

EuroCCP Risk Management Approach and Processes

Important Introductory Note

This note sets out, at a high-level, a summary of European Central Counterparty Limited's ("EuroCCP's") approach to risk management. This summary is provided for information purposes only and should not be regarded as a definitive or comprehensive description of EuroCCP's risk management framework. Furthermore, this note should not be regarded as any substitute for EuroCCP's Rules. It should be noted that one or more aspects of this approach may be subject to change.

Risks Assumed by a Central Counterparty

The primary function of a central counterparty ("CCP") is to provide the guarantee to trading firms that a transaction will settle at the price agreed at trade execution even if the original counterparty was unable to meet its obligations. The CCP therefore has to manage two types of risk:

- **Credit risk**, which is the probability of a CCP Participant's default; and
- **Market risk**, which is the difference between the trade price that the CCP has to honour and the price at which it can replace the trades of a defaulted Participant.

CCP Risk Management Tools

A CCP uses a combination of risk management tools to mitigate credit and market risk in order to ensure it can meet its obligations to all its Participants. CCPs generally have 3 lines of defense in risk management. A CCP may place different emphasis on specific measures depending on its business model. An isolated comparison of one dimension of risk management between CCPs could therefore be misleading.

Admission Criteria: The most fundamental risk management measure is a CCP's admission criteria for clearing Participants. Admission criteria set the minimum financial standards of the firms with which a CCP will do business. Higher financial standards for admission result in a lower probability of exposure to a clearing Participant insolvency.

Margining: After admission, the most important tool used by a CCP to manage its exposure to a Participant's default is the calculation and collection of margin from the Participant. Margin is put up by a clearing Participant to cover the amount of potential loss to the CCP if it defaulted and the CCP had to fulfill its obligations at prevailing market prices. The CCP prescribes what types of assets are acceptable as collateral.

Additional Defenses: A CCP would have various safety nets to ensure its own continued viability should a Participant default and the margin calculated and collected from that Participant is insufficient to cover the CCP's losses. Examples of these additional defenses are the retained earnings or equity of the CCP, loss sharing among the surviving Participants through their contribution to a loss sharing mechanism (variously called a Guarantee Fund or default fund), an insurance policy, and financial guarantees from a third party or a parent. CCPs have rules on the order in which they invoke these final defenses should the need arises.

EuroCCP Risk Management Approach

The EuroCCP approach to risk management is founded on the three decades of experience and know-how of its parent, DTCC, in running critical market infrastructures. The two areas of primary focus of risk management for EuroCCP consist of (i) monitoring the financial health of Participants and (ii) a robust margin calculation and collection process. EuroCCP places emphasis on proper credit and market exposure management rather than finite amounts of insurance policies and parent guarantees which, as recent market events illustrate, carry their own inherent risks. The reliance on proper margining and collateralisation as central tenets of risk management is underscored by the fact that DTCC - the market infrastructure that clears virtually the entire US market in equities, government and mortgage backed securities, settling \$1.48 quadrillion worth of transactions - had just over \$500 million in shareholders' equity at the end of 2009.

EuroCCP Admission Criteria and Credit Risk Monitoring

EuroCCP requires Participants to be well-capitalised. We require at least €20 million in *excess* regulatory capital for Individual Clearing Participants and €70 million in *excess* regulatory capital for General Clearing Participants. Trading firms that do not meet these criteria can secure the guarantee of an adequately capitalised parent or a third-party, or alternatively use the services of a General Clearing Participant rather than become a direct Participant themselves. Many firms provide a General Clearing Participant service; currently a trading firm can choose from the list of EuroCCP General Clearing Participants should it require an intermediary.

The minimum capitalisation level for clearing Participants was established in consultation with the first group of potential Participants, in line with the EuroCCP user-governance business model. The requirement is not only much higher than that of NSCC (the DTCC subsidiary that serves as the CCP for US equities) but is also the highest among CCPs in Europe. All other things being equal, more highly capitalised firms are less likely to become insolvent, thus contributing to the overall safety of the CCP.

Once admitted, a Participant's financial condition remains under surveillance regarding its leverage and credit standing. A Participant is considered to be highly leveraged where the amount of the margin required by EuroCCP is greater than the Participant's excess regulatory capital. A Participant is considered to have a lower credit standing where there are indicators that would cause EuroCCP concern that there is a material possibility of default. A Participant which has high leverage and

/or low credit standing may be required to post additional collateral to cover EuroCCP's higher credit exposure.

