available recovery tools that allow it, in the different identified scenarios, to allocate losses for which there are no prefunded resources and cover liquidity shortfalls, restore the matched book and replenish the financial resources used, including the CCP's equity, in order to continue to provide critical services.

The tools must be transparent, included in the CCP's internal rules and designed to allow its participants to control and manage their potential risk exposure, while creating the right incentives for all parties involved to control the amount of risk that affects the system, and participate in the management of risks and defaults. The tools should also be designed to minimise the negative impact on direct and indirect participants and the financial system in general.[32]

3.2.3 Resolution

Although the possibility is remote, if the waterfall is not sufficient to cover the losses and the recovery plan is unable to restore the viability of the FMI or has not been implemented in a timely and appropriate manner, the authorities would, as indicated in the Key Attributes, have the power to require the CCP to enter into resolution.

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31 A full description of how the CCP's lines of defence work and are calculated can be found in Núñez, S. and Valdeolivas, E. (2019). "Central counterparties: benefits, costs and risks". Bank of Spain, *Financial Stability Review*, No. 36.

32 CPMI-IOSCO report (2017). *Recovery of financial market infrastructures*. July, provides a complete overview of the recovery planning process, the content of recovery plans and the possible tools that can be considered, as well as the scenarios that can trigger their use and the characteristics of the most suitable tools in the context of those scenarios.

This decision could also be taken when, even if the recovery plan has not been fully implemented, the authority considers that the recovery measures will not be sufficient to restore the viability of the CCP or financial stability is likely to be compromised.

Unlike the recovery phase, which the CCP itself is responsible for activating and implementing, a resolution can only be triggered by the decision of a resolution authority.

In the European Union, the recently approved and published CCP R&R Regulation provides the appropriate legal framework to manage situations that imply the non-viability of a CCP (see Exhibit 1). The European Regulation is based on the FSB's Key Attributes and on the same principles as the recovery and resolution framework that applies to banks. However, given that the business carried out by CCPs is very different from that of banks, the tools contained in the Regulation are better aligned with the risk and business profile of these entities. Exhibit 1 contains a summary of its main elements.

European Regulation on the recovery and resolution of central counterparties EXHIBIT 1

The main objectives of the CCP R&R Regulation are: to ensure the continuity of critical CCP functions, maintain financial stability and ensure taxpayers are not exposed to costs associated with restructuring and resolution of bankrupt clearing houses.

The new Regulation is based on the following pillars:

– **Prevention and preparation**. CCPs and resolution authorities are required to develop recovery and resolution plans setting out how to manage any form of financial difficulty that depletes the CCP's existing resources. If the resolution authorities identify any obstacles during the course of the planning process, they may require the CCP to take appropriate action to remove them.

– **Early intervention**. The supervisory authorities have early intervention powers that allow them to act before a problem becomes critical and the financial situation deteriorates irreparably. For example, they may require the CCP to take specific actions in its recovery plan or to make changes to its business strategy or legal or operational structure.

– In the unlikely event of the failure of a CCP, the national authorities may use **resolution tools** to restore the matched book and absorb losses. Such tools include the cancellation of contracts, the write-down of own instruments, cash calls on clearing members, variation margin gains haircutting, sale of the CCP or parts of its business, or the creation of a bridge CCP. Although the purpose of the resolution measures is to prevent the costs associated with the failure of a CCP being passed on to the taxpayer, in exceptional circumstances the regulation envisages, as a measure of last resort, the possibility of providing extraordinary public support on a temporary basis, providing there is a solid and credible recovery plan in place.

The CCP R&R Regulation does not specify which tools and competencies should be used in each of the possible resolution scenarios. It leaves the choice of the most appropriate tool for each situation to the discretion of the resolution authority. Whenever possible, the resolution authority should act in accordance with the agreed resolution plan.

– **Safeguards and compensation**. The use of resolution tools is governed by certain safeguards to ensure that all affected parties are treated fairly. Thus, the Regulation endorses the 'no creditor worse off' (NCWO) principle, according to which no creditor should be worse off in the event of resolution than it would be if the CCP went into liquidation. The Regulation also provides for a compensation mechanism that allows the resolution authorities to require the CCP to compensate non-defaulting members entitled to a NCWO claim with shares of the CCP, debt instruments or rights to future earnings.

– **Institutional framework and coordination between authorities and jurisdictions**. Each State must designate at least one resolution authority, there being no resolution authority for CCPs at the European level, in contrast with the situation for banks, where there is the Single Resolution Mechanism. The resolution authority must have operational and functional independence to prevent any conflict of interest with the supervisor, but they must act in a coordinated manner.

Taking into account the global and systemic nature of CCPs, the Regulation establishes close coordination between national authorities and those of other jurisdictions in which the CCP is relevant within the framework of resolution colleges, in order to ensure that the resolution measures are applied consistently, taking into account the impact on the affected stakeholders and financial stability.

ESMA plays a key role as the European reference authority for CCPs. A permanent committee has been created, the ESMA Resolution Committee, with coordination and regulatory development functions similar to those of the European Banking Authority (EBA), on which the CCP resolution authorities will sit, with the bank resolution and supervisory authorities (including the EBA) as observers.

– The CCP R&R Regulation also provides for the possibility of **temporarily suspending the central clearing obligation** for CCPs in resolution, when this serves the overall purpose of preserving financial stability. The decision will be made by the European Commission, at the request of the resolution authority for the CCP in resolution or its competent authority, following a non-binding opinion from ESMA. This decision should only be taken when it serves the overall purpose of preserving financial stability and market confidence, in particular, to prevent contagion and avoid counterparties and investors having large and uncertain exposures to a CCP.

The Regulation **comes into force immediately, with staggered application** over a period of up to two years, so that during that period the second-level regulation can be developed and approved for practical implementation, the corresponding resolution authorities can be appointed and the resources necessary for the exercise of their functions can be provided.

It was published on 22 January 2021. The provisions for recovery plans are applicable from February 2022. The provisions regarding the CCP's second tranche of equity and rights to future profits in recovery are applicable from February 2023 and the remaining provisions will apply from August 2022.

Although in Spain no CCP resolution authority has been officially designated to date, the CNMV, in its capacity as the competent authority for supervision, has been exercising this function in the preparation and analysis of CCP resolvability. In accordance with FSB guidelines, the CNMV has created and chairs the crisis management group at BME Clearing, the forerunner of its resolution college. In terms of organisation and resources, since 2015, the CNMV has had a unit in place to which resolution functions have been assigned, which is hierarchically and functionally separate from the units that carry out the supervisory functions of the CCP, as required by the European Regulation.

The new European Regulation provides a set of instruments and powers that the resolution authority may apply in different circumstances to deal with the non-viability of a CCP, requiring compliance with all pending contractual obligations whenever possible. In the case of member default losses, the resolution authority must rematch the CCP's portfolio and allocate outstanding losses through position and loss allocation instruments. Non-default losses must be absorbed by shareholders' equity instruments. If these instruments are not sufficient, the resolution authorities can write off the debt and the unsecured liabilities, in accordance with their priority under applicable Spanish insolvency regulations and apply loss allocation instruments to the necessary extent and without jeopardising overall financial stability. Table 1 lists the resolution tools envisaged in the new European CCP R&R Regulation.

