

April 3, 2025 09:47 PM GMT

The Oil Manual

More Tariffs, More OPEC

Higher-than-expected US import tariffs and OPEC's decision to accelerate production growth have put considerable downwards pressure on oil prices. We leave our forecasts unchanged until further clarity emerges, sticking with our \$67.5/bbl Brent forecast for 2H25 for now.

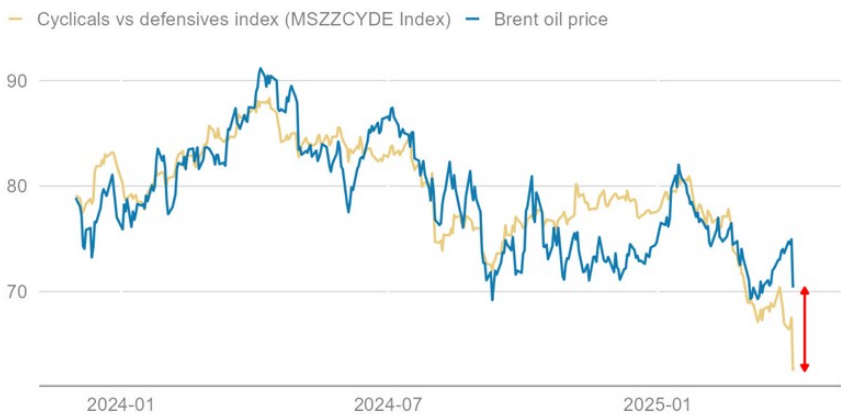
Key Takeaways

- Our economists estimate the average US import tariff will increase from 2-3% to ~20%, higher than the 8-9% they expected
- Recession is not our base case but a realistic bear case; in recession, demand growth typically falls at least to zero, risking ~1 mb/d of expected demand
- In addition, OPEC announced it will accelerate the unwinding of its production cuts, releasing 411 kb/d of quota in May, the equivalent of three monthly increases
- So far, we have modelled a surplus in the oil market of ~0.8 mb/d in 2Q-4Q25, and on this basis, we estimate Brent price to decline to \$67.5/bbl.
- Several aspects remain uncertain; for now, we leave these forecasts unchanged until more clarity emerges, but risks arguably skew in a cautious direction

**Exhibit 1:** The performance of cyclical-vs-defensive equities has deteriorated, reflecting a weakening economic outlook which has also put pressure on oil prices

Oil price vs cyclicals/defensives index

Since Dec 2023



Source: Bloomberg, Morgan Stanley Research

MORGAN STANLEY & CO. INTERNATIONAL PLC+

Martijn Rats, CFA

Equity Analyst and Commodities Strategist  
Martijn.Rats@morganstanley.com

+44 20 7425-6618

Charlotte Firkins

Research Associate  
Charlotte.Firkins@morganstanley.com

+44 20 7425-3866

Amy Gower (Amy Sergeant), CFA

Commodities Strategist  
Amy.Gower1@morganstanley.com

+44 20 7677-6937

**Exhibit 2 :** We leave our Brent forecasts unchanged for now

Brent price forecasts

(\$/bbl)	2Q25	3Q25	4Q25	2026
New	70.0	67.5	67.5	70.0
Previous	70.0	67.5	67.5	70.0
Change	0.0	0.0	0.0	0.0

Source: Morgan Stanley Research

Previous research:

- The Oil Manual: [Tariffs & OPEC](#)
- The Oil Manual: [Of Tariffs & Sanctions; Action & Reaction](#)
- Chartbook: [March 2025](#)
- Oil Data Digest: [\(1\) China, \(2\) India, \(3\) United States](#)
- [Weekly Oil Stock Summary](#)

Morgan Stanley does and seeks to do business with companies covered in Morgan Stanley Research. As a result, investors should be aware that the firm may have a conflict of interest that could affect the objectivity of Morgan Stanley Research. Investors should consider Morgan Stanley Research as only a single factor in making their investment decision.

**For analyst certification and other important disclosures, refer to the Disclosure Section, located at the end of this report.**

+ = Analysts employed by non-U.S. affiliates are not registered with FINRA, may not be associated persons of the member and may not be subject to FINRA restrictions on communications with a subject company, public appearances and trading securities held by a research analyst account.

# More Tariffs, More OPEC

The front-month Brent crude oil future declined nearly 7% on Thursday, driven by two factors:

- **First, import tariffs announced by the US government came in substantially higher than expected.** Our economists had expected the average US import tariff to increase from the current rate of ~2.5% to 8-9% going forward. However, following yesterday's announcement, they now estimate this will increase to ~20%, more than double their initial expectation.
- **Second, OPEC announced it would accelerate the unwinding of its production cut,** releasing 411 kb/d of quota in May, the equivalent of three regular monthly increases (according to the prior agreement, quota was to be released at 120-140 kb/d per month).

Needless to say, these factors weigh heavily on the forward supply/demand outlook. As previously discussed (see [here](#) and [here](#)), import tariffs - and the counter-tariffs they usually elicit - are particularly a headwind for sectors such as trade, transportation, manufacturing, etc - in short, the oil-intensive parts of the economy.

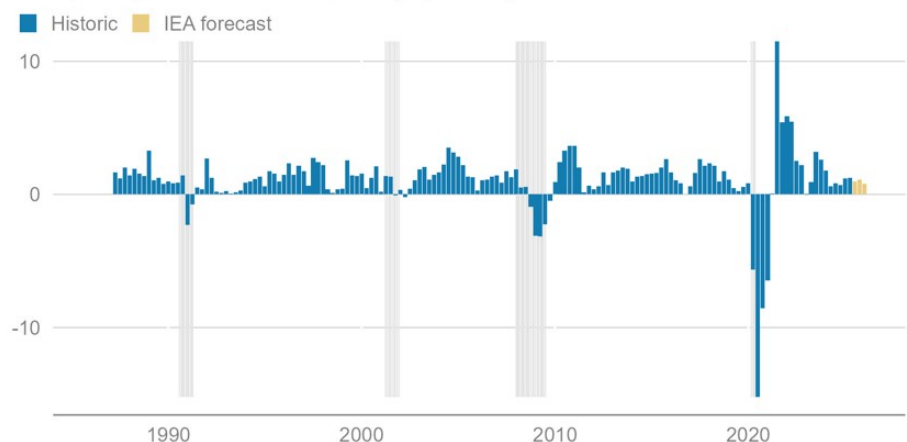
To get an idea of what this might do to oil demand, we highlight [Exhibit 3](#). Our economists argue that whilst recession is not a base case, it has become a realistic bear case. [Exhibit 3](#) shows the year-on-year change in global oil demand, based on quarterly data since 1985, overlaid with periods of US recessions (grey bands).

In total, there have been four recessions over this ~40 year period. However, two of them were unusually severe, which were the financial crisis in 2008/09 and Covid in 2020. We do not see these as useful templates for what could lie ahead.

**Exhibit 3:** During the mildest US recession of the last 40 years, global oil demand still stopped growing on a year-on-year basis

## Oil demand and recessions

Change in global oil consumption (yoy; mb/d) and US recessions



Source: IEA, Morgan Stanley Research

That said, the recessions of 1990/91 and 2001 may well be indicative of what happens to oil demand in a recession: in the 1990/91 recession, oil demand growth turned negative year-on-year for two quarters, whilst in the 2001 recession, demand growth dropped to zero on a year-on-year basis.

At the moment, we forecast ~0.9 mb/d of oil demand growth in 2025, which is already slightly below the consensus which we estimate at ~1.1 mb/d. However, if the economic impact from tariffs is indeed such that it triggers a recession, and the 1990/91 and 2001 recessions are indicative, then year-on-year demand growth could fall at least to zero, in effect putting ~1 mb/d of oil demand at risk.

Our modelling has so far been showing a surplus of 0.8 mb/d in our total oil liquids model over the remaining three quarters of 2025, whilst our 'crude-on-crude' balance has shown a 0.4 mb/d surplus. On this basis, we have estimated Brent to average \$70/bbl in 2Q and fall to \$67.5/bbl in 2H. Risks to estimates for the market balance are now probably skewed to the upside, whilst risks to our price forecasts are skewed down.

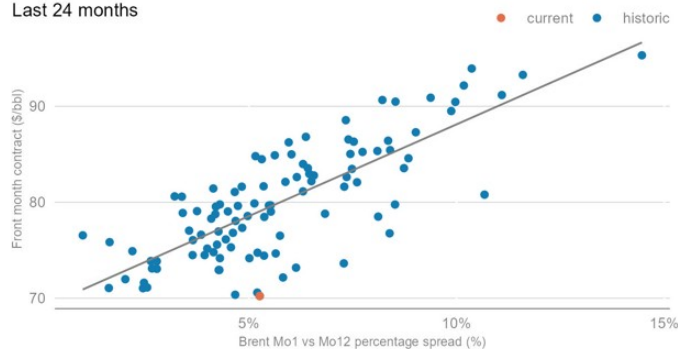
Still, much is uncertain for now, both on the demand side as well as regarding the eventual impact on OPEC production – a quota increase is not the same as an actual production increase. With that in mind, we leave these estimates unchanged for now, waiting for additional clarity to emerge.

When it comes to price, we highlight again that Brent's spot price already appears low compared to current calendar spread (see [Exhibit 4](#)), and that calendar spreads are already relatively low compared to inventory levels (see [Exhibit 5](#)). Whilst the supply/demand outlook appears soft – and may eventually get softer – these two observations also suggest that prices already discount some of this future weakness – probably more so than usual.

**Exhibit 4:** Brent's spot price already appears low compared to calendar spreads...

#### Brent time spread vs flat price

Last 24 months



**Exhibit 5:** ...and calendar spreads are already quite low compared to inventories

#### Inventory cover vs time spreads

Monthly data since 1995



# Summary balances and price forecasts

## Exhibit 6:

Liquids balance														y/y change		
	2022	2023	1Q24	2Q24	3Q24	4Q24	2024	1Q25	2Q25	3Q25	4Q25	2025	2026	2024	2025	2026
<b>Demand</b>	<b>99.9</b>	<b>102.0</b>	<b>101.3</b>	<b>102.8</b>	<b>103.8</b>	<b>103.6</b>	<b>102.9</b>	<b>102.6</b>	<b>103.3</b>	<b>104.8</b>	<b>104.5</b>	<b>103.8</b>	<b>104.5</b>	<b>0.8</b>	<b>0.9</b>	<b>0.7</b>
OECD	45.6	45.7	44.8	45.6	46.2	46.1	45.7	45.3	45.2	46.1	46.0	45.7	45.6	- 0.0	- 0.0	- 0.0
Non-OECD	54.3	56.4	56.5	57.2	57.6	57.6	57.2	57.3	58.1	58.7	58.5	58.2	58.9	0.8	0.9	0.8
<b>Non-OPEC supply</b>	<b>67.0</b>	<b>69.4</b>	<b>69.5</b>	<b>70.3</b>	<b>70.6</b>	<b>70.8</b>	<b>70.3</b>	<b>70.5</b>	<b>71.5</b>	<b>72.1</b>	<b>72.2</b>	<b>71.6</b>	<b>72.5</b>	<b>0.9</b>	<b>1.3</b>	<b>0.9</b>
USA	17.9	19.4	19.4	20.2	20.3	20.7	20.2	20.2	20.6	20.7	20.8	20.6	21.0	0.7	0.4	0.4
Russia	11.1	11.0	10.8	10.8	10.6	10.6	10.7	10.6	10.5	10.5	10.5	10.5	10.5	- 0.3	- 0.2	- 0.0
OPEC NGLs/condensate	5.3	5.4	5.4	5.5	5.5	5.4	5.4	5.5	5.6	5.6	5.7	5.6	5.7	0.0	0.1	0.1
<b>Call on OPEC crude</b>	<b>27.6</b>	<b>27.2</b>	<b>26.4</b>	<b>27.0</b>	<b>27.7</b>	<b>27.4</b>	<b>27.1</b>	<b>26.7</b>	<b>26.2</b>	<b>27.0</b>	<b>26.6</b>	<b>26.6</b>	<b>26.3</b>	<b>- 0.1</b>	<b>- 0.5</b>	<b>- 0.3</b>
OPEC crude	27.7	27.4	26.9	27.4	27.5	27.2	27.3	27.4	27.4	27.4	27.5	27.4	28.1	- 0.2	0.2	0.6
<b>Implied balance</b>	<b>0.1</b>	<b>0.2</b>	<b>0.5</b>	<b>0.4</b>	<b>- 0.2</b>	<b>- 0.2</b>	<b>0.1</b>	<b>0.7</b>	<b>1.1</b>	<b>0.4</b>	<b>0.9</b>	<b>0.8</b>	<b>1.7</b>	<b>- 0.1</b>	<b>0.7</b>	<b>1.0</b>
Misc to balance	0.2	- 0.6	0.2	0.3	- 1.7	0.4	- 0.2	- 0.6	-	-	-	- 0.2	- 0.0	0.4	0.0	0.1
<b>Stock change</b>	<b>0.3</b>	<b>- 0.3</b>	<b>0.8</b>	<b>0.7</b>	<b>- 1.9</b>	<b>0.2</b>	<b>- 0.1</b>	<b>0.1</b>	<b>1.1</b>	<b>0.4</b>	<b>0.9</b>	<b>0.6</b>	<b>1.7</b>	<b>0.3</b>	<b>0.7</b>	<b>1.1</b>

