

Interest Rate Swaps Products: Risk Framework

2019

Disclaimer

Neither futures trading nor swaps trading are suitable for all investors, and each involves the risk of loss. Swaps trading should only be undertaken by investors who are Eligible Contract Participants (ECPs) within the meaning of Section 1a(18) of the Commodity Exchange Act. Futures and swaps each are leveraged investments and, because only a percentage of a contract's value is required to trade, it is possible to lose more than the amount of money deposited for either a futures or swaps position. Therefore, traders should only use funds that they can afford to lose without affecting their lifestyles and only a portion of those funds should be devoted to any one trade because traders cannot expect to profit on every trade.

CME Group, the Globe Logo, CME, Globex, E-Mini, CME Direct, CME DataMine and Chicago Mercantile Exchange are trademarks of Chicago Mercantile Exchange Inc. CBOT is a trademark of the Board of Trade of the City of Chicago, Inc. NYMEX is a trademark of New York Mercantile Exchange, Inc. COMEX is a trademark of Commodity Exchange, Inc. All other trademarks are the property of their respective owners.

The information within this communication has been compiled by CME Group for general purposes only. CME Group assumes no responsibility for any errors or omissions. Additionally, all examples in this communication are hypothetical situations, used for explanation purposes only, and should not be considered investment advice or the results of actual market experience. All matters pertaining to rules and specifications herein are made subject to and superseded by official CME, CBOT, NYMEX and COMEX rules. Current rules should be consulted in all cases concerning contract specifications.

Copyright © 2019 CME Group Inc. All rights reserved.

Agenda

IRS: Risk Framework

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

IRS Clearing Offering

IRS Product Scope

Fixed/Float Currency	Tenor Years						Index Months			
	10	11	15	21	31	51	1	3	6	
USD							✓	✓	✓	LIBOR/SOFR
EUR							✓	✓	✓	EURIBOR
GBP							✓	✓	✓	LIBOR
CAD								✓		CDOR
JPY							✓	✓	✓	LIBOR
CHF								✓		LIBOR
AUD								✓	✓	BBR
SEK								✓		STIBOR
DKK									✓	CIBOR
NOK									✓	NIBOR
MXN								28d		TIIE-BANXICO
KRW								✓		KRW-CD-KSDA- BBG
CLP										CLP-TNA (Índice Cámara Promedio)
NZD								✓		BBR
HKD								✓		HIBOR
SGD									✓	SOR-VWAP
HUF									✓	BUBOR
CZK									✓	PRIBOR
PLN									✓	WIBOR
ZAR								✓		JIBAR
CNY										CNY-CNREPOFIX=CFXS-Reuters

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
SOFR vs. Fed Funds	
SOFR vs. Libor	
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

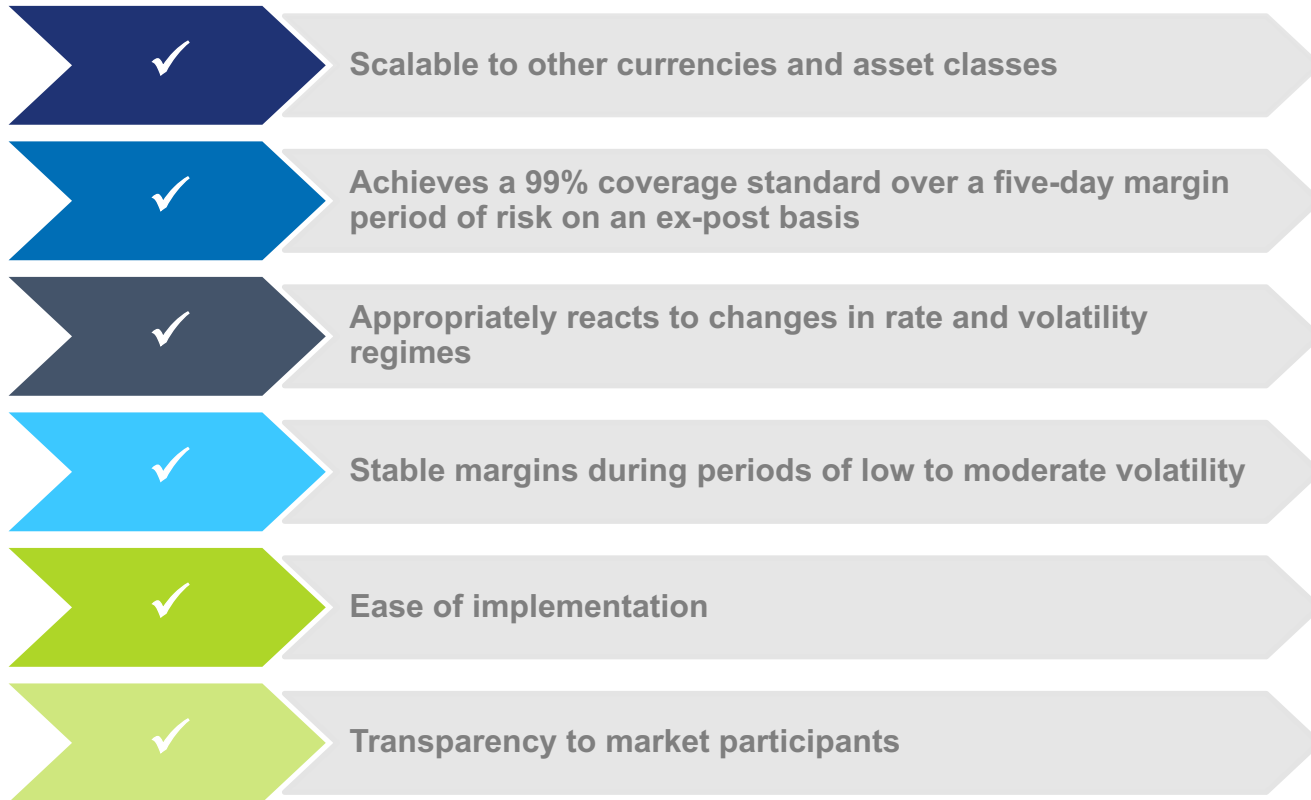
CME Clearing offers portfolio margining between the following exchange-traded interest rate derivatives, IRS, and Swaptions:

