



TAKING STOCK OF PRICES

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Dow Jones Newswires, February 1, 2004



Concerns about record-low supplies underpin today's high oil prices, although some experts argue these fears are overblown and unnecessarily harmful to consumers.

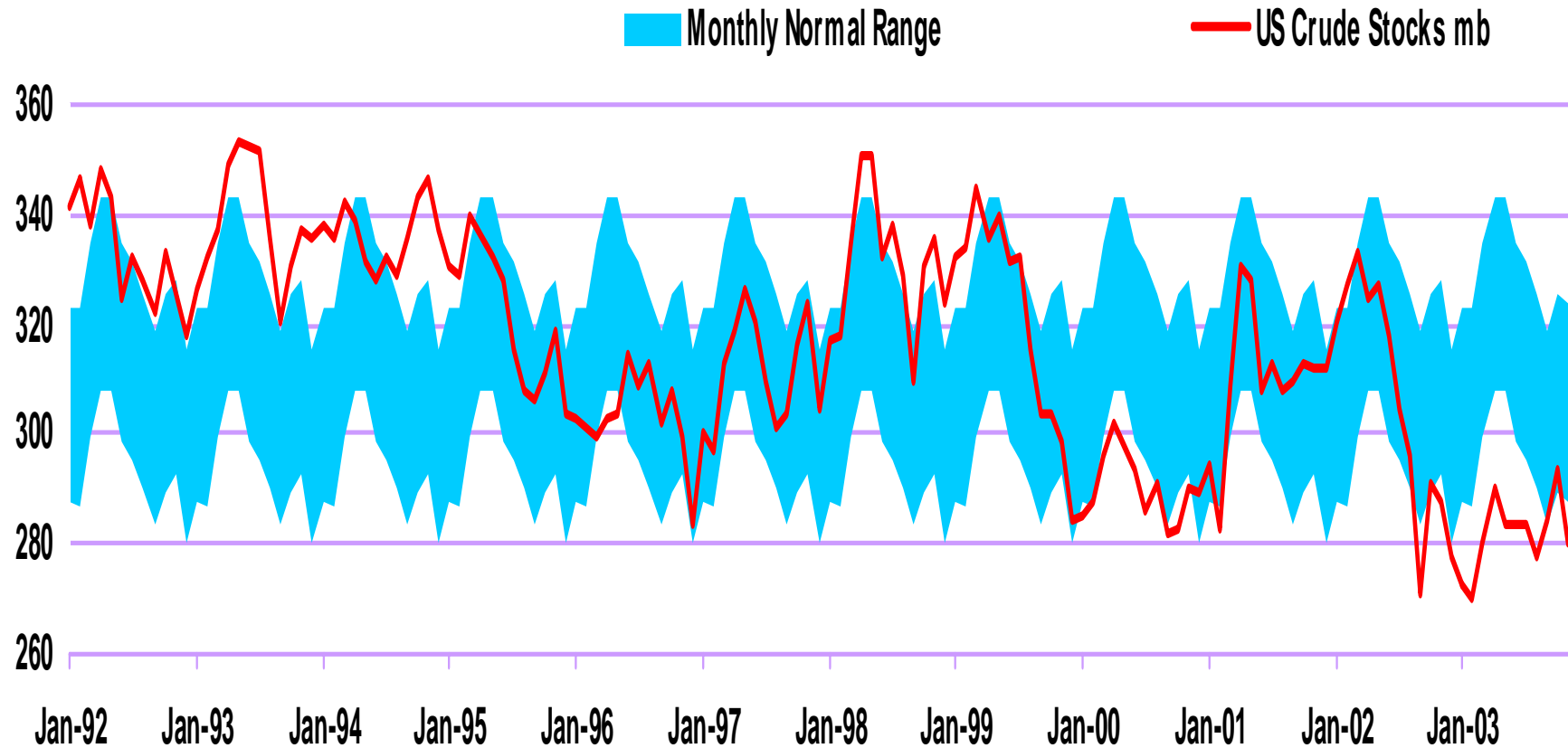
“The biggest myth in oil markets right now is that we have precariously low levels of inventory ... This is a tremendous disservice to consumers ... Traders are using the government numbers to put the fear factor in the market”.

“There's really no good economic reason why crude prices are so high right now ... It's just the hype in the market”.



US Industry Crude Oil Stocks & Historical Range

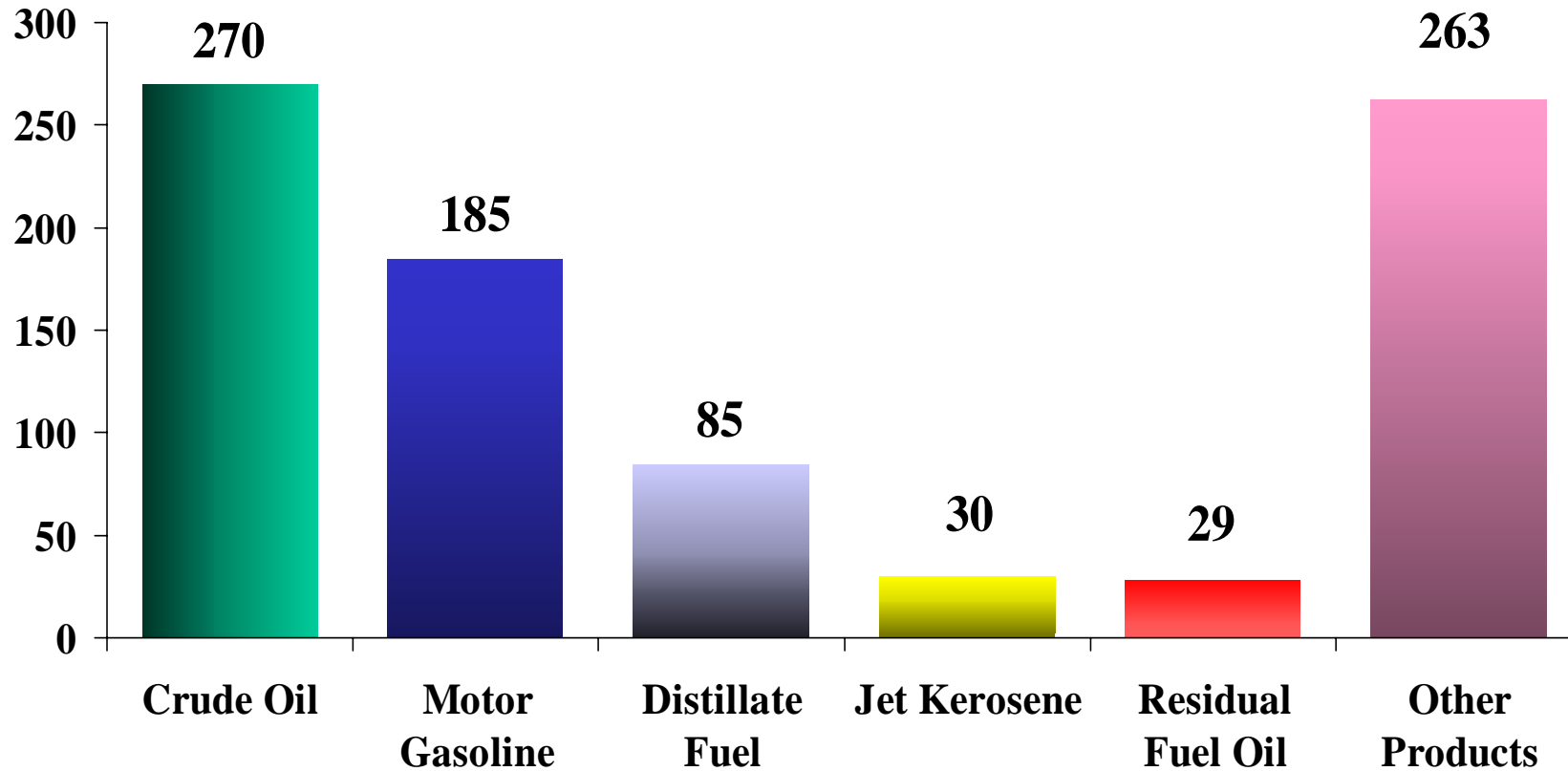
Data through latest weekly January data



- US weekly crude stocks are at all-time lows



Notional US Minimum Operating Stocks (mb) - National Petroleum Council December 1988 -

