

Bloomberg Analytics for CME Swap Clearing

- CME-Specific USD Valuation Curve
- CME Cleared Swaptions Initial Margin Calculations

CME-Specific USD Valuation Curve

CME Specific USD Curve in Bloomberg

- ✓ CME developed its own USD curve in June 2015 to provide transparency to the marketplace
- ✓ Users have the ability to change to a CME USD curve on the Swap Manager Page (SWPM) for one time calculations
- ✓ Users can change the default USD curve to the CME curve through the Swap Curve Builder Page (ICVS)
- ✓ After setting the default USD curve to CME, Swap Manager (SWPM), Swap Curve Builder (ICVS) and Invoice Spread Analysis (IVSP) page will have the USD CME curve populated

Swap Manager (SWPM)

From the Swap Manager page, you have the ability to change to a CME curve valuation

1. Select the + sign next to Market
2. By selecting the dropdown Fwd, you will have the ability to select USD CME Swap Curve
3. Re-calculate to update the output after the USD CME Swap Curve is selected

GRAB

91) Actions | 92) Products | 93) Views | 94) Info | 95) Settings | Swap Manager

10) Solver (Premium) | 31) Load | 32) Save | 35) Trade | 38) CCP | 43) Send to EMIR

3) Main | 4) Details | 9) Curves | 6) Cashflow | 7) Resets | 9) Scenario | 10) Risk | 11) CVA | 12) Matrix

Deal: Fixed Float Swap | Counterparty: SWAP CNTRPARTY | Ticker: / SWAP | Properties

Swap

Leg 1: Fixed	Receive	Leg 2: Float	Pay
Notional	10MM	Notional	10MM
Currency	USD	Currency	USD
Effective	0D 04/28/2016	Effective	0D 04/28/2016
Maturity	10Y 04/28/2026	Maturity	10Y 04/28/2026
Coupon	1.796335 %	Index	3M US0003M
Pay Freq	SemiAnnual	Spread	0.000 bp
Day Count	30I/360	Leverage	1.00000
Calc Basis	Money Mkt	Latest Index	0.63385
		Reset Freq	Quarterly
		Pay Freq	Quarterly
		Day Count	ACT/360

Market: USD (30/360, S/)

Dscnt: 23 | B | USD (30/360, S/)

Fwd: 23 | B | USD (30/360, S/)

Leg 1: NPV: 10,000,000.00 | Leg 2: NPV: -10,000,000.00

Valuation Results

Par Cpn	1.796335	Premium	0.00000
Principal	0.00	BP Value	0.00000
Accrued	0.00		
NPV	0.00		

Calculators

PV01	9,244.95
DV01	9,245.12
Gamma (1bp)	9.77

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Swap Curve Builder (ICVS)

From the ICVS page, after selecting line 59 (US Dollar Curve number 23), you have the ability to change to a CME curve valuation as the default

1. Select the dropdown next to Name and select USD CME Swap Curve
2. Select the dropdown next to Actions and select Set as Default
3. Re-calculate to update the output after the USD CME Swap Curve is selected

The screenshot shows the Swap Curve Builder (ICVS) interface. The top navigation bar includes '91) Actions', '92) Modes', and 'Settings'. A dropdown menu is open under 'Settings', showing 'Name USD (30/360, S/A vs. 3M LIBOR)' and 'Default'. A second dropdown menu is open under 'Actions', showing 'Set as Default'. The main area displays a table of Cash Rates, a table of Swap Rates, and a Zero Rates Chart. The Zero Rates Chart shows a curve starting at approximately 0.38% for 0/N and rising to about 1.79% for 10 YR. The interface also includes a 'Legend' section with '3M IMM Eurodollar' and 'Cvx Adj' set to 0.03.