Resolution tools envisaged in the CCP R&R Regulation

TABLE 1

Loss allocation tools		
Cash calls on non-defaulting members	➔	To cover default and non-default losses, restore its ability to meet its payment obligations, replenish prefunded resources, and recapitalise the CCP. Cap: twice the contribution to the default fund. They must be included in the CCP regulations.
Variation margin gains haircutting	➔	To cover default and non-default losses, restore its ability to meet its payment obligations, replenish prefunded resources, and recapitalise the CCP. Cap: one x the contribution to the default fund to cover non-default losses. They must be included in the CCP regulations.
Position allocation tools		
Total or partial termination of contracts	➔	Termination of contracts affected by the default, or if necessary, of all contracts, to restore a matched book.
CCP loss absorption tools		
Write-down and conversion of equity and debt instruments	➔	To absorb losses, recapitalise the CCP or the bridge CCP, or support the sale of the business instrument. Shareholders' instruments should be written-down prior to the use of loss allocation tools in favour of non-defaulting members or in conjunction with this measure unless a different sequence can minimise deviations from the NCWO principle and better achieves the resolution objectives.
Asset transfer tools		
Sale of business	➔	Sale of all or part of the CCP to another entity.
Bridge CCP	➔	The authority creates a bridge CCP to which the essential functions would be transferred. This could be sold at a later date. Non-essential functions would be wound down.
Government stabilisation tools		
Public equity support	➔	Public financial support for the recapitalisation of a CCP in exchange for instruments of ownership. Last resort. At the same time, the write-down and conversion of equity and debt must be implemented. Credible State recovery plan.
Temporary public ownership	➔	The CCP would move into temporary public ownership through the transfer of instruments to the State. At the same time, the write-down and conversion of equity and debt must be implemented. Credible State recovery plan.

Source: CNMV, based on the CCP R&R Regulation.

Annexes 1 and 2 present practical examples of the application of resolution tools based on the allocation of losses caused by default of CCP members, in various scenarios, and by other events beyond their control.

In addition, the resolution authority must, once the losses have been absorbed and the portfolio has been rematched, ensure that the prefunded resources are restored to the levels required for the CCP to continue operating, following the applicable regulation. Lastly, the resolution authority should be able to compensate non-defaulting clearing members who are entitled to such compensation, in accordance with the NCWO principle, if the application of loss allocation instruments would result in larger losses than those that they would have suffered as a result of their obligations under the CCP's operating rules.

For a CCP to be resolved successfully, adequate financial resources and tools must be in place to support an orderly resolution and minimise any adverse effect on financial stability. As seen in previous sections, given the capital structure of a CCP and the absence of loss-absorbing debt, its loss-absorbing capacity when in distress depends largely on its members, through prefunded resources, such as the default fund, or committed resources, such as cash calls. The use of these resources may compromise the solvency of the members, create lines of contagion through their customers or other financial institutions, and could also be procyclical, exacerbating liquidity problems in times of stress. Similarly, the lack of suitable resources or tools would prevent the resolution authority from achieving its resolution objectives and could lead to greater financial instability.

As part of their resolution planning, the resolution authorities should periodically assess the adequacy of existing tools and resolution scenarios, and attempt to estimate their impact on the financial resources available for use in resolution, as well as the possible implications for financial stability deriving from their use.

To help authorities determine whether there are any gaps in the resources and tools available for resolution that need to be addressed, the FSB has published Guidance on financial resources to support CCP resolution and on the treatment of CCP equity in resolution, discussed in Section 4.

3.2.4 Advances in resolution planning

As the resolution of CCPs is a priority on the G20 agenda, one of the FSB's objectives is to achieve progress in resolution planning and analysis of the resolvability of CCPs considered to be of systemic importance in more than one jurisdiction, regardless of whether the corresponding jurisdictions have a specific legal resolution framework. For this purpose, the FSB has asked the authorities to set up Crisis Management Groups (CMGs) for these CCPs, made up of the relevant resolution and supervisory authorities of the jurisdictions involved in order to improve resolution preparation and facilitate its management and coordination at cross-border level.

There are currently 13 CCPs that are systemically important in more than one jurisdiction.[33] All the entities on the list, except one that has been recently included, have a CMG.[34]

33 The CPMI-IOSCO has identified these entities since 2017 and they are reviewed every two years using the FSB Guidance on CCP resolution and planning as a reference (SI > 1).

34 FSB (2020). *2020 Resolution Report*. 18 November.

List of CCPs that are systemically important in more than one jurisdiction TABLE 2

CCP	Home jurisdiction
BME Clearing	Spain
CC&G	Italy
CME Inc.	USA
Eurex Clearing	Germany
EuroCCP	Netherlands
HKFE Clearing Corporation	Hong Kong
ICE Clear Credit	USA
ICE Clear Europe	United Kingdom
LCH Ltd	United Kingdom
LCH SA	France
Nasdaq Clearing	Sweden
Options Clearing Corporation	USA
SIX x-clear	Switzerland

Source: FSB (2020). *2020 Resolution Report.* 18 November.

Throughout 2021, the corresponding authorities, in coordination with the CMGs of the systemically important CCPs are expected to make significant progress in planning and assessing the resolvability of these infrastructures.[35]

Specifically, resolvability will be assessed focusing on the adequacy of the financial resources available. To facilitate this assessment, work is under way to define scenarios that could lead to the resolution of CCPs. This definition is key to quantifying funding needs, so the stress events used must go beyond any extreme but plausible circumstances. However, it is not easy to accurately develop these types of scenarios to make them credible.

For this purpose, reverse stress tests could also be carried out, where the starting point is the non-viability of the CCP, with losses exceeding the available resources, and from there the scenarios that could lead to this situation are identified.

3.3 Importance of stress testing

The large number of interconnections and interdependencies of central clearing at cross-sector and cross-border level is undoubtedly the greatest indicator of its concentration of systemic risk (see Section 2.3 of this article). Therefore, further work must be done to better identify, measure and control this risk at a global level. We would highlight the work undertaken by the FSB in this area[36] in 2017 (based on data at 30 September 2016) to identify, quantify and assess the interdependencies among CCPs, their clearing members and service providers (custodians, settlement

35 The work plan is laid out in the FSB (2020). *2020 Resolution Report. 18 November 2020.*

36 FSB, CPMI, IOSCO and BCBS (2017). (*Op. cit.*).

banks, credit and liquidity providers, and investment counterparties), as well as their systemic implications. This study was last updated and expanded in 2018.[37]

The study, which is unique in the global central clearing field, provides a good starting point for understanding the possible sources of systemic risk in this activity, although, as the report itself recognises, it is not an exercise or stress test aimed at assessing the resilience of the framework that supports central clearing on a worldwide scale, but is limited to analysing its level of interconnection.

At the European Union level, ESMA, in coordination with the ESRB and national supervisory authorities, has been conducting stress tests since 2016 to assess the resilience of the European CCP sector to defaults by its members and market shocks. These assessments are carried out annually, in accordance with EMIR. The last test carried out, the results of which were published in July 2020, confirms the overall resilience of European Union CCPs to shocks defined by the ESRB and multiple defaults by their members, to liquidity and concentration risk (no systemic risks were identified, although the test did prompt several recommendations aimed at improving CCP risk management systems).[38]

Although these tests are important for assessing the level of resilience to severe but plausible shocks, they are not designed to assess the risk that would affect the financial system as a result of the failure of one or more of the main central clearing nodes.

The direct interdependence of central clearing with the banking sector – and indirectly with the non-banking financial sector – mainly with the buy side, as their client, suggests that it is advisable to carry out further joint and coordinated testing, both at sector and cross-border level, to identify how sector imbalances are transmitted and spread and ways of improving the global resilience of the financial system.

One measure that can be envisaged is to improve transparency and access to information on levels of risk exposure of interconnected entities, both for the entities that must manage their risks and for the authorities, as an essential factor for strengthening the resilience of the global financial system.

