OIL ANALYST

High Freight Costs: Wide Crude Differentials, High Product Prices

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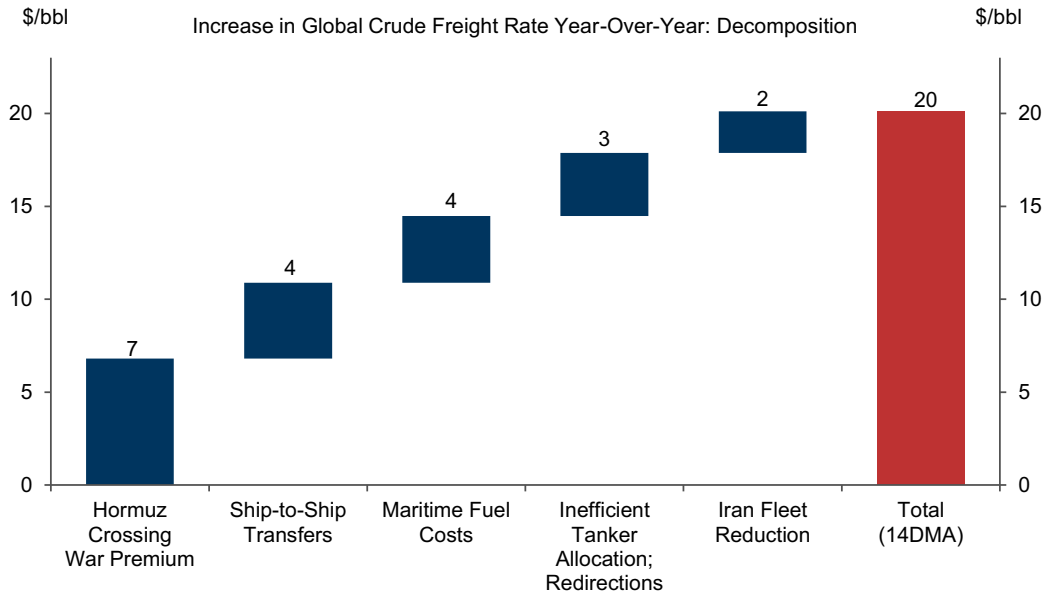
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- The global average crude freight rate surged above $20/bbl from $3/bbl a year ago. The rally in crude freight rates initially began in the very large crude carrier (VLCC) segment and on Middle Eastern routes, but it has spread to all major crude trading routes, particularly affecting long-haul voyages. While most traded crude benchmarks do not directly include transportation costs in their prices (i.e., are priced on a Free-on-Board basis), high freight rates may reduce refiners' overall demand for crude and/or skew it towards more closely located crude suppliers. We analyze the drivers of near record-high crude freight rates and the implications for crude producers and refiners.
- While global freight rates have edged down over the last few days—likely on an easing in the risk premium—the global average remains seven times higher than a year ago. Focusing on freight fundamentals, we identify five drivers of the $20/bbl year-over-year surge in the average global crude freight rate (14DMA) that will likely continue to support global freight rates as long as the conflict on the Middle East persists: 1) a high war risk premium in Hormuz (accounting for $7/bbl or 1/3 of the increase in the global average crude freight rate), 2) ship-to-ship transfers outside the Persian Gulf that tie up tankers for longer (accounting for $4), 3) higher maritime fuel prices (accounting for $4), 4) inefficient tanker allocation and an increase in tanker redirections (accounting for $3), and 5) the blockage of the Iranian fleet, which boosts demand for non-sanctioned crude tankers (accounting for $2).
- Overall, we see high freight rates widening crude price differentials by changing crude trading patterns and supporting refined product prices, while suppressing refiners' net margins.
  - Crude producers with greater dependence on distant buyers may have to discount their crude more heavily to retain demand from refiners facing high transportation costs (e.g., producers in the Middle East selling to refiners in Asia or US WTI sold to Europe or Far East Asia). Meanwhile, prices of crude from more centrally located producers (e.g., Brent in Northwestern Europe or ESPO in Russia) may gain from some demand reallocation.
  - Refiners with greater dependence on imported crude from distant suppliers (e.g., refiners in Asia) would have to either pass higher freight costs on to final consumers or accept lower net refinery margins. Passing

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higher costs on to consumers is more challenging when final oil demand is more flexible because oil alternatives are widely available (e.g., EVs in China) or in economies where retail fuel prices are regulated. High freight costs have weighed particularly heavily on Asian refineries' net margins, threatening their refined product output, which could then raise global refined product prices.

Exhibit 1: We Estimate that the Hormuz Crossing War Premium and Ship-to-Ship Transfers Account for Over 1/2 of the $20 Year-Over-Year Increase in Global Crude Freight Rate



We estimate the $4 contribution from maritime fuel costs to the $20 yoy rise in freight rates using their historical relationship and bottom-up estimates of fuel oil consumption per voyage for a typical tanker. We assume that the yoy increase in Murban-Basrah differential can be fully attributed to the Hormuz crossing war premium, with a 1/6 spillover rate to the global freight rate, based on the relative share of Hormuz exports in global seaborne exports. We assume that the other three fundamental factors fully explain the remaining $10 yoy rise in freight rates and that the impact of each of these three factors is proportional to the tightening effect on the net global supply of crude tankers in million barrels.

