Exploring The Impact Of Increasing Collateral (Margin) Requirements

Jon Gregory
Mandatory Clearing and Bilateral Margin Rules

The Impact of Increased Margin Requirements

The Impact of Mandatory Clearing

Conclusions
Regulatory Response to the Crisis

• In order to reduce systemic risk, the G20 agreed in 2009 to require
  – Central clearing of standardised OTC derivatives
  – All standardised OTC derivatives should be traded on exchanges or electronic platforms
  – Reporting of OTC derivatives to trade repositories
  – Higher capital requirements for non-centrally-cleared OTC derivatives

• In 2011, the mandate was expanded to cover
  – Bilateral margin requirements for non-centrally clearable derivatives

High Level Impact of Bilateral Margin Rules and CCPs

Bilateral Clearing (no margin)

Bilateral Clearing (with initial margin)

Central Clearing

Capital

Default fund

Margins

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# Traditional View vs. Clearing and Mandatory Margining

<table>
<thead>
<tr>
<th></th>
<th>Traditional bilateral clearing (no initial margin)</th>
<th>Central clearing (or bilateral clearing with initial margin)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model</strong></td>
<td>Survivor pays</td>
<td>Defaulter pays</td>
</tr>
<tr>
<td><strong>Margining</strong></td>
<td>Variation margin or none</td>
<td>Variation and initial margin</td>
</tr>
<tr>
<td><strong>Loss absorbency</strong></td>
<td>Capital (and variation margin)</td>
<td>Initial margin (and default funds and capital)</td>
</tr>
<tr>
<td><strong>Risk horizon</strong></td>
<td>~1-year</td>
<td>~5-days</td>
</tr>
<tr>
<td><strong>View</strong></td>
<td>Long-term (e.g. based on fundamental credit analysis and ratings)</td>
<td>Short-term (e.g. dependent on short-term market volatility)</td>
</tr>
<tr>
<td><strong>Credit quality sensitivity</strong></td>
<td>Strong</td>
<td>Weak</td>
</tr>
<tr>
<td><strong>Market risk sensitivity / procyclicality</strong></td>
<td>Small</td>
<td>Potentially large (although reduced by using stressed data, for example)</td>
</tr>
<tr>
<td><strong>Incentive</strong></td>
<td>Losses aligned to risks</td>
<td>Loss mutualisation and potential moral hazard</td>
</tr>
<tr>
<td><strong>Default close out</strong></td>
<td>Uncoordinated bilateral close out</td>
<td>Coordinated auctions</td>
</tr>
</tbody>
</table>
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Conclusions
Variation Margin Potentially Creates Liquidity Risk

“In the case of variation margin, the BCBS and IOSCO recognise that the regular and timely exchange of variation margin represents the settlement of the running profit/loss of a derivative and has no net liquidity costs given that variation margin represents a transfer of resources from one party to another”
BCBS-IOSCO (2013)

“The following discussion of CME cash flows emphasizes variation margin payments because, as will be discussed, these payments placed the greatest stress on the financial system during the week of October 19.”
Brady (1988)
**Initial Margin Potentially Creates Additional Problems**

<table>
<thead>
<tr>
<th>Variation margin</th>
<th>Initial margin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parties pay what they owe to each other</td>
<td>Parties pay more than what they owe</td>
</tr>
<tr>
<td>Calculation relatively straightforward and objective (for vanilla products certainly)</td>
<td>Calculation highly subjective and difficult (e.g. VAR models, confidence level and margin period of risk)</td>
</tr>
<tr>
<td>Typically has to be in cash (CCPs)</td>
<td>Liquidity securities can be used</td>
</tr>
<tr>
<td>Perfect variation margining leads to standard pricing results (OIS discounting, Piterbarg 2010)</td>
<td>Initial margin is “imperfect” in this sense as parties will bear funding costs in relation to paying and receiving initial margin</td>
</tr>
<tr>
<td>Netting of offsetting margins is natural</td>
<td>Netting is not natural</td>
</tr>
<tr>
<td>No major problems with re-hypothecation and segregation</td>
<td>Re-hypothecation and segregation issues have to be resolved</td>
</tr>
</tbody>
</table>
Margining Can Cause Feedback Loops

- Significant price moves and market volatility
- Significant liquidation of assets
- Increase in margin requirements

Some key points
- Initial margin methodologies by their nature can be procyclical
- Variation margin risks increase in a more highly coupled system and more volatile market conditions
Margin Redistributes Risk (it doesn’t make it disappear)

- Suppose B has assets of 100

<table>
<thead>
<tr>
<th></th>
<th>Derivatives</th>
<th>Other creditors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Margin</td>
<td>Recovery</td>
</tr>
<tr>
<td>No margin</td>
<td>0</td>
<td>33</td>
</tr>
<tr>
<td>+ Variation margin</td>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td>+ Initial margin</td>
<td>75</td>
<td>0</td>
</tr>
</tbody>
</table>

Assume all of the initial margin is used in closeout costs.

