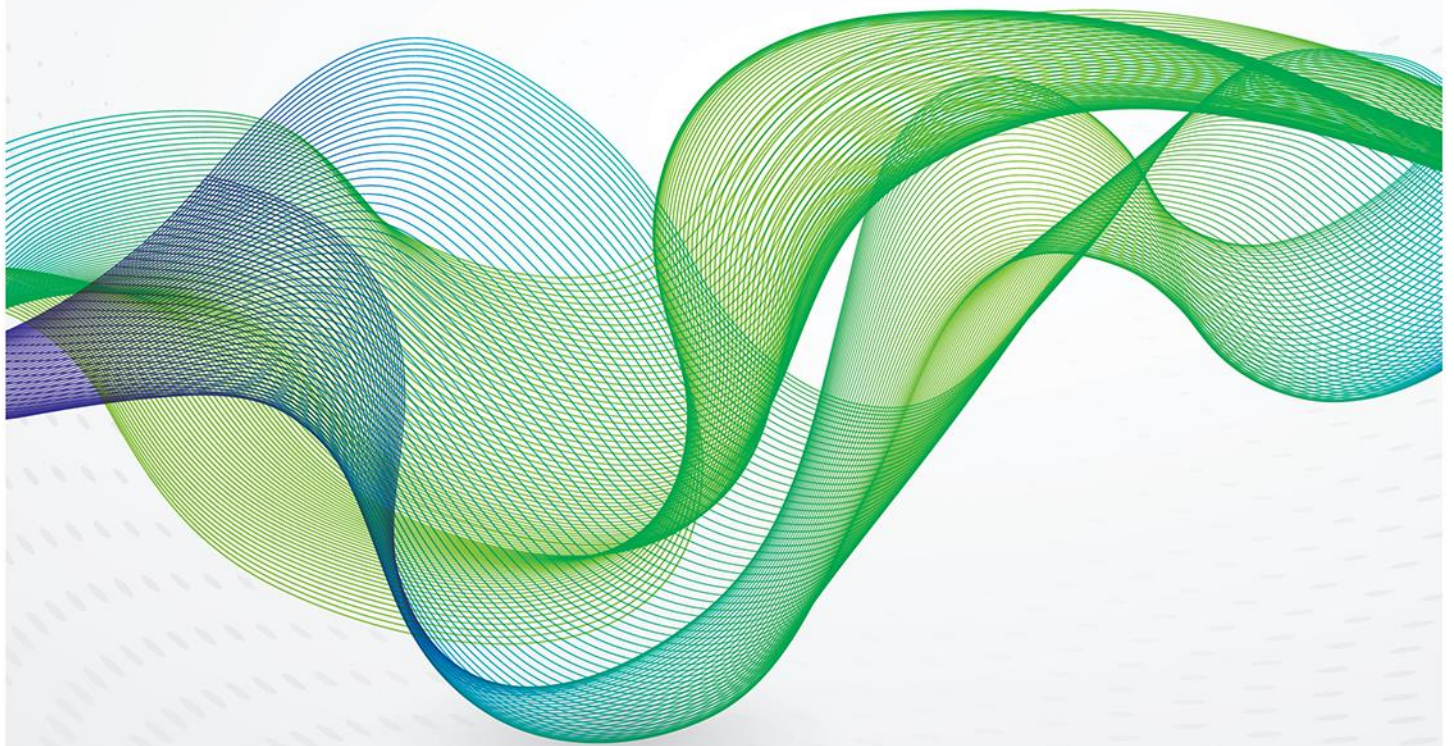
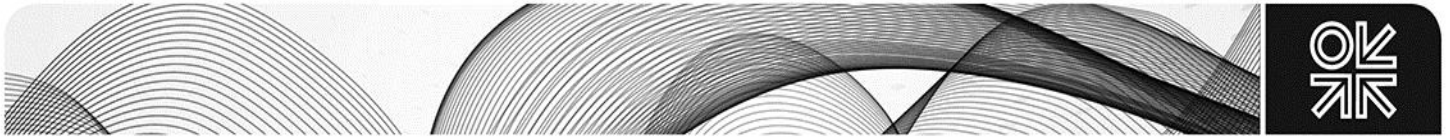


November 2018

What Next for Asian Benchmarks? – A Footnote





Introduction

The July 2018 Oxford Energy Comment addressed Saudi Arabia's decision to adopt the marker price of the Oman crude futures contract, as traded on the Dubai Mercantile Exchange (DME), in the formula it uses to price its long-term crude oil sales to Asia (effective October 2018).¹ This short comment discusses the pattern of contract trading on the DME and its implications for liquidity, and presents potential solutions to the problem of illiquidity as the contract approaches expiry.

