

Futures & Commodity Contracts

To adjust or not to adjust that is the question

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The debate on whether to adjust the history of futures and commodity contracts at rollover continues to rage. Both sides have valid arguments, but before considering those let's look at why it might be necessary and what it entails. Futures contracts trade either in contango or backwardation, but there is some confusion about these terms, so they need to be explained first.

A futures contract is said to be in contango when the futures price is higher than the spot price, and in backwardation when the futures price is lower than the spot price. If you consider a single futures contract, it must approach the spot price as it approaches expiry. This means that during its life, a contract in contango falls towards the spot price and a contract in backwardation rises towards the spot price. This means that contango contracts have a downward bias and backwardation contracts have an upward bias.

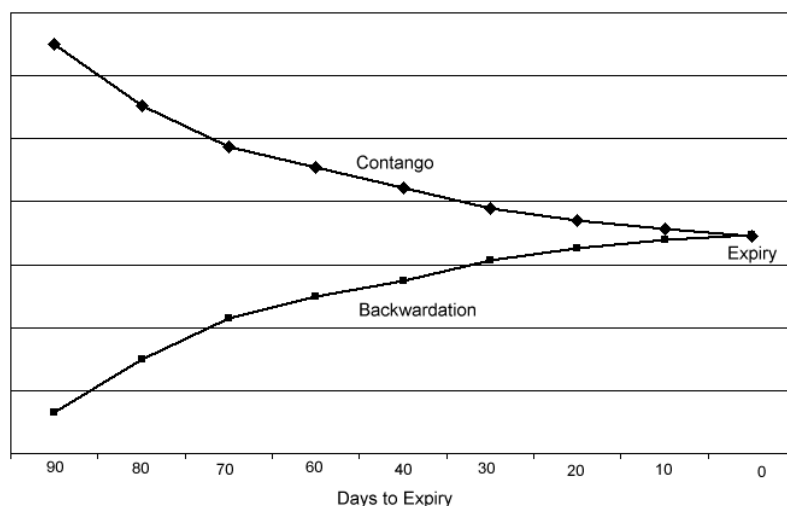


Figure 1 – Single contract curve – price vs days to expiry

The lines in figure 1 can be confusing and misleading, because they imply a downward sloping forward curve for contango and an upward sloping for backwardation, but that is not the case at all. A forward curve is something completely different and this is where the confusion is. In figure 1, the curve for a single contract in contango is downward sloping because the futures price starts above the spot but must converge towards it and equal it on expiry. It is not a forward curve at all, it shows the progress of the price over time. Forward curves on the other hand don't show a single contract, they don't show the progress of price over time, instead they show a snapshot of price of every forward contract as at today. In other words they tell you price you have to pay today for any delivery date.

Figure 2 is a forward curve of the Brent Crude future. It shows that current price of each forward contract.

