

Advisory Notice

Clearing House

TO: Clearing Member Firms
Back Office Managers

FROM: Clearing House Department

ADVISORY #: 07-173

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SUBJECT: **Clearing and Bookkeeping Processing for CME Swaps on Swapstream**

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Introduction

In the first quarter of 2008, CME will introduce an innovative new product: **CME Swaps on Swapstream**, also known as **standardized cleared interest-rate swaps**.

These swaps will trade electronically on CME's **Swapstream™** swaps trading system. In addition, firms may submit privately negotiated swap transactions for clearing either through a block facility available in Swapstream, or directly to clearing.

The initial swap products to be offered will be IMM-dated fixed versus floating. "IMM-dated" means that their start and maturity dates will coincide with the standard expiration dates of CME's International Monetary Market (IMM) interest-rate and currency futures, basically the third Wednesday of a specified month.

CME plans to introduce USD and EUR denominated swaps for the first phase. The USD-denominated swap will be indexed to the 3-month LIBOR, and the EUR-denominated swap will be indexed to the 6-month EURIBOR. Swaps denominated in other currencies will be added in future phases.

It is anticipated that CME's standardized cleared swaps products will be regulated by the U.K. Financial Services Administration (FSA.) Unlike most OTC products, however, these will be **cleared**, *ie*, CME Clearing will clear and guarantee every trade. There are several advantages to the manner in which these swaps will be processed. Key operational efficiencies are:

- Swap positions will be kept on a net basis unless firms specify otherwise, and it will be possible to liquidate positions simply by executing an offsetting trade.
- Swap positions will be marked to market daily, and the resulting amounts will be **banked** normally, exactly like futures settlement variation.
- The effect of coupon payments will be included in the daily mark to market process.

In other words, it will not be necessary to manage cash flows associated with coupons, track reset dates, or rely on cumbersome and expensive "tear-up" solutions.

Product features

To explain the features of the product we will use a USD-denominated swap. These swaps will have the following attributes:

1. Quarterly fixed coupon frequency
2. 3 Month LIBOR as the floating rate
3. Actual/360 day count conventions for Fixed and Floating legs of the swaps
4. Payment in arrears

These attributes are consistent with popular IMM-dated interest rate swap conventions. The following is a sample specification of a 10y cleared interest rate swap expiring April 16th 2017.

Table 1: Sample product specification

Attribute	Description	
Maturity	IMM April 2017	
Currency	USD	
Minimum tradable increments	100,000	
Start date	IMM April 2007	
Roll date	IMM Start Date less 2 Business days	
	Floating	Fixed
Index	USD-LIBOR-BBA	
Basis	ACT/360	ACT/360
Payment frequency	3 months	3 months
Roll convention	IMM	IMM
Holiday centers	US-NY & London	US-NY & London

Listing Conventions

These swaps will mature (have their end date) on IMM dates – the third Wednesday of the month, adjusted as necessary for holidays, following Eurodollar and currency futures conventions. The start date of each swap is determined by the nearest fixed coupon anniversary, and similarly occurs on an IMM date.

For each start-date, the swaps will be listed for maturities going out 30 years – 3 months to 30 years. For USD LIBOR swaps, maturities will be listed for each of three forward start-dates, corresponding to each of the three relative positions in the quarterly cycle. The table below lists illustrates a listing example for start-dates: March, April and May 2007, assuming that today is March 1, 2007:

Table 2: Listing example

Start Date	Mar-07	Apr-07	May-07	Total Listed Contracts : 360
Contracts	Jun-07	Jul-07	Aug-07	
	Sep-07	Oct-07	Nov-07	
	Dec-07	Jan-08	Feb-08	
	Mar-08	Apr-08	May-08	
	Jun-08	Jul-08	Aug-08	
	Sep-08	Oct-08	Nov-08	
	Dec-08	Jan-09	Feb-09	
	Mar-09	Apr-09	May-09	
	Jun-09	Jul-09	Aug-09	
	Sep-09	Oct-09	Nov-09	
	Dec-09	Jan-10	Feb-10	
	Mar-10	Apr-10	May-10	
	Jun-10	Jul-10	Aug-10	
	Sep-10	Oct-10	Nov-10	
	Dec-10	Jan-11	Feb-11	
	Mar-11	Apr-11	May-11	
	Jun-11	Jul-11	Aug-11	
	Sep-11	Oct-11	Nov-11	
	Dec-11	Jan-12	Feb-12	
	Mar-12	Apr-12	May-12	
	Jun-12	Jul-12	Aug-12	
	.	.	.	
	.	.	.	
	.	.	.	
	.	.	.	
	.	.	.	
	Jun-36	Jul-36	Aug-36	
	Sep-36	Oct-36	Nov-36	
	Dec-36	Jan-37	Feb-37	
	Mar-37	Apr-37	May-37	

