

# An Introduction to CME Interest Rate Products



## What Are Futures and Options?

Futures contracts are standardized, legally binding agreements to buy or sell a specific product or financial instrument in the future. The buyer and seller of a futures contract agree on a price today for a product to be delivered or settled in cash at a future date. Each contract specifies the quantity, quality and the time and location of delivery and payment.

The value of a futures contract is derived from an underlying financial measure or market, such as interest rates, equity index levels, foreign exchange rates, or commodity prices – hence the term *derivatives*. As the value of the underlying measure or market changes, the value of the futures contract based on that measure or market also changes. Institutions and individuals that face financial risk based on the movement of the underlying measure or market can buy or sell futures that will change in value to offset that financial risk. Such transactions are known as *hedging*. Institutions and individuals also buy and sell futures hoping to profit from price changes. These transactions are considered *speculation*.

CME also offers investors options on futures. Options can be thought of as insurance policies. The option buyer pays a price for the right – but not the obligation – to buy or sell a futures contract within a stated period of time at a predetermined price. The combination of options and futures – both risk-management tools – can give market participants the leverage of futures and the more limited risk of options. Options provide the opportunity to limit losses while maintaining the possibility of profiting from favorable changes in the futures price.



## Global Leadership in the Financial Marketplace

CME is the largest and most diverse financial exchange in the world for trading futures and options – handling nearly 800 million contracts worth more than \$460 trillion in a single year. Founded in 1898, we serve the risk-management needs of customers around the globe by offering the widest range of benchmark financial products available on any exchange, traded via our CME Globex electronic trading platform and on our trading floors.

Our innovative products cover major market segments – including interest rates, equities, foreign exchange, commodities and alternative investment products – and improve the way these markets work for customers everywhere. In addition, our clearing house matches and settles all trades and guarantees the creditworthiness of every transaction that takes place in our markets.



## Overview of CME Interest Rate Products

CME interest rate products enable banks and other lenders worldwide to hedge interest rate risks, and in turn help to reduce the overall cost of borrowing and financing. Without these tools, potential lenders would be less willing to lend or would only be willing to lend at higher rates to offset the possibility of adverse shifts in interest rates. CME interest rate products enable lenders to manage that risk. As a result, institutions that use CME interest rate futures products are able to increase their lending and pass some of the efficiencies, in terms of lower costs, onto their commercial and consumer clients.

CME trades more short-term interest rate futures and options than any other exchange in the world. Averaging more than 1.6 million contracts traded daily, CME interest rate futures products represent an annual notional (underlying cash) value of \$400 trillion. Participants in the cash or over-the-counter (OTC) interest rate markets use CME products to manage interest rate risks ranging from 30 days to 10 years.

The cornerstone of the CME interest rate product line is CME Eurodollar futures, the world's most actively traded futures contract. A benchmark for investors globally, CME Eurodollar futures provide a tool for hedging fluctuations in interest rates on U.S. dollars deposited in overseas banks. The majority of CME Eurodollar futures trade electronically. In addition, options on CME Eurodollar futures, such as CME Mid-Curve options, are the most actively traded exchange-listed interest rate options in the world. Their liquidity offers traders and hedgers an even greater opportunity to take advantage of their views on the direction of U.S. interest rates. Other products in the CME interest rate suite include CME 1-Month LIBOR futures, 2-, 5- and 10-year CME Swap futures, and CME 3-month Euroyen futures. These products offer risk managers additional latitude in hedging other portions of the U.S. yield curve and in hedging Japanese yen-denominated interest rate risk. For a complete list of CME interest rate products, see page 8.

### Why Use CME Interest Rate Products?

Participants in the CME interest rate futures market take a view on the market's direction – some see interest rates rising in the future while others anticipate that they will fall. Someone who wants to protect against higher rates in the future will want to pay a fixed rate and receive a floating rate in an interest rate swap. Correspondingly, someone who anticipates a decline in rates may want to receive fixed interest rate payments and pay floating rates. Both sides are seeking a way to minimize risk and maximize profits; they are hedgers. A speculative market also exists for interest rates, consisting of traders seeking opportunities to profit from interest rate adjustments or market volatility.

For example, a bank may have variable rate sources of funds but commercial banking customers who are demanding fixed rate loans. With CME interest rate futures, the bank can create futures positions to hedge its variable interest rate risk. Eurodollar futures prices move inversely to rates. When rates rise, futures prices fall and when rates fall, futures prices increase, similar to the price behavior of notes and bonds. If a bank needs to hedge against rising interest rates they can sell CME Eurodollar futures and conversely if they need to protect against a fall in rates they can buy futures.