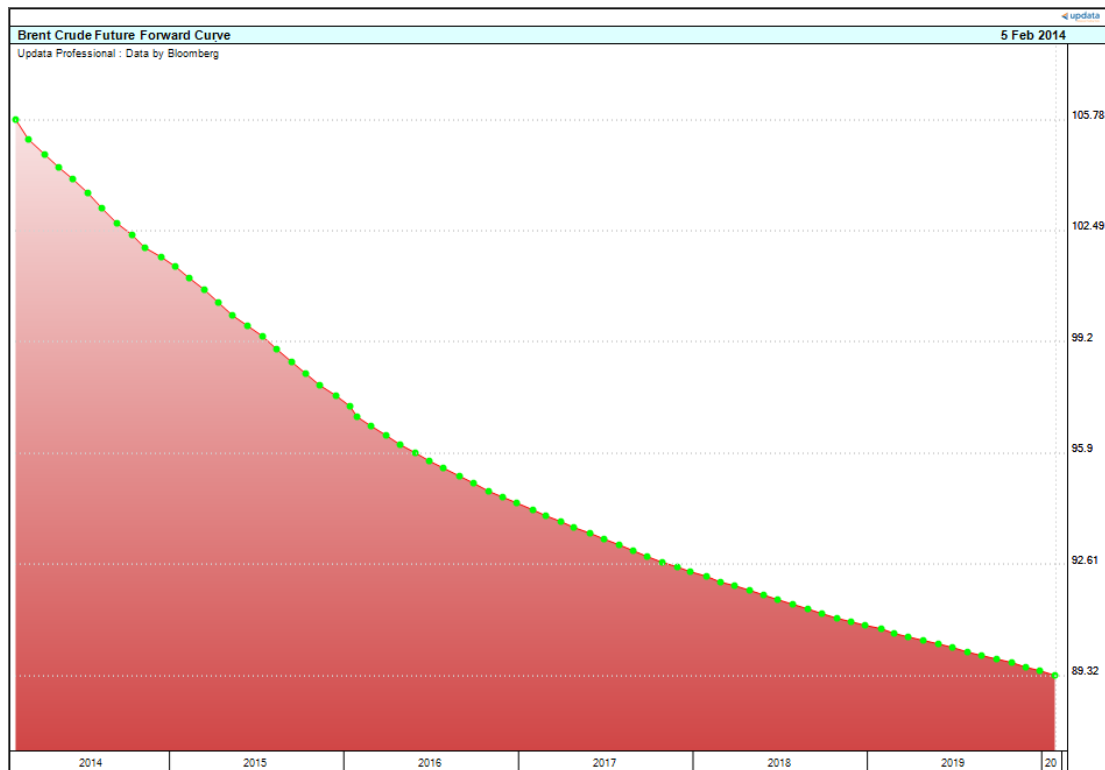


Figure 2 – Forward curve of Brent crude now

A falling forward curve, as in the case of figure 2, means that contracts for delivery further out in time are trading at a lower price than those for earlier delivery. This means that traders are prepared to pay more for earlier delivery. A downward sloping forward curve indicates that the contract is in backwardation. So why would anyone pay more for delivery now rather than delivery later? The answer is varied, but it could be that there is a need for delivery now, perhaps weather has caused a demand for the commodity now making it impossible to wait for later delivery even though it is cheaper to do so.

A rising forward curve on the other hand means that contracts for delivery further out in time are trading at a higher price than those for earlier delivery. This means that traders are prepared to pay more for delivery of the commodity in the future. This upward sloping forward curve indicates that the contract is in contango. Why would anyone want to pay more on the futures market for later delivery? The answer is cost of ownership, such as storage and insurance if you take delivery now. Those costs are not incurred if you take delivery in the future.

A contract in contango does not have to be in contango all the time, it can change to backwardation at any stage, and in doing so, the curve gradually changes shape. Figure 3 shows Brent crude curves as at today, 2 years, 3 years and 4 years ago. You can see it was in contango 4 years ago, then flattened out 3 years ago to a slight contango, but then 2 years ago it had switched to backwardation where it is today.

