



Drowning in Sour Oil Adapting to a New Crude Quality Dynamic

2005 EIA Midterm Energy Outlook
April 12, 2005

Jay Saunders

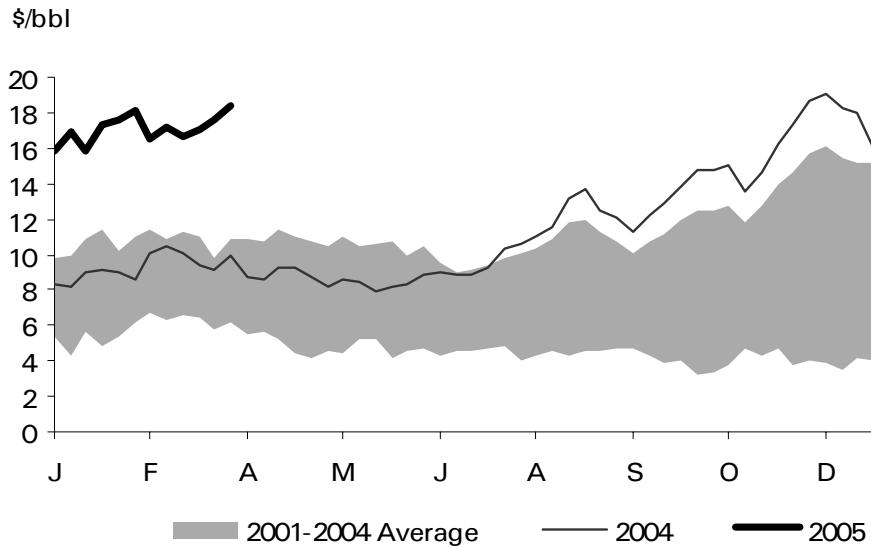
Energy Analyst

Deutsche Bank

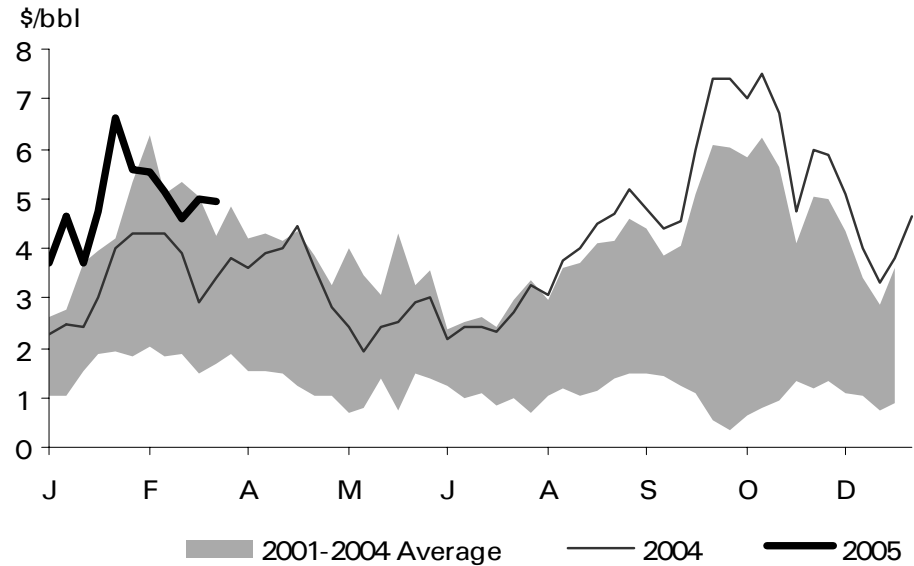
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Issue at Hand: Crude Quality Spreads Going Nuts

