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Gauging the oil price level that impedes global growth – modelling oil demand destruction

Oil market focus: With oil markets unable to react to the inexorable march higher in oil prices given supply inelasticity outside of OPEC+, demand destruction is becoming increasingly prevalent as a core mechanism to rebalance markets, once inventories are exhausted. We parameterise through a bottom-up country by country modelling approach to measure the sensitivity of higher oil prices to changes in global oil demand. Our simulations signal that a USD5/b increase in oil prices (that is entirely demand driven) from a Brent crude base of USD80/b, lowers global oil demand by 0.3-0.4m b/d – holding all other variables constant. Given the sheer magnitude of the oil market deficit which we forecast at -1.8m b/d in Q4 2021 (see here), our modelling estimates suggests that oil prices will have to climb to between USD100-110/b for demand destruction to materially balance markets – leaving thus the onus on OPEC+ as the core force to make up for the shortfall (see here).

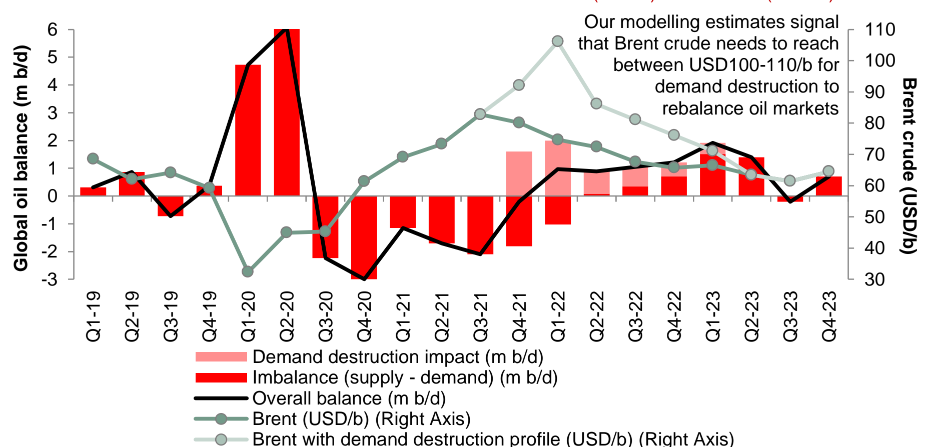
Week in review and week ahead: Oil prices have continued to climb to new highs, buoyed by continued constrained acute supply and rising demand from the critically tight gas market for the power sector, coalescing to create a rigorously tight oil market with all the near-term risks skewed to the upside. We remain tactically bullish for the week ahead, with positive catalysts moving at pace stemming from the lingering knock-on effect of the gas supply crunch leading to an even tighter physical oil market, the continuing draws in stockpiles and mobility easings continuing swiftly.

Oil price forecast: We have recently marked-to-market our quarterly profile higher wherein our modelling estimates now signal that the prevailing market deficit which started in June 2020, will not pivot into oversupply until Q2 2022 (see here). Given the tight oil market, we forecast Brent ending Q4 2021 and Q1 2022 at USD87/b and USD82/b, respectively – widening the strong backwardation embedded into the oil futures curves and generating positive carry for oil investors. Thereafter, with the market expected to return to a mild surplus, leads us to be tactically bearish with a leg lower to USD74/b, USD72/b, and USD66/b in Q2, Q3 and Q4 2022, respectively.

Core indicators: Prices, market positioning, timespreads, futures, inventories, storage and products performance over the previous week are covered below.

CHART OF THE WEEK: OIL AT USD100-110/B WILL REBALANCE MARKETS

GLOBAL OIL BALANCE WITH DEMAND DESTRUCTION IMPACT (M B/D) VS. BRENT (USD/B)



Source: Bloomberg, EIA, IEA, OPEC, MUFG Research

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Oil market focus

Gauging the oil price level that impedes global growth – modelling oil demand destruction

Acute supply shortage in oil – and broader energy – markets continues to linger on, propping up prices

The relentless surge in oil prices throughout this year is leading to questions about the implications for the global economy. With oil markets unable to react to the inexorable march higher in oil prices given supply inelasticity outside of OPEC+, demand destruction is becoming increasingly prevalent as a core mechanism to rebalance markets, once inventories are exhausted.