EuroCCP Margining Process

The margin amount required from each Participant is intended to cover the potential loss to EuroCCP should that Participant default and EuroCCP has to replace all open trades of the Participant at the prevailing market price. There are six components to EuroCCP's calculation of its exposure to replacement cost risk:

- **Mark to market** on unsettled and failed trades, which is the value change between the execution price and the current market price of the securities.
- **Haircut on fails**, an amount equivalent to a percentage of the absolute value of failed transactions.
- **VaR on end of day positions**, to cover the uncertainty of market volatility. The Value at Risk methodology estimates the maximum possible losses for a given portfolio based on a given confidence level over a particular time horizon. EuroCCP's VaR methodology on end of day positions in liquid securities uses 150 days of pricing history (front-weighted) and a 99% confidence level for a 3-day holding period, which represents the estimated time needed to close out a portfolio.
- **VaR on intra-day positions**, which covers predicted intra-day risk between margin collection and the collection of margin on the following day. This methodology applies VaR on historical, front-weighted intraday activities by taking 4 daily snapshots over the preceding 60 days. If the predicted intra-day risk is higher than the observed end-of-day risk, a margin requirement differential is collected from the Participant. This approach ensures that margin covering estimated intra-day risk is collected in the morning. In contrast, an intra-day margining procedure run during the trading day is only effective provided that margin can successfully be collected intra-day.
- **Coverage component**, a daily front-weighted back-test using 100 days of portfolio history to detect instances where VaR accounted for less than 95% coverage. The difference to reach 99% coverage, if any, is collected from the Participant. The purpose of the back-test is to mitigate VaR model risk.
- **Special charges**, which may be levied on illiquid securities and large intraday price swings.

EuroCCP Guarantee Fund

The EuroCCP Guarantee Fund provides an aggregate pool of collateral available to settle transactions and cover loss. The Guarantee Fund may be utilized to facilitate settlement and cover losses related to a Participant default should the Participant's margin amounts be insufficient.

The EuroCCP Guarantee Fund is recalculated and collected daily from Participants whose Guarantee Fund amount has increased from the previous day. Any incremental amount is advised to Participants at the same time as the notice for their daily margin amount.

There are 3 components to the EuroCCP Guarantee Fund:

- **Stress test** is performed daily, based on 50 historical stressed market conditions. Each stressed scenario is applied to each account's portfolio for that day. A deficiency arises where a simulated loss is greater than the margin amount held. The three largest deficiencies for each scenario are summed, then the highest sum of the 50 scenarios is selected as the Guarantee Fund requirement and allocated among all Participants. The allocation is based on each Participant's total absolute net positions.
- **Capital risk premium** is levied on a Participant whose total required margin amount for the day exceeds its *excess* regulatory capital, and is calculated according to a formula that results in the premium being in proportion to the risk presented.
- **Internal ratings** determine whether a Participant is required to increase its Guarantee Fund contribution, if warranted by a deterioration in its credit status.

EuroCCP Loss Allocation Rules

To provide nevertheless for the possibility that a Participant's margin amount and contributions to the Guarantee Fund are insufficient to cover EuroCCP's losses in the event of the Participant's default, EuroCCP rules enable loss sharing among the surviving Participants according to their respective levels of recent activity.

Whether and how a clearing Participant passes any loss-sharing obligations to its own clients is a business decision for each Participant.

This policy of residual risk mutualisation is consistent with the DTCC and EuroCCP user-owned, user-governed, at-cost business model. As a user-governed entity, Participants bear the consequences of loss sharing and are represented on the board of directors, thus providing a governance safeguard against risk management shortcomings that could lead to loss sharing. In DTCC's entire 30-plus years of operating history, during which time it has wound down and closed out several dozen defaulted Participants, DTCC has never needed to resort to loss sharing even though it has always been able to do so. DTCC recently closed out the open positions of bankrupted Lehman Brothers, Inc., which involved over \$500 billion in market participants' exposure, without impact on its retained earnings or loss sharing.

EuroCCP Rules define how losses resulting from Participant defaults are to be allocated according to a hierarchy. It should be noted that the following bullet points reflect only a high-level summary of certain key Rules relevant to this issue and are not a substitute for a detailed consideration of EuroCCP's Rules themselves.

- Rule 12 defines the default rules and procedures for the satisfaction of default losses. This provides for EuroCCP to look first to the defaulting Participant's collateral deposited with EuroCCP by way of margin.

- Rule 4, Section 10.3 allows EuroCCP to use the defaulting Participant's contribution to the Guarantee Fund to set off against any net loss following the application of the Participant's collateral.
- Rule 4, Section 10.4 allows EuroCCP the discretion to decide whether to apply its retained earnings to cover any loss not satisfied by the Participant's collateral and Guarantee Fund contribution.
- Rule 4, Section 10.6 allows EuroCCP to allocate remaining "Excess Losses" among Participants. The distribution of such loss-sharing is determined by reference to each Participant's pro-rata share of total margin amount contributions over the previous 20 business days.
- Rule 4, Section 10.7 allows a Participant to cap its loss allocation following a demand from EuroCCP for a contribution towards the Excess Loss. Provided that the Participant does so within certain timescales set out in the Rules, the Participant can terminate its participation, in which case that Participant's liability in respect of the relevant Excess Loss will not exceed an amount equal to two times the sum of its margin amount and the required Guarantee Fund contribution of the Participant, each as determined immediately prior to the time of the allocation of the Excess Loss.
- Rule 4 Section 10.14-16 specifies the process for determining any refund payable to a Participant in respect of its contributions to loss-sharing in the event that EuroCCP is able to recover any part of the defaulting Participant's Excess Losses post-default.