WTI - Maya



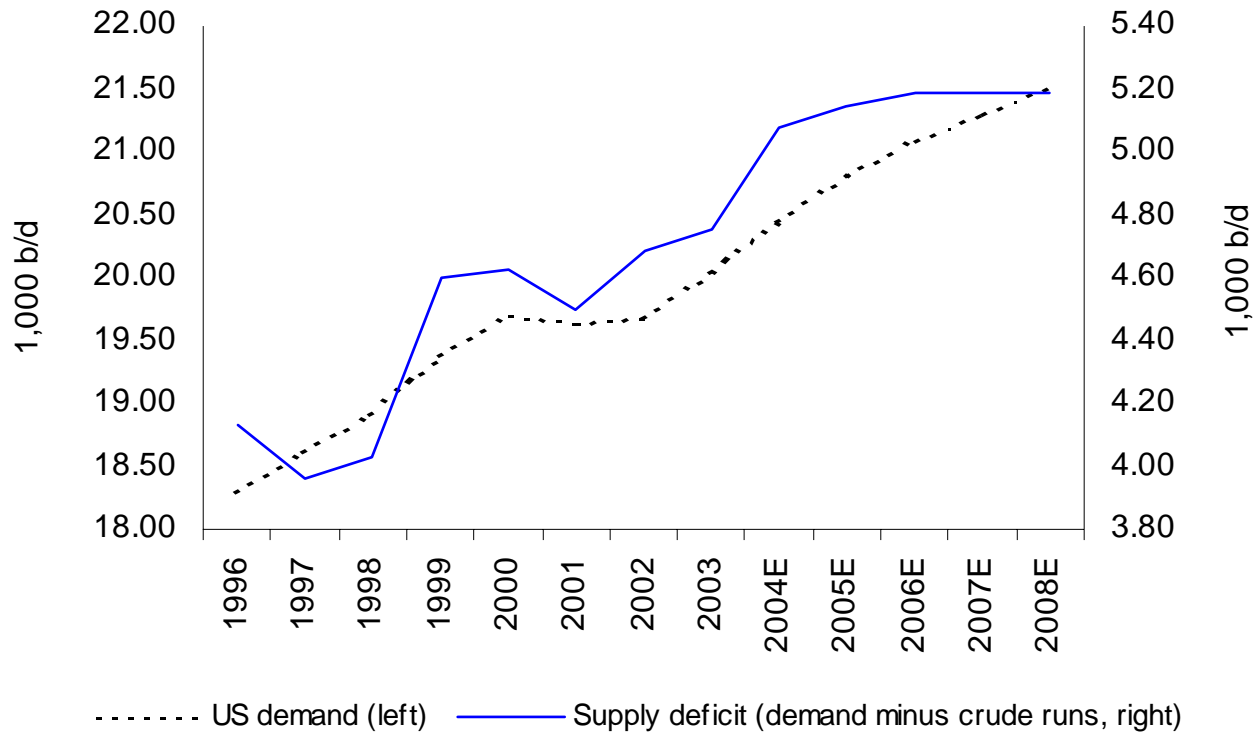
WTI - WTS



Source: Bloomberg, Deutsche Bank

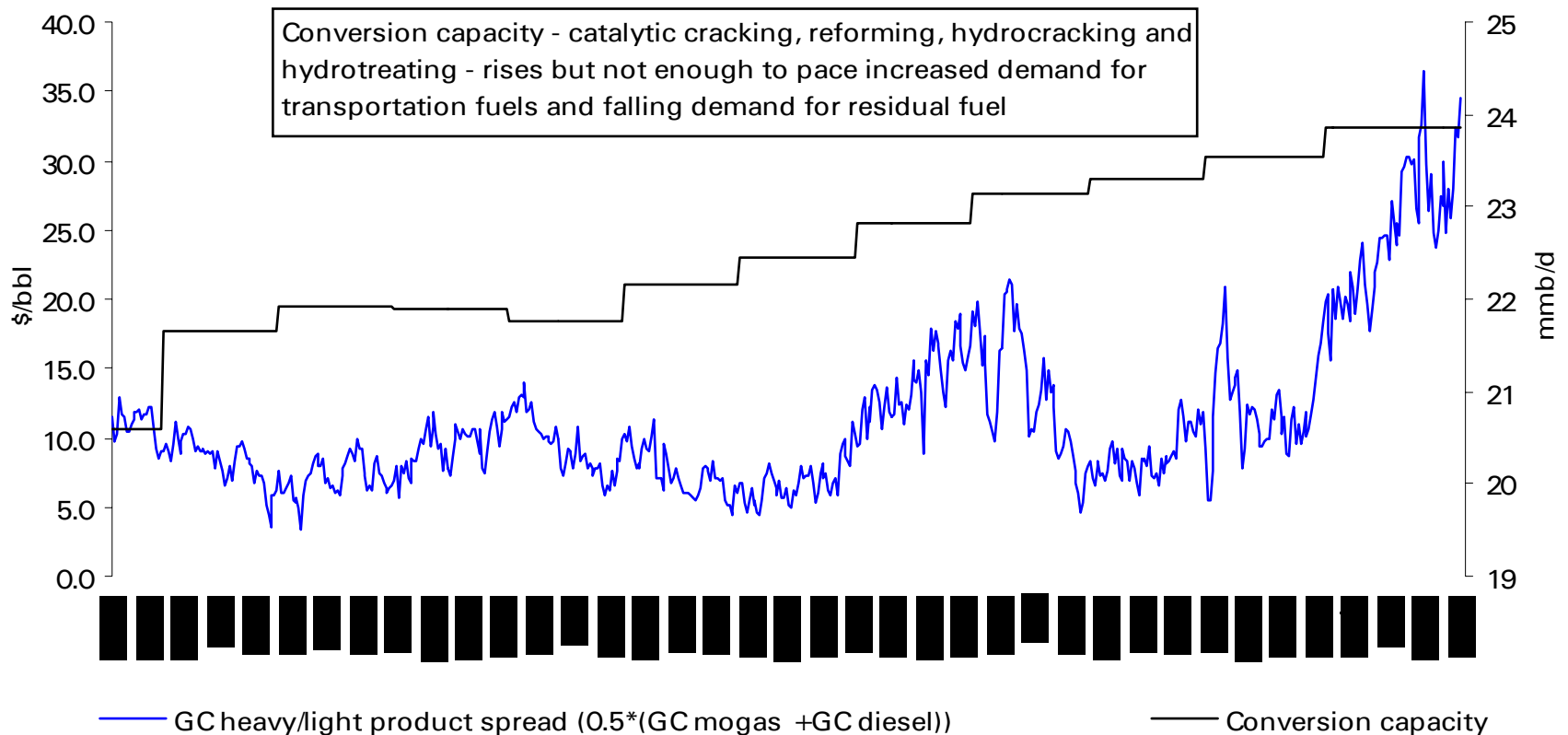


Refining capacity deficit continues to rise



Heavy/light product spread vs conversion capacity

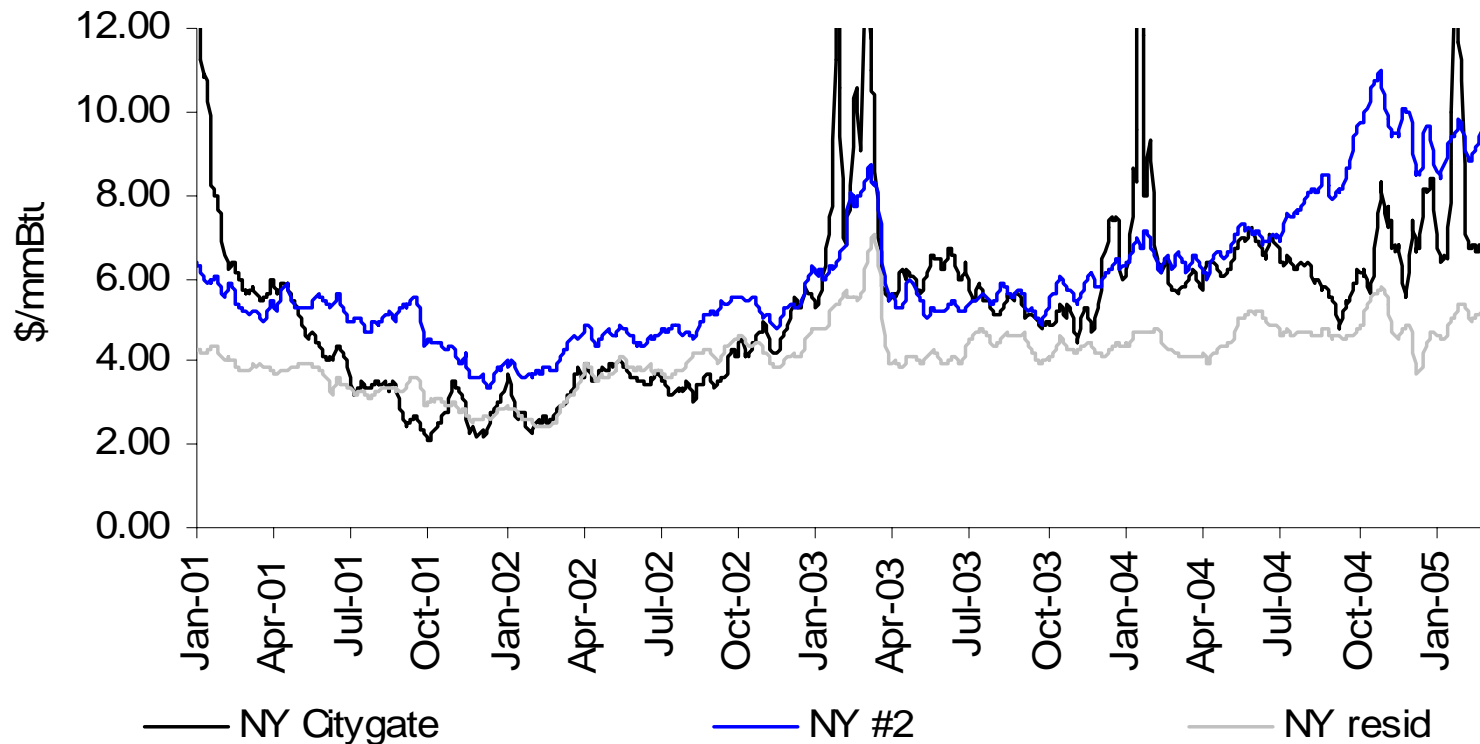
... Additions don't pace demand



Source: DOE/EIA, Bloomberg, Deutsche Bank

Natural gas vs distillate vs resid

... Clean fuels premium, gas against distillate not resid



Source: Bloomberg, Deutsche Bank

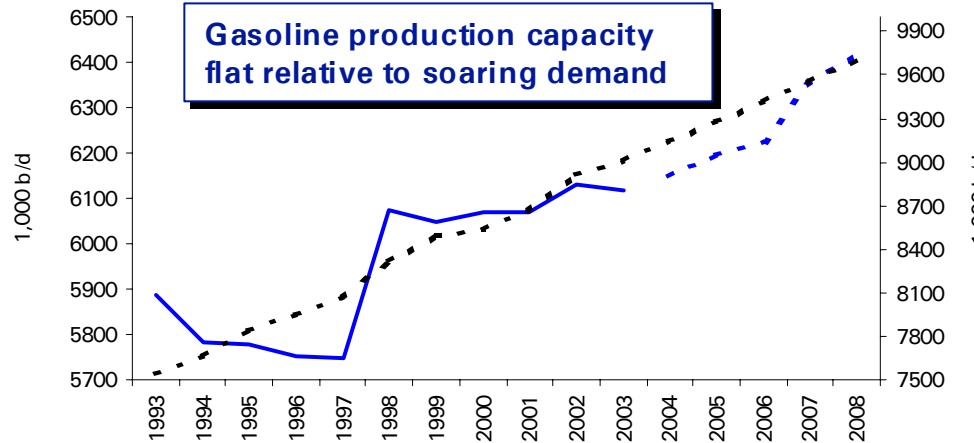
Deutsche Bank Macro Price Deck

	2002	2003	1Q04	2004	3Q04	4Q04	2004	1Q05	2Q05	3Q05	4Q05	2005E	2006E	2007E	2008E
Oil price - WTI (\$/bbl)	26.12	31.02	35.25	38.67	43.74	48.27	41.48	46.00	44.00	41.00	41.00	43.00	37.00	32.00	32.00
Oil price - Brent (\$/bbl)	25.03	28.45	31.30	35.79	41.16	44.88	38.28	43.00	41.00	38.00	38.00	40.00	35.00	30.00	30.00
Natural gas price - NYMEX (\$/mmBtu)	3.36	5.50	5.71	6.06	5.47	7.26	6.13	6.25	6.00	5.75	6.00	6.00	5.00	5.00	5.00
Refining Margins (\$/bbl)															
Northwest Europe	1.98	3.76	3.57	7.46	4.04	4.99	5.02	5.50	4.75	4.75	5.00	5.00	3.00	2.30	3.00
Mediterranean	1.48	3.40	3.95	5.25	4.65	5.26	4.78	4.00	3.50	3.50	4.00	3.75	3.00	2.60	3.00
US East Coast	4.24	7.63	9.72	10.71	9.08	11.71	10.31	10.00	9.00	8.00	9.00	9.00	8.00	6.50	6.00
US Midcontinent	5.32	7.39	7.78	13.33	9.00	6.81	9.23	8.00	9.00	8.00	8.00	8.25	7.00	6.00	6.00
US Gulf	2.14	3.79	5.45	8.07	4.61	2.60	5.18	6.00	7.00	5.00	5.00	5.75	4.50	3.00	3.00
