



CME Clearing Risk Management and Financial Safeguards Brochure

CME Clearing Overview

CME Clearing serves as the counterparty to every cleared transaction, becoming the buyer to every seller and a seller to every buyer, maintaining a matched book and limiting credit risk by guaranteeing financial performance of both parties. As a central counterparty, CME Clearing serves to promote the financial security of the marketplace by mitigating counterparty credit risk and providing operational and financial efficiencies. CME Clearing operates under Chicago Mercantile Exchange Inc. (CME Inc.), a wholly-owned subsidiary of CME Group Inc. (CME Group) and is a registered Derivatives Clearing Organization (DCO) with the Commodity Futures Trading Commission (CFTC). CME Clearing provides clearing services to multiple CFTC-registered Designated Contract Markets (DCMs) including:

- CME Inc.
- Board of Trade of the City of Chicago, Inc. ("CBOT")
- New York Mercantile Exchange, Inc. ("NYMEX")
- Commodity Exchange, Inc. ("COMEX")

CME Clearing has established partner relationships with other exchanges and clearing houses to provide more efficiencies to our customers.

Cross-Margining Programs:



CME Clearing Acts as Clearing House:



Mutual Offset System:



In addition to providing clearing services for exchange-traded derivatives, CME Clearing also provides clearing services to the over-the-counter (OTC) markets through distinct services for Interest Rate Swap (IRS) and Credit Default Swap (CDS) products until cessation in mid-2018.¹

Market participants access CME Clearing products through clearing members who serve as an integral part of the foundation upon which central clearing is built. Each clearing member assumes performance and financial responsibility for all transactions it clears, including transactions cleared on behalf of its customers, for its own account and for its affiliated companies. Additionally, clearing members are accountable as the guarantor for payment and performance bond obligations from the accounts it clears. CME Clearing evaluates the counterparty risk posed by its clearing members and ensures that each of our clearing members provide prudent oversight and evaluation of the market participants for which they clear. To maintain clearing membership in any of the CME Clearing offered asset classes, adequate financial resources, including performance bond (margin) obligations, contributions to the applicable asset class' Guaranty Fund and adequate capital resources are required. In addition to maintaining adequate financial resources, clearing members are subject to capital and financial reporting requirements established by the CFTC and CME Clearing, adherence to prudent risk management policies and participate in default management drills. CME Clearing is committed to providing clearing members with fundamental risk management tools to promote and protect the financial integrity of the market.

¹ As announced on September 14, 2017, CME Group announced that it will exit the company's credit default swaps clearing business by mid-2018. During this transition, CME will continue to provide full clearing services so that participants can continue to manage their risk. For additional information, a copy of the press release can be found here: <http://www.cmegroup.com/creditexit>

Pre-Trade Risk Management Controls

With a globally diverse group of clearing members and market participants, CME Clearing utilizes a wide range of techniques to assess the level of risks to which it is exposed under both normal and stressed market conditions. To aid in the assessment and management of risks to which it is exposed, CME Clearing maintains pre-trade risk management controls for clearing members. Examples of pre-trade risk controls are outlined in the diagram below.²



On-Going Risk Monitoring

Once a trade has passed the pre-trade check, the portfolio is subject to real-time monitoring by CME Clearing. Open trades on the CME Group markets and margin collateral used to secure those trades are subject to ongoing monitoring to ensure the collateral held against the risk is sufficient, given evolving market conditions. CME Clearing uses a proactive risk management approach through the tools and methodologies it employs. CME Clearing's risk management approach estimates potential market exposures in real-time and prevents the accumulation of losses by marking-to-market open positions at least once daily. In addition, CME Clearing monitors the financial and operational capabilities of clearing members to meet their obligations and the sufficiency of its resources to cover potential future obligations.