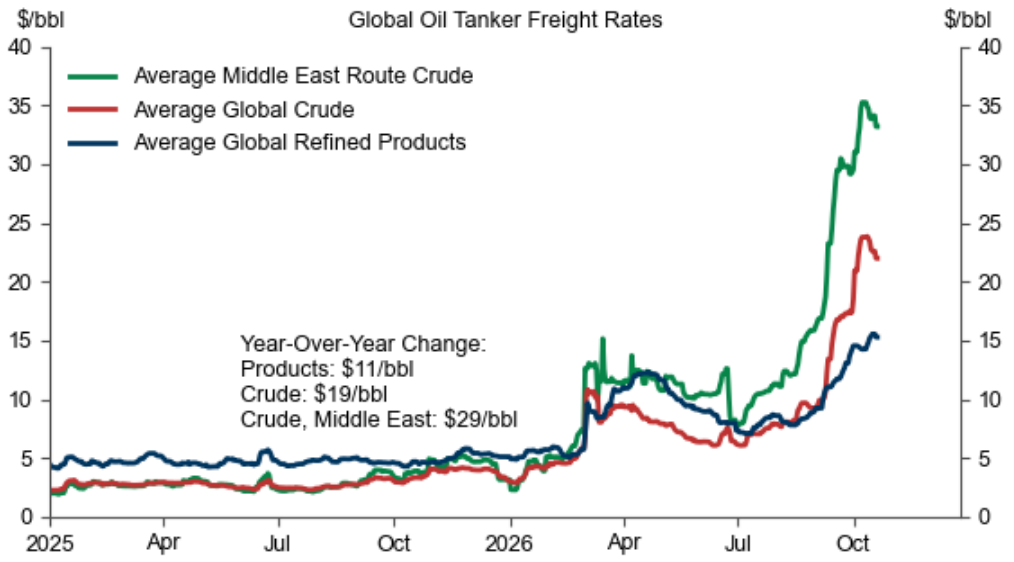
Source: Goldman Sachs Global Investment Research

The Freight Rate Rally: Started in the Middle East, but Spread Globally

The global average crude freight rate surged above $20/bbl from $3/bbl a year ago, with rates on Middle Eastern routes rising above $35/bbl (Exhibit 2). While traded crude benchmarks do not directly include transportation and insurance costs in their prices, i.e., are priced on a Free-on-Board basis at the producing country's port of loading, a crude buyer—typically a refiner—has to cover crude delivery expenses, including transportation and insurance costs. High crude freight rates may therefore reduce refiners' overall demand for crude as the effective price of delivered oil rises, weighing on demand for crude shipped via the affected routes. Refiners may also seek more closely located suppliers, changing established trading patterns and crude price differentials.

In this Oil Analyst, we analyze the drivers of near-record-high crude freight rates and the implications for crude producers and refiners.

Exhibit 2: The Global Average Crude Freight Rate Surged Above $20/bbl Last Week from $3/bbl a Year Ago, With Rates on the Middle Eastern Routes Increasing Above $35/bbl

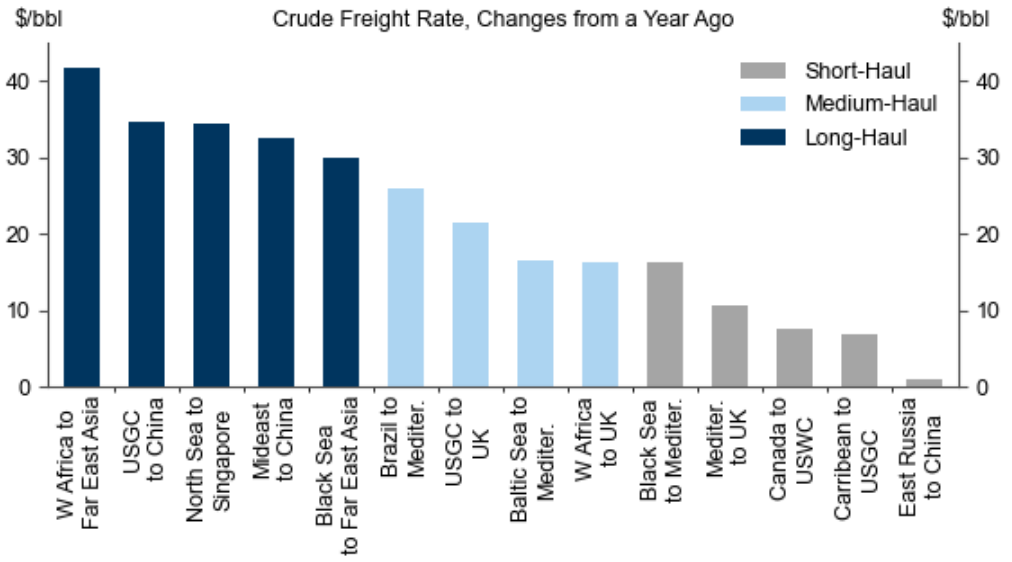


Source: Platts, Kpler, Goldman Sachs Global Investment Research

The rally in crude freight rates initially began in the very large crude carrier (VLCC) segment and on Middle Eastern routes. A large share of cost of transporting oil through the Strait of Hormuz is fixed per tanker as it is related to the risk of tanker attacks (e.g., crew risk compensation). As a result, larger vessels have been preferred on Middle Eastern routes to minimize disruption risk-associated costs per barrel. The premium for a VLCC over a tanker with 70% less capacity on the route from the Persian Gulf to Far East Asia jumped to $11/bbl in mid-September vs. a $1/bbl discount in 2026H1.