- 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. Treasury 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

IRS Margin Framework



Overview of the IRS Margin Framework

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

IRS Margin Framework

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

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

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

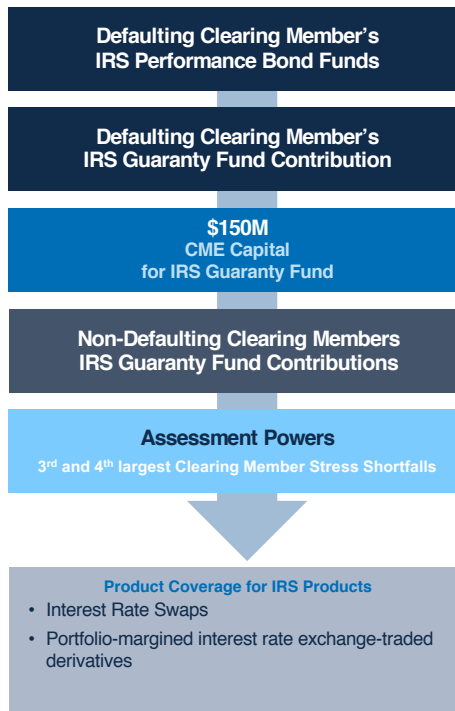
Guaranty Fund Contributions

- 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

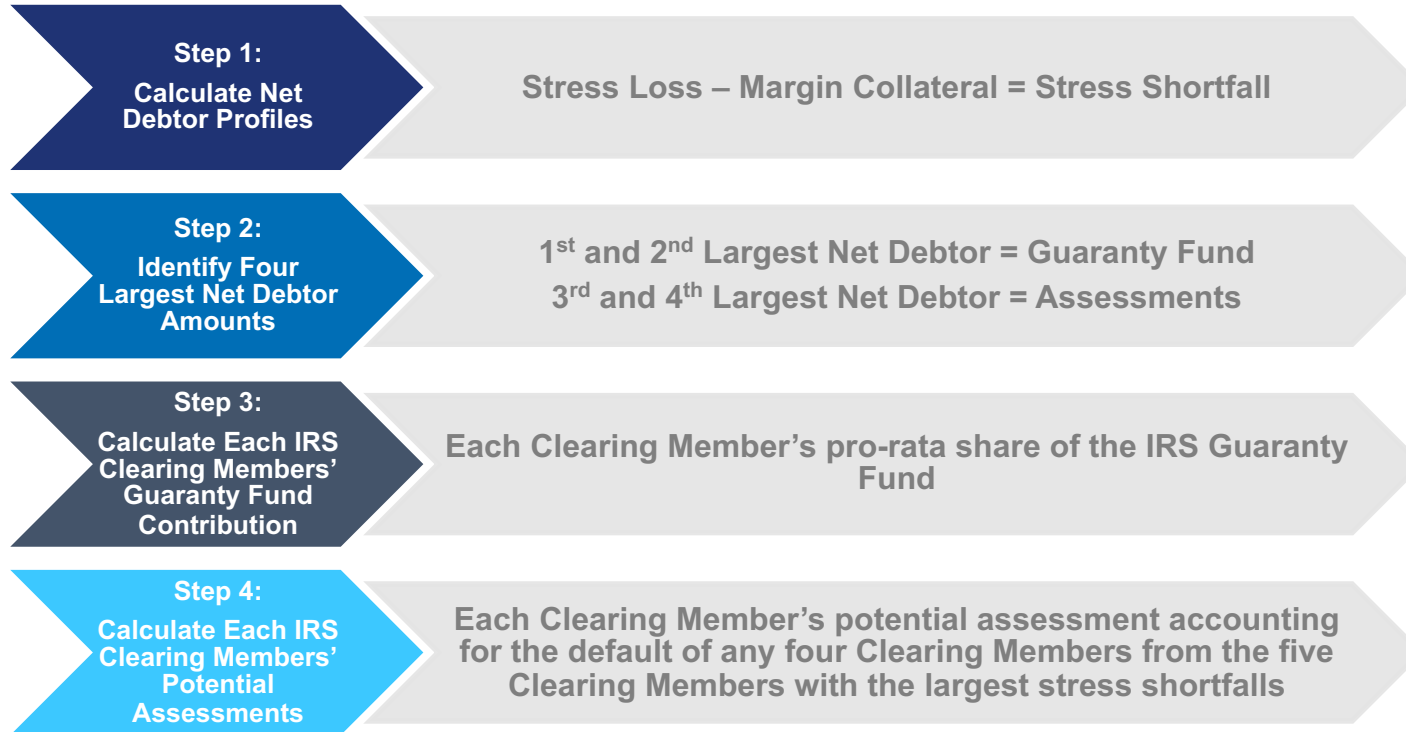
IRS Financial Safeguards

IRS Products' Financial Safeguards



IRS Financial Safeguards Sizing

IRS Financial Safeguards



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