Term	Bid	Ask
0/N	0.38120	0.38120
T/N	0.46000	0.55000
1 WK	0.39940	0.39940
1 MO	0.43695	0.43695
2 MO	0.52300	0.52300
3 MO	0.63385	0.63385
6 MO	0.91040	0.91040
12 MO	1.23885	1.23885

Term	Bid	Ask
1 YR	0.81110	0.81490
2 YR	0.97395	0.97655
3 YR	1.10948	1.11252
4 YR	1.23445	1.23755
5 YR	1.35042	1.35358
6 YR	1.45998	1.46302
7 YR	1.55945	1.56255
8 YR	1.64743	1.65057
9 YR	1.72497	1.72803
10 YR	1.79578	1.79915

Zero Rates Chart: Bid

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Swap Manager and Swap Curve Builder Defaults

After setting the default curve to USD CME Swap Curve, when opening the Swap Manager (SWPM) and Swap Curve Builder (ICVS) page, USD CME Swap Curve will be populated

GRAB

91) Actions 92) Products 93) Views 94) Info 95) Settings Swap Manager

10 Solver (Premi... 31) Load 32) Save 35) Trade 38) CCP 43) Send to EMIR

3 Main 4 Details 9 Curves 7 Resets 9 Scenario 10 Risk 10 CVA 12 Matrix

Deal Fixed Float Swap Counterparty SWAP CNTRPARTY Ticker / SWAP Properties

Swap

Leg 1:Fixed Receive Leg 2:Float Pay

Notional 10MM Notional 10MM

Currency USD Currency USD

Effective 0D 04/28/2016 Effective 0D 04/28/2016

Maturity 10Y 04/28/2026 Maturity 10Y 04/28/2026

Coupon 1.819456 % Index 3M US0003M

Pay Freq SemiAnnual Spread 0.000 bp

Day Count 301/360 Leverage 1.00000

Calc Basis Money Mkt Latest Index 0.63385

Reset Freq Quarterly

Pay Freq Quarterly

Day Count ACT/360

Valuation Settings

Curve Date 04/26/2016

Valuation 04/28/2016

CSA Coll. Ccy N/A

OIS DC Stripping

Market

Dscnt 23 B USD CME Swap C

Fwd 23 B USD CME Swap C

Leg 1: NPV 10,000,000.00 Leg 2: NPV -10,000,000.00

Valuation Results

Par Cpn	1.819456	Premium	0.00000	PV01	9,237.87
Principal	0.00	BP Value	0.00000	DV01	9,238.05
Accrued	0.00			Gamma (1bp)	9.83
NPV	0.00				

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GRAB

Default Curve Set

91) Actions 92) Modes 93) Settings Swap Curve Builder

USD 23 - USD (30/360, S/A vs. 3M LIBOR) Name USD CME Swap Curve Default Privilege Global 04/26/16

20 Curve Construction 20 Curve Analysis

Shift +0.00 bp

Cash Rates PCS CMPN Contiguous Futures Legend

Term	Bid	Ask	Contract	Price	Cvx Adj	Rate
D/N	0.38120	0.38120	1 JUN 16+3	99.3000	-0.00036	0.69963
T/N	0.46000	0.55000	2 SEP 16+3	99.1800	-0.00148	0.81852
1 WK	0.39940	0.39940	3 DEC 16+3	99.0800	-0.00295	0.91705
1 MO	0.43695	0.43695	4 MAR 17+3	99.0100	-0.00507	0.98493
2 MO	0.52300	0.52300	5 JUN 17+3	98.9350	-0.00763	1.05737
3 MO	0.63385	0.63385	6 SEP 17+3	98.8650	-0.01062	1.12439
6 MO	0.91040	0.91040	7 DEC 17+3	98.7850	-0.01405	1.20094
12 MO	1.23885	1.23885				

Market Rate Volatility 0.903%

Short End ACT/360 Middle ACT/360 Long End 301/360 S/A

Instruments with Spread

Zero Rates Chart

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Invoice Spread Analysis Default

After setting the default curve to USD CME Swap Curve, when opening the Invoice Spread Analysis (IVSP) page, the swap rates populated will reflect the USD CME Swap Curve even though it doesn't say this in the Forward Interest Rate Swap section

