

INTEREST RATE PRODUCTS

Eurodollar Packs and Bundles

Effective tools for dealing in strips of Eurodollar futures contracts.

Since their inception, Eurodollar Packs and Bundles have proven to be effective tools for those who deal in strips of Eurodollar future contracts. As of the second quarter of 2008, Pack and Bundle trading accounted for 10 percent of the total Eurodollar futures contracts traded at CME Group, and a significantly larger percentage of the volume traded in deferred contracts.

What are Bundles?

A Eurodollar Bundle consists of the simultaneous sale or purchase of one each of a series of consecutive Eurodollar futures contracts. The first contract in any Bundle is typically the first quarterly contract in the Eurodollar strip, but Bundles can be constructed starting with any quarterly contract. The matching algorithm used to match Bundles on CME Globex is FIFO. CME Group lists Bundles in 1-, 2-, 3-, 4-, 5-, 6-, 7-, 8-, 9- and 10-year terms to maturity:

Term to Maturity	Comprising One Each Of	DV01 (\$)	DV-Tick (\$)
1-Year	First 4 Contracts	100	25
2-Year	First 8 Contracts	200	50
3-Year	First 12 Contracts	300	75
4-Year	First 16 Contracts	400	100
5-Year	First 20 Contracts	500	125
6-Year	First 24 Contracts	600	150
7-Year	First 28 Contracts	700	175
8-Year	First 32 Contracts	800	200
9-Year	First 36 Contracts	900	225
10-Year	First 40 Contracts	1,000	250
5-Year Forward	First 20 Contracts	500	125

What are Packs?

Packs are the simultaneous purchase of an equally weighted, consecutive series of four Eurodollar futures. Like Bundles, Packs are an alternative method of executing a strip trade. All four-contract months in the strip are executed in a single transaction, eliminating the inconvenience of partial fills. CME Group lists Packs beginning with each quarterly expiration month out all 10 years of the yield curve. The matching algorithm used to match Packs on Globex is FIFO.

Pricing Packs and Bundles

Packs and Bundles are quoted on an average net change basis from the previous day's settlement in increments of one quarter (1/4) of a basis point (bp). The price quotation will reflect the simple average net change of the net price changes of each of the spread's constituent contracts.

Bundle Example #1: A trade is executed in the 2-Year Bundle at a price of -1. This reflects an agreement between the buyer and seller to trade the nearest eight Eurodollar contracts at an average net change in the contract's prices of 1 bp lower than the previous day's settlement prices.

Bundle Example #2: Assume that all of the nearest eight contracts have experienced a 3 bp price increase since yesterday's settlement; at the same time the prices of each of the next eight have posted net gains of 4 bps. Under these conditions, the implied fair-value price quotation for the 4-Year Bundle would be:

$$\frac{[(8 \times 3) + (8 \times 4)]}{16} = +2.25 \text{ bps}$$

Pack Example: A trade is executed in a White Pack with a net price change of -2.5-basis points from the previous day's settlement price. This would result in net price changes of -2 bps for the Pack's two nearest contracts and -3 bps for its two most deferred contracts. The result is an average price change of -2.5:

$$\frac{(2 \times -2) + (2 \times -3)}{4} = -2.5 \text{ bps}$$

Leg Price Assignment

The price algorithm used by CME Group to price the individual legs of a Pack and Bundle is driven by the following principle: To the extent that adjustments are necessary to bring the average price of the legs into conformity with the traded price, these price adjustments should begin with the most deferred leg of the spread and work forward to the nearest contract. The following example illustrates these principles.

Suppose a 3-Year Bundle trades at -2.5 bps from the previous day's settlement price. The day's actual net price changes for the legs are as follows: -2 bps for the nearest eight contracts and -3 bps for the next four contracts. The implied average net change is:

$$\frac{[(8 \times -2) + (4 \times -3)]}{12} = -2.33 \text{ bps}$$

In this example, the price exceeds the Bundle's price change by one sixth (1/6) of a bp. The price algorithm will resolve this in two steps. First, we deal with the integer portion of the -2.5 tick trade price (the 2) and then with the fractional portion (.5). Specifically, the algorithm would begin by assigning to each of the 12 legs a net price change of -2 ticks from the previous day's close. Then it would adjust these price changes downward, proceeding one contract at a time, beginning with the Bundle's terminal contract and working forward until the average net price change is the agreed up -2.5 bps. Following this procedure would result in a net price change of -2 for the Bundle's nearest six legs and -3 for the six most deferred legs:

$$\frac{(6 \times -2) + (6 \times -3)}{12} = -2.5 \text{ bps}$$

Implied Packs and Pack Spreads

In February 2006, CME Group introduced implied functionality for Packs and Pack Spreads out through the Purples (Q24). An implied order is an order created from individual outright orders available in the market place. Implied IN/OUT spreading occurs when the trading engine simultaneously works synthetic spread orders in spread markets and synthetic orders in the individual leg markets without the risk to the trader/broker of being double filled or filled on one leg and not on the other leg.

Implied spread functionality for Packs and Pack Spreads will imply the front month to front month Pack Calendar spreads. CME Group implies Pack spreads generated from outright Pack orders:

- Buy 1 U8 White Pack: +1
- Sell 1 U9 Red Pack: +3.0
- Creates 1 implied bid White/Red Pack spread: -2.0

Additionally, a combination of an outright Pack and a Pack Spread will generate an implied outright Pack order. The following example creates an implied order in the Red Pack:

- Buy 1 U8 White Pack: +2.0
- Sell 1 U8 White/Red Pack Spread: +1.0
- Creates an implied 1 lot bid in the U9 Red Pack: +1.0

In November 2008, CME Group increased its offering of Implied Packs and Pack Spreads to go out all 10 years of the yield curve, and also introduced implied functionality to Pack Butterfly spreads.

A Pack Butterfly is similar to standard Butterfly spreads except the "wings" are composed of packs instead of calendar spreads. For example, a White-Red-Green Pack Butterfly consists of:

- Buying (selling) 1 White Pack
- Selling (buying) 2 Red Packs
- Buying (selling) 1 Green Pack

Pack Butterflies are traded in increments of one quarter (1/4) of a bp and match using the Pro-Rata algorithm also used by Eurodollar futures.

To view real-time quotes for any of the spreads discussed above, please go to www.cmegroup.com/edge.

For more information on Eurodollar futures, visit www.cmegroup.com/eurodollars.

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