

Final Report

Framework for the 6th ESMA Stress Test Exercise for Central Counterparties

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1 Introduction

1. This report sets out the framework for the 6th ESMA stress test exercise for Central Counterparties (CCPs) including the scope, the methodology, the expected deliverables and the implementation plan.
2. Section 2 discusses the different components of the stress test, which are the credit risk component, the concentration risk analysis, the recovery and resolution component, and the reverse stress test. For the components that were already part of the previous exercises (i.e. credit, concentration and reverse stress test) the note focuses on the methodological changes and implications. The design of the new recovery and resolution component is discussed in detail. The required steps and implementation plan for the 6th ESMA CCP stress test exercise are presented in section 3.
3. This framework is complemented by four technical documents, which are published simultaneously with the framework on ESMA's website. The first document (Instructions - Annex 1) sets out instructions to the CCPs for the calculation and reporting of the required data, including for translating the market stress shocks prepared by the ESRB into profit-and loss (P&L) calculations for portfolios of the CCP. The instructions will be shared with the CCPs when launching the data request together with the validations (Annex 2) and the ESRB market stress scenario (Annex 3). The validations document details the checkpoints for the validation process and specifies the allocation of work across the participating authorities (i.e. NCAs and ESMA).

2 Design of the 6th ESMA CCP Stress Test exercise

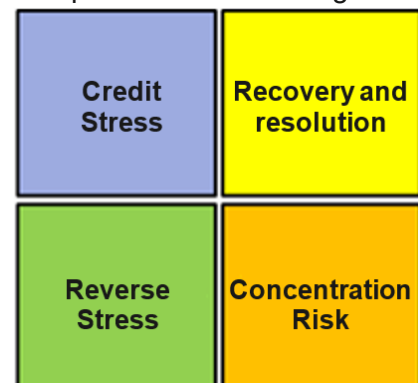
2.1 Background

4. Stress testing CCPs' default waterfalls, both individually and system-wide, is an important supervisory tool to ensure the sector is safe and resilient to member defaults and market shocks.
5. CCPs are systemically important and their resilience is critical to the stability of the EU financial system. By their nature, CCPs are counterparties to all their clearing members. Failure of CCPs to effectively mitigate risks could lead to spill-over effects and may exacerbate systemic risk. As evidenced in previous ESMA stress test exercises, CCPs are highly interconnected through common participants, which may propagate failures in one CCP throughout the system.
6. The ESMA supervisory stress test is a critical tool in assessing the implications of system-wide events and thus the resilience of the system of EU and Tier 2 CCPs. The ESMA stress test is complementary to the stress tests run daily by individual CCPs. Whereas individual CCP stress tests, on the basis of stringent prudential requirements, focus on the resilience of their own business activity, participants and cleared products, the ESMA stress tests takes into account how a default of one of the CCP's clearing members impacts other CCPs and the system as a whole.
7. One of the objectives of EMIR Regulation¹ is to promote central clearing and ensure safe and resilient CCPs. ESMA is mandated to regularly, in cooperation with the ESRB, initiate and coordinate assessments of the resilience of CCPs to adverse market developments. These assessments shall include both EU and third-country Tier 2 CCPs. Also, ESMA needs to take into account, where possible, the aggregate effect of CCP recovery and resolution arrangements on Union financial stability.

¹ 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

2.2 Objectives and scope

8. The objectives of the 6th ESMA stress test follow directly from the legal mandate given to ESMA under EMIR. The objectives are to:
 - assess the resilience of CCPs to adverse market developments and identify any potential shortcomings,
 - assess the aggregate effect of CCPs' recovery and resolution arrangements on Union financial stability, and
 - issue recommendations as appropriate.
9. ESMA will assess the resilience of all CCPs in scope, individually and as a system. This will be done based on, as much as possible, common methodologies and criteria.
10. The ESMA CCP stress testing exercise is not aimed at assessing the compliance of individual CCPs with regulatory requirements nor at identifying any potential deficiency of the stress testing methodology of the CCPs. It may however expose individual shortcomings in which case ESMA will issue the necessary recommendations.
11. The exercise will cover all authorised EU CCPs as well as Tier 2 CCPs, which totals 16 CCPs.
12. The 6th stress test exercise covers credit and concentration risks, also in the form of a reverse stress analysis, while the liquidity risk assessment is paused, and a new recovery and resolution component is introduced in line with ESMA's evolving mandate.
13. Counterparty credit and concentration risks are core of types of risks faced by CCPs and this exercise incorporates several methodological improvements including the enhancement of additional scenarios, an analysis of the risks stemming from sponsored clearing arrangements and the effects from porting of clients positions.
14. The main innovation in this stress test is the introduction of the recovery and resolution component, that aims at assessing how CCPs would deploy recovery tools in response to extreme loss scenarios and what would be the impact for various stakeholders.



2.3 Credit Stress Test

2.3.1 Objectives and Scope

15. The objective of the credit stress test is to assess the sufficiency of CCPs' resources to absorb losses under a combination of market price shocks and member default scenarios.

16. The CCPs will be asked to report the losses they would face in case of clearing member defaults under the provided common market stress scenarios for one reference date. ESMA will then identify the entities with the top exposures by aggregating the losses for this date across accounts, clearing members and CCPs in order to compare the losses to the stressed value of the financial resources that would be available to cope with the default on the reference date.

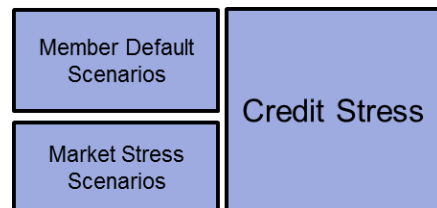
17. The stress losses will comprise not only the losses imposed by the market stress shocks but will also include the additional impact from the liquidation of concentrated positions and from wrong way risk exposures. The CCPs will report data at account level and ESMA will aggregate losses and incorporate the impact from these additional stress assumptions, while respecting the loss segregation rules imposed by EMIR and CCPs' rulebooks.

18. Building on the work introduced in the previous exercise, ESMA will further develop and improve the identification and assessment of additional theoretical market stress scenarios. Such scenarios will be defined after receiving and analysing CCPs' cleared exposures in order to focus on scenarios that could be impactful considering actual exposures. ESMA plans to further enhance the methodology for defining these scenarios as well as for applying them, by incorporating the market liquidation costs from the concentration component. The principles and limitations of the methodology that is to be used to identify and implement these scenarios are presented in section 2.3.4.

19. The wrong way risk adjustment, considers not only the wrong way cleared exposures, but also the impact from posting collateral that is issued or guaranteed by another defaulting clearing member.

20. For this 6th exercise, ESMA will introduce two additional exploratory analysis with the aim of assessing the impact of joint defaults of sponsored clearing members and sponsoring agents and assessing the impact of porting client accounts.

21. Finally, the reverse stress test analysis assesses the absorption capacity of CCPs by increasing the number of defaulting entities, the severity of the market shocks



and the impact of assuming different levels of severity in the assumptions underlying the estimation of the concentration cost.

2.3.2 Member Default Scenarios

22. The member default scenarios define the conditions used to select the clearing members that are assumed to be in default. Central banks, governments and interoperable CCPs are not included in the list of entities that may be assumed to be in default for the purpose of this exercise. The member default scenarios to be employed, and the rationale underpinning their choice and calibration are discussed below.