GRAB

United States 97) Settings 98) Feedback Invoice Spread Analysis

Ticker	Eff Date	Future Px	CTD Security	Fwd Yld	Swp Rate	Inv Sprd	Low	6M Range	High
1) TUM6	07/06/2016	109-14 ³ / ₄	T 1 03/15/18	.7131	.8402	12.7105	.2		12.8
2) FVM6	07/06/2016	121-12+	T 1 ³ / ₈ 08/31/20	1.1374	1.0997	-3.7727	-13.7		-1.3
3) TYM6	06/30/2016	130-26+	T 2 ³ / ₈ 12/31/22	1.4988	1.3481	-15.0679	-22.6		-9.5
4) UXYM6	06/30/2016	141-14	T 2 ³ / ₄ 11/15/25	1.7622	1.5956	-16.6663	-21.7		-10.9
5) USM6	06/30/2016	165-19	T 4 ¹ / ₂ 02/15/36	2.1604	2.0412	-11.9264	-24.7		-6.1
6) WNM6	06/30/2016	173-15	T 3 ³ / ₄ 08/15/41	2.4984	2.1212	-37.7185	-46.1		-25.1

June Contracts September Contracts

Future Contract - TYM6 Comdty

Contract: 82 Price: 130-26+

CTD Security: T 2³/₈ 12/22 Delivery: 06/30/16

DV01: Fwd: 6511 Fwd Yield: 1.4988

Spot: 6657

9) Forward Interest Rate Swap (SWPM)

Notional: 10 MM Swap Rate: 1.3481

Effective: 06/30/16 Maturity: 12/31/22

Fixed DV01: 6502

Fwd Curve: S23: USD Swaps (30/360,S/A)

S42: USD OIS Swaps

Disc Curve: S23 USD Swaps (30/360,S/A)

Invoice Spread: -15.0679

Historical Spread

Invoice Spread Analysis -36.3437

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 SN 637379 H141-2792-0 09-May-16 15:34:59 EDT GMT-4:00

CME Cleared Swaptions Initial Margin Calculations

Swap Manager: Option Valuation(SWPM-OV)

From the SWPM-OV page, you have the ability to calculate margins for CME USD swaptions.

1. Select the dropdown Delivery, and select Cleared (Physical) And Press <GO>
2. Underlying swap economics can be viewed by selecting the “+” next to underlying
3. To save, press the SAVE TAB: #32 <GO>
4. Select the dropdown CCP #38 <GO> and select CME CORE

Enter all values and hit <GO>.

91) Actions 92) Products 93) Views 94) Info 4 Settings 95) Swap Manager
 10) Solver (Premiur.. 31) Load 32) Save 35) Trade 38) CCP 43) Send to EMIR
 3) Main 4) Details 5) Curves 6) Cashflow 7) Resets 9) Scenario 10) Risk

Deal Swaption Counterparty IRS CNTRPARTY Ticker / IRS 20) Properties

Option
 Style European Notional 10MM
 Position Long Receiver Currency USD
 Type 1Y X 5Y Strike 1.542706
 Expiration 06/01/2017 Delivery Cleared (Physical)
 Swap Start 06/05/2017 Fee(Pay) 0.000000
 Swap End 06/05/2022 Fee Date 06/01/2017
 Modification D 2 BD Premium Paid At Expiry

Underlying Market

Valuation Settings
 Curve Date 06/01/2016
 Valuation 06/01/2016
 Model Normal
 Volatility Type Normal
 CSA Coll Coy USD
 OIS DC Stripping

Valuation Results

ATM Strike	1.542706	Implied Vol (bp)	80.14	DV01	2,625.62
Yield Value (bp)	31.946	Underlying Prem	0.000000	Gamma (1bp)	28.82
NPV Without Fee	155,511.61	Forward Prem	1.56485	Vega (1bp)	1,940.47
NPV	155,511.61	Premium	1.55512	Theta (1-day)	-232.59

22) Calculators

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 SN 235908 6599-4287-0 01-Jun-16 10:19:01 CDT GMT-5:00

CME CORE Margin Calculator

Once CME CORE is selected as a CCP, the below screen will show the CME initial margin amount in USD.