This cross-segment differential has narrowed substantially over the last two weeks. The crude freight rally has now spread across vessel segments and routes, as charterers outside the Middle East try to keep ships from diverting to more lucrative Persian Gulf routes. Freight rates on long-haul voyages to Asia have increased especially steeply, with the West Africa-to-Far East Asia freight rate rising by more than $40/bbl year-over-year (yoy) (Exhibit 3).

Exhibit 3: The Rally in Freight Rate Started From the Middle East, but Now Spread to All Major Routes, Especially Affecting Long-Haul Voyages



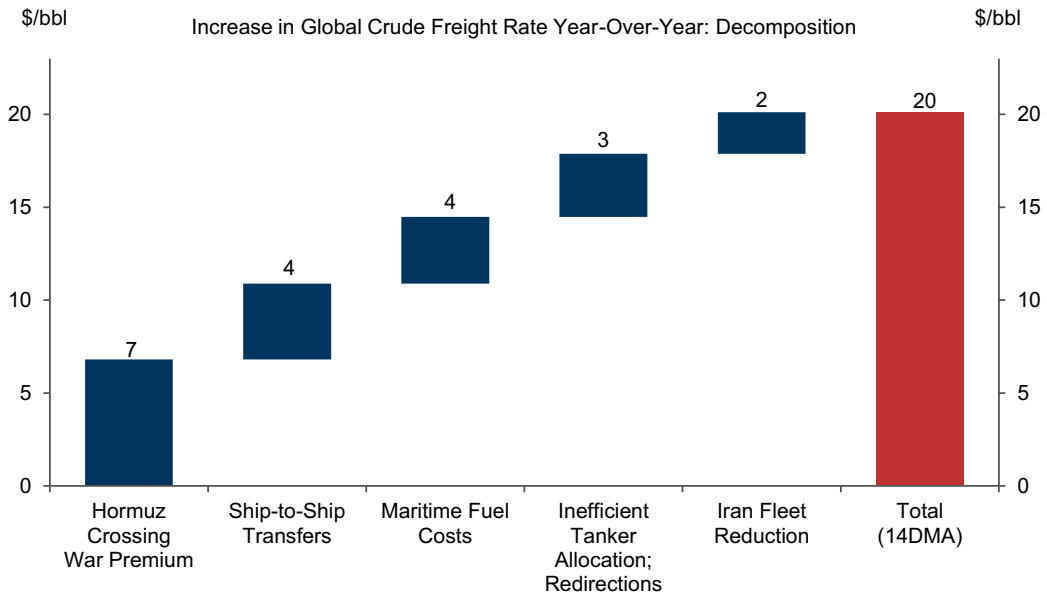
Source: Platts, Goldman Sachs Global Investment Research

Explaining the Freight Price Rally

Our estimate of the global average crude freight rate has edged down over the last couple of days. We suspect that a moderation in the freight risk premium helps to explain some of the recent decline in freight rates given limited changes in the tanker supply- and demand fundamentals. The weakening in global crude imports over the last week is also consistent with some reduction in refiners' willingness to pay record-high delivery costs on top of elevated FOB crude prices. However, the global average crude freight rate remains seven times higher than a year ago and is unlikely to sharply drop further as long as the conflict in the Middle East persists. Higher freight rates for longer pose some upside risk to our Brent forecast along with the risks of more intense shipping attacks, damage to oil infrastructure, and a stickier geopolitical risk premium.

Assuming that fundamentals fully explain the $20/bbl yoy surge in the average global crude freight rate (14DMA), we identify five key drivers of the rally (Exhibit 4).

Exhibit 4: We Estimate that the Hormuz Crossing War Premium and Ship-to-Ship Transfers Account for Over 1/2 of the $20 Year-Over-Year Increase in Global Crude Freight Rate



We estimate the $4 contribution from maritime fuel costs to the $20 yoy rise in freight rates using their historical relationship and bottom-up estimates of fuel oil consumption per voyage for a typical tanker. We assume that the yoy increase in Murban-Basrah differential can be fully attributed to the Hormuz crossing war premium, with a 1/6 spillover rate to the global freight rate based on the relative share of Hormuz exports in global seaborne exports. We assume that the other three fundamental factors fully explain the remaining $10 yoy rise in freight rates and that the impact of each of these three factors is proportional to the tightening effect on the net global supply of crude tankers in million barrels.