### Price forecast - Brent (\$/bbl)

Period	Bear	Base	Bull
1Q25	55.0	75.0	95.0
2Q25	55.0	70.0	95.0
3Q25	55.0	67.5	95.0
4Q25	55.0	67.5	95.0
2026	55.0	70.0	95.0

### Price forecast - WTI (\$/bbl)

Period	Bear	Base	Bull
1Q25	50.0	71.0	90.0
2Q25	50.0	66.0	90.0
3Q25	50.0	63.5	90.0
4Q25	50.0	63.5	90.0
2026	50.0	66.0	90.0

Crude and condensate balance														y/y change		
	2022	2023	1Q24	2Q24	3Q24	4Q24	2024	1Q25	2Q25	3Q25	4Q25	2025	2026	2024	2025	2026
<b>Demand</b>	<b>81.8</b>	<b>83.0</b>	<b>83.3</b>	<b>83.0</b>	<b>83.8</b>	<b>83.3</b>	<b>83.4</b>	<b>83.3</b>	<b>83.3</b>	<b>84.9</b>	<b>83.8</b>	<b>83.8</b>	<b>84.3</b>	<b>0.4</b>	<b>0.5</b>	<b>0.5</b>
Refinery runs	81.1	82.2	82.7	82.5	83.0	82.9	82.8	82.8	82.6	84.0	83.2	83.1	83.6	0.6	0.4	0.5
Direct burn	0.7	0.8	0.6	0.5	0.8	0.4	0.6	0.6	0.7	0.9	0.6	0.7	0.7	- 0.2	0.1	- 0.0
<b>Non-OPEC supply</b>	<b>51.8</b>	<b>53.3</b>	<b>53.7</b>	<b>53.3</b>	<b>53.3</b>	<b>53.7</b>	<b>53.5</b>	<b>54.1</b>	<b>54.3</b>	<b>54.6</b>	<b>55.0</b>	<b>54.5</b>	<b>55.2</b>	<b>0.2</b>	<b>1.0</b>	<b>0.6</b>
USA	12.0	12.9	12.9	13.2	13.2	13.4	13.2	13.4	13.5	13.5	13.6	13.5	13.7	0.3	0.3	0.2
Russia	10.7	10.6	10.5	10.4	10.2	10.3	10.3	10.2	10.2	10.2	10.2	10.2	10.2	- 0.3	- 0.1	- 0.0
<b>OPEC supply</b>	<b>29.6</b>	<b>29.4</b>	<b>29.0</b>	<b>29.4</b>	<b>29.6</b>	<b>29.3</b>	<b>29.3</b>	<b>29.6</b>	<b>29.6</b>	<b>29.7</b>	<b>29.8</b>	<b>29.7</b>	<b>30.4</b>	<b>- 0.1</b>	<b>0.4</b>	<b>0.7</b>
Crude	27.7	27.4	26.9	27.4	27.5	27.2	27.3	27.4	27.4	27.4	27.5	27.4	28.1	- 0.2	0.2	0.6
Condensate	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.2	2.3	2.3	2.3	2.3	0.1	0.2	0.0
<b>Implied balance</b>	<b>- 0.4</b>	<b>- 0.2</b>	<b>- 0.6</b>	<b>- 0.2</b>	<b>- 0.9</b>	<b>- 0.3</b>	<b>- 0.5</b>	<b>0.4</b>	<b>0.7</b>	<b>- 0.7</b>	<b>1.0</b>	<b>0.4</b>	<b>1.2</b>	<b>- 0.3</b>	<b>0.9</b>	<b>0.8</b>
Misc to balance	0.5	- 0.2	1.1	0.8	- 1.1	0.4	0.3	0.3	0.2	0.0	0.1	0.1	0.1	0.5	- 0.2	- 0.1
<b>Stock change</b>	<b>0.1</b>	<b>- 0.4</b>	<b>0.4</b>	<b>0.6</b>	<b>- 2.0</b>	<b>0.1</b>	<b>- 0.2</b>	<b>0.7</b>	<b>0.8</b>	<b>- 0.6</b>	<b>1.1</b>	<b>0.5</b>	<b>1.3</b>	<b>0.2</b>	<b>0.7</b>	<b>0.8</b>

Source: IEA, S&P Global, Argus, Energy Aspects, Wood Mackenzie, Rystad, Vortexa, Morgan Stanley Research

# Prices

Exhibit 7:

## Global energy prices compared

Index: 1 year ago = 100

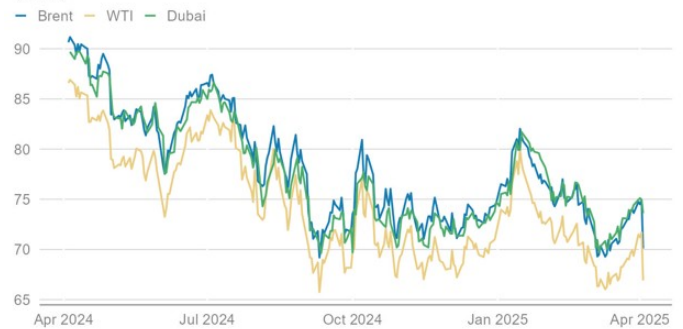


Source: Bloomberg, Platts, Morgan Stanley Research

Exhibit 8:

## Benchmark crude oil prices

(\$/bbl)

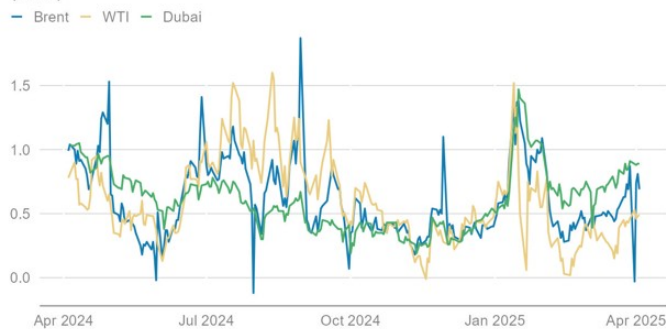


Source: Bloomberg, Platts, Morgan Stanley Research

Exhibit 9:

## Calendar spreads Mo1 vs Mo2

(\$/bbl)



Source: Bloomberg, Platts, Morgan Stanley Research

Exhibit 10:

## Calendar spreads Mo2 vs Mo6

(\$/bbl)



Source: Bloomberg, Platts, Morgan Stanley Research

Exhibit 11:

## WTI/Brent spread

Mo1 (\$/bbl)

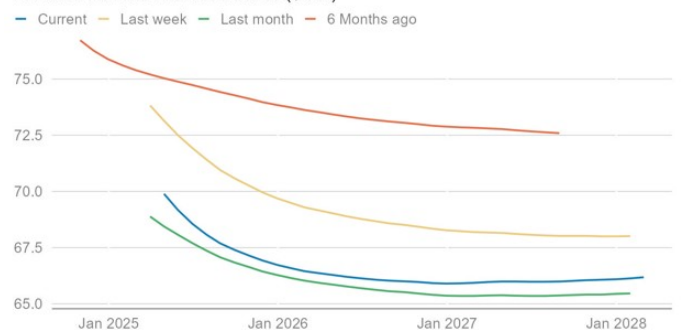


Source: Bloomberg, Morgan Stanley Research

Exhibit 12:

## Brent futures

Forward curve on different dates (\$/bbl)



Source: Platts, Morgan Stanley Research

Exhibit 13:

**Brent CFD curve**

(\$/bbl)

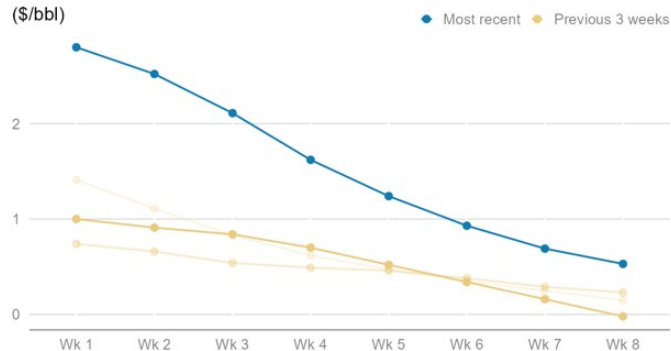


Exhibit 14:

**CFD curve structure**

Spread between week 2 and week 6 (\$/bbl)

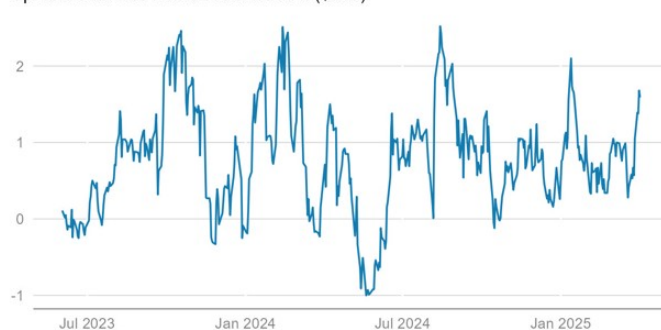


Exhibit 15:

**Brent DFL curve**

(\$/bbl)

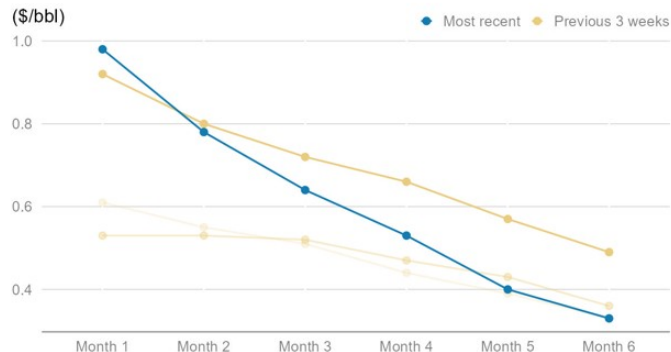


Exhibit 16:

**DFL curve structure**

Spread between month 1 and month 6 (\$/bbl)

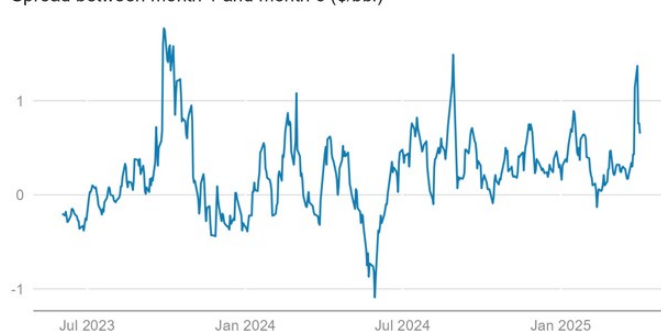


Exhibit 17:

**Cash Dubai premium**

Platts Cash Dubai vs M2 Dubai swaps spread (\$/bbl)

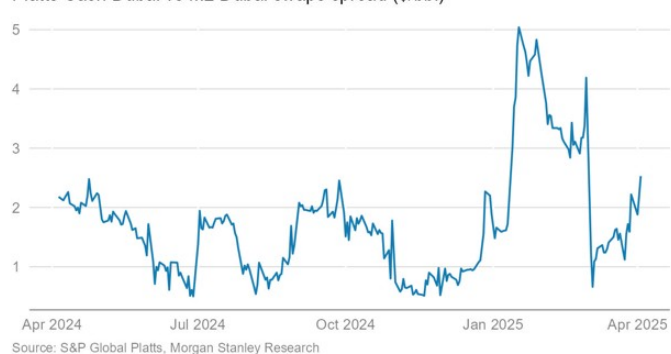
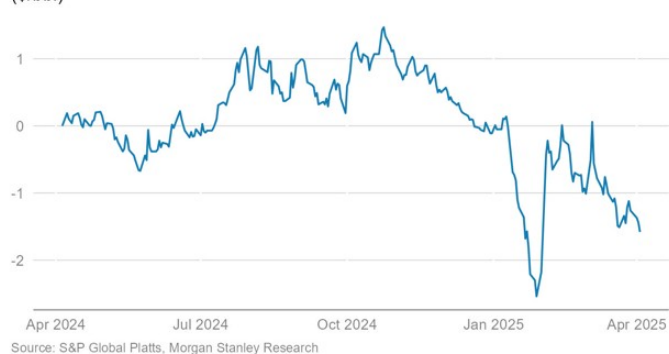