Since October 2018 Saudi Aramco has used the DME Oman daily settlement price in its pricing formula for Asian customers. The DME Oman futures contract settles daily, based on a weighted average of trades between 16.25 and 16.30 Singapore time (often referred to as a 'window'). In line with the usual timing of Asian oil purchases, this contract trades two months before the actual month of loading. Therefore, during November 2018, for example, the front month contract is January 2019. The Oman official selling price (OSP) is set using the monthly average of the DME Oman daily settlements. Physical Oman is generally traded on the basis of this OSP.

On most days the DME Oman settlement is based on a relatively large volume of trades. However, this volume tends to fall rapidly as the last day of trading approaches. In March 2016 DME introduced a new methodology² designed to boost liquidity on the last day of the contract ('on expiry'). Nevertheless, as the price spike at the end of September 2018 shows, the problem persists. While this was an extreme event, it still needs to be addressed. The most likely solution, as presented here, is the introduction of an alternative delivery mechanism.

DME liquidity

Oman has all the natural characteristics to be a global oil benchmark,³ whether on its own or as a part of the Dubai 'brand'. Saudi Aramco's move from Platt's Oman to the DME Oman assessment was driven in part by the high volume of daily trades of Oman crude on the DME compared to alternative Oman assessments. For example, the November 2018 DME Oman contract traded on average 1,860 lots (1.8 million barrels [bbl]) per day, while on many days it traded well over 4,000 lots (see Table in the Appendix).⁴ What is particularly noteworthy is that the same contract saw the delivery of 56 physical cargoes, or almost the entirety of Oman's oil exports.⁵ Contrary to other crude oil futures contracts, the open interest on the DME Oman contract tends to increase as contract expiry approaches (see Figure 1).

The DME Oman futures contract suffers from a lack of liquidity outside the DME settlement window.⁶ Virtually all the volumes are traded in the five-minute assessment window. This makes it a poor futures contract for hedging and longer-term proprietary trading, but the large volumes traded and the resulting price discovery at settlement make it a solid benchmark for pricing purposes.⁷ What is more, the inclusion of the contract into the Aramco Asian OSP may well increase its liquidity.

¹ Bassam Fattouh's July 2018 Oxford Energy Comment: 'What next for Asian Benchmarks', www.oxfordenergy.org/wpcms/wp-content/uploads/2018/07/What-Next-for-Asian-Benchmarks.pdf. For all the details please read the original paper as the main arguments are not repeated here.

² The new methodology is explained on page 5 under 'Possible causes', second paragraph.

³ Bassam Fattouh: 'What next for Asian Benchmarks', Oxford Energy Comment July 2019, www.oxfordenergy.org/wpcms/wp-content/uploads/2018/07/What-Next-for-Asian-Benchmarks.pdf.

⁴ Oman has only traded once on a fixed-price basis in the Platts Window since February 2016, and bids and offers for Oman partials are equally rare.

⁵ September Oman's exports were 903,000 barrels per day (source: Argus, 8 October 2018).

⁶ The window is 16.25–16.30 Singapore time.

⁷ Adi Imsirovic, 'Oil markets in transition and the Dubai oil benchmark', Oxford Energy Comment, October 2014.

