Hedging Bonds with Euro DSFs

APRIL 2, 2014

John W. Labuszewski
Managing Director
Financial Research & Product Development
312-466-7469
jlab@cmegroup.com

Frederick Sturm
Executive Director
Financial Research & Product Development
312-930-1282
Frederick.sturm@cmegroup.com
CME Group is offering Deliverable EUR Interest Rate Swap futures ("Euro DSFs") as a novel means of gaining exposure, or managing the risks attendant, to Euro (EUR) denominated Interest Rate Swap (IRS) instruments.

But they may also be used as a means of hedging or spreading vs. other EUR denominated fixed income investments such as bonds or notes issued by a government or corporate entity.

This note summarizes the salient features of EUR DSF contracts and discusses their relationship with Euro-denominated bonds.

**EUR DSF Overview**

Euro DSF contracts call for the delivery of "plain-vanilla" EUR denominated interest rate swap ("IRS" or "swaps") carried by CME Clearing. Specifically, Euro DSF contracts call for the delivery of an IRS denominated in Euros (EUR). Contracts call for the delivery of a 2-, 5- and 10-year term swap notionally valued at €100,000. They are configured as a swap between semi-annual floating rate payments based upon 6-month EURIBOR vs. annual fixed rate payments.

Euro DSFs are listed for expiration on a quarterly basis, with termination of trading (generally) on the Monday preceding the 3rd Wednesday of the contract months of March, June, September and December.

Each contract, when first listed for trading is assigned a fixed rate determined by the exchange, e.g., 0.50%, 0.75%, 1.00%, 1.25%, etc. To illustrate, the 2-year Euro DSF for June 2014 delivery is listed with a 0.75% coupon. Similarly, the June 2014 5- and 10-year Euro DSFs carry coupons of 1.75% and 2.50%, respectively.

Euro DSF contracts are quoted as 100 points of par value plus the Non-Par Value (NPV) of the swap to-be-delivered, in percent of par. NPV represents the present value (PV) of fixed rate payments minus the PV of the floating rate payments.

\[
Non\ Par\ Value = PV(\text{Fixed Rate Payments}) - PV(\text{Floating Rate Payments})
\]

NPV may be positive or negative, depending upon the relationship between prevailing swap rates and the fixed rate or coupon associated with the swap as assigned by the Exchange. Thus, DSF contracts may be quoted as either above or below par, e.g., 101.00, 98.50%, etc.

The minimum allowable price fluctuation, or tick size, for the 5- and 10-year contracts equals 0.01 points or €10.00, based on a €100,000 face value contract (= 0.01 x 1% of €100,000). The tick size for the 2-year contract equals 0.005 points or €5.00 per contract.

DSF contracts utilize the convention of referring to the buyer of Swap futures (or "long") as the receiver of the fixed rate (payer of floating rates) upon delivery of the underlying Swap. Likewise, the seller (or "short") is the payer of the fixed rate (receiver of floating rates) upon delivery.

**Reference Conventions**

<table>
<thead>
<tr>
<th>Swap Futures</th>
<th>Delivered or Actual Swap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buyer (Long)</td>
<td>Fixed Rate Receiver (Floating Rate Payer)</td>
</tr>
<tr>
<td>Seller (Short)</td>
<td>Fixed Rate Payer (Floating Rate Receiver)</td>
</tr>
</tbody>
</table>

Upon delivery of an actual swap in satisfaction of a maturing contract with a settlement price above par, an invoice amount is paid from long to short. If the settlement value is below par, an invoice amount is paid from short to long. If the settlement is equal to par, no payments are made upon delivery at all.

These invoice amounts represents the NPV of the deliverable-grade swap as reflected in the futures settlement price on the final trading day of a DSF contract.

Once the invoice price is paid and the IRS instrument established, the Swap is subject to a margin requirement and is marked-to-market (MTM) on a daily basis. This implies that if the swap is originally booked at an invoice price that departs from zero (€0), the MTM during the forthcoming
clearing cycle will effectively offset that amount. Thus, like futures, there are no unrealized gains or losses associated with the swap position created upon delivery of the DSF.