BOX 1: MEMBER DEFAULT SCENARIOS

All CCPs Cover-2 groups Scenarios

Across all CCPs, identify the two clearing member groups with the highest aggregate exposure under a particular market stress scenario. All clearing members that belong to an identified corporate group are assumed to default across all CCPs. This scenario will give an aggregate view of the impact of the default of two groups of clearing members. Regarding the exact condition to be used to select the clearing member groups, the first choice is to select the top-2 groups that would lead to the highest aggregate breach of prefunded resources across all CCPs. However, depending on the results, and as seen in previous exercises, it may be that this selection just focuses on the breach of one CCP (that is already presented under the cover-2 groups per CCP scenario) and propagates to all other CCPs the default of the same two clearing member groups with no material additional implications. In such a case, this selection condition could fail to adopt a more systemic point of view, as for example by exploring the default of pairs of groups that would put simultaneous pressure on multiple CCPs. If there is no breach of prefunded resources or if the breach is already presented under the individual CCPs' scenarios with no material implications to other CCPs, one can choose to select the two clearing member groups that would cause at an aggregate level the highest losses above the defaulters' margin and default fund contributions.

The final calibration of the selection criteria for these scenarios will be done after the analysis of the results. In all cases, it will be ensured that if there are breaches of prefunded resources at one or more than one CCPs, these will be presented and discussed under at least one of the selected scenarios. Furthermore, it can be considered to run and present in the final report more than one variant if needed to ensure that all relevant results are highlighted.

In general, the "All CCPs Cover-2 groups" scenarios may fail to stress all CCPs individually, as it can be that defaulting entities, that are being selected as the most relevant at an ESMA level, may not be relevant or may not even be participants at some of the CCPs. Therefore, we will also run the cover-2 groups per CCP scenario.

Cover-2 groups per CCP Scenarios

For this scenario, we will select the defaulting clearing members as the members belonging to the top-2 corporate groups of clearing members for each individual CCP. The defaulting clearing member groups are selected per CCP; hence they may be (and in most cases will be) different for each CCP and they are not considered to be in default in other CCPs. When a group is considered to be in default in one CCP, all clearing members that belong to the identified corporate group are assumed to default for the same CCP.

The “*All CCPs Cover-2 groups*” scenarios, where we select the top-2 groups across all CCPs, cannot be used to assess the resilience of individual CCPs, as the selection algorithm will always focus on the two most systemically important groups and may fail to highlight shortfalls for individual CCPs. Therefore, the inclusion of “per-CCP” scenarios is important to assess the resilience of individual CCPs. The groups that will be selected for each CCP are the ones that lead to the highest resource consumption beyond required margin collateral and beyond the Default-Fund-level prefunded mutualised resources, including the default fund, the dedicated resources (“skin-in-the-game”) and other prefunded Default-Fund-level resources. Thus, the selection process will select the two groups that could together lead to a depletion of the prefunded resources. If such pairs of groups are not to be found, ESMA will select the two groups that would lead to the highest consumption. This can be done either on a relative (i.e. % of resources consumed) or on an absolute basis (amount of resources consumed). This may lead to different results for CCPs that have more than one default fund. The selection of defaulting entities based on the relative consumption may focus on a smaller default fund that was closer to creating a breach, instead of selecting pairs of groups that would cause larger losses (in absolute EUR terms) at a larger default fund. Moreover, one can choose to focus on the losses above own resources of the defaulting members (including margin and default fund contribution) or the losses above only margin.

The final calibration of the selection criteria will be done after the analysis of the results. As in the case of the “*All CCPs Cover-2 groups*” scenarios, it can be considered to run and present in the final report more than one variant if needed to make sure that all relevant results are highlighted. In all cases, the same conditions will apply to all CCPs to ensure a fair and consistent presentation of the results.

2.3.3 Market Stress Scenarios

23. The common market stress scenario² of the 6th ESMA CCP stress test exercise was designed by the ESRB’s Task Force on Stress Testing in close collaboration

² Link to ESRB scenarios: <https://www.esrb.europa.eu/mppa/stress/html/index.en.html>

with the European Central Bank (ECB) and ESMA. The shocks were produced using the tool that is employed for the calibration of financial shocks for adverse scenarios at the ECB and has been in use for the calibration of financial shocks for the EBA, EIOPA and ESMA scenarios.

24. It is important to note that the market stress scenarios should not be bound to only replicate past historical scenarios but also use past observations in combination with a narrative that reflects the assessment of prevailing sources of systemic risk for the EU financial system to produce shocks that model potential future market conditions.
25. The stress test is a scenario-based analysis measuring how CCPs would fare under hypothetical adverse economic developments. The scenario has been designed to be severe to meet CCP-specific regulatory requirements. When modelling the stress scenario, it is not possible to cover all possible movements of different risk factors and their co-movements within and across asset classes. In the 6th exercise ESMA will again complement the stress test results derived from the common market stress scenario by identifying additional theoretical market stress scenarios and assessing their impact on CCPs.

2.3.4 Overview of Methodology and key modelling choices

26. The set of price/yield shocks included in the common market stress scenario will need to be run by individual CCPs. The scenario is defined for a set of high-level risk factors across different asset classes. The asset classes and list of risk factors were updated to reflect the main risks of products cleared by the in-scope CCPs. Given that it is not feasible to define scenarios for each and every risk factor of all CCP-cleared contracts, the CCPs will need to translate the risk factor shocks into a P&L for their cleared products and the members' portfolios.
27. Therefore, the ESMA Stress Test Expert Group has developed a set of instructions that explain how these are expected to be implemented and ESMA will provide these instructions together with the data request and the common market stress scenario. The instructions were drafted to provide clarity and address all material implementation challenges. The instructions were shared with the European Association of CCP Clearing Houses (EACH) for consultation before the finalisation of the design. Some of the key provisions in the instructions are listed below for illustration purposes and to better represent the assumptions, possible limitations, and resources implications of the exercise.
28. In previous exercises we used two stress dates and one common market stress scenario. The full analysis (i.e. including concentration risk and reverse stress test) was only run for one of the dates. Running the same shocks on different dates may lead to materially different results due to differences in positions, the prevailing level

of resources, or the level of prices. However, collecting data and running results for multiple dates increases significantly the burden for all stakeholders and the experience so far has not justified the value of this approach considering the proximity of the two dates and the restricted scope of the analysis performed for the second date. ESMA sees benefit in reducing the burden on CCPs and hence the 6th stress test will be based on one date (**27/03/2026**).

29. For this date the default will be modelled as a weekend default. This means that all payments/obligations due on Friday prior to the default are assumed to be met in full. After the default (which occurs during the weekend), no payments would be exchanged between the CCP and the defaulting member. Trading access is assumed to have been revoked in the weekend, so that no position changes were accepted after the last novation cycle of Friday. The open positions would therefore reflect the positions as of Friday end-of-day, including all transactions that were accepted for novation during Friday. All price movements are supposed to be happening instantaneously at the time the defaults are announced.
30. The CCPs are asked to report the data at account level. This allows ESMA to incorporate the additional stress assumptions, i.e. the losses from concentrated positions and the impact from wrong-way risk, including in the reverse stress test results.
31. The data will also be reported for variants of the common market stress scenario, including different severity steps (each scaling the base shocks at increasing severity) and, for the first time, an antithetic scenario assuming opposite direction shocks. These variants will accommodate the sensitivity analysis and the reverse stress test.
32. The CCPs are asked to report separately the minimum required collateral, not including any excess amounts, and the total available collateral. The usage of the minimum required collateral is meant to reflect a scenario where members would have withdrawn under stressed conditions any collateral exceeding the minimum required.
33. The CCPs will revalue the collateral alongside the cleared products using the market stress scenarios shocks. CCPs will again report and use for the credit stress component the stressed values of margin and default fund collateral actually provided by clearing members (as opposed to the stressed values of relevant resources following re-investment). This implies that any market risk P&L for such collateral beyond haircuts will affect the default waterfall. However, any additional credit risk stemming from the re-investment of collateral will not be reflected.
34. The CCPs are asked to report separately any Powers of Assessment that can be called from non-defaulting members and additional own resources subject to further conditions detailed in the instructions.

