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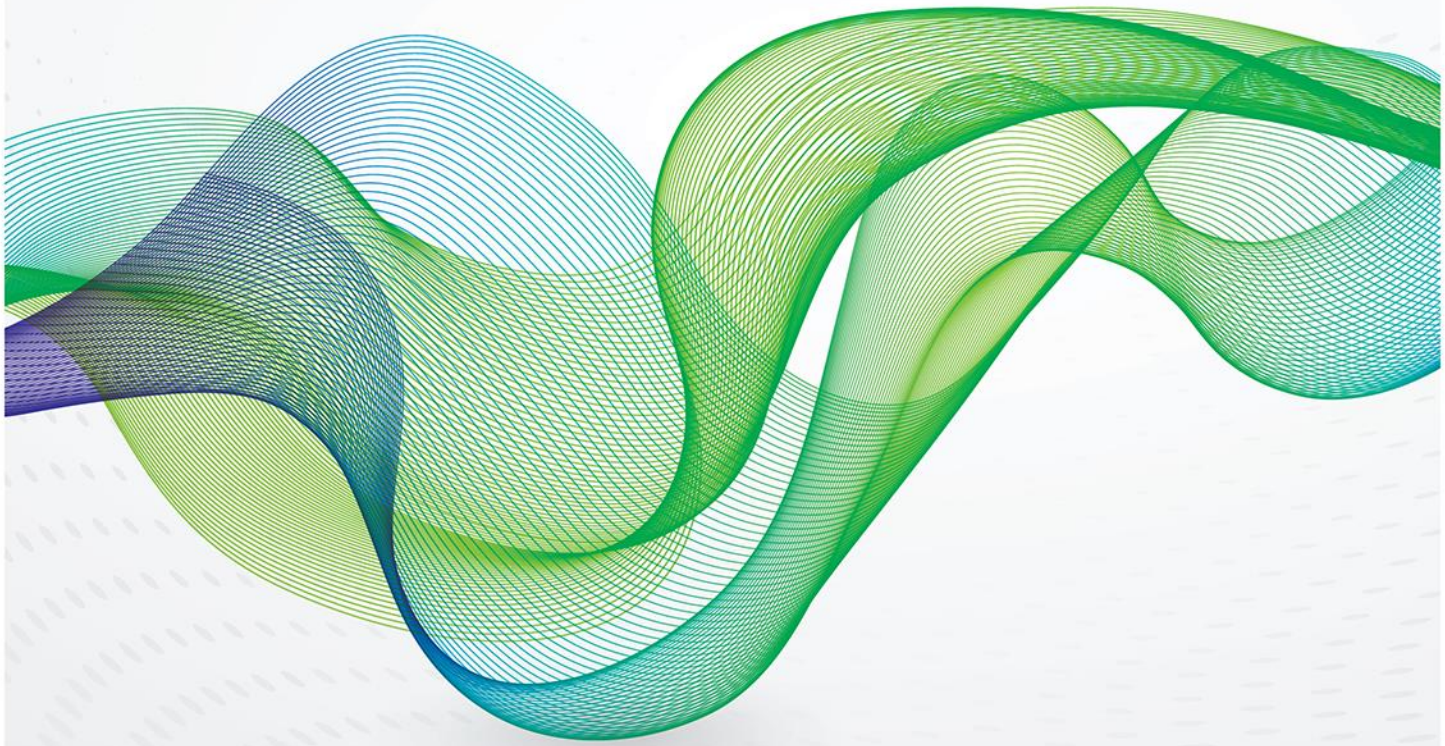
Middle East Benchmarks and the Demand Shock



OXFORD ENERGY COMMENT

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Introduction

In October 2018, Saudi Aramco changed the pricing formula it uses to price its long-term crude oil sales to Asia. Rather than using the equally weighted average prices for Dubai and Oman as assessed by the Price Reporting Agency (PRA) S&P Global Platts (referred to in this article as Platts Dubai and Platts Oman), Saudi Aramco replaced Platts Oman in the formula with the marker price of the Oman Crude Futures Contract traded on the Dubai Mercantile Exchange (referred to as DME Oman).[1] Until recently, the market barely felt the difference, as historically Platts Oman and DME Oman have been closely aligned and the price difference was very small (a few cents) on most days.[2] However, the current crisis has exposed the vulnerabilities of existing benchmarks, leading to very different price outcomes, with the divergence between DME Oman and Platts Oman assessment reaching $6.56 per barrel on 22 April 2020. While this divergence could prove to be only a temporary phenomenon, caused by the massive oil demand shock due to the pandemic, it exposed the structural differences between the two benchmarks, methodologies, and the crudes they represent. Recent events have generated a healthy debate on the usefulness and limitations of existing benchmarks in the Gulf region, whether the PRAs need to adjust their underlying assessment methodologies, and whether the producers need to revisit their pricing formulas. This Energy Comment analyses some key aspects of this debate and explores the potential shifts in crude pricing systems. Given the tensions in the region's existing medium sour benchmarks, the desire of a key regional player to introduce a new futures contract and a light sour benchmark,[3] alongside the rise of China as the major importer of Gulf crude and its desire to shift pricing to its own futures contract, we expect the changes to the Gulf crude oil pricing system, which were occurring before the current crisis, to accelerate.