In conclusion, we would stress the importance of increasing global cooperation in the identification, measurement and control of systemic risk inherent to central clearing in order to obtain conclusions about the impact that the default of an entity could have on the financial system or the real economy, and to better understand the risk transmission channels through CCPs.

37 ESMA (2020). *3rd EU-wide CCP Stress Test Report*. 13 July.

38 FSB, CPMI, IOSCO and BCBS (2018). (*Op. cit.*).

4 FSB 2020 Guidance on financial resources to support CCP resolution

The FSB 2020 Guidance was drawn up by the FSB Cross-border Crisis Management Group for Financial Market Infrastructures (fmiCBCM), in close collaboration with CPMI and IOSCO.

This group, which reports to the FSB Resolution Steering Group (ReSG), a permanent high-level group that reports directly to the FSB plenary, has the primary role of developing standards and guidance on resolution of systemically important financial institutions and preparing, coordinating and assisting in crisis management. The ReSG has three working groups with sector mandates: the cross-border crisis management group for banks (bankCBCM), the cross-border crisis management group for insurance (iCBCM) and the cross-border crisis management group for market infrastructures (fmiCBCM).

Currently, the fmiCBCM group is co-chaired by a representative of the US resolution authority, Ricardo Delfin, of the Federal Deposit Insurance Corporation (FDIC) and by María José Gómez Yubero, of the CNMV.

When planning the resolution of a CCP, it is necessary to ensure that the proper resources and tools are available, and to understand the potential adverse effect that the use of certain resources and tools could have on financial stability in a resolution scenario.

This guidance aims to identify and assess the sufficiency and suitability of the financial resources and the treatment of capital to support an orderly resolution and minimise any adverse effect on financial stability.

It provides operational guidance on the issues to be taken into account when carrying out the assessment, but does not provide international regulatory responses beyond those already defined in the Key Attributes and other documents aimed at facilitating their practical application.[39]

The guidance is divided into two parts. The first contains guidelines for assessing the adequacy of financial resources to absorb losses and cover other costs in resolution. The second sets out possible approaches for the treatment of CCP equity in resolution.

39 The *Key Attributes of Effective Resolution Regimes for Financial Institutions* establish a framework for the resolution of market infrastructures, including CCPs. The Annex to the Key Attributes specifies how these are implemented for the resolution of market infrastructures, including CCPs. *Appendix II-Annex 1 to the Key Attributes* (FMI Annex). *Guidance on Central Counterparty Resolution and Resolution Planning* (FSB Guide 2017) provides guidance on the application of the Key Attributes.

4.1 Assessing the adequacy of financial resources to support CCP resolution

The resolution authority (RA) of a systemically important CCP, in cooperation with the CCP's supervisory authorities, should develop and regularly update a resolution plan that addresses the different scenarios that could lead a CCP to resolution, as well as carrying out periodic evaluations of resolvability to confirm the feasibility and credibility of the plan. Both the resolution plan and the resolvability assessment should be discussed within the crisis management group.

Resolution scenarios may arise for two reasons, separately or jointly:

- **Default Losses (DL)**: Situation that occurs when the CCP has declared a default by one or more clearing members.

- **Non-Default Losses (NDL)**, where the CCP suffers losses for any reason other than a default of a member, such as lack of commercial viability or fraud, legal risks, operational failures, matters relating to deposits or investments, including the loss of viability caused by cyberattacks.

As part of planning, the RA should identify the financial resources and tools that it can reasonably expect to be available at the time of entry into resolution and assess whether they would be sufficient to achieve the resolution objectives in each of the scenarios, as well as the resources that it expects will remain available, following the rules of the CCP, at the time of entry into resolution to:

- Address uncovered losses.

- Replenish resources in accordance with applicable requirements within an appropriate time frame.

- Cover the costs associated with maintaining the critical functions of the CCP until resolution.

- Satisfy temporary liquidity needs.

To do this, the guide proposes a five-step process (Table 3) which is analysed below.

Five-step process to assess the adequacy of financial resources and tools available TABLE 3

Step 1	→	Identifying hypothetical default and non-default loss scenarios (and a combination of these) that may lead to resolution.
Step 2	→	Conducting a qualitative and quantitative evaluation of existing resources and tools available in resolution.
Step 3	→	Assessing potential resolution costs.
Step 4	→	Comparing existing resources and tools with resolution costs and identifying any gaps.
Step 5	→	Evaluating the availability, costs and benefits of potential means of addressing any identified gaps.

Source: FSB 2020 Guidance and CNMV.

4.1.1 Step 1: Identifying scenarios

The RA must first consider a 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.

Non-default loss scenarios (NDL)

In accordance with the PFMI, CCPs should include comprehensive loss allocation procedures in their recovery planning. However, in extreme situations, 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 because of a failure to maintain the CCP's critical functions. Therefore, the RA should consider in its resolution plans at least the following risks when defining the scenarios for NDL:

- **Investment risk**. The risk that losses on investments of initial margin or default fund assets could arise for various reasons, such as the failure of a counterparty or due to investment losses.

- **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 access to its assets or have difficulty converting collateral in the form of financial instruments into cash. This could cause liquidity and/or solvency challenges to a CCP, depending on the nature of the failure and the time it takes to regain access to the assets.

- **Operational risk**. 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 service providers.

- **Legal risk**. Crystallisation of legal risks, including legal, regulatory or contractual penalties could lead to significant losses or uncertainty for the CCP.

The RA must design scenarios in which the CCP's recovery plan is not sufficient to fully cover possible losses and the CCP has to be brought to resolution.

Default loss scenarios

As we have already seen, this is the risk of default of several clearing members. To identify the scenarios for the treatment of default losses, the RA must take into account the loss allocation arrangements developed in accordance with the PFMI. The RA must design scenarios in which the arrangements fail and an orderly wind down is not appropriate, which would lead to the resolution of the CCP.

The FSB 2020 Guidance proposes that the RA should consider in its resolution planning at least the following hypothetical default loss scenarios.

Non-default loss (NDL) and default loss (DL) scenarios to consider in the resolution plan TABLE 4

Default Losses (DL)	Non-Default Losses (NDL)
• The CCP does not have sufficient resources and tools for recovery, as established by PFMI. • The CCP's loss allocation arrangements set out in the recovery plan do not work as intended. • Multiple clearing members fail to meet their obligations under the CCP's recovery plan. • The relevant authorities establish that resolution must be initiated before any of the agreements or tools in the CCP's recovery plan are implemented.	• The CCP does not have sufficient financial resources or tools to cover NDL. • Specific CCP arrangements to cover NDL in the recovery plan cannot be used or do not work as intended. • The clearing members of the CCP do not meet their obligations in the event of recovery. • The shareholders of the CCP do not support the actions agreed in the event of recovery of the CCP. • The relevant authorities establish that the resolution must be initiated before some of the recovery agreements or tools are applied or before the CCP goes into liquidation.

Source: CNMV, based on FSB 2020 Guidance.

Public consultation on FSB 2020 Guidance.[1] Identifying scenarios EXHIBIT 2

The identification of these scenarios was a disputed issue in the consultation on FSB 2020 Guidance. On the one hand, the CCPs considered the proposed scenarios to be severe and implausible, not compatible with current international standards and contrary to the incentive system that supports central clearing. However, clearing members supported the idea that the circumstances leading to the resolution of a CCP are likely to go beyond the severe but plausible conditions for which a CCP should have sufficient prefunded resources. In the end, FSB 2020 Guidance recommended that RAs consider resolution scenarios that go beyond those used in recovery planning.

1 FSB (2020). *Guidance on financial resources to support CCP resolution and on the treatment of CCP equity in resolution. Overview of responses to the consultation and Summary of virtual outreach events on 25 and 30 June 2020*. 16 November.

