GH Trader's LLC
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research note

# Cheapest-to-Deliver Changes

*In its simplest terms a change in the Cheapest-to-Deliver (CTD) means added volatility for any trader of fixed income products. As volatility picks up in the market so do changes in the CTD. The markets have just come through a long period with very little volatility. However, that's changing. It's time to look at the CTD dynamic again.*

This paper will try and keep this subject in its simplest terms. Furthermore, I will use the financial futures products at the CBOT as examples of changes in the CTD. Lastly, I'll be referring to US traded treasury products only.

If you're trading, for example, the 10 year note futures, you're really trading an underlying cash note with a coupon, price, duration, etc. That note is the CTD. For now, that's all you need to know. Oh…and…of course, you need to know that the CTD can change, like it did in the 10 yr note on 06/12/2007. That was the first change in a very long time. When the change occurred you saw volatility occur that appeared to come out of nowhere, to most traders. However, there are some trader's that knew precisely that a change in the CTD had occurred. You should become one of those traders. Let's take a closer look at change that I mentioned above.

There was a change in the CTD in the 10yr futures. That change occurred on 6/12/2007. Moreover, we've had another change since 6/12, then back to the original CTD! And the 10s were just a blip compared to the 5s and 30s. The 5yr changed 3 times & the 30yr futures changed 6 times!

So what happens when we change? We get a mini flight-to-quality in the market. One second the 10 yr note future is really the

4 3/4 of 05/14 with an implied futures price of say, 104.24+

The next second its

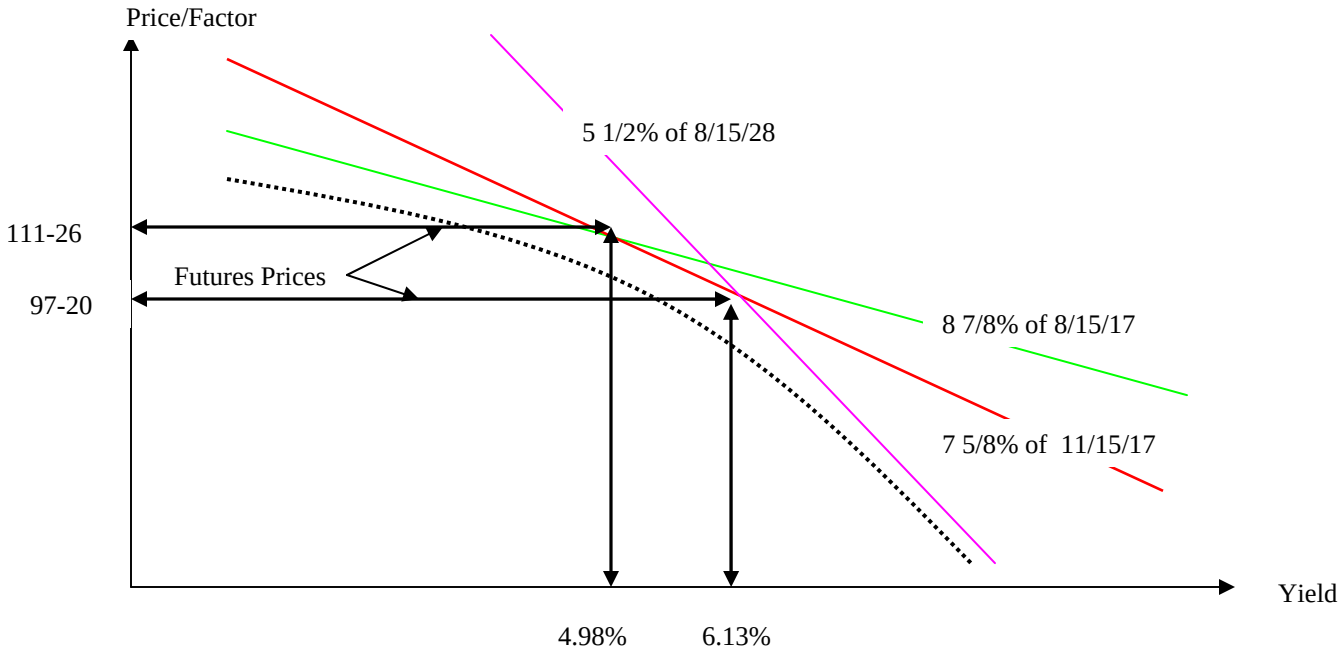
4 1/4 of 08/14 with an implied futures price of say, 104.22

The reason for the change is that we hit a price level where it makes more sense to deliver a different bond/note than the one that had been getting delivered. The characteristics of that new note are different and with that, the futures price. One second, say, we're 104.24+ bid for 1,700; 104.25 offer for 2,500 and the next second we're 104.22 sellers with someone hitting the market down with 8,000 contracts. Why did they do that? Simply put, at these price levels an arbitrage opportunity has been created between the underlying cash market and the futures. The trader is simply locking in a guaranteed profit, of a couple of basis points, on as many as he/she can.