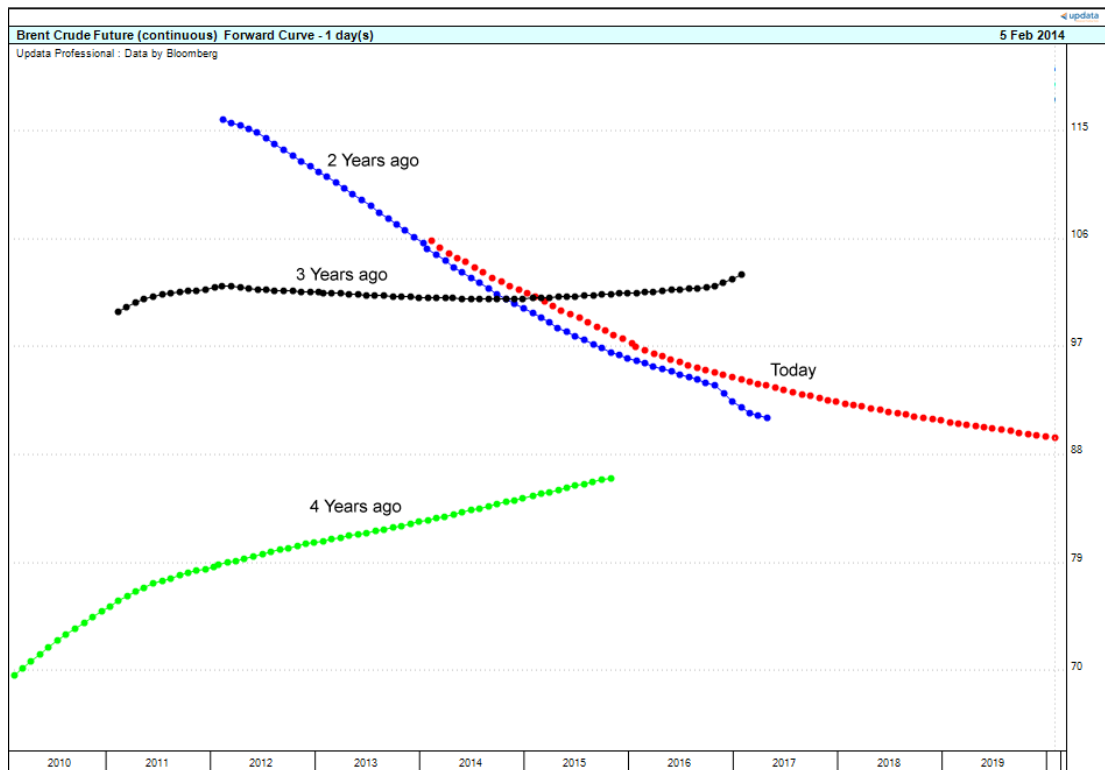


Figure 3 Brent Crude forward curve now, 2 years, 3 years and 4 years ago

When looking at forward curves, it is important to note that a forward curve is not a predictor of price. A rising forward curve does not mean that prices will rise, nor does a falling curve predict prices will fall. It is simply telling you that today, if you want to buy the commodity for delivery on some future date, you have to pay more, or less, than the near contract price. If the market price rises or falls due to demand or supply, the forward curve will keep its shape but move up or down as the case may be.

Now that contango and backwardation has been explained, how does this make any difference to us as technical analysts? When the front month or near contract reaches expiry, the next contract becomes the front month and consequently, as you have seen, there is a difference between the price of the expiring contract and the price of the new front month. This is called the rollover gap and is positive if the contract is in contango or negative if it is in backwardation. This has a dramatic effect on continuation contracts are created by stitching together all the front months, thereby producing a long history for analysis. When the front contract expires, the next contract is added to the data.

The problem is the gap and whether the back history should be adjusted to remove both the positive or negative gaps created at rollover. Gaps are removed by taking the difference in price between the expiring contract and the next contract. If the gap is positive, the contract is in contango, that gap is added to the back history to bring it up to the level of the new contract. If the gap is negative, the contract is in backwardation, the gap is subtracted from the back history. There are many theories about how and when these adjustments should take place, but it is not the purpose of this article to go into it. The assumption here is that it is done on expiry, although some are based on volume or open interest to get the timing right. Some use the absolute difference and use a ratio.

For ease of dealing with adjusted and unadjusted contracts, I use the term 'continuous' for adjusted contracts and 'contiguous' for unadjusted contracts. Chart 1 shows the contiguous contract, thicker line, overlaid on the continuous contract. Notice the difference. The contiguous contract shows, throughout its history, the actual price traded. The continuous contract shows the history with the gaps removed by adding or subtracting the gap from the history. The difference is plain to see in 2011/2012 where the actual price reached \$125, but the adjusted one did not. Also, in early 2009 the continuous chart made a low of \$22 whereas the actual price never reached that level.

You may be thinking, why on earth would anyone want to use a continuous chart?