US Gulf 3-2-1	3.82	4.94	7.10	9.73	6.85	4.60	7.07	6.00	6.50	5.00	5.00	5.63	5.40	3.60	3.60
US Rockies	5.12	6.93	6.45	11.34	7.72	6.03	7.88	6.00	9.00	8.00	7.00	7.50	8.00	6.00	6.00
US West Coast	8.11	11.96	16.33	23.25	17.98	16.90	18.62	15.00	14.00	14.00	11.00	13.50	12.00	10.00	10.00
US Pacific-Northwest	6.78	9.46	9.93	19.49	14.51	12.33	14.06	11.50	10.73	9.20	8.43	9.97	8.80	7.30	7.30
Asia	1.82	3.76	6.83	6.59	8.37	10.43	8.07	6.50	6.50	6.50	6.50	6.50	5.00	3.50	4.00
World	1.98	3.77	5.28	7.37	5.67	6.01	6.09	6.00	6.08	5.42	5.50	5.75	4.17	2.93	3.33
WTI-Maya	5.04	6.79	9.33	8.66	11.86	16.18	11.51	16.00	14.00	12.00	14.00	14.00	12.00	8.00	6.50
WTI-WTS	-1.18	2.65	3.43	2.95	6.14	5.45	4.49	5.00	4.50	4.50	4.30	4.58	3.50	2.70	2.70
Brent-Dubai	-1.26	2.14	2.70	2.22	5.83	9.02	4.94	6.00	4.50	3.50	3.00	4.25	3.00	2.30	2.30

US Refining... Strong demand squeezes patchwork supply

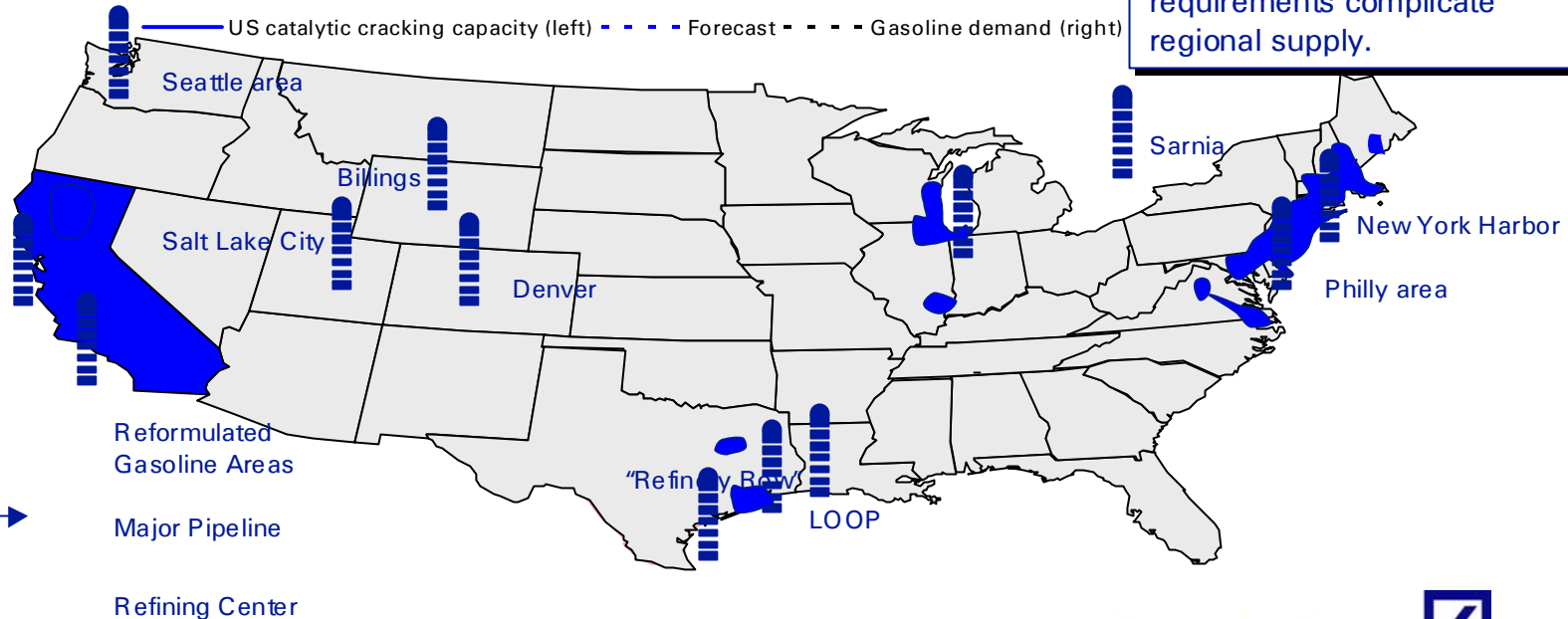
Sulfur removal

Gasoline to 120ppm in 2004, 90ppm 2005 and 30ppm 2006; Diesel to 15ppm 2006. Refiners lighten crude slate - and widen light crude price premium to heavy grades - to meet rather than invest in desulfurization.



MTBE bans

California, New York, Connecticut - MTBE is an oxygenate gasoline additive used to meet fuel specs; replacement is ethanol (corn based), which is good on octane but not volatility, so need another 100kb/d gasoline to offset removal of volatile components. Further, patchwork gasoline requirements complicate regional supply.



