

Oil Tracker: Prices Retreat, Risks Remain

Brent crude prices retreated almost \$4/bbl from Monday's highs to \$77/bbl as China policymakers did not provide details on the size of stimulus, and as Israel continues to weigh its retaliation options. Geopolitical risk premium gauges also retreated somewhat this week after sharp increases last week in Brent implied volatility and in call options implied volatility skew.

While the development of the conflict remains uncertain, we see \$10-20/bbl of upside to Brent at the peak in the case of disruptions in Iranian production. The latest preliminary satellite-based data from Kpler suggest zero seaborne crude exports from Iran this week so far, but we note three caveats. First, high-frequency export data is volatile and prone to revisions. Second, Bloomberg reported satellite imagery from Sentinel Hub suggesting that Iran is still shipping some crude from Kharg Island. Third, potential precautionary export halts may rebound fast. Hence, in the absence of major disruptions to Iran oil production, we expect prices to stabilize around current levels this quarter.

Despite the price rally, our trackable net supply remained unchanged week-over-week as small dips in our Canada and Iran production nowcasts offset an increase in our Russia production nowcast. Faster draws in our OECD commercial stocks nowcast and last-week's rally narrowed the gap between the Brent 1M/36M timespread and its fair value. However, oil positioning still remains at its 1%, and its potential reversal can support prices.

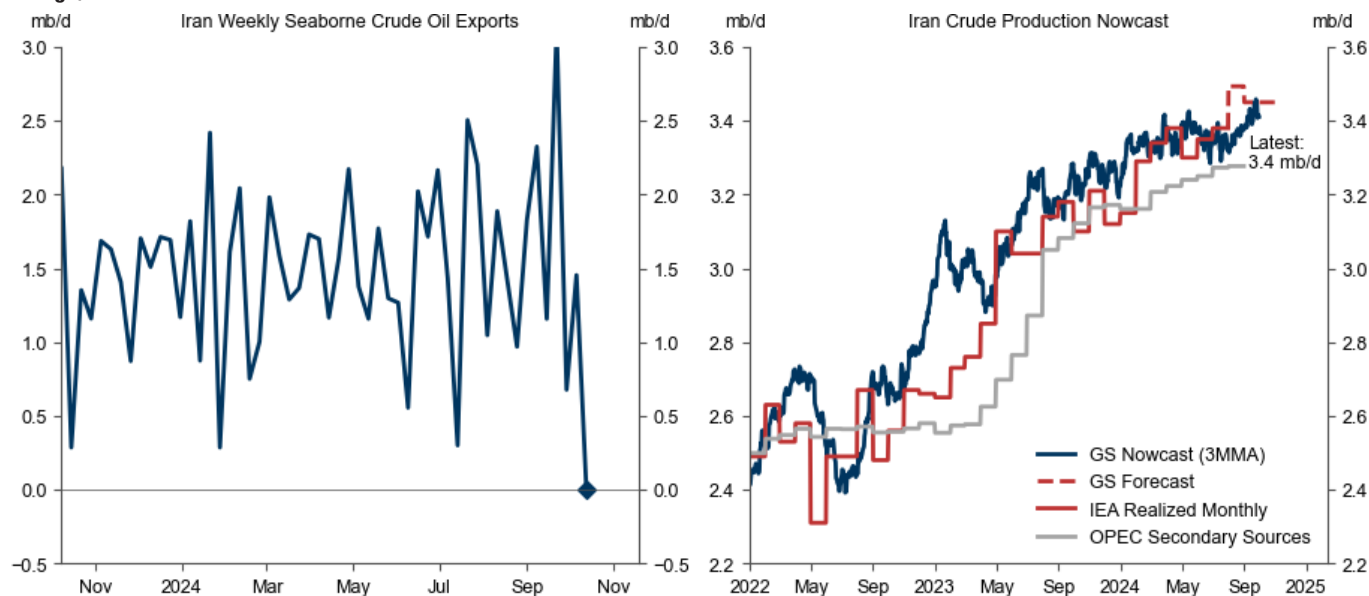
Yulia Zhestkova Grigsby
+1(646)446-3905 |
yulia.grigsby@gs.com
Goldman Sachs & Co. LLC

Daan Struyven
+1(212)357-4172 |
daan.struyven@gs.com
Goldman Sachs & Co. LLC

Callum Bruce, CFA
+1(212)902-3053 |
callum.bruce@gs.com
Goldman Sachs & Co. LLC

Chart of the Week

Exhibit 1: Preliminary Data Suggest That Iran Weekly Crude Exports Dropped to Zero So Far This Week, but Uncertainty Over Satellite Data Is High, and Our Iran Nowcast Points to Stable Crude Production



Source: Kpler, JODI, GTT, IEA, OPEC, Goldman Sachs Global Investment Research

Key Trends

- Using preliminary satellite-based data from Kpler, our chart of the week suggests that Iran weekly seaborne crude oil exports dropped to zero this week so far, with the caveats of potential delays and revisions in satellite data.
 - This measure of Iran weekly crude exports temporarily dropped to zero five times over the past three years as high-frequency export data is very volatile.
 - Our nowcast suggests that Iran crude production increased by 0.2mb/d over the past year.
 - Higher risks of Iranian crude exports disruptions tightened medium grades' crude bases and prompt timespreads last week.
- On the positive side for prices:
 - Our Canada liquids nowcast edged down by 0.1mb/d last week, while the US oil rig count decreased by 5.
 - Although Hurricane Milton's path avoided most of Gulf of Mexico oil fields, closures of many Gulf Coast ports can temporarily disrupt oil flows.
 - Our OECD commercial stocks declined by 10mb last week on larger draws in US products stocks.
 - Our global index of dirty (i.e. mostly crude) tanker freight rates rallied 31% over the last week.
 - Net managed money positioning edged up by 3mb last week and remains at the 1st percentile despite the last week rally.

- On the negative side for prices:
 - Our Russia liquids production nowcast increased again last week by 0.3mb/d as Russia's crude exports rebounded.
- The call options implied volatility skew jumped to its mid-April levels while Brent implied volatility surged above its model-implied fair value for the first time this year.

Exhibit 2: Our Trackable Net Supply Was Unchanged Week-on-Week

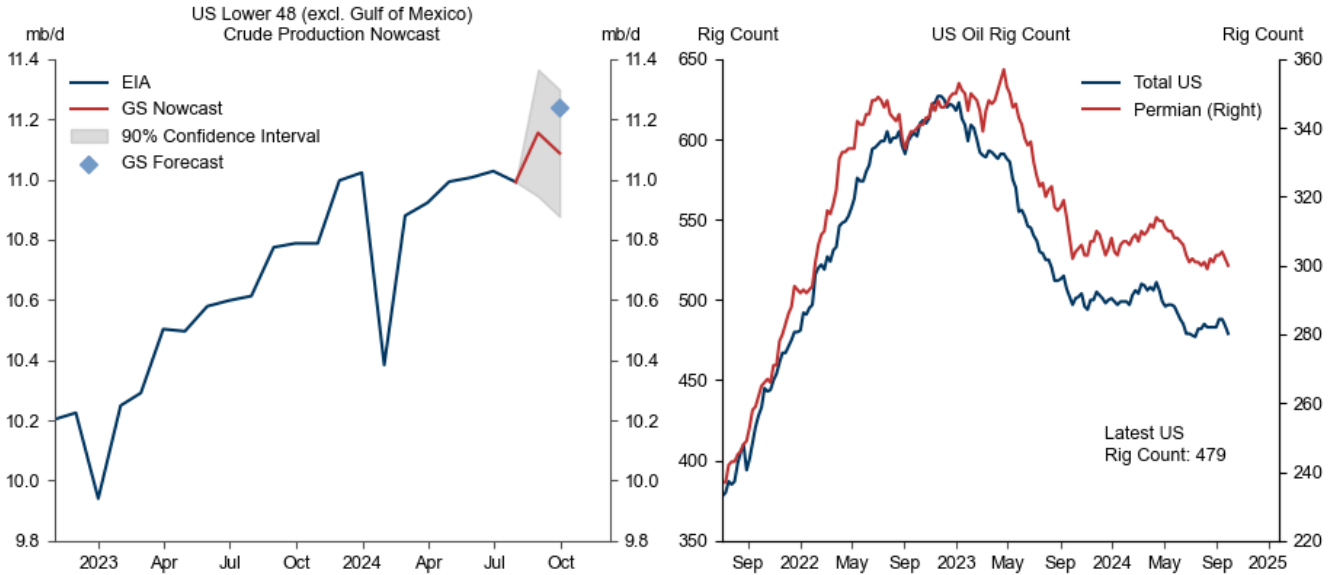
Indicator	Current value	Change from last week	Change from 4 weeks ago
Supply			
US Lower 48 crude nowcast (mb/d)	11.1	0.0	-0.1
Canada liquids nowcast (mb/d)	5.9	-0.1	-0.2
Russia liquids nowcast (mb/d)	10.9	0.3	0.6
Iran crude nowcast (mb/d)	3.4	-0.1	-0.2
Libya crude nowcast (mb/d)	0.5	-0.1	-0.6
Demand			
China oil (mb/d)	16.0	0.0	-0.1
OECD Europe oil	13.6	0.0	-0.6
Total change in trackable imbalance, Supply-Demand (mb/d)		0.0	0.2
Inventories			
OECD commercial stocks (mb)	2800	-10	-15
Global commercial stocks (mb)	4769	11	15
Timespreads			
Brent 1M/36M gap with fair value (pp)	-7	2	7
Average crude basis (% change in pp)	1.2	-0.2	-0.2
Average crude prompt timespread (% change in pp)	0.7	0.2	-0.2
Volatility			
Brent implied volatility gap with modeled fair value (pp)	4	3	9
Oil net managed money positioning (mb)	89	3	-14

