

Insights into U.S. Treasury Futures

CBOT Treasury futures are standardized contracts for the purchase and sale of US government notes or bonds for future delivery. The US government bond market offers the greatest liquidity, security (in terms of credit worthiness), and diversity among the government bond markets across the globe. The US government borrows through the US bond market to finance its maturing debt and its expenditures. As of December 2013, there were \$11.9 trillion of US government bonds and notes outstanding as marketable debt.

The US government borrows money primarily by issuing bonds and notes for a fixed term, e.g. 2-year, 5-year, 10-year, and 30-year terms at fixed interest rates determined by the prevailing interest rates in the marketplace at the time of issuance of the bonds. Strictly speaking, US Treasury bonds have original maturities of greater than 10 years at time of issuance, and US Treasury notes have maturities ranging from 2-Yrs to 10Yrs (2, 3, 5, 7 and 10yr). For the purpose of this note, US Treasury bonds and notes are applicable for general references to the US bond market or US bonds unless described otherwise.

US Treasury bonds trade around the clock leading to constant price fluctuations. In general, bond prices move in inverse proportion to interest rates or yields. In a rising rate environment, bondholders will witness their principal value erode; in a declining rate environment, the market value of their bonds will increase.

IF Yields Rise ▲ THEN Prices Fall ▼

IF Yields Fall ▼ THEN Prices Rise ▲

The US Treasury futures and options contracts are available for each of the Treasury benchmark tenors: 2-year, 5-year, 10-year, and 30-year. The Ultra T-Bond futures contract has been the fastest growing Interest Rate futures contract at CME Group since it was launched in January 2010. The Ultra T-Bond has filled a void by incorporating the longest tenor government bonds as the underlying.

Each of the bond and note future contracts has an associated delivery bond basket that defines the range of bonds by maturity that can be delivered by the seller to the buyer in the delivery month. For example, the 5-year contract delivers into any US government fixed coupon bond that has a remaining maturity of longer than 4 years and 2 months and an original maturity of no more than 5 years and 3 months. The delivery mechanism ensures the integrity of futures prices by ensuring that they are very closely tied to the prices of US government bonds and their yields (interest rates). In practice, most participants trade US Treasury futures contracts with the intent of either closing out the futures position or rolling them into longer expiry futures contracts. The US Treasury futures are listed on the March, June, September, and December quarterly cycles. Since 2000, only about 7% of Treasury futures positions result in physical delivery at expiration.

Treasury Futures Contract Details

	2-Yr T-Note	5-Yr T-Note	10-Yr T-Note	T-Bond	Ultra T-Bond
Face Amount	\$200,000	\$100,000	\$100,000	\$100,000	\$100,000
Deliverable Maturities	1 ¾ - 2 Years	4 1/6 - 5 ¾ Years	6 ½ - 10 Years	15 Years up to 25 Years	25 Years to 30 Years
Contract Months	March Quarterly Cycle: March (H), June (M), September (U) and December (Z)				
Trading Hours	Globex: Sunday - Friday 5:00pm - 4:00pm				
Last Trading	Last business day of contract month		Day prior to last seven (7) business days of contract month		

Minimum Tick	In percent of par to one-quarter of 1/32nd of 1% of par	In percent of par to one-quarter of 1/32nd of 1% of par	In percent of par to one-half of 1/32nd of 1% of par	In percent of par to 1/32nd of 1% of par	In percent of par to 1/32nd of 1% of par
Minimum Tick Value	\$15.625	\$7.8125	\$15.625	\$31.25	\$31.25

Each US Treasury futures contract has a face value at maturity of \$100,000 with the exceptions of 2-year and 3-year US Treasury futures contracts which have face value at maturity of \$200,000. Prices are quoted in points per \$2000 for the 2-year and 3-year contract and points per \$1000 for the all other US Treasury futures. The fractional points are expressed in 1/32nd in line with the convention in US government bond market. The minimum tick size for the 30-year (T-Bond) and Ultra T-Bond contracts is 1/32nd of one point (\$31.25), 10-year contract is half of 1/32nd of one point (\$15.625), and 2-year, 3-year (\$15.625) and 5-year contracts are one-quarter of 1/32nd of one point (\$7.8125).

Treasury futures are standardized, highly liquid, and transparent instruments. In 2013 alone, our US Treasury futures volumes grew by more than 20% with average daily volume of 2.69 million contracts. In addition, futures are a neutral security, which can be easily traded from the long or short sides. Treasury futures positions provide the security of facing CME Clearing, which acts as the counterparty to every trade*. Finally, US Treasury futures provide easy access to leverage and both capital and operational efficiencies.