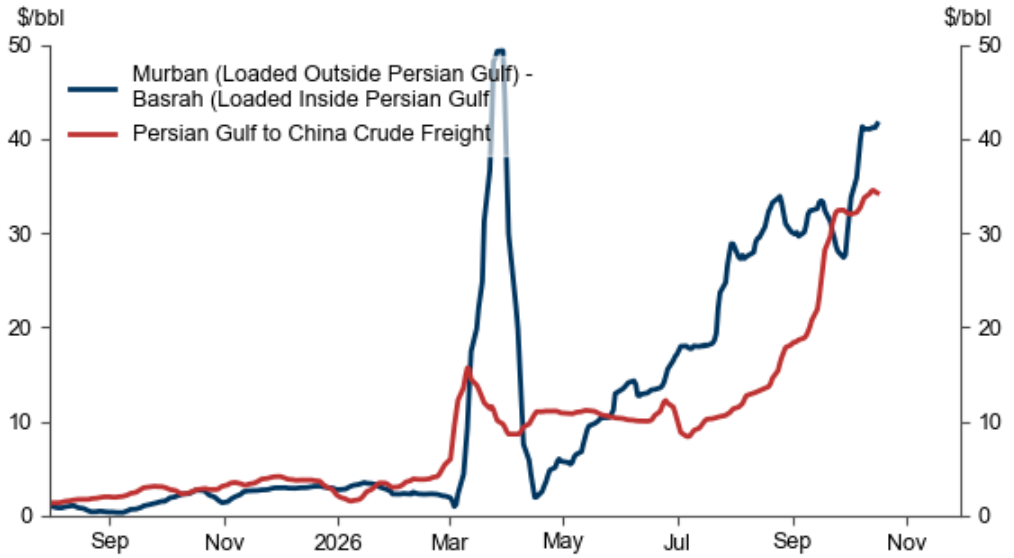
Source: Goldman Sachs Global Investment Research

1. Hormuz Crossing War Risk Premium

Following the recent escalation in attacks on tankers in Hormuz, the risk premium for crossing the Strait has risen significantly, reflecting higher insurance costs and crew payments. Independent regional shippers likely also have a lot of bargaining power, as producers are likely willing to discount their crude to accommodate high transportation premiums given their very low breakevens, a desire not to shut in production, and a decline in the perceived probability of a quick resolution to the Middle Eastern conflict.

To gauge the risk premium for Hormuz crossings, we compare prices of crude loaded at ports outside and inside of the Persian Gulf. The premium for Murban crude assessed at the UAE's Fujairah port (east of Hormuz) vs. Basrah crude assessed at an Iraqi port (west of Hormuz) has increased by $35/bbl year-over-year (yoy) (Exhibit 5).[1] Since nearly 1/6 of global seaborne crude exports still go via Hormuz, our $35 war premium estimate explains $7/bbl or 1/3 of the yoy increase in the global average crude freight rate.

Exhibit 5: The Premium for Murban Crude Loaded Outside the Persian Gulf Surged to Over $40/bbl Over Basrah Crude, Loaded Within the Persian Gulf, Reflecting a Hefty Risk Premium for Crossing Hormuz



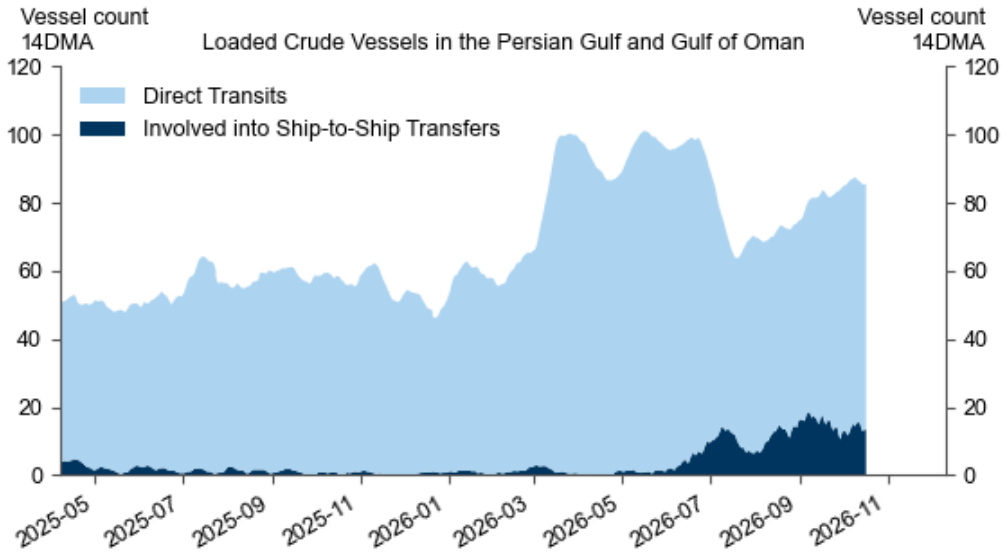
Source: Platts, Goldman Sachs Global Investment Research

2. Ship-to-ship Transfers

A recovery in Persian Gulf crude exports can ease crude prices, but it lifts freight rates when ship-to-ship transfers are driving the export increase. About 1/6 of tankers operating in the Persian Gulf and Gulf of Oman engage in ship-to-ship transfers every day, tying up vessels for longer and reducing fleet availability (Exhibit 6). Kpler reported that the average round trip for a Gulf of Oman VLCC engaged in ship-to-ship transfers increased to 23 days vs. 10 days for a typical direct Hormuz round trip. We estimate that ship-to-ship transfers account for a $4 or 1/5 of the yoy increase in the global average crude freight rate.

