Macro Hive: Why Do Central Banks Use Futures Prices?

(Henry Occleston, henry.occleston@macrohive.com, 22 June 2022)

Summary

- Futures prices are important to understand. They are used by various institutions in their forecasts and thus help shape government and central bank policy.
- However, their effectiveness as a forecast of actual future price is limited.
- Using UK inflation and the Bank of England as an example, we explain what futures are and why forecasters use them despite their limitations.

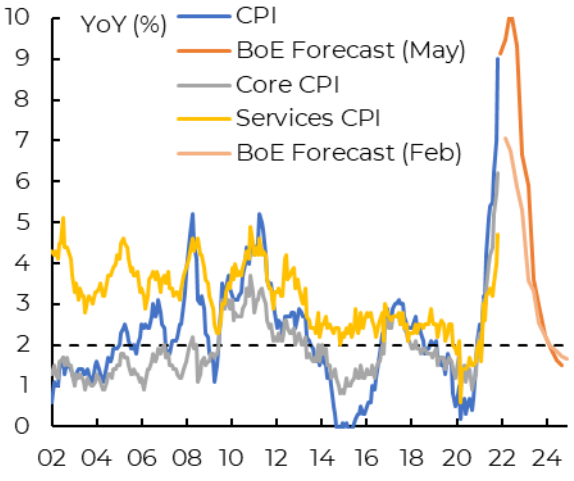
UK Inflation and the Bank of England

UK inflation reached an eye-watering 9.1% YoY in May, and forecasts anticipate it will only rise further. At its June meeting, the Bank of England (BoE) raised its forecast peak to above 11% in the fourth quarter. In its May Monetary Policy Report, it had forecast a peak above 10%, a 3pp rise on its previous forecast (Chart 1).

The spike in forecasts was due largely to expectations that the UK energy regulator, Ofgem, would raise its price cap by 40% in October. Just a few weeks later, Ofgem's CEO announced it estimated the cap would rise by 42%. This clearly alarmed the UK government, and Chancellor Rishi Sunak announced new support for households shortly after.

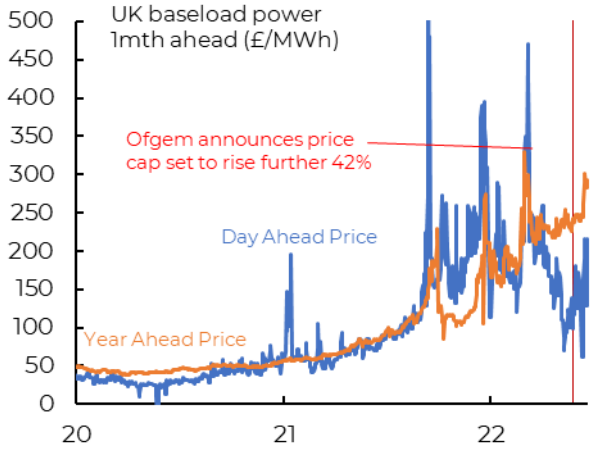
Yet at the time of the Ofgem announcement, day-ahead wholesale UK energy costs had collapsed down to levels last seen in mid-2021. So where did the anticipated rise come from? The answer lies in the futures pricing for UK electricity (power) contracts. Or more precisely, it lies in the price for 'year-ahead' power (Chart 2). That is, the price of contracts traded that will allow delivery of power a year from today.

Chart 1: BoE Forecasts CPI to Keep Rising Into October



Source: BoE, Bloomberg Macro Hive

Chart 2: Day-Ahead UK Power Cheapens, But Year-Ahead Grows More Expensive



Source: Bloomberg, Macro Hive

Given futures prices are clearly impacting forecasts and ultimately government policy, we should answer several questions:

- What are futures?
- What determines their price?
- Are they any good at predicting future prices?

What Is the Futures Market?

Futures are simply agreements traded on an exchange (that is, with standardised terms) that allow participants to arrange for the 'delivery' of an asset at a future date and a predetermined price.