Our 1- and 4-week changes are based on the real-time values recorded as of 1 week or 4 weeks ago. Red color highlights changes in our trackable imbalance that are bullish for prices, blue color highlights changes that are bearish for prices.

Source: Goldman Sachs Global Investment Research

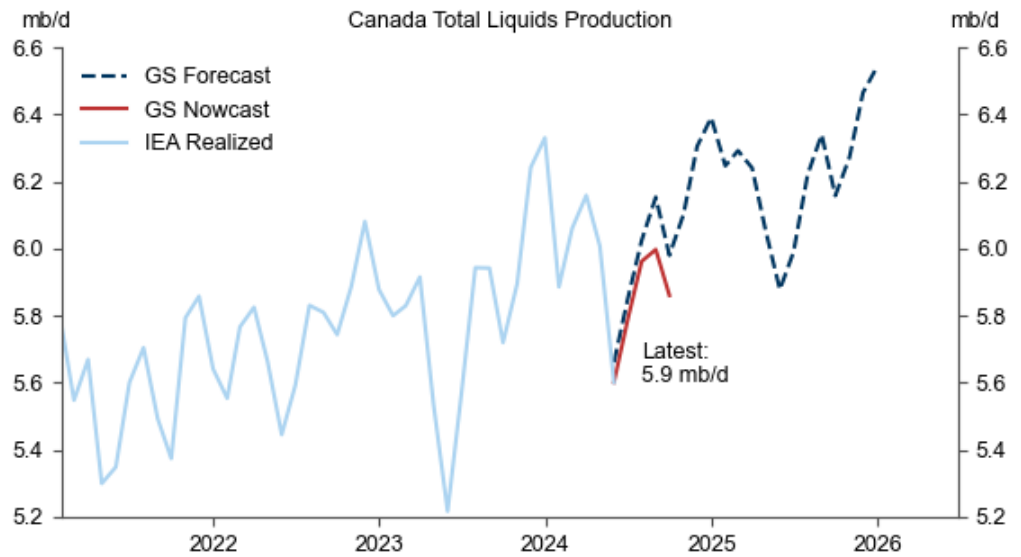
Supply

Exhibit 3: Our US Lower 48 (excl Gulf of Mexico) Crude Production Remained at 11.1mb/d Last Week (0.2mb/d Below Our September Expectation); the US Oil Rig Count Decreased by 5 to 479



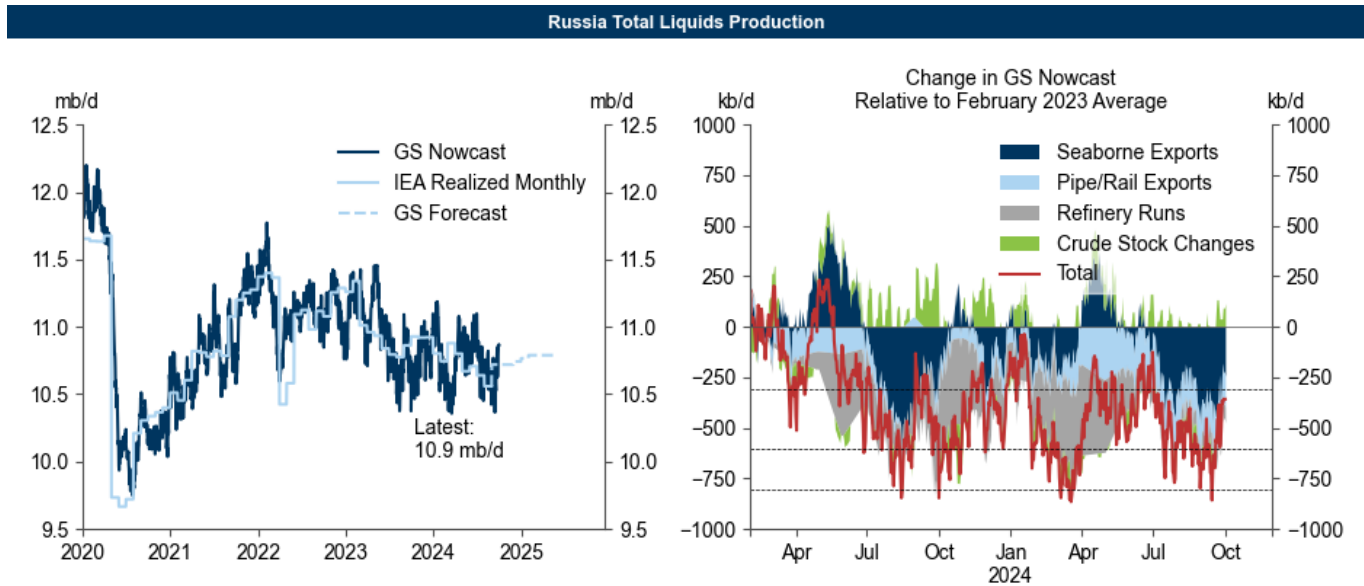
Source: EIA, Genscape, Baker Hughes, Haver Analytics, Bloomberg, Primary Vision, Goldman Sachs Global Investment Research

Exhibit 4: Our Canada Total Liquids Production Nowcast Edged Down by 0.1mb/d Last Week to 5.9mb/d, 0.1mb/d Below Our September Expectation