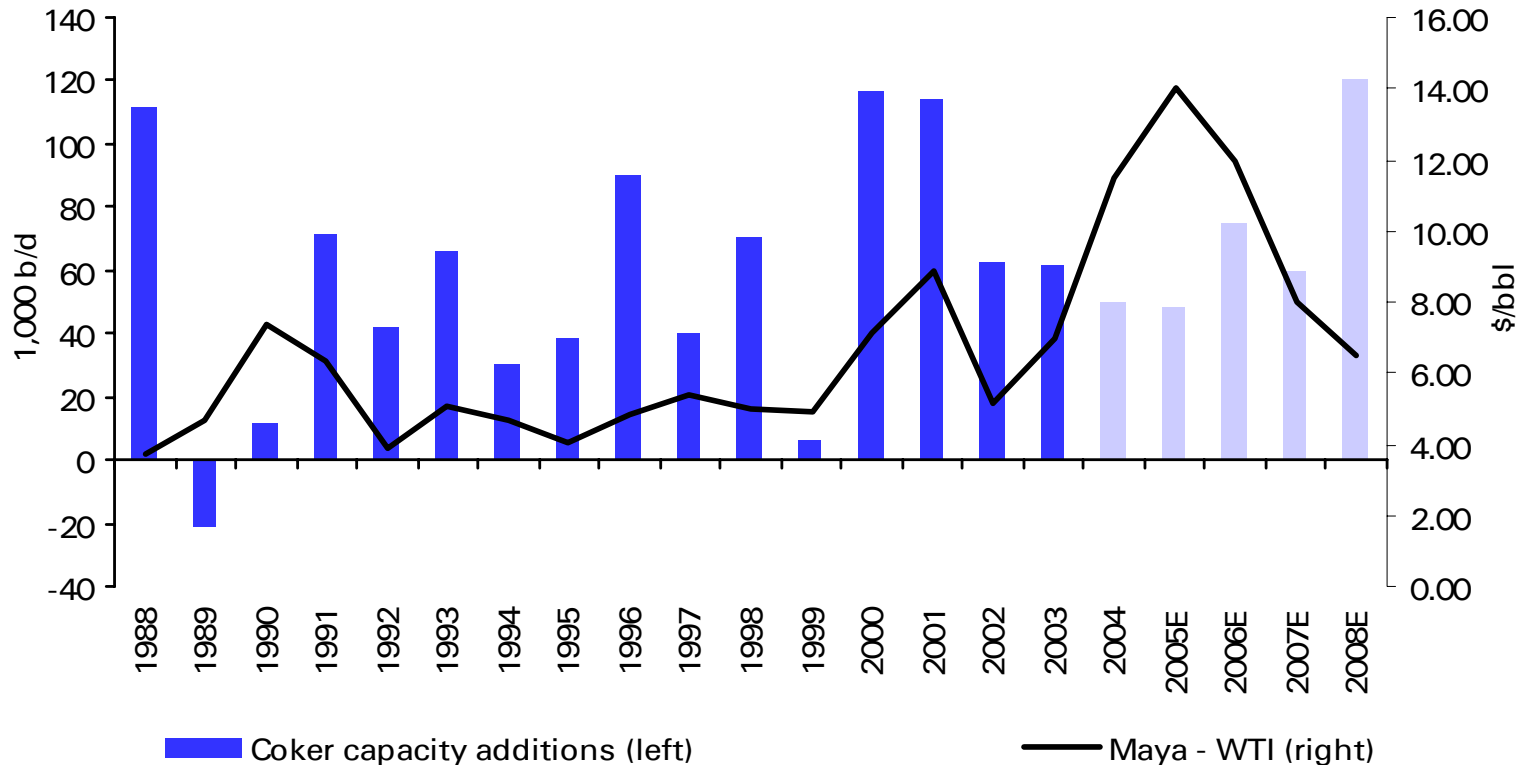
Sulfur specification timeline

...It's global

	2003	2004	2005	2006	2007	2008	2009
US	Tier II Gasoline - 120ppm 2004, 90ppm 2005, 30ppm 2006			On-road diesel, 15ppm June 2006	Off-road diesel	Jet fuel? Fuel oil?	
Europe		50ppm gasoline and diesel begin 2005				10ppm gasoline and diesel	
Singapore			50ppm diesel 2006				
Phillipines		500ppm diesel from 2,000, 50ppm 2006					
Australia		150ppm gasoline sulfur cap					
China			800ppm to 500ppm gasoline in cities				
India		Gasoline and diesel 500ppm from 2,500 and 1,000 April 1, 2005					

US Coker Additions vs Heavy/Light Spread

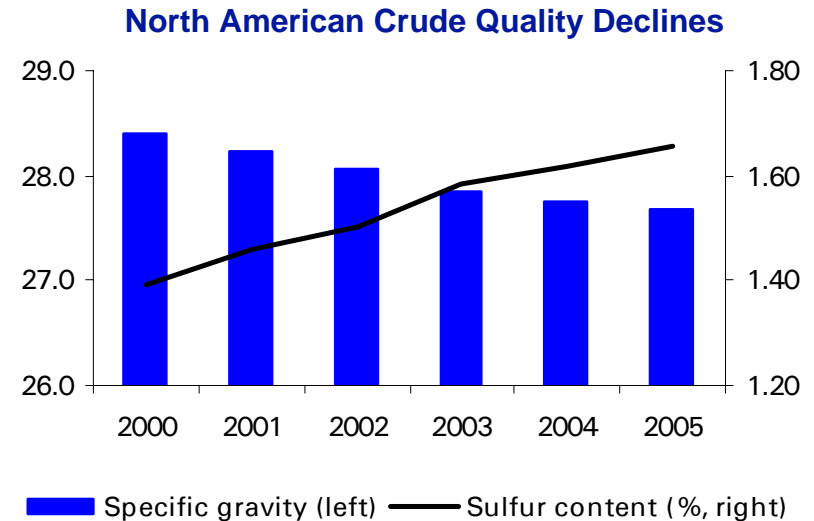
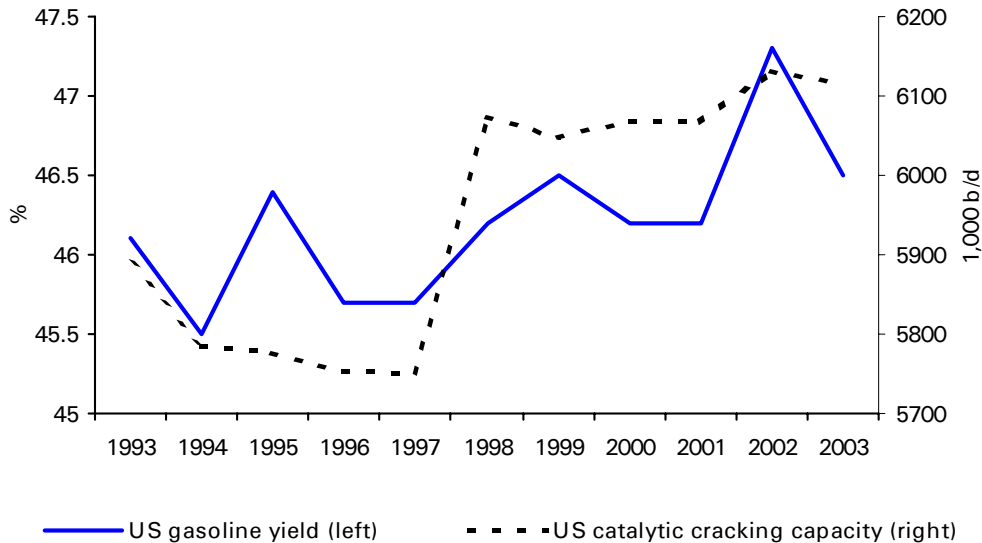
3-year investment cycle - and spread - extended, little plans for growth



