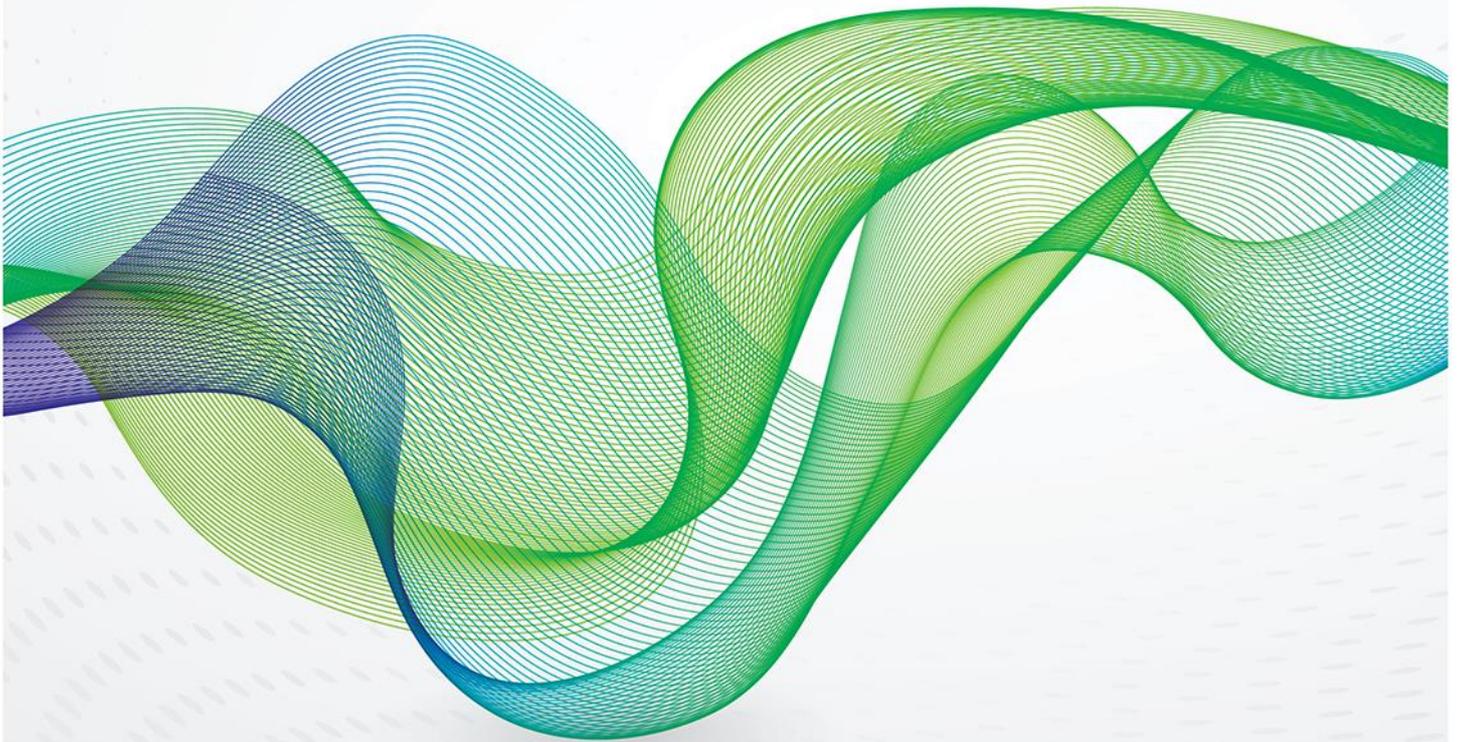


March 2017

Oil Benchmarks: What next?





*“...the rotten tree-trunk, until the very moment when the storm-blast breaks it in two,
has all the appearance of might it ever had.”*
Isaac Asimov

1. Introduction

For the trading community, 2017's 'IP week' in London (20-23 February) was not just concerned with the forecast level of crude oil prices, but about how those prices are expressed, assessed and reported. Once again the security of international oil price benchmarks is a significant cause for concern.

In the case of the US benchmark, loosely labelled 'WTI', production, infrastructure and pricing is evolving rapidly and it is difficult to be certain exactly how it will turn out. But the good news is that US pricing is developing along broadly comprehensible lines in response to identifiable market factors: the almost doubling of prices since this time last year has boosted the rig count and domestic production levels from a much slimmed down cost base; and, new infrastructure is opening up to accommodate the lifting of the forty year crude oil export ban in December 2015.