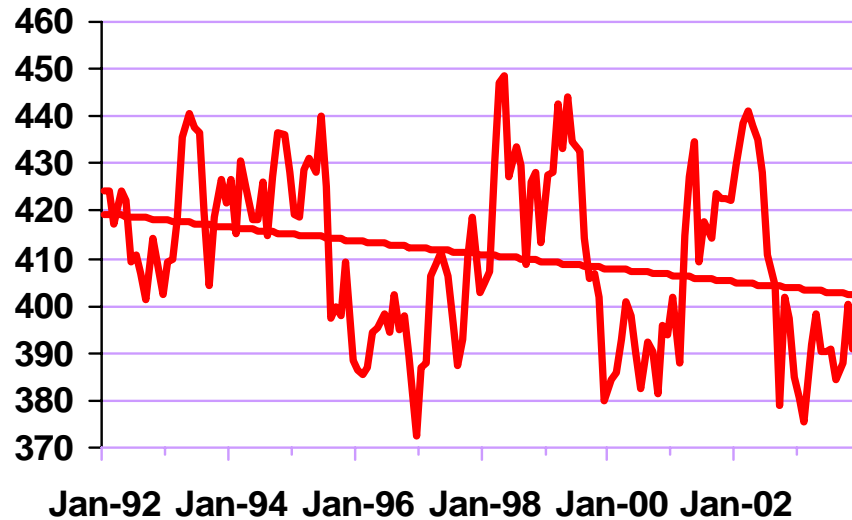


Notional US minimum crude operating levels – 270 mb

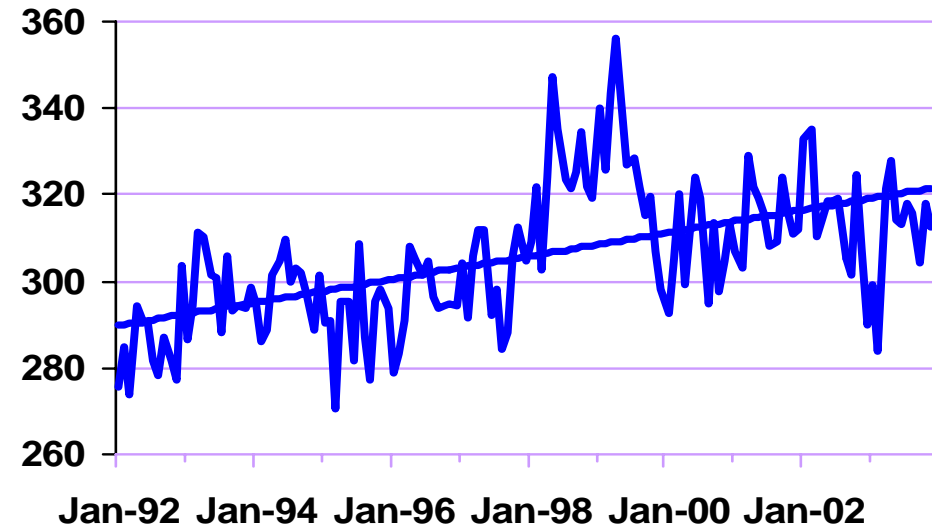


Long Term Industry Crude Stocks Trends in the OECD

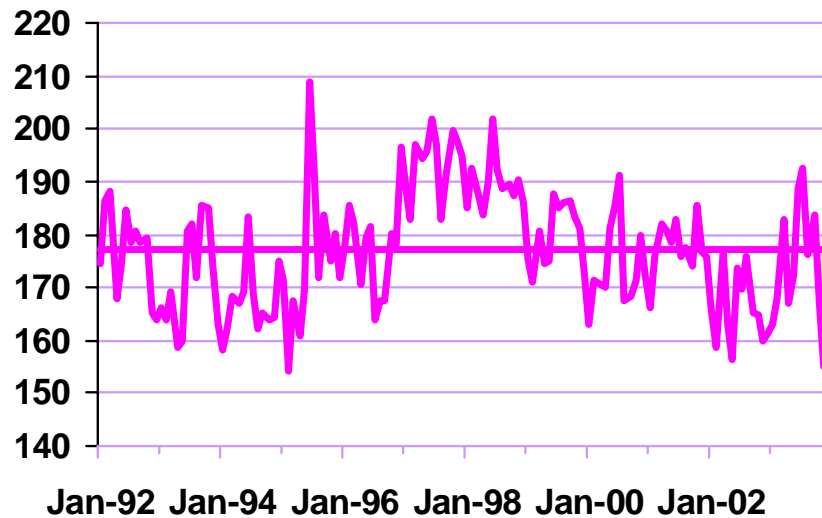
— OECD North American Crude Stocks - mb



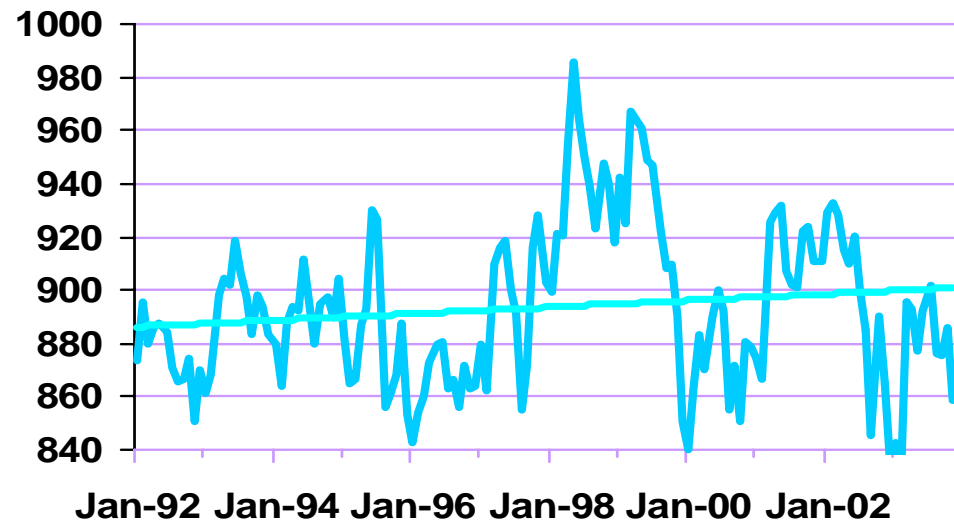
— OECD Europe Crude Stocks - mb



— OECD Pacific Crude Stocks - mb



— OECD Crude Stocks - mb





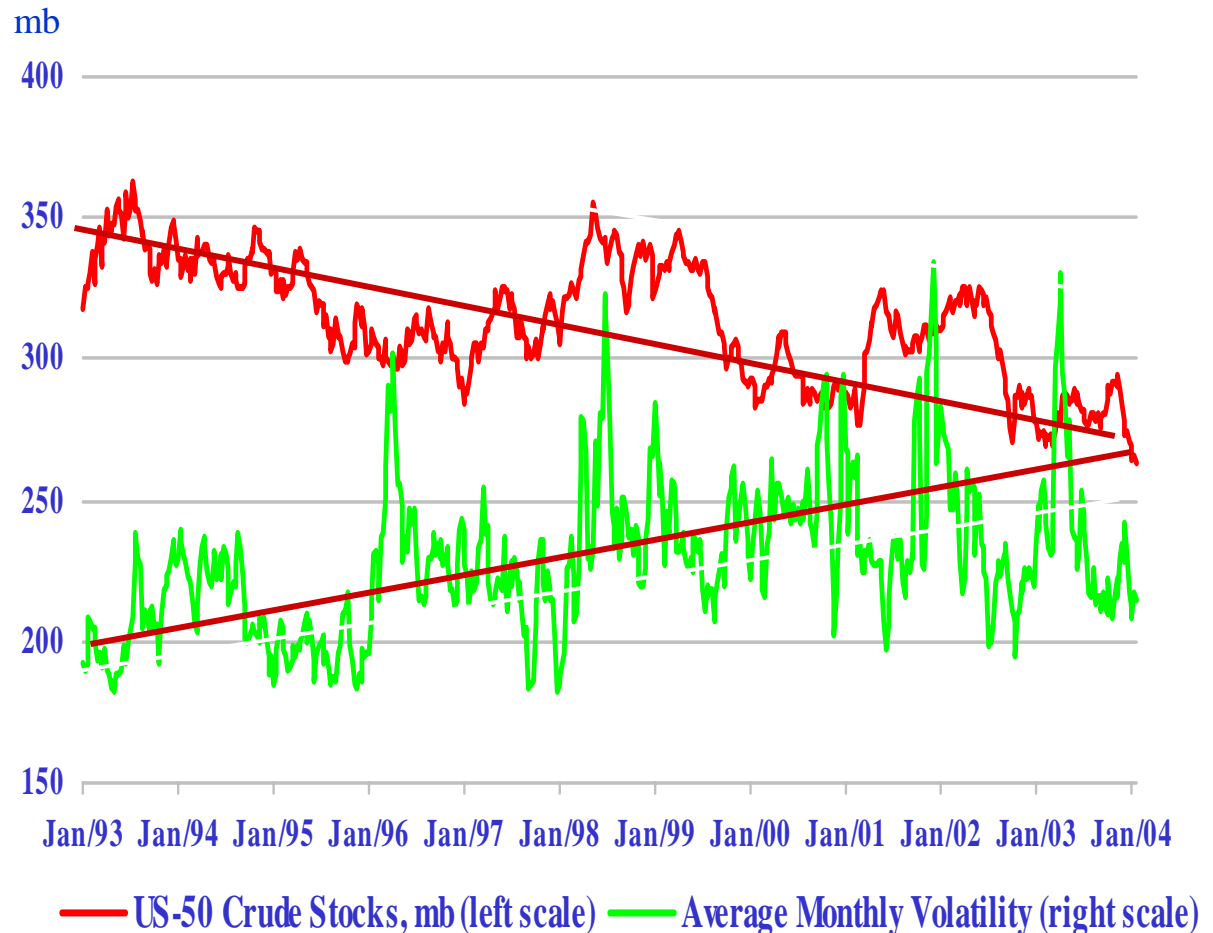