Source: DOE, Deutsche Bank

Underinvested US Refining Needs Sweeter Crude Slate

And increasingly heavy barrel further widens heavy discount

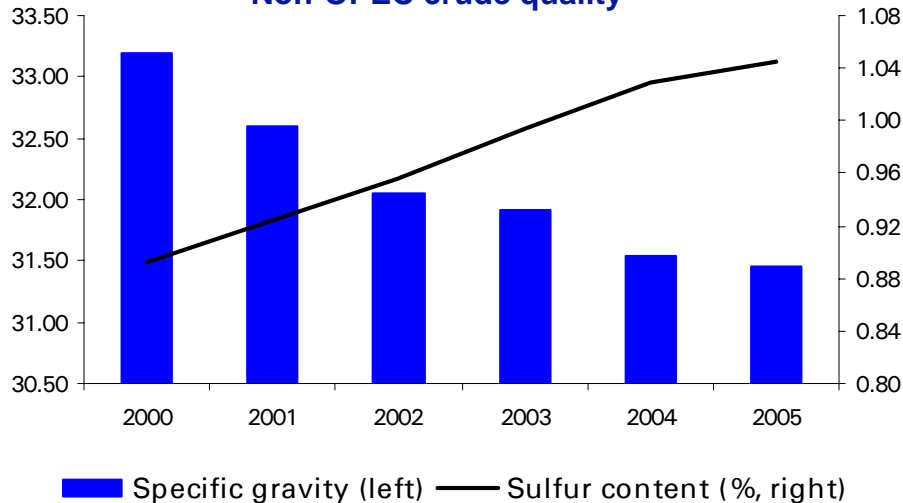


Source: Bloomberg, DOE, Deutsche Bank

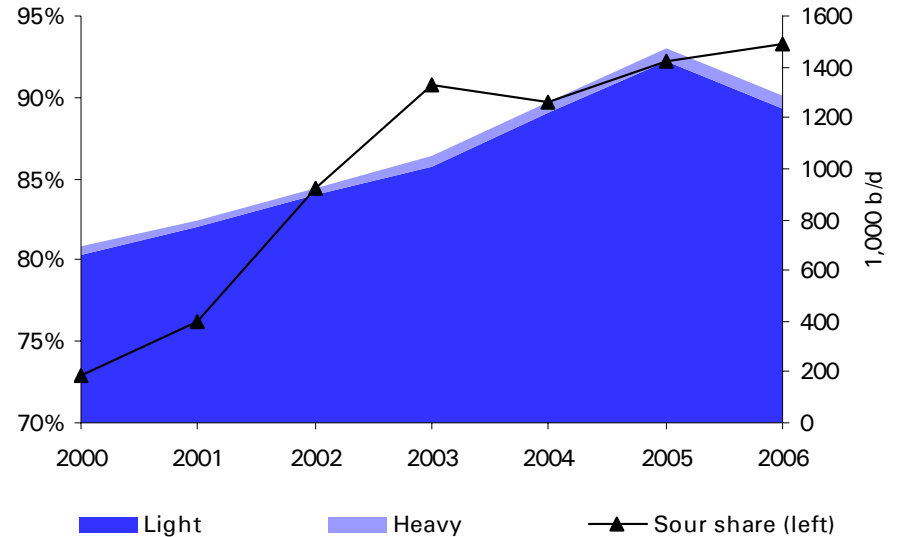
Drowning in Sour Crude

Non-OPEC, GOM crude quality deteriorating just as ridding world fuels of sulfur

Non-OPEC crude quality

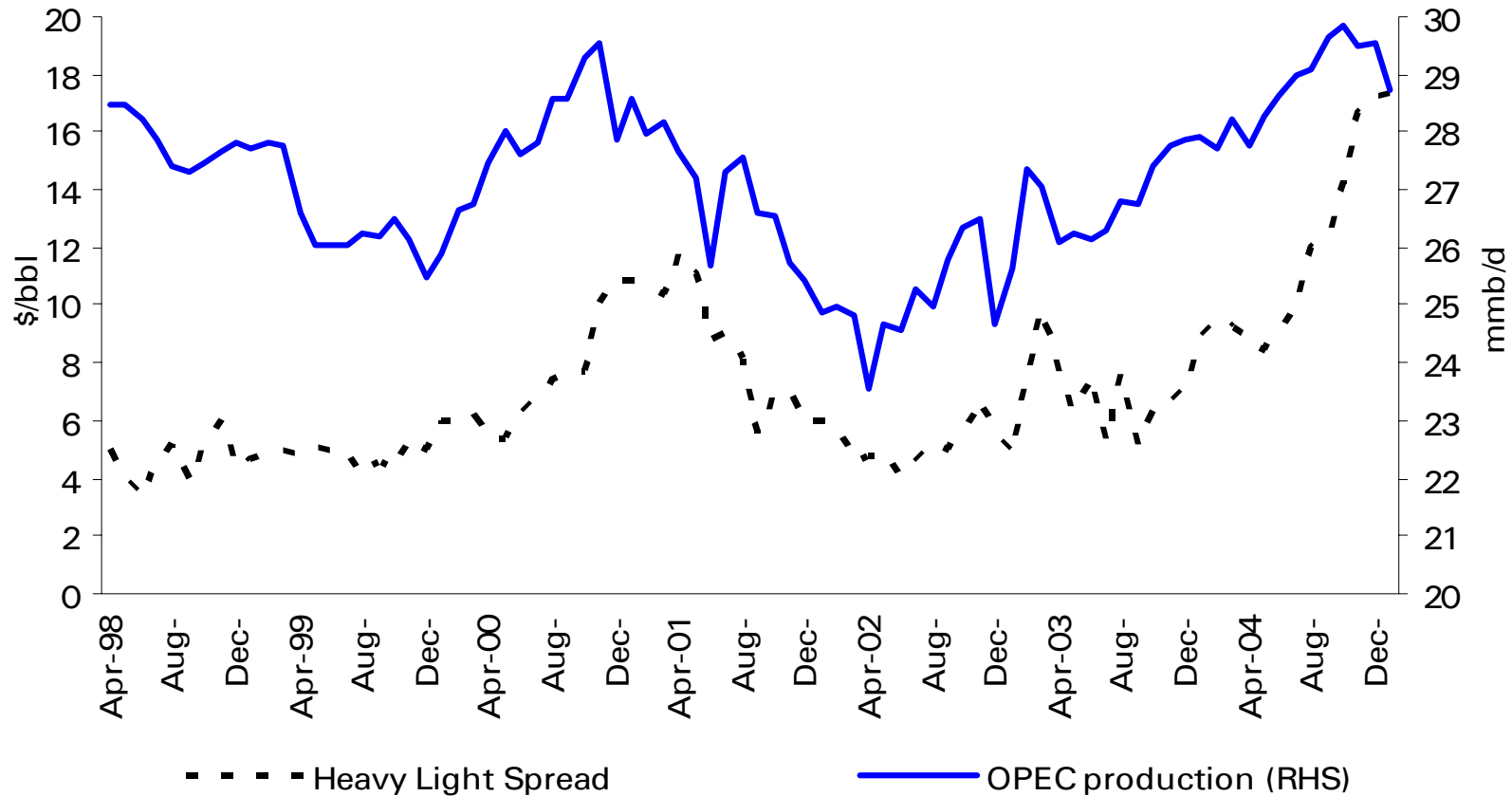


Gulf of Mexico crude quality



Source: Wood Mackenzie, Deutsche Bank

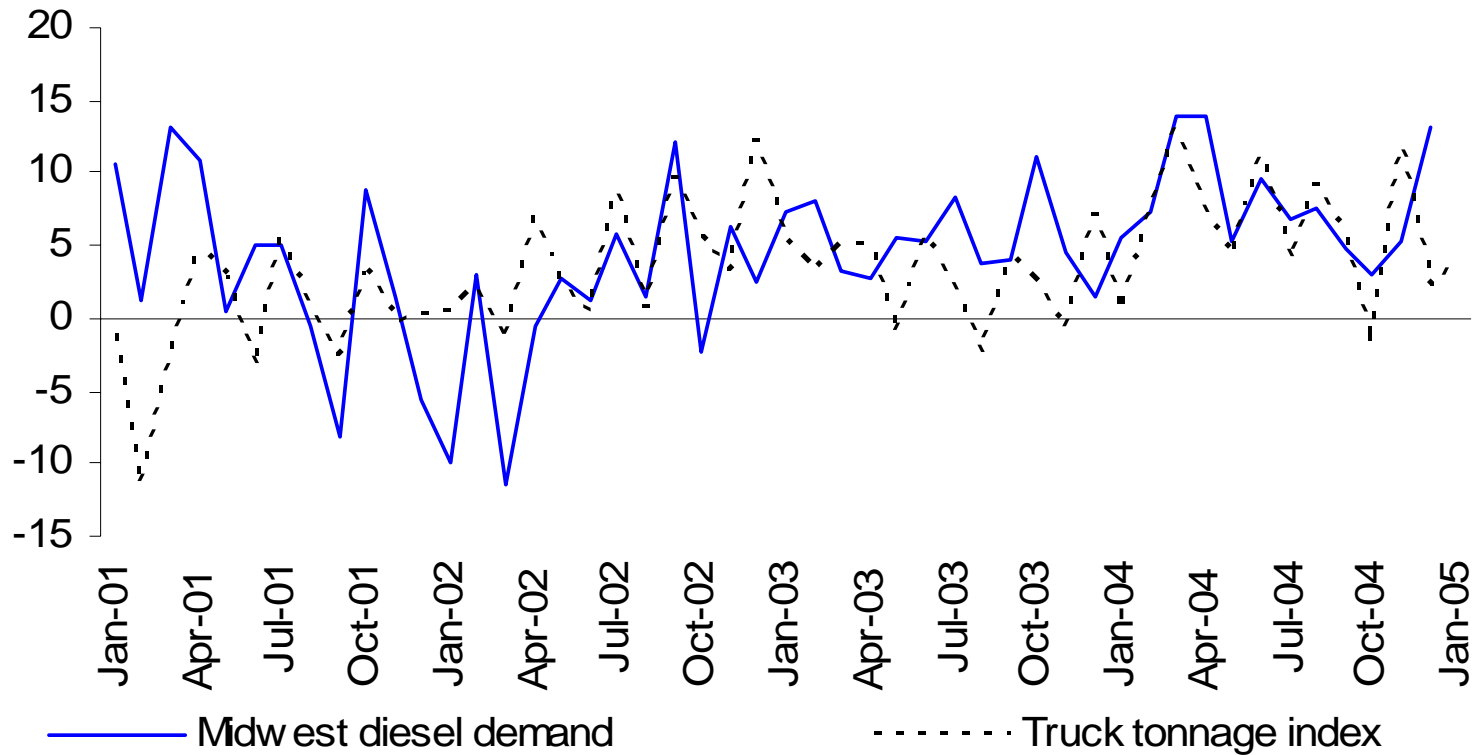
Heavy Crude Discount Moves with OPEC Production



Source: IEA, Bloomberg, Deutsche Bank

Diesel's Truckin'

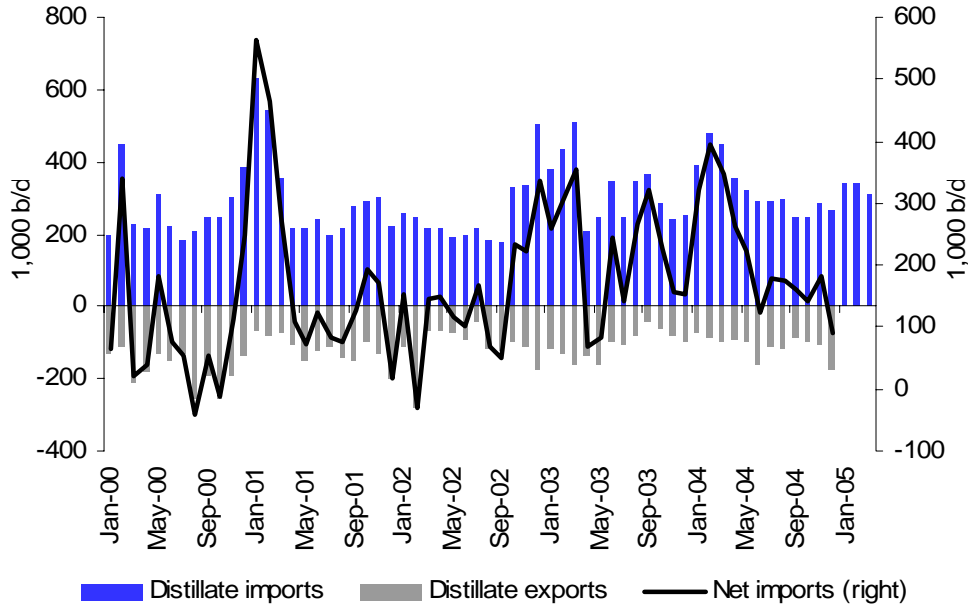
... Midwest diesel demand vs trucking activity