A summary of DSF contract terms and conditions may be referenced in the appendix to this document.

**Delivery Eligibility**

Anyone with a properly established futures account may trade EUR DSF contracts. However, regulations restrict holding of actual interest rate swaps (IRS) to Eligible Contract Participants (ECPs) as defined in Section 1a(18) of the Commodity Exchange Act. ECPs may generally be thought of as institutional market participants or high-net worth individuals. Thus, only ECPs are permitted to participate in the delivery process of actual swaps.

Moreover, only CME IRS Clearing Members may carry IRS exposures assigned upon delivery of expiring EUR DSF contracts. Participation in a EUR DSF delivery is limited to (1) CME IRS Clearing Members; or (2) customers registered with CME by a CME IRS Clearing Member as a CME IRS Participant.

**Risk Management with EUR DSFs**

EUR DSF contracts may be used to manage risk exposures associated with Euro denominated bonds or notes. Or they may be used as a component of a spread vs. such bonds or notes.

In either case, the trader should consider placing the hedge or spread by reference to a hedge ratio (HR) that balances the change in the value of the instrument to be hedged ($\Delta_{\text{hedge}}$) with any change in the value of the DSF contract ($\Delta_{\text{DSF}}$).

$$\Delta_{\text{hedge}} = HR \times \Delta_{\text{DSF}}$$

We solve for the hedge ratio (HR) as follows.

$$HR = \frac{\Delta_{\text{hedge}}}{\Delta_{\text{DSF}}}$$

Further, we operationalize “change in value” as Basis Point Value (BPV), as follows.  

$$HR = \frac{BPV_{\text{hedge}}}{BPV_{\text{DSF}}}$$

**Hedging EUR Bonds or Notes**

Holders of fixed income investments such as notes and bonds are exposed to the risk of rising rates. To neutralize these risks, construct a hedge by selling EUR DSF contracts. Entities who may be short notes or bonds are, of course, exposed to the risk of falling rates and should buy EUR DSF futures as a hedge.

**Hedging Tactics**

<table>
<thead>
<tr>
<th>Note or Bond</th>
<th>EUR DSF Contracts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long or Holder</td>
<td>Sell EUR DSFs</td>
</tr>
<tr>
<td>Short</td>
<td>Buy EUR DSFs</td>
</tr>
</tbody>
</table>

DSFs represent the risks associated with an interest rate swap, which departs from the essential structure of a conventional note or bond in many key aspects. Still, there is often sufficient correlation between the fluctuating values of notes and bonds to permit the application of an effective hedge.

In order to test this proposition, we examine the performance of securities issued by European sovereign entities including Germany, France and Italy. 2 We compare the price fluctuations in these securities to the simulated or estimated performance of 10- and 5-year EUR DSFs. 3

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1 BPV measures the expected change in the value or price of a fixed income instrument per the assumption that interest rates fluctuate by one basis point (0.01%).

2 Bunds and Boblis are references to long- and intermediate-term securities issued by the Federal Republic of Germany. OATs or “Obligations Assimilables du Trésor” represent securities issued by the Republic of France. BTPs or “Buoni del Tesoro Poliennali” are issues of the Republic of Italy.

3 This simulation was accomplished by converting prevailing rates associated with 10- and 5-year term Euro denominated swaps into a value that resembles a bond price. Note, of course, that EUR DSFs are quoted in points reflecting the structure of a note or bond. We caution, however, that these values are simulated or estimated and that historical observation of actual DSF values as transacted will be more valuable. As this is written on a pre-launch basis, however, that is impossible and simulated values will have to suffice for current purposes.
Specifically, we examine the performance of various securities with approximate 10-year terms over the past year. This includes the 1.5% Bund maturing February 2023 ("1.5% Feb-23 Bund"); the 4.25% OAT maturing in October 2023 ("4.25% Oct-23 OAT"); and, the 4.75% BTP maturing August 2023 issued by Italy ("4.75% Aug-23 BTP").