## Who Trades CME Interest Rate Products?

CME interest rate products are used by major domestic and international banks, portfolio managers and other financial institutions that face interest-rate risks from their lending and borrowing activities. In addition, government securities dealers, hedge funds, independent traders and arbitrageurs are active users of CME interest rate products. In many cases CME interest rate futures are used for pricing and hedging over-the-counter (OTC) positions. For example:

- » Bank swap dealers can use CME Eurodollar futures to hedge interest rate swaps they have created in the OTC market. If a corporate customer is paying a fixed rate and receiving a floating rate, the bank will hedge its side of the transaction with CME Eurodollar futures to protect against the risk of rising interest rates.
- » Mortgage lenders can sell CME Eurodollar futures to hedge against the risk of rising interest rates after their applicants have locked in a fixed rate before closing on their mortgage loans. With CME Eurodollar options, lenders can hedge the risk of borrowers re-negotiating their mortgage rates if interest rates decline.
- » Banks are able to offer long-term loans and deposits with highly competitive rates by using options on CME Eurodollar futures. These products protect against sudden increases or declines in rates which could adversely affect the customers and the profitability of the bank. For example, a bank receiving payments on floating rate loans can protect against a decline in interest rates by purchasing a series of consecutive CME Eurodollar call options.

### Futures Terms

Futures prices are listed in daily newspapers and other media. These are the terms you will typically see.

**Expiration month:** The month and year in which a futures or options contract will expire and be settled.

**Open:** The average price at which the first bids and offers were made or the first transactions were completed during the trading period.

**High:** Top bid or top price at which a contract was traded during the trading period.

**Low:** Lowest offer or the lowest price at which a contract was traded during the trading period.

**Settlement price:** The official daily closing price, typically set at the midpoint of the closing range.

**Net change:** The amount of increase or decrease from the previous trading period's settlement price.

**Yield settlement:** The interest rate implied by the settlement price.

**Volume:** The number of contracts traded (one side of each trade only) for each delivery month during the trading period.

**Open interest:** The accumulated total of all currently outstanding contracts (one side only). Refers to unliquidated purchases and sales.



## Advantages of CME Interest Rate Markets

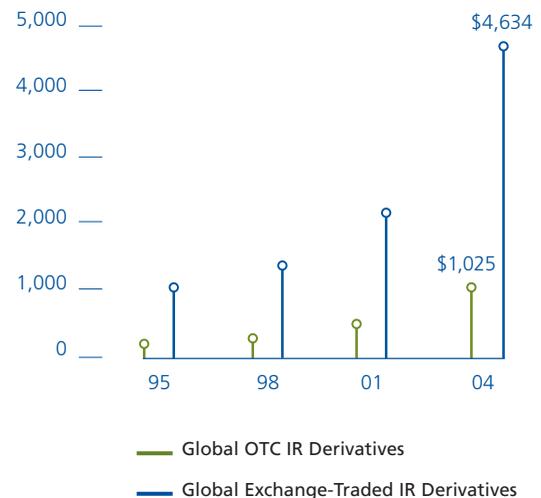
CME interest rate products are part of a broad derivatives market, which also includes the OTC swap and interest rate derivative markets. These markets have grown in tandem over the last quarter century and it is widely accepted that neither could have grown to their current size without the other. However, there are significant advantages to exchange-traded products, such as those offered by CME:

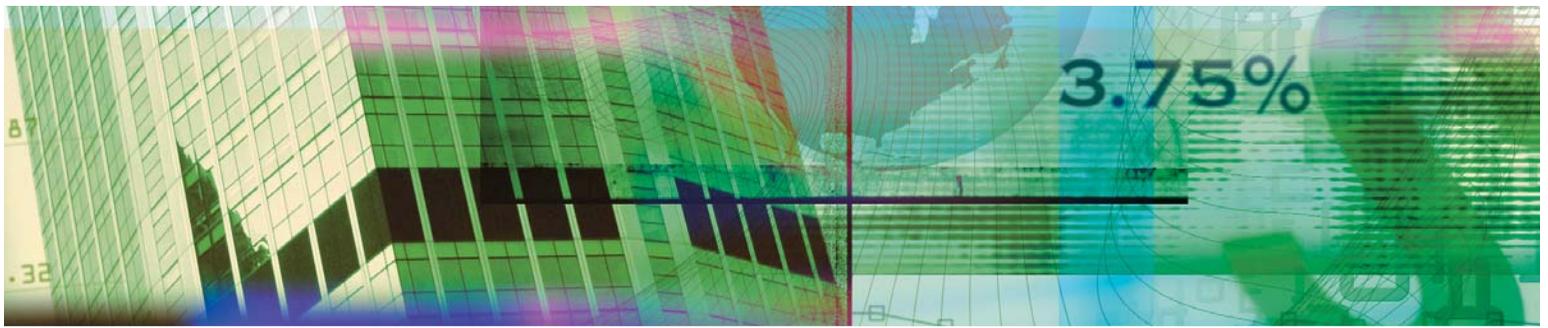
- » **Concentrated liquidity** – More than 1.5 million CME interest rate futures trade each day at CME. As a result of this deep liquidity, spreads in CME markets are consistently tight.
- » **Price transparency** – At CME, trading transactions take place in an open, fair and anonymous trading environment. CME market prices are universally available in real time. Electronic trading participants can see the top five bids and offers and the prices at which trades are executed at all times.
- » **Market integrity** – By serving as the counterparty to every trade, the CME Clearing House virtually eliminates the risk of credit default and protects the financial integrity of CME markets. CME’s centralized clearing function also enables any market participant to close or modify positions independent of the other party or parties in the original trade.
- » **Regulatory assurance** – The quality and strength of CME’s regulatory capabilities underlie the financial security of our markets. Our integrated compliance and market surveillance functions assure market participants of the highest trading standards and supervision. CME markets are monitored by the Commodity Futures Trading Commission (CFTC), an independent federal regulatory agency.

The magnitude and rapid growth of the exchange-traded interest rate derivatives markets and the OTC market can be seen in the chart below, which contrasts the amount of average daily turnover in each of those markets. On a daily turnover basis, the volume – and liquidity – of global exchange-traded products exceeds that of the OTC market by more than four times. The extensive liquidity of CME interest rate futures attracts participants from both the money and capital markets who seek to transfer their risk with one product line.

**Global Turnover in OTC and Exchange-Traded Interest Rate Derivatives Market**

(Average daily turnover in April of each year, notional value in \$ billions)





## Pricing of CME Interest Rate Futures Contracts

CME Eurodollar prices are determined by the market's forecast of the 3-month London Interbank Offered Rate or 3-Month LIBOR. The futures prices are derived by subtracting the implied interest rate from 100.00. That price reflects the market's expectation of where 3-month LIBOR deposit rates will be trading at some point in the future. For instance, an anticipated interest rate of 5.00 percent will translate to a futures price of 95.00 ( $100.00 - 5.00 = 95.00$ ). Given this price construction, if interest rates rise, the price of the futures contract falls, and vice versa. Therefore, to profit from declining interest rates, you would buy the futures contract (known as "going long"); to profit from a rise in interest rates, you would sell the contract (known as "going short"). In either case, if your market view turns out to be correct, you would be able to liquidate or offset your original position and realize a gain. If your market view is incorrect, however, your transaction could result in a loss.

Prices of CME interest rate futures trade in increments of one-quarter ( $\frac{1}{4}$ ) and one-half ( $\frac{1}{2}$ ) of one basis point, depending upon when the contract expires. This is often referred to as the "tick" value. Gains or losses are calculated simply by determining the number of ticks moved, multiplied by the value of the tick.

A full tick or basis point in CME Eurodollar futures, for example, is worth \$25.00. The \$25.00 basis point value is based on the \$1,000,000 notional (underlying cash) value of this contract, as calculated below:

$$\text{\$1,000,000 notional value} \times .0001 \text{ (one basis point)} \times 90/360 \text{ (three month) deposit period} = \text{\$25.00}$$

Tick values vary with each product. For the nearest expiring or "spot" month in CME Eurodollar futures (serial or quarterly) and 1-month CME LIBOR futures, the minimum price fluctuation is  $\frac{1}{4}$  of a basis point or a " $\frac{1}{4}$  tick," which is \$6.25. For all other CME Eurodollar, CME LIBOR and all CME Treasury Bill contracts, the minimum price fluctuation is  $\frac{1}{2}$  of one basis point, or a " $\frac{1}{2}$  tick," which is \$12.50. For both the CME Euroyen TIBOR and CME Euroyen LIBOR Japanese yen-denominated contracts, the minimum price fluctuation is  $\frac{1}{2}$  of one basis point or a " $\frac{1}{2}$  tick," which is ¥1,250.