[1] The Murban–Basrah differential also reflects quality differences: Murban is a light sweet crude, while Basrah is a medium sour crude. We therefore use changes in the differential, rather than its absolute level, to estimate the increase in transit costs, assuming that these changes reflect higher transit costs.

Exhibit 6: About 1/6 of Tankers Operating in the Persian Gulf and Gulf of Oman Are Engaged in Ship-to-Ship Transfers

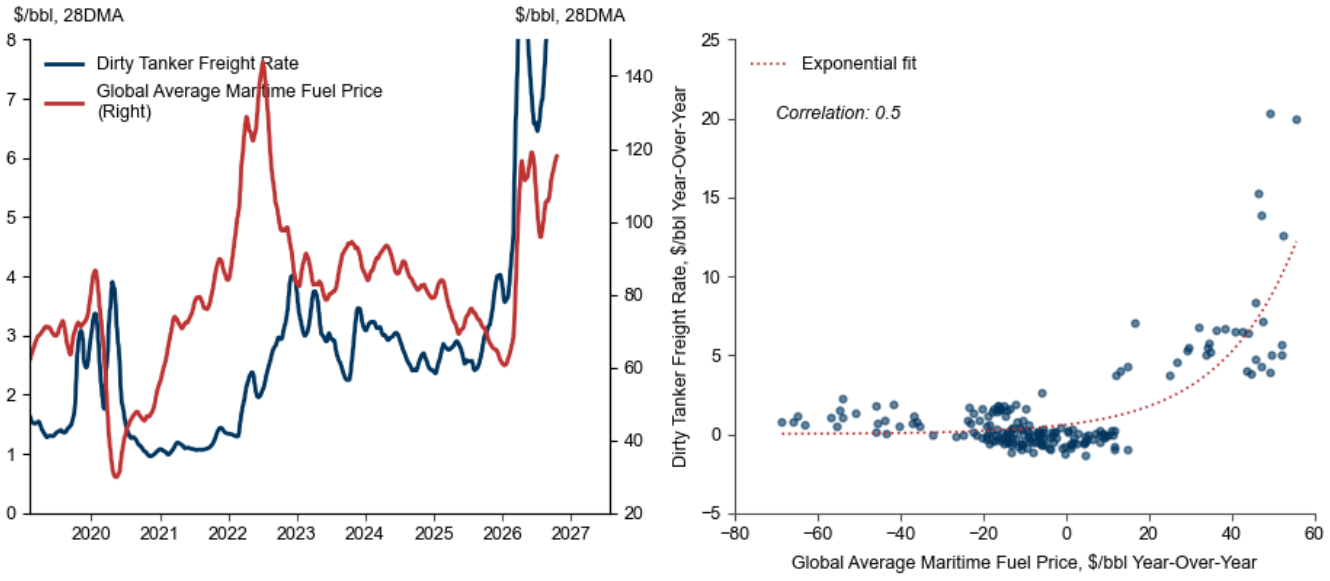


Source: Kpler, Goldman Sachs Global Investment Research

3. Higher Maritime Fuel Cost

Crude tanker operating costs have also risen substantially, reflecting higher crew salaries and, especially, elevated bunker fuel prices. We estimate that global maritime fuel oil prices have increased by nearly $50/bbl, or 70% yoy amid weak exports from the Persian Gulf and Russia and resilient bunker demand from tankers and container ships (Exhibit 7). Higher fuel costs explain an estimated $4/bbl, or 18%, of the yoy increase in the global average crude freight rate.

Exhibit 7: Maritime Fuel Oil Prices Increased by Nearly 70% Year Over Year, Pushing Operating Costs for All Crude Tankers Higher



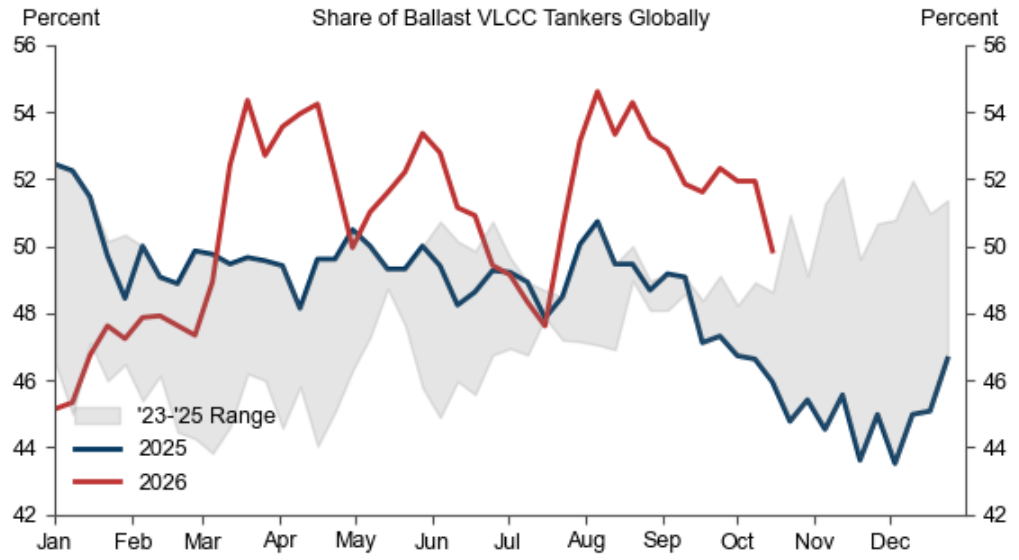
Source: Platts, Refinitiv Eikon, Goldman Sachs Global Investment Research

4. Inefficient Tanker Allocation and Redirections

Reduced VLCC availability as more vessels are tied up in Persian Gulf transfers has led to suboptimal use of smaller tankers on long-haul routes typically dominated by VLCCs. But even among available VLCCs, half are currently in ballast—4 percentage points more than a year ago (Exhibit 6). The increase in tanker idling is concentrated outside the Persian Gulf, where tankers await the shuttle fleet, and near Russian ports amid an elevated risk of drone attacks at Black Sea ports.