In addition to the Forward starting swaps, CME will list Overnight Index Swaps, also called OIS swaps. These are spot (current-starting) fixed versus floating swaps on the Fed Funds rate, which mature on the IMM start dates of the listed forward swaps, and which roll each day to the next-day's spot-starting swap. (The roll process is described in detail below.)

For example, suppose today is Thursday March 1, 2007, and some of the forward-starting swaps start on the March IMM date of Wednesday, March 21. There will be a spot-starting Overnight Index Swap available for trading today, maturing on March 21.

The product exchange for all standardized cleared swaps will be specified as **CME** -- ie, these will be considered as normal CME products. The product type specified in FIXML and in the SPAN file will be **IRS** (for interest-rate swap.)

Because the product is standardized, the only data elements needed to identify the specific contract are:

- Product exchange -- **CME**
- Product type code -- we will use a value of **IRS** for **interest-rate swap** in FIXML and in the SPAN file
- Product code -- for example **USD3L** for the standard swaps indexed on the 3-month LIBOR swaps and **EUR6E** for EUR denominated swaps indexed on the 6 month EURIBOR
- Contract month ("contract period code") identifying the maturity, in CCYYMM format -- for example **201712** for December 2017.
- The starting month of the swap will be identified in the attributes of the contract, for example **200712** for December 2007. This start month will change on the roll dates (this process is explained in more detail below.)

Prices will be expressed in percent out to four decimal places. The minimum price fluctuation for USD-denominated swaps will be one-tenth of a basis point, *ie*, 0.0010. The minimum price fluctuation for EUR-denominated swaps will one-twentieth of a basis point, *ie*, 0.0005. A typical price for a USD-denominated swap might be 5.3260%.

Rolling the swap to the next-shortest tenor

Suppose on Friday, June 1, 2007, you take a position in a ten-year swap, starting on the IMM date in June 2007 (Wednesday June 20th) and ending on the corresponding IMM date in June 2017. The fixing date for the first calculation period for this swap is two days prior to the start date, namely Monday June 18th.

On that fixing day, Monday, June 18th, clearing processing for this ten-year swap proceeds normally.

Prior to the start of business for the following day, Tuesday June 19th, the position in the ten-year swap is converted ("rolled") into a corresponding position in a nine-and-three-quarter-year swap, starting on the IMM date in September 2007 and ending on the IMM date in June 2017. The new swaps are immediately available for trading.

Note that the product code and the maturity are not changed. Only the starting date, and the corresponding value for tenor, are changed to the next-available value in the quarterly cycle.

Conceptually, this process is identical to stripping the first coupon and valuing the swap starting three months forward with the difference in the fixed and floating cash flows re-invested for a shorter tenor.

As is described in more detail below, the monetary impact of the roll is taken into account in the derivation of the **swap value factor** to be used on each day, and in an adjustment to the start-of-day price used to mark the incoming position to the end-of-day settlement price.

Trading and clearing eligibility, and credit limits

There will be restrictions on the type of participants eligible to trade these swaps: this is not a retail product. All end-customer accounts will have to be registered. As part of the registration process, clearing firms will be able to specify daily position limits for each such customer, expressed in gross notional terms, broken out by product and maturity bucket.

All CME full class-A clearing member firms are eligible to clear these standardized interest-rate swaps. The "firm number" ("trading firm number", "execution firm number") used to identify the executing firm of the trade will be a standard CME firm number.

Non-Seg product status

These interest-rate swap products are **not** futures and are not subject to CFTC customer-segregation requirements for futures. Firms may elect to specify the origin as either C or H on the trade, but regardless of how they do this, trades will post in clearing to "**house**" position accounts, and the margin and variation requirements will be handled through "**non-segregated**" settlement accounts.