US-50 Industry Crude Stocks vs. WTI Price Volatility

US industry crude stocks are on a long-term lower trend

Clear relationship between lower stocks & increased price volatility

As stocks get tighter, takes longer, and costs more, to replenish supply from greater distances (heating oil stocks from Russia)

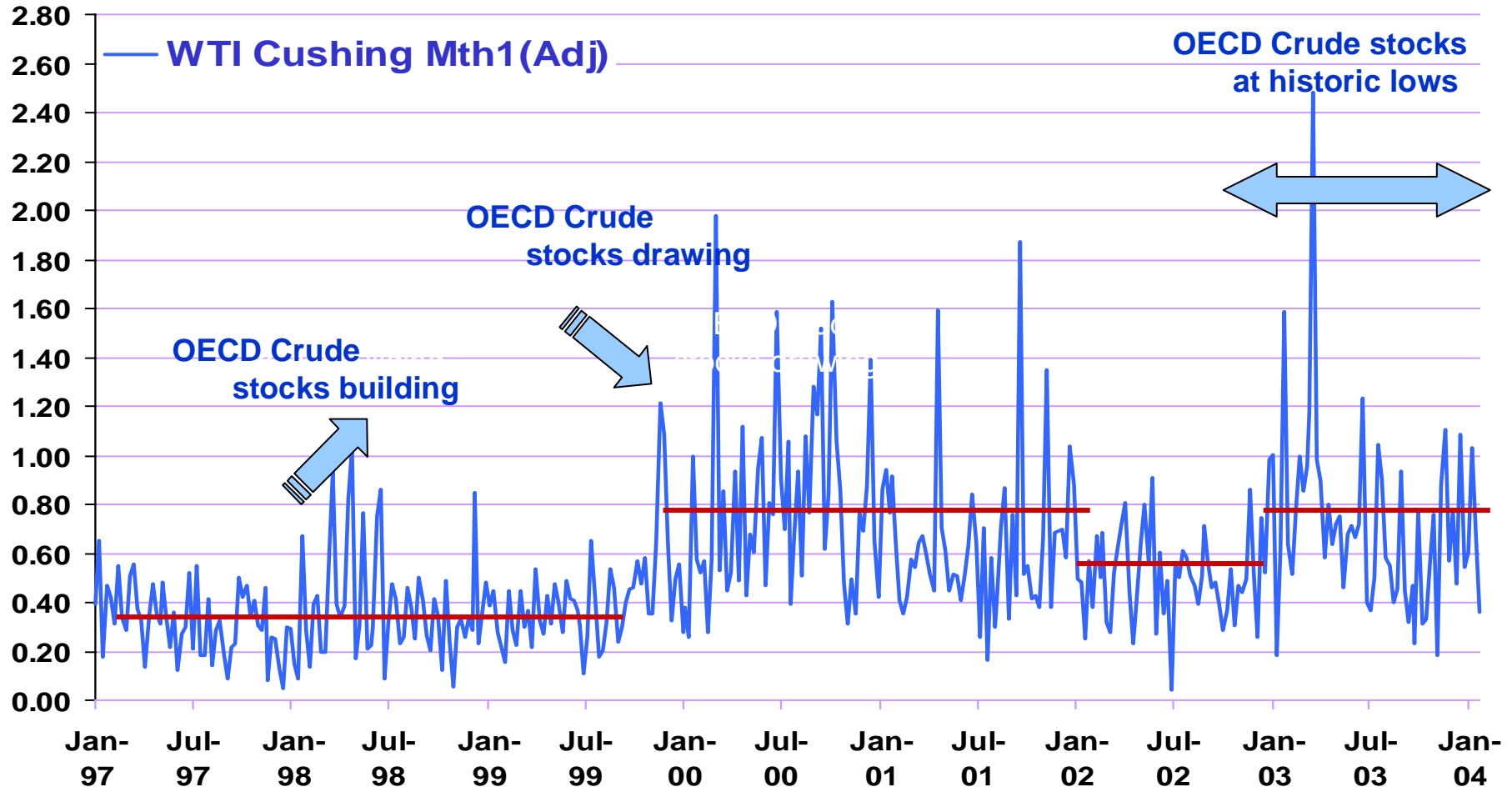
**What if cold winter in both Russia and US East Coast?
What if Black Sea ports closed due to storms?**