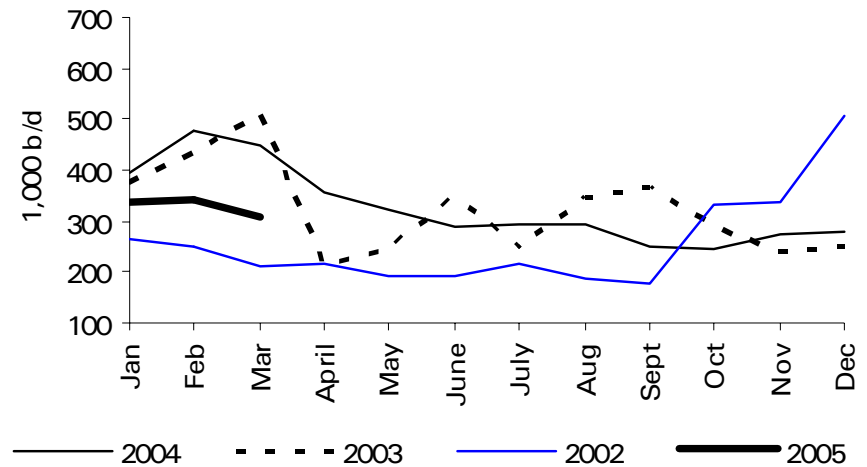
Source: ATA, DOE, Deutsche Bank

US Distillate Imports/Exports

... Rising exports to a tight Europe constraining US



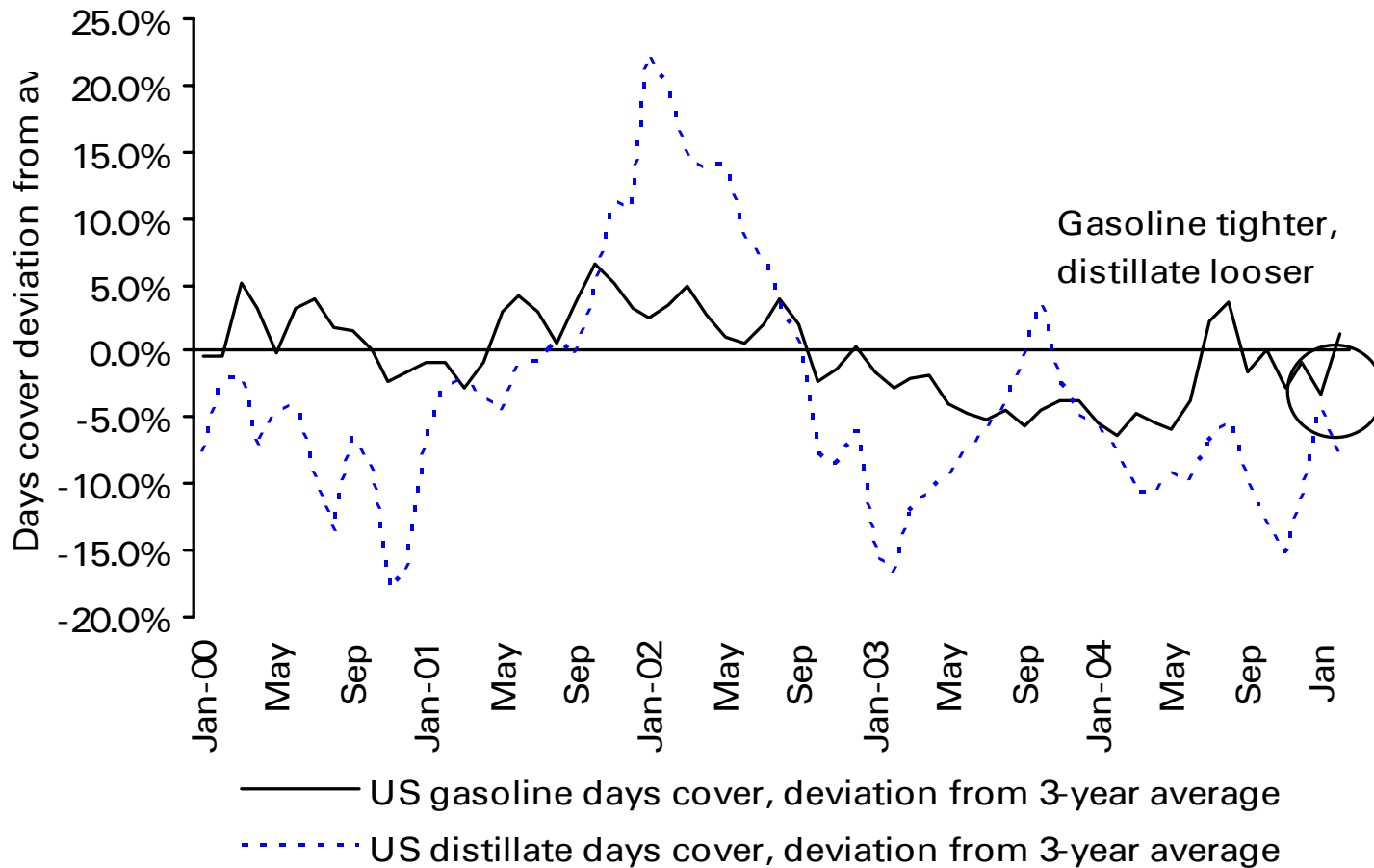
Gross imports drop in Q4, Q1



Source: DOE/EIA, Deutsche Bank estimates

Demand Cover by US Gasoline and Distillate Inventories

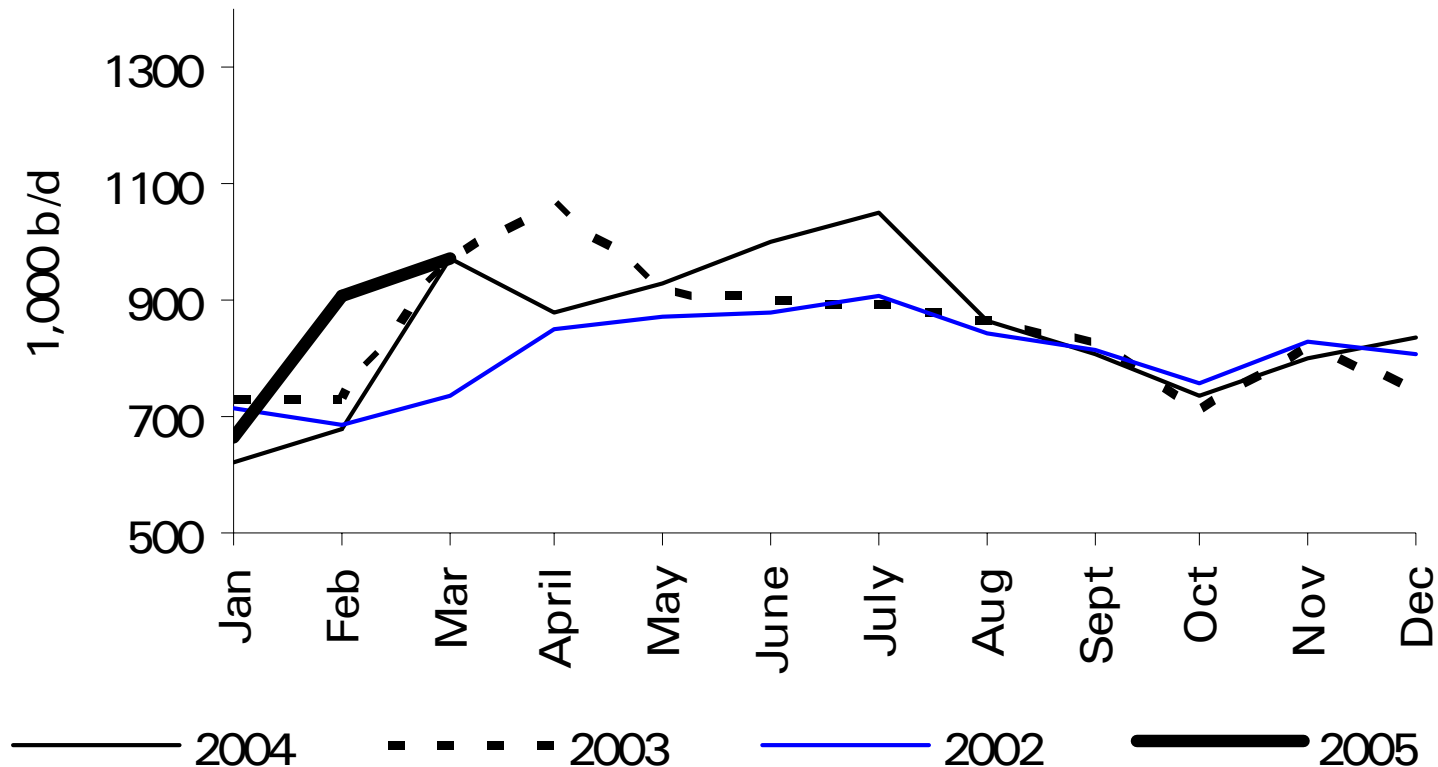