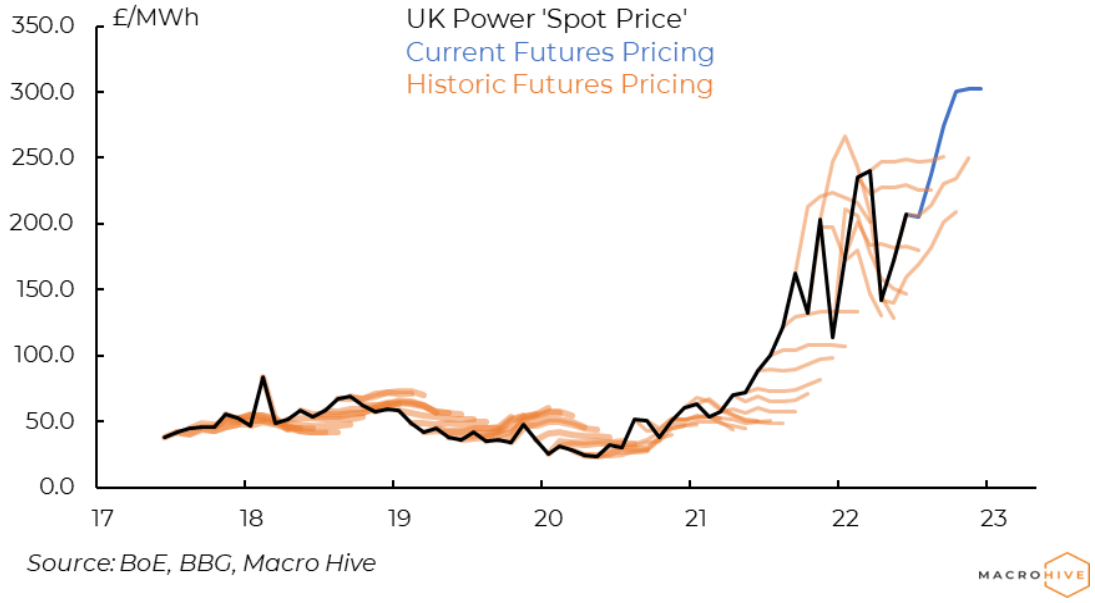
Take the example of commodities. Futures allow a manufacturer of wind turbines to arrange for the delivery of steel at a future date (to secure future supply) and lock in a price now. Equally, it allows steel producers to lock in a price now for steel they will deliver in the future.

Futures are beneficial for several reasons. They give industries some certainty in their supply chains and their order books. The also enable market participants to speculate on asset prices through trading the contract, rather than the underlying asset.

What Determines Futures Prices?

The largest determinant of futures prices is the 'spot' price. This is the price people pay for assets for immediate (or at least very short-term) delivery. Importantly, just because an asset trades for delivery on a future date now at a certain price does not mean it will be trading at that 'spot' price when the future date comes. Often, there will be substantial differences in the path ahead implied by futures prices and the ultimate spot price that is realized (Chart 3).

Chart 3: UK Power Futures Often Do Not Correlate With Realised Spot Price



The paths of the futures prices can vary widely. However, they are anchored much more closely to the prevailing spot price at the time of the contract's pricing than they are to the spot price at the date of delivery.

Whether the futures trade above or below spot largely depends on the asset.

- **Currencies:** in currency markets, the futures price will be determined by the difference in interest rates that could be earned between the two currencies being traded.
- **Commodities:** for commodities, it will be determined by the balance of the premium required for storage and insurance, and the discount due to the extra value of having an asset now, rather than later (the 'convenience yield').
- **Interest rates:** for interest rates, it tends to be based on market expectations for rates in the future, adjusted for the nebulous 'term premia' associated with future uncertainty.

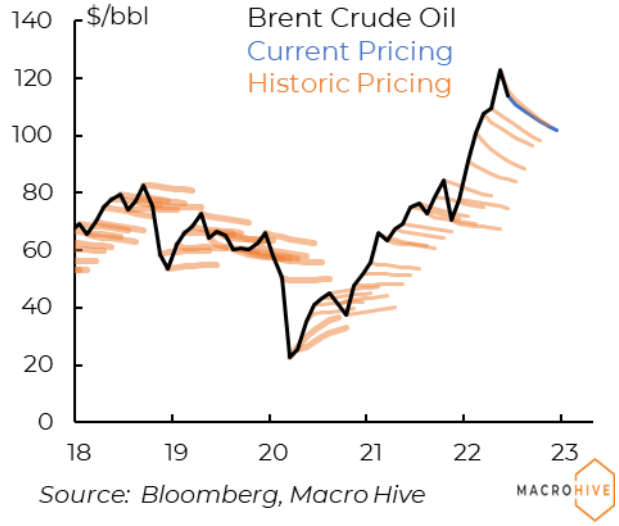
Are Futures Prices Any Good at Predicting Future Spot Price?

As Chart 3 shows, UK power futures are relatively good at showing predictable seasonal patterns. We can see this in Chart 3, where the futures prices (the orange and blue lines) rise and fall in line with winter (higher power prices) and summer (lower power prices) months are largely priced in even months in advance. However, they fall down in predicting more volatile situations, such as since 2021.