35. The CCPs are instructed on how to identify or adjust when needed the shocks to be applied to their own products using the high-level risk factor shocks and how to calculate the P&L stemming from those shocks. The amounts will again be reported in currency (EUR) also accounting for the provided FX shocks.
36. The key methodological improvements that were introduced in the credit component of this 6th stress test exercise are discussed in detail below.

2.3.5 Simulating additional theoretical market stress scenarios

37. ESMA will identify additional theoretical market stress scenarios and assess their impact on CCPs. The objective of this module is to complement the common market stress scenario with an exploratory analysis of the impact of additional theoretical scenarios.
38. The common market stress scenario forms the basis of the assessment of resilience of CCPs to shocks reflecting the triggering of one or more of the sources of systemic risk to the EU financial system as identified by the ESRB. However, CCPs may also be exposed to more asset-specific or even CCP-specific risks, sometimes also linked to particular positions or strategies.
39. When modelling stress scenarios it is not possible to cover all possible co-movements between risk factor for all CCPs. Hence, there is a need to focus on scenarios that would be relevant or impactful for in-scope CCPs. Therefore, ESMA plans to define such scenarios after receiving and analysing CCPs' exposures.
40. From a methodological perspective, ESMA will identify the key risk factors for the different CCPs and use the available historical data of risk factor behaviour and correlations between risk factors to replay the historic moves and/or to come up with hypothetical moves inspired from past stress events. ESMA would then use the shocks implied by the theoretical scenarios defined on the basis of this process to simulate the P&L for already reported clearing members positions as of the reference date and assess the sufficiency of CCPs financial resources to withstand such shocks. In all cases, all theoretical scenarios would be run for all CCPs.
41. During the design of the theoretical scenarios, different elements will need to be assessed: plausibility, relevance of historical events to the current environment, and an exploratory analysis of scenarios not contained in the historical data set. For example, it is acknowledged that with regard to the definition of such scenarios one needs to be careful, on the one hand when anchoring the plausibility assessment on only what has happened in the past, and on the other hand assuming that what has happened in the past is still plausible and applicable to current market conditions. Hence, a significant degree of expert judgement will be used, and any

assumptions or limitations will need to be detailed to allow the interpretation of the results.

42. The accuracy of the results using the theoretical scenarios will be restricted by the calculation of results using first-order sensitivities to risk factors and also using position data with a more limited level of granularity compared to the data used internally by CCPs. In this sense, the results will not have the same level of accuracy as those computed through full revaluation and full product specifications by CCPs for the main market stress scenario. Nonetheless, ESMA will aim to reconcile the produced estimates with CCPs. As an improvement compared to the 5th exercise, ESMA plans to also incorporate the market liquidation costs from the concentration component into the loss estimation.
43. As in the previous exercise, there will be different flavours of additional theoretical scenarios. First, ESMA plans to select historical scenarios based on identified key risk factors and scale them to increase severity. Second, ESMA plans to sample scenarios from a model which will be fitted to historical data. By this, ESMA intends to explore the impact of plausible changes to the correlation structure.
44. The results of this assessment will be used as an exploratory analysis to identify potential weaknesses not highlighted by the main stress scenario and any residual limitations will be duly noted in the final report.

2.3.6 Assessing the impact from sponsored clearing arrangements

45. In this 6th exercise, ESMA will conduct an exploratory analysis of sponsored clearing models developed by the CCPs in scope. (Guaranteed) sponsored clearing models reflect the increased activity of non-bank market participants in central clearing. The exploratory analysis will seek to assess the current state of adoption of such models, and their materiality for the resilience of CCPs.
46. ESMA will collect data on existing offerings, including on the relationships between sponsoring and sponsored clearing members, and additional resources posted to support these activities to better understand the materiality of risks posed to CCPs from joint defaults of Sponsors and Sponsored Clearing Members.

2.3.7 Assessing the impact from porting client accounts

47. Additionally, ESMA will conduct for the first time an assessment of how the porting of client accounts from a defaulting clearing member to surviving clearing members may impact the credit and concentration stress testing results.
48. Whereas a no-porting assumption allows to conservatively account in the stress test also for any losses stemming from client accounts, the porting of client

accounts could increase overall concentration costs due to the break in netting sets. ESMA will assess this potential impact by testing for a scenario where all eligible client accounts of defaulting members are successfully ported, calculating consistent results across credit and concentration modelling for the remaining positions.

2.3.8 Limitations of the Credit Stress

49. As in all exercises of this scale and type, there are residual limitations:

- The credit stress test exercise includes the impact from concentrated positions. However, the estimation of this impact is subject to limitations, which are described in the relevant methodology, including due to the restricted modelling of the default management procedure, the model granularity and the uncertainties around the estimation of the market impact parameters.
- Investment risks, including market and credit risk assumed as a result of CCPs' investments are not assessed in the credit stress test component. The exercise does incorporate an assessment of the market risk for provided collateral using the market stress scenarios and an adjustment for the wrong-way risk resulting from margin collateral issued by clearing members. Any additional market or credit risks, also resulting from the re-investment of provided collateral are not covered in the main credit stress test. The impact from such investment risks is explored under a dedicated non-default risk scenario in the context of the new recovery and resolution component.
- The estimation of the wrong-way-risk adjustment is subject to limitations, including due to uncertainties in the estimation of the recovery values. Moreover, in the interest of avoiding complexity, the wrong-way risk effects on cleared index products are not modelled.
- Operational risks, including those that may lead to increased credit risks, such as the operationalisation of default procedures, are also not reflected in the credit stress test results.
- Any additional second round effects to prices following the default of entities will not be modelled (i.e. the price shocks are the ones including in the scenarios and the number of defaults are the ones described above, but the two are taken exogenously). Also, the default of additional entities due to losses accumulated from non-cleared portfolios will not be modelled.
- The objective of employing additional theoretical market stress scenarios is to complement the common market stress scenario with an exploratory analysis of the impact of additional theoretical scenarios. However, when modelling the scenarios and credit exposure, it is not possible to cover all possible risk factors and then all

possible combinations of risk factor shocks for all CCPs, as this would require modelling several thousands of risk factors and then all their co-movements.

2.4 Concentration Risk Analysis

2.4.1 Objectives of the Concentration risk analysis

50. The objective of the concentration component is to assess the impact of liquidation costs derived from concentrated positions on the resilience of CCPs.