Historical role of Oman in the formula

When it comes to adopting new benchmarks or changing the price formula, the process is usually very slow, and it took Saudi Aramco many years to make the move to DME Oman for part of its pricing formula. Saudi Aramco's switch from Platts Oman to the DME Oman was driven in part by the high volume of daily trades of Oman crude on the DME compared to the alternative assessments of Oman. Prior to the Aramco shift, Oman hardly ever traded on fixed-price basis in the Platts Window and bids and offers were equally rare.

Despite this attractive feature from the perspective of price discovery, the DME Oman futures contract suffers from a lack of liquidity outside the DME settlement window. Virtually all the volumes are traded in the five-minute assessment window.[4] Furthermore, financial players in the market tend to square their positions well before the expiry of the contract to avoid physical delivery and as a result liquidity tends to dry close to expiry. Falling liquidity can, at times, contribute to higher volatility and this did occur multiple times close to the expiry of the DME Oman contract.[5] This makes it a poor futures contract for hedging and longer-term proprietary trading. To overcome the liquidity problem and reduce volatility, in March 2016, DME introduced a new settlement methodology where 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 spread averaged over the three preceding days prior to the last day of trading.[6] This change however

[1] Fattouh, B. (2018), 'What Next for Asian Benchmarks?', Oxford Energy Comment, Oxford: Oxford Institute for Energy Studies.
[2] The average spread in 2019 was $0.08/ barrel.
[3] Mehdi, A. E. Muneeb, A. Imsirovic, and B Fattouh (2019), 'Murban: A benchmark for the Middle East?' OIES Energy Comment, Oxford: Oxford Institute for Energy Studies.
B. Fattouh and A. Imsirovic: 'Oil Benchmarks Under Stress' OIES Energy Comment, Oxford: Oxford Institute for Energy Studies.
[4] While Dubai derivatives are quite liquid outside the Platts window, Dubai partials generally do not trade on fixed price basis outside the window either. Equally, Oman partials when traded are usually condensed into a single minute of the window, and do not trade outside of the window.
[5] For more details about this and other issues regarding the DME contract, see: Imsirovic: 'What Next for Asian Benchmarks? – A Footnote', Oxford Energy Comment, November 2018 and Rushforth, J. and V. Blei (2020), Yields vs sulfur: What is driving crude benchmarks in 2020? OIES Energy Comment, Oxford: Oxford Institute for Energy Studies.
[6] Imsirovic, A. (2018) 'What Next for Asian Benchmarks? – A Footnote', Oxford Energy Comment, Oxford: Oxford Institute for Energy Studies.

has not improved the liquidity of the contract close to expiry. As a result, participants who wish to be fully hedged, will find it very hard to hedge the spread movement over these last three days.

The inclusion of the contract into the Aramco Asian OSP (official selling price) was expected to increase the contract's liquidity, but this did not materialise, and refineries generally do not seem to hedge the Oman leg through the DME Oman contract. This is surprising as the Oman/ Dubai differential can easily fluctuate well over a dollar per barrel.

Given that the Asian refiners do not seem to hedge the Oman portion of their exposure, swaps markets similar to those surrounding Dubai and those that link Dubai to Brent are almost non-existent.[7] This, coupled with the established liquidity in the Singapore 'pricing window', at least towards the end of the month and the contract expiry, gives Platts Dubai an edge, despite the fact that Dubai has no futures contract setting a Dubai fixed price. While ICE labels Dubai as 'futures', these in effect are monthly swaps that price off Brent via EFS, swaps and swap spreads, normally based on Platts' assessments.

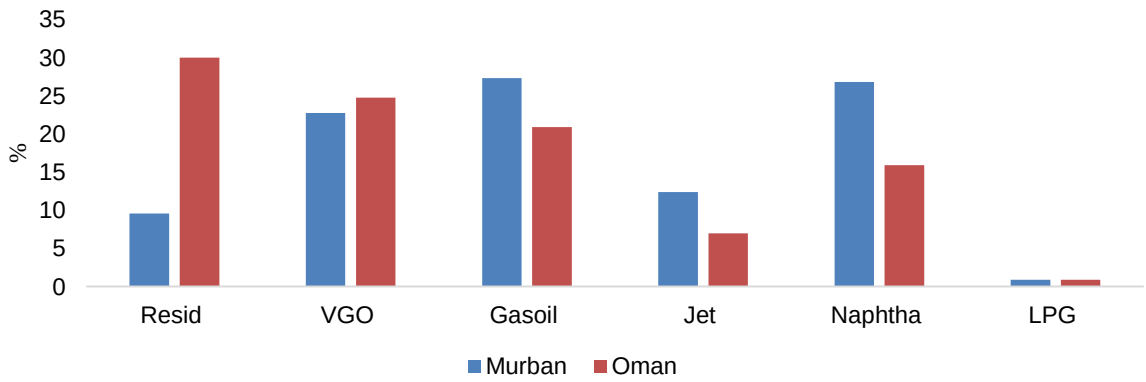
These and other factors (for instance one argument against the DME Oman contract is its sole reliance on the Oman grade as the only deliverable crude[8]) indicate that it may be premature for producers to take the step and shift the entire pricing formula to DME Oman. But while such a radical shift is unlikely anytime soon, the severity of the demand shock exposed the fragilities of the currently used benchmarks and pricing formulas, especially light crude benchmarks, and the pressure for change will persist.