4.1.2 Step 2: Qualitative and quantitative evaluation of existing resources and tools available

The RA 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. To do this, the RA must take into account:

i) Possible adverse effects on **financial stability** that may render the resource or tool unusable or unavailable in resolution.

ii) The feasibility and credibility of achieving the resolution objective of maintaining the **continuity of critical functions**.

iii) The need to **avoid exposing taxpayers to loss**.

iv) The potential impact on **stakeholders' incentives** to support recovery or resolution.

It is also necessary to identify the legal and operational limitations to the competences of the RA at national or cross-border level, as well as the implications of the "no creditor worse off than in liquidation" (NCWOL)[40] safeguard and the potential for related compensation claims. In each scenario, the RA must take into account the implications arising from the specific types of products cleared, the likely speed of crystallisation of a particular scenario and the risks of implementing the plan, including the risk that a resource is not available, or a tool cannot be used as intended or in a timely manner.

The FSB 2020 Guidance indicates that the RA may also consider developing resolution playbooks, and conducting crisis simulation exercises in coordination with other authorities, to understand the practicality and feasibility of the resolution plan.

To assess each specific resource or tool (Table 5 shows the tools included in the FSB 2020 Guidance that can be used in DL/NDL scenarios), the RA must take into account specific factors as described below.

40 "No creditor worse off than in liquidation" principle (NCWOL), according to which no creditor should be worse in the event of a resolution than it would have been if the CCP had gone into liquidation.

DL and NDL resolution tools and resources TABLE 5

Default Losses (DL)	Non-Default Losses (NDL)
• Cash calls. • Variation Margin Gains Haircutting (VMGH). • Full tear-up or partial tear-up of contracts. • Replacement of minimum resources. • CCP equity and other resources available from the parent or subsidiaries. • Powers of the RA.	• Insurance coverage and other third-party resources to support operational continuity. • CCP equity and other resources available from the parent or subsidiaries. • Allocation of losses to clearing members. • Allocation of losses to creditors in resolution. • Powers of the RA.

Source: CNMV, based on FSB Guidance.

Tools for default loss (DL) scenarios

i) The RA must have a clear understanding of the tools for allocating losses to clearing members, cash calls, variation margin gains haircutting (VMGH) and the cancellation ("tear-up") of contracts. The RA needs to know how they work, when and with what limitations they can be used, how they can affect participants, the governance process for their application and their possible implications for financial stability.

ii) The RA must analyse the arrangements by which the default fund and minimum prefunded capital (i.e., the minimum resources to ensure the functioning and viability of the CCP and for maintaining its authorisation) would be replenished, including the viability, reliability and timeliness of such arrangements, as well as any possible implications for financial stability.

iii) In regard to the CCP's own resources, the RA must identify the capital available to cover the losses as part of the default waterfall and when it can be used. It is also important to know whether any additional financial resources from the CCP or its parent or group entities exist.

iv) Lastly, RAs must know of any legal powers available to them to assign losses, recapitalise the CCP or seek restitution from its management or control bodies. Among other matters, RAs should 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 the NCWOL implications.

Tools for non-default loss (NDL) scenarios

i) In studying the tools applicable in non-default loss scenarios, RAs must analyse the availability and scope of coverage of any insurance policies to cover various types of non-default risk, and/or any other third-party resources, such as committed liquidity and credit lines or economically similar arrangements, that could support the operational continuity of the CCP in the event of non-default losses.

ii) The next aspect to be analysed is the availability of CCP equity to cover different types of non-default losses or any additional financial resources 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. As we can see, this tool is listed before the tools for allocating losses to clearing members or creditors.

iii) RAs must also be aware of the scope and terms of any contractual arrangements for allocating non-default losses to clearing members. Consideration should be given to the effect of any financial caps or legal or operational constraints for allocating losses and the risk of clearing members failing to meet calls for funds, as well as the impact on clearing members and their clients, and on financial stability.

iv) The RA should consider the extent of its legal powers to allocate losses to CCP creditors and to convert their claims into equity, and understand the insolvency hierarchy of the CCP's creditors, 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.

v) In these scenarios, it is also necessary to analyse the legal powers of the RA in the same terms as in the scenario for default losses.

Public consultation on FSB 2020 Guidance.[1] EXHIBIT 3
Evaluation of tools and resources

One of the issues in the public consultation process that attracted most of the comments was the possible use of variation margin gains haircutting (VMGH), mainly by the clients of clearing members, who considered that this could lead to significant liquidity problems as it encourages the early unwinding of their positions. Others however underlined the need to have all the financial resources available.

Many respondents also expressed the view that a clearer policy on the use, composition and amount of resources and tools is required. The FSB emphasises that the guidance is not intended to offer an opinion on the resources and tools that must be available for the resolution of CCPs in each jurisdiction or on how their use should be regulated, or which resources and tools would be the most appropriate in the case of the resolution of a specific CCP. The objective is to provide RAs with guidance on the issues to consider when evaluating each available resource or tool and thus ensure that they are able to determine whether the resolution strategy is reasonable and consistent with the Key Attributes.

1 FSB (2020). *Guidance on financial resources to support CCP resolution and on the treatment of CCP equity in resolution. Overview of responses to the consultation and Summary of virtual outreach events on 25 and 30 June 2020*. 16 November.

4.1.3 Step 3: Assessing potential resolution costs

In this step, the RA 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, which will be conditioned both by the organisational structure of the CCP and by the types of products cleared.

They would include the potential amount of the CCP's losses and the costs of replenishing its financial resources, the operational costs of the CCP for maintaining the continuity of its critical functions, the administrative costs of the RA relating to the resolution of the CCP and any other extraordinary costs, such as management, legal or accounting costs, as well as additional costs that may arise after the resolution, including potential NCWOL compensation.

In the assessment, the amount of resolution costs associated with the potential resolution strategy or strategies should be evaluated, the period of time in which the costs can be generated and in which they have to be covered, both short and long term, who will bear the different types of costs and how the costs not covered by the resolution tools may be recoverable, and from what source.

Public consultation on FSB 2020 Guidance.[1] Cost assessment EXHIBIT 4

The public consultation raised the consideration of costs in insolvency proceedings and how they should be estimated and calculated, although this point was ultimately excluded from the guidance due to the lack of international harmonisation of insolvency regulations.

1 FSB (2020). *Guidance on financial resources to support CCP resolution and on the treatment of CCP equity in resolution. Overview of responses to the consultation and Summary of virtual outreach events on 25 and 30 June 2020*. 16 November.

4.1.4 Step 4: Identifying any gaps between resources and costs

Taking into account the resolution scenarios identified in Step 1, the RA should compare the resolution costs assessed in Step 3 with 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 take into account the availability and sufficiency of resources to cover the different costs, the types and amount of costs that are not covered and the underlying reasons for any gaps in resources. In addition, it is important to consider the time horizon for executing the resolution strategy and how the resolution costs will be paid.

In any case, the RA should bear in mind that the lack of an identified gap does not preclude the potential for such a gap to exist.

Public consultation on FSB 2020 Guidance.[1] EXHIBIT 5
Identifying any gaps

The public consultation highlighted the difficulty of carrying out this step, given that quantifiable resources had be to compared with potential future costs. Even though analysis is indeed difficult to implement, it is still beneficial for an RA to carry out such structured analysis.

1 FSB (2020). *Guidance on financial resources to support CCP resolution and on the treatment of CCP equity in resolution. Overview of responses to the consultation and Summary of virtual outreach events on 25 and 30 June 2020*. 16 November.