Notwithstanding the tight market, oil remains underinvested

As we recently catalogued, acute bottlenecks and widespread supply shortfalls that have little to do with COVID-19 and instead have been caused by structural underinvestment in the oil industry through much of the last decade, have been the key factor behind the widespread supply shortfalls, biting at a time that the velocity of inventory declines is accelerating (see here). This has been the major determinant in fuelling the precipitous surge in oil prices this year – historically periods of underinvestment are usually deep and are followed by sharply rising oil prices to compensate investors to take long-cycle risk. Though, these constraints on long-cycle commodity production were less evident in the weak demand environment of 2018-20. With the onset of the pandemic, as authorities prioritised large-scale stimulus programme to bolster economic activity, these structural supply constraints are becoming increasingly apparent. As such, the consequence has been higher and more volatile oil prices, which will likely be a common characteristic of the energy transition.

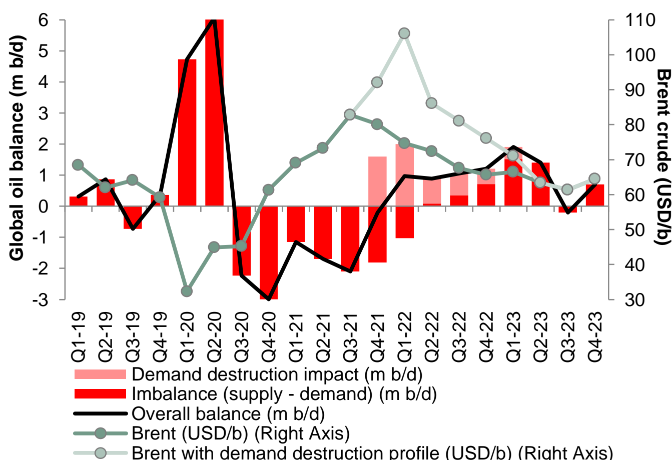
Implications of higher oil prices on the global economy

Against this backdrop, we believe that oil prices are hovering at levels that could begin to cause demand destruction. We acknowledge that modelling the oil price level that pushes the marginal cost of consumption level is not a straightforward exercise with ample assumptions needed. From the perspective of the world economy, economic theory suggest that a rise in oil prices lowers oil demand and with it weakens global GDP growth. A number of key channels are important to highlight from the impact of higher oil prices:

1. Wealth transfer. There will be a transfer from oil consuming countries to oil exporting ones, as the propensity to spend of those who lose income (energy consumers) is generally larger than the propensity to spend of

OUR MODELS SIGNAL THAT OIL NEEDS USD100-110/B FOR DEMAND DESTRUCTION TO BALANCE MARKETS

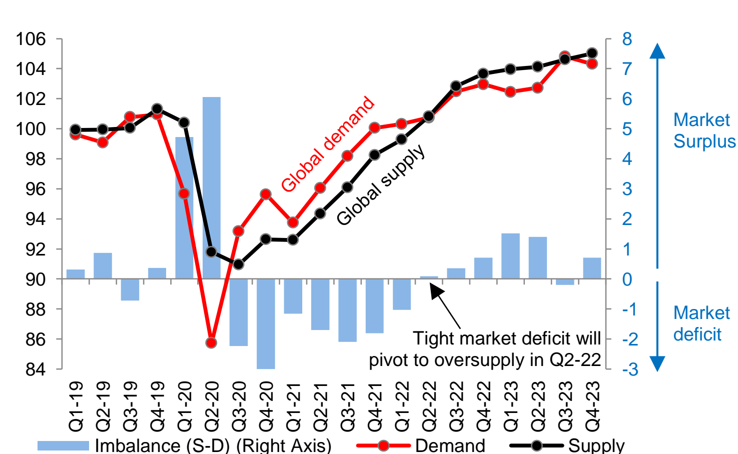
GLOBAL OIL BALANCE (M B/D) VS. BRENT OIL (USD/B)



Source: Bloomberg, EIA, IEA, OPEC, MUFG Research

OIL'S TIGHT MARKET IS SET TO PIVOT TOWARDS OVERSUPPLY FROM Q2 2022 – BEARISH PRICE SIGNAL

GLOBAL OIL DEMAND, SUPPLY AND OVERALL BALANCE (M B/D)



Source: Bloomberg, EIA, IEA, OPEC, MUFG Research

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those who gain income (energy producers), there will be some fall in demand.

2. Higher input costs in oil consuming countries. There will be a rise in the cost of production of goods and services in the economy, given the increase in the relative price of energy inputs, putting pressure on profit margins, notably in emerging markets where the oil intensity has declined as a slower pace than in developed markets.
3. Inflationary pressures. There will be an impact on inflation, the magnitude of which will depend on the degree of monetary tightening and the extent to which consumers seek to offset the decline in their real incomes through higher wage increases, and producers seek to restore profit margins.
4. Financial markets implications. There will be both direct and indirect impact on financial markets. Actual as well as anticipated changes in economic activity, corporate earnings, inflation and monetary policy following sustained oil price increases will affect equity and bond valuations, as well as FX markets.
5. Higher capex spending in oil exporting countries. Depending on the expected duration of oil price increases, the change in relative prices creates incentives for suppliers of energy to increase production (to the extent that there is scope for doing so) and investment, and for oil consumers to economise.