Volatility of Cash WTI price 1997-2004

Weekly standard deviation of daily price change - \$bbl

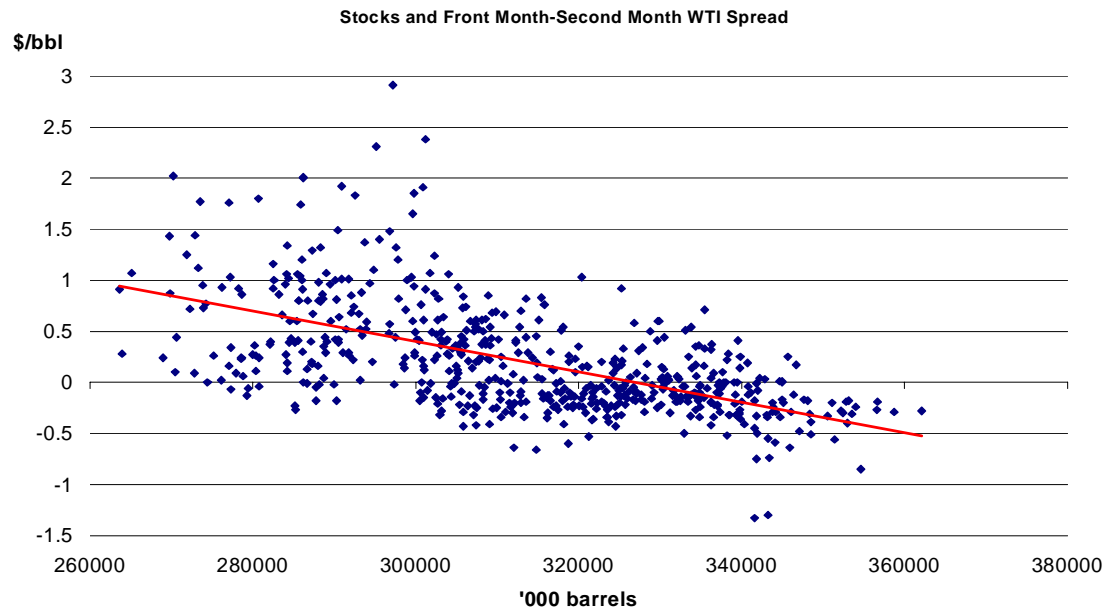
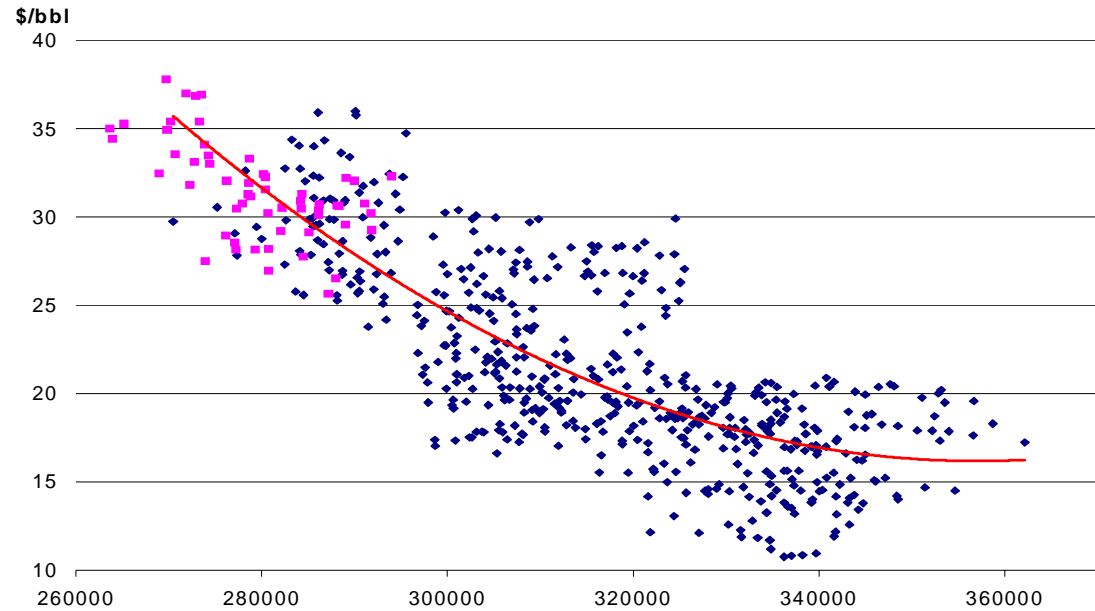


Price volatility moves in line with backwardation and high prices



US Industry Crude Stocks vs. Prices

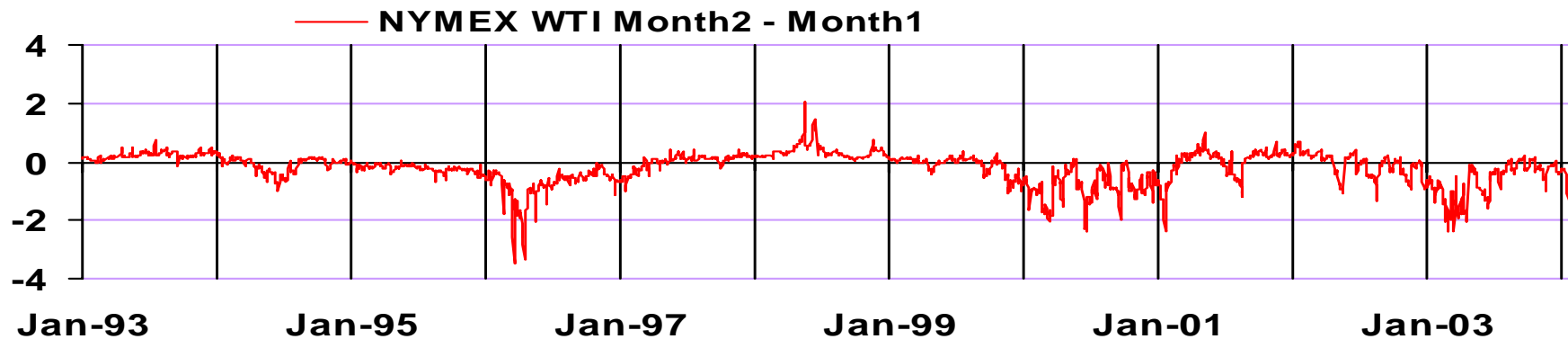
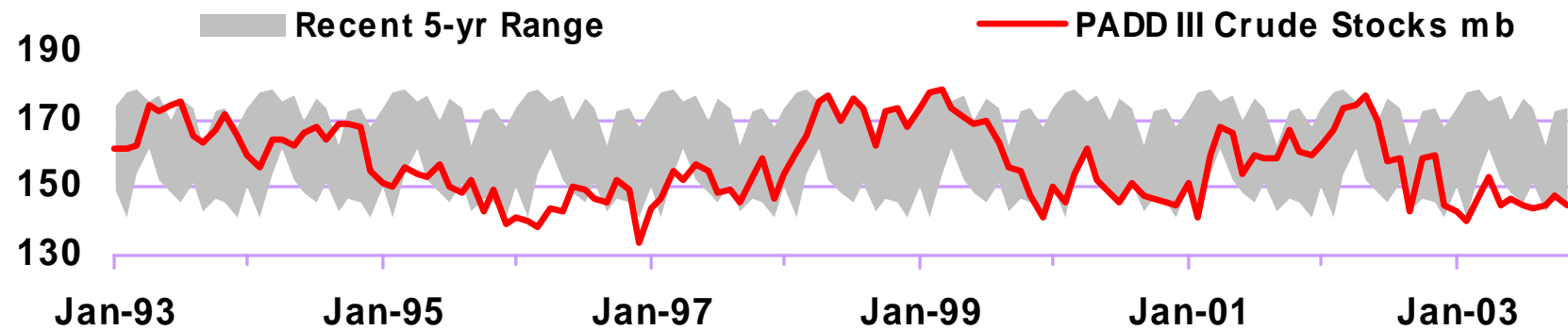
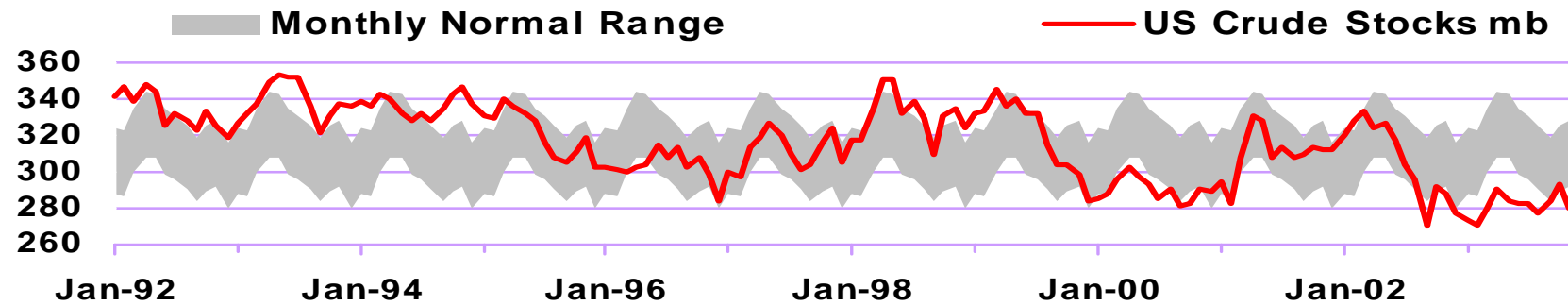
**US crude stocks & WTI prices.
Higher prices are associated
with lower inventory levels.**