... Looking a lot like 2000



Source: DOE, Deutsche Bank estimates

Flat US Gasoline Imports Supports Prices

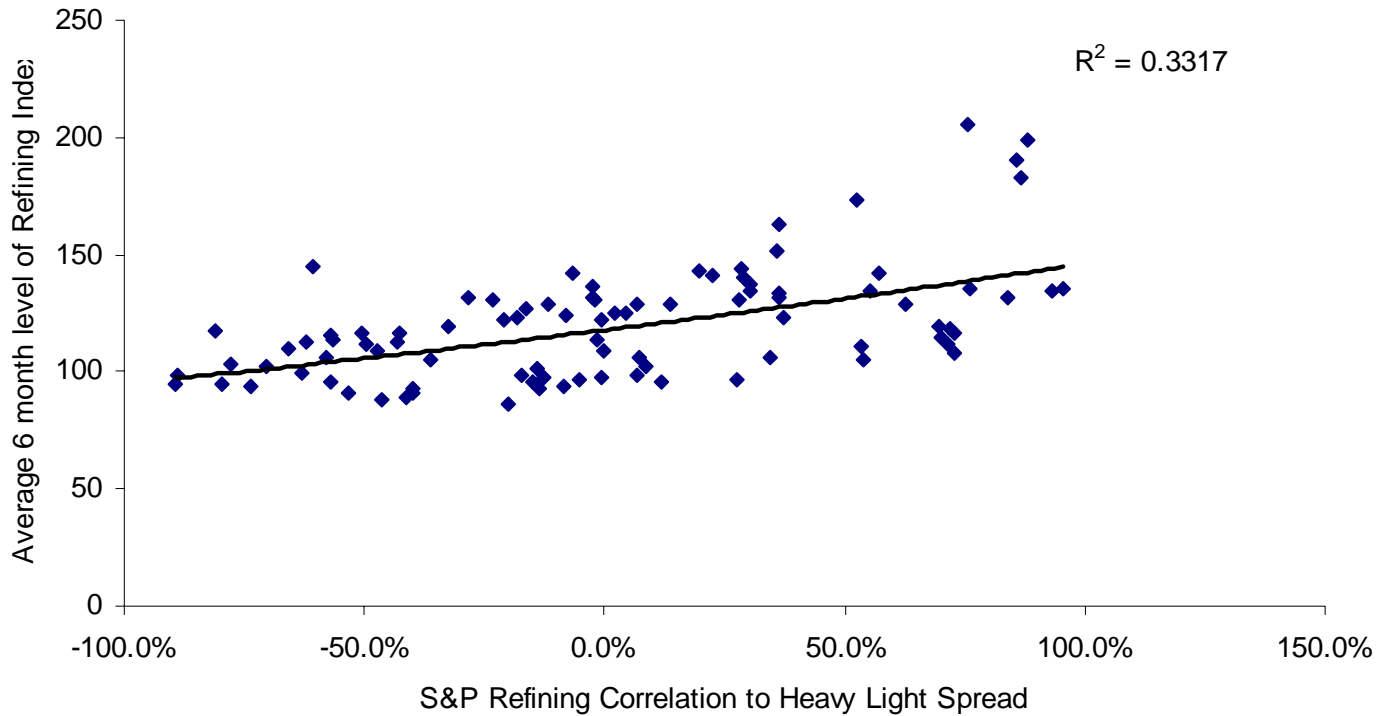
... What's going to fill the gap? Potentially yields but only in short term



Source: DOE, Bloomberg, Deutsche Bank

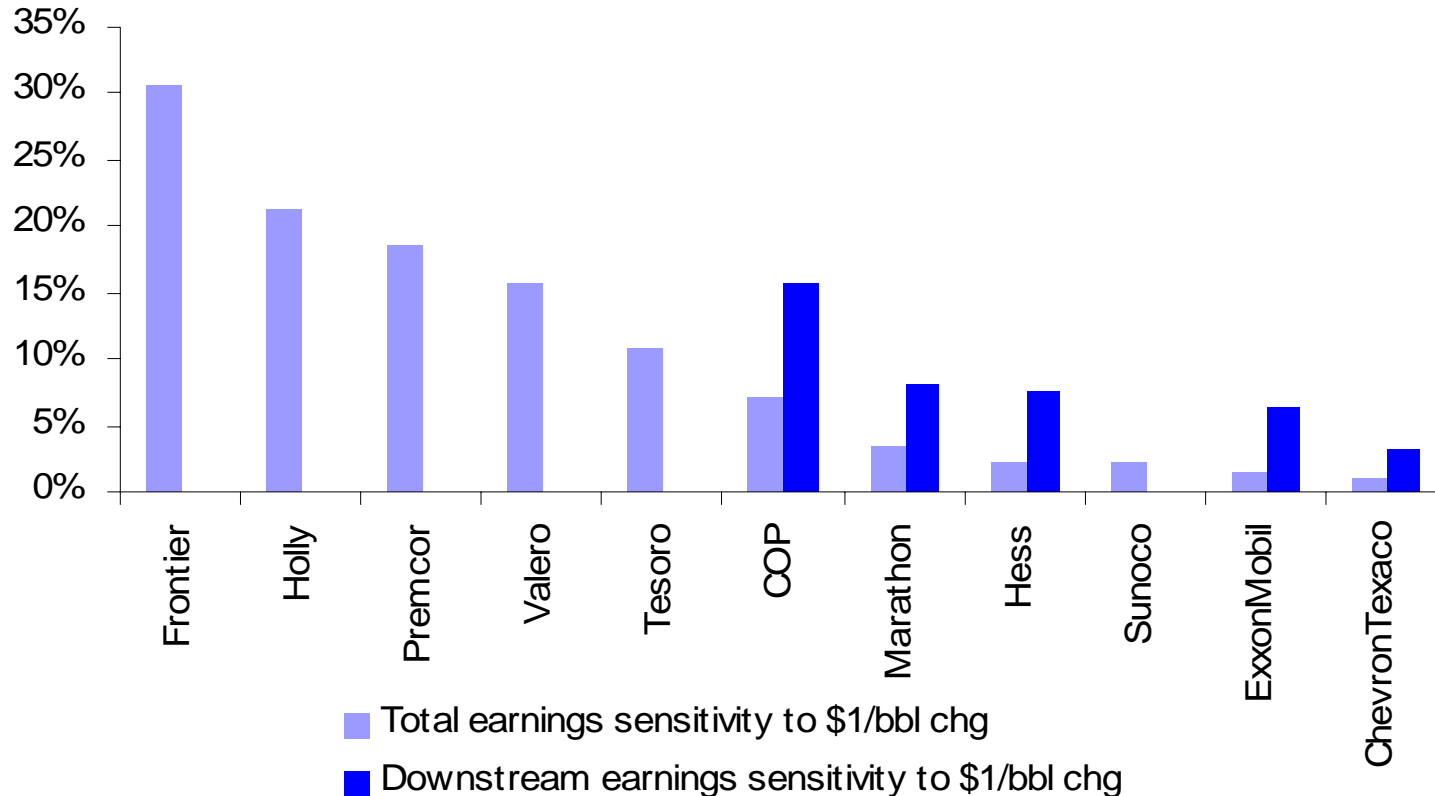
Refiners vs Heavy/Light spread

...Best fit - it matters!