Our models signal that for each USD5/b increase in Brent crude, takes 0.3-0.4m b/d of global oil demand from a Brent crude base of USD80/b

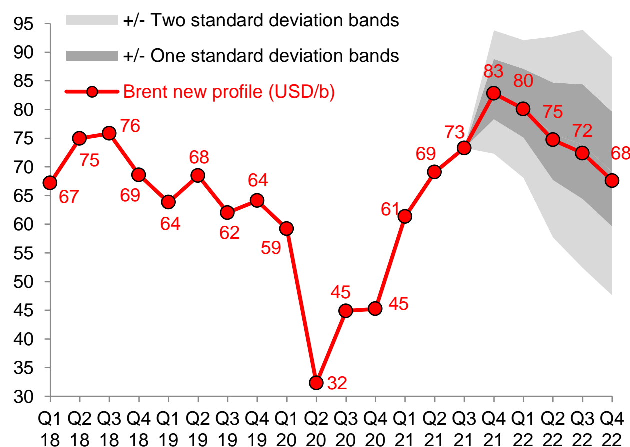
In the context of the aforementioned economic theory, we run several simulations that endeavours to determine the oil price level that leads to demand destruction to an extent that slowdowns the global economy. Our simulations signal that a USD5/b increase in oil prices (that is entirely demand driven) from a Brent crude base of USD80/b, lowers global oil demand by 0.3-0.4m b/d – holding all other variables constant. Given the sheer magnitude of the oil market deficit which we forecast at -1.8m b/d in Q4 2021 (see here), our modelling estimates suggests that oil prices will have to climb to between USD100-110/b for demand destruction to materially balance markets – leaving therefore the onus on OPEC+ as the core driving force to make up for the shortfall (see here).

We remain bullish oil until Q2 2022

We recently telegraphed that the setup for oil could not be more favourable throughout the autumn and winter months (see here). The vaccine-led recovery has driven physical goods demand to reach such high levels that the global system is becoming increasingly constrained in its ability to match the supply. Such supply

MUFG'S OIL PROFILE SIGNALS A PEAK IN Q4 2021 WITH A BEARISH 2022 BIAS GIVEN THE LIKELY SURPLUS

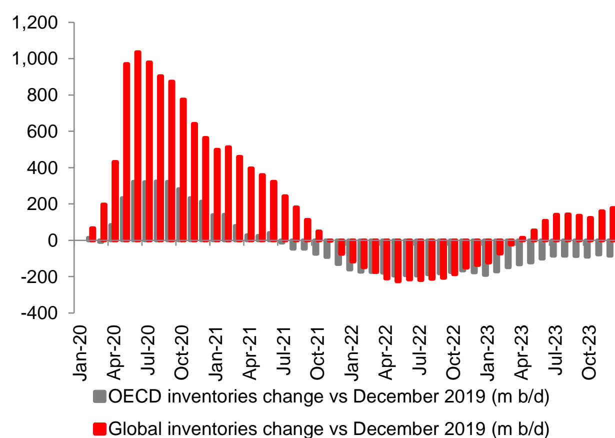
AVERAGE BRENT (USD/B) WITH ONE AND TWO STANDARD DEV. BANDS



Source: Bloomberg, EIA, IEA, OPEC, MUFG Research

OIL INVENTORY DRAWS HAVE ACCELERATED, WITH THE MARKET STILL IN A LARGE DEFICIT

GLOBAL AND OECD OIL INVENTORIES VS DECEMBER 2019 (M B/D)



Source: Bloomberg, EIA, IEA, OPEC, MUFG Research

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constraints are biting at a time that the velocity of oil inventory declines is accelerating and the coming winter is creating asymmetric upside price risks. With pandemic inventory buffers exhausted, supply shortages that spur such high price shocks will be negated by demand elastic destruction as the only option to rebalance markets (that is, the cure for high prices is high prices – a self-correcting mechanism). It is at this point, in conjunction with the looming constructive supply impulses (weaker OPEC+ compliance, more Iranian barrels, an increase in US shale supply and a steady build-up of oil inventories) that we turn tactically bearish from Q2 2022.