Exhibit 18:

**Brent/Dubai spread**

(\$/bbl)





# Differentials

Exhibit 19:

## North sea

Differential to forward Dated Brent (\$/bbl)

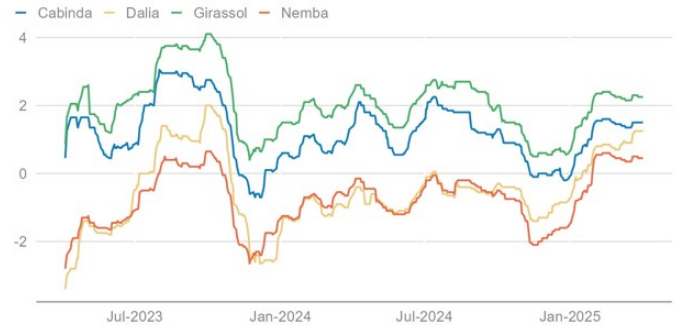


Source: S&amp;P Global Platts, Morgan Stanley Research

Exhibit 20:

## Angola

Differential to Dated Brent strip (\$/bbl)



Source: S&amp;P Global Platts, Morgan Stanley Research

Exhibit 21:

## Nigeria

Differential to Dated Brent strip (\$/bbl)



Source: S&amp;P Global Platts, Morgan Stanley Research

Exhibit 22:

## Kazakhstan

Differential to Dated Brent strip (\$/bbl)



Source: S&amp;P Global Platts, Morgan Stanley Research

Exhibit 23:

## Russia

Differential to Dated Brent strip (\$/bbl)

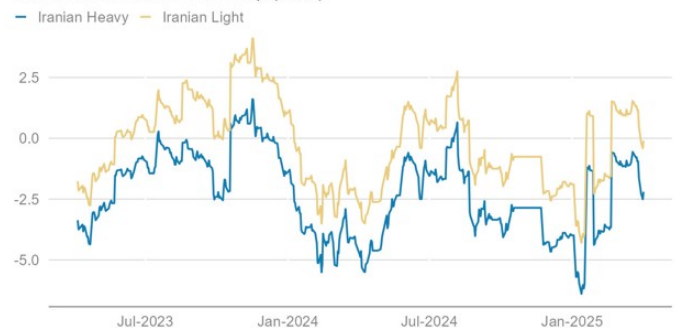


Source: S&amp;P Global Platts, Morgan Stanley Research

Exhibit 24:

## Iran

Differential to Dated Brent strip (\$/bbl)



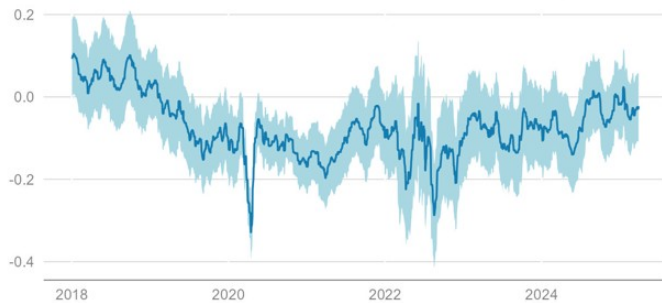
Source: S&amp;P Global Platts, Morgan Stanley Research

# Crude Quality

Exhibit 25:

## Heavy vs Light

Premium/(discount) for every 1 degree increase in API Gravity (\$/bbl)

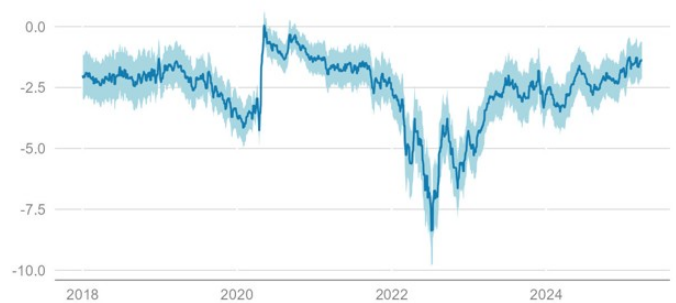


Note: analysis based on weekly regression across 95 seaborne crudes  
Source: Platts, Morgan Stanley Research

Exhibit 26:

## Sweet vs Sour

Premium/(discount) for every 1% increase in sulfur content (\$/bbl)

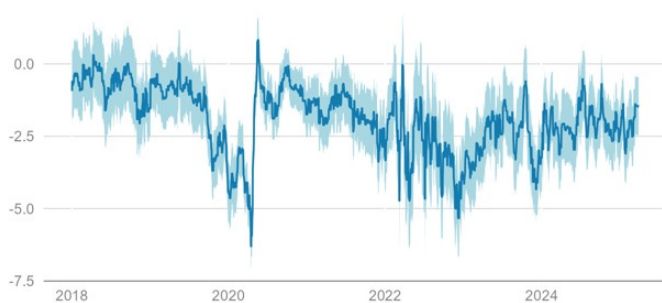


Note: analysis based on weekly regression across 95 seaborne crudes  
Source: Platts, Morgan Stanley Research

Exhibit 27:

## East vs West of Suez

Premium/(discount) for West- over East-of-Suez crudes (\$/bbl)

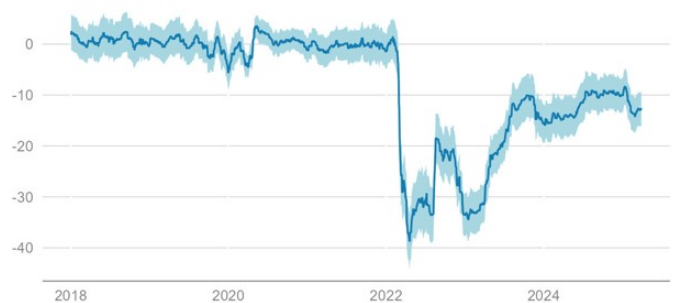


Note: analysis based on weekly regression across 95 seaborne crudes  
Source: Platts, Morgan Stanley Research

Exhibit 28:

## Russian vs non-Russian origin

Premium/(discount) for Russian crudes (\$/bbl)



Note: analysis based on weekly regression across 95 seaborne crudes  
Source: Platts, Morgan Stanley Research

The analyses above are based on a daily regression of the price of 95 seaborne crudes against 1) their API gravity, 2) their sulphur content, 3) a dummy variable indicating whether the crude's origin is East or West of Suez, and 4) another dummy variable indicating whether the grade is from Russian origin or not. The charts above show how sensitivity of these 95 crude prices to each of these variables has changed over time.



# Refining Margins

Exhibit 29:

## Cracking netback margin - Northwest Europe

Hydroskimming (\$/bbl)

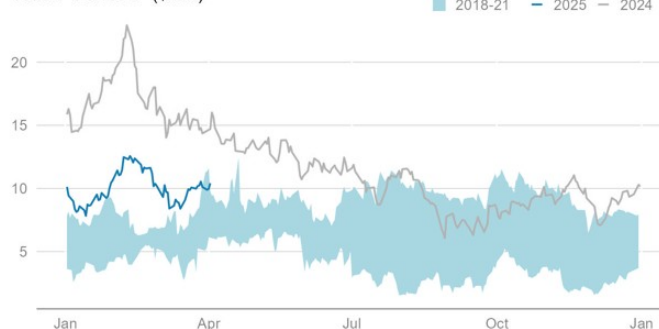


Source: S&amp;P Global Platts, Morgan Stanley Research

Exhibit 30:

## Cracking netback margin - Northwest Europe

VISB/FCC/HCU (\$/bbl)

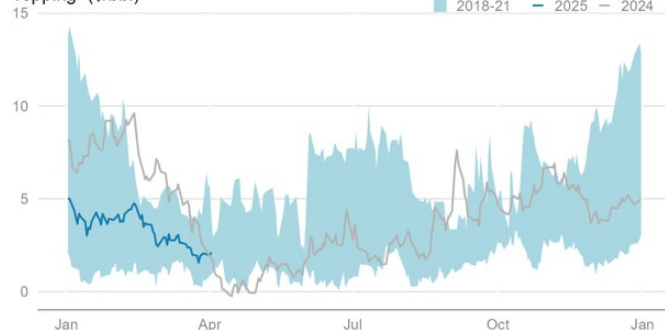


Source: S&amp;P Global Platts, Morgan Stanley Research

Exhibit 31:

## Cracking netback margin - Southeast Asia

Topping (\$/bbl)

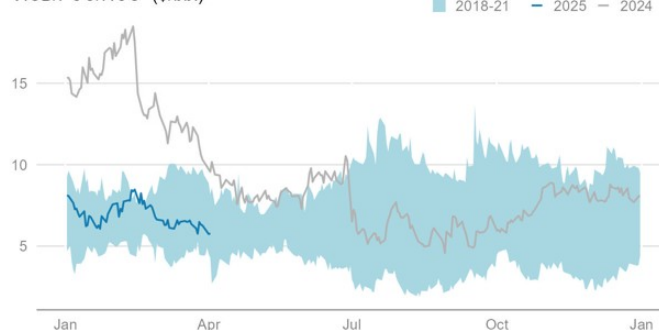


Source: S&amp;P Global Platts, Morgan Stanley Research

Exhibit 32:

## Cracking netback margin - Southeast Asia

VISB/FCC/HCU (\$/bbl)

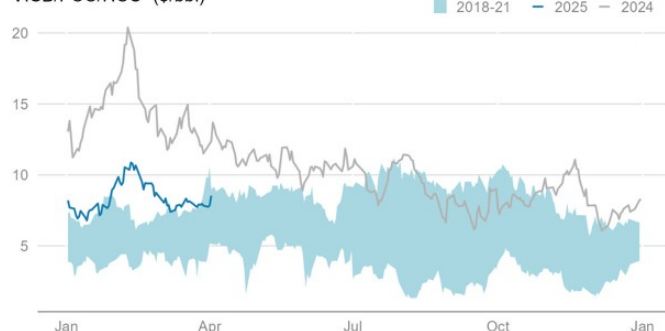


Source: S&amp;P Global Platts, Morgan Stanley Research

Exhibit 33:

## Cracking netback margin - Western Mediterranean

VISB/FCC/HCU (\$/bbl)



Source: S&amp;P Global Platts, Morgan Stanley Research

Exhibit 34:

## Cracking netback margin - USGC

FCC/HCU/Coking (\$/bbl)