Furthermore, the futures market is not the same market it was 2 minutes earlier. It has taken on a whole new deliverable note, literally. With that dynamic-change come's price

change. Then, when you think you have it figured out, the market rallies 4 tics and it changes back to the old deliverable; now you're trading the old note. Add this new volatility to the already volatile market and your eyes start spinning. You as a trader have never seen the market move this way. It's moving that way because the underlying deliverable note is changing on a single price change. Let's look at this scenario in a picture.

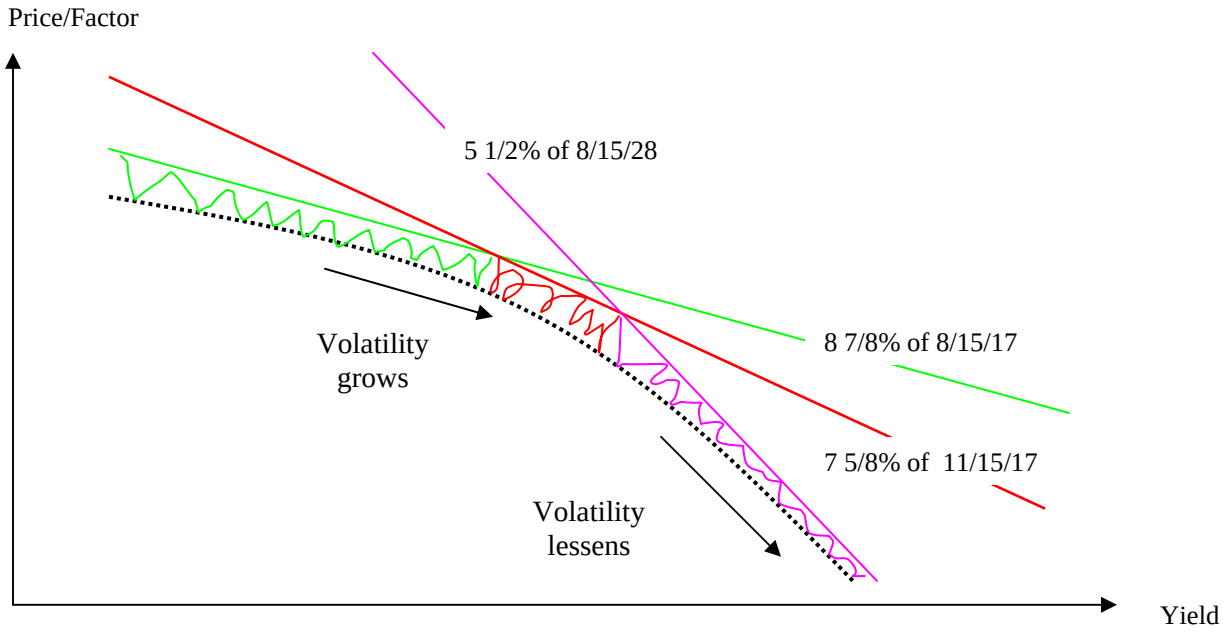
Here's a picture from *The Treasury Bond Basis, 3rd Edition*, by Burghardt, Belton, Lane, & Papa: (Note that it's not the specific scenario outlined above.)




The easiest way to interpret the picture above, for our type of trading, is to

- focus on the curved dashed line; that's the bond-futures contract.
- Now look at the green line, that's the underlying deliverable bond that the bond-futures take on the life of.
- Here's the key
    - Pay close attention to where the two arrows meet at the 111-26 line and the 4.98% line. At that point, the red line is intersecting the green line. See how the *curved* line is farther away from the green line? The space between the lines got bigger. THAT'S A PICTURE OF VOLATILITY!
    - When price was up and yield was down, there wasn't much risk in the change of the cheapest to deliver. The market experiences low volatility.
    - When price fell and yield rose, a big enough amount, uncertainty entered the market. That uncertainty takes the form of a question, *'what's the CTD?'* That uncertainty creates a lot of volatility.

I've recreated the chart from above, below, and colored in the area that I want you to see, with scribbled color-coordinated lines.




The scribbled green line represents the difference between the futures price and the CTD. Although they are supposed to be identical in price, for many reasons I will not cover in this paper, they aren't. However, once the futures contract 'knows' what the CTD is, they follow each other very closely, providing little opportunity for arbitrage unless uncertainty arises about what the CTD is going to be.

As the green scribble moves closer to the red scribble uncertainty grows, hence volatility rises in the futures market. Continuing along the same path, as the market moves farther away from the green scribble, along the path of the red scribble, things calm down until they move further towards the pink scribble and uncertainty grows again.

What we are experiencing currently in our markets is similar to the green and red lines. Yield rose/price fell far enough that the CTD changed. As we moved from green to red volatility picked up because of the uncertainty whether yields would keep rising enough to make the red become CTD. Indeed they did rise enough that a CTD changed. Then, yields went down and the CTD changed back. That's where the volatility came in. The changing of the CTD.

Thank you,
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