Mark-to-market our quarterly oil profile upwards

Based on these considerations, we have recently marked-to-market our quarterly profile higher wherein our modelling estimates now signal that the prevailing market deficit which started in June 2020 (see here), will not pivot into oversupply until Q2 2022 (from our initial estimates of Q1 2022). This is driven by winter demand risks which is now squarely skewed to the upside as the global gas crunch will increase gas-to-oil substitution (see here), and thus lead to an even tighter for longer physical oil market pushing oil inventories to lower levels. This will generate further price appreciation. We forecast Brent ending Q4 2021 and Q1 2022 at USD87/b and USD82/b, respectively – widening the strong backwardation embedded into the oil futures curves and generating positive carry for oil investors. Thereafter, with the market expected to return to a mild surplus, leads us to be tactically bearish with a leg lower to USD74/b, USD72/b, and USD66/b in Q2, Q3 and Q4 2022, respectively.

Risks are skewed to the upside

Absent (i) the stagflationary winds blowing through the global economy taking a firmer hold; (ii) a potentially new COVID-19 variant that renders vaccines less effective; (iii) a swift return of Iranian barrels should a rapprochement with the US materialise; and/or (iv) a rapid pivot of US shale supply away from their current “value over volume” strategy, all the near-term risks have shifted to the upside. Moreover, diminishing OPEC spare capacity as well as oil service and carbon cost inflation skew risks upwards. Critically, our new bullish near-term call on oil would not be derailed by either a faster Fed taper nor the rising rates environment given that oil is a spot (anchored) asset which is not vulnerable to only depend on the prevailing “level” of demand and supply, and thus are not vulnerable to rising rates which only slow down the “growth” rate of demand (see here).

Week in review and week ahead

Oil prices continue to march higher and we remain tactically bullish for the week ahead

Oil prices have continued to climb to new highs, buoyed by continued constrained acute supply and rising demand from the critically tight gas market for the power sector, coalescing to create a rigorously tight oil market with all the near-term risks skewed to the upside. We remain tactically bullish for the week ahead, with positive catalysts moving at pace stemming from the lingering knock-on effect of the gas supply crunch leading to an even tighter physical oil market, the continuing draws in stockpiles and mobility easings continuing swiftly. The blowout in Brent crude timespreads in recent trading days signals that the pathway even higher oil prices remains firm.

Markets are being drawn into how much gas/LNG can be imported into Europe and how much oil can replace gas in the months ahead

With Europe heading into winter with well-below gas inventory levels, markets are progressively fixated on both the magnitude of imported gas/LNG to the continent and how much oil can replace gas in the months ahead. For an oil markets perspective, oil can assist the gas market better manage a potential colder average winter, but this would require even larger gas price rallies and the process will be fraught with complexities.

We estimate gas-to-oil switching at 1.9m b/d across Europe, Asia and the Middle East

The core question is if there is adequate substitution from gas to oil to help prevent a gas shortage through winter, and if so, can the oil market accommodate such a demand shock. From a bottom up perspective, our estimates point that the conceivable capacity for gas-to-oil switching at 1.9m b/d (1.3m b/d in power generation and 0.6m b/d in industrial usage) across Europe, Asia and the Middle East. This is a function of the available capacity, potential load factors, plants level stocks, regional price incentives, LNG trade access, the degree of LNG long-term contracting, and historical trends. Should only a fraction of this potential switching occur this winter – in tandem with rising demand for heating oil – then this could result in a global oil demand surge of between 0.5-1.5m b/d (conditional on how cold the winter months transpire). This could potentially require a faster ramp-up that the pledged 0.4m b/d of monthly hikes in OPEC+ production when it next meets on 4 November.

We do not rule out an unique and acute bullish impulse for oil and we do not rule out a transitory oil price spike north of USD85/b in Q4 2021

The ongoing widening gas-oil price spread – which has risen markedly since early August – will provide a test of our estimated gas-to-oil substitution sensitivities. The usage of oil to ease the gas constraints faces the obstacle of the price incentive needs to clear its higher CO_2 emissions in Europe, which remains highly uncertain. Key from a gas market perspective will be the price incentive necessary to achieve such a substitution from gas-to-oil. Based on our estimate, the current risk premium in gas prices is already offering the space for switching to become viable, with current levels incentivising oil cargoes, in our view. In extremis, a severe tightening in global gas supplies presents an unique and acute bullish impulse for oil as a widening deficit depletes inventories with markets struggling to find a balance.