Demand shock impacts the Dubai and Oman 'baskets'

The historically high correlation between DME Oman and Platts Oman gave the impression that the differences between these benchmarks and the underlying assessment methodologies were minor. This however was not the case and it took the current crisis to expose the extent of the differences. The key difference is that Platts Oman and Dubai benchmarks reflect baskets of crudes where the cheapest grade sets the price, while the DME futures contract is based on a single grade.

In particular, Oman and Dubai Platts baskets include Murban. This is a light high sulfur type of crude with a low fuel oil and a very high jet and particularly naphtha yield (see Figure 1). Under 'normal' market conditions, given its better quality, Murban traditionally trades at a premium (see Figure 2) relative to the other Middle East grades such as Dubai and Upper Zakum (UAE), Oman (Oman), Al Shaheen (Qatar) and has been introduced by Platts to act as a 'safety valve' to prevent dominant players from squeezing the market.

Figure 1: Product yields of Oman and Murban crudes (%)

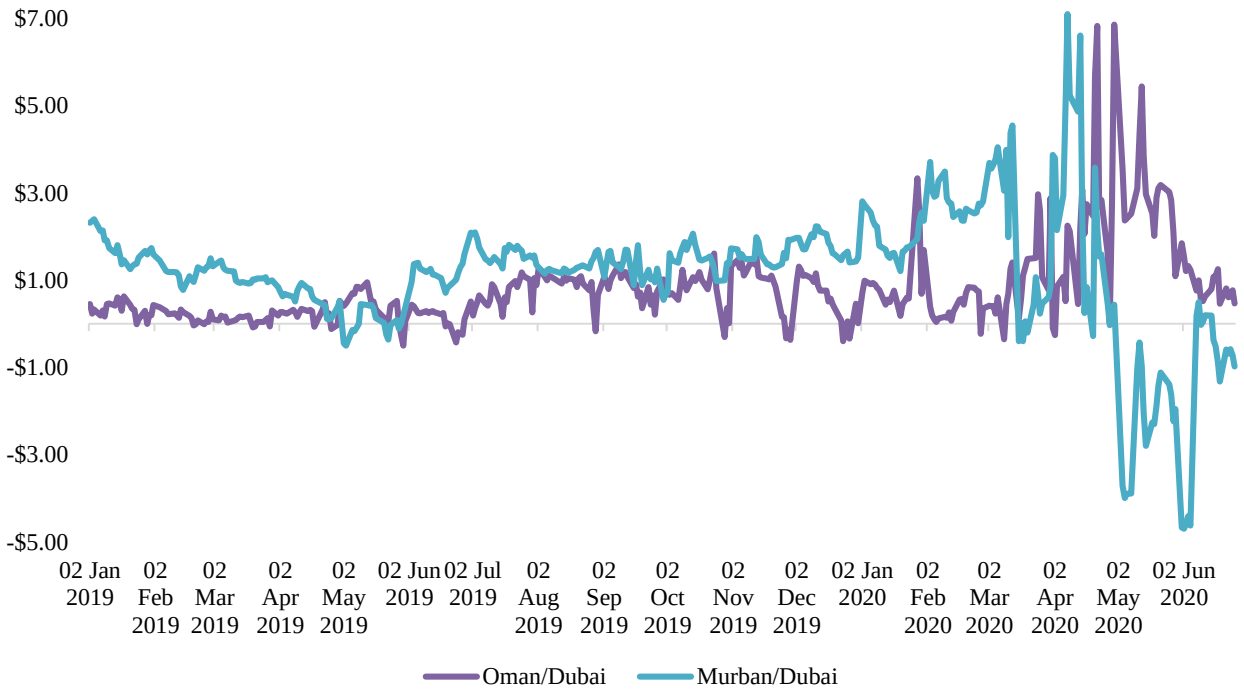


Source: Crude Assays

[7] The fact that both legs are futures also explains why swaps markets are not likely to be developed in the same manner as the Dubai-Brent swaps.
[8] Rushforth, J. and V. Blei (2020), Yields vs sulfur: What is driving crude benchmarks in 2020? OIES Energy Comment, Oxford: Oxford Institute for Energy Studies.

In the extreme market conditions in April caused by the pandemic, product prices took an unexpected turn and transportation fuels such as jet and gasoline, which normally trade at a premium, became heavily discounted.[9] This resulted in heavy discounts for Murban which became the cheapest crude in the Dubai and Oman baskets, setting the price for both of Platts benchmarks. On the other hand, DME Oman, continued to reflect the value of Oman. In a nutshell, DME Oman and Platts Oman were reflecting the values of different crudes. This created a price divergence between the two benchmarks, with Platts Dubai and Platts Oman trading at a historically large discount to DME Oman.

Figure 2: Oman and Murban V Dubai, all front month, $/barrel



Source: Argus

The implications of this divergence have generated a healthy debate on the usefulness and limitations of existing benchmarks in the Gulf region, whether the PRAs need to adjust their underlying assessment methodologies, and whether the producers need to revisit their pricing formulas. For instance, Fattouh and Imsirovic,[10] argued that 'Platts Oman performed as expected – it did what it said 'on the tin… However, at least temporarily, this did not make them useful contracts'.