51. The Credit component of the Stress Test applies market shocks to positions regardless of their size. All positions are valued at the mid-price, regardless of their size and direction, implicitly assuming that the CCP will be able to close out positions at this price. However, in practice, when closing out positions a CCP might incur costs beyond those factored in the shocked mid-price. The inability to perform market transactions at the mid-price is a manifestation of market illiquidity. The level of market illiquidity risk is linked to the size of the position and the depth of the market.



52. Market illiquidity can be broken down into two parts:

- An exogenous component generated by the bid-ask spread. Bid-ask spreads create a cost for closing out even small positions.
- An endogenous component, when positions are large relative to market capacity and their liquidation in a short time frame (such as in the context of a CCP's default management process) causes mid-market prices to move further in an adverse direction than would have been observed otherwise. The extent of this effect depends on the size of the position in relation to market depth, which is the ability of the market to absorb transactions without materially impacting the market price.

53. For the world's largest and most liquid markets, such as interest rates on major currencies, the exogenous component generated by the bid-ask spread is of minor importance. It can be larger in other markets such as credit or energy markets.

54. However, in virtually all markets, for sufficiently large positions, the endogenous impact generated by the liquidation on market prices dominates that of bid-ask spreads.

55. The analysis consists of the identification of concentrated positions, the estimation of the potential liquidation costs, and the assessment of potential implications to CCP resources. This analysis develops along the following conceptual steps:

- Identification of concentrated positions of clearing members both at an individual CCP level and across CCPs.
- Estimation of the liquidation costs of concentrated positions for individual CCPs and at system-wide level during a market stress situation including the implications of the simultaneous liquidations at different CCPs of the same asset or contract.

- The combination of the liquidation costs with those stemming from market shocks to produce an estimate of the overall costs that would need to be absorbed by CCPs in the event of clearing member defaults.
 - Comparison of concentration and liquidity add-ons held by the CCPs based on their margin models for the different asset classes and products they clear against the estimated impact of liquidating concentrated positions.
56. In this exercise the methodology will continue to cover the concentration risks originating from asset classes considered in previous exercises as well as the liquidation of non-cash collateral. Additionally, the analysis of model risk will aim to examine the impact of various assumptions employed in the methodology.

2.4.2 Scope and overview of methodology

57. CCPs will be required to provide the following information:

- Account-level details of cleared positions as of the reference date. The aggregation will be performed per product, following specific guidelines detailed in the Instructions document (Annex 1) for each asset class. For some asset classes, CCPs only need to report details of positions that are above certain materiality thresholds at product level. Positions below the thresholds are considered too small to be relevant to the concentration risk analysis and will be reported in aggregate rather than at product level, for the purpose of a complete portfolio description.
- Estimates of traded volumes for the different products, and of unitary liquidation cost for positions of different sizes relative to the traded volumes. The definition of liquidation costs will present some differences across asset classes to take into account their specific characteristics.
- The level of concentration add-ons in the CCPs' margin framework (i.e. the additional margin called and received from each clearing member specifically to cover concentrated positions), broken down per asset class. Where the CCP total margin includes a contribution specifically linked to the position size but not collected as a separate add-on, CCPs will be asked to separate the two according to a clear logic. CCPs will also be asked to identify any clearing members that are not called to post concentration add-ons due to special status.

58. Using the information submitted by CCPs, ESMA will:

- Develop common liquidation cost models for all asset classes based on CCPs' liquidation estimates using an aggregation methodology. More details on the process are specified below in the dedicated section of this document.
- Combine the positions reported and the common liquidation cost models to estimate the liquidation costs attributable to concentration in each service and asset class. The modelling choices will be adapted to specific characteristics of each asset class.

- Perform different analyses with the calculated concentration costs as detailed in the *Analysis of results* section, including model risk assessments detailed further in the *Assessment of model risk* section.
59. The design of the framework ensures that many concentrated spread positions, even market neutral ones, will in general be captured by the analysis, if the different legs of the spread fall into separate product buckets. This reflects the underlying assumption that the transaction costs associated with concentrated positions in two different underlyings cannot be offset. For example, a large short position in one equity and a large long position in another equity will not offset each other's costs. Likewise, electricity or commodity derivatives with different delivery points will be captured.
60. Curve / calendar spreads in the same underlying will be captured to the extent that the different legs of the spread position fall into separate buckets in the aggregation rules defined for the relevant asset class.
61. The specific definition used to identify product buckets is an integral part of the methodology, since different choices in this respect would lead to different views on the CCP positions and different estimates of concentration costs.
62. The definition of liquidation costs for each position is also based on specific assumptions on the drivers of the liquidation cost (principal risk factor per position and relation to the traded volume), the analytic specification of the cost as a function of the relative size, and the methodology used by ESMA to aggregate the CCP submissions.
63. Modelling any auction mechanism presents many theoretical and practical challenges. This would be even more challenging in an ESMA exercise with a large variety of market and service structures. Therefore, modelling the auction mechanism is out of reach for this exercise.
64. The methodology does also not attempt to model a gradual reduction of concentrated positions as these get liquidated, during and potentially exceeding the MPOR. Instead, liquidation is modelled as happening in a single tranche for all positions, leading to the modelled liquidation costs.

Asset class scope

65. The equity and bond cash and repo security markets are in scope of the concentration risk analysis. For derivatives, the scope will cover Equities, Bond, Interest Rate, Foreign Exchange, Inflation, Credit and Commodity derivatives, including Emission allowance and Freight derivatives.

66. To limit the overall complexity, some asset classes and sub-classes have been excluded from the calculation of liquidation costs. Structured finance products, securitised derivatives, CFDs, volatility index derivatives and dividend derivatives are not covered.
67. The choice of asset classes to be excluded was informed by different criteria including the limited volumes in CCPs (structured finance products, securitised derivatives) and the need to avoid overall complexity of calculations (volatility index derivatives, dividend derivatives).
68. For the excluded classes the analysis will not include information on the concentration risks present in these segments, therefore potentially not presenting a fully exhaustive view of the impact on CCPs. For some of these asset classes, position information may nevertheless be requested for use beyond the Concentration Risk Analysis. The detailed coverage is available in the Instructions.

Aggregation and reporting of positions

69. The Instructions document details the aggregation rules for each asset class. The target sub-classes are built from tables of the annex III of the Commission Delegated Regulation 2017/583 on MiFID II, dealing with transparency requirements. The segmentation criteria are complemented where necessary to improve the granularity, with for instance, the introduction of a delivery / cash settlement location for some commodity derivatives.
70. To allow for a simpler implementation, the positions should be valued and reported without considering the impact of the market risk scenario.
71. The principles governing that aggregation are the following:
- For securities, the positions will be aggregated at the ISIN level, with size measured based on the market value of each position.
 - For equity derivatives, positions will be aggregated on the basis of the underlying. For other derivatives, the aggregation will be done according to different categories and maturity buckets. The details for each asset class are set out in the Instructions.
 - The size of derivatives positions will be based on their exposures, and will be measured on the aggregate of all relevant positions, including both linear (e.g. futures/forwards) and non-linear positions (e.g. options).
 - The exposure used as measure of position size will be the delta, that is, the linear sensitivity to the principal risk factor. The vega will also be collected for the aggregated positions and used in the analysis where material and practicable.

