Eurex Clearing’s Risk Management Framework

ECB - Money Market Contact Group

Frankfurt
Tuesday, 3 September 2013

César Matos
Eurex Clearing’s Risk Management Framework mitigates CCP specific risks

Member Admission & Monitoring

- Diversified, high quality membership reduces risk of member failure
- Member Acceptance Principles
- Credit Rating Principles
- Regulatory oversight
- Technical & operational requirements

Margining & Collateralisation

- “Defaulter pays“ model
- Members’ positions are constantly evaluated and risk of portfolio is calculated in real time
- Members cover their risk with high quality collateral which is the mainstay of the security system
- Intraday Margin Calls ensure that risk is always covered
- Standardized End of Days Process
- Concentration & Wrong Ways Risk Principles

Lines of Defense

- Loss mutualisation covers extreme tail risks
- The Lines of Defense cover potential tail losses and protect wider market
- Stress Testing Framework ensures that risk is covered in extreme market conditions
- Each member contributes to a mutual clearing fund that covers the default of two largest members
- Contribution of CCP’s capital ensures incentive for CCPs to maintain prudent risk management

Default Management

- Default Management minimizes losses and protects the integrity of the wider market
- In case of member failure the Default Management Process is utilized
- The structure of the Default Management Process sets incentives for members to support the CCP
- Treasury principles ensure access to different liquidity sources, reliable under stressed market conditions

All components of the framework have been adapted and enhanced to be EMIR compliant and will be continuously improved to stay industry benchmark in CCP risk management
Eurex Clearing has a Strong Governance Framework

**Supervisory Board**
- Independent external members
- Market participants
- Home regulator participation

**Risk Committee**
- 2 Supervisory Board members
- 8 Clearing Members
- 8 Clients
- Home Regulator participation

**Executive Board**
- CEO, CRO, COO, Treasury (all on board level)
- Credit, Compliance and Chief Technology Officer are directly reporting to Executive Board

**Advisory Committees**
- Default Related Committees
  - Default Management Committees
  - (internal) Emergency Committee
- Disciplinary Committee****
- Product Related Committees
  - Derivatives Clearing
  - Cash Equity Clearing
  - Repo & Bonds Clearing
  - OTC Product
  - CDS Market

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* Eurex Clearing is „Recognised Overseas Clearinghouse“. This status will be obsolete once Eurex Clearing is reauthorized under EMIR
** Application to become „Derivatives Clearing Organization“  
*** Application to become EMIR compliance CCP 
**** Committee planned
Member acceptance principles ensure diversified and high quality membership (1/2)

• Legal Requirements
  The applicant
  – is licensed by the local authority to provide credit to customers in relation to products cleared and to receive collateral in the form of cash or securities and
  – is under surveillance of a responsible local authority according to standards equivalent to the applicable regulatory standards of the EU
  – needs to sign the Clearing Conditions

• Contribution to the Clearing Funds
  – The Clearing Fund contribution can be submitted in the form of collateral in securities and/or cash.
  – Clearing Fund contribution is linked to the risk exposure or at least the minimum contribution amount.

<table>
<thead>
<tr>
<th>Asset Class</th>
<th>Dynamic Component</th>
<th>Minimum in EUR mn (GCM / CM)</th>
<th>Minimum in EUR mn (DCM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Clearing Fund</td>
<td>2% of Total Margin Requirement*</td>
<td>5.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Credit Clearing Fund</td>
<td></td>
<td>50.0</td>
<td>n.a.</td>
</tr>
</tbody>
</table>

* this measure will be changed to a percentage of Initial Margin (i.e. Additional Margin + Future Spread Margin for RBM).
Member acceptance principles ensure diversified and high quality membership (2/2)

- **Minimum Requirement**

<table>
<thead>
<tr>
<th>Asset Class</th>
<th>Dynamic Component</th>
<th>Minimum in EUR mn (GCM)</th>
<th>Minimum in EUR mn (DCM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equities</td>
<td>20% of Additional Margin [+Futures Spread Margin]</td>
<td>15</td>
<td>3.75</td>
</tr>
<tr>
<td>Bonds</td>
<td></td>
<td>30</td>
<td>7.5</td>
</tr>
<tr>
<td>Exchange traded derivatives</td>
<td></td>
<td>50</td>
<td>12.5</td>
</tr>
<tr>
<td>Energy/ Emissions</td>
<td></td>
<td>50</td>
<td>12.5</td>
</tr>
<tr>
<td>Interest Rate Derivatives</td>
<td></td>
<td>30</td>
<td>n.a.</td>
</tr>
<tr>
<td>Repo</td>
<td></td>
<td>200</td>
<td>50</td>
</tr>
<tr>
<td>Securities Lending</td>
<td></td>
<td>200</td>
<td>50</td>
</tr>
<tr>
<td>Credit Default Derivatives</td>
<td>25% of Total Margin</td>
<td>1,000</td>
<td>n.a.</td>
</tr>
</tbody>
</table>