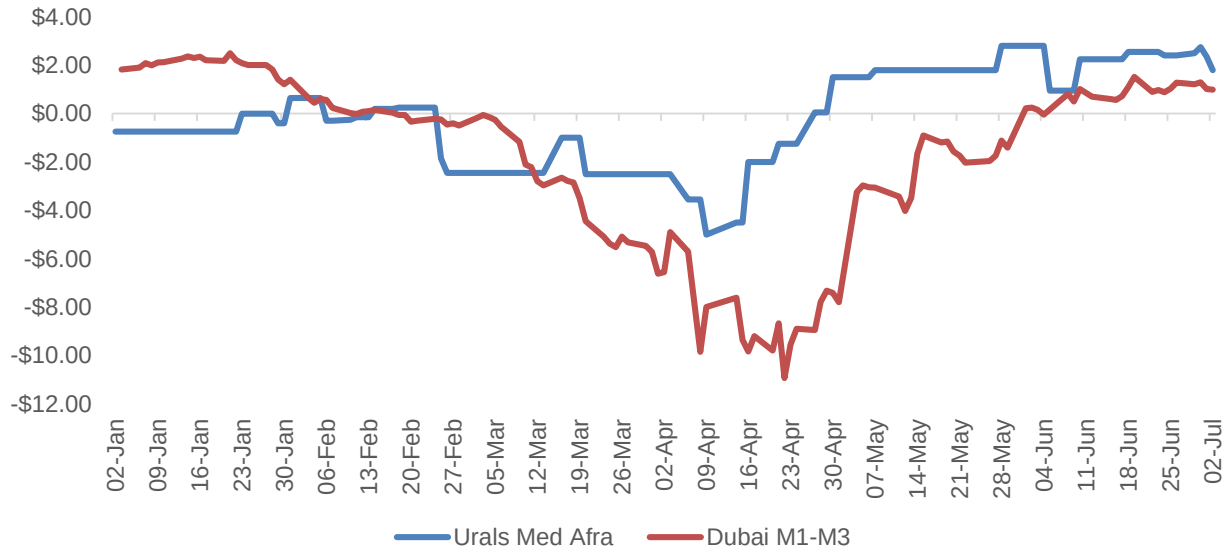
Mehdi[11] approached the issue from the perspective of oil exporters arguing that 'as these differences become clearer, the structural divergence in DME Oman/Platts Oman pricing is likely to feed into producer decision-making'. Using the example of Iraq's crude exports (mainly medium sour grades), Mehdi argues that given the wide divergence between DME Oman and Platts Oman, Iraq had little choice but to 'convert its exposure to Platts Dubai/Oman by raising the OSP differential', however, this solution is temporary as the 'ability to predict the forward spread between Murban and Oman/Dubai is a serious challenge going forward'.

[9] For details, see Fattouh and Imsirovic: 'Nigerian Barrels and the Demand Shock: Differentials and Changing Oil Trade Flows', Oxford Energy Comment, June 2020.
[10] Fattouh, B. and A. Imsirovic (2020), 'Shocks and Differentials: How are the oil markets coping?' Oxford Energy Comment, Oxford: Oxford Institute for Energy Studies.
[11] Mehdi, A. (2020), 'Middle East Benchmark Pricing and the Oil Crisis, Oxford Energy Comment, Oxford: Oxford Institute for Energy Studies.

In contrast, Rushforth and Blei[12] have argued the case from the perspective of refineries and refinery margins. According to this logic, 'Murban, and by extension Platts Dubai and Oman, were weaker as a result of low refinery margins and that was exactly what one would have expected in an efficient crude market. The traditional focus on sulphur in crudes was simply not relevant during April… Indeed, had refiners been using a benchmark that ignored their own fundamental economics, including the demand destruction in gasoline and jet fuel, they would have faced immense pain, unless they were able to pass through these higher costs on to the product markets'. Eventually, this would have caused prodcuers to lose their share in a key market.

Indeed, both Platts Dubai and Oman benchmarks showed remarkable weakness during this period, relative to other market indicators. Figure 3 below shows a comparison between the falls in Urals and Dubai differentials. Both are sour grades, and despite the fact that Urals crude differentials fell to historically low levels, Dubai differentials fell much sharper.