Determination of the common market-impact sensitivity tables

72. For each asset class it clears, each CCP will be requested to provide a sensitivity table containing the estimates of liquidation costs. The specifications of the sensitivity tables are defined in the Instructions. The CCP should be able to justify the numbers provided as realistic measures of potential liquidation costs during a stress situation, and consistent with its concentration add-on methodology.
73. Typically, for any given asset sub-class within that asset class, the table should give the cost (bps or % of market value) for executing trades that are x0.5, x1, x2, x5 of the average daily volume (or average daily notional amount when relevant) in stressed market conditions after at least one large clearing member just defaulted. The exact content of each table is specified in the Instructions.
74. From all the contributions received, ESMA staff will build a common ESMA sensitivity table for that asset class, based on its aggregation methodology. This step may involve accuracy and plausibility checks on the CCP submissions as well as the removal of outliers.
75. For each table, ESMA staff will propose a methodology to calculate the market impact given a position size. This could involve simple interpolation / extrapolation techniques or the fitting of a functional form.
76. After consultation with the ESMA group of experts on CCP stress testing, the common set of tables and the methodology for using these table to estimate a market impact will be finalised and used as baselines.
77. The final report will include the common sensitivity tables for each asset class. This will make sure that the market can duly understand results, and the inputs provided by CCPs. This transparency should also act as an incentive for CCPs to provide adequate estimates.

Computation of concentration risk

78. Following the framework aggregation rules and required granularity, the CCPs will have reported the concentrated positions of each of its clearing members at account level.
79. For each aggregation level, the size of the position to be liquidated will be computed under the chosen modelling assumptions. ESMA staff will evaluate the size of this position (or its hedge) relative to the average daily volume (or such relevant parameter). Then, using the common ESMA sensitivity tables, the liquidation market impact of the position will be determined.
80. This market impact will then be allocated at account level in order to be able to appropriately assign concentration costs into the waterfall.

81. When estimating concentrated positions, ESMA staff will allow for hedges with evident economic rationale such as delta hedging single stock derivatives with the underlying stock.
82. In case of multiple clearing member defaults, the total position will be used to get the total market impact. This market impact will then be apportioned to the different clearing members.

Analysis of results

Concentration risk analysis

83. For each CCP, a descriptive analysis of the concentration risk across asset classes and clearing members will be performed. The computed concentration risks will be compared to the reported concentration add-ons and required margins of the CCPs.
84. Through these analyses, we will assess the effectiveness of the CCP models to account for the concentration risk relative to the common benchmark of the liquidation costs estimated by ESMA. The analysis will be conducted to identify relative shortfalls for a specific CCP at asset class level, globally across asset classes, or market-wide for an asset class. The risk will be quantified in absolute terms and in relation to the total margin required.

Combined concentration and market shock scenario

85. The losses stemming from the liquidation of concentrated positions will be added to the scenario P&L caused by the market shocks. ESMA staff will then feed these losses through the waterfall to estimate the total stressed loss over the members' required resources. This will highlight the additional impact of concentration risk on mutualised resources.
86. ESMA staff will review the choice of Cover 2 defaulting clearing members to check whether this may have been different once concentration risk is factored in.

Assessment of model risk

87. Estimating price impact for hypothetical large sales as a function of the sold volume is a challenging task, in particular under stressed market conditions. Moreover, the market impact parameters are derived from the CCPs' own estimates, with the potential for model risk in the translation from the CCP's models, and in some asset classes a sparse set of contributions. As in the previous exercise, the common set of sensitivities used by ESMA will be reported for transparency.

88. Model risk will be assessed in different ways. Reverse stress testing will be used to identify the level of market impact at which the Cover 2 resources would be breached (instead of relying solely on CCPs' market impact sensitivity estimates).
89. Further model risk tests will explore the sensitivity of the results to flexing the base model's assumptions. These will consider the offsetting of liquidation costs for correlated assets at different levels of granularity, the impact of porting client accounts, and the choice of functional form of the liquidation cost function, including for example extrapolation and tests against alternative formulations such as the alternative approach developed by Fukker et al (2022)³ and already employed in previous exercises.

2.4.3 Limitations of the Concentration Risk Analysis

90. This exercise does not aim to model the whole default management procedure. More specifically, there is no distinction between the process for OTC and exchange-traded instruments, and no attempt to factor-in the detailed mechanics of an auction which could lead to smaller or bigger concentration costs.
91. Some calendar / curve risks within asset classes are not being considered when the relevant positions fall into the same proposed buckets for the relevant asset class. These risks are not being considered to limit the complexity of the exercise. Conversely, for some asset classes, market practices could allow for more aggregation than considered in the framework.
92. The modelled liquidation costs will not take into account the effect of any positions held by the defaulters outside the CCPs in scope for the exercise, for example on a non-cleared basis or at other CCPs. It is reasonable to expect that in an actual default there might be a further strain on the market capacity from these positions being liquidated at the same time.

³ Fukker and al (2022). Contagion from market price impact: a price-at-risk perspective, ECB Working Paper.

2.5 Recovery and resolution

2.5.1 Objectives of the recovery and resolution component

93. As per EMIR 3 and the CCP Recovery and Resolution Regulation (CCPRRR)⁴ ESMA must perform Union-wide resilience assessments considering aggregate effects of recovery and resolution arrangements on Union financial stability.



**Recovery and
resolution**

94. Hence, the objective of the recovery and resolution component is to simulate the activation of CCP recovery and resolution arrangements and assess the effects on the financial stability of the European Union.

95. The framework provides for a methodology, that allows for a consistent comparison of how CCPs would deploy recovery tools in response to extreme loss scenarios, as well as the impact of a potential resolution cash call by resolution authorities before service closure. The methodology includes the

- **Replication of rulebook-driven recovery actions** at CCP and Default Fund (DF) levels.
- **Quantification of loss absorbency** of each recovery tool (Skin In The Game, Assessments, Variation Margin Gain Haircutting (VMGH), Position Allocation, etc.), compare their effectiveness, and side-effects as well as the incentives they provide.
- **Identification of structural vulnerabilities**, such as concentration of assessments, multi-default interactions, and tool sequencing effects on clearing members and also clients.

98. The assessment is expected to support supervisory convergence across CCPs and to provide an analytical basis for resolution authorities (NRAs) as well as ESMA and ECB/SSM.

96. As such, the exercise will test the resilience of the system of CCPs beyond extreme and plausible events. This exercise is not designed to check compliance of CCPs with regulatory requirements or identify deficiencies in individual CCPs' recovery plans.

⁴ Regulation (EU) 2021/23

97. Given the above, the framework will concentrate on default losses and non-default losses scenarios that are severe enough to trigger recovery and resolution phases for at least some CCPs.

2.5.2 Regulatory background of the recovery and resolution component

98. Under the CCPRRR, CCPs shall develop and maintain a recovery plan providing for measures to be taken in the case of both default and non-default events and combinations of both, in order to restore their financial soundness if needed, without any extraordinary public financial support, and allow them to continue to provide critical functions following a significant deterioration of their financial situation or a risk of breaching their capital and prudential requirements under EMIR.

99. Such a plan should include a comprehensive range of capital, loss allocation, position allocation and liquidity actions required to maintain or restore the viability and financial soundness of the CCP including to restore its matched book and capital, and replenish pre-funded resources and maintain access to sufficient sources of liquidity which are necessary for the CCP to maintain its viability as a going concern and to continue providing its critical services.

100. Loss allocation actions may include recovery cash calls and a reduction in the value of gains payable by the CCP to non-defaulting clearing members (Variation Margin Gain Haircutting (VMGH)).