Source: IEA, AER, EIA, Kpler, IIR, Goldman Sachs Global Investment Research

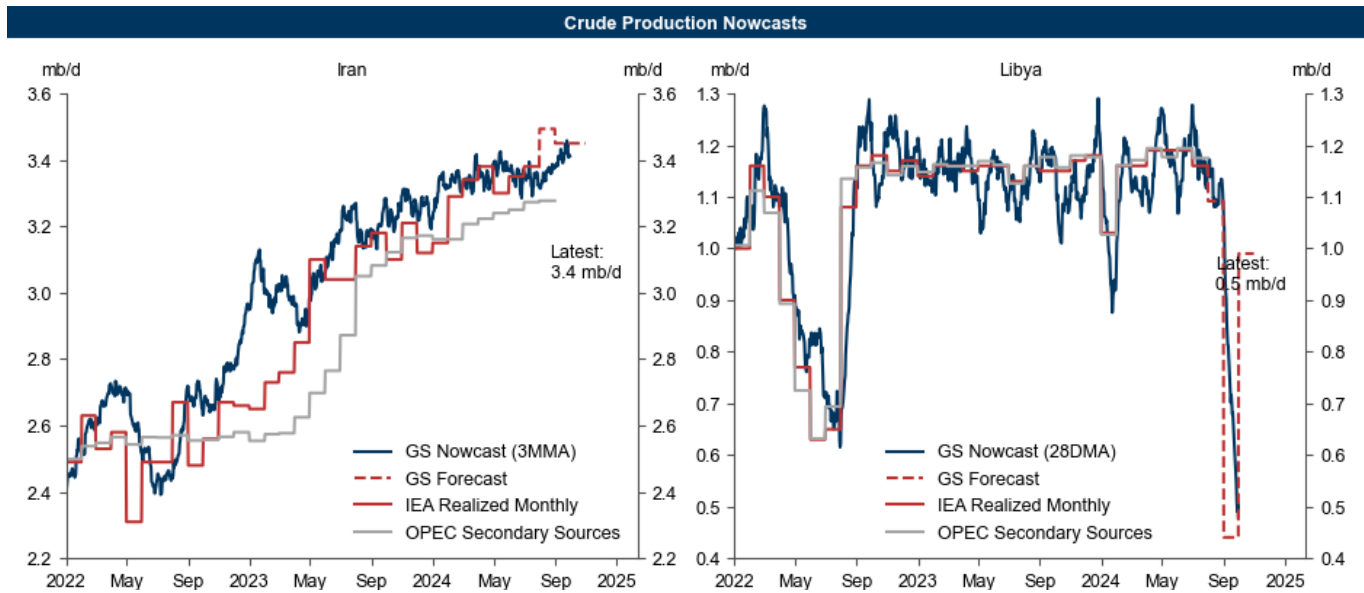
Exhibit 5: Our Russia Production Nowcast Increased by 0.3mb/d Last Week to 10.9mb/d on Higher Seaborn Exports, and Now Stands 0.1mb/d Above Our October Expectation



Nowcast is a 28-day moving average. Dashed lines on the right show pledged cuts of 0.5, 0.8, and 1.0mb/d cumulatively vs. revised February 2023 level. The combination of output (0.5mb/d) and export (0.5mb/d) cut pledges creates uncertainty about the size of the total supply cut pledge. The war may reduce the ability to measure maintenance and refinery runs in Russia. We have limited visibility of stock changes from the satellite data as a large share of Russia's stocks is stored within the pipeline system. As a result, we may underestimate reallocation of crude to stocks after the recent refinery attacks, and thus understate production.

Source: IEA, Petro-Logistics, Kpler, IIR, Goldman Sachs Global Investment Research

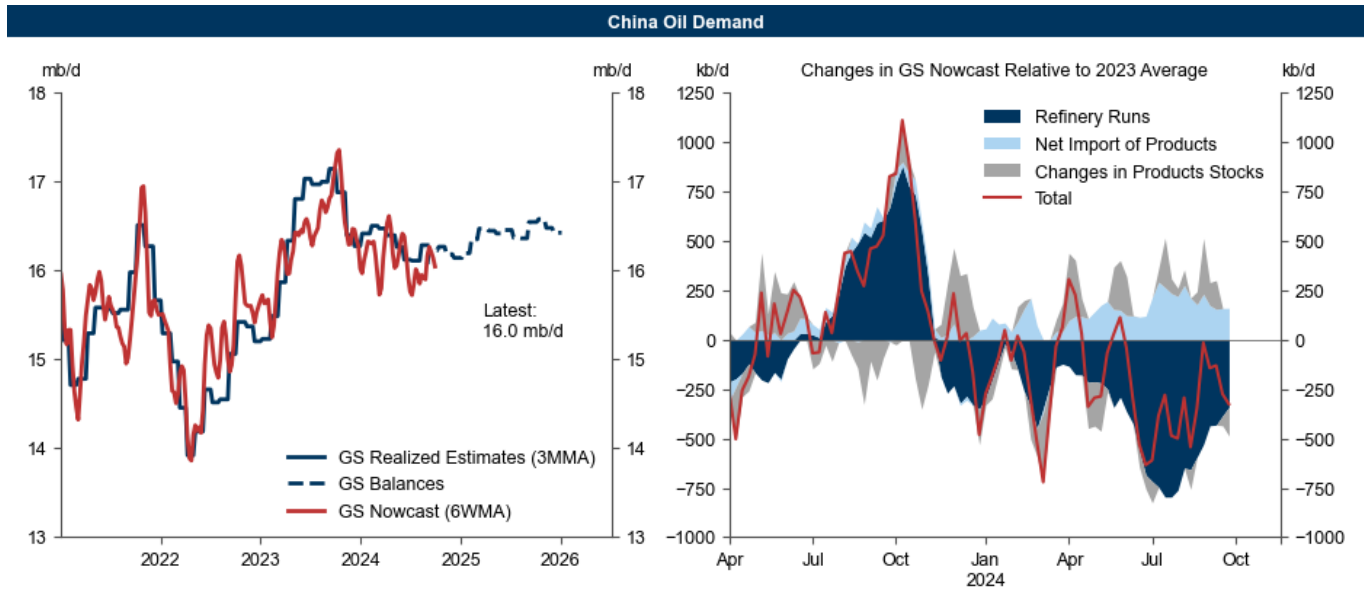
Exhibit 6: Our Iran Crude Production and Libya Crude Production (28-Day Moving Average) Nowcasts Both Edged Down by 0.1mb/d Last Week to 3.4mb/d and 0.5mb/d, Respectively, in Line With Our September Expectations



Source: Kpler, JODI, GTT, IEA, OPEC, Goldman Sachs Global Investment Research

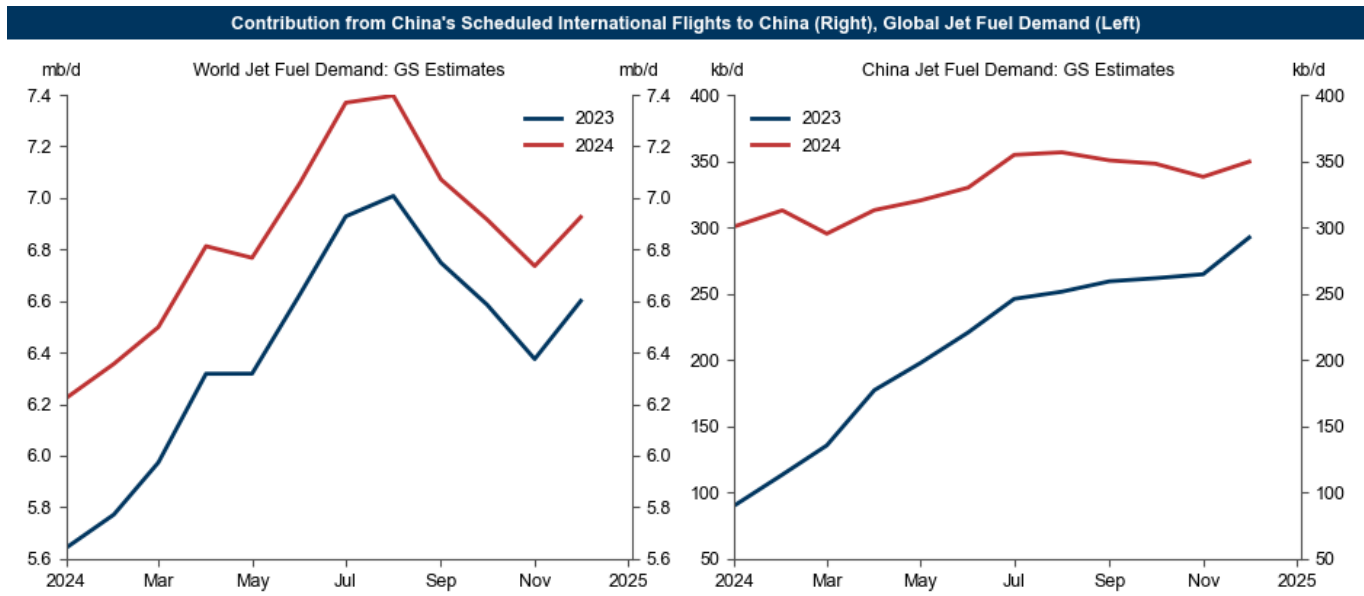
Demand

Exhibit 7: Our China Oil Demand Nowcast Remained at 16.0mb/d Last Week and Stands 0.2mb/d Below Our September Expectation