Additional CME Clearing risk management functions include:

- Real-time risk monitoring
- Daily exchange of mark-to-market
- Daily recalculation of performance bond requirements
- Monthly recalculation of Guaranty Funds with daily monitoring
- Collateral acceptability and limits
- Counterparty risk monitoring
- Liquidity risk management

CME Clearing monitors intraday price movements and trading activity 24 hours a day, 6 days a week. To assess the impact of these price and activity changes on clearing members, CME Clearing tracks market participant's exposures in real-time.

CME Clearing limits the accumulation of losses through daily settlement variation, known as the mark-to-market calculation, which removes debt from the system by settling profits and losses rather than allowing outstanding obligations to accumulate in the system. CME Clearing calculates mark-to-market twice daily for futures and options, and once daily for OTC products to limit the risk associated with trading hours in the European and Asian time zones. CME Clearing also reserves the right to perform ad hoc settlement cycles as market conditions warrant or to call for additional performance bonds as necessary. The below chart visualizes CME Clearing's facilitation of settlement variation flow between clearing members.

² More information on pre-trade risk controls can be found in the Globex Reference Guide, found here: <http://www.cmegroup.com/globex/files/GlobexRefGd.pdf>



Performance bond (also referred to as initial margin) requirements are good-faith deposits to mitigate failure to perform on open positions, acting as an ex-ante risk-based tool to cover potential future exposures. All clearing members are required to post maintenance performance bond levels to CME Clearing, which represents the minimum amount of protection against potential losses of a position or portfolio. The buffer between initial performance bond and maintenance performance bond levels is currently 10% where CME Clearing has the discretion to increase the buffer where appropriate. CME Clearing requires that clearing members collect initial performance bond levels from a customer when an account is new or when the account's equity falls below minimum maintenance performance bond requirements to provide the clearing member with a buffer for a customer's account to incur some losses before issuance of another performance bond call. In addition to the collection of performance bond, each clearing member contributes a risk-based (or minimum) amount to the Guaranty Fund(s) associated with its clearing membership(s). The Guaranty Funds are a mutualized pre-funded pool of resources to cover losses associated with extreme, but plausible, market events that can be used in the event of a clearing member default.

Customer Protections

Pursuant to CFTC regulations, CME Clearing employs an account structure that distinguishes and segregates customer positions and performance bonds from that of their clearing members and their affiliates. Performance bond is collected on a gross omnibus basis for customers – i.e., one customer's exposures cannot offset another customer's exposures to reduce performance bond requirements. Performance bond accounts for customer's futures and options on futures exposures are referred to as "customer segregated accounts" and cleared swaps are referred to as "cleared swap customer accounts."

Regulatory requirements for customer protections are different for futures and options on futures than for cleared swaps. The performance bond account structure for futures and options on futures is referred to as Customer Gross Margining (CGM). The performance bond account structure for cleared swaps is referred to as Legally Segregated Operationally Commingled (LSOC). LSOC requires the individual identity of customers and tracking of individual performance bond values.

Financial Surveillance

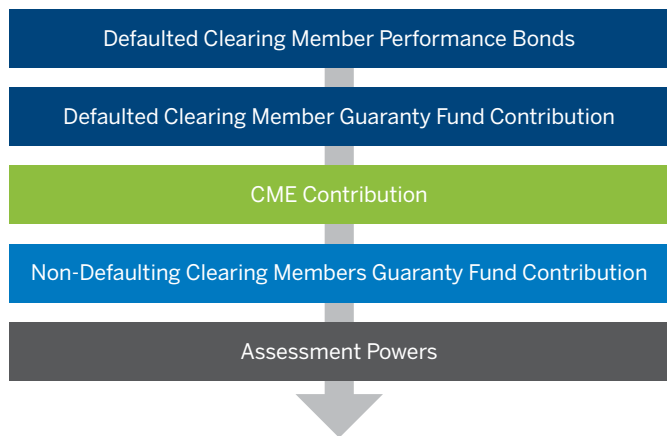
CME Clearing's Financial and Regulatory Surveillance department (FRS) operates a financial surveillance program to monitor the financial condition of clearing members and compliance with customer segregation requirements. FRS performs CME Inc.'s Designated Self-Regulatory Organization (DSRO) function by conducting on-site, risk-based examinations on a surprise basis every nine to fifteen months. Through the surveillance program, FRS monitors clearing member's capitalization levels through regular financial statement submissions and ensures clearing member adherence to notification, inspection and information sharing requirements.