Meanwhile, more frequent redirections following attacks in the Red Sea and Black Sea lengthen voyages, keeping oil on tankers for longer. We estimate that inefficient tanker allocation and redirections explain $3/bbl or 17% of the yoy increase in the global average crude freight rate.

Exhibit 8: Half of All VLCCs Are Currently in Ballast—4pp Above Last Year Levels—With More Tankers Idling Near Russian Ports and Outside of the Persian Gulf



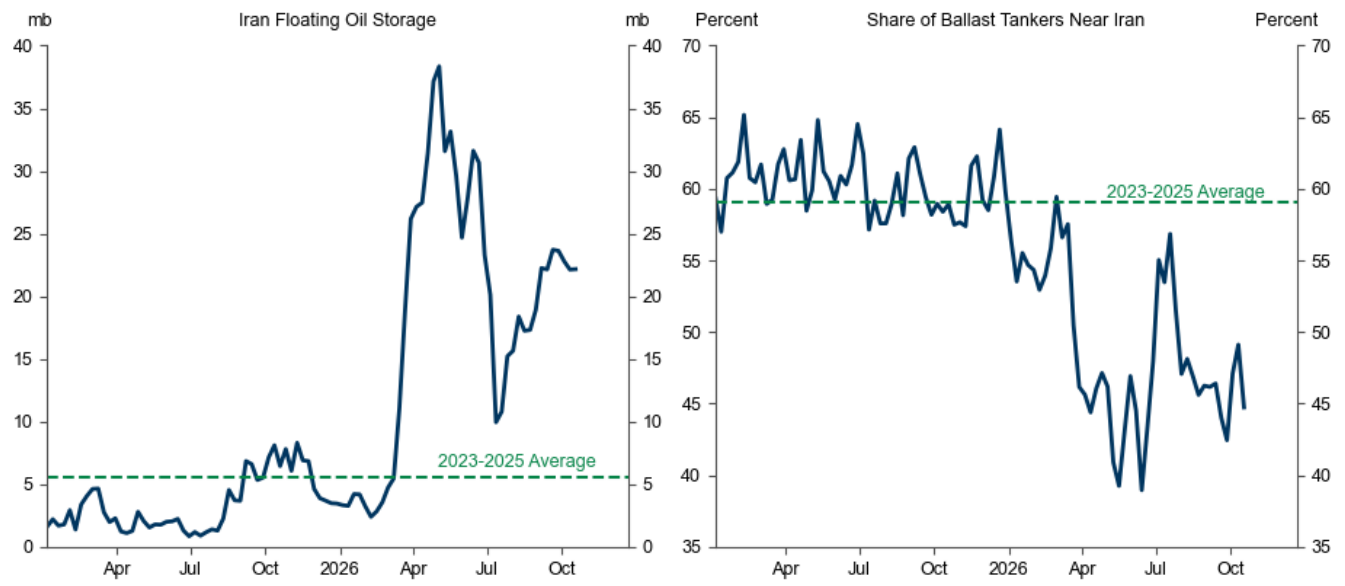
VLCC stands for a very large crude carrier. Ballast tankers do not carry any commercial cargo and only contain seawater for stability.

Source: Kpler, Goldman Sachs Global Investment Research

5. Blockade of the Iranian Fleet

The size of the Iranian fleet on the water has shrunk by nearly 40% yoy, with most loaded tankers used for storage, as the US blockade has sharply reduced Iranian crude exports (Exhibit 9). Although Iranian crude and the Iranian fleet have been sanctioned for years, Iranian oil and tankers previously met 1.7mb/d of Asian crude demand. Demand for these missing barrels has shifted to other non-sanctioned producers and shippers, putting further upward pressure on open-market crude prices and freight rates. We estimate that the blockade explains $2/bbl or 10% of the increase in the global average crude freight rate.

Exhibit 9: The US Blockade Has Pushed Many Iranian Vessels to Be Used as Storage Rather Than Transportation



Ballast tankers do not carry any commercial cargo and only contain seawater for stability.

Source: Kpler, Goldman Sachs Global Investment Research

Overall, we expect the five drivers supporting crude freight rates to persist largely as long as the Middle Eastern conflict remains in its current state. Even under our baseline, in which Brent crude prices decline to $90/bbl by year-end and average $80/bbl in 2027, recovering Persian Gulf production and stable exports would require continuing ship-to-ship transfers without reliable freedom of navigation through the Strait. The US blockade also appears unlikely to be lifted without a peace deal. Moreover, occasional attacks on tankers in the region are likely to keep the Hormuz war risk premium elevated. A lack of progress in restoring Middle Eastern refined product exports suggests that bunker fuel supplies may remain tight for longer.