Firms may choose how they wish this clearing account structure to be set up. For example, they may post swap trades to an existing or a new house position account, and they may bank the resulting variation through either an existing or a new non-seg settlement account. If the firm elects to use a new non-seg settlement account, then the bank account(s) tied to this may be either existing non-seg bank accounts or new ones.

Trade processing functions

Following standard swap market conventions, **buying the swap** (going long) means **paying fixed** and receiving floating, and selling the swap (going short) means receiving fixed and paying floating.

For trades executed on Swapstream, firms will receive standard FIXML clearing trade confirmation messages. These will appear as regular electronically-executed trades, with venue **SWS**, short for Swapstream. As with any electronic execution, firms may change the origin or account number, either via the FEC user interface or by submitting a FIXML change message.

For privately negotiated trades, firms may use the Swapstream interface to submit a block trade. In future phases CME may open other interfaces to receive block trades.

Swap trades may be given up and/or transferred, but not average-priced.

Trade-related clearing messaging will utilize FIXML.

Position processing

Trade and position quantities will be expressed in **true notional amount**. For example, the trade quantity on a trade for five million USD notional will be 5,000,000.

On Swapstream, trades will be executed in multiples of 100,000 notional, with a minimum quantity of 1,000,000. Initially, privately-negotiated trades will also be limited to multiples of 100,000 notional, but eventually this restriction may be removed and arbitrary whole-dollar notional amount accepted.

Firms may, but are not required to, submit PCS ("position change specification") data for these swap products. If PCS data is not submitted, then positions will be kept in clearing on a purely **net basis**, with each trade treated as liquidating to the extent possible, and the ending position at the end of a given day determined by netting the start-of-day position with all trades cleared that day.

Regardless of whether firms submit PCS, all positions will be treated as fully inter-commodity spreadable.

Mark to market calculations

At the close of each business day, CME will determine and publish a daily **settlement price** for each eligible swap contract. This will be derived in a manner similar to that for futures, and will represent an appropriate price as of the end-of-day for valuing open swap positions.

Similar to the way variation is calculated for futures, the daily mark-to-market amount for each interest-rate swap position will be determined as:

- Mark-to-market amount on the start of day position, from start of day price to current day's settlement price, plus
- Mark-to-market amount for each trade cleared that day, from trade price to current-day's settlement price.

The mark-to-market amount for a swap trade or start-of-day position represents the change in Net Present Value of the swap. To simplify this processing, CME will derive for every swap contract, at the close of each business day, a **Swap Value Factor (SVF)**. The SVF may have as many as **twelve** decimal places.

The Swap Value Factor is analogous to the contract value factor for a normal futures or option contract, except that it changes every day. Using the Swap Value Factor, the mark to market calculation for the start-of-day position or for current-day trades in interest rate swaps is analogous to the manner in which it's done for FX spot and forwards contracts: take the difference between the two prices, multiply by the swap value factor and then by the quantity, then round.

Note that position or trade quantities are always expressed in their true notional amount. A long position quantity, or buy trade (paying fixed), is expressed as a positive number, and a short position quantity, or sell trade (receiving fixed), is expressed as a negative number.

Rounding is done at the end of the calculation, and is always to the normal precision of the currency in which the swap is denominated. For EUR, GBP and USD-denominated swaps, rounding is to two decimal places (to the nearest penny), and for JPY-denominated swaps, rounding is to the nearest whole yen amount.

To calculate the mark-to-market amount for the start-of-day position:

- Determine the start of day price. On most days, this will be identical to the end-of-day settlement price from the previous day, but on days when the swap has rolled to the next-shortest tenor, it will be an adjusted price.
- Subtract the start of day price, from the current day's end-of-day settlement price.
- Multiply this result by the current day's swap value factor.
- Multiply this result by the position quantity.
- Round to the precision of the settlement currency.

To calculate the mark-to-market amount for a current-day trade:

- Subtract the trade price from the current day's end-of-day settlement price.
- Multiply this result by the current day's swap value factor.
- Multiply this result by the trade quantity.
- Round to the precision of the settlement currency.

To calculate the mark-to-market amount for a previous-day trade:

- Calculate the mark to market from original trade price to settlement price on the original trade date, using the swap value factor for that original trade date.
- For each subsequent date up to and including the current business date: calculate the mark to market amount from the start-of-day price to that day's settlement price, using the swap value factor for that date.
- Take the sum of all of these mark to market amounts for each business date from original trade date through the current business date.