**Backwardation is related to
low stocks, and increased price
volatility**

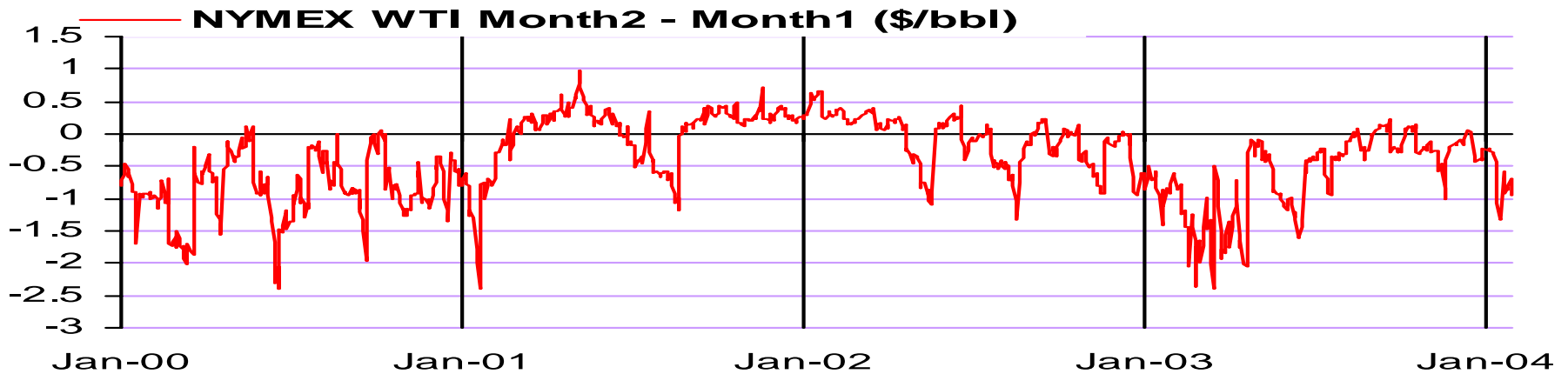
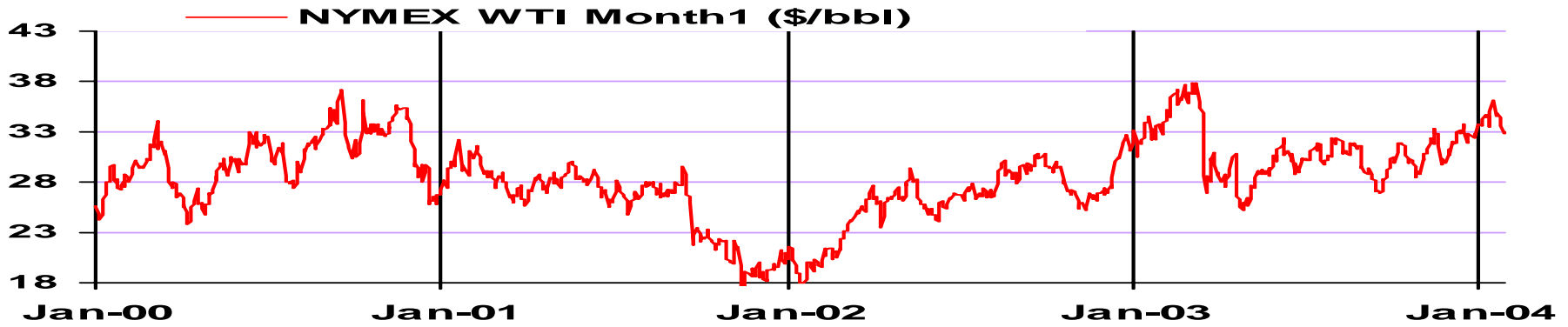
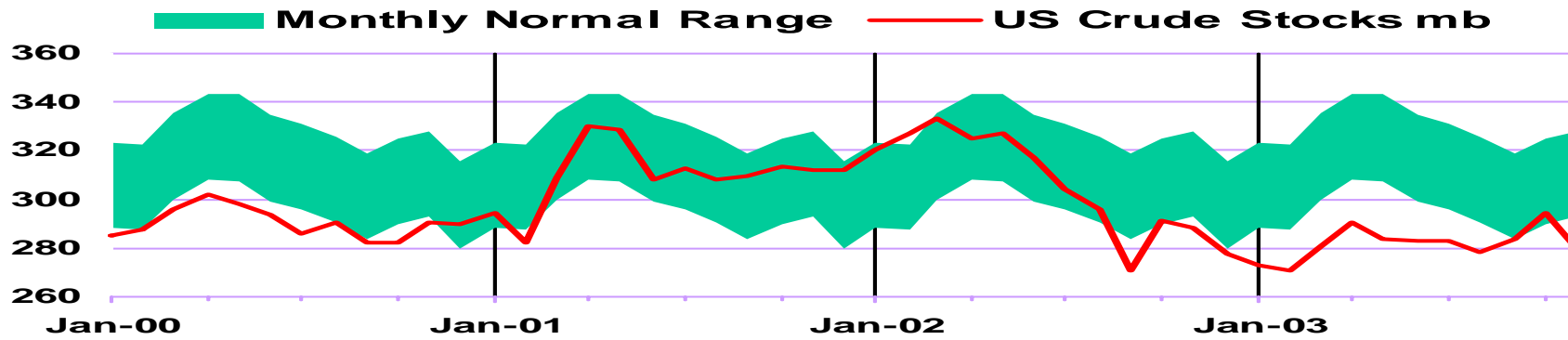