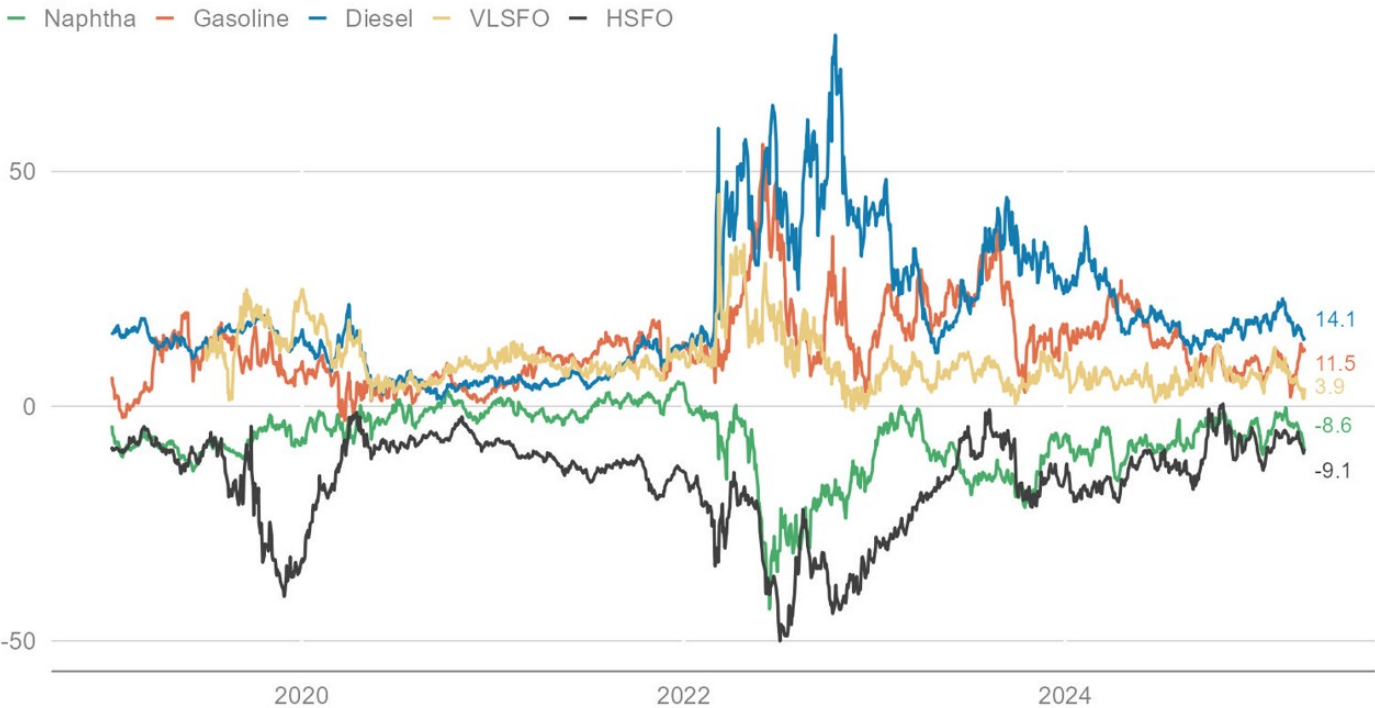
Source: S&amp;P Global Platts, Morgan Stanley Research

# Product Cracks Spreads

Exhibit 35:

## Refined product crack spreads

vs Dated Brent; basis: Antwerp-Rotterdam-Amsterdam (\$/bbl)



Source: Platts, Morgan Stanley

Exhibit 36:

## Forward refining margins

Based on typical European configuration (\$/bbl)

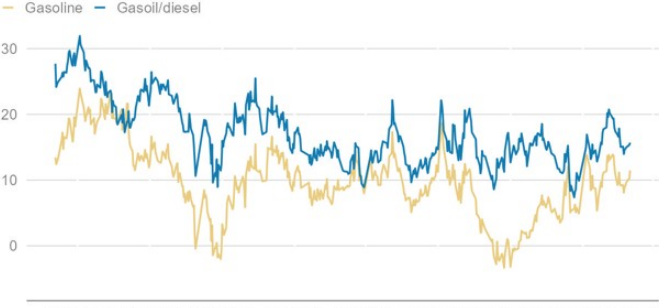


Note: analysis assumes yields of 30% gasoline, 60% middle distillate, 5% naphtha and 5% HSFO  
Source: Bloomberg, Morgan Stanley Research

Exhibit 37:

## China

Bohai Bay product crack spreads, excl. tax, \$/bbl

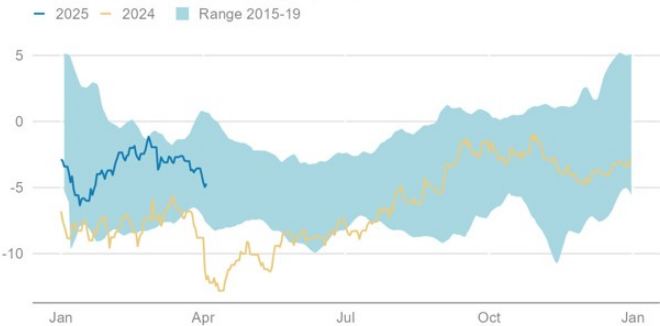


Source: Argus, Morgan Stanley Research

Exhibit 38:

**Naphtha**

Crack spread to Brent - NW Europe (\$/bbl)

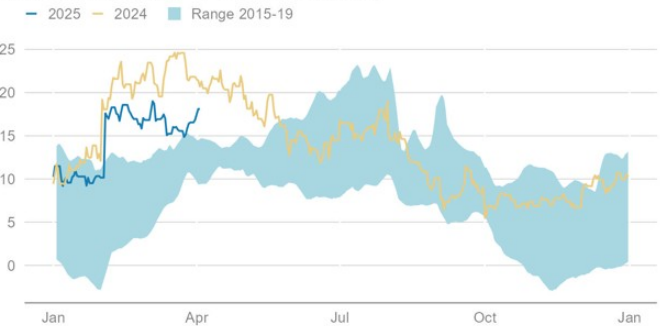


Source: S&P Global Platts, Morgan Stanley Research

Exhibit 39:

**Gasoline**

Crack spread to Brent - US Gulf Coast (\$/bbl)

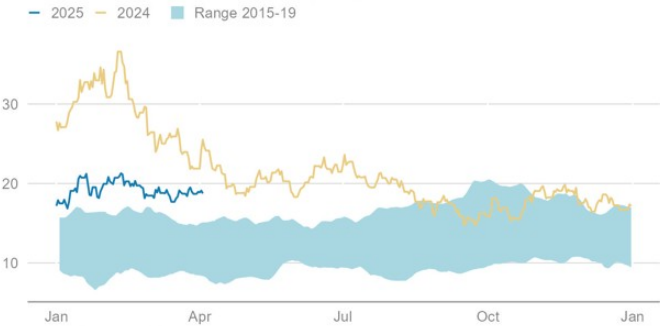


Source: S&P Global Platts, Morgan Stanley Research

Exhibit 40:

**Jet fuel**

Crack spread to Brent - NW Europe (\$/bbl)



Source: S&P Global Platts, Morgan Stanley Research

Exhibit 41:

**Gasoil/diesel**

Crack spread to Brent - NW Europe (\$/bbl)

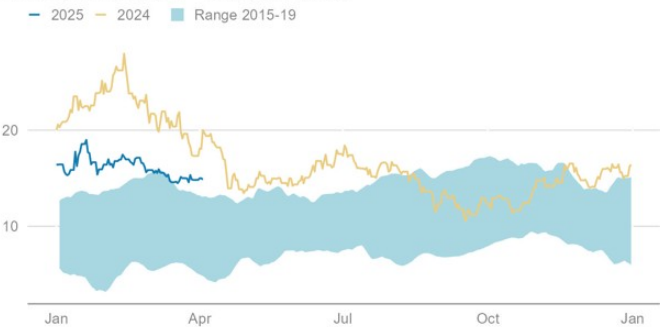


Source: S&P Global Platts, Morgan Stanley Research

Exhibit 42:

**Gasoil/diesel**

Crack spread to Brent - Singapore (\$/bbl)

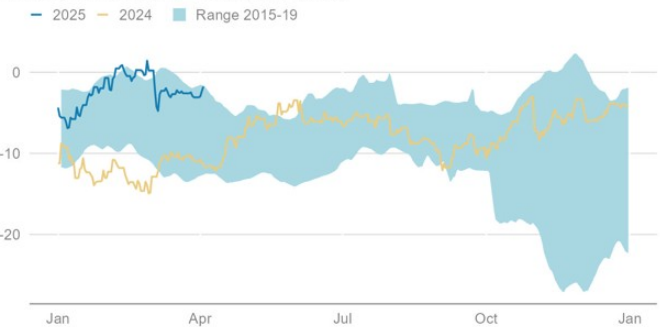


Source: S&P Global Platts, Morgan Stanley Research

Exhibit 43:

**High-sulphur fuel oil**

Crack spread to Brent - Singapore (\$/bbl)



Source: S&P Global Platts, Morgan Stanley Research

# Refinery outages

Exhibit 44:

## Refinery outages

(mb/d)

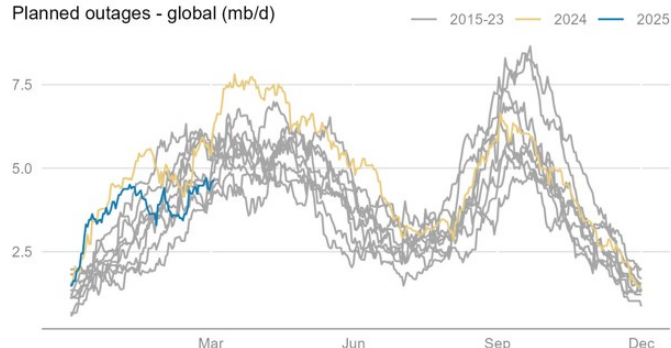
region	Actual													Known outlook	
	Mar 2024	Apr 2024	May 2024	Jun 2024	Jul 2024	Aug 2024	Sep 2024	Oct 2024	Nov 2024	Dec 2024	Jan 2025	Feb 2025	Mar 2025	Apr 2025	May 2025
Africa	0.58	0.77	1.08	0.83	0.78	0.77	0.72	0.74	0.73	0.52	0.43	0.47	0.51	0.69	0.63
Brazil	0.10	0.21	0.15	0.13	0.15	0.12	0.09	0.05	0.05	0.09	0.16	0.15	0.12	0.09	0.10
China	0.69	1.43	1.41	1.48	1.22	0.99	0.70	0.73	0.60	0.51	0.46	0.40	0.68	1.61	2.11
Europe	1.15	1.66	1.63	1.24	0.62	0.40	0.91	1.48	0.83	0.47	0.68	1.25	1.12	0.80	0.91
India	0.14	0.13	0.12	0.10	0.13	0.19	0.33	0.46	0.25	0.05	0.00	0.05	0.05	0.34	0.16
Japan	0.25	0.33	0.44	0.71	0.87	0.67	0.38	0.36	0.24	0.12	0.26	0.48	0.39	0.17	0.37
Korea	0.23	0.26	0.15	0.36	0.12	0.12	0.09	0.09	0.00	0.00	0.17	0.22	0.55	0.00	0.11
Middle East	0.38	0.33	0.39	0.21	0.09	0.02	0.27	0.33	0.64	0.60	0.45	0.52	0.07	0.29	0.49
Other	1.81	2.50	2.55	2.38	1.83	1.88	2.12	2.01	1.71	1.64	2.01	2.21	1.80	1.57	1.39
Russia	0.68	1.12	1.10	0.90	0.45	0.49	0.84	0.71	0.23	0.15	0.20	0.70	0.48	0.78	0.93
Taiwan	0.18	0.18	0.10	0.10	0.10	0.16	0.17	0.25	0.12	0.13	0.07	0.00	0.09	0.09	0.00
US	1.26	1.31	0.46	0.15	0.52	0.52	0.97	0.95	0.47	0.12	1.02	1.38	1.22	1.33	0.49
World	7.38	10.05	9.57	8.59	6.89	6.25	7.51	8.15	5.86	4.32	5.88	7.83	6.95	7.62	7.61

Source: IIR, Morgan Stanley Research

Exhibit 45:

## Refinery outages

Planned outages - global (mb/d)

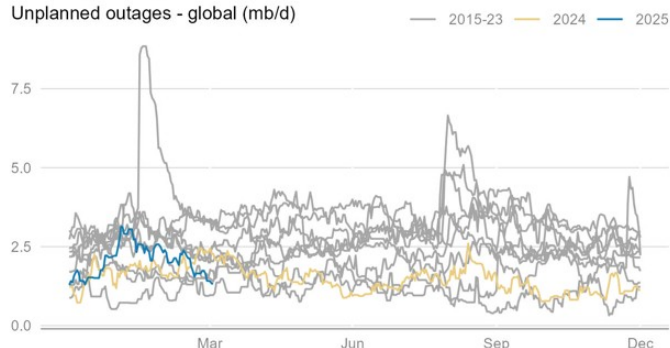


Source: IIR, Morgan Stanley Research

Exhibit 46:

## Refinery outages

Unplanned outages - global (mb/d)



Source: IIR, Morgan Stanley Research

# Inventories

Exhibit 47:

## Observable crude oil inventories

(million bbl)

