

## Basis Cheap/Rich

THC technologies offer a new measure to capture trading opportunities by identifying the value of futures contracts relative to the on-the-runs: Basis cheap/rich.

There are multiple drivers of futures contract prices:

1. The on-the-run price movements that measure the “yield curve risks”;
2. The prices of the basket of deliverable bonds, including the cheapest-to-deliver (CTD) bond, relative to the on-the-runs, called the CTD cheap/rich;
3. The futures contract prices relative to the basket of deliverable bonds, called the futures cheap/rich.

When we use a basis trade to isolate the yield curve risk from the futures price movements, the residuals are the combination of the CTD cheap/rich and the futures cheap/rich, the spread of which, in turn, is called the “basis cheap/rich”.

Often traders use the “spread price” (the futures prices net of the on-the-run price) to identify the relative value between the futures and the on-the-run. However, the use of the spread price assumes the following.

(1) There is an on-the-run bond that mitigates all yield curve risk of the futures contract.

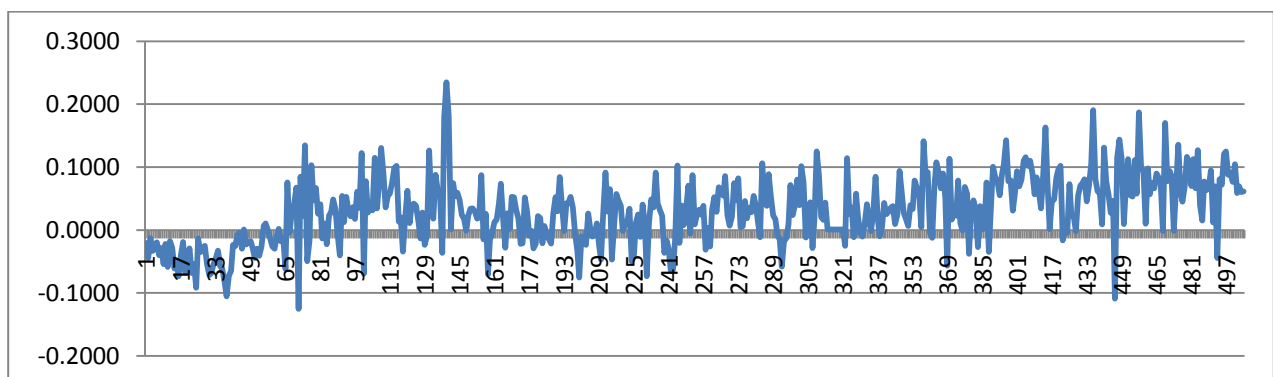
(2) There is no possibility of any switches in the CTD.

Both assumptions, however, do not apply in most cases. Further the spread price only depicts the relationship between futures trends and on-the-run; not the actual cheap/rich level of the futures. Since the cheap/rich level tends to converge to zero, this trend should provide strong buy/sell signals.

### Basis Cheap/Rich of ULU0

To illustrate, consider ULU0, which has been gaining liquidity. **Figure 1** depicts the basis cheap/rich trend from 6/2/2010 to 6/11/2010, 7:00am- 2:00pm CST at 5 minute intervals. The y-axis value is in \$ on a 100 notional. When the basis cheap/rich is 0.031 (-0.031), the futures contract is 1 tick rich (cheap). If a basis is significantly higher (lower)

Figure 1. The basis cheap/rich of ULU0 ( from 6/2/2010 to 6/11/2010, 7:00am- 2:00pm CST at 5 minute intervals).



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than the mean, (e.g. +/- 1 Standard Deviation), then it would be a sell (buy) signal.

Figure 1 shows significant intraday variations. Even taking the relative illiquidity of the UL contracts into consideration, the variations suggest opportunities in the use of limit orders to capture the trading opportunities.

### Setting up a Trade – an Illustration

The basis cheap/rich identifies the value. Traders should also determine if the trade can isolate the yield curve risk. There are alternative ways to approach this problem depending on the contracts and the trade requirements. Traders can use the hedge ratios (see “hedge ratio tab”) to determine the number of contracts needed to hedge \$X million of the on-the-runs. For example, a \$10MM 30 year on-the-run position is hedged with 85 ULU0 contracts. The tail risk has a DV01 of -\$83 only. Alternatively, using the key rate DV01 approach, users can construct butterfly or double butterfly trades. Futures positions can be entered in the Position-Risk Tab. Select the hedge ratio and then Optimize accordingly, and the system-defined optimal trades will be presented. The risk exposure of the trade can be viewed in Position-Risk Tab after clicking on “trade”.

### Concluding Notes

Basis cheap/rich is a key to determining relative value of the futures vis-à-vis the yield curve. Determining relative value involves detailed financial modeling, including that of delivery options, cheap/rich values of the futures, bonds in the basket, and more. The measure is accurate and coherent. It can be used in many ways.

For example, this bulletin illustrates the use of limit orders in trading the UL contracts; a method that can be used for other contracts. Since this measure does not depend on pairing the futures and on-the-runs, butterfly and double butterfly trades using futures and bonds can easily be implemented. Furthermore, since the values of all bonds and futures are measured relative to the yield curve by the basis cheap/rich, we can monitor and construct trades with a portfolio of futures and bonds using the basis cheap/rich of the portfolio.

Given the basis cheap-rich trends, traders can use the 1 day or 5 day Z-scores, Bollinger band or other time series technical measures, along with market information, to decide on the entry and exit points. These are just some of the possible applications.

Note that there are multiple ways to use the basis cheap/rich in THC Decisions. Users can use the following tabs.

1. Bias Signal to monitor the Z-scores on the basis cheap/rich as buy/sell signals
2. Cointegration to view the variations of the basis cheap/rich impacting on the P/L of a trade
3. Pricing Monitor to view all the contracts’ basis cheap/rich relative to other valuation components
4. Trend Analysis to view the trends of the basis cheap/rich
5. Position-Risk to input a trade position and view its risk exposure
6. Optimization to determine the pairwise, butterfly, double butterfly and other hedging strategies.

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