Figure 3: Collapse in Urals and Dubai differentials during April 2020, $/barrel

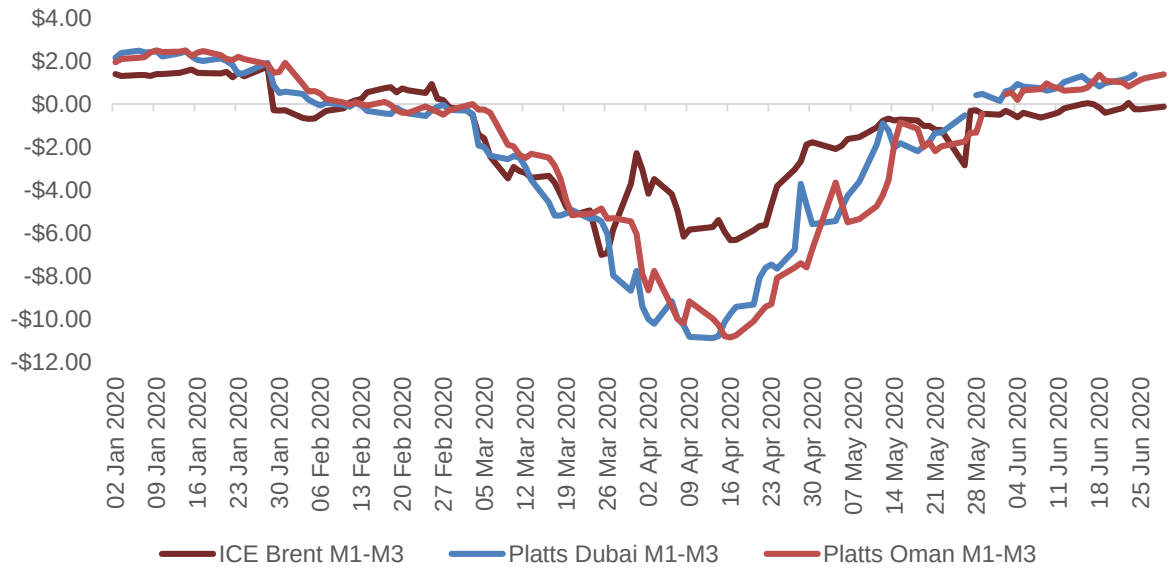


Source: Argus, Platts

The extent of the contango (as measured by the M1-M3 spread) between Brent on the one hand and Platts Oman and Dubai on the other over the same period (Figure 4 below) reveal a similar picture. As explained below, it is hard to explain the extent of the contango on the Platts Asian benchmarks with any factor other than the impact of Murban deliveries on the benchmark values.

[12] Rushforth, J. and V. Blei (2020), Yields vs sulfur: What is driving crude benchmarks in 2020? OIES Energy Comment, Oxford: Oxford Institute for Energy Studies.

Figure 4: Price term structure of Brent and Platts Dubai and Oman (spreads M1-M3), $/barrel



Source: ICE, Platts

Netback prices

The focus of crude pricing from the perspective of refineries is not new. Netback pricing has been used by integrated companies in valuing oil transferred between subsidiaries and was adopted by Saudi Arabia during the second half of 1985.[13] But the context matters. As argued by Mabro,[14] the sharp oil price falls of late 1985 and 1986 were the result of a fundamental change in Saudi Arabia's and OPEC's overall oil policy: 'the formal abandonment of a traditional system of price administration in favour of competition for additional export volumes'. But as Mabro emphasises, 'netback pricing was the instrument chosen by Saudi Arabia…. to implement this fundamental change in policy'. At that time, by guaranteeing positive refining margins, Saudi Arabia restored its market share. But crude prices did collapse as refineries had no incentive to stop runs and as products prices collapsed as a result of increased supplies, these downward pressures were shifted to producers through lower crude prices. This experiment with netback pricing was abandoned and Saudi Arabia shifted to pricing its crude based on a benchmark pricing formula.[15]

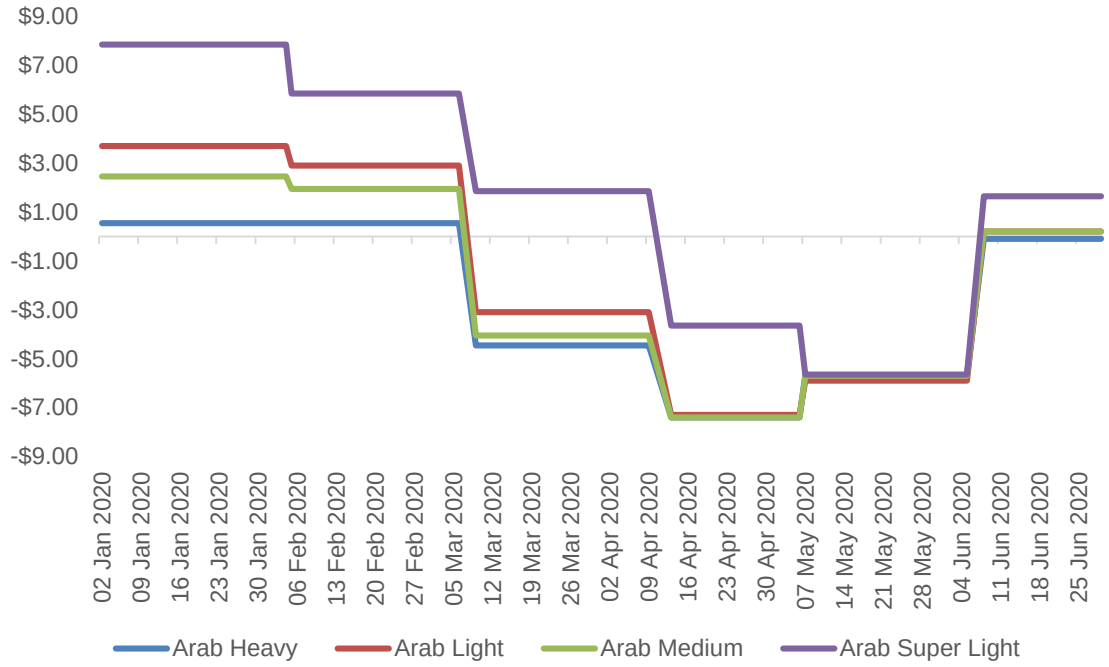
The current context is fundamentally different. Saudi Arabia, in cooperation with other producers, is leading one of the largest cuts in history in an attempt to balance the market.[16] While oil producers do take into account refining margins when pricing their crudes, the objective is not to guarantee refineries positive margins. In fact, if this was the objective, it would undermine OPEC+ producers' current efforts of tightening the market. In a situation of excess refinery capacity, refinery margins are usally weak and many simple refineries may have to shut. As demand improves, product prices increase, and refinery runs rise, putting downward pressure on refining margins in the process. Thus, as long as the excess