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Oil price forecasts and ranges

MUFG AVERAGE OIL PRICE FORECASTS (USD PER BARREL), AS OF 06 OCTOBER 2021

USD/b			Average quarterly forecasts					Average annual forecasts	
	Spot	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	2021	2022
Brent	81.1	73.3	82.8	80.1	74.7	72.4	67.6	71.6	73.7
NYMEX WTI	76.7	70.7	79.8	76.8	71.0	68.9	64.2	68.7	70.2
Brent ranges	---	---	68.6 – 95.9	64.4 – 92.3	56.3 – 85.6	54.0 – 82.5	49.2 – 78.9	---	---
WTI ranges	---	---	65.6 – 88.3	60.3 – 87.7	53.0 – 79.5	51.9 – 76.8	46.7 – 72.4	---	---

Source: MUFG Research

MUFG QUARTER-END OIL PRICE FORECASTS (USD PER BARREL), AS OF 06 OCTOBER 2021

USD/b			Quarter end forecasts					Average annual forecasts	
	Spot	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	2021	2022
Brent	81.1	78.4	85.2	82.4	74.3	71.9	65.6	71.6	73.7
NYMEX WTI	76.7	74.7	81.9	79.2	70.8	68.2	61.8	68.7	70.2
Brent ranges	---	---	71.6 – 98.5	67.8 – 95.3	56.2 – 85.4	53.5 – 81.3	47.8– 76.5	---	---
WTI ranges	---	---	68.5 – 90.3	61.5 – 88.7	52.4 – 79.0	50.9 – 76.0	44.5 – 70.5	---	---

Source: MUFG Research

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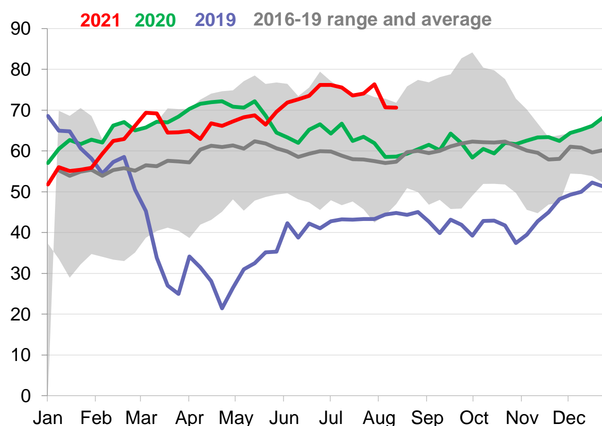
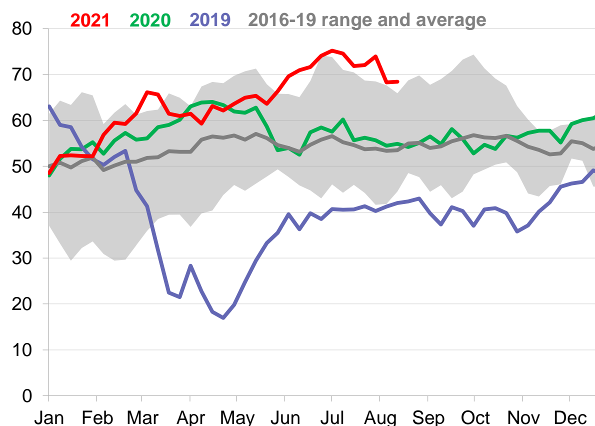
Core indicators – prices and market positioning