		Level	Average daily change					
		Current	-4 wks	-13 wks	-26 wks	Mar	Feb	Jan
<b>Commercial</b>								
	United States	441.4	0.29	0.32	0.16	0.23	0.36	0.37
	Japan	71.3	0.32	0.12	0.01	0.34	-0.25	0.24
	ARA region	49.3	-0.09	-0.04	-0.02	-0.08	0.25	-0.26
	Other OECD	566.5	0.03	0.21	0.07	-0.02	0.24	0.40
	China	865.8	0.23	-0.44	-0.15	0.16	-0.93	-0.62
	Other non-OECD	1,094.3	0.55	0.16	-0.05	0.59	0.42	-0.52
	Floating storage	55.5	-0.77	-0.02	0.05	-0.53	0.02	0.52
	Oil-in-transit	1,089.8	-0.13	0.53	0.31	0.73	1.27	-0.24
Sub-total	—	<b>4,233.8</b>	<b>0.4</b>	<b>0.8</b>	<b>0.4</b>	<b>1.4</b>	<b>1.4</b>	<b>-0.1</b>
<b>SPR</b>								
	United States	396.4	0.04	0.03	0.08	0.04	0.01	0.05
	Japan	269.5	0.11	0.05	0.02	0.06	0.08	0.00
	ARA region	1.0	0.00	0.00	0.00	0.00	0.00	0.00
	Other OECD	267.9	0.00	0.00	-0.01	0.00	0.00	0.00
	China	186.4	0.01	-0.04	-0.02	0.04	0.04	-0.20
Sub-total	—	<b>1,121.2</b>	<b>0.2</b>	<b>0.0</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	<b>-0.2</b>
Total	—	<b>5,355.0</b>	<b>0.6</b>	<b>0.9</b>	<b>0.4</b>	<b>1.6</b>	<b>1.5</b>	<b>-0.3</b>

Source: IEA, EIA/DOE, PJK, IE, Genscape, PAJ, Platts, Vortexa, Morgan Stanley Research



Exhibit 48:

**Observable oil products inventories**

(million bbl)

		Level	Average daily change					
		Current	-4 wks	-13 wks	-26 wks	Mar	Feb	Jan
<b>On land</b>								
	Light ends	461.8	-0.28	0.12	0.16	-0.34	-0.21	0.87
	Middle distillates	728.0	-0.31	-0.02	-0.02	-0.29	-0.01	0.25
	Fuel oil & resid	146.5	0.17	0.04	0.05	0.19	-0.01	-0.07
	Other/not specified	513.1	0.51	-0.49	-0.49	0.45	-0.60	-1.36
Sub-total	—	<b>1,849.35</b>	<b>0.09</b>	<b>-0.35</b>	<b>-0.30</b>	<b>0.01</b>	<b>-0.83</b>	<b>-0.31</b>
<b>At sea</b>								
	Light ends	190.0	-0.21	-0.08	0.08	-0.16	0.51	-0.27
	Middle distillates	340.9	0.03	-0.16	-0.08	-0.21	-0.01	-0.23
	Fuel oil & resid	139.5	0.35	0.04	0.06	0.09	0.40	-0.24
	Other/not specified	143.0	-0.04	-0.13	0.02	-0.07	-0.22	-0.17
Sub-total	—	<b>813.41</b>	<b>0.13</b>	<b>-0.33</b>	<b>0.08</b>	<b>-0.35</b>	<b>0.68</b>	<b>-0.91</b>
Total	—	<b>2,662.77</b>	<b>0.22</b>	<b>-0.68</b>	<b>-0.22</b>	<b>-0.34</b>	<b>-0.15</b>	<b>-1.22</b>

Source: IEA, EIA/DOE, PJK, IE, Genscape, PAJ, Platts, Vortexa, Morgan Stanley Research

Exhibit 49:

**Observable crude oil and oil products inventories**

On land, at sea and in-transit (mln bbl)

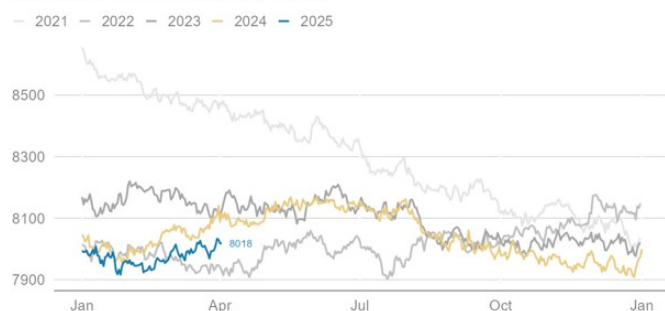
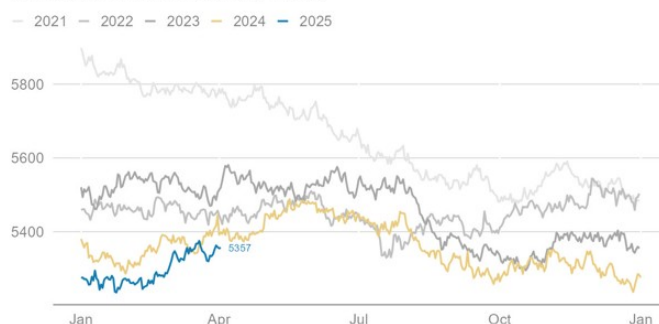
Note: Inventories include SPR  
Source: IEA, EIA/DOE, PJK, IE, Genscape, PAJ, Platts, Vortexa, Morgan Stanley Research

Exhibit 50:

**Observable crude oil inventories**

On land, at sea and in-transit (mln bbl)



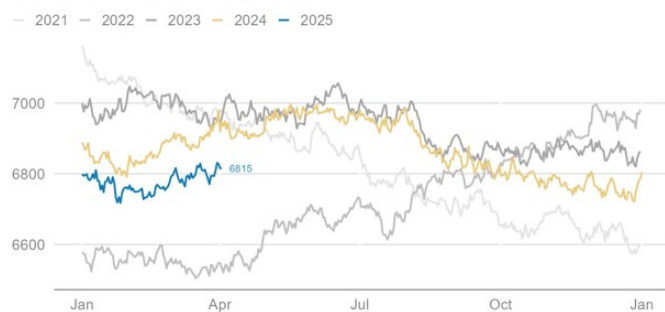
Source: IEA, EIA/DOE, PJK, IE, Genscape, PAJ, Platts, Vortexa, Morgan Stanley Research



Exhibit 51:

**Observable crude oil and oil products inventories**

In commercial storage only (mln bbl)

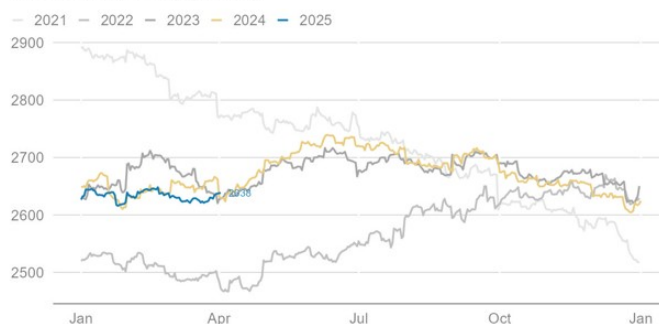


Note: inventories on land, at sea and in-transit, not including SPR in OECD countries  
 Source: IEA, EIA/DOE, PJK, IE, Genscape, PAJ, Platts, Vortexa, Morgan Stanley Research

Exhibit 52:

**OECD commercial oil inventories**

Total oil, on land only (mln bbl)



Source: IEA, EIA/DOE, PJK, PAJ, Platts, Vortexa, Morgan Stanley Research

Exhibit 53:

**Observable refined oil products inventories**

On land, at sea and in-transit (mln bbl)

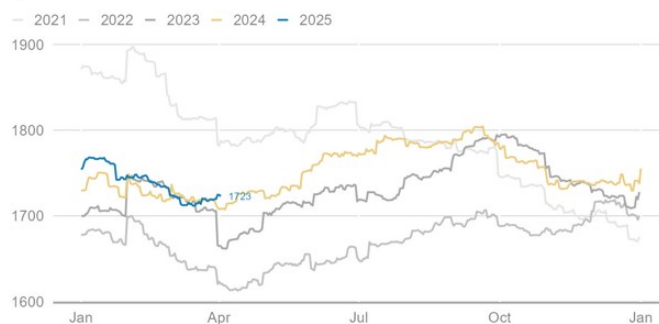


Source: IEA, EIA/DOE, PJK, IE, PAJ, Platts, Morgan Stanley Research

Exhibit 54:

**Observable refined oil products inventories, on-land only**

(mln bbl)

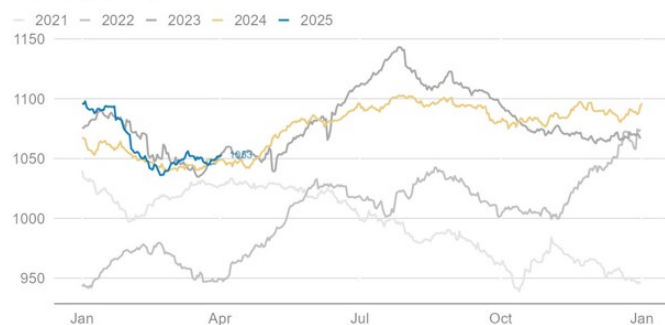


Source: IEA, EIA/DOE, PJK, IE, PAJ, Platts, Morgan Stanley Research

Exhibit 55:

**Observable crude oil inventories in China**

On land (mln bbl)

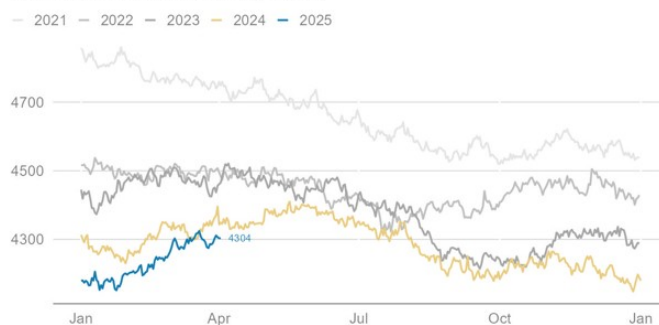


Source: IEA, EIA/DOE, PJK, IE, PAJ, Platts, Morgan Stanley Research

Exhibit 56:

**Observable crude oil inventories outside China**

On land, at sea and in-transit (mln bbl)



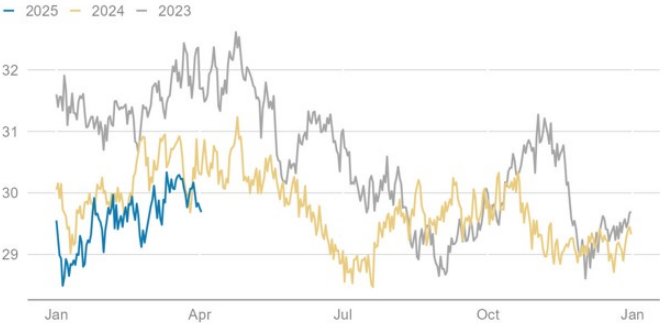
Source: IEA, EIA/DOE, PJK, IE, PAJ, Platts, Morgan Stanley Research

# Seaborne exports

Exhibit 57:

**OPEC 9+3**

Seaborne exports of crude oil and oil products (mb/d)

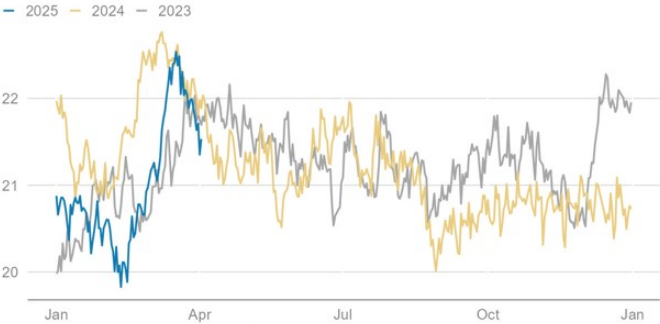


Source: Vortexa, Morgan Stanley Research

Exhibit 58:

**Non-OPEC**

Seaborne exports of crude oil (30-day moving avg; mb/d)

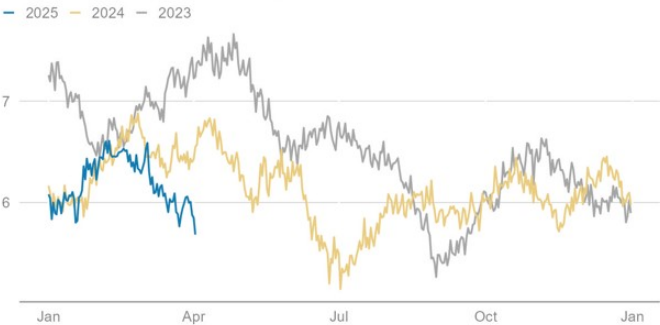


Source: Vortexa, Morgan Stanley Research

Exhibit 59:

**Saudi Arabia**

Seaborne crude oil exports (mb/d)

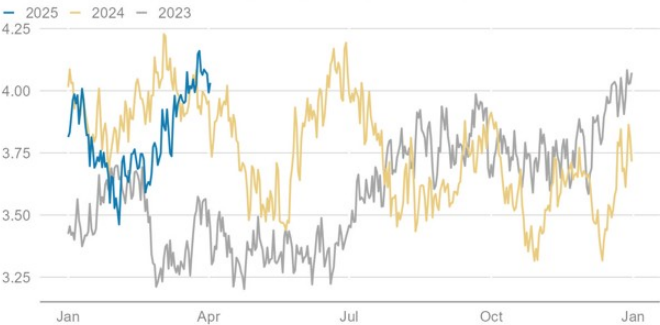


Source: Vortexa, Morgan Stanley Research

Exhibit 60:

**Brazil and Guyana**

Seaborne exports of crude oil (30-day moving avg; mb/d)

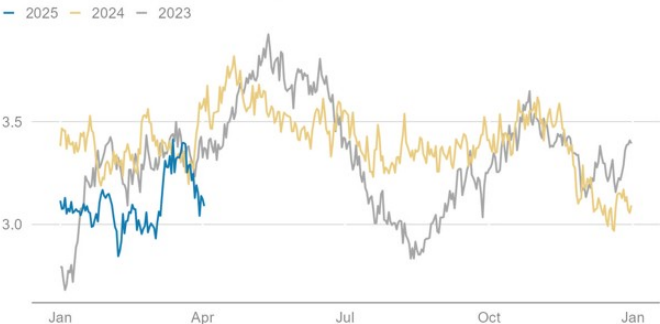


Source: Vortexa, Morgan Stanley Research

Exhibit 61:

**Russia**

Seaborne crude oil exports (mb/d)

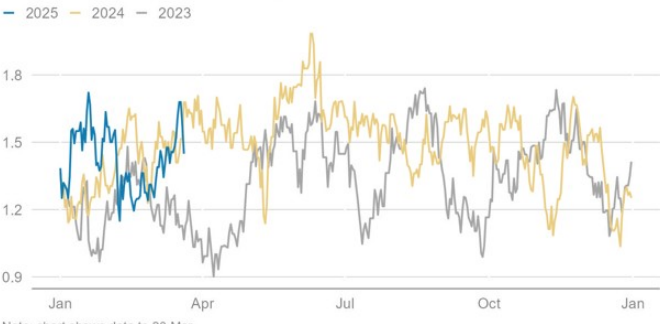


Source: Vortexa, Morgan Stanley Research

Exhibit 62:

**Iran**

Seaborne crude oil exports (mb/d)



Note: chart shows data to 20 Mar  
Source: Vortexa, Morgan Stanley Research

# US production

Exhibit 63:

## US crude + condensate production

Different sources compared (mb/d)



Exhibit 64: seaborne exports

## United States

Seaborne crude oil exports (mb/d)

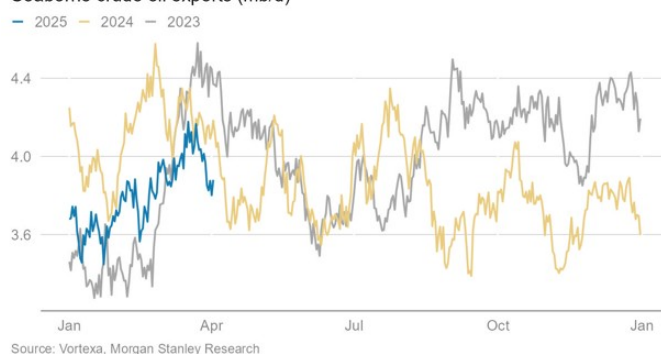


Exhibit 65:

## Permian

Crude oil and condensate production (mb/d)

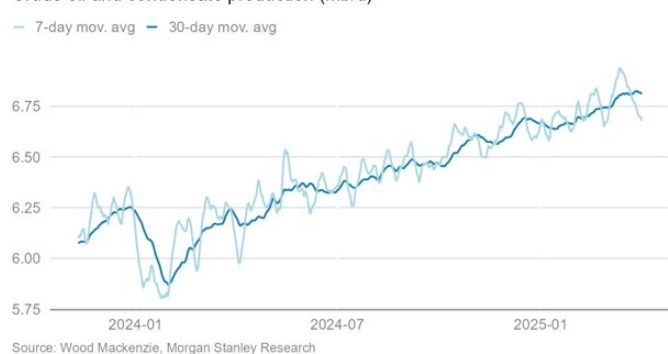


Exhibit 66:

## Eagle Ford

Crude oil and condensate production (mb/d)

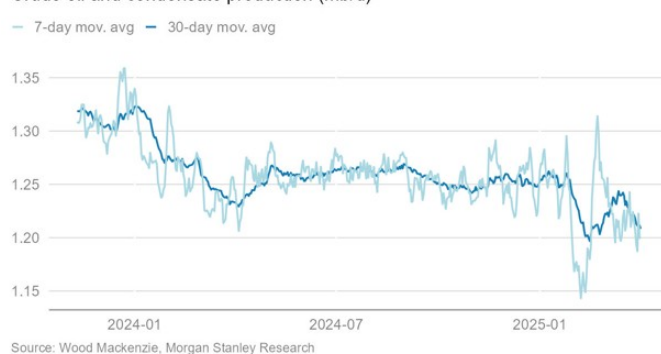


Exhibit 67:

## North Dakota

Crude oil and condensate production (mb/d)



Exhibit 68:

## Total GOM

Crude oil and condensate production (mb/d)



# Positioning

Exhibit 69:

**Total oil**

COT report - Managed money and Other reportables (number of contracts)

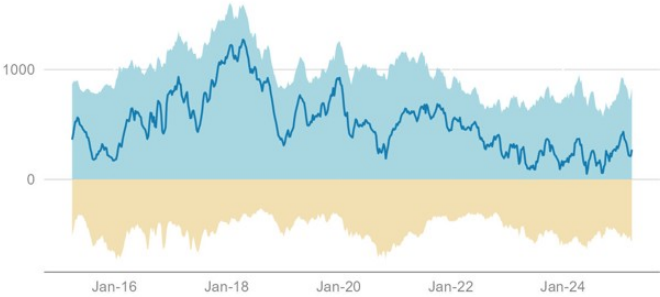


Note: light blue = long positions, yellow = short position, dark blue = net position  
Source: CFTC, Morgan Stanley Research

Exhibit 70:

**Brent and WTI**

COT report - Managed money and Other reportables (number of contracts)

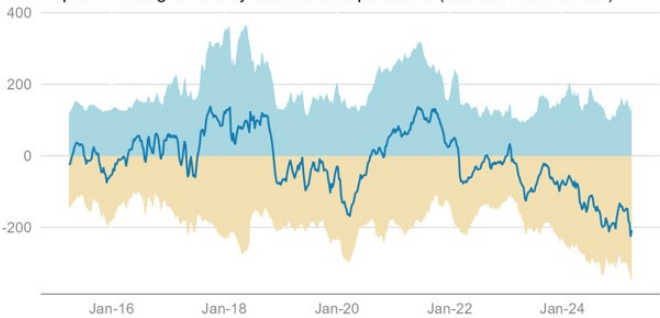


Note: light blue = long positions, yellow = short position, dark blue = net position  
Source: CFTC, Morgan Stanley Research

Exhibit 71:

**Gasoil and Heating Oil**

COT report - Managed money and Other reportables (number of contracts)

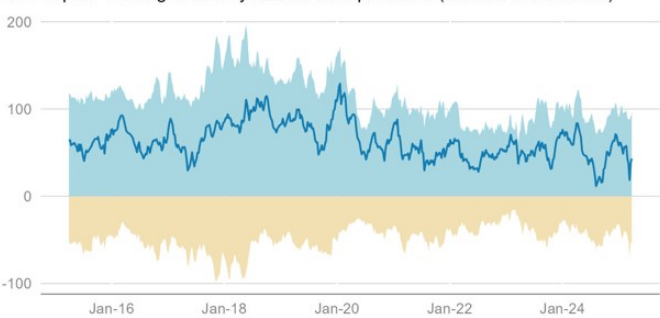


Note: light blue = long positions, yellow = short position, dark blue = net position  
Source: CFTC, Morgan Stanley Research

Exhibit 72:

**Gasoline - NY Harbour RBOB**

COT report - Managed money and Other reportables (number of contracts)



Note: light blue = long positions, yellow = short position, dark blue = net position  
Source: CFTC, Morgan Stanley Research

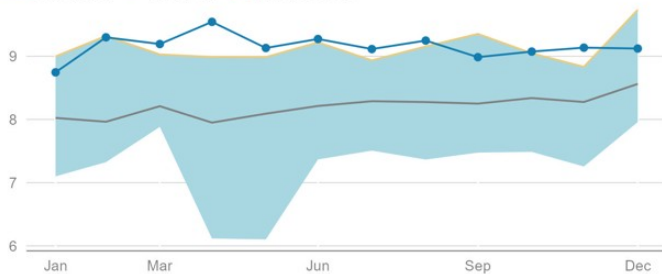
# Other selected charts

Exhibit 73:

## Motor fuel imports

Top 100 ports (mb/d)

— Current year — Prev. year ■ Range 2016-23

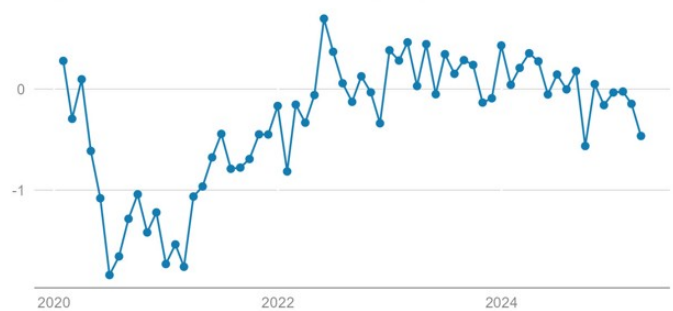


Note: analysis based on the 100 largest ports where imports are >90% of total flow, excluding large trading ports like Singapore, Rotterdam, etc  
Source: Vortexa, Morgan Stanley Research

Exhibit 74:

## Seaborne crude oil arrivals - Europe

Change vs seasonal average from 2016-23 (mb/d)



Note: analysis based on EU + Norway + UK  
Source: Vortexa, Morgan Stanley Research

Exhibit 75:

## Clean products net imports

Nigeria (30-day moving avg; mb/d)

— 2025 — 2024 — 2023 — 2022



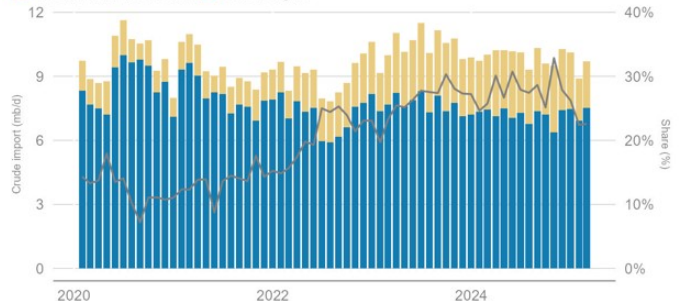
Source: Vortexa, Morgan Stanley Research

Exhibit 76:

## Crude oil imports

China, split by origin

■ Russia, Iran, Venezuela ■ Other origins

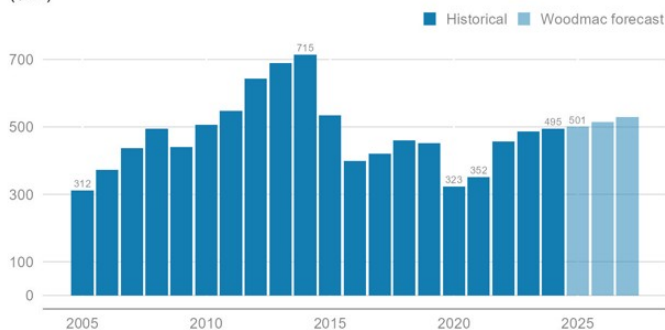


Source: Vortexa, Morgan Stanley Research

Exhibit 77:

## Global oil & gas capex

(\$bn)