4.1.5 Step 5: Possible means for addressing any identified gaps

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

– Whether any additional tools or resources may be needed to support resolution.

– How the authorities can contribute to closing the gap.

– The financial stability implications of each option.

– 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.

In this analysis, the RA must consider the potential implications of requiring any additional resources or tools, according to the nature of the resources, whether the RA has the power to issue additional cash calls that are not envisaged in the CCP's rules, and whether write-down or bail-in powers are available to provide additional loss absorbing and recapitalisation capacity.

In addition, consideration should be given to the potential impact of the additional resource requirements on the CCP's ongoing business model and its incentives structure, and whether the resolution strategy and cost of implementation can be changed.

Lastly, bearing in mind that any unaddressed gaps could prevent the RA from achieving the resolution objectives and thereby propagate financial instability, or alternatively risk exposing taxpayers to losses, the resolution authority, in cooperation with other relevant authorities, should consider the steps to be taken to address such gaps, including changes to the CCP's operating rules or the applicable legal regime.

4.2 Treatment of CCP equity in resolution

This was one of the most complex topics addressed when preparing the guidance. The complexity stems from the apparent misalignment between the general risk management and loss allocation principles contained in the PFMI and those contained in the Key Attributes for loss absorption and determining the NCWOL safeguard.

The former recognises the principle of mutualisation of losses, according to which the clearing members, including their clients, absorb the losses of a CCP in the event of default by any of its members. In this case, only a small portion of the CCP's own resources (SITG) would be used to absorb losses, thereby protecting the rest of its equity and resources, ensuring the continuity of its business activity and maintaining its authorisation.

Only in non-default loss (NDL) scenarios would the CCP's own resources, including its equity, be at risk. However, some CCPs have arrangements that allocate portions of non-default losses – particularly those arising from investment or custody risks – to clearing members.

This commonplace situation contrasts with the general purpose of resolution, according to which shareholders and creditors must absorb losses in a manner that respects the creditor hierarchy in liquidation. As a consequence, the resolution Key Attributes recognise that the capital of the CCP must absorb losses first and in full, and that the resolution authorities should have the power to write down (in full or in part) the CCP's equity.[41]

However, the NCWOL safeguard, which grants creditors 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, also extends to the shareholders of the CCP according to the Key Attributes.[42] In order to determine the NCWOL for participants, the assessment of losses must also include the application of all 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 rules of the CCP and the legal framework provided for the resolution authority, shareholders may have a NCWOL compensation claim for any losses imposed on equity in resolution.

This would also be inconsistent with the Key Attributes principle that equity should be fully loss absorbing in resolution and could introduce moral hazard.

As a consequence, difficulties arise in establishing a general principle for the treatment of CCP equity that is consistent with the PFMI and the Key Attributes, which is compounded by the lack of international harmonisation of insolvency regimes

41 "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". FSB Key Attribute 1.2. FSB (2017). (*Op. cit.*). Sections 4.1 and 4.2.

42 FSB (2017). (*Op. cit.*). Section 5.

and the options envisaged in the rules of the different CCPs according to the regulations that apply to them.

The guidance provides resolution authorities with regulatory policy options and guidelines (described below) to assess and treat the CCP's equity when drawing up resolution plans in a manner that is consistent with the principles outlined and legal regimes in force in each jurisdiction.

4.2.1 Analysis of the treatment of CCP equity in resolution and possible adjustment mechanisms

The RA must consider the impact that any limitation of the CCP's equity to the absorption of losses could have on its ability to take the appropriate measures to achieve the treatment of CCP equity set out in the Key Attributes. Based on this assessment, the RA may decide to adjust the exposure of CCP equity to losses or consider additional options to address the identified limitations.

Mechanisms to adjust the CCP's equity exposure to losses in resolution that are consistent with the Key Attributes include:

– Modification of the contractual loss allocation arrangements 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. The RA would have to take into account the need to recapitalise the CCP so that it can continue to provide its critical clearing services.

– The full or partial write-down of CCP equity to allocate remaining losses after default management and recovery measures have taken place. As in the previous case, the need to recapitalise the CCP would have to be taken into account.

– Transfer of the CCP's remaining open positions and related collateral to a bridge CCP and then winding down the residual CCP.

– Dilution of existing ownership by raising new capital through the conversion of any debt instruments or other eligible liabilities into equity, issuing new shares or compensation of clearing members through the issue of new shares in exchange for their bearing more losses than required under the CCP's rules and arrangements.

4.2.2 Implementing policy for the treatment of CCP equity in resolution

As a result of the analysis undertaken, the guidance proposes some (policy) options that could be considered to address the challenges relating to CCP equity fully bearing losses in resolution.

– Provide the authorities with sufficient powers to require that CCPs modify their capital structures, rules or other governance documents in a manner that subordinates shareholders to other creditors or establishes the point at which equity absorbs losses.

– Propose 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.

– As a last option, 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 that justifies their acceptance of such limitations.

In any case, when evaluating the benefits and drawbacks of changes to the treatment of CCP equity, the relevant home authorities should evaluate and justify whether said change would be appropriate, taking into account its impact on CCP management incentives and participation in recovery and support resolution, the impact on clients given the availability of alternative CCPs, how a change of ownership would affect the continuity of critical services, the impact on business models and structures of CCPs and the effect on other group entities that could also be market infrastructures (such as trading platforms or central depositories).

Public consultation on FSB 2020 Guidance.[1] Treatment of equity EXHIBIT 6

The different public consultation processes have given rise to divergent views on the extent to which the CCP's equity should (or should not) be exposed to losses on resolution, beyond the prefunded CCP equity for covering losses as part of the default waterfall (SITG). Thus, while clearing members hold the view that CCP equity should fully absorb losses, the CCPs argue that the use of a CCP's equity in resolution, including where it is used as compensation to participants that contributed to a recovery or resolution, reduces incentives for market participants to appropriately manage their risks and actively participate in the default management process and recovery efforts, thus promoting CCP resolution over recovery.

In regard to the possible compensation of non-defaulting members and end users for absorbing losses, either during recovery or in resolution, using both equity and rights to future profits, CCPs hold the view that this also discourages members from participating in the management of default losses and from bidding in auctions for the defaulted portfolio.

1 FSB (2020). *Guidance on financial resources to support CCP resolution and on the treatment of CCP equity in resolution. Overview of responses to the consultation and Summary of virtual outreach events on 25 and 30 June 2020*. 16 November.

5 Factors to improve the resolvability of CCPs. Incentives and divergent interests

Progress towards defining a CCP resolution framework has involved a great deal of debate concerning issues such as the use of margin variation gains haircutting (VMGH), resources, the liability for non-default losses of CCP members, the sources of liquidity available to CCPs in stress conditions and the boundaries between recovery and resolution and financial resources to support CCP resolution.

The different consultations undertaken have revealed the existence of divergent interests and conflicting positions regarding the allocation of losses in the recovery and resolution of CCPs and the regulatory measures available.

The regulatory response to these questions should take into account that the regulation of CCPs is based on a delicate and essential incentives structure, which seeks to ensure that both the CCP and the clearing members and clients support and actively participate in the risk management of the CCP.[43]

All tools offer advantages for some and disadvantages for others and their application can have procyclical effects. Therefore, the potentially harmful macroprudential implications, such as the risk of contagion, misalignment of incentives or uncertainty about the obligations of participants[44] should be carefully considered. Table 6 shows an analysis of the effectiveness of the different tools, as well as their limitations and possible impact in terms of systemic risk.