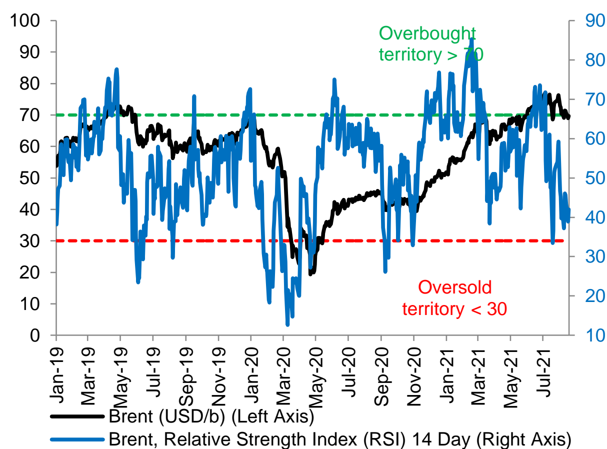
BRENT SPOT
USD/B



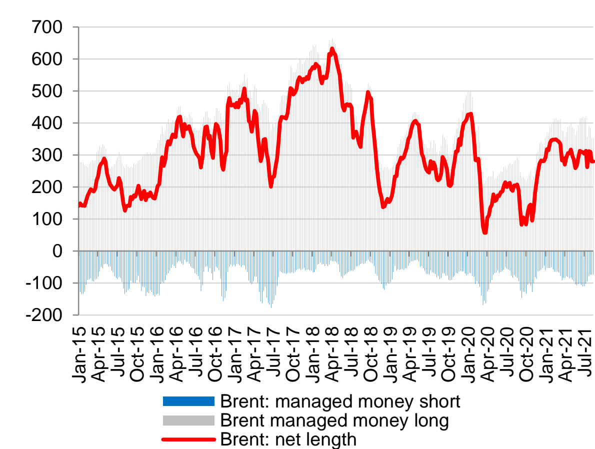
NYMEX WTI SPOT
USD/B



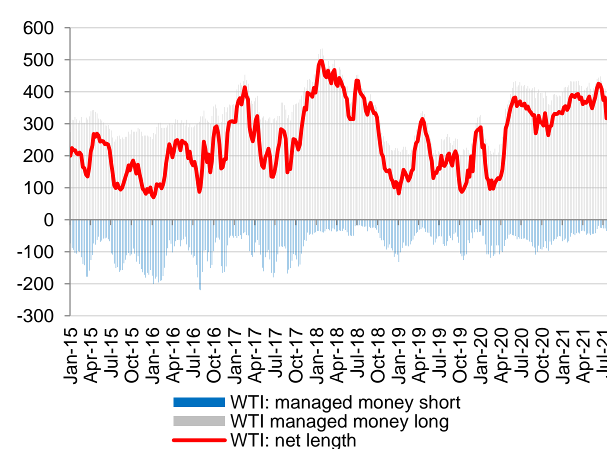
14 DAY RELATIVE STRENGTH INDEX (RSI) AND WTI
USD/B AND 0-100 INDEX (<30 = OVERSOLD; >70 = OVERBOUGHT)



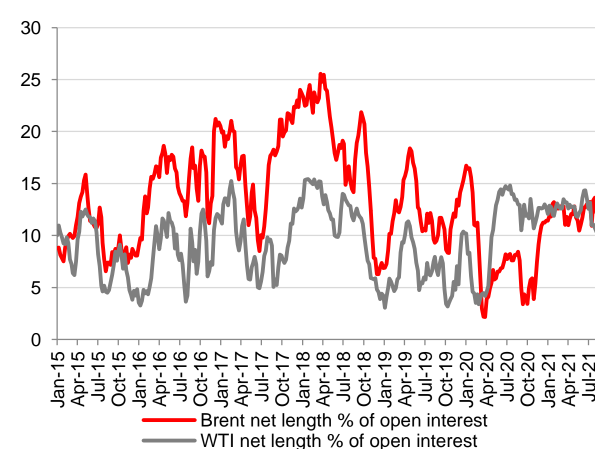
BRENT NET LENGTH MANAGED MONEY
CONTRACTS (THOUSANDS)



WTI NET LENGTH MANAGED MONEY
CONTRACTS (THOUSANDS)



NET LENGTH MANAGED MONEY / OPEN INTEREST
%

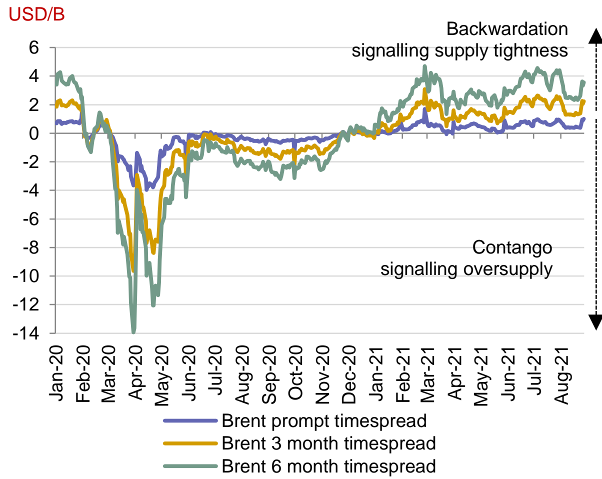


Source: Bloomberg, EIA, IEA, OPEC, MUFG Research

Core indicators – timespreads and futures

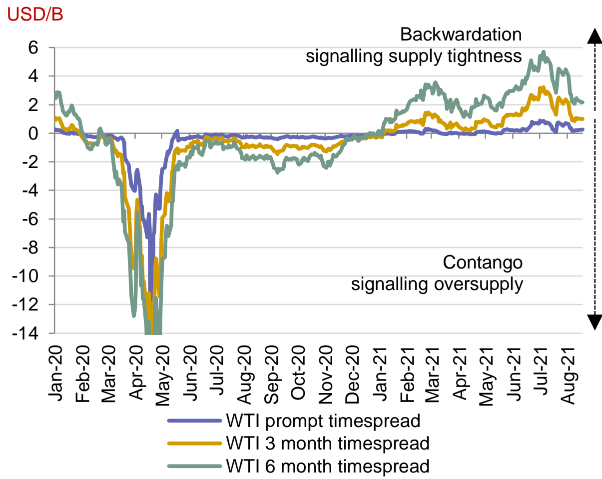
BRENT TIMESPREADS – FRONT, 3 A ND 6 MONTHS