Source: IEA, S&P, Kpler, GTT, Oilchem, MySteel, Bloomberg, Goldman Sachs Global Investment Research

Exhibit 8: We Expect Global Jet Fuel Demand to Pickup on Holiday Traveling After the November Dip

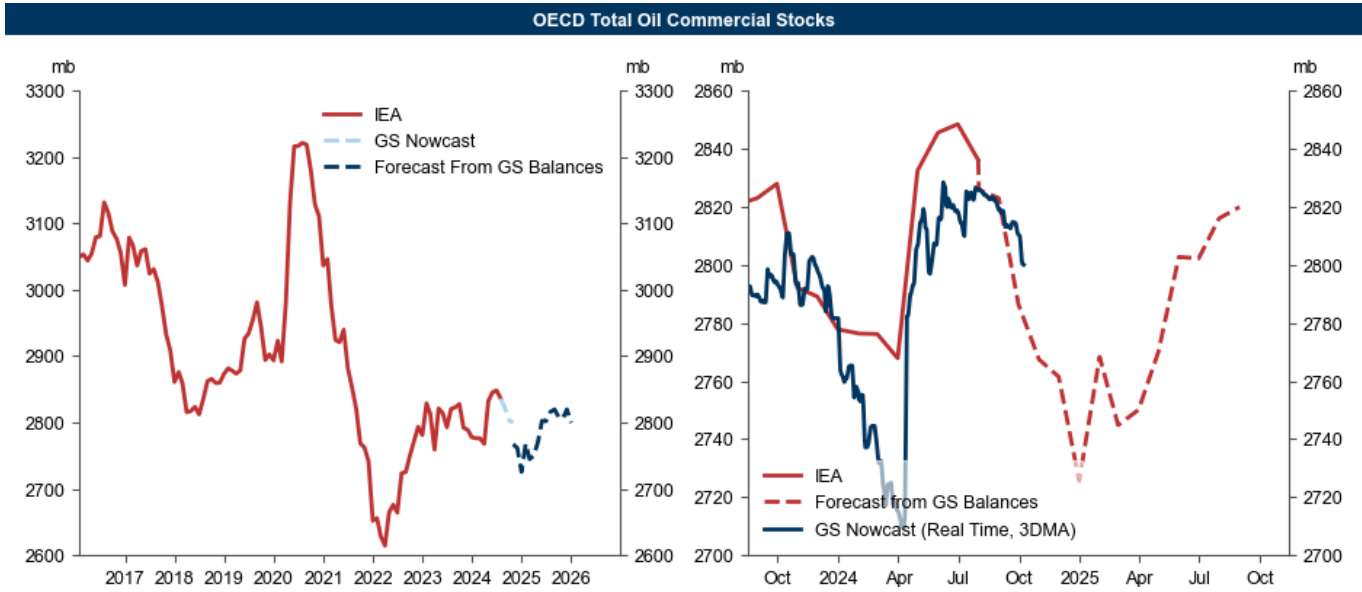


RHS: Left axis is scaled by 2 because only half of the total fuel demand from international China flights enters China demand.

Source: OAG, IEA, JODI, Goldman Sachs Global Investment Research

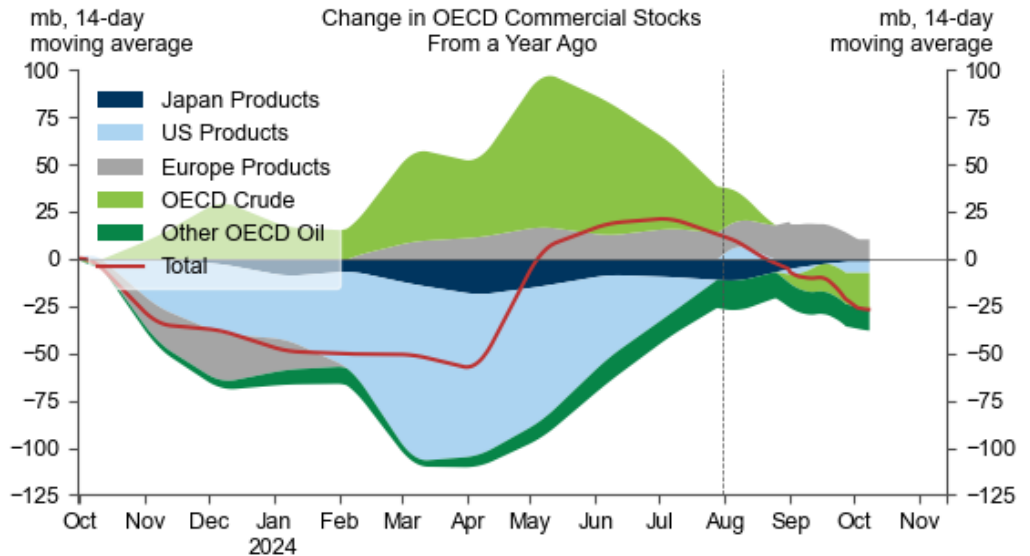
Inventories

Exhibit 9: Our OECD Total Oil Commercial Stocks Nowcast Decreased by 10mb Last Week to 2,800mb and Now Stands 33mb Above Our End-of-October Balance Forecast of 2,767mb



Source: IEA, Kpler, DOE, Euroilstocks, ARA PJK, PAJ, Haver, Goldman Sachs Global Investment Research

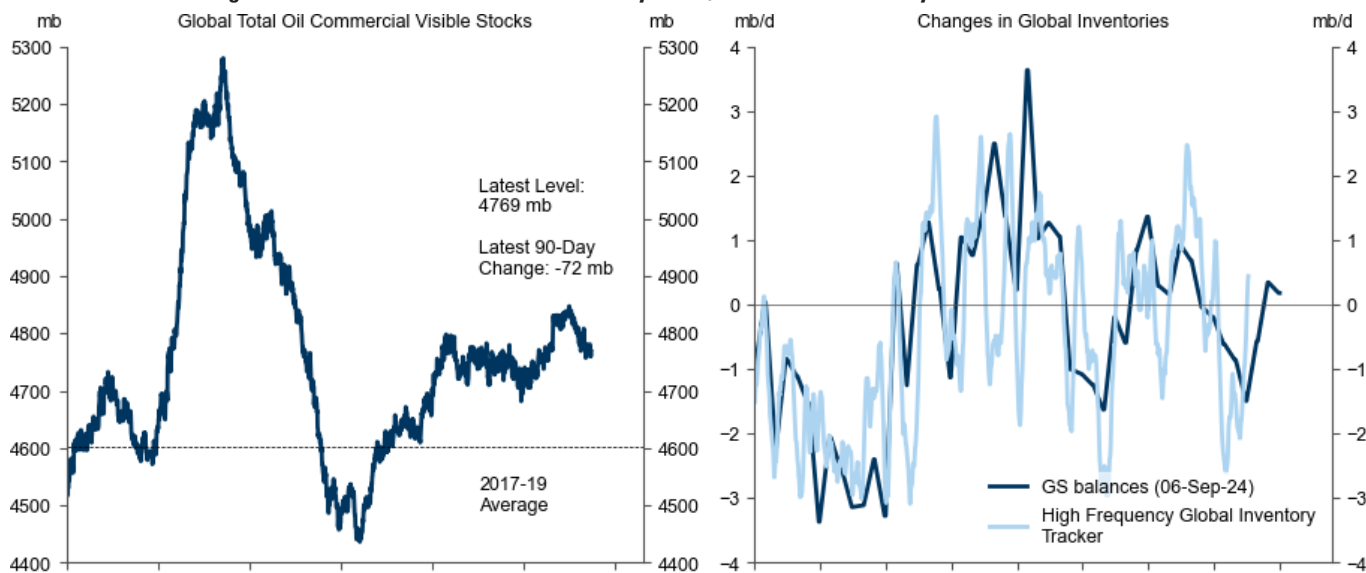
Exhibit 10: Our OECD Commercial Stocks Nowcast Is Down 27mb From Its October 2023 Level



The dotted line indicates the latest realized observation from the IEA (end of June).