Thus, for example, a hypothetical inclusion of public money as a last resort resolution tool could introduce moral hazard in the sense that members could be discouraged from contributing resources to the CCP's lines of defence or could participate less actively in auctions with the expectation that the taxpayers will ultimately intervene to rescue the CCP. From the point of view of the CCP, the compensation mechanisms for non-defaulting members in the event that they have to make additional contributions in resolution also introduces moral hazard. However, members have expressed the view that this mechanism provides an equitable solution and encourages clearing members to support the management, recovery and resolution process.

Resolution cash calls also stress the incentives regime for stakeholders, especially if they are used to recapitalise the CCP and clearing members receive nothing in return for their contributions.

The possibility of increasing its capital buffer (SITG) with the aim of encouraging the CCP to engage in prudent risk management is also questioned by these entities since it reduces their business margins. CCPs rely on the fees they charge on cleared volumes as their sole source of income and, given the current low interest rate environment, it cannot be ruled out that some CCPs may seek higher returns through riskier investment practices.

One of the tools most questioned by members and their clients is the use of VMGH reduction due to its potential procyclical and destabilising effects. For this reason, despite its possible effectiveness to absorb losses, the application of this measure

43 "*Effective* CCP resolution planning should have regard to maintaining 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 so reduce the likelihood of resolution". FSB (2014). (*Op. cit.*). Preamble; FMI Annexes 1.1 and 3.1.

44 ESRB (2017). *Opinion on a central counterparty recovery and resolution framework.* July. This document analyses the effects arising from the application of the different resolution tools.

must be limited (to be used only with suitable products under the supervision of the competent authority if applied in recovery and with certain limits).

Effectiveness, limitations and potential systemic risk of resolution tools TABLE 6

	Effectiveness of the tool	Limitations	Potential systemic risk
Loss allocation tools			
Cash calls on non-defaulting members	• Provides additional, non prefunded, resources to absorb losses. • Normally included in the regulations of the CCP and subject to limits, which provides certainty to members.	• The amount is normally limited. • Moral hazard for CCPs, which discourages risk management. • Strain on member incentives if used to recapitalise the CCP with no compensation to members.	• Solvency and liquidity problems for members. • Procyclical effects in stressed market conditions. • Market liquidity stresses. • Risk of contagion.
Variation margin gains haircutting	• Provides immediate access to resources to absorb losses. • Normally included in the regulations of the CCP, although not in a generalised manner but with time, quantitative or other limitations.	• Does not allow the CCP to meet its objective of ensuring compliance with obligations. • Puts pressure on member and customer incentives. • Difficult to apply to clients. • It can cause members and clients to seek an alternative CCP.	• Liquidity problems for members and clients. • May trigger a liquidity spiral. • Procyclical effects. • Risk of contagion.
Position allocation tools			
Total or partial termination of contracts	• Allows a matched book to be restored. • Avoids the enforced allocation of positions.	• Does not allow the CCP to meet its objective of ensuring compliance with obligations. • Exposes members and clients to uncovered risks and position replacement costs.	• Solvency and liquidity problems. • Market liquidity stresses. • Risk of contagion. • Procyclical effects.
CCP loss absorption tools			
Write-down and conversion of equity and debt instruments	• Contributes to loss absorption and recapitalisation of the CCP.	• Limited effectiveness, as the CCP's equity is relatively low and it does not have a significant volume of debt. • Increases compensation costs.	• If all the capital is not written down, there may be conflicts of interest between new and old shareholders that may jeopardise the resolution objectives.
Government stabilisation tools			
Public support	• Facilitates loss absorption and recapitalisation. • Stabilises the CCP. • Facilitates the instrumentation of transfer tools.	• Last resort measure that is temporary and conditional on recoverability. • Puts stress on the incentives system to encourage members to participate in the CCP's lines of defence and on the CCP to manage its risk.	• Puts resolution goals at risk. • Moral hazard. • Generates losses for taxpayers.

Source: CNMV.

While it is not considered a resolution tool as such, the temporary suspension of the central clearing obligation[45] may be necessary in severe circumstances as part of a resolution in order to head off a serious threat to financial stability. Although, as the ESRB points out,[46] the application of this tool must be assessed from a macroprudential standpoint, and in any case, the existence and availability of alternative CCPs with the capacity to offer the CCP's services in resolution and the ability of the members to comply with the alternative CCP requirements should be considered.

Lastly, it should also be mentioned that in the mutualisation of losses regime on which central clearing is based, in which the participants of CCPs have to assume most of the default losses, it should be considered that the application of resolution tools may translate into a risk of contagion if the CCP does not consider the potential impact of the tools on its members. Therefore, these measures must be as transparent and predictable as possible, so that participants can estimate and manage their exposure to the CCP. Proper risk management by members not only minimises the likelihood of default, but also reduces uncertainty surrounding the potential need to provide additional funds.

Therefore, it is essential to establish the appropriate incentives and the regulatory response must take into account this delicate relationship of incentives and interrelations, in addition to the impact of any measure on financial stability.

6 Next steps

To move forward, during the preparation of its 2020 Guidance, the FSB held several forums for discussion and consultation with the main stakeholders, which resulted in the document being enhanced and the different sensitivities to delicate issues being properly weighed up. As a result of these consultations, the need for a clearer policy on the financial resources available to a CCP has been confirmed.

Some participants in these events reiterated the need to clarify the role of central banks in providing liquidity to CCPs and to limit central clearing to certain types of products. Among the topics most related to resilience, recovery, and resolution, participants made the following suggestions:[47]

- Develop requirements on the amount of equity a CCP is required to hold and how equity would be required to cover losses in recovery and resolution.

- Determine how default and non-default losses should be allocated between the CCP and clearing members/participants.

45 Singh, M. and Turing, D. (2018). *Central Counterparties Resolution – An Unresolved Problem*. IMF Working Paper, WP 18/65 analyses, *inter alia*, the effectiveness of a possible relaxation of the central clearing obligation.

46 ESRB (2017). Opinion on a central counterparty recovery and resolution framework. July.

47 As stated in document FSB (2020). *Guidance on financial resources to support CCP resolution and on the treatment of CCP equity in resolution. Overview of responses to the consultation and Summary of virtual outreach events on 25 and 30 June 2020*. 16 November.

– Distinguish between the “operational” and “financial” resources of a CCP.

– Introduce caps on the use of loss-absorbing resources (cash calls, variation margin gains haircutting (VMGH) and partial tear-ups (PTUs)) from market participants in recovery and resolution to diminish their pro-cyclical and market destabilising effect.

– Develop governance arrangements for the use of certain tools (particularly VMGH and PTUs) in recovery and resolution.

– Further facilitate enhanced cooperation between CCP supervisory and resolution authorities, particularly across crisis management groups (CMGs).

– Analyse the need for new types of prefunded resources for CCP resolution, such as bailinable bonds.

– Consider new types of powers for the resolution authority, such as the ability to suspend central clearing.

In view of this, and taking into account the wide scope of the comments and the close links between the resilience, recovery and resolution of CCPs, the FSB, together with CPMI and IOSCO, will develop a joint work plan to consider, during the course of 2021, the development of international policy on the use, composition and amount of financial resources in recovery and resolution to further strengthen the resilience and resolvability of CCPs in default loss and non-default loss scenarios. This would include assessing whether any new types of prefunded resources would be necessary to enhance CCP resolvability.

To progress in this area, the workshops that are being jointly organised by the FSB, BCBS, CPMI and IOSCO to help the authorities assess the potential impact on financial stability of the use of CCP recovery and resolution tools should be mentioned. These workshops, which will be held in several sessions between December 2020 and June 2021, will serve both to reduce knowledge gaps and identify possible solutions that reflect the concerns of the different authorities and foster dialogue and improve coordination in their approach to systemic risk.[48]

Section 4 of this article refers to one of the most recent advances in determining the resources available to address the resolution of a CCP, the new FSB Guidance. This provides operational guidance to help authorities identify the aspects that must be taken into account when assessing each resource or tool, but it does not provide a specific policy for each case.