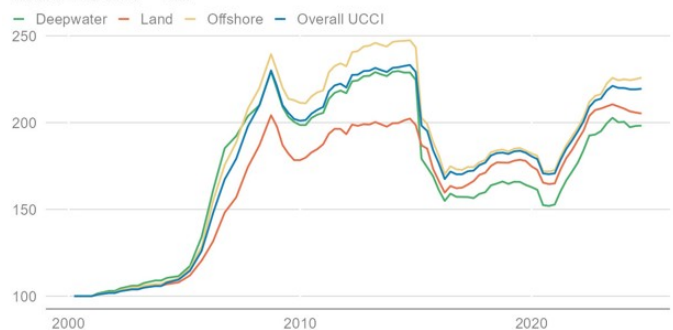


Source: Wood Mackenzie, Morgan Stanley Research

Exhibit 78:

## Upstream capital cost

Index: 1Q 2000 = 100



Source: S&P Global, Morgan Stanley Research

*Important note regarding economic sanctions. This research may reference jurisdiction(s) or person(s) which are the subject of sanctions administered or enforced by the U.S. Department of the Treasury's Office of Foreign Assets Control ("OFAC"), the United*

*Kingdom, the European Union and/or by other countries and multi-national bodies. Any references in this report to jurisdictions, persons (individuals or entities), debt or equity instruments, or projects that may be covered by such sanctions are strictly incidental to general coverage of the relevant economic sector as germane to its overall financial outlook, and should not be read as recommending or advising as to any investment activities in relation to such jurisdictions, persons, instruments, or projects. Users of this report are solely responsible for ensuring that their investment activities are carried out in compliance with applicable sanctions.*



## Disclosure Section

The information and opinions in Morgan Stanley Research were prepared or are disseminated by Morgan Stanley & Co. LLC and/or Morgan Stanley C.T.V.M. S.A. and/or Morgan Stanley México, Casa de Bolsa, S.A. de C.V. and/or Morgan Stanley Canada Limited and/or Morgan Stanley & Co. International plc and/or Morgan Stanley Europe S.E. and/or RMB Morgan Stanley Proprietary Limited and/or Morgan Stanley MUFG Securities Co., Ltd. and/or Morgan Stanley Capital Group Japan Co., Ltd. and/or Morgan Stanley Asia Limited and/or Morgan Stanley Asia (Singapore) Pte. (Registration number 199206298Z) and/or Morgan Stanley Asia (Singapore) Securities Pte Ltd (Registration number 200008434H), regulated by the Monetary Authority of Singapore (which accepts legal responsibility for its contents and should be contacted with respect to any matters arising from, or in connection with, Morgan Stanley Research) and/or Morgan Stanley Taiwan Limited and/or Morgan Stanley & Co International plc, Seoul Branch, and/or Morgan Stanley Australia Limited (A.B.N. 67 003 734 576, holder of Australian financial services license No. 233742, which accepts responsibility for its contents), and/or Morgan Stanley Wealth Management Australia Pty Ltd (A.B.N. 19 009 145 555, holder of Australian financial services license No. 240813, which accepts responsibility for its contents), and/or Morgan Stanley India Company Private Limited having Corporate Identification No (CIN) U22990MH1998PTC115305, regulated by the Securities and Exchange Board of India ("SEBI") and holder of licenses as a Research Analyst (SEBI Registration No. INH000001105), Stock Broker (SEBI Stock Broker Registration No. INZ000244438), Merchant Banker (SEBI Registration No. INM000011203), and depository participant with National Securities Depository Limited (SEBI Registration No. IN-DP-NSDL-567-2021) having registered office at Altimus, Level 39 & 40, Pandurang Budhkar Marg, Worli, Mumbai 400018, India; Telephone no. +91-22-61181000; Compliance Officer Details: Mr. Tejarshi Hardas, Tel. No.: +91-22-61181000 or Email: tejarshi.hardas@morganstanley.com; Grievance officer details: Mr. Tejarshi Hardas, Tel. No.: +91-22-61181000 or Email: msic-compliance@morganstanley.com which accepts the responsibility for its contents and should be contacted with respect to any matters arising from, or in connection with, Morgan Stanley Research, and their affiliates (collectively, "Morgan Stanley").

For important disclosures, stock price charts and equity rating histories regarding companies that are the subject of this report, please see the Morgan Stanley Research Disclosure Website at [www.morganstanley.com/researchdisclosures](http://www.morganstanley.com/researchdisclosures), or contact your investment representative or Morgan Stanley Research at 1585 Broadway, (Attention: Research Management), New York, NY, 10036 USA.

For valuation methodology and risks associated with any recommendation, rating or price target referenced in this research report, please contact the Client Support Team as follows: US/Canada +1 800 303-2495; Hong Kong +852 2848-5999; Latin America +1 718 754-5444 (U.S.); London +44 (0)20-7425-8169; Singapore +65 6834-6860; Sydney +61 (0)2-9770-1505; Tokyo +81 (0)3-6836-9000. Alternatively you may contact your investment representative or Morgan Stanley Research at 1585 Broadway, (Attention: Research Management), New York, NY 10036 USA.

### Analyst Certification

The following analysts hereby certify that their views about the companies and their securities discussed in this report are accurately expressed and that they have not received and will not receive direct or indirect compensation in exchange for expressing specific recommendations or views in this report: Amy Gower (Amy Sergeant), CFA; Martijn Rats, CFA.

### Global Research Conflict Management Policy

Morgan Stanley Research has been published in accordance with our conflict management policy, which is available at [www.morganstanley.com/institutional/research/conflict/policies](http://www.morganstanley.com/institutional/research/conflict/policies). A Portuguese version of the policy can be found at [www.morganstanley.com.br](http://www.morganstanley.com.br)

### Important Regulatory Disclosures on Subject Companies

The equity research analysts or strategists principally responsible for the preparation of Morgan Stanley Research have received compensation based upon various factors, including quality of research, investor client feedback, stock picking, competitive factors, firm revenues and overall investment banking revenues. Equity Research analysts' or strategists' compensation is not linked to investment banking or capital markets transactions performed by Morgan Stanley or the profitability or revenues of particular trading desks.

Morgan Stanley and its affiliates do business that relates to companies/instruments covered in Morgan Stanley Research, including market making, providing liquidity, fund management, commercial banking, extension of credit, investment services and investment banking. Morgan Stanley sells to and buys from customers the securities/instruments of companies covered in Morgan Stanley Research on a principal basis. Morgan Stanley may have a position in the debt of the Company or instruments discussed in this report. Morgan Stanley trades or may trade as principal in the debt securities (or in related derivatives) that are the subject of the debt research report.

Certain disclosures listed above are also for compliance with applicable regulations in non-US jurisdictions.

### STOCK RATINGS

Morgan Stanley uses a relative rating system using terms such as Overweight, Equal-weight, Not-Rated or Underweight (see definitions below). Morgan Stanley does not assign ratings of Buy, Hold or Sell to the stocks we cover. Overweight, Equal-weight, Not-Rated and Underweight are not the equivalent of buy, hold and sell. Investors should carefully read the definitions of all ratings used in Morgan Stanley Research. In addition, since Morgan Stanley Research contains more complete information concerning the analyst's views, investors should carefully read Morgan Stanley Research, in its entirety, and not infer the contents from the rating alone. In any case, ratings (or research) should not be used or relied upon as investment advice. An investor's decision to buy or sell a stock should depend on individual circumstances (such as the investor's existing holdings) and other considerations.

### Global Stock Ratings Distribution

(as of March 31, 2025)

The Stock Ratings described below apply to Morgan Stanley's Fundamental Equity Research and do not apply to Debt Research produced by the Firm.

For disclosure purposes only (in accordance with FINRA requirements), we include the category headings of Buy, Hold, and Sell alongside our ratings of Overweight, Equal-weight, Not-Rated and Underweight. Morgan Stanley does not assign ratings of Buy, Hold or Sell to the stocks we cover. Overweight, Equal-weight, Not-Rated and Underweight are not the equivalent of buy, hold, and sell but represent recommended relative weightings (see definitions below). To satisfy regulatory requirements, we correspond Overweight, our most positive stock rating, with a buy recommendation; we correspond Equal-weight and Not-Rated to hold and Underweight to sell recommendations, respectively.

Stock Rating Category	Coverage Universe		Investment Banking Clients (IBC)			Other Material Investment Services Clients (MISC)	
	Count	% of Total	Count	% of Total IBC	% of Rating Category	Count	% of Total Other MISC
Overweight/Buy	1516	40%	387	46%	26%	694	40%
Equal-weight/Hold	1682	44%	380	45%	23%	805	47%
Not-Rated/Hold	3	0%	0	0%	0%	0	0%
Underweight/Sell	598	16%	81	10%	14%	227	13%
Total	3,799		848			1726	

Data include common stock and ADRs currently assigned ratings. Investment Banking Clients are companies from whom Morgan Stanley received investment banking compensation in the last 12 months. Due to rounding off of decimals, the percentages provided in the "% of total" column may not add up to exactly 100 percent.

## Analyst Stock Ratings

Overweight (O or Over) - The stock's total return is expected to exceed the total return of the relevant country MSCI Index or the average total return of the analyst's industry (or industry team's) coverage universe, on a risk-adjusted basis over the next 12-18 months.

Equal-weight (E or Equal) - The stock's total return is expected to be in line with the total return of the relevant country MSCI Index or the average total return of the analyst's industry (or industry team's) coverage universe, on a risk-adjusted basis over the next 12-18 months.

Not-Rated (NR) - Currently the analyst does not have adequate conviction about the stock's total return relative to the relevant country MSCI Index or the average total return of the analyst's industry (or industry team's) coverage universe, on a risk-adjusted basis, over the next 12-18 months.

Underweight (U or Under) - The stock's total return is expected to be below the total return of the relevant country MSCI Index or the average total return of the analyst's industry (or industry team's) coverage universe, on a risk-adjusted basis, over the next 12-18 months.

Unless otherwise specified, the time frame for price targets included in Morgan Stanley Research is 12 to 18 months.

## Analyst Industry Views

Attractive (A): The analyst expects the performance of his or her industry coverage universe over the next 12-18 months to be attractive vs. the relevant broad market benchmark, as indicated below.

In-Line (I): The analyst expects the performance of his or her industry coverage universe over the next 12-18 months to be in line with the relevant broad market benchmark, as indicated below.

Cautious (C): The analyst views the performance of his or her industry coverage universe over the next 12-18 months with caution vs. the relevant broad market benchmark, as indicated below.

Benchmarks for each region are as follows: North America - S&P 500; Latin America - relevant MSCI country index or MSCI Latin America Index; Europe - MSCI Europe; Japan - TOPIX; Asia - relevant MSCI country index or MSCI sub-regional index or MSCI AC Asia Pacific ex Japan Index.

## Important Disclosures for Morgan Stanley Smith Barney LLC Customers

Important disclosures regarding the relationship between the companies that are the subject of Morgan Stanley Research and Morgan Stanley Smith Barney LLC or Morgan Stanley or any of their affiliates, are available on the Morgan Stanley Wealth Management disclosure website at [www.morganstanley.com/online/researchdisclosures](http://www.morganstanley.com/online/researchdisclosures). For Morgan Stanley specific disclosures, you may refer to [www.morganstanley.com/researchdisclosures](http://www.morganstanley.com/researchdisclosures).

Each Morgan Stanley research report is reviewed and approved on behalf of Morgan Stanley Smith Barney LLC. This review and approval is conducted by the same person who reviews the research report on behalf of Morgan Stanley. This could create a conflict of interest.

## Other Important Disclosures

Morgan Stanley Research policy is to update research reports as and when the Research Analyst and Research Management deem appropriate, based on developments with the issuer, the sector, or the market that may have a material impact on the research views or opinions stated therein. In addition, certain Research publications are intended to be updated on a regular periodic basis (weekly/monthly/quarterly/annual) and will ordinarily be updated with that frequency, unless the Research Analyst and Research Management determine that a different publication schedule is appropriate based on current conditions.

Morgan Stanley is not acting as a municipal advisor and the opinions or views contained herein are not intended to be, and do not constitute, advice within the meaning of Section 975 of the Dodd-Frank Wall Street Reform and Consumer Protection Act.

Morgan Stanley produces an equity research product called a "Tactical Idea." Views contained in a "Tactical Idea" on a particular stock may be contrary to the recommendations or views expressed in research on the same stock. This may be the result of differing time horizons, methodologies, market events, or other factors. For all research available on a particular stock, please contact your sales representative or go to Matrix at <http://www.morganstanley.com/matrix>.