Historical Relation: Stocks and Backwardation





Stocks, Prices & Backwardation - Patterns Holds

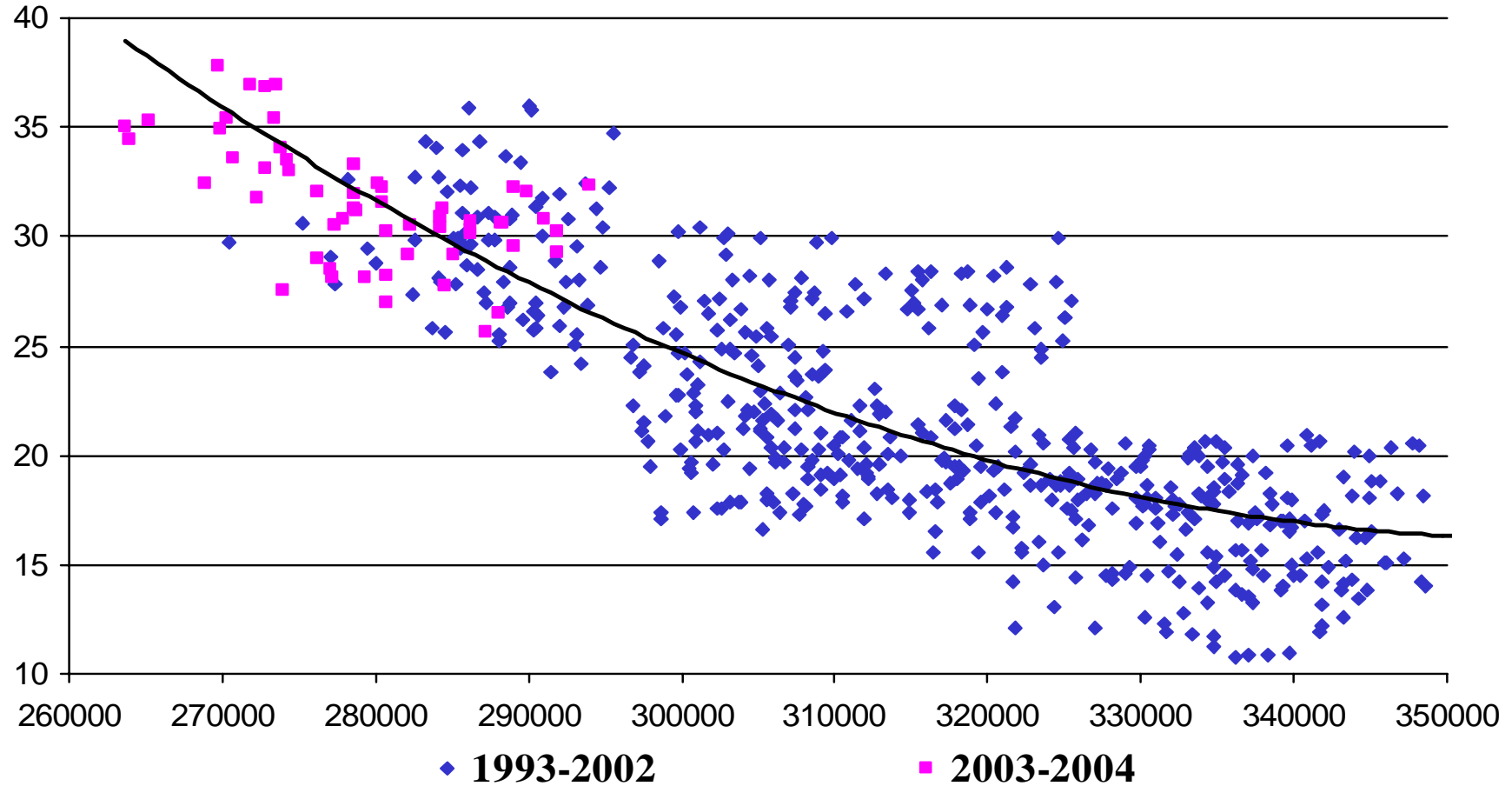




US Crude Stocks and Prices

Jan93-Jan2004

\$/barrel



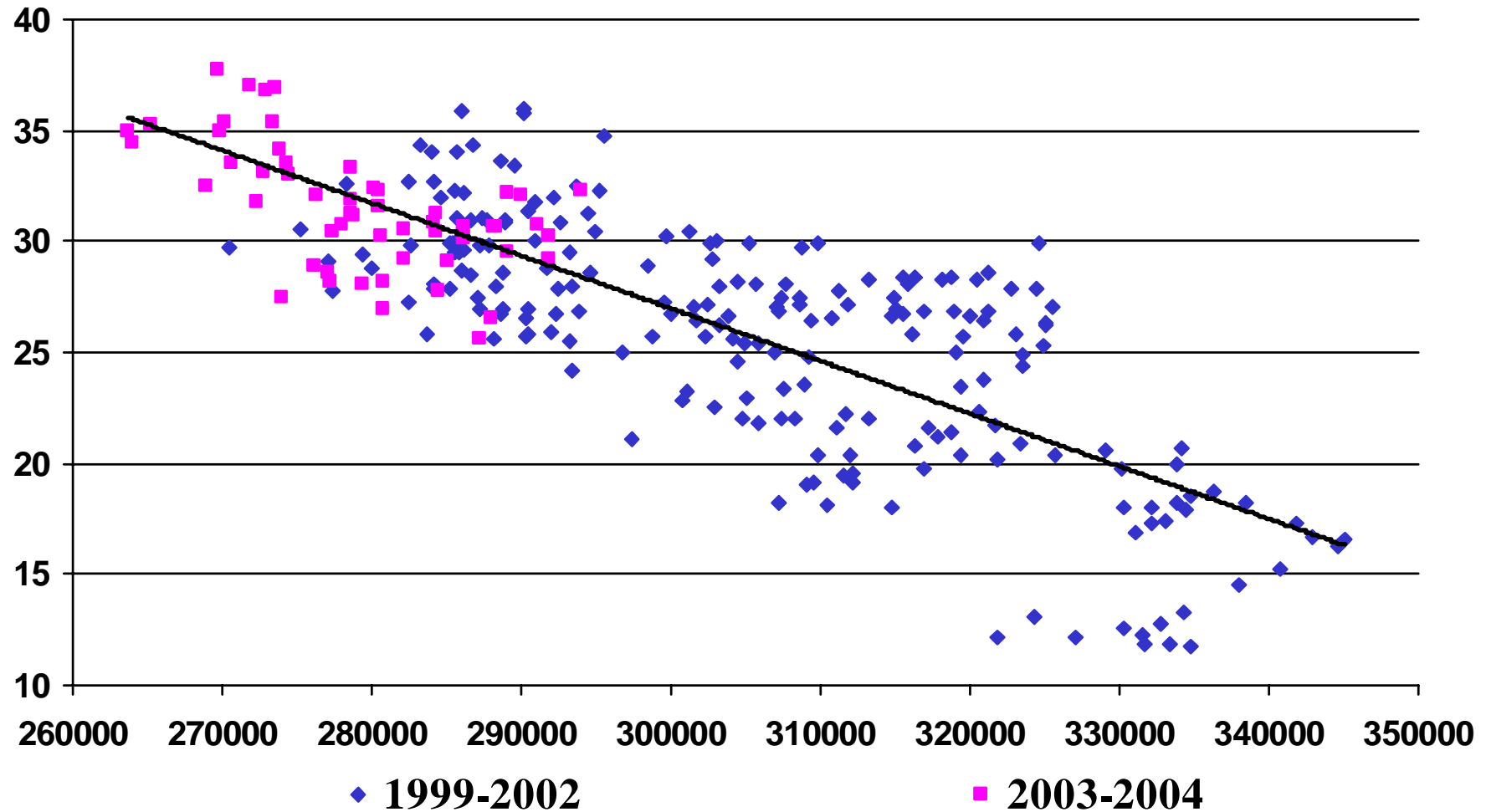
Prices would appear to be supported in the plus \$35 range