Source: IEA, Kpler, DOE, Euroilstocks, PAJ, ARA PJK, Haver, Goldman Sachs Global Investment Research

Exhibit 11: Our Tracking of Global Oil Commercial Stocks Drew by 0.8mb/d Over the Last 90 Days



LHS: The chart shows the sum of all data available through the coverage period of the last US DoE Weekly Petroleum Report, and assumes a few datapoints not reported yet remain stable (by forward-filling). RHS: GS Balance series is a 28-day moving average of monthly balances. The high frequency global inventory tracker is a 28-day change, 14-day moving average that uses all visible crude and product stocks data with rescalings to estimate invisible stocks. Areas of coverage include the US, ARA (Antwerp-Rotterdam-Amsterdam) in Europe, Fujairah in the Middle East, and Singapore and the locations covered by Longzhong in China.

Source: Kpler, DOE, Euroilstocks, ARA PJK, PAJ, Singapore Enterprise, Fujairah, OilChem, Goldman Sachs Global Investment Research

Exhibit 12: Global Total Oil Commercial Visible Stocks Edged Up by 11mb (0.2%) Last Week on Larger EM Crude Stocks and Are Now Up 15mb (0.3%) From 4 Weeks Ago (Although Uncertainty Around Satellite Data Is Always Significant)

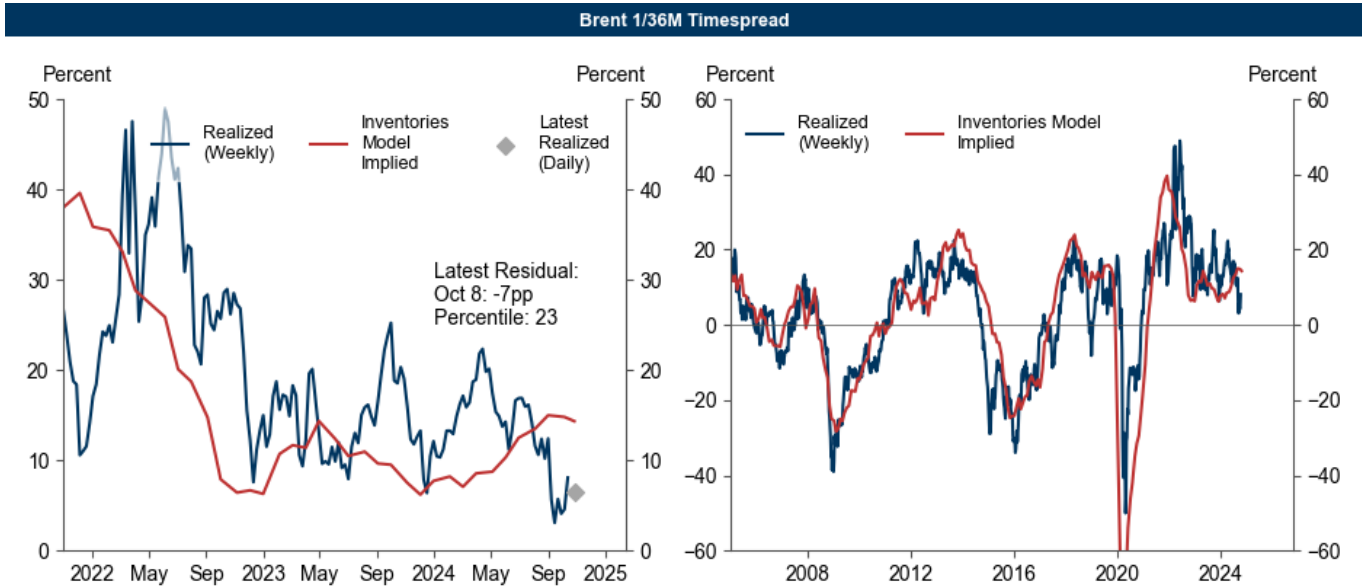
Global Total Oil Commercial Visible Stocks						
Timely Stocks Data	Region	Change From Week Ago		Change From 4 Weeks Ago		Last Date of Most Recent Coverage
		in mb	in %	in mb	in %	
Kpler Crude	DM	-3	-0.3	-7	-0.7	10/4/2024
	EM	12	0.8	-2	-0.2	10/4/2024
DOE Products	US	-5	-0.6	-2	-0.2	9/27/2024
Euroilstocks Products	Europe	0	0.0	12	2.1	8/31/2024
ARA Products	Netherlands and Belgium	0	0.1	2	3.7	9/29/2024
PAJ Products	Japan	2	3.0	5	8.3	9/28/2024
Singapore Enterprise Products	Singapore	3	7.6	-3	-6.9	9/29/2024
Fujairah Products	UAE	0	2.5	-2	-11.0	9/30/2024
Longzhong Products	China	0	0.0	0	0.1	9/25/2024
Kpler Oil on Water	DM	-5	-3.4	-13	-8.9	10/4/2024
	EM	6	1.3	25	5.6	10/4/2024
Total Landed Crude		9	0.4	-9	-0.4	
Total Landed Products		1	0.0	12	0.7	
Total Oil on Water		1	0.2	12	2.0	
Total Oil		11	0.2	15	0.3	

The chart shows all the visible stocks released through this week.

Source: Kpler, DOE, Euroilstocks, ARA PJK, PAJ, Singapore Enterprise, Fujairah, OilChem, Goldman Sachs Global Investment Research

Prices

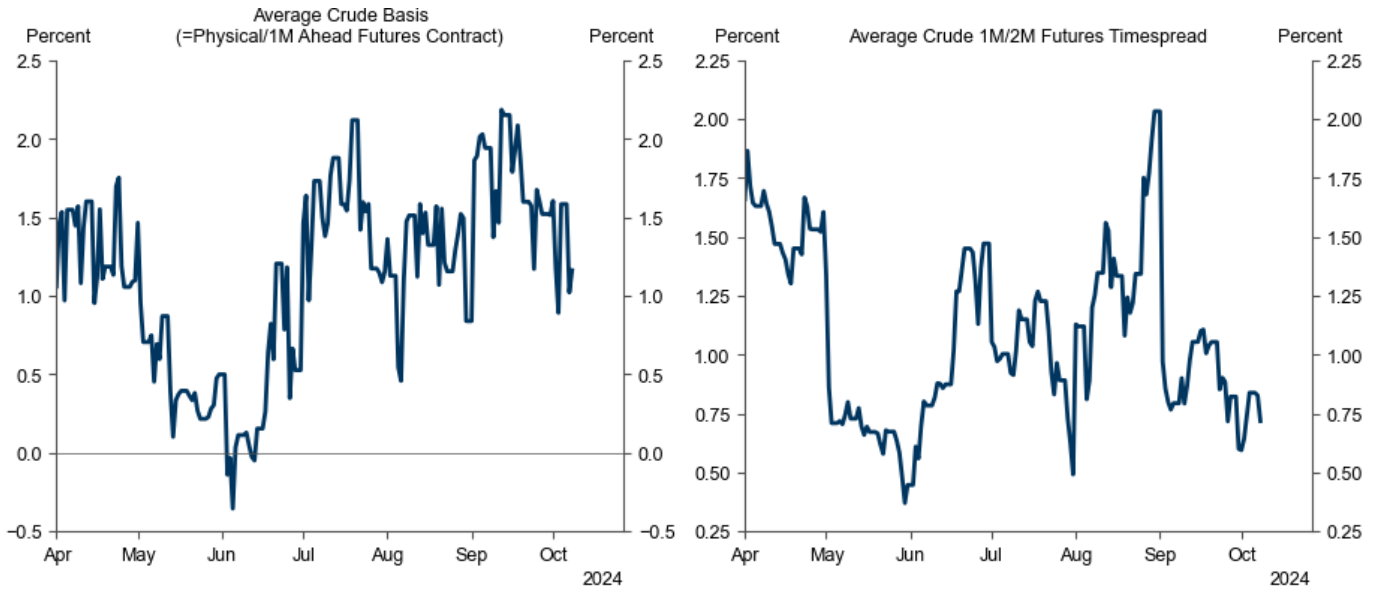
Exhibit 13: The Gap Between the Brent 1/36M Timespread and Its Inventory-Implied Fair Value Narrowed by 2pp to -7pp, Recovering to the 23rd Percentile



We report the percentile of the timespread's residual in a sample from January 1st, 2005 till the most recent observation.