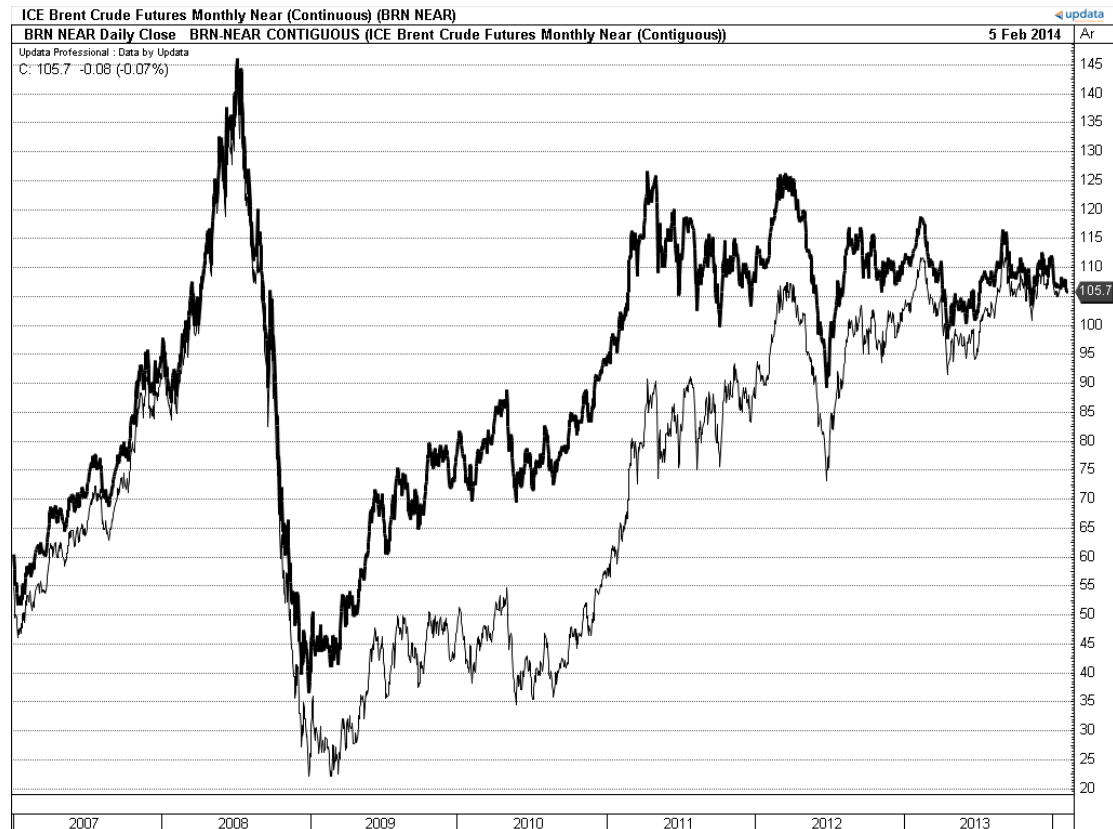


Chart 1 Brent Crude Contiguous (thick) overlaid on continuous (thin)

Charts 2 and 3 show Brent crude contiguous and continuous respectively with rollover days circled. It shows gaps, either up or down when contracts are rolled over. It doesn't look like much but as you have seen above, it makes a big difference to the long history chart.



Chart 2 Brent Crude contiguous



Chart 3 Brent crude continuous

Continuous and contiguous contracts only differ up to the last rollover. From that day until the next rollover they are identical, so if you are a short-term trader you won't

need to worry about rollover gaps. You can see this in Chart 4 which shows Brent Crude continuous, black bars, overlaid with contiguous, grey bars. It shows that they are different until the January rollover, after which they are the same until the next rollover.



Chart 4 showing Brent crude continuous candle overlaid with a contiguous

The difference between contiguous and continuous contracts is best shown in Point and Figure form, where you can see how dramatic the difference is. Charts 5 and 6 show \$1 x 3 Point and Figure charts of Brent crude contiguous and continuous contracts respectively.



Chart 5 Brent crude \$1 x 3 contiguous



Chart 6 Brent crude \$1 x 3 continuous

So which is right? Which is most useful to the technical analyst and what is the justification for choosing one over the other? The clue is in the Point and Figure

trend lines. Because the continuous chart is not distorted by gaps, the trend is clearer and more defined. The uptrend is strong and still in place on continuous Brent, whereas the trend on the contiguous chart is undecided and switches from up to down every few columns.

What you have to remember about the gap at rollover is it is not a gap created by demand or supply, it is simply the gap between the futures price and the spot price. That means a chart breakout caused by a large gap is not a trading breakout at all. And in Point and Figure charts a column whose length is used to determine a Point and Figure vertical target is distorted if there is a gap involved in its creation, leading to an incorrect target.

Non-traded gaps affect everything to do with technical analysis. The calculation of moving averages and all technical indicators is affected by a sudden price gap leading to inaccurate charts and there analysis.

When deciding whether adjusted or non-adjusted is best, consider that if instead of rolling over from one from month to the next, you had simply bought the current front contract when it was listed a few years or months ago, you would not see a gap at rollover, because rollover gaps only occur when switching from an expiring contract to the next front contract. But perhaps the most convincing piece of evidence that supports the use of adjusted continuation charts is to overlay a cash alternative, in this case, the ETF of Brent, OILB, listed in US\$ on the London market. The type of continuation chart that most closely matches the cash contract must surely be the best way to adjust the long histories. Chart 7 shows Brent crude continuous, which you recall is the back adjusted contract, with OILB, the thicker line, overlaid. You can see that the continuous contract follows OILB closely. Compare this with chart 8, which shows unadjusted Brent crude contiguous contract with OILB overlaid. You can see immediately that the contiguous contract and OILB are different. They go up and down at the same time but the levels reached are different. This supports the case for adjusting the history.



Chart 7 Brent Crude continuous (thin) with OILB ETF (thick) overlaid



Chart 8 Brent Crude contiguous (thin) with OILB ETF (thick) overlaid

It is clear that there are major differences between continuous and contiguous charts, so which one should the technical analyst use? The answer is it depends what you want from the chart. If you are a technical analyst looking at trends, support and resistance levels, moving average crossovers, calculated indicators and of course Point and Figure targets, you should use a continuous adjusted chart. However if you are looking to see where the earlier front contracts actually traded, because you believe these will be important in the future, you should use contiguous adjusted charts.