[13] Mabro, R. (1986), 'The Netback Pricing System and the Price Collapse of 1986'. WPM 10, Oxford: Oxford Institute for Energy Studies.
[14] Mabro, R. (1986), 'The Netback Pricing System and the Price Collapse of 1986'. WPM 10, Oxford: Oxford Institute for Energy Studies.
[15] Fattouh, B. (2011), 'An Anatomy of the Crude Oil Pricing System', The Oxford Institute for Energy Studies Working Paper No 40. Oxford: Oxford Institute for Energy Studies.
[16] Fattouh, B. and A. Economou (2020), 'Is the worst of the oil crisis behind us?', Oxford Energy Comment, Oxford: Oxford Institute for Energy Studies.

capacity remains, margins will remain poor and the idea that benchmarks should be valued to ensure positive margins reflects a value judgement.

While netbacks are important from refineries' and producers' perspective, the fact remains that Middle East producers need a robust and reliable benchmark to price their crudes. From a producers' perspective (such as Saudi Arabia), having two benchmarks in the same formula reflecting the values of two different crudes (one light and one medium) is not ideal as it complicates setting their OSPs. For a producer like Iraq whose exports are concentrated in the sour category pricing their crude off a light variety such as Murban is also not ideal and requires massive adjustment in the OSPs. Many were surprised about the sharp adjustment of Aramco's and SOMO's OSPs to Asia in June (for July loading; see Figure 5), but part of this reflected the weaknesses in the underlying benchmark.

Figure 5: Saudi OSP for exports to Asia, $/barrel



Source: Argus

Murban premium

The fact that (normally) better quality Murban is included in the basket is not unique to Middle East pricing. The Brent system is based on a basket of crudes (Brent, Forties, Oserberg, Ekofisk,Troll) with Forties having fundamentally different characteristics from the rest of the crudes. The addition of crude is one of the PRAs methods to provide enough liquidity to prevent the benchmark from being influenced by dominant players. The high volumes of production[17] renders Murban as a good candidate to include in the Dubai and Oman basket. But volume is just one issue and PRAs have to closely monitor how such an addition could impact the basket.

Given its higher quality and in order to encourage sellers to deliver Murban against the contract, Platts introduced a quality premium (QP) for Murban.[18] In principle, this QP can take any value and can be adjusted depending on market conditions.[19] For instance, in tight market conditions and if Murban is

[17] Note that only destination-free Murban can be delivered into the contract. This is only a fraction of the total volume produced.
[18] This is common, well tried and relatively successful practice used in the 'Brent basket'.
[19] 'The QP will be paid by a buyer to a seller for the nomination and delivery of a cargo of Murban crude oil into a physical convergence of Dubai, Al Shaheen, Upper Zakum or Oman during the Platts MOC assessment process. Platts announces the Murban QP on the first publishing day of each month, two months prior to the QP coming into effect… A QP of zero will be

the only crude that can be delivered against the contract, the QP could be adjusted upwards to encourage delivery of the grade. On the other hand, if demand for Murban collapses and its price falls below the rest of the basket, then the QP is adjusted downward. If it is less than $0.50, the QP is set at zero.

Under 'normal' market conditions, Murban would always trade at a sizeable premium to Dubai and Oman, so premiums less than zero have not been specified. However, market conditions, at least in the second quarter of 2020, have been anything but normal. The collapse of light end prices rendered the Murban grade not desired by refineries, at least not at prices above Dubai and Oman. As the grade was delivered into the Dubai and Oman baskets, the idea that its premium to these crudes was negative was not considered. This is quite puzzling as there is no reason why the QP should not reflect this eventuality: that refiners would avoid taking delivery of an inferior grade of crude unless the seller paid them a compensation. Setting a negative QP for Murban, at the time of temporary weakness would have been a straightforward and justifiable fix to most of the issues concerning the Platts benchmarks considered in this paper.

Oman and Chinese demand

One of the main arguments against DME Oman as a benchmark is the dominance of Chinese refineries as the main buyers of Omani crude.[20] Indeed, the bulk of Oman crude is regularly destined for China. There are concerns that this feature undermines the credibility of the benchmark as the DME Oman price will reflect the pricing power of China's refineries and the country's fundamentals. These fundamentals are different from those in the rest of Asia, especially given that China's domestic prices for petroleum products are regulated.