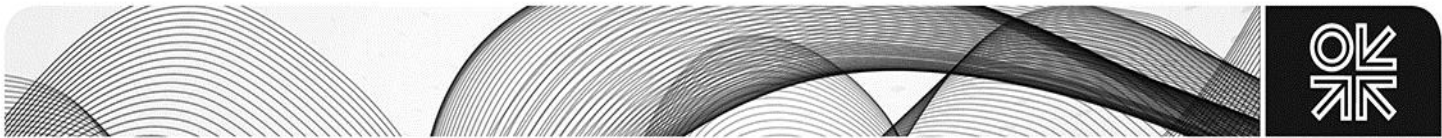
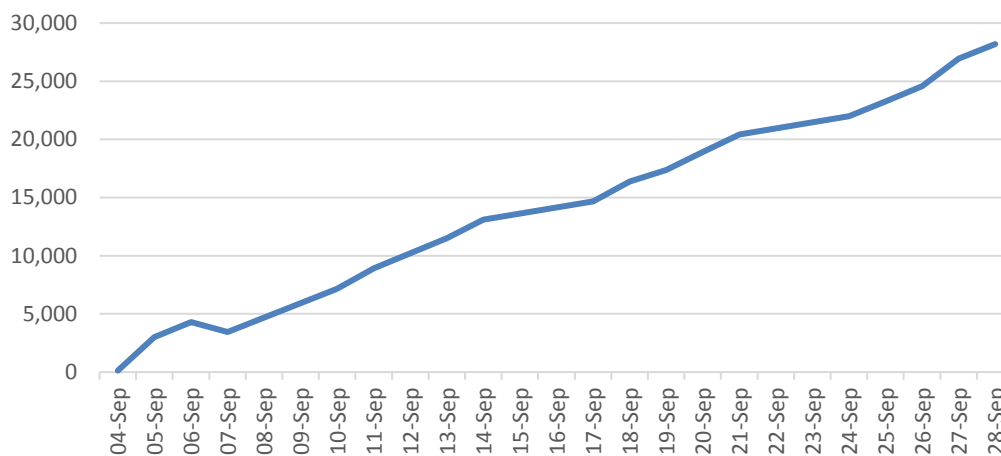


Figure 1: Open position on DME, November 2018 contract (1,000 bbl)

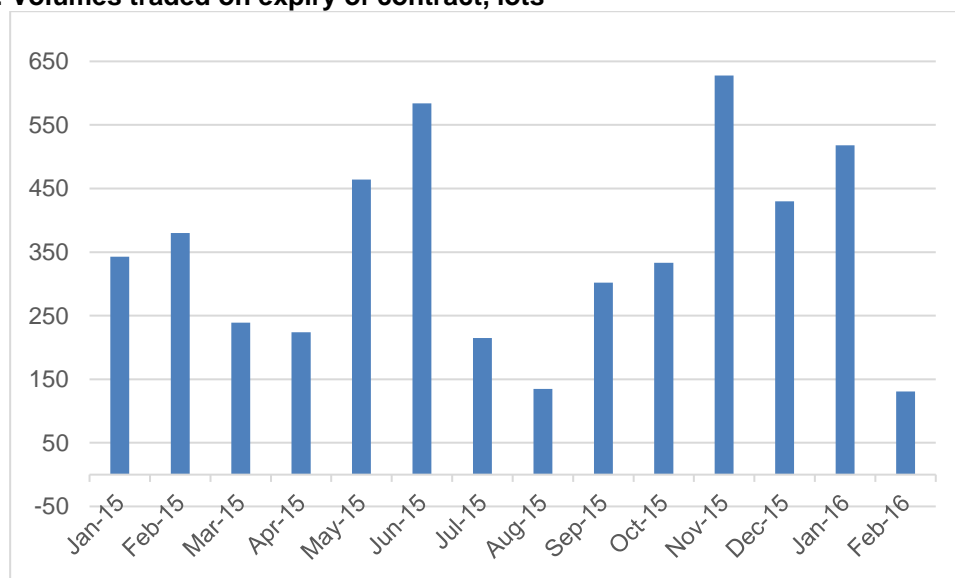


Source: Author, DME.

However, the DME Oman contract is far from perfect as a benchmark. While liquidity during the settlement period is usually good, it tends to fall quite rapidly towards the end of the month (see Figure 2 below). During the January 2015 to February 2016 period, volumes traded on expiry were never greater than 700 lots or 700,000 barrels per day (kbd), far less than the usual volumes of about 4,500 lots. Normally, all the physical Oman crude oil traded outside the exchange is bought and sold on the Oman OSP basis, adjusted for a small premium.

Given that most of Oman’s exports, amounting to about 900 kbd, tend to be delivered through the DME exchange, any daily settlement volume of less than 900 lots would indicate that some sellers and buyers are clearly taking price risk and not hedging on the last day of trading.⁸ We can see in Figure 2 below that not one daily settlement on expiry over the period January 2015 to February 2016 traded anywhere near the expected volume of 900 lots.

Figure 2: Volumes traded on expiry of contract, lots



Note: 1 lot = 1,000 barrels.