Unless specified otherwise, the liable equity capital required for multiple clearing licenses is the sum of the requirement for each clearing license. When calculating the minimum liable equity requirement for equity markets, Xetra, XIM, ISE, or for Eurex Exchange and EEX, the minimum liable equity capital requirements are not added. The maximum relevant requirement applies. For example, a GCM license for Xetra and XIM requires liable equity capital of EUR15mn.

- **Dynamic Component:**
  - Capital requirements are scaled to represent the risk of the individual Clearing Member.
  - Clearing Members are monitored regularly and must fulfill liable equity capital requirements at all times.
## Types of Margin

<table>
<thead>
<tr>
<th></th>
<th>Timeframe: yesterday to today</th>
<th>Timeframe: today to tomorrow</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Premium Margin</strong></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td><strong>Variation Margin</strong></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td><strong>Additional Margin</strong></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td><strong>Future Spread Margin</strong></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

### Equities/Index options
- X

### Futures
- X

### Options on Futures
- X

### Bonds/Repo
- X

### Equities
- X

### Cash
- X

### Unrealized P&L
- X

### Realized P&L
- X

### Potential loss
- X

**Additional Remark:**
During the Intraday Margin Calculation GC Pooling is re-evaluated every 20 minutes throughout the day.

Calculated based on:
(a) ECB-Haircuts for GC Pooling → plus potential Supplementary Margin
(b) Margin Parameters for Single Repos
Concentration & Wrong Way Risk principles

Overview

Adverse Risk Constellations

Concentration Risk

<table>
<thead>
<tr>
<th>Issue</th>
<th>Issuer</th>
<th>Sector</th>
<th>Country</th>
</tr>
</thead>
</table>

Wrong Way Risk

<table>
<thead>
<tr>
<th>Sector own</th>
<th>Country own/any</th>
</tr>
</thead>
</table>

Ban on Own Issues & Close Links

Clearing Member

<table>
<thead>
<tr>
<th>Limits &amp; Thresholds absolute &amp; relative</th>
</tr>
</thead>
</table>

Clearing House

<table>
<thead>
<tr>
<th>Limits &amp; Thresholds absolute &amp; relative</th>
</tr>
</thead>
</table>

Collateral Pool

<table>
<thead>
<tr>
<th>Portfolio</th>
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<table>
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</table>

<table>
<thead>
<tr>
<th>Member</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Credit Quality</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Thresholds based on Traffic Lights</th>
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</table>

<table>
<thead>
<tr>
<th>Thresholds based on constellation and dual Traffic Lights</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Portfolio</th>
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</table>
## Margin Collateral: Only secure, liquid and accessible collateral is accepted

<table>
<thead>
<tr>
<th></th>
<th>EUR, DEM</th>
<th>CHF</th>
<th>USD, GBP, DKK, NOK, SEK, AUD, CAD, JPY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fixed Income</strong></td>
<td>■ Category 1 of the ESCB, Issuer ≠ Clearer</td>
<td>■ SNB Repo eligible</td>
<td>■ Government bonds</td>
</tr>
<tr>
<td>Securities</td>
<td>■ Exchange listed (except Bublis)</td>
<td>■ Issuer ≠ Clearer</td>
<td>■ Exchange listed</td>
</tr>
<tr>
<td></td>
<td>■ Admissible portion of issued capital: 25%</td>
<td>■ Exchange listing</td>
<td>■ Admissible portion of issued capital: 25%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>■ Admissible portion of issued capital: 25%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>■ DAX, Euro Stoxx 50, Issuer ≠ Clearer</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>■ Issuer ≠ Clearer</td>
<td></td>
</tr>
<tr>
<td>Equities</td>
<td>■ Admissible portion of free float: 5%</td>
<td>■ Admissible portion of free float: 5%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>■ Max. 30% of required daily collateral</td>
<td>■ Max. 30% of required daily collateral</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Precious</td>
<td>■ As announced by Eurex Clearing</td>
<td>■ SMI</td>
<td>■ SNB Repo eligible</td>
</tr>
<tr>
<td><strong>Metals</strong></td>
<td>■ Max. 30% of required daily collateral</td>
<td>■ Issuer ≠ Clearer</td>
<td>■ Exchange listed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>■ Admissible portion of free float: 5%</td>
<td>■ Admissible portion of issued capital: 25%</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cash</strong></td>
<td></td>
<td>■ SNB Repo eligible</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Eligible currencies for Cash Collateral are EUR, CHF, GBP and USD</td>
<td>■ Issuer ≠ Clearer</td>
<td></td>
</tr>
</tbody>
</table>