It is becoming increasingly apparent that the price of WTI assessed at Houston, a new benchmark for exportable crude, is a very different animal from WTI at Cushing, the delivery point for the long-established futures contract. As new infrastructure comes on-stream, the Houston hub stands a good chance of becoming the seat of a new international price benchmark. This will be particularly so if the market is able to deliver more stable domestic volumes of predictable quality from the Permian Basin and the Bakken shale at the Gulf Coast, rather than the potpourri of domestic grades sold at Cushing. For the moment WTI at Houston is not liquid enough to stand on its own two feet and it trades at a differential to the high volume futures contract. But the auguries would be good for the US Gulf Coast establishing a reliable physical, forward and futures market in time, if it were not for the Trump factor. It is uncertain if President Trump will proceed with the rumoured 20% border adjustment tax to support domestic production at the expense of Mexican imports, and potentially imports from other countries where there is a balance of payments issue, while leaving US exports exempt. If this happens, all bets are off: the tariff war that would inevitably kick off in response to such an action would take us into uncharted territory. While this threat is unresolved, using any US benchmark to price or hedge oil outside the US would involve a big basis risk.

In the case of the Middle East benchmark, trade in the over-the-counter Dubai/Oman/Upper Zakum/Murban/Al Shaheen basket, remains firmly in Chinese hands with concentration levels of more than 95%, a level that would be unacceptable in any regulated market. The evidence of trading patterns publicised by a prominent price reporting agency (PRA) suggests that one Chinese company concentrates on buying the third month forward contract. It then allows those long positions to mature and closes them by selling when they become front month, which, perhaps coincidentally, is when other Chinese companies are active buyers. The company selling the "First to Third month spreads" in this way will make a loss in a contango market and a gain when there is backwardation: in other words it is "putting its money where its mouth is". This activity, taken in isolation, is difficult to construe as in any way abusive. Nevertheless this is an unwelcome pattern of trade for any producer that prices its physical sales by reference to the front month Dubai basket price and consequently likes to see high front month prices.

The Dubai Mercantile Exchange's (DME) Oman contract is gaining liquidity, but the volume remains a fraction of that seen on the US futures contract. This means that any large company that has a lot of business to do can swamp the market, whether it intends to or not. The DME's contract is regulated by the Dubai Financial Services Authority, which has the power to impose position limits to prevent domination of the futures contract by any one company. This arguably makes it a safer bet for pricing and hedging crude oil cargoes. Any company determined to circumvent such a regulatory volume limit



would be forced to enlist the cooperation of third parties to “front-run” their trades.

In the case of the troubled European benchmark, the Brent/Forties/Oseberg/Ekofisk (BFOE) basket, the problem is less overt. Following a consultation launched in December 2016, one of the major PRAs announced at the start of IP week that it would add the Norwegian grade, Troll, to the BFOE basket when assessing the price of the January 2018 forward contract from 1st September 2017. It will also consider Troll physical cargo trades when assessing the influential Dated Brent price from 1st December 2017.

Historically when similar announcements were made in 2002, when Forties and Oseberg were introduced to the basket, and in 2007, when Ekofisk was added, the PRA announcement was closely followed by confirmation from the major oil company, Shell UK, that it would amend its “SUKO 90” general terms and conditions (GTCs) of trade to reflect the addition of a new grade. This time Shell is dragging its feet over the addition of Troll to the basket of deliverable grades in the 30-Day forward contract.

The SUKO 90 GTCs were originally drafted, and are periodically updated, by Shell - but they are the common terms used by all parties buying and selling 30-Day BFOE forward contracts in the OTC market. Common terms are an essential facet of any liquid contract where one cargo can be traded many times over: without common terms along a chain of supply, traders would be subject to legal basis risk if they did not buy and sell on back-to-back terms. The fact that Shell has not immediately amended its terms to include Troll suggests some reluctance to add this grade to the basket.¹ There is nothing to stop other companies from continuing to use SUKO 90 terms and making their own amendments on a bipartite basis to include Troll. No-one owns the forward contract so no-one can dictate which amendments traders may accept or reject. But the use of inconsistent GTCs would lead to a two-tier market for 30-Day BFOE, with or without Troll, which would be divisive and a hindrance to market liquidity.

Some players point out that Troll has too high a quality to ever be delivered into the BFOE basket: sellers with the option to deliver one of 5 alternative grades of oil to fulfil a sales commitment will always deliver the least valuable of those 5 grades. Troll’s quality is ~36° API, ~0.15% Sulphur, which makes it potentially the most valuable grade in the basket. However, this is tempered by its moderately high Total Acid Number (TAN) of 0.7 mg KOH/g. This level of acid is too high for most refineries without stainless steel metallurgy to run neat, but is not so high that it cannot be managed with some blending with lower acid grades.

Troll typically trades at >\$1/bbl above Dated Brent, which means it would be unlikely to be declared into a 30-Day BFOE chain or be the grade that sets the value of Dated Brent, the lowest priced of the grades in the basket on any given day, other than in exceptional circumstances, without the addition of a quality premium. And therein lies the rot at the core of the Brent market: if the contract was functioning as intended there would be no need for a quality premia to be added to the price of 30-Day BFOE when a cargo of Troll is delivered.