Source: IEA, CME, Goldman Sachs Global Investment Research

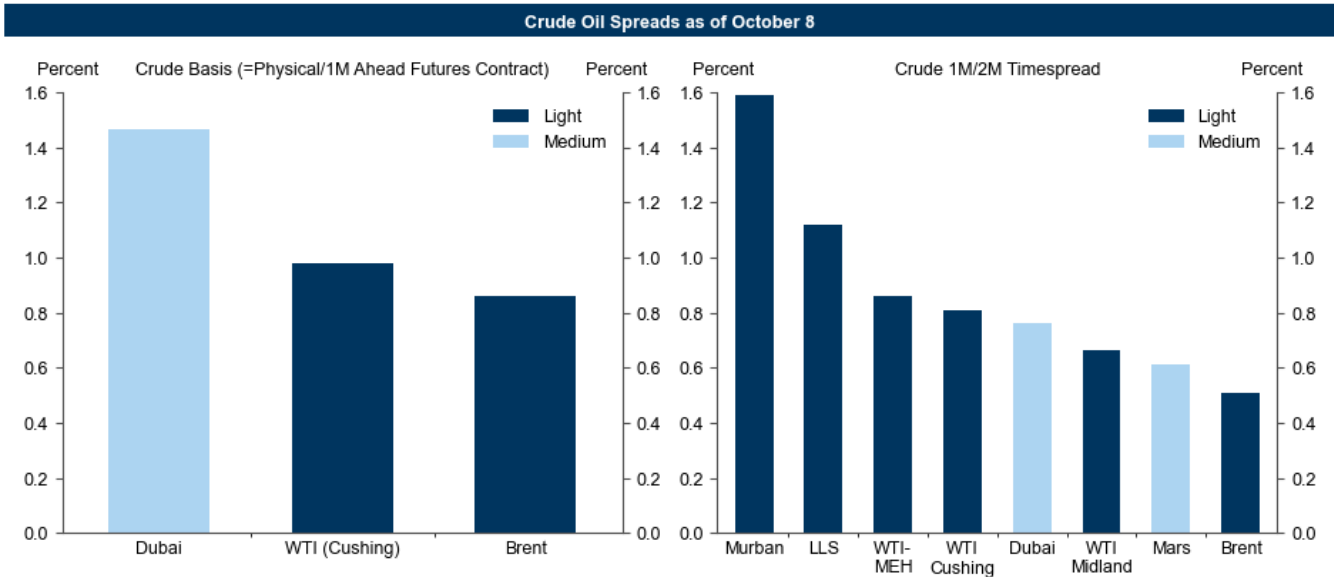
Exhibit 14: The Average Crude Basis Decreased Last Week by 0.2pp, While the Prompt Timespread Increased by 0.2pp



Basis represents the difference (in % of 1M ahead futures) between spot physical crude futures and 1M ahead financial futures. We include Brent, Dubai, and WTI in crude basis on the left panel and Brent, Dubai, WTI, Mars, Midland, LLS, and WTI-MEH in 1M/2M timespreads on the right panel. We construct average crude spreads by first taking an unweighted average of crude types within a region and then taking a production-weighted average across regions.

Source: Platts, CME, Goldman Sachs Global Investment Research

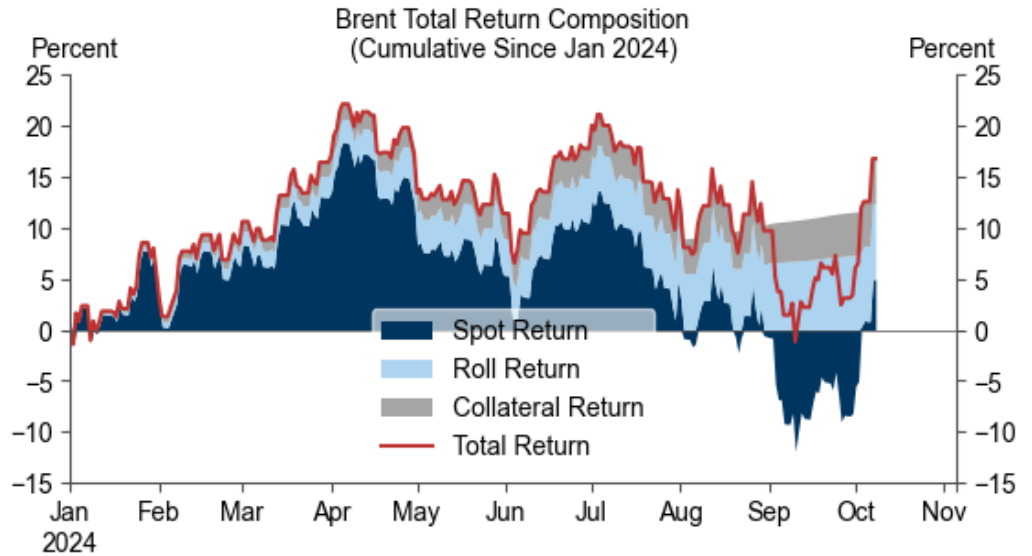
Exhibit 15: Higher Risks of Iranian Crude Exports Disruptions Tightened Medium Grades' Crude Bases and Prompt Spreads Last Week



We measure WTI Cushing crude basis as WTI Calendar Delta in percent of 1M ahead WTI futures.

Source: Platts, CME, Goldman Sachs Global Investment Research

Exhibit 16: The Total Return on Brent Futures Jumped 10.7pp Last Week to 16.8% Year-to-Date

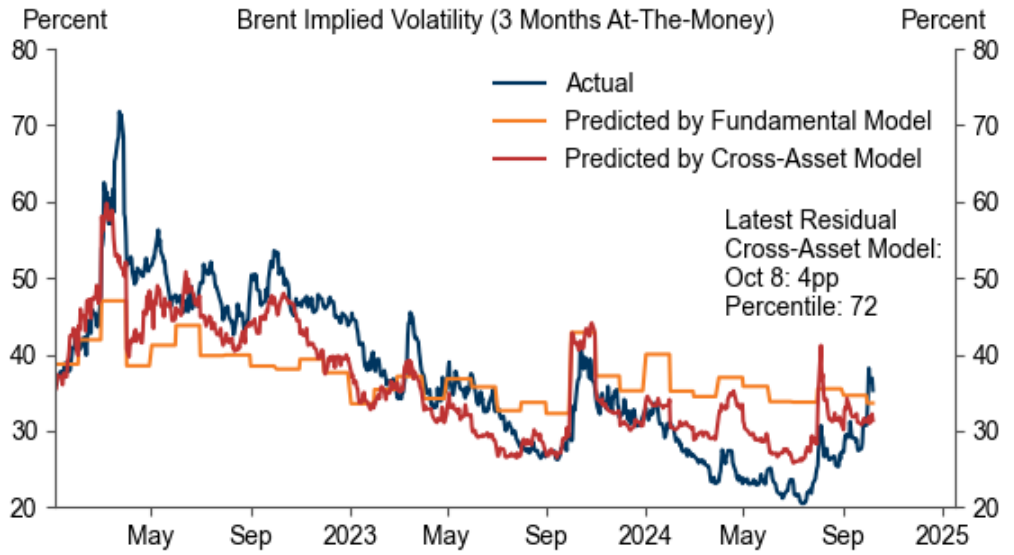


The collateral return corresponds to the interest earned on a hypothetical fully collateralized contract position on Brent futures.

