Interest Rate Swaps Products: Risk Framework

2019
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Agenda

IRS: Risk Framework

- IRS Clearing Offering
- IRS Margin Framework
- IRS Financial Safeguards
- Customer Resources
IRS Clearing Offering
## IRS Product Scope

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### Zero Coupon Swaps
- USD | EUR | GBP | 50 years
- CLP | 20 years
- BRL | 10 years

### Overnight Index Swap (OIS)
- USD | EUR | GBP | JPY | 30 years
- SOFR | 30 years
- COP | 20 years
- INR | 10 year
- AUD | 6 years
- CAD | 3 years

### Basis Swaps
- USD | EUR | GBP | 51 years
- AUD | JPY | 31 years
- Fed Funds vs. Libor (USD) | 30 years

### Forward Rate Agreements (FRA)
- USD | EUR | GBP | JPY | AUD | CAD | 3 Days – 3 Years
- CHF | CZK | DKK | HUF | JPY | NOK
- NZD | PLN | SEK | SGD | ZAR

### Swaptions
- USD (£ 2 years expiry) | 30 years
IRS Products Available for Portfolio Margining

IRS Clearing Offering

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

- Eurodollar Futures
- U.S. Treasury Futures
  - 2-year
  - 5-year
  - 10-year
- U.S. Treasury Bond Future
- Ultra U.S. Treasury Bond Future
- Ultra 10-year U.S. Treasure Note Future
- 30-day Federal Funds Future
- U.S. MAC Swap Futures
  - 2-year
  - 5-year
  - 10-year
  - 30-year
IRS Margin Framework
IRS Margin Framework Goals

- 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
Overview of the IRS Margin Framework

- 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.
- IRS products’ portfolios 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.
Market Risk Component for the IRS Margin Framework

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

\[
\max \left\{ \omega_1 \ast \text{Filtered HVaR Components} + \omega_2 \ast \text{Unscaled Components}, \text{Event Risk Component} \right\}
\]

* Weight for the Filtered HVaR component is currently set at 0.75 and for the Unscaled component is currently set at 0.25
IRS Financial Safeguards
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 at least 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%)
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
IRS Financial Safeguards Sizing

Step 1: Calculate Net Debtor Profiles

Stress Loss – Margin Collateral = Stress Shortfall

Step 2: Identify Four Largest Net Debtor Amounts

1\textsuperscript{st} and 2\textsuperscript{nd} Largest Net Debtor = Guaranty Fund
3\textsuperscript{rd} and 4\textsuperscript{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
Stress Testing Overview

IRS Financial Safeguards

Stress testing is designed to ensure that the IRS Guaranty Fund is sufficiently sized to cover losses during extreme but plausible market conditions that could result in losses that would exceed available margin collateral.

- CME Clearing’s stress testing is overseen by a comprehensive governance structure designed to ensure thorough review and scrutiny of stress scenarios and procedures.

Identify Historical Scenarios

- Stress testing scenarios are identified to reflect financial market crises over the past four decades.
- The key indicator for these scenarios is the sudden uptick of the realized volatility of the yield curve.

Construct Synthetic Scenarios

- Synthetic scenarios are utilized to supplement historical scenarios that represent macro- and micro-shocks.
Customer Resources
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