Collateral haircuts are reviewed on a regular basis and adjusted if required.
Lines of defense waterfall ensures loss coverage in normal and extreme market conditions

Eurex Clearing’s lines of defense are crisis proven – default fund has never been employed.

Eurex Clearing Lines of Defense

- **Position Netting**: Close-out of all positions
- **Collaterals of member in default**: Total collateral held at Eurex Clearing approx. € 47.74 * bn
- **Clearing fund contribution of member in default**: Min. € 1.0 m (DCM) or € 5.0 m (GCM)
- **Dedicated amount of Eurex Clearing**: € 50 m
- **Clearing fund contribution of other members**: Approx. € 1.49 bn
- **Assessments to the clearing fund**: Max 2 assessment limit liability of CM to 3x prefunded clearing fund contribution
- **Parental Guarantee**: € 700 m guaranteed by Deutsche Börse AG
- **Remaining equity of Eurex Clearing**: Approx. € 248 m, Eurex Clearing thus fully EMIR compliant

Coverage in normal market conditions (Lehman/ MF Global)

Coverage in extreme market conditions

Lines of Defense before Eurex Clearings Capital sum up to more than € 4.5 bn

Values as of 07/2013

* Monthly average collateral value after haircut
Stress Testing

General Stress Testing Principles

Eurex Clearing as the central counterparty has to fulfill its obligations to clearing members, both in day to day business and under extreme market conditions. While day to day risks are aimed to be covered by margins, additional losses due to extreme but plausible market conditions should be covered by the Clearing Fund. Moreover, portfolio and risk model monitoring give a broader analysis basis and reverse stress testing assesses the overall vulnerability of the clearinghouse.

A. Clearing Fund Dimensioning (Core Stress Testing)

The Clearing Fund dimensioning assumes the default of two largest CMs with extreme but plausible market stress. The aggregation of stress losses reflects the setting of two clearing member defaults and conservative portability assumptions due to segregation.

B. Portfolio and Model Monitoring

Portfolio and model risk monitoring Stress Testing gives additional information about the risks inherent in portfolios beyond the Initial Margin confidence level. Further sources of risk and model risks are identified (i.e. by further scenarios, stressing liquidity, feedback effects, varying the model parameters).

C. Reverse Stress Testing

The vulnerability of Eurex Clearing is assessed by Reverse Stress Testing which determines scenarios that would exceed Eurex Clearing’s financial resources (i.e. how many defaults need to happen or how extreme market stress should be to have critical impact on Eurex Clearing).
Appendix
The new Default Management Process reflects best practice and complies with market expectations and regulatory guidelines

Overview of future Default Management Process framework

<table>
<thead>
<tr>
<th>Process step</th>
<th>Description</th>
<th>Covered by:</th>
</tr>
</thead>
</table>
| Set-up/ client Transfer | • Client position and collateral transfer  
• Convention of Default Management Committee  
• Close-out netting per framework agreement  
• Portfolio and market evaluation | Margin and clearing fund contribution of defaulted clearing member |
| Preliminary Measures | • Handling as required for short maturity positions, e.g. by rolling  
• Technical preparation  
• Preparation of portfolio for liquidation | |
| Hedging | • Define hedging for defaulting portfolios  
• Hedge portfolio based on management decision | |
| Independen t Sale | • Selling the portfolio independently if it is small or special | Remaining Lines of Defense |
| Auction per liquidation group | • Mandatory participation in auctions for all clearing members holding clearing licenses with respect to all positions held in the auctioned portfolio  
• NCMs, RCs and clients are able to bid as well, fulfilling the CM’s bidding obligation  
• Economically reasonable bid for a minimum of auction units required  
• Penalty fee and clearing fund juniorization if not fulfilled | |
| Asset Class Resolution | • If Auction results in remaining positions  
a) Eurex Clearing will hold the positions and charges any losses resulting from them to non-bidders, or  
b) Non-bidder agrees to enter into respective transactions with Eurex Clearing | |
ECAG’s Risk Framework

September 2nd, 2013

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