2. Quality Premia Should be Unnecessary in the Brent Basket

Quality premia for Oseberg and Ekofisk have been a feature of the BFOE basket since 2013. Back in 2002, following several “squeezes” on what was then the 15-day Brent forward market, traders agreed to amend the 15-Day Brent forward contract such that if Brent was in short supply, either because a trader had cornered the market or because there was a production problem, sellers could supply the alternative grades of Forties or Oseberg instead. To give buyers more time to deal with the unexpected delivery of a grade other than the Brent they were expecting, the notice period for declaring what cargo would be delivered in satisfaction of a prior sales commitment was increased from 15 days to 21 days. Although the quality of the three grades, Brent, Forties and Oseberg, was

¹ Ambivalence about the addition of Troll to the basket is understandable. There may be some self-serving reluctance to accept Statoil-operated Troll into the BFOE basket because it boosts the competitive position of Statoil.

not identical, no quality premia were deemed necessary. This was because Forties and Oseberg would only be supplied if Brent was squeezed such that its price artificially exceeded the rest of the market. As production continued to dwindle the forward contract was again amended in 2007, adding Ekofisk to the basket of grades that could be supplied in lieu of Brent if there were insufficient cargoes of Brent available. So we now had a 21-day BFOE forward contract.

The concept of having a basket of deliverable grades survived the step change in Forties quality in 2007 when Buzzard was introduced to Forties Blend. Buzzard made Forties Blend the least valuable grade in the so-called “BFOE” basket, so it was the grade that sellers thereafter always tended to supply. Buyers -well aware of this fact and behaving as any rational economic actor would- expected to receive Forties when they bought 21-Day BFOE and adjusted the price they were prepared to pay for the contract accordingly. To protect buyers against production fluctuations in Forties Blend, from 2007 a sulphur price de-escalator was introduced for cargoes of Forties Blend delivered into the forward contract that exceeded 0.6% Sulphur. A further minor housekeeping amendment was made to the contract in 2012 to extend the notice period for delivering cargoes from 21 to 25 days. Buyers of 25-Day BFOE still knew that they were going to be delivered the least valuable grade, Forties, and priced their purchases of 25-Day BFOE accordingly.

The issue with constructing a basket of grades that can be used to set a price benchmark is that the basket contains real physical cargoes, subject to the pull and drag of random market factors. Some grades in the basket may be more popular than others with refiners and some will be arbitrated into other regions when international price differentials so dictate. In which case the cargoes that PRAs and other theoreticians deem ought to be available to do duty as part of a pricing benchmark basket simply seek better profit opportunities elsewhere. This has been the case with Forties.

The supply of Forties Blend periodically dries up because some refiners like it and they tie the shrinking supply up in their own refining systems or into arbitrage opportunities in other regions. If the market was a healthy one, when Forties is in short supply its price ought to go up relative to the price of the other grades in the basket, Brent, Oseberg and Ekofisk. Given this price signal, a rational economic actor would supply one of those three grades instead of Forties when Forties becomes too expensive because of demand from other regions. But that is not what happens. Despite the paucity of Forties Blend cargoes available to supply into 25-Day BFOE cargoes, its assessed price continued to value it as the lowest quality grade in the 25-Day BFOE basket. So sellers started to seek cash compensation for delivering Brent or Oseberg or Ekofisk into the forward contract instead of delivering the “least valuably priced” Forties, which was not in fact available.

This cash compensation was introduced in 2013 in the form of quality premia to be paid to sellers of 25-Day BFOE that supply Oseberg or Ekofisk instead of Forties to buyers of 25-Day BFOE. Currently quality premia for Oseberg and Ekofisk are published by the PRA that introduced them, Platts, for the current delivery month and the following delivery month, with the relevant premium to apply being determined by the bill of lading date of the cargo in question. The premia are set by a formula:

- $QP_{Eko} M = 60\% \times (\text{Ave} (MP_{Eko} - MP_{(\text{lowest of BFO})}) M - 1)$
- $QP_{Ose} M = 60\% \times (\text{Ave} (MP_{Ose} - MP_{(\text{lowest of BFE})}) M - 1)$

Where: QP= Quality premium; M= Month;

Ave= Average;

and MP= Market Price.

The QP is subject to a minimum value of \$0.25/bbl. To put this in context a margin of \$0.25/bbl on a 600,000 bbl cargo, the standard size in the BFOE market, is equivalent to \$125,000. That is an off-putting margin for error in any oil trader’s book.