The screenshot displays the CME CORE Margin Calculator interface. The main window shows the following details:

- Contract Type:** CME IM
- Notional:** 10,000,000
- Effective Date:** 06/05/2017
- Maturity:** 06/05/2022
- Mkt Date:** 06/01/2016
- Deal Ccy:** USD
- Display Currency:** USD
- CME IM:** 81,573.95 USD

The interface also includes a 'Valuation Results' section at the bottom with the following data:

Valuation Results	Value	Implied Vol (bp)	Value	Value
ATM Strike	1.540393	80.14	DV01	2,623.74
Yield Value (bp)	31.913	-0.00319	Gamma (1bp)	28.82
NPV Without Fee	155,346.00	1.56319	Vega (1bp)	1,940.40
NPV	155,346.00	1.55346	Theta (1-day)	-232.59

Additional information at the bottom of the screen includes contact details for various regions (Australia, Brazil, Europe, Germany, Hong Kong, Japan, Singapore, U.S.) and a copyright notice: Copyright 2016 Bloomberg Finance L.P. SN 235908 6599-4287-0 01-Jun-16 10:26:27 CDT GMT-5:00

CME CORE Margin Calculator

Users have the option to display initial margin in different currencies by selecting the Display Currency dropdown. The USD and selected currency will be displayed as well as the FX rate used.

GRAB

91) Actions | 92) Products | 93) Views | 94) Info | 95) Settings | Swap Manager

10) Solver (Premiur... | 31) Load | 32) Save | 35) Trade | 38) CCP | 43) Send to EMIR

3) Main | 4) Details | 9) Curves | 6) Cashflow | 7) Resets | 9) Scenario | 10) Risk | 10) CVA | 12) Matrix

Deal | Swaption | Counterparty | IRS CNTRPARTY | Ticker / IRS | 20) Properties

Option | Valuation Settings

Style | CME CORE Margin Calculator | 06/01/2016 | 06/01/2016

Position | Display Currency | GBP

Type | OV

Expiration | Notional | 10,000,000 | Receive | Fixed

Swap Start | Effective | 06/05/2017 | Day | Float

Swap End | Maturity | 06/05/2022

Notification Days | Mkt Date | 06/01/2016

Underlying | Deal Ccy | USD

Leg 1:Fixed | Coupon | Pay Freq | Day Count | Calc Basis

CME IM	81,305.35	USD
BBG FX Rate	1.448226	
BBG Equiv IM	56,141.34	GBP

The margin is calculated by CME Group. The service is online from Sunday at 6pm through Saturday at 1am EST and is subject to daily maintenance.

CME Group CME CORE Margin Calculator Close

Market

Valuation Results | 22) Calculators

ATM Strike	1.536217	Implied Vol (bp)	80.11	DV01	2,626.81
Yield Value (bp)	31.959	Underlying Prem	0.00259	Gamma (1bp)	28.78
NPV Without Fee	155,568.82	Forward Prem	1.56541	Vega (1bp)	1,940.42
NPV	155,568.82	Premium	1.55569	Theta (1-day)	-232.01

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Swaptions Margin Efficiencies

- Calculating margins for multi-trade swaptions portfolios and Portfolio Margining of swaptions and swaps can be performed directly through CME CORE: www.cmegroup.com/core
- Margin offsets of up to 91% are possible when swaptions are margined with cleared interest rate swaps.
 - Swaptions are also available for Portfolio Margining with CME Eurodollar, Treasury, and Deliverable Swap Futures.
- Swaption margin matrix available in CME CORE that displays indicative margin results for select swaption tenors and the swaps that were used as a delta hedge.

CORE Margin Calculator

Home | Margin Calculator | Reports | Download Center

Rates | Futures & Options | CDS | FX

New swaptions simple upload template and updated supported products list now available in the Download Center.