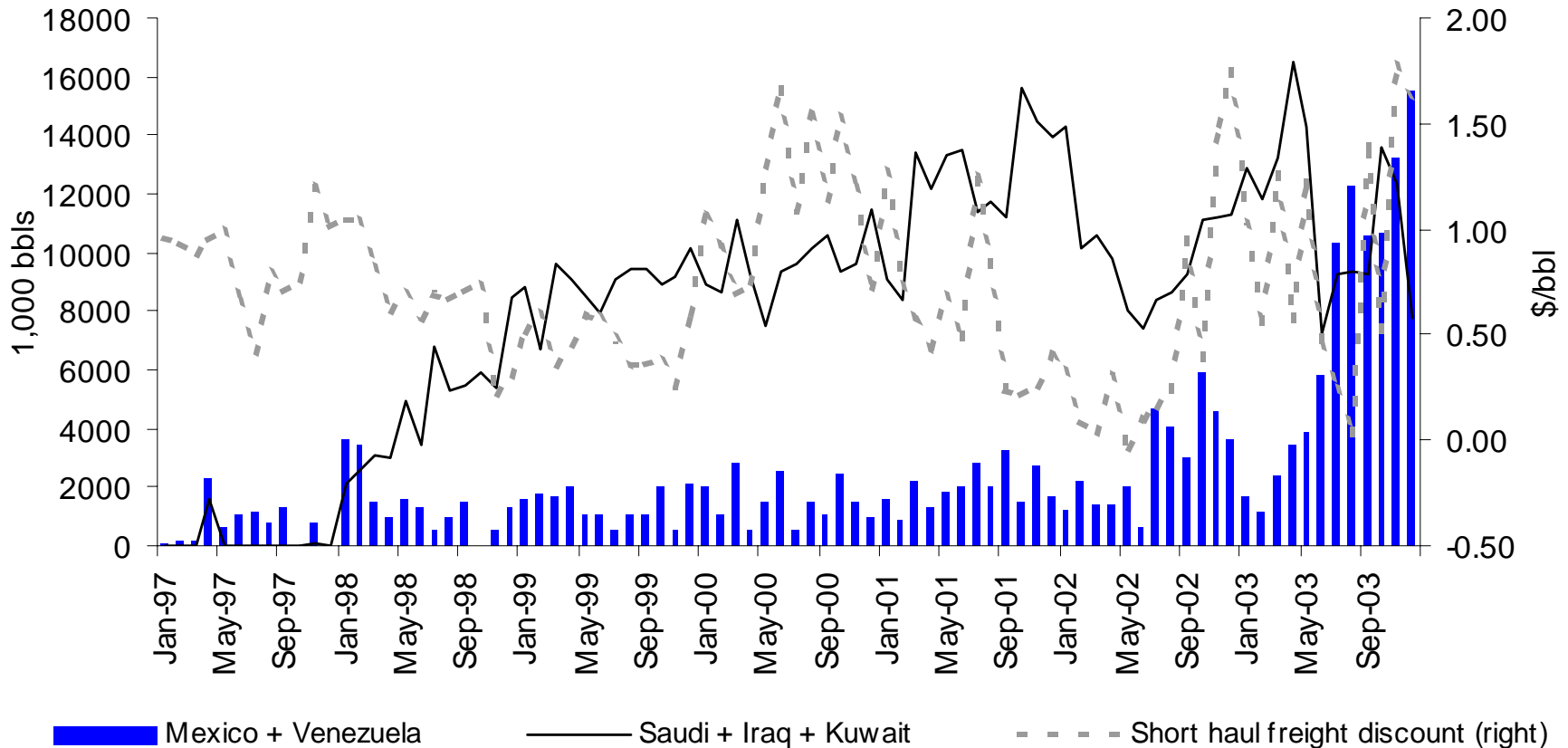


Heavy crude sensitivities

Frontier, Holly, Premcor, Valero, and Sunoco registers



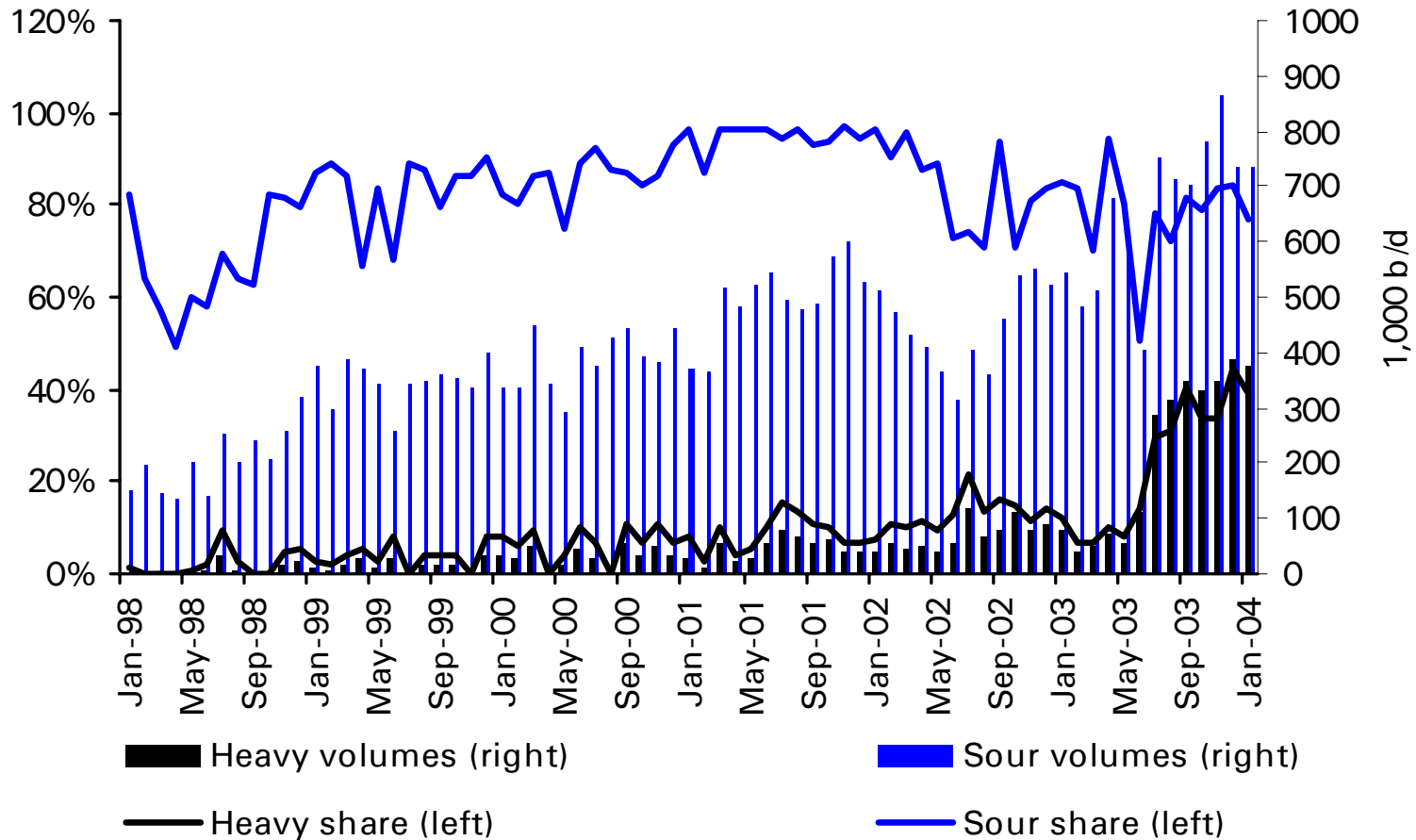
Valero's Switch to Short-Haul Supply Saves on Freight



Source: US DOE, Worldscale, Deutsche Bank

Valero Cheapens Crude Diet

Discounts increase with heavier slate



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Jay Saunders

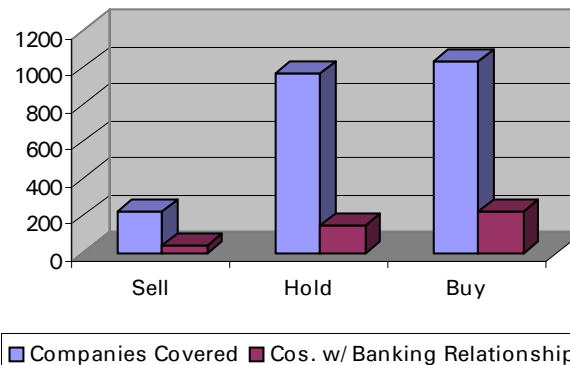
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Buy: Total return expected to appreciate 10% or more over a 12-month period

Hold: Total return expected to be between 10% to -10% over a 12-month period

Sell: Total return expected to depreciate 10% or more over a 12-month period

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