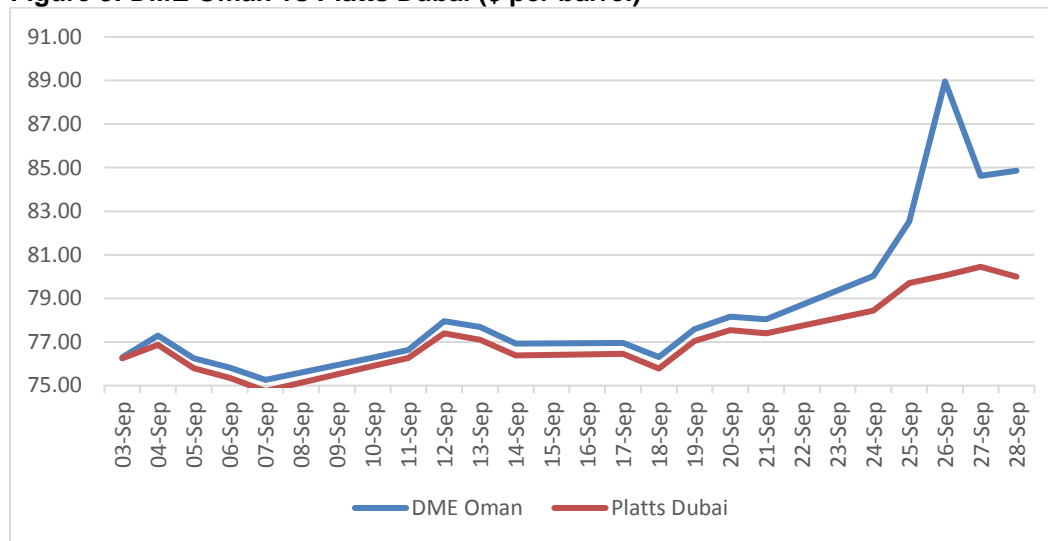
Source: Author, DME.

⁸ As physical Oman is mainly bought and sold on an OSP basis, we would expect about 900 lots to be traded on any day (roughly Oman’s daily production) if all the buyers and sellers were fully hedged.

Price spike of September 2018

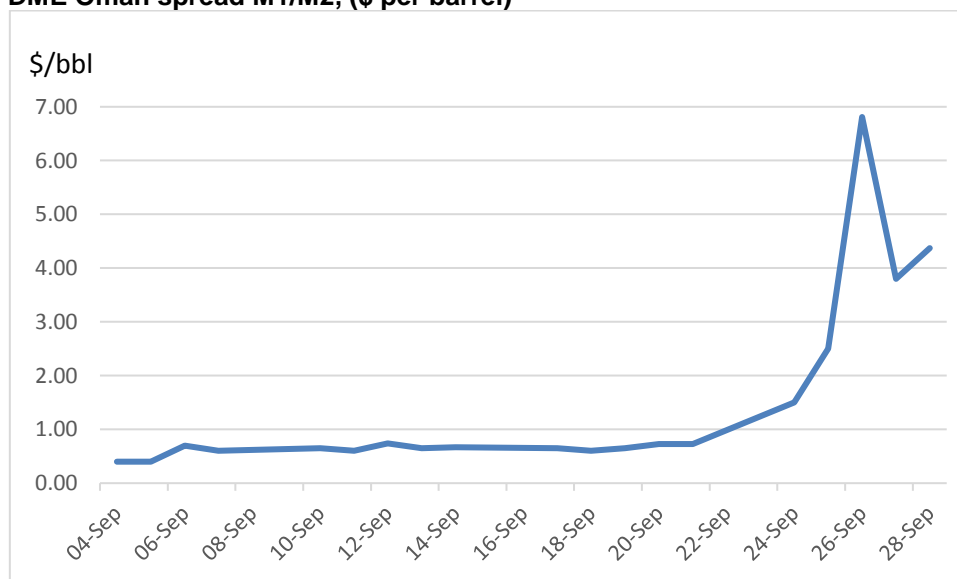
Falling liquidity is usually a contributor to large price swings. One of these swings happened just days before the DME Oman price was due to be used for the first time in the Saudi price formula.⁹ On Monday 24 September the front month DME contract, November Oman, picked up in strength. Figures 3 and 4 (as well as data in the Appendix) show this very large price increase in relation to Platts Dubai and in the second month of DME Oman contracts (the M1/M2 Oman spread). This was an unprecedented hike of almost \$7/bbl. The following day it fell considerably, but remained elevated relative to the 'normal' levels traded that month.