Charts 4, 5 and 6, meanwhile, show examples across a range of assets, none of which track closely with reality. For oil, the futures pricing tends to gravitate towards some middle-ish value, pointing downwards when above $40-60bbl and upwards when below there (Chart 4). For EURUSD, they simply reflect the relatively consistent rates differential between USD and EUR (Chart 5). Finally, for the BoE's bank rate, while they should (in theory) reflect the estimate of bank rate (plus some term premia), from 2008-2022 they have consistently priced far more hikes than were ultimately delivered (Chart 6).

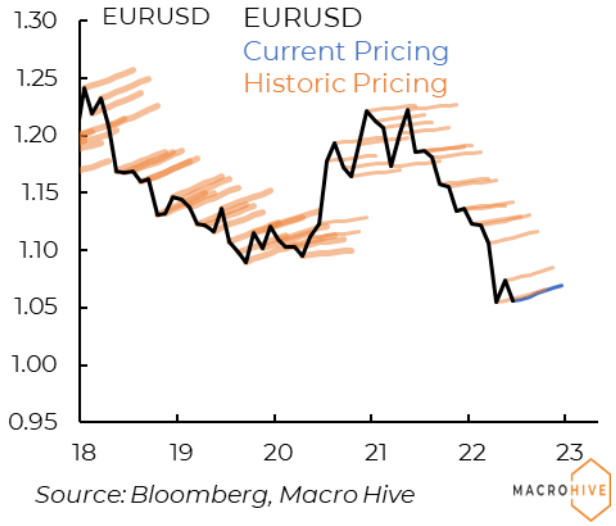
In short, the results are hardly positive. It is a small sub-set of examples, but it shows that futures are often not attempting to estimate future value. And even when they are, they are not very successful.

Chart 4: Futures Have Consistent Mean Reversion in Brent Crude



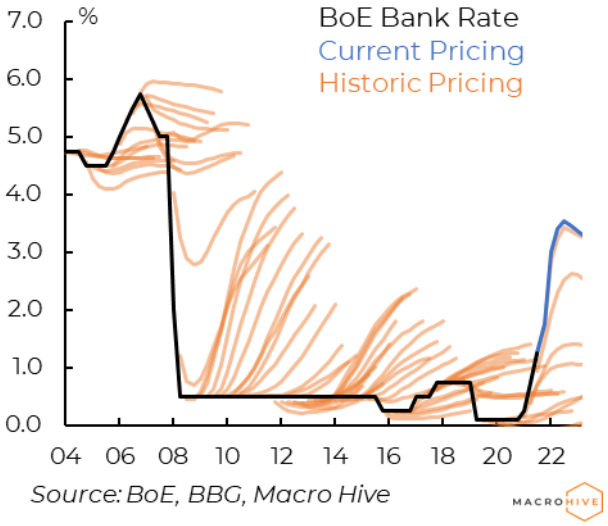
Source: Bloomberg, Macro Hive

Chart 5: Futures Reflect Rates Differential, Not Spot Expectations, for Currencies



Source: Bloomberg, Macro Hive

Chart 6: Futures Overestimate BoE Hikes Since the GFC



So Why Do Institutions Use Futures in Forecasts?

The poor predictive power of futures brings us full circle. Why would Ofgem use them to forecast price cap changes that will affect tens of millions of people when they are so unlikely to be accurate?

The reason is perhaps twofold:

(1) The energy companies that Ofgem regulates typically buy in the futures rather than spot market. It therefore more closely reflects their business model.
(2) Using futures prices as a forecast for model inputs is pretty much the norm.

On the second point, banks, governments and central banks all use futures prices to plug holes in their models that need inputs they do not themselves forecast. The ECB use them for assumptions around energy, oil and commodity prices. The BoE do the same, even including the market-implied path for rate hikes as their assumption for base rate.

The main reason for their use is that, unless an institution wishes to take an explicit view on an asset, the alternatives are limited. Does the BoE have extra insights into the world of oil? Can it justify spending time and money attempting to accurately forecast the price? Probably not.

How Can We Use Futures?

Futures prices are not predictors of future price. They are generally used where an institution simply does not want to take an explicit view on an asset in their forecasts. This is important to understand when making sense of their forecasts, especially given the world of volatile energy prices in which we currently live.

So why should we care about futures prices? Staying abreast of where futures trade and understanding the limitations in their predictive power has two uses. It helps us see where important forecasts (such as those of the central banks) may fail. And it means we can better predict when they might be about to change.