The outcome of this formula is apparent before the sellers of BFOE cargoes are obliged by their contract to declare the grade and date of any cargo that will be delivered in satisfaction of its short forward BFOE position. Since the beginning of 2015, this declaration has to be made 30 clear days,



rather than 25 clear days, before the first day of the cargo's scheduled delivery date range, i.e. we now trade a 30-Day BFOE contract, rather than a 25-Day BFOE contract. These quality premia are also taken into account when assessing the price of the internationally influential Dated Brent price assessment.

Despite the fact that the price premia applied to Oseberg and Ekofisk ought not to be necessary, no such premium is offered for cargoes of Brent Blend delivered into the 30-Day BFOE contract when Forties is in short supply. Although we continue to use the brand name "Brent" for the 30-Day forward market, since 2007 when Forties became the least valuable grade in the basket, 30-Day BFOE has in fact been a Forties contract and Dated Brent has in effect become Dated Forties.

The introduction of the quality premia has increased the incidence of deliveries of Oseberg and Ekofisk into the 30-Day BFOE contract, despite the one-month lag in the data used to calculate the price premium for the cargoes to which it is applied. So to that limited extent, the quality premia have been a success: the practice has provided the PRAs with sufficient data to continue to assess the prices of the four grades in the basket. But markets do not exist just to provide data to PRAs: markets exist to provide the necessary tools for companies to buy and sell physical oil and to manage their risk. What we cannot know is how much more liquid the 30-Day BFOE contract would be if it functioned in accordance with economic principles that dictate that in a perfect market the price of goods in short supply is driven up by demand.

3. Planning Economics

While this issue engages the trading community, elsewhere in the oil sector companies use the price of Brent not only as a reference point for pricing other international grades of oil, but as the planning price in their project economics and as the basis of tax reference pricing and cost recovery pricing in Production Sharing Contracts. Yet the price of Brent is not fit for these purposes.

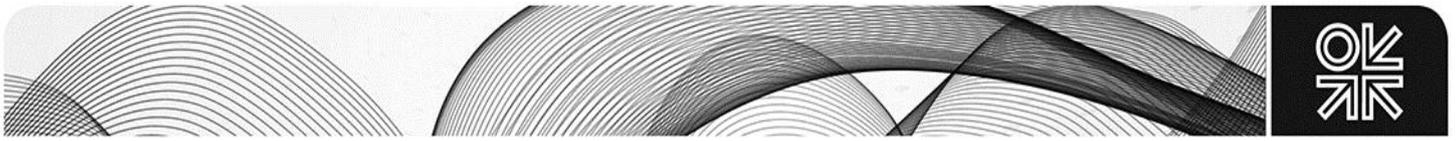
For example, the development plan of new oil fields typically use a price assumption that is derived from Brent, plus/minus a quality differential calculated as the difference between the Gross Product Worth (GPW) of Brent and the GPW of the new grade in question. This calculated GPW differential is then applied to the reported market price of Brent to infer a likely market price of the new grade. These GPW calculations are carried out to a degree of accuracy made spurious by the fact that on any given day, the market price of Brent may actually be the market price of Forties, Oseberg or Ekofisk. To be completely accurate, the GPW differential ought to be calculated relative to the grade in the basket that sets the price of Brent.

The practical difficulty of determining whether Brent, Forties, Oseberg or Ekofisk set the price of Dated Brent on any given day leads most companies and their advisers to ignore this issue altogether. They simply assume that since the published price assessment is labelled "Brent" they should work out any GPW differential based on a Brent assay, rather than a more likely Forties assay.

4. What Next?

It is to be hoped that Shell's apparent hesitation in endorsing the introduction of Troll to the BFOE basket is because it is reluctant to compound the need for illogical quality premia that are necessary to make the existing Brent contract work. Whether or not Troll ends up in the BFOE basket, this issue will not go away: Brent, Forties, Oseberg, Ekofisk and Troll are all on a declining production trend, suggesting that more and increasingly disparate grades of crude oil will have to be added to the basket over time. If the market does not cut out the rot at the heart of the Brent basket now, the decay will get worse over time as more grades are grafted onto the contract.

Given that oil traders are conservative and do not like radical changes, the next incremental step in the evolution of the Brent basket might be to redefine what we mean when we refer to Brent. The publication and acceptance of a Brent Standard assay, that would not change over time even if Brent changes or disappears, would be a good starting point. We could then assess quality differentials by



applying a GPW differential between the Brent Standard assay and the quality of any grade that is added to the delivery basket over time. This is not a radical proposal: this principle is already applied widely throughout the industry in the case of Value Adjustment Mechanisms and Quality banks used for compensating companies whose oil quality is degraded or improved by commingling with another field.

Unless we take a step back and address the imperfection at the heart of the Brent basket mechanism, the market will continue to forego the liquidity that could be enjoyed if Brent were functioning properly. We are not spoiled for the choice of other oil price benchmarks to use. Brent may yet be cured with a bit of cooperation and ingenuity.