Figure 3: DME Oman vs Platts Dubai (\$ per barrel)



Source: Author, Platts and DME.

Figure 4: DME Oman spread M1/M2, (\$ per barrel)

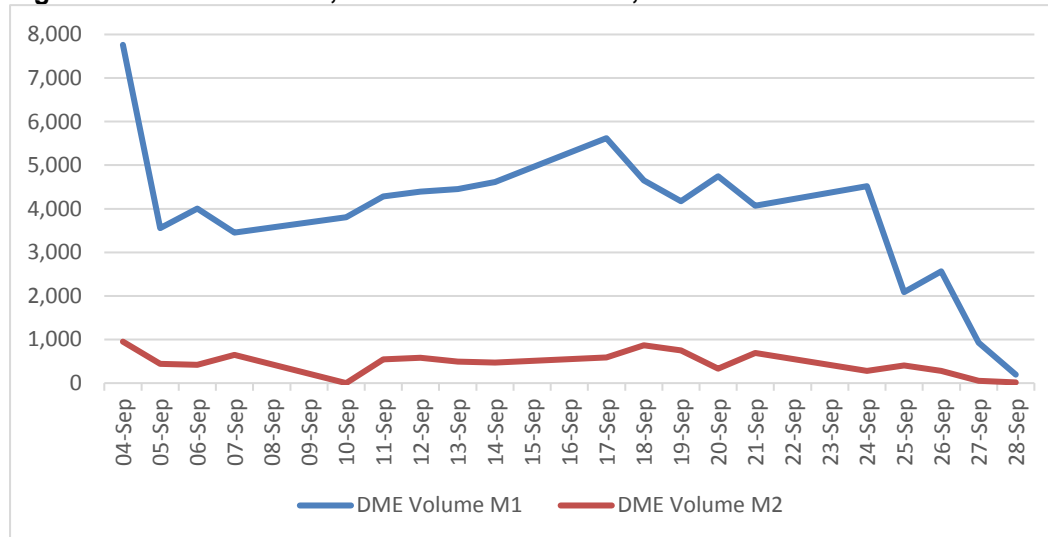


Source: Author, DME.

⁹ The Saudi Aramco formula started using Oman pricing from 1 October 2018 for December delivery.

It is difficult to say with certainty what caused this sharp price movement.¹⁰ DME, like any other futures exchange, does not disclose the identities of the parties involved. However, what is known is that the traded volumes collapsed that week more than usual (perhaps due to the 34th Annual Asia Pacific Petroleum Conference [APPEC] week taking place in Singapore – it appears that many traders may have been attending). As Figure 5 below shows, only 195 lots changed hands on the last day of trading.

Figure 5: Volumes traded, DME Oman M1 and M2, lots



Source: Author, DME.

Clearly the price hike occurred in the context of poor liquidity, and additional buying by anyone caught short would have moved the market substantially. It is made worse by the fact that any buyer trying to cover volumes sold at the OSP would happily buy at inflated prices because the selling price would be equally high.¹¹ What are possible reasons for the poor liquidity and price anomaly?

Possible causes

Two possible causes for the poor liquidity deserve attention. Firstly, financial players in the market tend to square their positions well before the expiry of the contract to avoid physical delivery. As mentioned earlier, physical players would still have some 900 odd lots to trade every day, simply to hedge their daily positions. Secondly, traders taking delivery hope to secure exactly the required volumes before the end of the contract. Where a trader is caught short or long after the contract expiry, she may face very costly adjustments.¹² For this reason, trading on the last day can cause anxiety and traders may wish to avoid it.¹³

From March 2016 DME introduced a new settlement methodology designed to solve this last day liquidity problem. According to the new methodology, the last day of trading is not settled on the actual trades of the front month (M1), but against the second trading month (M2) plus the M1/M2

¹⁰ One of the arguments put forward was a lack of Iranian barrels due to US sanctions (ZeroHedge: 'What explains the bizarre price surge in Oman crude?', 28 September 2018). However, the sanctions were not new, and a scramble for barrels would have resulted in higher prices over the whole month, not just a few days. While sanctions had an impact on the availability of sour crude, I do not believe that they were directly related to this extraordinary, yet brief, price hike on the DME.