Implications from Higher Freight for Crude Producers and Refiners

We see high freight rates widening crude price differentials by changing trading patterns, supporting refined product prices, and compressing refiners' net margins. Because the recent increases have been particularly pronounced on long-haul routes, producers and refiners dependent on these routes for crude distribution and supply are most affected. How the burden is shared depends mainly on producers' ability to find alternative buyers and refiners' ability to find alternative supplies, pass higher transportation costs on to consumers, or absorb them.

1. Crude Producers

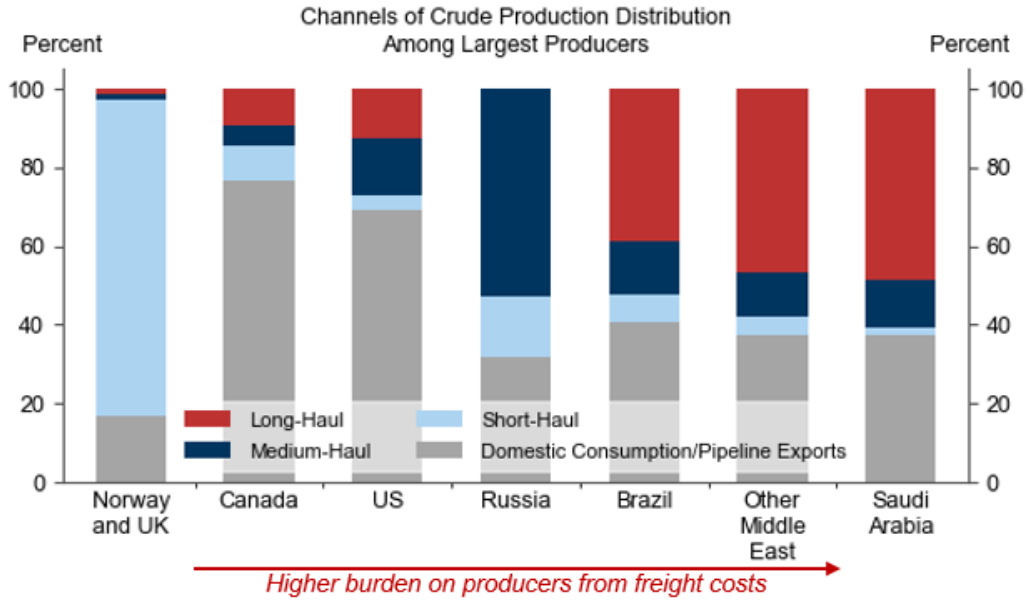
Refiners' crude demand depends on 1) the effective delivered crude input costs, which includes the producer benchmark price, transportation, and insurance, and 2) refined product prices. Higher transportation costs therefore raise refiners' effective crude prices and soften demand. Transportation accounts for a larger share of total crude costs on long-haul routes. Producers more dependent on distant buyers may consequently have to offer deeper discounts to retain demand when freight rates rise

(Exhibit 10).

Specifically, Middle Eastern producers sell nearly half their crude through long-haul exports, primarily to Far East Asia. Exceptionally high freight rates on Middle Eastern routes are pushing producers to discount crude sharply, especially grades shipped from within the Persian Gulf (Iraqi Basrah, UAE Upper Zakum, Qatari Al Shaheen). High freight costs from the US Gulf Coast to Northwest Europe also widened the Brent-WTI differential to $14/bbl last week, compared with the usual $5/bbl, as US producers lowered prices to maintain exports of nearly 2mb/d to Europe.

Meanwhile, as refiners facing high freight rates seek alternative supplies, crude from more centrally located producers may benefit from demand reallocation. Specifically, Brent in Northwestern Europe strengthened in the first half of October on higher demand from European and Mediterranean refiners, while Russia's ESPO crude benefited from some reallocation of Asian demand.

Exhibit 10: Crude Producers More Dependent on Distant Buyers Are More Vulnerable to Freight Rate Increases and May Have to Offer Deeper Discounts



We show 2026 year-to-date average distribution shares.

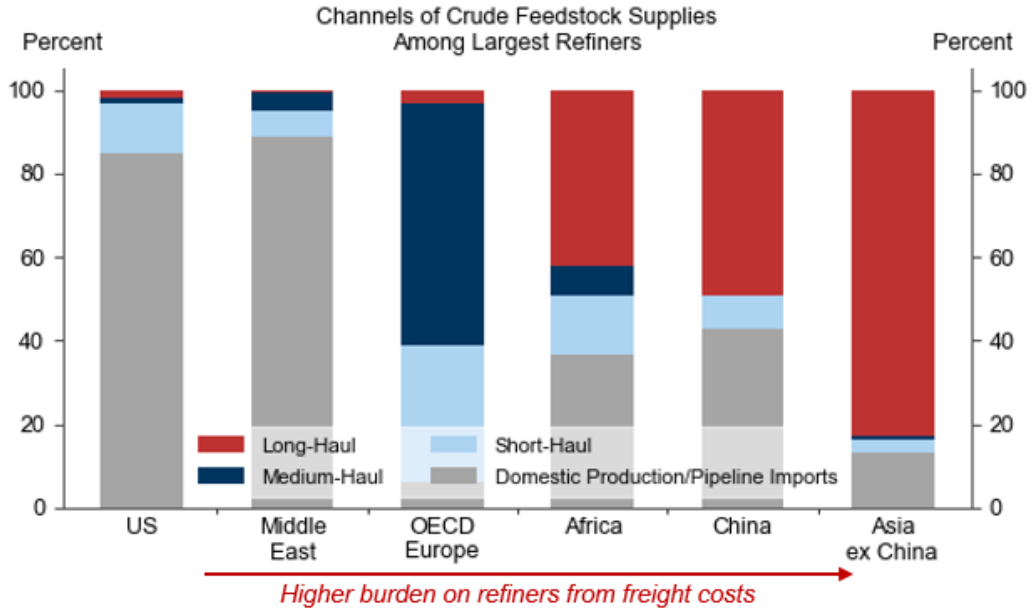
Source: Kpler, Goldman Sachs Global Investment Research