The fact that most of Oman ends up in China is certainly true. As Figure 6 clearly shows, this year, over 80 per cent of all the Oman crude was delivered in China. A good share of that buying is done by a trading arm of one Chinese Major alone where Unipec shipped close to 70 per cent of all the Oman going into the country.[21] This does not necessarily imply that Chinese companies dominte trading activity of the DME futures contract or have exercised any undue influence on the contract (the lack of exchange data prevents us from testing this hypothesis).[22] But China is the second biggest refiner and the biggest oil importer in the world. Its dominance in the Middle East benchmarks is not unexpected and will only increase.[23] Chinese 'Majors' and their trading arms, Unipec and Chinaoil are also the biggest players in the Dubai window where they take two out of three top spots in terms of volume traded.[24] In fact, this dominance was a key reason why Platts introduced Murban into the basket in the first place.

announced if 60% of the observed price difference between the grades is less than 50 cents/b.' https://www.spglobal.com/platts/plattscontent/_assets/_files/en/our-methodology/methodology-specifications/apag-crude-methodology.pdf

[20] Rushforth, J. and V. Blei (2020), Yields vs sulfur: What is driving crude benchmarks in 2020? OIES Energy Comment, Oxford: Oxford Institute for Energy Studies.

[21] January to May 2020. Author calculation, using Clipper data. Actual share calculated is 68.93%.

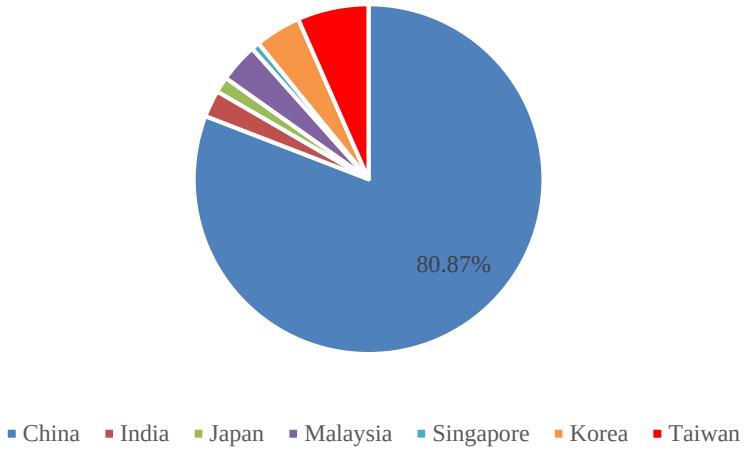
[22] According to DME, Chinese entities account for approximately 10% of front-month activity and lift just over a third of physical barrels (buy/sell) via DME between January and May 2020.

[23] Cang, A. (2020), China Oil Titans Plan Joint Crude Buying to Add Market Clout, Bloomberg, 29 June 2020.

[24] Top players (Platts data) Jan. to May 2020 are:

Company	sell vol.	buy vol.	total buy & sell
SIETCO	18,225	73,275	91,500
UNIPECASIA	61,225	950	62,175
CHINAOIL & PCHK	14,325	21,475	35,800
TOTSA	15,600	16,650	32,250
RGES	26,225	0	26,225
BPSG	6,900	16,400	23,300
LUKOIL	5,650	11,700	17,350
VITOLSG	6,900	7,750	14,650
GUNVORSG	3,925	8,325	12,250

Figure 6: Delivery destinations for Oman crude in 2020 (%)



Source: Calculated from Clipper data

There has been a conscious decision by the Chinese leadership to participate and 'compete for oil pricing power'.[25] With encouragement from the top of China's leadership, the Shanghai International Energy Exchange (often referred to as INE) launched its own crude oil futures on 26 March, 2018. The contract is for delivered (into designated bonded shore tanks so that the price is net of tax) medium sulphur grades of crude oil (32 API and 1.5 per cent sulfur), priced in domestic currency (RMB). Grades of oil which can be delivered into the contract include domestic Shengli and six other Middle Eastern grades: Basra Light, Oman, Dubai, Upper Zakum, Qatar Marine and Masila. The contract has been a success, with a high volume of trades, making INE the third largest oil exchange in the world.