Therefore, the Guidance will be reviewed within five years, in consultation with CPMI and IOSCO, to assess whether additional adjustments are needed, taking into

48 Fabio Panetta, member of the ECB Executive Board, makes concrete proposals for progress and coordination between the public and private sectors in understanding the implications and systemic interactions related to central clearing. Panetta, F. (2020). “Joining forces: stepping up coordination on risks in central clearing”. *Introductory remarks at the Second Joint Bundesbank/ECB/Federal Reserve Bank of Chicago Conference on CCP Risk Management*. February.

account the performance of the market and the experience of resolution authorities in its application, in coordination with the other authorities involved through crisis management groups.

The recent approval of the European Regulation on CCP recovery and resolution will allow a specific, harmonised recovery and resolution framework to be established for all CCPs in the European Union, the application of which will benefit from the new FSB Guidance.

The Regulation itself recognises that the European Commission must review its content to incorporate international developments in regard to the treatment of capital in resolution and, within the same period of five years, concerning the financial resources available to the resolution authorities to cover non-default losses of members and the CCP's own resources to be used in recovery and resolution.

7 Conclusions

CCP resolution remains a complex and challenging issue in legal, economic and operational terms, which is also conditioned by the diverging interests of the parties involved and by a complex incentives regime that ensures participation and proper risk management.

Given the cross-border nature of the clearing activity and the considerable interdependencies with the rest of the financial system, a harmonised global regulation is required, in addition to a high level of coordination between the corresponding authorities.

Although notable progress has been made in the design of a global harmonised clearing house resolution system, these constraints have meant that despite its having been identified as a priority reform after the global financial crisis, work continues at international and European level, and it is necessary to obtain a deeper understanding of the risk implications and contagion channels that derive from the close links between banks and CCPs.

Due to their essential role in the financial system, the disorderly collapse of a CCP could lead to serious systemic shock. Therefore, maintaining the continuity of critical central clearing functions is key for financial stability.

The forthcoming implementation in the European Union of a regulatory framework on CCP recovery and resolution represents an important step towards improving the resilience and resolvability of these entities, reinforcing their preparedness and that of the national authorities to address the failure of CCP in a coordinated manner, which helps ensure the smooth operation of the markets and bolsters confidence in the financial system.

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Annex 1 Example of the practical application of a CCP default waterfall and resources available in resolution in scenarios of default by its members

A CCP is assessed in different loss scenarios caused by the default of between two and six clearing members. These scenarios illustrate when the CCP would go into resolution and the cost in terms of the resources required to restore its viability.[49]

To simplify the exercise, only loss absorption tools are used, consisting of cash calls on non-defaulting members, both in recovery and resolution, to address the default.

Basic data of the CCP TABLE 7

Minimum capital according to Art. 16 EMIR	4
1st tranche of SITG	1
2nd tranche of SITG	2

Source: CNMV.

Scenario of default by two members

The accumulated risk for the CCP is 14, having applied the initial margins and the contributions to the collective guarantee fund of both defaulting members.

– The next step is to use the first tranche of the CCP's own resources, which is 1. The collective guarantee provided by the non-defaulting members would then be applied, which, in this case, amounts to 8.

– Subsequently, the second tranche of CCP resources would be applied, which in this example is 2.

– To cover the remaining loss, which currently stands at 3, the CCP would start the recovery phase and request additional funds from non-defaulting members for that amount (this cash call in recovery would be limited to 1 x the contribution to the default fund, and there would be a margin of 5 additional non-prefunded resources in recovery).

In this scenario, to cover a loss of 14, prefunded resources of clearing members have been used for an amount of 8, resources of the CCP for an amount of 3, and non-prefunded resources required from members for an amount of 3. In addition, for the CCP to continue operating, non-defaulting members must replace the collective guarantee, amounting to 8, and the CCP must replace its own resources. The total cost would be 25.

49 None of the scenarios include the potential additional costs deriving from the right to compensation resulting from the application of the NCWO safeguard. Operational, administrative and other costs related to maintaining critical CCP functions or the resolution itself are also excluded.

Total cost and resources in a scenario of two defaulting members

TABLE 8

	Prefunded resources		Non-prefunded resources			
Initial loss	Non-defaulting members	CCP	Cash call in recovery	Replacement of collective guarantee	Replenishment of CCP's own resources	Total cost
-14	8	3	3	8	3	25

Source: CNMV.

In this scenario, the CCP has sufficient resources to cover the losses caused by the default of its two largest members, and it has not been necessary to activate the resolution phase.

Scenarios of three or more defaulting members.

In the following scenarios shown in Table 9, applying this same mechanism, it can be observed that the resolution phase is activated after the default of three clearing members.

Total cost and resources in a scenario of three or more defaulting members

TABLE 9

Scenarios: Number of defaulting members	Going concern			Recovery phase			Resolution phase			Total cost
	Initial loss	Prefunded resources		Non-prefunded resources			Prefunded resources		Non-prefunded resources	
		Non-defaulting members	CCP	Cash call in recovery	Replacement of collective guarantee	Replenishment of own resources CCP	CCP equity	Cash call in resolution	CCP recapitalisation	
Default of 3 members	-16	6	3	6	6	3	1	0	1	26
Default of 4 members	-17	4	3	4	4	3	4	2	4	28
Default of 5 members	-19	3	3	3	3	3	4	6	4	29
Default of 6 members	-20	0	3	0	0	3	4	-	4	14[1]

Source: CNMV.

1 Does not take into account that the open loss is still -13.

Once the resolution phase has been activated, since all available resources have been consumed to enable the CCP to address the total loss caused by the default of its members by itself, the CCP's equity will be used first. With equity of 4 (in addition to the 2 SITG tranches), based on the default of 4 members, a full write-down must be made to absorb the losses and in this scenario it is also necessary to make a cash call (for an amount of 2) on non-defaulting members. This leaves a margin of 6 that will allow the CCP to be recapitalised (replenishing the written-down equity of 4) so that it can continue operating.

The cap on cash calls available in resolution (2 times the collective guarantee according to the CCP R&R Regulation) is exhausted in the scenario of 5 defaulting members, with the absorption of the remaining loss, but there is no additional buffer to recapitalise the CCP. Thus, in the resolution phase the objective of keeping the CCP operating would not be achieved.

In the last scenario, with all members in default, there is a final resource mismatch of -13.

After analysing the different scenarios, it can be observed that the CCP's equity and resources are fixed amounts, regardless of the number of defaulting members. Furthermore, the greater the number of defaulting members, the lower the available collective guarantee, as the additional contribution from non-defaulting members is also lower. In these non-default scenarios, the resolution phase should be activated when there are 3 defaulting members, where the maximum number of defaults that could be successfully managed in resolution stands at 4.

Default loss scenarios

TABLE 10

(1) Accumulated risk	(2) Number of defaulting members	(3) Tranche of CCP's own resources	(4) Collective guarantee of non-defaulting members	(5) Replacement of the collective guarantee	(6) Additional resources of CCP	(7) Contribution of clearing members in recovery	(8) Resources available in recovery (3+4+6+7)	(9) Loss applying the recovery plan	(10) Buffer applying the recovery plan	RESOLUTION	(11) CCP equity	(12) Contribution of clearing members in resolution	(13) Resources available in resolution (11+12)	(14) Loss	(15) Buffer applying the resolution plan
14	2	1	8	8	2	8	19	0	5		–	–	–	0	–
16	3	1	6	6	2	6	15	-1	–		4	12	16	0	15
17	4	1	4	4	2	4	11	-6	–		4	8	12	0	6
19	5	1	3	3	2	3	9	-10	–		4	6	10	0	–
20	6	1	0	0	2	0	3	-17	–		4	0	4	-13	–

Source: CNMV.