2. Crude Consumers — Refiners

Similarly, refiners more dependent on crude imported from distant suppliers would have to find alternative feedstock, pass higher freight costs on to final consumers, or accept lower net refining margins. Chinese and other Asian refiners—which import 50% and 80% of their crude via long-haul routes, respectively—are particularly vulnerable to rising freight rates because freight accounts for a relatively high share of their crude costs (Exhibit 11).

Refiners' ability to substitute alternative crude is generally limited in the short run: they would need to outbid regular buyers, raising the cost of alternative supplies as well. Moreover, refineries are typically configured for a specific crude diet, and feedstock changes can reduce refined product yields.

Exhibit 11: Refiners Importing Crude Feedstock from Distant Producers Are More Exposed to High Freight Costs

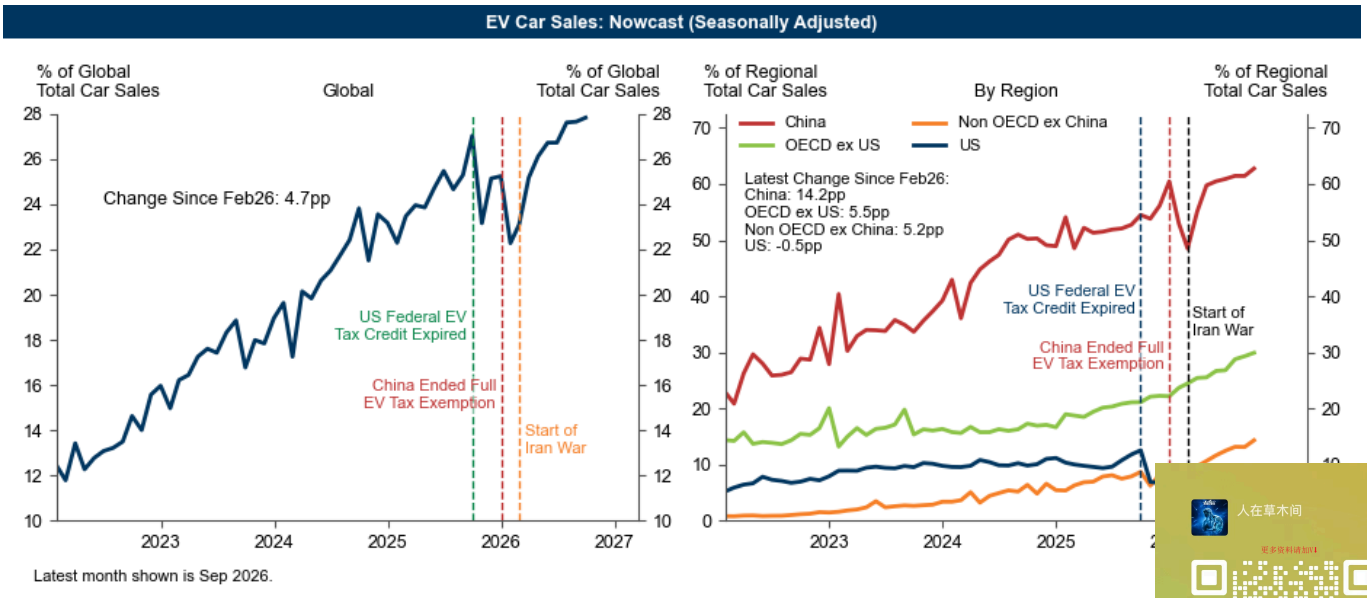


We show 2026 year-to-date average distribution shares.

Source: Kpler, Goldman Sachs Global Investment Research

Refiners' ability to pass freight costs on to consumers depends on final demand's sensitivity to prices increases. Passing on higher costs is more challenging when final oil demand is more flexible because widely available oil alternatives (e.g., EVs in China; Exhibit 12) or in economies where governments regulate and cap retail fuel prices (South Korea, Eastern Europe). Consumers' ability to absorb higher fuel costs without reducing demand is also limited by income and hence is limited in low-income economies.

Exhibit 12: Passing Higher Freight Costs On to Final Consumers Is More Challenging for Refiners in Countries With More Alternatives to Refined Products



Source: Haver, Goldman Sachs Global Investment Research

Refiners' ability to absorb higher freight costs depends on their net refi