We further examine the 0.5% Bobl maturing in February 2018 ("0.5% Feb-18 Bobl"); the 4% OAT of April 2018 ("4% Apr-18 OAT"); and, the 4.5% BTP of February 2018 ("4.5% Feb-18 BTP").

Visual inspection of our graphics suggests that there is some relationship between these securities and our simulated EUR DSF values. Still, it appears that the relationship between the German and French issues and EUR DSF values is stronger than the relationship between the Italian securities and EUR DSFs.

This may be confirmed by examining the correlations between the weekly fluctuations in various 10- and 5-year sovereign securities vs. those associated with 10- and 5-year EUR DSF values, respectively. Note that the correlations are generally high with respect to German and French issues but quite low with respect to Italian issues.

**Weekly Correlation Select Sovereign Securities vs. EUR DSFs**

(February 2013 – February 2014)

<table>
<thead>
<tr>
<th>Securities</th>
<th>5-Yr 1% EUR DSF</th>
<th>10-Yr 2% EUR DSF</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5% Feb-18 Bund</td>
<td>0.836</td>
<td>-</td>
</tr>
<tr>
<td>1.5% Feb-23 Bobl</td>
<td>-</td>
<td>0.812</td>
</tr>
<tr>
<td>4% Apr-18 OAT</td>
<td>0.920</td>
<td>-</td>
</tr>
<tr>
<td>4.25% Oct-23 OAT</td>
<td>-</td>
<td>0.888</td>
</tr>
<tr>
<td>4.5% Feb-18 BTP</td>
<td>0.300</td>
<td>-</td>
</tr>
<tr>
<td>4.75% Aug-23 BTP</td>
<td>-</td>
<td>0.188</td>
</tr>
</tbody>
</table>

NOTE: EUR DSFs represent simulated or estimated values.

This result may be explained by reference to the relatively low credit quality attributed to Italian issues relative to German and French securities.

These observations are underscored by examining scatter diagrams of the weekly changes in the value of these securities vs. EUR DSFs. Note that the scatter diagram depicting the performance of the 4.25% French issue of October 2023 vs. a hypothetical 10-year 2% coupon EUR DSF is rather tight.
By contrast, the scatter diagram depicting the performance of the 4.5% Italian issue of February 2018 vs. a hypothetical 5-year 1% EUR DSF is clearly quite loose.

Thus, one might conclude that the correlations between EUR DSFs and German and French issues, while not perfect, are nonetheless sufficient to support use of EUR DSF contracts as a hedging tool. Correlations between EUR DSFs and Italian securities appear to be insufficient to warrant a hedge.

**Constructing a Hedge**

A classic BPV HR may be deployed with respect to the deployment of EUR DSFs vs. German or French issue.

*E.g.*, assume you wish to hedge the risks associated with a €10 million face value unit of the 10-year 4.25% OAT of October 2023 with use of our hypothetical 10-year 2% EUR DSF contract. This security had a BPV of €106.83 per €100,000 face value; or, €10,683 per €100 million. We estimate a BPV = €91.11 associated with the 10-year 2% EUR DSF as of February 28, 2014. Applying our equation to calculate an HR as above, we calculate a hedge ratio equal to 117 contracts.

\[ HR = \frac{€10,683}{€91.11} = 117 \text{ or SELL 117 contracts} \]

**Spreading EUR DSFs vs. Sovereigns**

One might further trade DSF contracts vs. European sovereign securities in anticipation of movement amongst the respective yield spreads. Private credit risks are represented in the EURIBOR rate that drives the value of EUR DSFs. By contrast, public credit risks are represented in sovereign security values. Classically, one might expect that public credit risks and associated yields would be less than private credit and yields.

But there may be quite some variation in the credit quality of sovereign issuers. Currently we see that German sovereign yields are generally less than those associated with EURIBOR based swaps. On the opposite side, Italian yields run quite a bit higher.

In any event, one may express an opinion regarding the credit spread between swaps and sovereign European instruments using EUR DSF contracts spread vs. those sovereign securities. One might buy sovereigns and sell EUR DSFs in anticipation of credit episodes and widening spreads. Or, sell sovereigns and buy EUR DSFs in anticipation of improving credit quality and narrowing spreads.