¹¹ The 'inflated' price would be used in the calculation of the OSP. The only risk for a trader selling on an OSP basis is that she pays more than the settlement price. Another possible scenario could be a trader who has shorted oil on DME Oman-related pricing covering this short on Dubai-related pricing.

¹² If short, they may have to arrange for an equity producer to sell them the additional barrels outside the exchange. If long, they may have to ask the buyer to agree to be delivered a smaller volume (the buyer may have to incur 'dead freight' or additional shipping costs for existing barrels). In any case, the premium may be in dollars rather than cents per barrel.

¹³ One way of avoiding trading on the last day is to trade daily volume earlier in the month and hedge it with a liquid instrument such as Brent. Then, on the last day of the DME Oman contract, the Brent position could be reversed.

spread averaged over the three preceding days prior to the last day of trading. In other words, the last day of the November 2018 contract was 28 September and it settled not against November DME trades, but against the December DME contract settlement plus the average of the November/December spread as settled on 25, 26, and 27 September.¹⁴

There are two problems with this new methodology. Firstly, the change has not improved the liquidity of the contract close to expiry. Secondly, participants who wish to be fully hedged have no way of hedging the spread movement over these three days. As the extreme case of the November 2018 contract shows, the spread was trading at roughly 50 US cents in backwardation most of the month, in line with the prevailing Dubai spread.¹⁵ However, on 26 September, it jumped to \$6.81 and ended up at an average of \$4.37 (which was then used to calculate the last day of pricing).

September 2018 was an extreme month and it is unlikely that such sharp price movements would happen again. However, the 'new' methodology introduces additional basis risk in the contract. There is no way for a risk-averse market participant to fully hedge her position versus the OSP. While not a serious problem,¹⁶ this may cause DME Oman market participants quite some inconvenience. Given the growing importance of the DME Oman contract, it is important to find a lasting solution.

Possible solutions

All futures contracts and benchmarks evolve over time. As they evolve, new features are added and others are adjusted. This has been the case with Brent and WTI, as well as Dubai crude oil contracts. The same will happen with the DME contract.

One possible solution is to have a company that effectively polices the contract. Asian refiners traditionally buy their feedstock two months prior to the month of loading. Freight is a major component of the overall cost, so very large crude oil carriers (VLCCs) are chartered whenever possible. Once the ship is fixed, it is hard to change co-loading of various grades of oil on the same vessel. Asian refiners also tend to be more conservative than their European or US counterparts. So, when a price spike (such as the one shown in Figure 3) happens, most US and European refiners would react relatively quickly: they would sell the expensive grade of oil and buy something else, possibly better and cheaper (and have good profit to show for it). Asian refiners are more conservative; even \$8 per barrel potential profit at the end of September was not enough to entice a seller into the market.¹⁷

In the case of Oman, Petroleum Development Oman (PDO), a majority state-owned company that produces more than 70 per cent of the country's crude oil,¹⁸ could play the role of policing the Oman market. When there is a major expiry event, such as the one in September 2018, PDO could easily move volumes from the December loading programme into November. For a company producing well over one cargo of Oman per day, it should be relatively easy to move one or two cargoes from one loading month to the other. If PDO were to accept this role of a 'central banker' for DME Oman contracts, the likelihood of major price swings on the last day of trading would greatly diminish.¹⁹ However, it is highly questionable whether Aramco, or indeed any other producer, would leave even the smallest market intervention in the hands of PDO.

Another well tried and possibly more realistic idea is to introduce a similar (ideally better)²⁰ grade of oil into the delivery mechanism. Such arrangements exist for the WTI, Brent, and Dubai benchmarks.

¹⁴ December Oman settled at \$80.49 plus the average three-day spread of \$4.37, giving December settlement of \$84.86.

¹⁵ As published by Platts.