FRS' risk-based examinations are supplemented by separate onsite risk reviews conducted by CME Clearing's risk management staff every other year. Risk management staff focus on clearing members' holistic risk management program, including the clearing member's approach to market risk, credit risk and liquidity management, including in relationship to their customers.

Financial Resources and Default Management

CME Clearing has established separate financial safeguard waterfalls for each major asset class in which it provides clearing services; one for IRS, one for base products, which include futures, options on futures and cleared OTC products other than IRS and CDS and one for CDS until the planned cessation of CDS clearing business.¹ The financial safeguards waterfalls are designed to ensure that CME Clearing has sufficient resources to cover the potential future exposures of each of its clearing members and, without mutualizing losses under extreme but plausible market conditions, has additional resources to cover exposures borne by a clearing member default event. Each clearing member is required to participate in each applicable waterfall for the products it is eligible to clear. In the event of a clearing member default, CME Clearing may only utilize the resources associated with the financial safeguards waterfall(s) in which the clearing member participates.

Each major asset class' financial safeguard waterfall contains the following layers, which would be utilized in the prescribed order in the event of a clearing member default:



The layers of the financial safeguards waterfalls create a pre-defined and transparent structure of protections that give clearing members the information needed to assess potential liabilities in the event of a clearing member default.

Defaulted Clearing Member Performance Bonds

The first layer of the financial safeguards waterfall is comprised of the defaulted clearing member's initial margin (also known as performance bond). Performance bond is collected and calculated at least daily and covers at least 99% of potential future expected losses, the costs of closing out positions and concentration risk, if applicable. In managing past clearing member default events, even during the most recent financial crisis, performance bond funds collected from the defaulted clearing members were sufficient to cover the associated losses.

Defaulted Clearing Member Guaranty Fund Contribution

In the unlikely event that performance bond funds are insufficient to cover a clearing member default, the next layer in the financial safeguards waterfall is utilized, the defaulter's contribution to the mutualized Guaranty Fund. Each Guaranty Fund is designed to cover the tail risk of potential losses in excess of performance bond (considered stress shortfall) caused by the simultaneous default of the two largest clearing members (including affiliates) under extreme, but plausible, market conditions, as measured by CME Clearing's proprietary stress tests. This is commonly referred to as Cover 2. Each clearing member is required to contribute a risk-based, or minimum, amount to the Guaranty Fund for products in each major asset class it clears.

CME Contribution

Should the defaulter's funded resources become exhausted and losses persist, CME Clearing would utilize the next layer of the financial safeguard waterfall, its own contributed funds.

Non-Defaulting Clearing Member Guaranty Fund Contributions

Furthermore, if the defaulted clearing member's pre-funded resources and CME Clearing's contribution are insufficient to recover from a clearing member default, CME Clearing would invoke its right to use the mutualized default fund contributions of non-defaulting clearing members associated with the asset class in which the default occurred.

Assessment Powers

The final layer of the financial safeguards waterfall is CME Clearing's assessment powers. Assessment powers are determined independently for the base, IRS and CDS financial safeguards waterfalls to ensure coverage of extreme tail events in each specific major asset class.¹ Assessment powers give CME Clearing the right to call on non-defaulting clearing members for additional funds in the event the pre-funded resources of the waterfall are insufficient to resolve the loss. Clearing members must fund a call for assessment powers or they will be in default to CME Clearing. Assessment power calculations are reported to clearing members on a monthly basis and are sized as follows:

- **Base:**
275% of Member GF Contributions
- **IRS:**
3rd and 4th largest CM shortfalls
- **CDS:**
3rd and 4th largest CM shortfalls

For the base financial safeguards waterfall, assessment powers are sized at 2.75 times the aggregate Base Guaranty Fund requirement across all clearing members for a single default. For both the IRS and CDS financial safeguard waterfalls, assessment powers are sized to cover the third and fourth largest potential defaulting clearing members.¹

Default Management

Default management practices are designed to ensure the continuity of CME Clearing's services. CME Clearing has established practices and procedures that allow the clearing house to operationally manage a clearing member default while simultaneously maintaining continuity of clearing services to non-

defaulting clearing members. In the event of a clearing member default, CME Clearing may act immediately to:

- Port non-defaulted customer positions and collateral to a solvent clearing member(s)
- Hedge and/or liquidate defaulted positions
- Apply the clearing member's proprietary performance bond deposits and, if necessary, the clearing member's Guaranty Fund contribution and all other assets of the clearing member that are available to CME Clearing (e.g. exchange memberships)

At no time may CME Clearing use customer assets to cure losses associated with a clearing member house account default. Within an account class, all customer performance bond collateral and positions are held in omnibus accounts allowing CME Clearing to quickly port non-defaulting customers' collateral and positions to a solvent clearing member(s). Gross margining greatly improves the timeliness and likelihood of porting given all positions are fully collateralized. Additionally, to minimize the time necessary to port customers once a default has been declared, CME Clearing preemptively identifies clearing members with similar or complimentary customer profiles that could potentially consume the solvent customers from the defaulted clearing member.

Customer Segregated Account or Cleared Swaps Customer Account Default

In the event of a clearing member default related to a customer segregated account or cleared swaps customer account, CME Clearing will endeavor to port non-defaulting customers' positions and collateral to a non-defaulting clearing member(s), while liquidating the defaulting customers' positions. In both cases, CME Clearing may apply the defaulted customers' performance bond deposits, defaulted clearing member's performance bond and/or Guaranty Fund deposits to fulfill any outstanding obligations. In this default scenario, CME Clearing has the right to apply all customer performance bond deposits in the customer segregated account under the CGM structure to cover the losses related to the default; whereas, in the case of the cleared swaps customer account, CME Clearing may only use the collateral value of the defaulted customer to cover the losses related to its default under the LSOC structure.

Default Drills

Another proactive risk management measure CME Clearing conducts is the execution of semi-annual default management drills with its clearing members and market participants for each financial safeguards waterfall. Default management drills test the operational systems and processes in place and are designed to ensure both the clearing house and clearing members are operationally prepared to manage a potential clearing member default event. Each drill consists of a hedging phase, where appropriate, and an auction and/or liquidation of the hypothetically defaulting clearing member's positions.

Auction Process

With regards to a default in the base waterfall, CME Clearing may conduct an auction for selected market participants and clearing members to bid on the defaulted clearing member's portfolio. Base auction participation is voluntary and participants are selected at the discretion of the clearing house. Alternatively, CME Clearing may liquidate the defaulted positions using an electronic trading venue (i.e. CME Globex).

As part of CME Clearing's membership requirements, IRS and CDS clearing members must participate in the auction process of a defaulted clearing member's portfolio, which entails the construction of a competitive bid and potential participation on the relevant Active Default Management Committee.¹ The IRS and CDS Active Default Management Committees are comprised of seconded traders who assist the clearing house in the liquidation and/or hedging process of the defaulted clearing member's portfolio in order to facilitate an orderly auction.¹

Recovery Plan

CME Inc. maintains a recovery plan that is designed to preserve CME Clearing's critical services and operations in the highly unlikely event our viability is threatened as a going concern. Under the recovery plan and relevant CME Group Exchange Rules, CME Clearing has tools that allow us to manage uncovered credit and liquidity shortfalls as well as general business and operational risks that threaten its viability.



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