### Calculating Profits and Losses in Trading

Below is a sample calculation of profits and losses using a CME 3-month Eurodollar futures contract.

$$96.10 \quad \text{Contract value with an implied forward rate of 3.90\% (100.00 - 3.90 = 96.10)}$$

#### Example 1

$$\begin{array}{r} 96.10 \\ + .01 \\ \hline 96.11 = \end{array} \quad \begin{array}{l} \text{Implied forward rate drops .01\% to 3.89\%.} \\ \text{The contract trades .01 higher.} \\ \text{The increase in value per contract would be} \\ \text{one basis point (.01) which according to the} \\ \text{contract specifications equals \$25.00.} \end{array}$$

#### Example 2

$$\begin{array}{r} 96.10 \\ - .01 \\ \hline 96.09 = \end{array} \quad \begin{array}{l} \text{Implied forward rate rises .01\% to 3.91\%} \\ \text{The contract trades .01 lower.} \\ \text{The decrease in value per contract would be} \\ \text{one basis point lower, or \$25.00.} \end{array}$$

If 10 Eurodollar futures contracts are bought at 96.10 and then sold at 96.15, an increase of five basis points, the transaction would yield a profit. To determine the amount of the profit on this trade, a trader would use the following steps:

- Step 1:  $96.15 - 96.10 = 5$  basis points
- Step 2: Multiply 5 basis points x number of contracts (10) = 50 (points)
- Step 3: Multiply 50 points x \$25.00/per point = \$1,250.00 profit

Of course, if the contracts had lost five basis points, the loss would have been \$1,250.00.

By quantifying the economic risk of shifts in interest rates, a financial manager can determine the appropriate number of contracts to buy or sell to create an offsetting position in CME Eurodollars. In this way, the manager is able to hedge the interest rate risk.

*Please note: These examples do not include transaction fees (brokerage fees and other fees) which would need to be part of a complete analysis of hedging interest rate risk.*

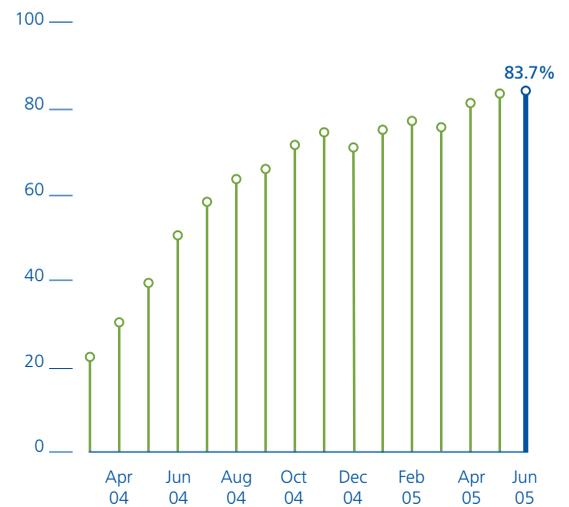


## Electronic Trading Around the Clock, Around the World

As a leader in electronically traded derivatives products, CME enables customers to access the widest array of benchmark futures and options contracts available on any exchange, via our CME Globex electronic trading platform. Trading on CME Globex is available on a single platform, virtually 24 hours a day – more than any other exchange in the world. Our customers can access the CME Globex trading platform through 740 direct connections in 27 countries around the world, as well as through telecommunications hubs – located in London, Amsterdam, Dublin, Frankfurt, Gibraltar, Milan, Paris and Singapore – that provide reduced connectivity costs, increased accessibility, and fast, efficient trading of CME products.

The platform's open architecture enables customers to access CME Globex using their own proprietary trading applications or the systems provided by futures brokers and independent software vendors, as well as a CME-provided trading application. In conjunction with the security of the CME Clearing House guarantee, the CME Globex trading platform offers speed of execution, transparency, anonymity and market integrity. Traders are able to see the top prices and other data right on their screens and transactions are executed in less than a second. The advanced capabilities of the CME Globex platform allow traders to execute all of the traditional (outright) transactions in futures as well as a variety of spread trades, including highly complex options spreads.

Percentage of CME Eurodollar Futures Traded on CME Globex





## Fully Integrated Clearing

At CME, we operate our own clearing house that matches and settles all trades and guarantees the creditworthiness of every transaction that takes place in our markets. Our integrated clearing function ensures the safety and soundness of our markets and helps differentiate us from our competitors.

With the CME Clearing House serving as counterparty to every trade—e.g., in the clearing process it becomes the buyer to each seller of a futures contract and the seller to each buyer—credit risk is virtually eliminated. Performance bond (collateral) deposits are required at each level in the clearing process—customer to broker, broker to clearing firm, clearing firm to clearing house. The performance bond is a good-faith deposit that represents the minimum amount of protection against potential losses.