USD/B



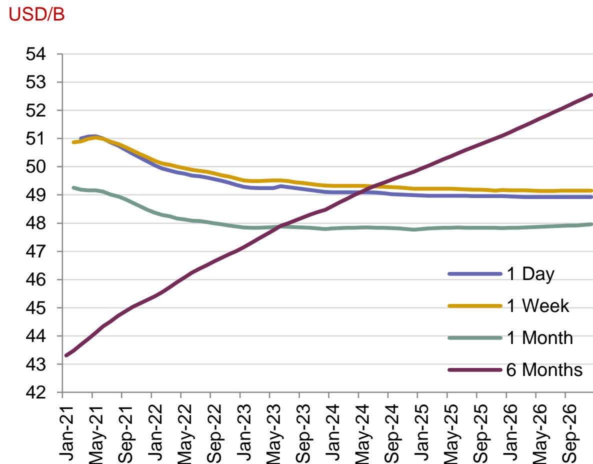
WTI TIMESPREADS – FRONT, 3 AND 6 MONTHS

USD/B



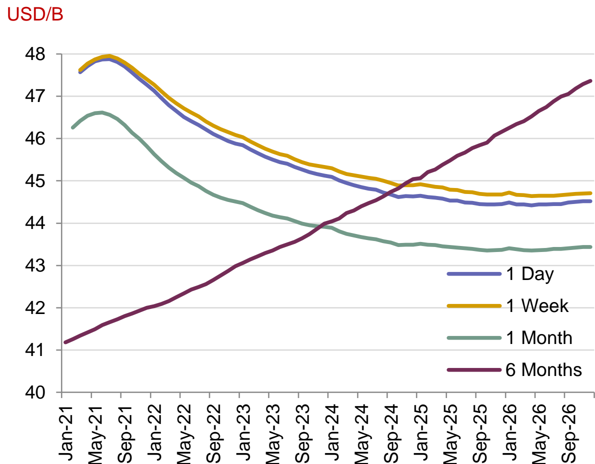
BRENT FUTURES CURVE

USD/B



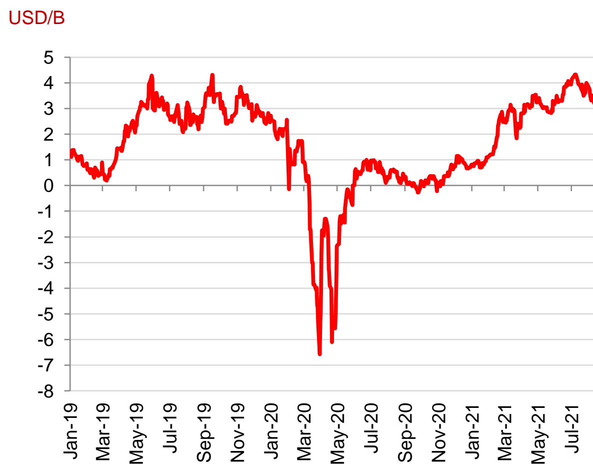
WTI FUTURES CURVE

USD/B



BRENT-DUBAI SPREAD

USD/B



BRENT-MURBAN SPREAD

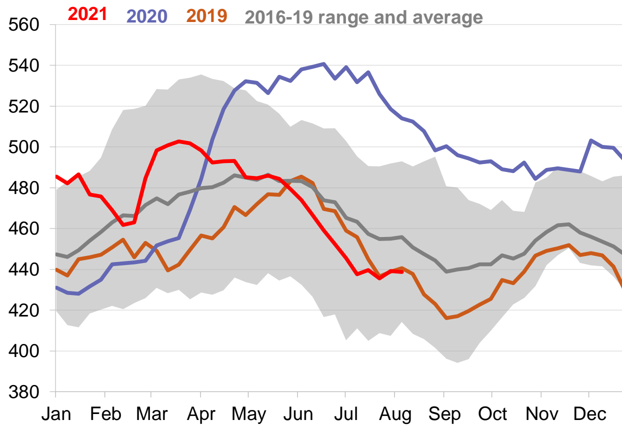
USD/B

Source: Bloomberg, EIA, IEA, OPEC, MUFG Research

Core indicators – inventories, storage and products

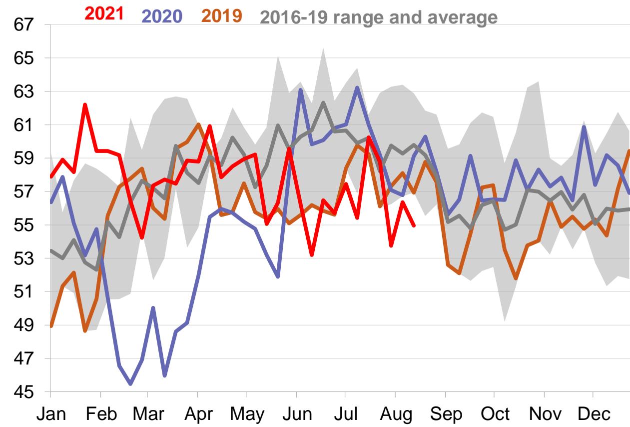
US CRUDE INVENTORIES