Crude Stocks and Prices

Jan99-Jan2004

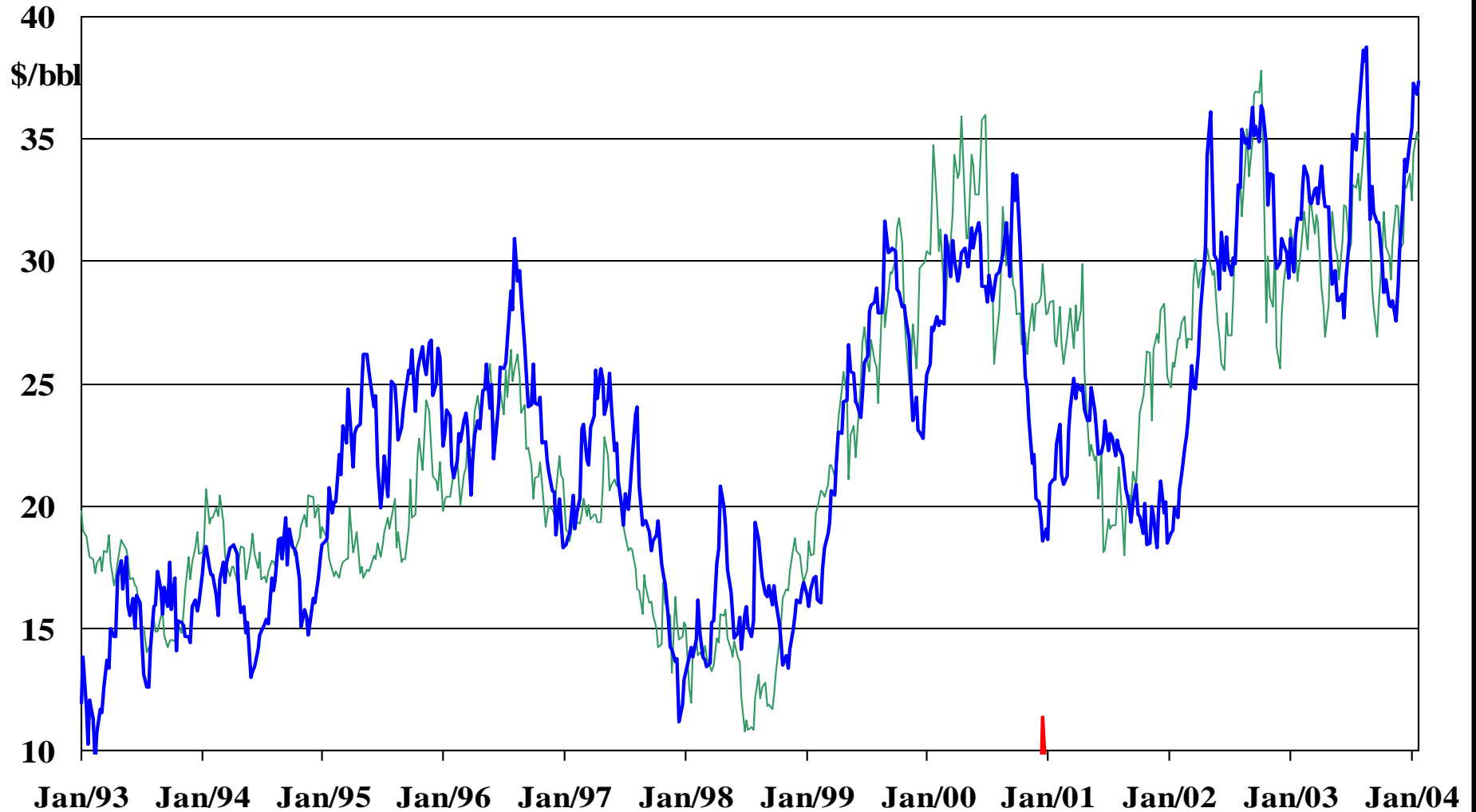
\$/barrel



Historical price-stock relationship even stronger over the last 5 years



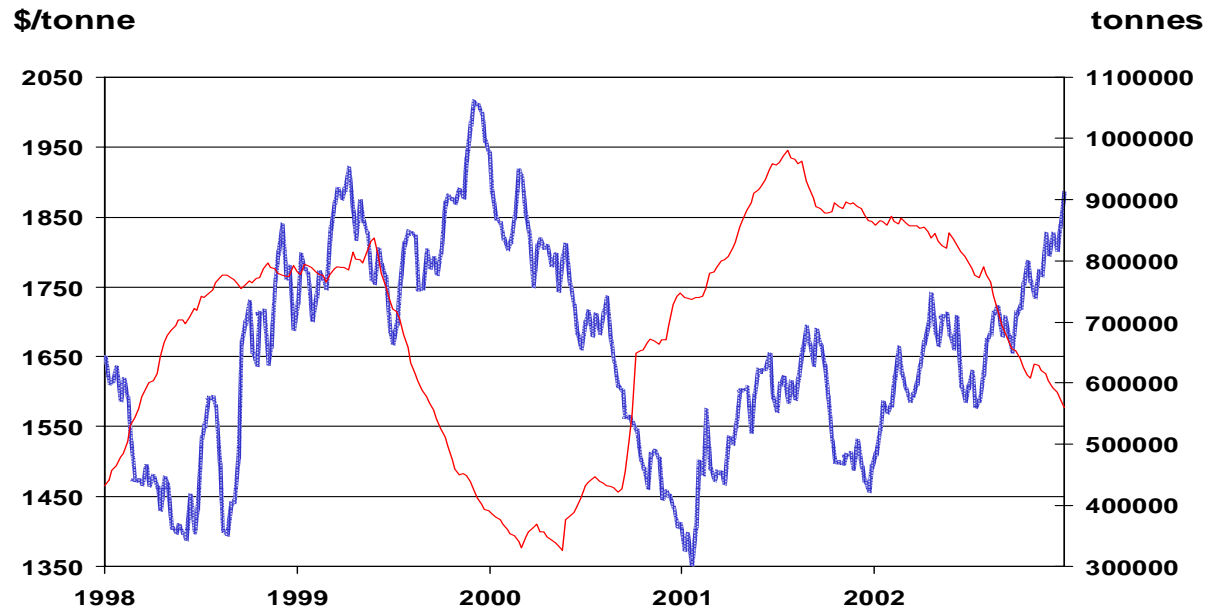
WTI Predicted Price Based on Stock Levels



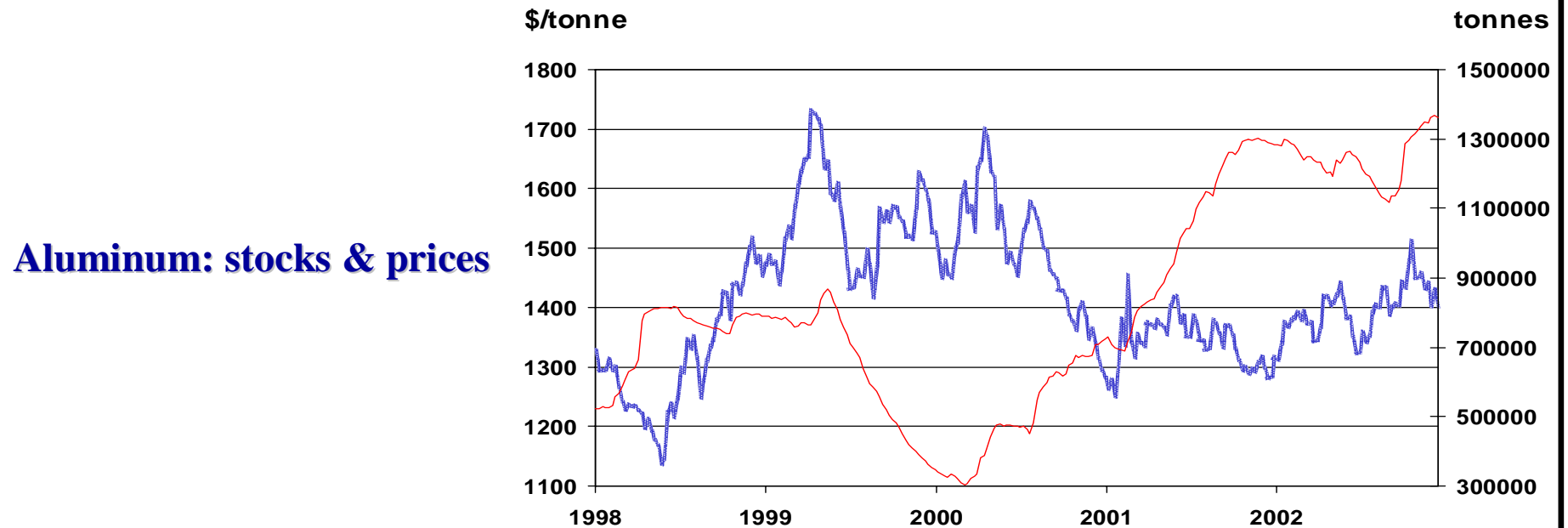
Good fit – worse in winter when market experienced higher average volatility