Source: Platts, Haver, ICE, Goldman Sachs Global Investment Research

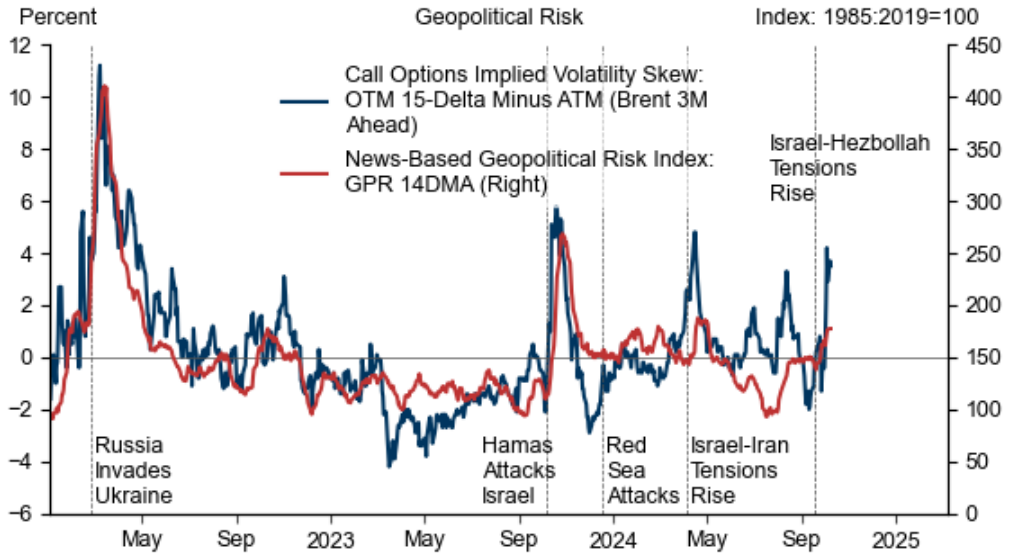
Volatility and Geopolitical Risks

Exhibit 17: The Gap Between Brent Implied Volatility and Its Modeled Fair Value Jumped by 3pp to 4pp Last Week (the 72nd Percentile)



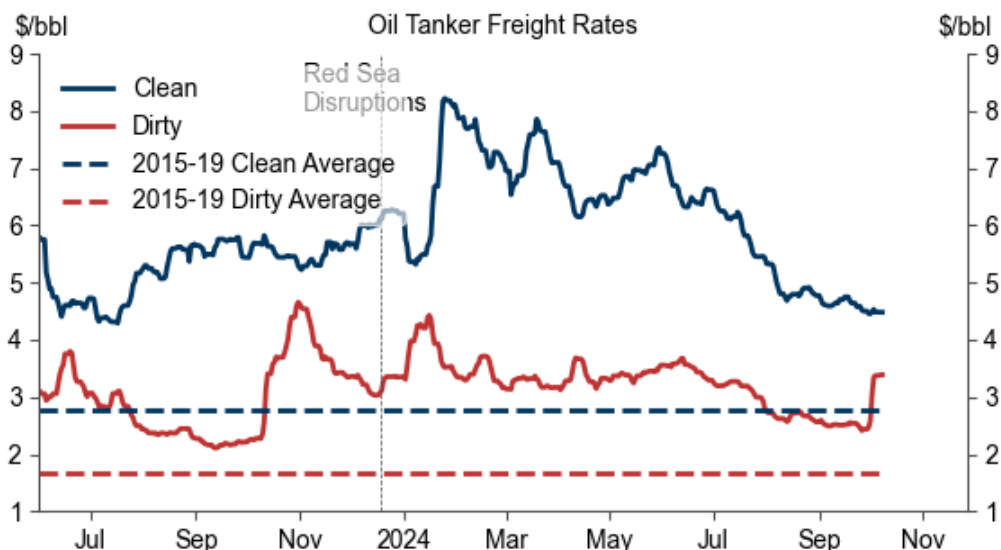
Source: ICE, Goldman Sachs Global Investment Research

Exhibit 18: The Call Implied Volatility Skew Jumped by 2.8pp Last Week to 3.5%



Source: Federal Reserve Board, ICE, Goldman Sachs Global Investment Research

Exhibit 19: The Average Global Clean Oil Tanker Freight Rate Jumped by 31% Last Week to \$3.4/bbl



Freight rates are a simple average across global routes.

Source: Refinitiv Eikon, Goldman Sachs Global Investment Research

Performance of Open Trade Recommendations

Exhibit 20: We Continue to Recommend a Long Position in Distillate Cracks Reflecting Our Structurally Bullish View on Refining

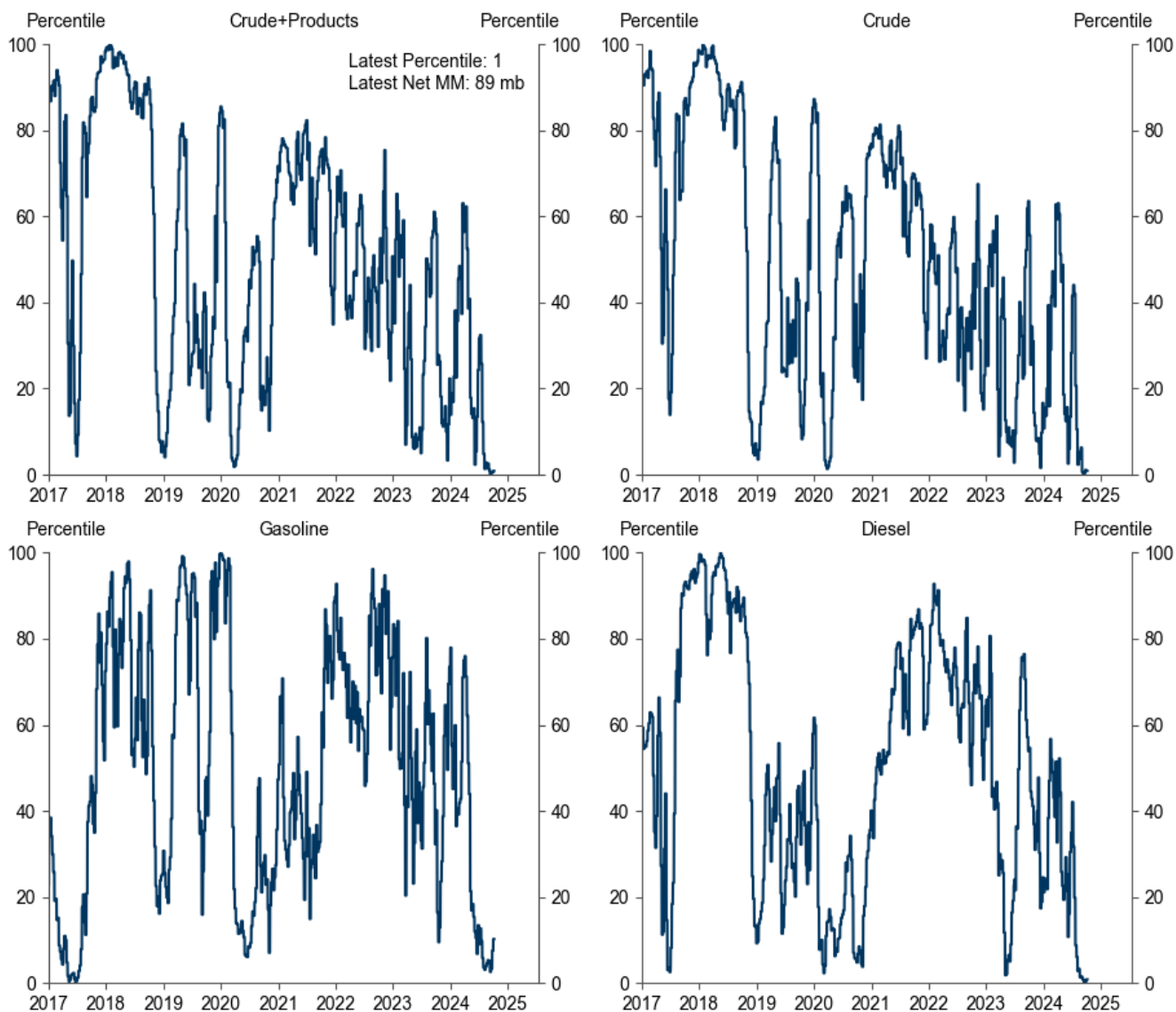
Open Trade Performances (\$/bbl)						
Trade Name	Trade Specification	Opening Date	Value at Opening	Current Level	Change Since Opening	7-Day Change
Structurally Strong Diesel	Long Dec-24 NW European (ARA) Gasoil-Brent Cracks	2024-03-11	23.58	17.58	-5.99	1.93
Performance of Trades Closed Since Jan 1st 2024 (\$/bbl)						
Trade Name	Trade Specification	Opening Date	Value at Opening	Closing Date	Value at Closing	Profit at Closing
Summer Gasoline Tightness	Long summer (2Q24 & 3Q24) EBOB gasoline-Brent cracks	2023-10-03	11.44	2024-02-06	17.28	5.84
OPEC Range Summer24	Short Jun24 Brent \$70 put, long \$80/\$90 call spread	2023-12-17	-0.22	2024-02-25	2.29	2.51
Constructive Crude	Long Dec24 Brent	2022-09-27	71.25	2024-03-13	79.69	8.44
OPEC Range Winter24 Short Put	Short Dec24 Brent \$70 put	2024-02-23	4.26	2024-03-13	3.07	1.19
Summer24 Deficit	Long Aug/Sep-24 Brent spreads	2023-11-16	0.26	2024-04-07	0.96	0.70
OPEC Range Winter24	Long Dec24 Brent \$80/\$90 call spread	2024-02-23	3.30	2024-06-25	4.43	1.13

