Interest Rate Swaps Products: Risk Framework

2021

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Agenda

IRS: Risk Framework

- IRS Clearing Offering
- IRS Margin Framework
- IRS Financial Safeguards
- Customer Resources

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IRS Clearing Offering

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IRS Product Scope

IRS Clearing Offering

CME Clearing provides clearing for the following types of IRS products:

- Fixed/float currency swaps
- Zero coupon swaps
- Overnight index swaps
- Basis swaps
- Forward rate agreements
- Swaptions

CME Clearing provides clearing for the following currencies for IRS products:

- USD
- EUR
- GBP
- CAD
- JPY
- AUD
- CHF
- CZK
- DKK
- HKD
- HUF
- MXN
- NOK
- NZD
- PLN
- SEK
- SGD
- ZAR
- BRL
- INR
- KRW
- CLP
- CNY
- COP

CME Group *A full list of CME Clearing's IRS Product Scope can be found at:*
https://www.cmegroup.com/trading/interest-rates/cleared-otc.html

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IRS Products Available for Portfolio Margining

IRS Clearing Offering

CME Clearing offers portfolio margining between the following types of exchange-traded interest rate derivatives with IRS and Swaptions:

- U.S. Treasury Futures
- SOFR Futures
- Eurodollar Futures & Options
- U.S. Swap Futures

For more information about the IRS products available for portfolio margining reach out to: IRSQuantRisk@CMEGroup.com

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IRS Margin Framework

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IRS Margin Framework Goals

IRS Margin Framework

- ✓ Scalable to other currencies and asset classes
- ✓ Achieves a 99% coverage standard over a five-day margin period of risk on an ex-post basis
- ✓ Appropriately reacts to changes in rate and volatility regimes
- ✓ Stable margins during periods of low to moderate volatility
- ✓ Ease of implementation
- ✓ Transparency to market participants

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Overview of the IRS Margin Framework

IRS Margin Framework

Total Margin = Market Risk Component + Liquidity Component

- The IRS margin framework uses a five-day margin period of risk while considering a prudent lookback period
- The IRS margin framework generates scenarios for interest rate curves, futures prices, spot FX rates, and Swaption implied volatilities that are synchronized across multiple currencies, futures, and FX pairs
  - Swaptions specific risks are incorporated into the market risk component
- Anti-procyclical measures are embedded into the IRS margin framework to avoid large step-changes in margin requirements with changes in volatility
- Portfolios of IRS products that present significant liquidation risk within the margin period of risk are subject to the liquidity/concentration add-on
  - For medium to large portfolios that could pose significant liquidity risk, the add-on prudently accounts for the cost of hedging and auctioning a directional or hedged IRS products' portfolio under a stressed market environment
- The calibration of the IRS margin framework's parameters are subject to ongoing monitoring and may be adjusted as warranted to account for changing market conditions

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Market Risk Component for the IRS Margin Framework

IRS Margin Framework

$$\max \{ \omega_1 * \boxed{\text{Filtered HVaR Components}} + \omega_2 * \boxed{\text{Unscaled Components}} , \boxed{\text{Event Risk Component}} \}$$

The market risk component is comprised of the following components*:

- **Filtered Historical Value-at-Risk ("HVaR") Components**: Historical returns are scaled based on an appropriate forecast of short-term volatility – Exponentially Weighted Moving Average ("EWMA")
  - The components utilize at-least a five-year rolling lookback period and re-scales the volatility adjusted historical returns based on short-term forecast volatility
  - The components are designed to be anti-procyclical so that margin levels avoid chasing volatility all the way to the bottom
- **Unscaled Components**: The Filtered HVaR components are complemented with the unscaled components which utilize historical scenarios from longer lookback periods, in addition to the rolling five-year lookback
  - The components also allow for the injection of hypothetical scenarios as warranted
- **Event Risk Component**: Designed to capture anticipated moves in the market arising from event-specific risks
- The value at risk for each of the market risk components is sampled as 99.7 percentile of the loss distribution on an individual basis
  - The final margins for the market risk components are computed by aggregating the value at risk across different components

** Weight for the Filtered HVaR component is currently set at 0.75 and for the Unscaled component is currently set at 0.25*

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IRS Financial Safeguards

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IRS Financial Safeguards Overview