These are among the reasons US Treasury futures have a broad and diverse mix of customer types including Asset Managers, Banks, Corporate Treasurers, Hedge Funds, Insurance Companies, Mortgage Bankers, Pension Funds, Primary Dealers, & Proprietary Traders. The vast hedging and speculative activity in US Treasury futures create nearly constant price fluctuations providing excellent opportunities trading for individual traders in addition to institutional trading accounts.

By serving as the counterparty to every transaction, CME Clearing becomes the buyer to every seller and the seller to every buyer, substantially reducing the financial performance risk of each market participant's position in CME Group products.

Trading Examples - U.S. Treasury Futures:

Historically, when the economy strengthens, interest rates are likely to rise for a number of reasons such as:

- Increased demand for loans
- Asset allocation out of bonds (typically considered a safe asset class) into stocks (typically considered a risky asset class)
- Increased likelihood of interest rate increases by the Federal Reserve Board

When interest rates rise, US Treasury futures prices fall.

Similarly, when the economy weakens, interest rates are likely to fall for reasons such as:

- Decreased demand for loans
- Asset allocation out of stocks into bonds
- Increased likelihood of interest rate cuts by the Federal Reserve Board

The US economy is more like a cruise liner than a speed boat in that it often stays on a path of strengthening or weakening for several months to a few years. This causes broader moves in interest rates that are spread over considerable time periods as opposed to very short periods.

Nevertheless, US Treasury futures produce short- term trading opportunities, as demonstrated in the following examples.

Example 1: A trader believes that the US economy is strengthening and intermediate Treasury yields will increase (5-Yr and 10-Yr).

This trader sells 10 contracts of March 2014 5-year US Treasury Note futures at 120 25/32.

The trader's view proves correct. The economic numbers continue to show that the US economy is strengthening. 5-Yr Treasury yields rise, and the March 2014 5-year T-Note futures price declines. The trader buys back the 100 March 2014 5-year T-Note futures contracts at 120 03/32.

Profit on this example trade = $10 * (120\ 25/32 - 120\ 03/32) * \$1000 = \$6,875$

(Profit or Loss = Number of contracts * Change in price * \$1000)

The profit calculation in this example can also be expressed in terms of minimum ticks or simply referred to as ticks. The tick size for 5-year contract is $\frac{1}{4}$ of $\frac{1}{32}$ nd of 1 point. The \$ value for minimum tick of the 5-year contract is \$7.8125.

Number of ticks made on the trade = $(25/32 - 3/32) * 4 = 88$ Ticks

Profit on this example trade = 10 Contracts X 88 Ticks X \$7.8125 = \$6875

Example 2: The monthly US non-farm payroll number on the first Friday of a month comes out significantly weaker than expected. This indicates a surprisingly weakening economy. As a result, Treasury yields decline, and US Treasury futures prices rise. A trader notices that the March 2014 10-year T-Note futures have responded to the report by posting modest rally from 125 05/32 to only 125 15/32. He believes that the weakness in the number was a significant surprise and more participants will soon need to buy notes.

This trader buys 10 contracts of March 2014 10-year T-Note futures at 125 15.5/32.

The trader view proves correct. Intermediate Treasury yields continue to fall, and the

10-year T-Note future price rises further. An hour later the trader sells back the 100 March 2014 10-Yr T-Note futures contracts at 125 23/32.

Profit on this example trade = $10 * (125\ 23/32 - 125\ 15.5/32) * \$1000 = \$2344$ (rounded to nearest dollar)

Similar to the previous example, let us re-calculate the profit in this example using ticks. The tick size for 10-year contract is $\frac{1}{2}$ of $\frac{1}{32}$ nd of 1 point. The \$ value for minimum tick of the 10-year contract is \$15.625.

Number of ticks made on the trade = $(23/32 - 15.5/32) * 2 = 15$ Ticks

Profit on this example trade = 10 Contracts X 15 Ticks X \$15.625 = \$2344 (rounded to nearest dollar)

Conclusion

The US Treasury futures complex of the CME Group consists of liquid and easy to access markets that offer a wide variety of strategies for a broad and diverse mix of customer types needing to hedge exposures to interest rates and traders seeking to assume risk to take advantage of anticipated changes in interest rates.

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