Portfolio Summary | My Cleared Trades | Add | Remove | Remove All | View | Export Summary | Templates

Saved On	Name	Description	Account	Firm	Margin Type	#Trades	NPV	Margin Result
06-01-2016	Portfolio Aggregate Aggregate	Swap + Swaption Combined 1M10Y	Aggregate	Aggrega...	IRS	2	\$ 877,544	\$ 244,248
06-01-2016	Portfolio 4567 TEST	Swap 1M10Y	TEST	4567	IRS	1	\$ -10,416	\$ 1,581,701
06-01-2016	Portfolio 1234 TEST	Swaption 1M10Y	TEST	1234	IRS	1	\$ 887,960	\$ 854,266

Page 1 of 1

Created On: June 1, 2016 | Name: Portfolio Aggregat... (IRS) | Firm: Aggregate | Account: Aggregate | # Trades: 2 | Margin: \$ 244,240

IRS & Swaptions | Futures & Options | Delta Ladder

Firm ID	Account ID	Cleared Trade ID	Cleared	Product Type	Currency	Effective Date	Maturity Date	Direction	Notional	NotionalType	FutureValueNotional	Netting ID	Client ID	Blending ID	Leg1 Type	Leg1 ccy	Leg1 Start
1	Aggrega...	Aggregate	NO	VANILLA	USD	07-06-2016	07-06-2026	RECEIVE	44000000	BULLET					FIXED	USD	NONE
2	Aggrega...	Aggregate	NO	VANILLA_SWAPTION	USD	07-06-2016	07-06-2026	PAY	100000000	BULLET					FIXED	USD	NONE

Swaptions Margin Efficiencies in MARS<GO>

To perform Margin assessment at portfolio level enter MARS CCP<GO>

1. Select the trades to perform portfolio margin analysis
2. Select the 9) Calculate
3. Assess impact of Margin Offsetting deals

What-If Position	CostPx	Delta	MktPx	Face	Amount	Principal	Accrued	Interest	MktVal	Port	Ccy	P&L
[-] Portfolio Totals										785,529	16	
*CME					145,011,088				.00	785,529	16	
BLOOMBERG LP					145,011,088				.00	785,529	16	
/SWAP 1.72 07/05												
Receive Fixed	CRIG	1	1.18	1.18	45,011,088	531,042.01			.00	531,042	16	
Pay Float					45,011,088	-1,948,291.49			.00			
/IRS 1.72 07/05												
Pay	CRIG	1	.24	.25	100,000,000	254,486.87			.00	254,487	15	

Security	Market Value	Initial Margin	Incremental IM
*CME	789,486.87	389,711.84	
BLOOMBERG LP	789,486.87	389,711.84	--

Portfolio offset IM = 390K (compared to individual IM values of 1,827K plus 280K)

CME CORE Margin Calculator

Type: IRS
 Notional: 45,011,088.299531
 Effective: 07/05/2016
 Maturity: 07/05/2026
 Mkt Date: 06/06/2016
 Deal Ccy: USD

Display Currency: USD

Receive: Fixed
 Pay: Float
 CME IM: 1,827,318.26 USD

The margin is calculated by CME Group. The service is online from Sunday at 6pm through Saturday at 1am EST and is subject to daily maintenance.

CME Group CME CORE Margin Calculator

Close

CME CORE Margin Calculator

Type: OV
 Notional: 100,000,000
 Effective: 07/05/2016
 Maturity: 07/05/2026
 Mkt Date: 06/06/2016
 Deal Ccy: USD

Display Currency: USD

Receive: Float
 Pay: Fixed
 CME IM: 280,379.83 USD

The margin is calculated by CME Group. The service is online from Sunday at 6pm through Saturday at 1am EST and is subject to daily maintenance.

CME Group CME CORE Margin Calculator

Close

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Futures trading is not suitable for all investors, and involves the risk of loss. Futures are a leveraged investment, 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 a futures 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 they cannot expect to profit on every trade. All references to options refer to options on futures.

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