IRS Financial Safeguards

- CME Group Exchange Rules define a default by a Clearing Member to be the failure of such Clearing Member to promptly discharge any obligation to the Clearing House or such Clearing Member becomes subject to any bankruptcy or insolvency proceedings

Guaranty Fund Sizing

- The IRS Guaranty Fund covers the potential loss caused by the simultaneous default of the two IRS Clearing Members and their affiliates with the largest stress shortfall – also, referred to as Largest Net Debtor amount
- The IRS Guaranty Fund is re-sized on a monthly basis or more frequently as market conditions warrant
  - The size of the IRS Guaranty Fund is calculated daily for risk management review
  - CME Clearing is permitted and able to re-size the IRS Guaranty Fund intra-cycle, where necessary
- Assessment powers cover losses beyond the pre-funded resources comprising the IRS Guaranty Fund
  - Assessments for the IRS financial safeguards waterfall structure are sized to cover the stress shortfall arising from the default of the 3rd and 4th largest Clearing Members and their affiliates

Guaranty Fund Contributions

- Each IRS Clearing Member is required to contribute a minimum amount to the IRS Guaranty Fund defined as the greater of:
  - $15 million; or
  - Clearing Member’s proportional share of the IRS Guaranty Fund based on:
    - a) 30-day trailing average of their Largest Net Debtor amount (90%)
    - b) 30-day trailing average of their Gross Notional (10%)

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IRS Financial Safeguards Waterfall

IRS Financial Safeguards

IRS Products' Financial Safeguards

Defaulting Clearing Member's IRS Performance Bond Funds

Defaulting Clearing Member's IRS Guaranty Fund Contribution

$150M
CME Capital for IRS Guaranty Fund

Non-Defaulting Clearing Members IRS Guaranty Fund Contributions

Assessment Powers
3rd and 4th largest Clearing Member Stress Shortfalls

Product Coverage for IRS Products

- Interest Rate Swaps
- Portfolio-margined interest rate exchange-traded derivatives

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IRS Financial Safeguards Sizing

IRS Financial Safeguards

Step 1: Calculate Net Debtor Profiles	Stress Loss – Margin Collateral = Stress Shortfall
Step 2: Identify Four Largest Net Debtor Amounts	1^{st} and 2^{nd} Largest Net Debtor = Guaranty Fund 3^{rd} and 4^{th} Largest Net Debtor = Assessments
Step 3: Calculate Each IRS Clearing Members' Guaranty Fund Contribution	Each Clearing Member's pro-rata share of the IRS Guaranty Fund
Step 4: Calculate Each IRS Clearing Members' Potential Assessments	Each Clearing Member's potential assessment accounting for the default of any four Clearing Members from the five Clearing Members with the largest stress shortfalls

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Stress Testing Overview

IRS Financial Safeguards

As a central counterparty, CME Clearing's exposures are based on their Clearing Members' positions

- CME Clearing utilizes stress testing to determine the two largest potential IRS Clearing Member stress shortfalls, which sizes the IRS Guaranty Fund
  - Stress testing is conducted daily to measure the impact of stresses to IRS Clearing Members' current positions
- CME Clearing includes all IRS Clearing Members' portfolios in its stress testing scenario selection to measure the impact across a broad set of portfolios and exposures
  - Historical scenarios are used to identify market shocks that have impacted the industry in the past
  - Additional, macro-economic and statistical stress scenarios are used to measure the impact of market shifts not observed using purely historical scenarios
- CME Clearing's stress testing is overseen by a comprehensive governance structure designed to ensure thorough review and scrutiny of stress scenarios and procedures

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Customer Resources

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CME CORE: Clearing Online Risk Engine

Customer Resources

CME CORE is an interactive margin calculator that enables users to calculate and evaluate initial margin requirements for all CME Group Products and efficiently manage risk using powerful OTC analytics

Supported CME Clearing products

- Exchange-Traded Derivatives
- IRS Products
- FX Swaps Products

Accessing CME Core

- Sign-up for free at https://cmecore.cmegroup.com/core
- E-mail CORE team at cme.core@cmegroup.com to obtain access to OTC margin calculators

Key Benefits

- Timely margin funding information for trade execution and reconciliation
- Effectively mitigate risk
- Interaction with CME Clearing margin frameworks
- Simple portfolio upload and fast margin results
- Download latest SPAN and CME Optimizer versions of software
- API connectivity available
- Deployable IRS products software available
- Real-time margin dashboard and positions features

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