Morgan Stanley Research is provided to our clients through our proprietary research portal on Matrix and also distributed electronically by Morgan Stanley to clients. Certain, but not all, Morgan Stanley Research products are also made available to clients through third-party vendors or redistributed to clients through alternate electronic means as a convenience. For access to all available Morgan Stanley Research, please contact your sales representative or go to Matrix at <http://www.morganstanley.com/matrix>.

Any access and/or use of Morgan Stanley Research is subject to Morgan Stanley's Terms of Use (<http://www.morganstanley.com/terms.html>). By accessing and/or using Morgan Stanley Research, you are indicating that you have read and agree to be bound by our Terms of Use (<http://www.morganstanley.com/terms.html>). In addition you consent to Morgan Stanley processing your personal data and using cookies in accordance with our Privacy Policy and our Global Cookies Policy ([http://www.morganstanley.com/privacy\\_pledge.html](http://www.morganstanley.com/privacy_pledge.html)), including for the purposes of setting your preferences and to collect readership data so that we can deliver better and more personalized service and products to you. To find out more information about how Morgan Stanley processes personal data, how we use cookies and how to reject cookies see our Privacy Policy and our Global Cookies Policy ([http://www.morganstanley.com/privacy\\_pledge.html](http://www.morganstanley.com/privacy_pledge.html)).

If you do not agree to our Terms of Use and/or if you do not wish to provide your consent to Morgan Stanley processing your personal data or using cookies please do not access our research.

Morgan Stanley Research does not provide individually tailored investment advice. Morgan Stanley Research has been prepared without regard to the circumstances and objectives of those who receive it. Morgan Stanley recommends that investors independently evaluate particular investments and strategies, and encourages investors to seek the advice of a financial adviser. The appropriateness of an investment or strategy will depend on an investor's circumstances and objectives. The securities, instruments, or strategies discussed in Morgan Stanley Research

may not be suitable for all investors, and certain investors may not be eligible to purchase or participate in some or all of them. Morgan Stanley Research is not an offer to buy or sell or the solicitation of an offer to buy or sell any security/instrument or to participate in any particular trading strategy. The value of and income from your investments may vary because of changes in interest rates, foreign exchange rates, default rates, prepayment rates, securities/instruments prices, market indexes, operational or financial conditions of companies or other factors. There may be time limitations on the exercise of options or other rights in securities/instruments transactions. Past performance is not necessarily a guide to future performance. Estimates of future performance are based on assumptions that may not be realized. If provided, and unless otherwise stated, the closing price on the cover page is that of the primary exchange for the subject company's securities/instruments.

The fixed income research analysts, strategists or economists principally responsible for the preparation of Morgan Stanley Research have received compensation based upon various factors, including quality, accuracy and value of research, firm profitability or revenues (which include fixed income trading and capital markets profitability or revenues), client feedback and competitive factors. Fixed Income Research analysts', strategists' or economists' compensation is not linked to investment banking or capital markets transactions performed by Morgan Stanley or the profitability or revenues of particular trading desks.

The "Important Regulatory Disclosures on Subject Companies" section in Morgan Stanley Research lists all companies mentioned where Morgan Stanley owns 1% or more of a class of common equity securities of the companies. For all other companies mentioned in Morgan Stanley Research, Morgan Stanley may have an investment of less than 1% in securities/instruments or derivatives of securities/instruments of companies and may trade them in ways different from those discussed in Morgan Stanley Research. Employees of Morgan Stanley not involved in the preparation of Morgan Stanley Research may have investments in securities/instruments or derivatives of securities/instruments of companies mentioned and may trade them in ways different from those discussed in Morgan Stanley Research. Derivatives may be issued by Morgan Stanley or associated persons.

With the exception of information regarding Morgan Stanley, Morgan Stanley Research is based on public information. Morgan Stanley makes every effort to use reliable, comprehensive information, but we make no representation that it is accurate or complete. We have no obligation to tell you when opinions or information in Morgan Stanley Research change apart from when we intend to discontinue equity research coverage of a subject company. Facts and views presented in Morgan Stanley Research have not been reviewed by, and may not reflect information known to, professionals in other Morgan Stanley business areas, including investment banking personnel.

Morgan Stanley Research personnel may participate in company events such as site visits and are generally prohibited from accepting payment by the company of associated expenses unless pre-approved by authorized members of Research management.

Morgan Stanley may make investment decisions that are inconsistent with the recommendations or views in this report.

To our readers based in Taiwan or trading in Taiwan securities/instruments: Information on securities/instruments that trade in Taiwan is distributed by Morgan Stanley Taiwan Limited ("MSTL"). Such information is for your reference only. The reader should independently evaluate the investment risks and is solely responsible for their investment decisions. Morgan Stanley Research may not be distributed to the public media or quoted or used by the public media without the express written consent of Morgan Stanley. Any non-customer reader within the scope of Article 7-1 of the Taiwan Stock Exchange Recommendation Regulations accessing and/or receiving Morgan Stanley Research is not permitted to provide Morgan Stanley Research to any third party (including but not limited to related parties, affiliated companies and any other third parties) or engage in any activities regarding Morgan Stanley Research which may create or give the appearance of creating a conflict of interest. Information on securities/instruments that do not trade in Taiwan is for informational purposes only and is not to be construed as a recommendation or a solicitation to trade in such securities/instruments. MSTL may not execute transactions for clients in these securities/instruments.

Certain information in Morgan Stanley Research was sourced by employees of the Shanghai Representative Office of Morgan Stanley Asia Limited for the use of Morgan Stanley Asia Limited. Morgan Stanley is not incorporated under PRC law and the research in relation to this report is conducted outside the PRC. Morgan Stanley Research does not constitute an offer to sell or the solicitation of an offer to buy any securities in the PRC. PRC investors shall have the relevant qualifications to invest in such securities and shall be responsible for obtaining all relevant approvals, licenses, verifications and/or registrations from the relevant governmental authorities themselves. Neither this report nor any part of it is intended as, or shall constitute, provision of any consultancy or advisory service of securities investment as defined under PRC law. Such information is provided for your reference only.

Morgan Stanley Research is disseminated in Brazil by Morgan Stanley C.T.V.M. S.A. located at Av. Brigadeiro Faria Lima, 3600, 6th floor, São Paulo - SP, Brazil; and is regulated by the Comissão de Valores Mobiliários; in Mexico by Morgan Stanley México, Casa de Bolsa, S.A. de C.V. which is regulated by Comisión Nacional Bancaria y de Valores. Paseo de los Tamarindos 90, Torre 1, Col. Bosques de las Lomas Floor 29, 05120 Mexico City; in Japan by Morgan Stanley MUFG Securities Co., Ltd. and, for Commodities related research reports only, Morgan Stanley Capital Group Japan Co., Ltd; in Hong Kong by Morgan Stanley Asia Limited (which accepts responsibility for its contents) and by Morgan Stanley Bank Asia Limited; in Singapore by Morgan Stanley Asia (Singapore) Pte. (Registration number 199206298Z) and/or Morgan Stanley Asia (Singapore) Securities Pte Ltd (Registration number 200008434H), regulated by the Monetary Authority of Singapore (which accepts legal responsibility for its contents and should be contacted with respect to any matters arising from, or in connection with, Morgan Stanley Research) and by Morgan Stanley Bank Asia Limited, Singapore Branch (Registration number T14FC0118); in Australia to "wholesale clients" within the meaning of the Australian Corporations Act by Morgan Stanley Australia Limited A.B.N. 67 003 734 576, holder of Australian financial services license No. 233742, which accepts responsibility for its contents; in Australia to "wholesale clients" and "retail clients" within the meaning of the Australian Corporations Act by Morgan Stanley Wealth Management Australia Pty Ltd (A.B.N. 19 009 145 555, holder of Australian financial services license No. 240813, which accepts responsibility for its contents; in Korea by Morgan Stanley & Co International plc, Seoul Branch; in India by Morgan Stanley India Company Private Limited having Corporate Identification No (CIN) U22990MH1998PTC115305, regulated by the Securities and Exchange Board of India ("SEBI") and holder of licenses as a Research Analyst (SEBI Registration No. INH000001105); Stock Broker (SEBI Stock Broker Registration No. INZ000244438), Merchant Banker (SEBI Registration No. INM000011203), and depository participant with National Securities Depository Limited (SEBI Registration No. IN-DP-NSDL-567-2021) having registered office at Altimus, Level 39 & 40, Pandurang Budhkar Marg, Worli, Mumbai 400018, India; Telephone no. +91-22-61181000; Compliance Officer Details: Mr. Tejarshi Hardas, Tel. No.: +91-22-61181000 or Email: tejarshi.hardas@morganstanley.com; Grievance officer details: Mr. Tejarshi Hardas, Tel. No.: +91-22-61181000 or Email: msic-compliance@morganstanley.com; in Canada by Morgan Stanley Canada Limited; in Germany and the European Economic Area where required by Morgan Stanley Europe S.E., authorised and regulated by Bundesanstalt fuer Finanzdienstleistungsaufsicht (BaFin) under the reference number 149169; in the US by Morgan Stanley & Co. LLC, which accepts responsibility for its contents. Morgan Stanley & Co. International plc, authorized by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority, disseminates in the UK research that it has prepared, and research which has been prepared by any of its affiliates, only to persons who (i) are investment professionals falling within Article 19(5) of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005 (as amended, the "Order"); (ii) are persons who are high net worth entities falling within Article 49(2)(a) to (d) of the Order; or (iii) are persons to whom an invitation or inducement to engage in investment activity (within the meaning of section 21 of the Financial Services and Markets Act 2000, as amended) may otherwise lawfully be communicated or caused to be communicated. RMB Morgan Stanley Proprietary Limited is a member of the JSE Limited and A2X (Pty) Ltd. RMB Morgan Stanley Proprietary Limited is a joint venture owned equally by Morgan Stanley International Holdings Inc. and RMB Investment Advisory (Proprietary) Limited, which is wholly owned by FirstRand Limited. The information in Morgan Stanley Research is being disseminated by Morgan Stanley Saudi Arabia, regulated by the Capital Market Authority in the Kingdom of Saudi Arabia, and is directed at Sophisticated investors only.

The information in Morgan Stanley Research is being communicated by Morgan Stanley & Co. International plc (DIFC Branch), regulated by the Dubai Financial Services Authority (the DFSA) or by Morgan Stanley & Co. International plc (ADGM Branch), regulated by the Financial Services Regulatory Authority Abu Dhabi (the FSRA), and is directed at Professional Clients only, as defined by the DFSA or the FSRA, respectively. The financial products or financial services to which this research relates will only be made available to a customer who we are satisfied meets

the regulatory criteria of a Professional Client. A distribution of the different MS Research ratings or recommendations, in percentage terms for Investments in each sector covered, is available upon request from your sales representative.

The information in Morgan Stanley Research is being communicated by Morgan Stanley & Co. International plc (QFC Branch), regulated by the Qatar Financial Centre Regulatory Authority (the QFCRA), and is directed at business customers and market counterparties only and is not intended for Retail Customers as defined by the QFCRA.

As required by the Capital Markets Board of Turkey, investment information, comments and recommendations stated here, are not within the scope of investment advisory activity. Investment advisory service is provided exclusively to persons based on their risk and income preferences by the authorized firms. Comments and recommendations stated here are general in nature. These opinions may not fit to your financial status, risk and return preferences. For this reason, to make an investment decision by relying solely to this information stated here may not bring about outcomes that fit your expectations.

The trademarks and service marks contained in Morgan Stanley Research are the property of their respective owners. Third-party data providers make no warranties or representations relating to the accuracy, completeness, or timeliness of the data they provide and shall not have liability for any damages relating to such data. The Global Industry Classification Standard (GICS) was developed by and is the exclusive property of MSCI and S&P.

Morgan Stanley Research, or any portion thereof may not be reprinted, sold or redistributed without the written consent of Morgan Stanley.

Indicators and trackers referenced in Morgan Stanley Research may not be used as, or treated as, a benchmark under Regulation EU 2016/1011, or any other similar framework.

The issuers and/or fixed income products recommended or discussed in certain fixed income research reports may not be continuously followed. Accordingly, investors should regard those fixed income research reports as providing stand-alone analysis and should not expect continuing analysis or additional reports relating to such issuers and/or individual fixed income products.

Morgan Stanley may hold, from time to time, material financial and commercial interests regarding the company subject to the Research report.

Registration granted by SEBI and certification from the National Institute of Securities Markets (NISM) in no way guarantee performance of the intermediary or provide any assurance of returns to investors. Investment in securities market are subject to market risks. Read all the related documents carefully before investing.