AOC

No Margin

- Liability = 100
- Derivative Liability = 50

With Margin

- Liability = 100
- Derivative Liability = 50
- Margin
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## CCP Margin Requirements are Stronger and One-Sided

<table>
<thead>
<tr>
<th></th>
<th>Bilateral CSA</th>
<th>CCP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frequency</strong></td>
<td>Daily (or sometimes less frequently)</td>
<td>Daily (and intradaily in volatile markets)</td>
</tr>
<tr>
<td><strong>Symmetry</strong></td>
<td>Generally symmetric - can be asymmetric (e.g. thresholds)</td>
<td>Asymmetric in favour of the CCP</td>
</tr>
<tr>
<td><strong>Type (variation)</strong></td>
<td>Relatively flexible</td>
<td>Cash only (for most CCPs)</td>
</tr>
<tr>
<td><strong>Type (initial)</strong></td>
<td>Common and resolved bilaterally</td>
<td>None (CCP is essentially calculation agent)</td>
</tr>
<tr>
<td><strong>Disputes</strong></td>
<td>Common and resolved bilaterally</td>
<td>None (CCP is essentially calculation agent)</td>
</tr>
<tr>
<td><strong>Negotiation</strong></td>
<td>Bilateral</td>
<td>CCP rule book</td>
</tr>
<tr>
<td><strong>Changes</strong></td>
<td>Must be negotiated and agreed by both parties</td>
<td>CCP can change rule book</td>
</tr>
<tr>
<td><strong>Initial margin posting</strong></td>
<td>Bilateral</td>
<td>Unilateral (only CCP)</td>
</tr>
</tbody>
</table>
The Impact of a CCP
CCP Loss Waterfall

Initial margin (defaulter)

Default fund (defaulter)
CCP equity

Default Fund (non-defaulting members)

Other loss allocation methods

CCP Capital

Liquidity Support or CCP Fails

Defaulter pays

“Skin in the game”

Survivors pay

Losses
What is my Exposure to a CCP?

• **Initial margin exposure**
  - Lost if the CCP defaults (hopefully unlikely)

• **Default fund exposure**
  - Can be hit without the CCP defaulting (more likely)

• **Exposure to loss allocation**
  - Might represent a simple and bounded increased default fund exposure (e.g. rights of assessment capped at 100%)
  - Or possibly a unbounded exposure (e.g. VMGH and tear-up)
Basic Initial Margin and Default Fund Exposure

- Probability is assumed to follow an extreme value distribution
What is my Exposure to a CCP?

- **Increasing initial margins creates two effects in opposite directions**
  - The risk of loss mutualisation reduces (as the CCP has more IM from the defaulter)
  - But the total contribution to the CCP increases (since IM is more expensive than DF)
Default Funds and the “Prisoner’s Dilemma”

- **Impact of Prisoner’s Dilemma**
  - Members may not bid competitively in the auction
  - Methods such as AIPs and forced allocation encourage participation
Auctions and Heterogeneous Loss Allocation

- Clearing members will bid based on their:
  - Risk aversion and assessment of the value and risk of the portfolio(s)
  - Loss allocation in relation to their bid (e.g. default fund tranching)
  - Large initial margins make such loss allocation less relevant

![Graph showing best auction price for homogenous and heterogeneous cases. The graph illustrates that the winning bidder's default fund is protected, leading to a better (lower) price.](image)
The scandalous Lehman CME auction

By Felix Salmon | April 14, 2010

It was one of the least transparent and most underpriced asset sales since the days of Russian privatizations. In the chaos of the immediate aftermath of the collapse of Lehman Brothers, the CME Group auctioned off Lehman’s derivatives assets for less than half their value — handing a $1.2 billion windfall to Barclays, DRW Trading, and — you knew this was coming — Goldman Sachs.

Lehman may act against Goldman

NEW YORK: Lehman Brothers Holdings may have grounds to sue Goldman Sachs Group and Barclays after they demanded $1.2 billion in additional margin to assume trading positions auctioned by a Chicago exchange, bankruptcy examiner Anton Valukas said.

Goldman Sachs was the high bidder for Lehman’s equity derivatives at options and futures exchange CME Group Inc., and took $445 million of those assets at a private auction in September 2008, according to previously censored details of Valukas’s March 11 report. Barclays was the high bidder for Lehman’s energy derivatives and took $707 million in assets from CME.
Auctions and Co-operation

- Assuming clearing members co-operate
  - Then they bid less aggressively as initial margins increase
  - This suggests large initial margins can actually be dangerous

![Graph showing the relationship between IM + DF of defaulter and best auction price. The graph compares the best auction price in scenarios with no cooperation and co-operation, indicating that co-operation results in a worse price.]
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• Bilateral margin rules and the clearing mandate create a more complex OTC derivatives landscape where loss absorbency exists in multiple places
  – How to define initial margins and default funds?
  – How to regulate CCPs and set capital requirements for clearing members?
  – How to incorporate bilateral initial margins in bank capital requirements?

• Increases in margin (variation and initial) is costly and may create liquidity risk
  – And such risks and costs may increase in turbulent market conditions

• Margin does not reduce risk but does redistribute risk
  – We cannot claim (for example) that clearing reduces systemic risk but at best that it reduces systemic risk in OTC derivative markets

• CCPs give rise to a number of important effects
  – CCP exposure (as a CM) is more complex to assess than traditional counterparty exposure
  – Highly conservative initial margins are not necessarily a good idea as they discourage good bids in the auction and make default fund tranching ineffective