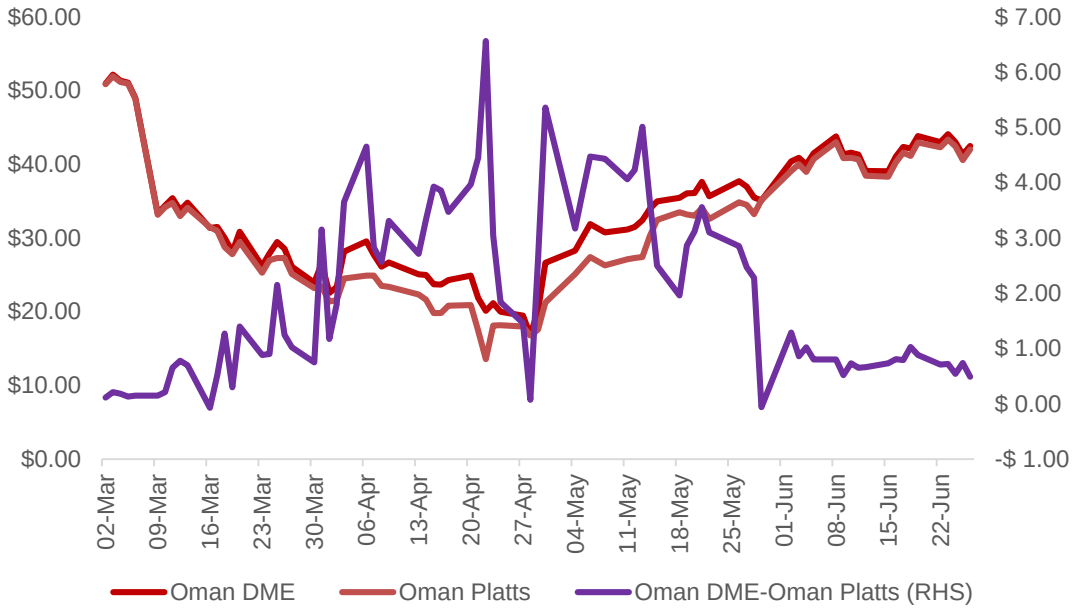
However, the INE oil contract was another victim of the market shock from the COVID-19 pandemic. Primarily dominated by retail investors and speculators, the contract for July delivery decoupled from the international markets.[26] At one stage, it was trading as high as $14/barrel higher than the equivalent June DME Oman contract (June FOB loading DME Oman can be purchased, shipped and delivered into the July INE contract). At the end, market logic prevailed and the trading arms of the 'Chinese Majors' purchased Oman and Basra Light for delivery into the July INE contract, partly alleviating the problem. While this may well be one of the reasons for DME Oman futures to surge in April and May this year (see Figure 7 below), the exchange did fulfil its role: A shortage of oil (Oman) in a Chinese contract was met by buying on and off the exchange, lifting Oman prices in the process. Platts Oman contract did not get bid up. This is simply because a buyer of the Platts Oman contract would likely have been delivered a Murban cargo, a grade not accepted in the INE contract. Thus, due to the Murban delivery option, the Platts Oman contract did not reflect the prevailing fundamentals of the Oman market.

Another interesting point concerns the convergence mechanisms of the two Oman contracts. Even if the buyer of Platts Oman did expect to be delivered an Oman cargo upon purchase of Oman partials, simply buying 20 partials (of 25 kb each) would not necessarily have done the trick. The trader would have to buy all 20 partials from the same seller to get the cargo. Therefore, there would be no guarantee

[25] "We must focus on establishing futures for crude and other commodities, to gradually strengthen China's pricing power in international markets" according to Guo Shuqing, chairman of the China Securities Regulatory Commission, China's top regulatory body' in Financial Times, February 9, 2012.
[26] For details see Imsirovic, A. (forthcoming): 'China and Oil Benchmarks: Where Next?', Oxford Energy Forum, Oxford: Oxford Institute for Energy Studies.

of obtaining a cargo and executing an arbitrage trade.[27] This is not an issue with the exchange where buying 500 lots of contract would guarantee a delivery.

Figure 7: DME Oman V Platts Oman, $/barrel



Source: DME, S&P Global Platts

Conclusion

The demand shock caused by the pandemic exposed some problems with the key oil benchmarks in the Middle East and Asia. The shock made it clear that DME Oman and Platts Oman are very different benchmarks. In particular, during the crisis, the Platts Oman benchmark reflected the value of Murban which temporarily got discounted based on the weakness of light end products caused by the shock. The approach of using gross product values to assess the 'quality' of a benchmark is narrow. Oil producers cannot guarantee positive refining margins, especially in the current situation of a large excess refining capacity and when OPEC+ is implementing one of the biggest cuts in history to rebalance the market.

The Dubai benchmark is harder to evaluate as there is no liquid and direct comparison to this dominant Asian benchmark. However, using some indirect measures such as dfferentials and term structure of prices (spreads), Dubai also suffered from the same problem – exaggerated weakness due to the Murban delivery option. But Dubai continued to benefit from the liquidity of the Brent complex to which it is deeply connected. Brent performed relatively well during the crisis with physical differentials doing most of the stretching.[28] It is important to emphasise that the inclusion of Murban into both Dubai and Oman basket is not necessarily a problem – all benchmarks can do with more liquidity and 'safety valves'. The way this is done matters. In this paper, we suggest that Platts should not exclude negative QPs when they are justified by rare and extreme market conditions. This fix would go a long way in both retaining the 'safety valve' in the contract and making sure that the benchmarks reflect fundamental values in the marketplace.

The DME Oman contract continues to have better liquidity during the assessment 'window' and likely reflects the value of Oman crude better. While the bulk of Oman crude is destined for China, any

[27] To increase a chance of securing an Oman cargo in the Platts window with more than one seller, the trader would probably have to buy a lot more than 20 partials, increasing price risk in the process.
[28] See Fattouh and Imsirovic (2020), 'Oil Benchmarks Under Stress', Oxford Energy Comment, OxfordL Oxford Institute for Energy Studies.

regional (and indeed global) benchmark will find it hard to avoid the influence of the largest crude importer in the world. Nevertheless, DME Oman contract continues to suffer from a number of issues, the main one being the liquidity in the last few days, prior to expiry. This needs further attention.

Recent problems have left Middle East producers in a conundrum: application of two fundamentally different benchmarks in their pricing formula has made setting the OSPs for their crude sales to Asia, at least temporarily, a difficult task. They may be facing a stark choice of either moving to a pricing formula with a single benchmark or simply waiting until the market normalizes in the hope that the recent demand shock is a one-off event. The introduction of a new Murban benchmark may also accelerate some of these dynamics. Any of these shifts may well shape the future of the Gulf crude pricing system.