The key difference for calculating mark-to-market from original trade date and original trade price, for interest rate swaps versus FX forwards or futures: you have to do the calculation day by day, using the swap value factor applicable to each day, and then sum all of these daily amounts.

Performance bond calculations

Performance bond calculations for cleared swap positions will be done on an equivalent basis. In other words, the true notional position amounts will be converted to a smaller, equivalent value, which will then be processed in SPAN® normally. This processing is identical to that which is used for margining FX spot and forward positions kept in notional.

For each position, you take the true notional position quantity, and divide by the equivalent position factor specified for the product on the type "P" (product parameters) record in the SPAN file. If this result is not an integer, round it up (away from zero) to the nearest integer.

The resulting equivalent position quantities are processed in SPAN normally.

Continuing the example from the previous page, suppose your end-of-day position in a particular swap is short 3M, and the equivalent position factor is provided as 1M. This would result in an equivalent position of -3, processed in SPAN normally.

CME will recognize all appropriate risk offsets between cleared swap positions and futures. For example, it is likely that there will be intercommodity spreads available between CME Eurodollar futures, and cleared swap positions on 3-month LIBOR.

Large Trader Reporting

All customer accounts trading these interest-rate products must be registered, which will allow the clearing system to derive end-customer positions from the executed trades. Therefore, there is no requirement for clearing firms to do large trader reporting for these products.

Fees

Fees will be based upon several factors, and will be calculated by CME's Exchange Fee System (EFS). EFS will provide clearers with both daily and monthly extract files of cleared trades and associated fees. Firms may simply read the fees from these extract files, and it is not necessary for firms to be able to replicate the fee calculations.

Data formats

FIXML messages for Swapstream trade confirmations, post-execution changes, privately-negotiated trades, give-ups and transfers will be exactly analogous to those for futures except that the instrument block will identify the contract as a swap rather than a future (**SecTyp="IRS"**), and the CFI code will be omitted, since it is undefined for interest-rate swaps.

The same changes will apply to the position and trade records in the FIXML trade register.

In the FIXML settlement price file containing all CME products, records for interest-rate swaps will be included, and in addition to the current day's settlement price and high and low prices, four additional values will be provided:

- the date on which the swap's final settlement price is determined (the **MatDt** attribute)
- the swap's current value for start date
- the swap's end date
- the start-of-day price
- the swap value factor for the current day

There will be a second, special settlement price file just for interest-rate swaps, which will provide the complete history of settlement prices and swap value factors by date for each eligible swap.

In the daily SPAN® file:

- ❖ Records for these contracts will similarly denote the product type as **IRS**.
- ❖ On the type "P" record for these contracts:
 - The money calculation method in byte 116 will be provided as **I** for interest-rate swap, indicating the special method for calculating the mark-to-market amounts.
 - Three new fields to provide maximum flexibility in specifying the Equivalent Position Factor will be added to the end of the record:
 - the factor itself, as 9(7)V9(7), in bytes 144-157
 - the exponent for the factor, as 9(2), in bytes 158-159
 - a sign for the exponent (+ or -), in byte 160
 - The contract value factor will be provided each day as the current Swap Value Factor for the lead month.
- ❖ On the type "B" record for each contract:
 - The swap value factor will be provided in three new fields specifying the **contract-specific** contract value factor, at the end of the record:
 - the factor itself, as 9(7)V9(7), in bytes 129-142
 - the exponent for the factor, as 9(2), in bytes 143-144
 - a sign for the exponent (+ or -), in byte 145
- ❖ On the type "8" record for all contracts:
 - The start-of-day price will be provided in two new fields (for all contracts except those that have just started trading.) This will be either the previous day's end-of-day settlement price, or an adjusted start-of-day price, for example on the roll day:
 - start-of-day price, as 9(7), in bytes 127-133
 - the sign for the start-of-day price, in byte 134

The following pages provide annotated FIXML examples.

Sample Trade Confirmation Message

Here's an annotated example of a trade confirmation message for an interest-rate swap. It's quite analogous to a trade confirmation message for electronic trades for futures done on Globex, except that the product type is identified as an interest-rate swap, the CFI code is omitted since it's not relevant for a swap, and the input source identifies the trade as executed on Swapstream.