101. Resolution plans are drawn up by the resolution authorities of the CCPs. The plans should cover a broad range of scenarios, distinguishing scenarios resulting from default events, non-default events and a combination of both, as well as different types of non-default events. Such plans include the resolution strategy, scenarios and tools, including the No Creditor Worse Off principle (NCWO).

102. As per EMIR 3, ESMA shall perform Union-wide assessments of the resilience of CCPs to adverse market developments in accordance with Article 32(2) of Regulation (EU) No 1095/2010, taking into account, where possible, the aggregate effect of CCP recovery and resolution arrangements on Union financial stability.

103. ESMA takes the above regulatory requirements into account in the design of the recovery and resolution component.

2.5.3 Scope and methodological principles for the recovery and resolution component

104. CCP recovery is the set of actions taken by a CCP to manage and absorb losses and replenish its depleted financial resources when it faces a severe financial

distress scenario that is beyond the resources covered by its standard default management procedures (i.e., when the default fund is exhausted).

105. The process is governed by the CCP's recovery plan, which must be drafted in advance and approved by regulatory authorities. Such recovery plans must cover a comprehensive range of extreme, forward-looking stress scenarios.
106. The recovery and resolution component of the ESMA CCP stress test will assess the impact of 3 separate recovery scenarios:
 - a. A default loss scenario, scaling up the ESRB common market stress scenario, while assuming the default of a large number of clearing member groups on the same day. This scenario should be severe enough to reach recovery (and resolution) for at least a few CCPs.
 - b. A non-default loss scenario, based on a cyber-theft event.
 - c. A non-default loss scenario, based on investment losses stemming from top reverse repo counterparties defaulting and/or market losses from direct investments.
107. The recovery and resolution default-loss stress test scenario combines market shocks with the sequential default of a large number of market participants on the same day. The same severe but plausible shocks that are used for the credit component are applied here but scaled up for increased severity.
108. The recovery and resolution component will not consider liquidity risk scenarios as they would need to rely on a liquidity stress analysis that is not in scope of the exercise this year. Operational losses beyond the cyber-theft scenario are also out of scope, due to limitations in modelling losses.
109. An analysis of the recovery tools used by CCPs to cover losses under the different scenarios will be performed. Those loss absorbing tools include, but are not limited to, cash assessments, variation margin gains haircutting and CCP capital. In addition, CCPs could also use other tools in case of failing auction (or service closure), such as partial or full tear-ups of contracts, as well as forced allocation of defaulting portfolio's positions.
110. The exercise will assess the aggregate effectiveness and side-effects of those different recovery tools, together with the incentives they provide for the different stakeholders, also considering the specificities of the different asset classes.
111. We will also assess the distribution of impact between clients and clearing members, with particular emphasis on variations across specific asset classes. National Resolution Authorities' (NRA) plans are not public, and strategy is not predetermined (e.g. choice in resolution tools and order). Therefore, the exercise will not model the resolution phase per se and only consider a resolution cash call (potentially after the exhaustion of CCP's capital first), should there be any

remaining losses after recovery phase. As a separate work to this exercise, NRAs could be involved on potentially extended scenarios, to simulate resolution phases for the most impacted CCPs and assess the impact on surviving clearing members.

2.5.3.1 Definition of the scenarios for the recovery and resolution component

112. Recovery and resolution testing will be run on a single date, which is the same date as used for the credit and concentration components.
113. The default-loss scenario will be based on the following default assumptions:
- **Market shocks:** To ensure consistency across risk factors and with the other components, the market shocks will be scaled up from the underlying ESRB market shocks used in the credit stress test. The scaling factor will range from 1.5 to 2.0 to reflect increased severity compared to the largest historical returns observed for at least some of the asset classes.
 - **Liquidation costs:** When relevant, liquidation costs will be assumed in line with the methodology used for the concentration component, also scaled up (e.g. to 2 times) for increased severity.
 - **All CCPs Cover-n groups:** Across all CCPs, identify n clearing member groups with the highest aggregate exposure under the considered market stress scenario. The number n will be chosen to trigger recovery and resolution phases for at least some of the CCPs and is expected to be 4 or 5.
 - **Default timing:** All the defaults are assumed to happen on the same day over the weekend, but sequentially by decreasing order of impact.
114. ESMA plans to design and implement a first non-default “cyber-theft” scenario as follows:
- **Narrative:** A cyber theft incident occurred where the CCP’s cyber defences failed, resulting in an unauthorised transfer of cash. The CCP has suffered a theft of a significant amount of cash following an external actor illegally gaining access to the CCP’s systems to make unauthorised transfers. Funds were redirected to a third-party’s bank account (and then onward from there) instead of being transferred from the CCP’s bank account to its investment agent or depositary. The operational vulnerability has been identified and remedied, preventing further theft.
 - **Support:** The CCP will not receive any uncommitted funds or other voluntary support from any third-party, including its parent company or other owners, to remedy the theft.
 - To the extent the CCP has applicable insurance coverage, this coverage will not be available in the immediate term.

- There is no realistic prospect of the CCP being able to trace and recover the sums lost.
 - **Impact:** Theft of all VM pay-ins called in the first margin run following the stressed market shock.
115. ESMA proposes to design and implement an additional “investment losses” non-default scenario as follows:
- **Narrative:** the CCP suffers stress losses stemming from direct investments and/or stress losses stemming from the default of top reverse repo counterparties, assuming market shocks from the underlying ESRB market stress scenario.
116. CCPs will report how they would have handled a recovery situation as of the stress test date, based on the rulebook provisions that would have applied.
117. It is assumed that all defaults occur sequentially but on the same day. Margins are collected as required prior to day 0. Payment of margins by the defaulting members fails on day 0 morning. The shocks are applied to the prices used for the last ‘good’ VM payment.
118. The market shocks will be assumed to be instantaneous, and the market factors assumed to then stay unchanged until the completion of all recovery and resolution activities.

2.5.4 Modelling of the tools

119. ESMA has defined a list of generic tools and how they apply, based on recovery plans for in-scope CCPs.
120. CCPs will provide information on the sequence of recovery tools under each scenario (default loss and non-default loss) at the stress test date. When the actual implementation of the tool differs from the proposed generic tool, the CCP will be able to provide details. On a best effort basis, ESMA staff will consider specificities, when material.
121. To reduce the validation effort for all stakeholders, CCPs will also provide a worked example for the different scenarios. Those worked examples will be designed to be as close as possible to the final scenarios, with the caveat that the final choice of defaulting clearing member groups will only be determined based on the complete set of CCP submissions.
122. When a CCP has the option to choose between different recovery tools or the order with which they are used, the CCP should provide all the different sequencings, while indicating the most likely order/choice for each of the worked

examples. Alternative sequencings will also be used, if they highlight other vulnerabilities.

123. Then ESMA will run for each CCP and scenario the recovery strategy.

2.5.4.1 Input from CCPs

124. The component will reuse the information already provided by CCPs for the purposes of the credit and concentration components. In particular, the component will leverage available information on the default fund, with DF and skin in the game (SITG) amounts, and clearing members, including their groups and individual DF contributions.

125. This information will be complemented by the CCPs with a CCP recovery strategy template that will ensure:

- Fidelity to individual CCP rulebooks.
- Ability to incorporate CCP-specific parameters (e.g., VMGH caps, replenishment rules).
- Full traceability from input rule to tool execution and output.