Source: Goldman Sachs Global Investment Research

Positioning

Exhibit 21: Total Oil Net Managed Money Edged Up by 3mb Last Week but Remains at the Very Low 1st Percentile (in a Sample From 2011)

Oil Net Managed Money as a Percent of Open Interest



We report the percentile of net managed money, not including other reportables, for Brent, WTI, Nymex HO, Nymex RBOB, and ICE Gasoil as a percent of open interest in a sample from January 1st, 2017 till the most recent observation.

Source: CFTC, Refinitiv Eikon, Goldman Sachs Global Investment Research

Methodology Notes for GS High Frequency Oil Indicators

- Russia total liquids production nowcast:** Our Russia supply nowcast estimates total liquids production as the sum of refinery runs, crude stock changes at ports and refineries, and crude seaborne and pipeline exports (latest methodology [here](#)).
- US Lower 48 crude production nowcast:** Our Lower 48 crude production nowcast includes all crude production from the US excluding Alaska and the Gulf of Mexico. We estimate crude production using daily pipeline-implied flows from Genscape, equipment needed to fracture oil wells (frac spreads), and the gap between official

EIA and pipeline-based production estimates (latest methodology [here](#).)

- 3. Iran crude production nowcast:** Our Iran supply nowcast estimates crude production as the sum of tracked crude exports, untracked crude exports, refinery intake of crude, and changes in crude inventories (latest methodology [here](#)).
- 4. Libya crude production nowcast:** Our Libya supply nowcast estimates crude production as the sum of tracked crude exports, refinery intake of crude, and changes in crude inventories.
- 5. Canada total liquids production nowcast:** Our Canada supply nowcast estimates total liquids production using changes in Alberta production and changes in implied production defined as the sum of exports, refinery runs, and changes in crude inventories (latest methodology [here](#))
- 6. OPEC model implied probability:** Our estimated probability of OPEC production decision is based on an unweighted average of five ordered multinomial logit models that regress OPEC decisions to decrease, hold, or increase production on OECD commercial stocks, cyclical oil price moves, Saudi's market share, and speculative positioning (latest methodology [here](#)).
- 7. China demand:** We perform a bottom-up nowcast of China oil products demand as the sum of refinery runs, net products imports, and product stock draws. We model monthly changes in S&P refinery runs as a function of monthly changes in refinery utilization rates from Mysteel, and monthly changes in capacity utilization from IIR. We then estimate model-implied 4-week changes in weekly refinery runs from 4-week changes in the 4-week moving average of refinery utilization rates and slow-moving changes in capacity. We initialize our refinery runs nowcast to match the level of "realized" refinery runs over the last 2 years. Similarly, we model changes in GTT net imports of products as a function of monthly changes in Kpler net imports of the corresponding products. We smooth the final nowcast using a 2-week moving average (latest methodology [here](#)).
- 8. OECD Europe demand:** We estimate OECD Europe demand based on demand in the EU4 (Germany, France, Spain and Italy), and incorporate jet demand using our jet fuel demand model. Our nowcast uses timely inputs on oil markets (e.g. refinery runs), macro activity (e.g. PMIs), fuel retail sales, preliminary national oil demand releases, and flight schedules (latest methodology [here](#)).
- 9. Jet demand:** Our methodology for measuring jet fuel demand uses global commercial flight schedule data combined with our aircraft efficiency database. We further calibrate this model on monthly IEA/JODI/Woodmac jet-type kerosene demand data for the OECD and a handful of other countries to estimate non-commercial flight demand (latest methodology [here](#)).
- 10. Global total oil commercial visible stocks:** We add up all visible oil stocks for both crude and products without any rescaling. Our data includes onshore crude stocks, crude oil on water, products on water, and measures of products stocks at various locations. The locations are the US, 16 European Majors, ARA (Antwerp-Rotterdam-Amsterdam) in Europe, Japan, Fujairah in the Middle East, and Singapore and the locations covered by Longzhong in China. The China Longzhong stocks cover all stocks except for those at SOE refineries, gas stations, and the

national strategic reserves.

- 11. OECD commercial stocks:** Our OECD commercial stocks nowcast consists of several region- and product-specific models, which regress IEA monthly historical data on high frequency stocks measures. We model monthly changes in OECD commercial stocks components using relevant high-frequency stocks and trade data, seasonality, Covid effects, and lagged stock changes for products (latest methodology [here](#)).
- 12. Brent timespreads:** We estimate timespreads using our OECD commercial stocks nowcast and our OECD demand forecast. We estimate Brent 1/36M timespreads based on the historical relationship with 1-4M ahead OECD commercial stocks as days of demand covered (DoDC) vs their 5-yr average after accounting for the impact of 3-Year US Treasury yields. We keep stocks as DoDC vs their 5-yr average constant over the next 1-4 months at the most recent observation based on our nowcast (latest methodology [here](#)). Finally, we remove March 2020-February 2023 observations from our sample to calculate the 5-year average for OECD commercial stocks DoDC.
- 13. Brent implied volatility:** We estimate two linear regression models for the fair value of Brent implied volatility. The fundamental model uses the GS Current Activity Indicator for the US (excluding Mar 2020-Aug 2020 outliers), deviations in OECD inventories, global spare capacity, oil balances volatility, and the geopolitical risk index. Our cross-asset model extends the fundamental model by incorporating high frequency perceptions of macroeconomic volatility via S&P 500 implied volatility (latest methodology [here](#)).
- 14. Release lags for nowcasts using Kpler exports and inventories data:** Given the frequent and sizable revisions to the early vintages of high frequency data, we wait 3 and 7 days before publishing nowcasts using high frequency inventories and exports Kpler data, respectively.

Disclosure Appendix

Reg AC

We, Yulia Zhestkova Grigsby, Daan Struyven and Callum Bruce, CFA, hereby certify that all of the views expressed in this report accurately reflect our personal views, which have not been influenced by considerations of the firm's business or client relationships.

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