(1) **Accumulated risk:** Risk for the CCP after the initial margin and the collective guarantee corresponding to the defaulting members have been used.

(2) **Number of defaulting members**: Number of defaulting clearing members.

(3) **Tranche of CCP's own resources:** The CCP's own resources applied in the default waterfall (first tranche of SITG).

(4) **Collective guarantee of non-defaulting members:** Collective guarantee of non-defaulting clearing members.

(5) **Replacement of the collective guarantee**: Non-prefunded contribution from non-defaulting members to replenish the default fund (DF).

(6) **Additional CCP resources:** Additional capital contribution from the CCP (second tranche of SITG).

(7) **Contribution of clearing members in recovery:** Non-prefunded contribution from non-defaulting members to absorb losses in recovery. According to the CCP R&R Regulation, this contribution would be capped at one time the DF.

(8) **Resources available in recovery:** The sum of the CCP's own resources (first tranche of SITG), the collective guarantee of the non-defaulting clearing members, the non-prefunded contribution of the non-defaulting members to absorb losses (cash call in recovery) and the additional capital contribution from the CCP (second tranche of SITG).

(9) **Loss applying the recovery plan:** Resources required to cover the difference between the resources available in recovery and the accumulated risk.

(10) **Buffer applying the recovery plan:** Resources available in recovery that are not used to cover losses and that may be used to replace the capital of the CCP and, where appropriate, reduce the cash calls from clearing members.

(11) **CCP equity:** Minimum own resources held by the CCP in accordance with Article 16 of EMIR.

(12) **Contribution of clearing members in resolution:** Non-prefunded contribution of non-defaulting members to absorb losses in resolution (cash call in resolution which according to the CCP R&R Regulation would be capped at twice the DF).

(13) **Resources available in resolution:** The sum of the CCP's equity of the CCP and the contribution of non-defaulting members in resolution (cash call in resolution).

(14) **Loss applying the resolution plan:** Resources required to cover the difference between the resources available in resolution and the accumulated risk.

(15) **Buffer applying the resolution plan:** Resources available in resolution that are not used to cover losses and that may be used to replace the capital of the CCPs and, where appropriate, reduce the cash calls on non- defaulting members.

Annex 2 Example of the practical application of a CCP default waterfall and resources available in resolution in scenarios of non-default losses

A CCP is considered in two loss scenarios caused by theft of the liquid assets deriving from investment of its members' guarantees.

Basic data of the CCP TABLE 11

Minimum capital according to Art. 16 EMIR	4
1st tranche of SITG	1
2nd tranche of SITG	2

Source: CNMV.

These scenarios also illustrate the moment at which the CCP would go into resolution and the cost in terms of resources required to restore its viability.[50]

To simplify the exercise, only loss absorption tools are used, consisting of cash calls made on clearing members, both in recovery and resolution, to address the default.

NDL scenarios

A risk due to the theft of liquid assets of -14 is considered. In the first place, the 1st tranche of SITG would be applied, for the amount of 1, followed by the collective guarantee of the members, which amounts to 8. As this is not sufficient, the 2nd tranche of SITG is activated, for the amount of 2, and, lastly, an additional non-prefunded contribution of 8 is required to cover all the losses in recovery.

In this scenario, to cover a loss of 14, prefunded resources of the CCP were used for an amount of 3, resources from the members for an amount of 8, and non-prefunded resources were required from the members for an amount of 3. In addition, for CCP to continue operating, members would have to replace the collective guarantee, for an amount of 8, and the CCP would have to replenish its own resources. The total cost would be 25.

The CCP has sufficient resources to cover the losses caused by the theft of liquid assets, and it has not been necessary to activate the resolution phase.

If the risk of theft of liquid assets rose to 25, following the same sequence as in the previous scenario, the resources available in the recovery phase, 19, would not be sufficient, so it would be necessary to activate the resolution phase.

50 None of the scenarios include the potential additional costs deriving from the right to compensation resulting from the application of the NCWO safeguard. Operational, administrative and other costs related to maintaining critical CCP functions or the resolution itself are also excluded.

In the resolution phase, the first losses are absorbed by the equity, which means writing down an amount of 4 and then additional funds are requested from the members for an amount of 2, with a cap of 12, which would cover the recapitalisation of the CCP. The resolution would cover its objectives in this case.

In the event that losses due to theft amounted to 40, the resolution would not meet its objectives, as there would be a resource gap of -9, without taking into account the replenishment of the CCP's capital.

Non-default loss scenarios

TABLE 12

(1) Risk due to theft of liquid assets	(2) Tranche of CCP's own resources	(3) Collective guarantee of members	(4) Replacement of the collective guarantee	(5) Additional resources of CCP	(6) Contribution of clearing members in recovery	(7) Resources available in recovery (2 + 3 + 5 + 6)	(8) Loss applying the recovery plan	(9) Buffer applying the recovery plan	RESOLUTION	(10) CCP equity	(11) Contribution of clearing members in resolution	(12) Resources available in resolution (10 + 11)	(13) Loss	(14) Buffer applying the resolution plan
14	1	8	8	2	8	19	0	5		–	–	–	0	–
25	1	8	8	2	8	19	-6	–		4	8	12	0	6
40	1	8	8	2	8	19	-21			4	8	12	-9	

Source: CNMV.

(1) **Risk of theft of liquid assets:** Loss caused by the theft of the assets deriving from initial margins and the collective guarantee.

(2) **Tranche of CCP's own resources:** The CCP's own resources applied in the default waterfall (first tranche of SITG).

(3) **Collective guarantee of members** Collective guarantee of clearing members.

(4) Replacement of the **collective guarantee**: Non-prefunded contribution from members to replenish the DF.

(5) **Additional CCP** resources: Additional capital contribution from the CCP (second tranche of SITG).

(6) **Contribution of members in recovery:** Non-prefunded contribution of members to absorb losses in recovery (cash call in recovery). According to the CCP R&R Regulation, this contribution would be capped at one time the DF.

(7) **Resources available in recovery:** The sum of the CCP's own resources (first tranche of SITG), the collective guarantee of the clearing members, the non-prefunded contribution of the members to absorb losses and the additional capital contribution from the CCP (second tranche of SITG).

(8) **Loss applying the recovery plan:** Resources required to cover the difference between the resources available in recovery and the accumulated risk.

(9) **Buffer applying the recovery plan:** Resources available in recovery that are not used to cover losses and that may be used to replace the capital of the CCP and, if applicable, reduce the cash calls on clearing members.

(10) **CCP equity:** Minimum own resources held by the CCP in accordance with Article 16 of EMIR.

(11) **Contribution of clearing members in resolution:** Non-prefunded contribution of non-defaulting members to absorb losses in resolution (cash call in resolution which, according to the CCP R&R Regulation would be capped at twice the DF).

(12) **Resources available in resolution:** The sum of the CCP's equity of the CCP and the contribution of members in resolution (cash call in resolution).

(13) **Loss applying the resolution plan:** Resources required to cover the difference between the resources available in resolution and the accumulated risk.

(14) **Buffer applying the resolution plan:** Resources available in resolution that are not used to cover losses and that may be used to replace the capital of the CCPs and, if applicable, reduce the cash calls on members.