126. Separately for each scenario, the CCP Recovery Strategy template will detail for each tool its:

- category (Loss Allocation, Replenishment, Service Closure, Position Allocation).
- type (Second / Other SITG, Assessment / Investment Cash Call, VMGH, CCP (Regulatory) Capital, Capital Increase, Insurance, Partial Tear-up, Forced Allocation of contracts, Full Tear-up, SITG Replenishment, Second SITG Replenishment, DF Replenishment Cash Call, CCP recapitalisation).
- scope (default fund or CCP level).
- ranking in the sequence for the recovery scenario.
- amount (when relevant, i.e. SITG, Insurance, Capital).
- allocation rule (Pro-rata to DF contributions, pro-rata to positive VM gains, formula-based allocations).
- details on caps/floors for the tools.
- cool-down arrangements: maximum number of uses and periods.
- if the remaining capacity of a tool can be used for multiple defaults.

127. The template will be complemented by a qualitative questionnaire, to clarify further points on both recovery and resolution phases and to allow the CCP to provide context when its actual recovery tools cannot be fully described with the proposed set of generic tools.

2.5.4.2 Modelling of CMs' loss allocation tools

128. Cash calls and similar tools will be modelled as additional cash contributions requested from surviving clearing members pro rata their default fund contributions, with a potential multiplier (e.g. 2 x DF contributions), floor or cap to be reported by the CCP.
129. VMGH will be modelled as non-distributed profits stemming from the market stress scenario and calculated pro rata surviving CMs' net positive PnL, with a potential floor or cap to be reported by the CCP.
130. Additional stress on recovery tools and resources may be considered (e.g. cash calls only partially met by surviving CMs, effective gains for VMGH could be lower in practice).

2.5.4.3 Porting

131. No porting will be assumed in the recovery and resolution component for this exercise.

2.5.4.4 Failing liquidation of defaulting portfolios

132. A failing liquidation assumption may be tested as part of the default loss scenario and could translate as an additional cost impacting surviving clearing members during the recovery phase.
133. CCPs will report the allocation tools that they would use in case of failing liquidation of defaulting portfolios (forced allocation, partial tear up).
134. It will then be assumed that the liquidation of the aggregated portfolio of defaulters will fail. As a result, the central counterparty's allocation mechanisms will affect the opposing positions of surviving clearing members in proportion to their respective sizes (for further details, see Position allocation and partial tear-ups).

2.5.4.5 Survivors vs. Defaulters

135. Defaulting groups/CMs are excluded from:
 - Assessments.
 - VMGH allocations.
 - Position allocation as recipients.
136. Interoperable CCPs are out of scope.

2.5.4.6 Position allocation and partial tear-ups

137. The framework will assume that the position allocation and partial tear-ups are made at the mark-to-market price (tear-up price) after the stressed shocks.
138. The additional costs incurred by non-defaulting clearing members and their clients to re-establish terminated positions are addressed independently. These replacement costs can be substantial, given that the volume of positions subject to tear-up or allocation often exceeds the market's immediate liquidity, making them unsuitable for standard auction processes.
139. The framework will report the combined total impact for non-defaulting members stemming from the direct use of the recovery tools (including cash calls, default fund contribution, VMGH) and the replacement costs for the cancelled trades.

2.5.4.7 Resolution

140. It is assumed that the recovery strategy of a CCP will be fully executed before entering the resolution phase, due to the No Creditor Worse Off (NCWO) principle and the inherent legal risk. If residual losses persist after the recovery strategy has been executed for certain CCPs, resolution cash calls will be considered instead of entering CCP service closure. Resulting losses will then be allocated among surviving CMs in proportion to their DF contributions.

2.5.4.8 Impact on CCPs and Clearing Members

141. The impact for the CCP will be calculated as the total amount of own resources used to cover losses stemming from the considered scenarios (e.g. SITG, Second SITG, regulatory capital, etc.). Replenishment of capital and (S)SITG will not be considered as a loss and will not be modelled.
142. Impact per CM group will be calculated as the total amount of lost profits, losses and costs stemming from applied recovery tools and resolution cash calls across CCPs under the considered scenarios (unpaid profits due to VMGH, cash contributions used to cover losses during recovery or resolution phases, replacement costs to manage allocated positions of defaulters). Replenishment of DF will not be considered as a loss and will not be modelled.

2.5.4.9 Service closure and NCWO counterfactual

143. Service closure and NCWO counterfactual will not be part of the modelling. It is assumed that losses will be covered as part of the recovery phase or through the resolution cash call.

2.5.4.10 Outputs

144. Outputs should aim at assessing the aggregate effects of recovery & resolution arrangements, in line with ESMA's mandate.

145. The framework integrates scenarios' inputs and recovery strategy to generate results at different levels:

- Recovery Strategy: results of the implementation of the recovery strategy and the resolution cash call for each CCP under each scenario, detailing applied tools and coverage of losses. Results are provided at CCP level for non-default scenarios and at DF level for the default scenario, also considering sequential defaults of clearing member groups, as this could affect the availability of some recovery tools. This report aims at verifying that the recovery engine correctly executes recovery strategies reported by CCPs.
- Per-CM Report: for each scenario and each CCP, impacts of recovery tools and potential resolution tools to the CCP and individual clearing members, including also lost DF contributions, SITG usage and other CCP resources. This report aims at estimating the impact on stakeholders.

146. ESMA will then assess the aggregate effectiveness and side-effects of the different recovery tools, the aggregate impact on individual clearing members and to quantify the distribution of impact between clients and clearing members, with particular emphasis on variations across specific asset classes. Impacts for CMs will be assessed against appropriate solvency metrics.

147. As this component will be run for the first time, and considering ESMA's mandate, only aggregate, anonymised results will be provided.

2.5.5 Limitations

148. Certain CCPs may implement recovery strategies at a more detailed level than default funds, such as by asset class or product type, or define recovery tools with specific features that are not entirely addressed by the proposed framework. The proposed approach represents a balance between CCPs' data requirements, modelling complexity, and the provision of informative results.

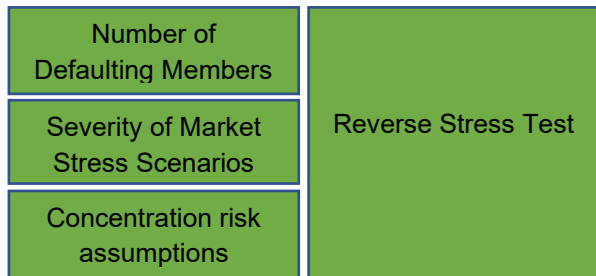
149. This exercise is only capturing three main scenarios, that are considered severe enough to assess recovery and potentially resolution, in line with existing international work. Other scenarios could be considered in future exercises.

150. The framework is currently considering the no porting scenario, as it would be overly complex to test other cases.

151. The impact of partial tear up and forced allocation to non-defaulting CMs is modelled in a simplified and similar manner. Improvements such as selecting specific contracts would require even more data being reported by CCPs with potentially limited benefits.
152. The assessment of the impact for clearing members and clients is limited to the information available for these stakeholders.

2.6 Reverse Stress Test

153. The reverse stress test analysis is used to assess the absorption capacity of CCPs under more severe assumptions. For the credit and concentration components, the number of defaulting entities, the level of shocks, and the severity of concentration risk assumptions are increased to identify at which point the resources of the CCP are exhausted.