The CME Clearing House handles more than 90 percent of all futures and options contracts traded in the U.S. This requires management of the substantial exposure that results from transferring more than \$460 trillion of risk and guaranteeing the performance of each of nearly 800 million contracts annually. On a daily basis, we hold nearly \$45 billion of collateral deposits to support the transactions that are being made in CME's markets. Twice daily, we move between \$1.5 billion and \$6 billion of funds to and from market participants.

### Getting Started in CME Interest Rate Futures

Today's greater need for risk management and hedging tools has required investors to become increasingly sophisticated about futures and options on futures products.

With customers around the world; a diverse product line; deep, liquid markets; around-the-clock electronic trading on a single platform and strategic alliances with other exchanges, CME is truly a global marketplace. Why not make it yours?

For additional information to help you get started trading CME interest rate products, please visit our Web site at [www.cme.com/IR](http://www.cme.com/IR). You will be able to access a number of other brochures and online seminars as well as marketing and education materials that can answer your questions or help you to begin trading these products. Additionally, if you would like to talk to a CME representative, please call our Customer Service Line, 1-800-331-3332.



## CME Interest Rate Products

### CME Eurodollar Futures and Options

Eurodollars are U.S. dollars deposited in commercial banks outside the U.S., and CME Eurodollar futures provide a tool for hedging fluctuations in interest rates on those deposits.

Launched in 1981, CME Eurodollar futures, which track three-month LIBOR (London Interbank Offered Rate), are the world's most actively traded financial contract and were the first futures product to be settled in cash, rather than physically delivered. A total of 40 quarterly futures contracts, spanning ten years, plus the four nearest serial (non-quarterly) months are listed at all times. Today more than 80 percent of CME Eurodollar futures, representing average daily volume of 1.3 million contracts, trade electronically on the CME Globex electronic trading platform.

### Mid-Curve Options on CME Eurodollar Futures

CME Mid-Curve options are short-dated options on long-dated CME Eurodollar futures contracts which expire in the second, third and fifth year of contracts on the CME Eurodollar futures curve. Traders can use the weekly expirations on the One-Year CME Mid-Curve options to take a view on upcoming economic data releases (e.g., employment figures, consumer confidence, housing starts). The serial and quarterly contract expirations provide hedging and speculative opportunities on the mid-range of the U.S. interest rate yield curve.

### CME One-month LIBOR Futures and Options

CME LIBOR futures represent one-month LIBOR rates on a \$3 million deposit. LIBOR is often used as the benchmark rate for commercial loans, mortgages and floating rate debt issues. CME LIBOR futures and options are of particular value to fixed income managers who need shorter-term intervals for managing their interest rate risk.

CME lists twelve consecutive monthly LIBOR futures at any given time, but most trading occurs in the expiration months that correspond with the quarterly expirations of CME Eurodollars – March, June, September and December.

### CME Euroyen Futures and Options

Euroyen are Japanese yen deposits outside of Japan. CME Euroyen futures provide a tool for hedging short-term risks on interest rate fluctuations on Euroyen, and enable arbitrageurs to trade the differences between interest rates on yen deposits in Tokyo and in London.

CME offers two 3-month Euroyen futures contracts; one settles to Euroyen TIBOR (Tokyo Interbank Offered Rate) and the other to Euroyen LIBOR. CME Euroyen futures expiration months correspond to the quarterly expirations of CME Eurodollars – March, June, September and December.

### CME 13-Week Treasury Bill Futures

U.S. Treasury bills, considered risk-free debt instruments, provide the foundation for the money markets and are seen as reflecting “pure” interest rate movements. They were launched in 1976 as CME's first interest rate futures contract. CME 13-week Treasury bill futures track the cash Treasury bill market and settle to the weekly Treasury bill auction rate.

### CME Also Offers the Following Interest Rate Futures Products

- » CME Swap Futures, based on the interest rate swap market.
- » CME 28-Day TIIE (Tasa de Interest Interbancario de Equilibrio) futures, based on the benchmark Mexican interbank money market.
- » CME 91-Day CETES (Certificados de la Tesorería de la Federación) Futures, based on Mexican government bonds.
- » CME Turn Futures, based on expectations for interest rates on the last business day of the year.
- » CME JGB (Japanese Government Bond) Futures, based on 10-year Japanese government bonds.
- » CME CPI (Consumer Price Index) Futures, based on the market's expectation for future inflation rates in the U.S.
- » CME Eurodollar FRA (Forward Rate Agreement) Switch Futures, based on the needs of risk managers in the OTC interest rate derivative community.

More information on each of these products is available on the CME Web site at [www.cme.com](http://www.cme.com).

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