<?xml version="1.0" encoding="UTF-8"?>	
<FIXML>	
<TrdCaptRpt	
RptID="100028"	trade ID
TransTyp="0"	new trade
RptTyp="0"	normal trade report
TrdTyp="0"	regular trade
ExecID="02066020070409085112TN0000001"	host execution ID
TrdDt="2007-04-09"	trade business date
BizDt="2007-04-09"	clear business date
MLegRptTyp="1"	outright
MtchStat="0"	matched
MsgEvtSrc="CMESys"	message from CME
TrdRptStat="0"	valid trade
TrdID="100028"	trade ID
TrdID2="111D300C31FP RTP02C40160"	internal CME trade ID
TrdHandlInst="0"	trade confirm message
LastQty="1000000.00"	trade quantity
LastPx="1.1518"	trade price
TxnTm="2007-04-09T08:51:14-05:00">	execution timestamp
<Hdr	
Snt="2007-04-09T08:51:14-05:00"	message time
SID="CME"	sender
TID="368"	receiver firm
SSub="CME"	sender exchange
TSub="CME"/>	receiver firm exchange
<Instrmt	
ID="USD3L"	product code -- USD 3-Mo LIBOR
SecTyp="IRS"	product type = interest rate swap
MMY="201706"	swap ending month = June 2017
Exch="CME"/>	product exchange
<RptSide	
Side="1"	buy
CICOrdID="00000004"	client order #
InptSrc="SWS"	trade input source is Swapstream
InptDev="API"	order entry method
CustCpcty="1"	CTI code
OrdTyp="L"	order type
SesID="RTH"	trading session
SesSub="E"	electronic venue
OrdID="004515"	host-assigned order number
AgrsrInd="Y">	aggressor indicator

<Pty ID="CME" R="21"></Pty>	clearing organization
<Pty ID="CME" R="22"></Pty>	trading firm exchange
<Pty ID="368" R="1"></Pty>	trading firm
<Pty ID="09589" R="24"><Sub ID="1" Typ="26"/></Pty>	customer & origin
<Pty ID="3F864" R="12"></Pty>	trader ID
<Pty ID="09589" R="44"></Pty>	operator ID
<Pty ID="368" R="4"></Pty>	clearing firm
<Pty ID="368" R="38"><Sub ID="2" Typ="26"/></Pty>	position acct & origin
<TrdRegTS TS="2007-04-09T08:51:12-05:00" Typ="1"/>	execution timestamp
</RptSide>	
</TrdCaptRpt>	
</FIXML>	

Settlement Price File

Here's an annotated example of what an interest-rate swap looks like in the main FIXML settlement price file for CME:

<MktDataFull	
BizDt="2007-04-11">	business date
<Instrmt	
Exch="CME"	product exchange
ID="USD3L"	clearing product code
Sym="U3L"	ticker code
Src="H"	data published by Clearing
SecType="IRS"	product type = interest-rate swap
MMY="201706"	swap ending month
MatDt="2017-03-15"	final settlement date
Desc="USD_30YR_3MOLIB">	
<Evnt EventType="8" Dt="2007-06-17" Txt="200706">	swap start date
<Evnt EventType="9" Dt="2017-06-16" Txt="201706">	swap end date
</Instrmt>	
<Full Typ="4" Px="78.92" Mkt="CME"/>	start-of-day price
<Full Typ="6" Px="78.98" Mkt="CME"/>	settlement price
<Full Typ="7" Px="78.97" Mkt="CME"/>	daily high
<Full Typ="8" Px="77.57" Mkt="CME"/>	daily low
<Full Typ="S" Px="123.9876" Mkt="CME"/>	swap value factor
</MktDataFull>	

We will also produce a special version of the FIXML settlement price file which contains only interest-rate swap contracts. In this special file, the complete history of the swap value factors, start-of-day prices and end-of-day settlement prices will be provided for every date for which the swap with the specified maturity has been eligible. For example:

```
<Full Typ="S" Px="123.9876" Mkt="CME" Dt="2007-06-01"/>
<Full Typ="S" Px="122.123465" Mkt="CME" Dt="2007-05-31"/>
<Full Typ="S" Px="117.8888" Mkt="CME" Dt="2007-05-30"/>
...
```

#####