154. The reverse stress test results will also incorporate the impact from concentrated positions and wrong-way risk.

155. The analysis will consider not only the number of defaulting entities and the severity of the market shocks, but also the impact of assuming different levels of severity in the assumptions underlying the estimation of the concentration cost.

156. The analysis will consider a number of defaulting entities under the member default scenarios of up to 5. Different levels of severity of the market stress scenarios are considered by scaling up the market stress shocks. The CCPs are asked to calculate and report the losses also after scaling up the shocks in the provided market scenarios for a number of steps (i.e. x1.2, x1.5, x2, -1x). CCPs will need to recalculate losses after scaling up the shocks before calculating the P&L to ensure proper outcomes, especially for products with leverage / non-linear pay-offs (e.g. options). For the 6th exercise the antithetical shock, i.e. multiplying the market stress shocks by -1, was included.

157. The analysis identifies whether there are plausible combinations of stress assumptions with systemic risk implications. It will focus on the clearing system as a whole and not on individual CCPs. Results of individual CCPs will be analysed only if needed to explore the source of events that may have had systemic relevance. We will try to capture the sensitivity of the results to the considered market stress scenarios and understand how the results are affected by changing the underlying conditions.

158. One of the limitations of this exercise is that second round effects are increasingly relevant as scenarios become more extreme. However, as in the core credit stress analysis, second round effects will not be accounted for in this exercise.

3 Implementation Plan

159. The implementation plan for the 6th ESMA CCP stress exercise consists of a design phase, which includes setting the scope and detailing methodological improvements compared to the previous exercise, as well as five steps to conduct the stress test.

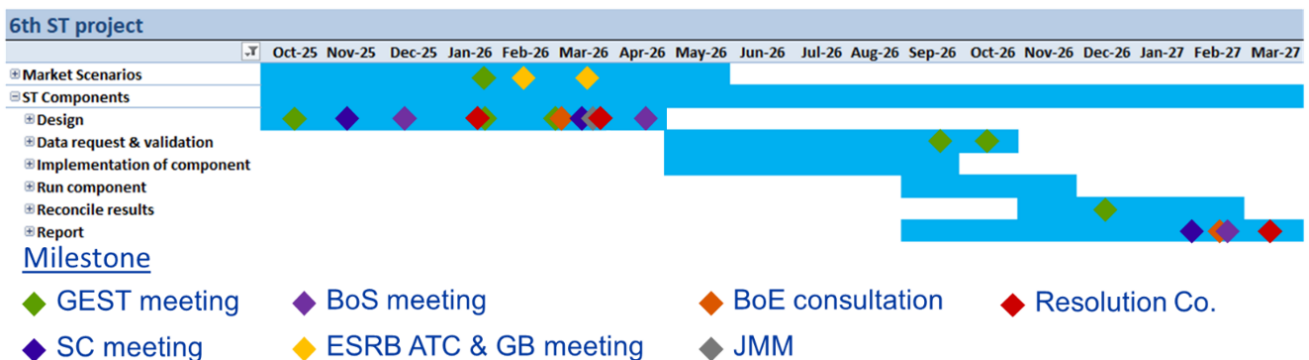
160. The design phase of the 6th stress test exercise will be completed in April 2026 when the ESMA Board of Supervisors (BoS) approves the stress test framework.

161. The next steps will be:

- 1) the launch of the data request;
- 2) the validation of the data provided by CCPs;
- 3) the calibration of the common sensitivity tables;
- 4) The computation of the results;
- 5) The finalisation of the report.

The individual results will be reconciled with CCPs before finalising the analysis and discussed with NCAs before sending for discussion at the CCP Supervisory Committee (CCPSC) and approval at the BoS.

162. According to the projected plan, the exercise will be finalised in Q1 of 2027.



163. The draft framework, data request, instructions and timeline were shared with EACH to collect the feedback from EU and Tier 2 CCPs and to inform the CCPs of required actions and challenges. It is envisaged to ask the CCPs to provide the required data within 9 weeks from the launch of the data request. New xml templates were also introduced for the credit component, that will help improve data quality and efficiency of the validation process.

164. To further enhance the efficiency of the process, the two traditional validation phases previously conducted separately by NCAs and ESMA will be consolidated. The new approach involves integrating the two traditional validation steps into a single, streamlined process. This integration aims to minimize duplication of efforts and expedite timelines by enabling CCPs to report data simultaneously to both ESMA and NCAs from the outset.
165. A continued involvement of NCAs during the validation process is indispensable to ensure data quality and safeguard the credibility of the exercise. In this framework, NCAs would be responsible for conducting sanity checks and more advanced or CCP-specific verifications in parallel with ESMA staff, who would focus on validating data formatting, completeness, and consistency.
166. To further reduce the overall effort required from NCAs, ESMA drafted the validation document with details about minimum checkpoints that will need to be validated. The validation document also describes the validation process including the deadlines and response times. This document is attached to this note (Annex 2).
167. Each NCA is expected to appoint one officer (per CCP or for all CCPs) that will be the single point of communication between the NCA and ESMA staff during the data request and validation phases. This officer is expected to be in regular contact with ESMA staff and fellow officers from other NCAs during the validation to facilitate the consistent implementation of the instructions across all CCPs. ESMA staff will coordinate and facilitate a consistent interpretation of the modelling requirements.
168. ESMA will be responsible for conducting completeness, formatting and consistency checks:
- A. **Completeness** of the data delivered, e.g. all required fields are reported in all cases and the number of records matches what is the expected;
 - B. **Format** of the data delivered conforms to the data request, e.g. numbers or text subject to the maximum or minimum restrictions are reported as required;
 - C. **Consistency** of the data delivered, e.g. the data reported across identical or linked fields can be matched, or that the totals match what is expected.
169. In parallel, NCAs will be responsible for sanity and scope checks that are specific to EU CCPs, since they have the expertise and knowledge of the market, whereas ESMA remains responsible for Tier 2 CCPs and may cooperate for this purpose with the Bank of England for the same checks:
- D. **Sanity** of the data delivered, e.g. amounts reported are in line with data reported regularly to NCAs;

E. **Scope** of the data delivered, e.g. data covers all services, products and members.

170. Finally, ESMA and NCAs will cooperate on checking reported amounts and calculations, with NCAs verifying in particular CCP-specific matters for EU CCPs:

F. **Amounts** reported comply with the instructions;

- Amounts reported respect the conditions set in the instructions, e.g. for credit not including / including excess collateral;
- Rules of the CCP are respected, e.g. CCP reported data to meet all settlement obligations;

G. **Calculations** comply with the instructions;

- Use of reference data as required by the instructions, e.g. use of the appropriate base prices to apply the shocks or FX rates to change currency;
- The CCP applies the provided stress shocks also adjusted where required by the instructions, e.g. calibration of multipliers for more volatile instruments or adjustment of implied volatility;
- Use of the pricing models as required in the instructions.

171. Each data validation round is expected to last one week, except for the first iteration that can last up to two weeks. On the final day, NCA and ESMA will then consolidate issues and request the CCP to resubmit corrected data within one week. In exceptional cases, deadlines may be extended by up to 5 days.

172. Taking into account both the summer period and the usual number of required iterations for each CCP, the entire process is anticipated to last about two months.