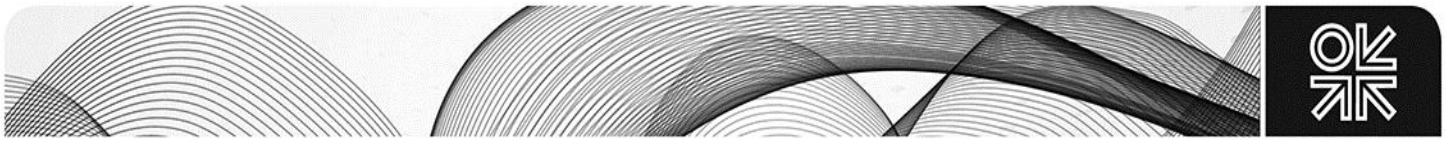
¹⁶ It is spread rather than absolute price risk. As the spread moves a lot less than the absolute price, the risk is much smaller. However, it should not be ignored as it introduces additional basis risk.

¹⁷ It is hard to say after the fact, but potential sellers were also busy in the APPEC week.

¹⁸ The Company is owned by the Government of Oman (with a 60 per cent interest), Royal Dutch Shell (34 per cent), Total (4 per cent), and Partex (2 per cent).

¹⁹ The role of 'policing' the contract would only ever happen in extreme circumstances, such as in September 2018 and on the last day of pricing.

²⁰ Ideally better because the buyers may not mind having better crude at the same price, while the increased liquidity would cap the price hikes. The seller would not mind delivering a better grade if the price is high enough.



There are numerous good candidates that DME could consider, such as Urals, ESPO, Murban or even Forties.²¹ Greater liquidity would cap any unexpected price increases.

Finally, DME could adopt a settlement similar to, or the same as, the RBOB²² gasoline futures contract:²³ the settlement 'window' on the last day is a lot wider, lasting for half an hour. This wide time period on the last day may well reduce the anxiety of the participants who need to square up the exact required volumes.

Of course, none of the above suggestions need be applied in isolation and they could work in a combination or all together to improve the liquidity of the contract. Equally, the list of suggestions is not exhaustive.

In summary, given Saudi Aramco's desire to retain Oman in its OSP formula, the move to DME Oman pricing can be justified given its relatively higher liquidity. Aramco could have opted to use the Platts Dubai contract in its Asian OSP, as Oman is already part of the Platts Dubai pricing methodology. The DME Oman futures contract may have low forward liquidity, but the volumes traded at the settlement are relatively large and facilitate good price discovery most of the month. However, during the last few days of trading there is a serious problem with the settlement due to low liquidity. Under extreme circumstances this can cause large price deviations similar to the one that happened at the end of September 2018. This problem needs urgent attention. A number of options are available to DME to address this problem as presented in this paper.

²¹ There are many more, including West African grades.

²² RBOB stands for reformulated blendstock for oxygenate blending. It is also a physical delivery contract.

²³ See www.cmegroup.com/trading/energy/refined-products/rbob-gasoline_contractSpecs_futures.html.



Appendix

Oman prices and Volumes during September 2018. Data from DME and Platts.

Date	DME Oman	Platts Oman	DME volume M1	DME open interest	DME Oman M2	DME volume M2	Oman M1/M2 spread
03-Sep	76.29	76.35					
04-Sep	77.29	77.25	7,762	127	76.89	952	0.40
05-Sep	76.25	76.20	3,560	3,014	75.85	440	0.40
06-Sep	75.82	75.35	4,003	4,311	75.12	423	0.70
07-Sep	75.26	75.25	3,454	3,454	74.66	650	0.60
10-Sep	76.28	76.25	3,807	7,160	75.63	0	0.65
11-Sep	76.64	76.65	4,285	8,925	76.04	547	0.60
12-Sep	77.95	77.95	4,397	10,207	77.21	582	0.74
13-Sep	77.69	77.65	4,454	11,511	77.04	495	0.65
14-Sep	76.93	76.85	4,617	13,106	76.26	472	0.67
17-Sep	76.96	76.95	5,617	14,665	76.31	586	0.65
18-Sep	76.31	76.30	4,652	16,381	75.71	871	0.60
19-Sep	77.59	77.65	4,173	17,363	76.94	750	0.65
20-Sep	78.16	78.25	4,744	18,923	77.43	335	0.73
21-Sep	78.04	78.10	4,071	20,431	77.31	691	0.73
24-Sep	80.02	79.25	4,522	21,984	78.52	282	1.50
25-Sep	82.53	80.70	2,088	23,272	80.03	406	2.50
26-Sep	88.96	81.35	2,563	24,582	82.15	283	6.81
27-Sep	84.62	81.60	928	26,938	80.82	51	3.80
28-Sep	84.86	80.95	195	28,195	80.49	15	4.37