*Credit Conditions Improving* ➔ *BUY Swaps & SELL U.S. Treasuries*

*Credit Conditions Deteriorating* ➔ *SELL Swaps & BUY U.S. Treasuries*

These spreads may be constructed using a BPV weighting technique in much the same manner as one would contract a hedge transaction.

**To Learn More**

To learn more about the Exchange’s suite of Deliverable Swap Futures (DSFs), please visit our website at [www.cmegroup.com/dsf](http://www.cmegroup.com/dsf).
Euro DSF Specifications

**Trading Unit**

€100,000 notional face value Interest Rate Swap (IRS), cleared by CME Clearing House, with tenors of 2-, 5- or 10-years, exchanging annual fixed interest payments at a rate per annum equal to Contract Fixed Rate for semi-annual floating interest rate payments based on the 6-month Euro interbank offered rate.

**Delivery Months**

March, June, September or December

**Contract Fixed Rate**

Established by Exchange at integer multiples of 25 basis points with 30/360 or Actual/360 day count fraction

**Quote Convention**

Prices quoted in price points: 100 points + non-par value (NPV) of Deliverable-Grade IRS where NPV is present value of IRS fixed-rate payments minus present value of IRS floating-rate payments as of Delivery Day

**Minimum Price Increment**

- 2-Year: 0.005 points (€5 per contract)
- 5-Year & 10-Year: 0.01 points (€10 per contract)

**Termination of Trade**

Trading in expiring futures terminates at 5:15 pm (CET) (generally 10:15 am CT) on 2nd TARGET business day before 3rd Wednesday of Delivery Month

**Delivery Day**

3rd Wednesday of Delivery Month

**Reference Conventions**

Fixed Rate Payer is "short" and "makes" delivery
Floating Rate Payer is "long" and "takes" delivery

**Reference Tenors**

2-, 5- and 10-Year IRS Instruments

**Notional Amount**

€100,000 (EUR) per futures contract

**IRS Effective Date**

3rd Wednesday of Delivery Month

**Termination Date**

3rd Wednesday of month of Reference Tenor anniversary of IRS Effective Date or Reference Tenor anniversary of IRS Effective Date

**Fixed Pay Dates**

Annually from IRS Effective Date

**Fixed Rate Day Count**

30/360

**Floating Pay Dates**

Semi-Annually from IRS Effective Date

**Floating Rate Day Count**

Actual/360

**Floating Rate Reference**

6-month EUR-EURIBOR-Reuters rate with no spread or compounding

**Physical delivery of IRS per Delivery Standard with Clearing Acceptance Date and Clearing Effective Date = 1st Business Day preceding 3rd Wednesday of Delivery Month**

**Delivery Invoice Price** = IRS Initial Payment Amount, per Final Settlement Price (P)

- If 100 < P, then IRS Floating Rate Payer pays, and IRS Fixed Rate Payer receives, €1,000 x (P – 100) per contract, rounded to nearest €0.01
- If P ≤ 100, then IRS Fixed Rate Payer pays, and IRS Floating Rate Payer receives, €1,000 x (100 – P) per contract, rounded to nearest €0.01

**Delivery Eligibility**

Limited to Eligible Contract Participants (per 17 CFR 1.3(m) and CME Rule 90005.C) and must be registered with CME by CME IRS Clearing Member as IRS Participant (CME Rules 90005.A. and 90005.B.)

**Position Accountability**

5,000+ contracts

**Minimum Block Trade Size (Cnts)**

- 2-Year: 1,500
- 5-Year: 750
- 10-Year: 500

**Block Trade Thresholds**

Block trades must be reported to Exchange by seller with 15 minutes of transaction

**Trading Hours and Venue**

- CME Globex: 5:00 pm to 4:00 pm (CT), Sun-Fri
- Open Outcry: 7:20 am to 2 pm (CT), Mon-Fri

Euro Interest Rate Swap futures shall trade on, and according to the rules of, the Chicago Board of Trade (CBOT) pending completion of all US Commodity Futures Trading Commission regulatory review periods.
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