MILLION BARRELS



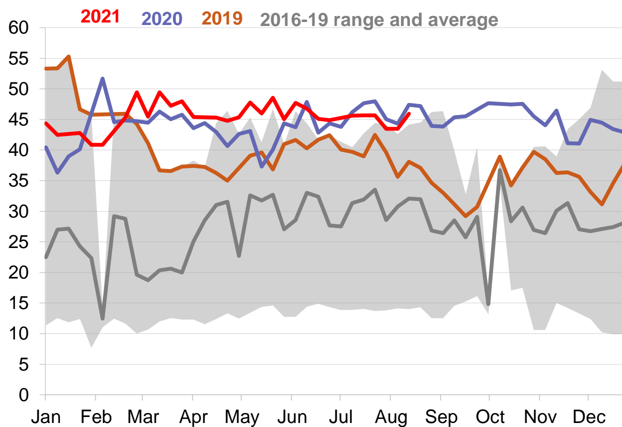
ARA CRUDE INVENTORIES

MILLION BARRELS



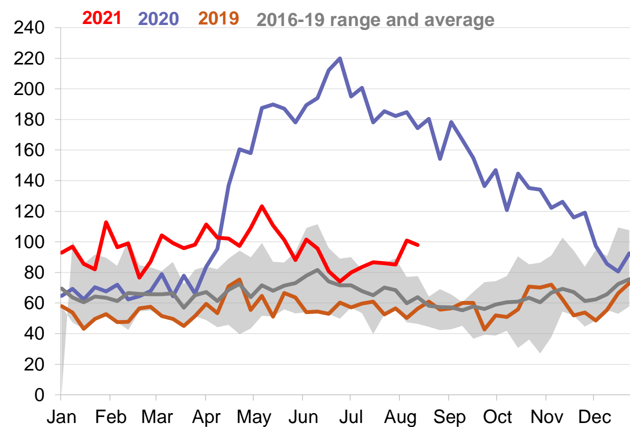
CHINA SHANDONG CRUDE INVENTORIES

MILLION BARRELS



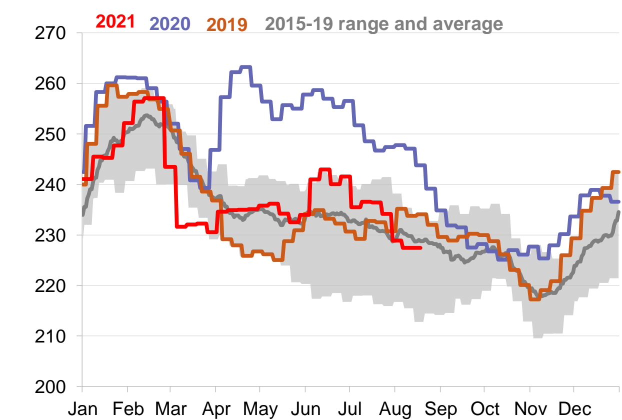
GLOBAL CRUDE FLOATING STORAGE

MILLION BARRELS



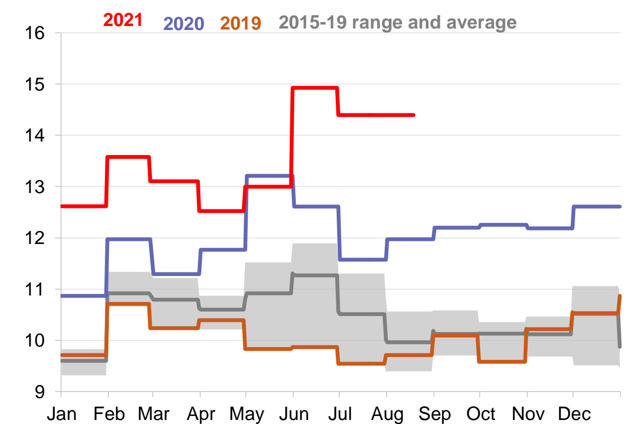
US GASOLINE INVENTORIES

MILLION BARRELS



JAPAN GASOLINE INVENTORIES

MILLION BARRELS



Source: Bloomberg, EIA, IEA, OPEC, MUFG Research

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