Other Commodity Markets – Stocks & Prices



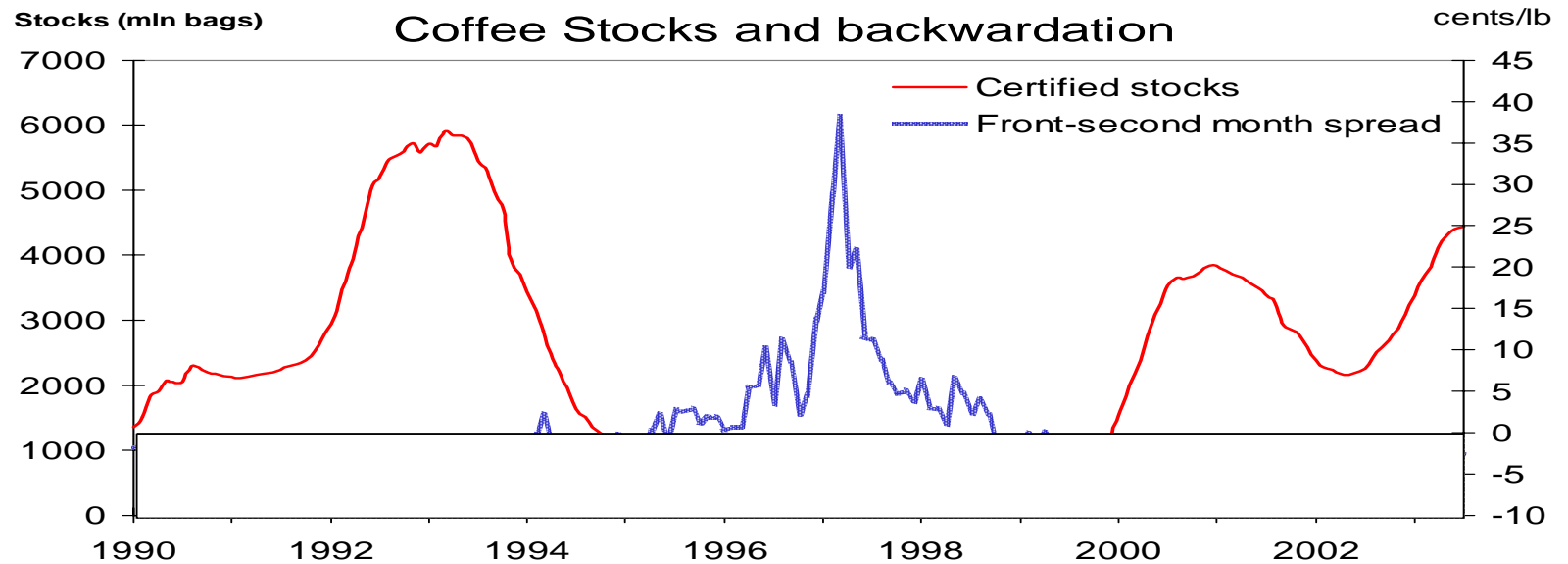
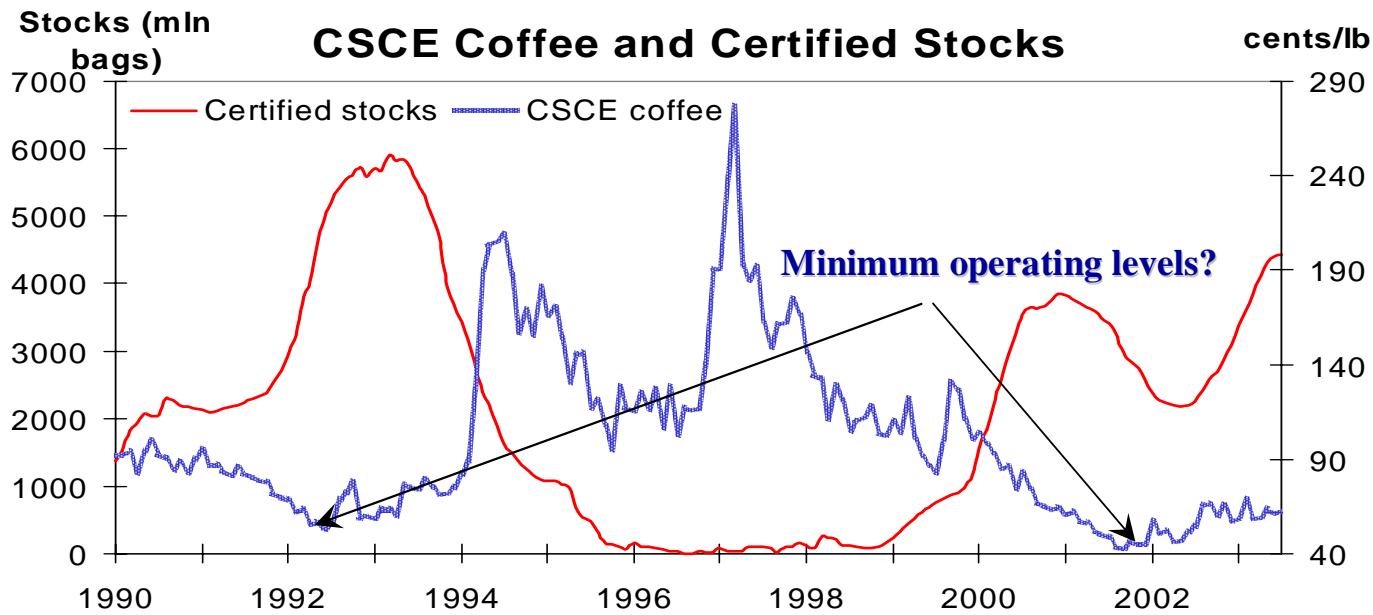
Copper: stocks & prices



Aluminum: stocks & prices



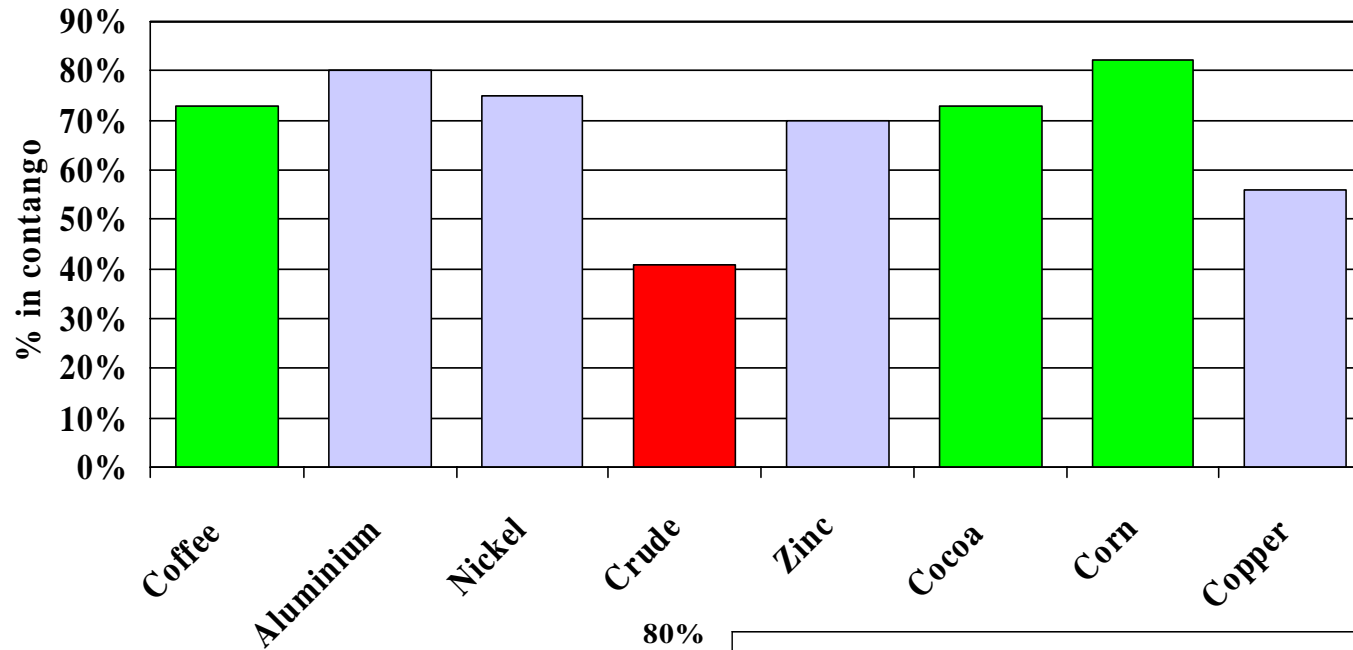
Coffee: Stocks, Prices Backwardation





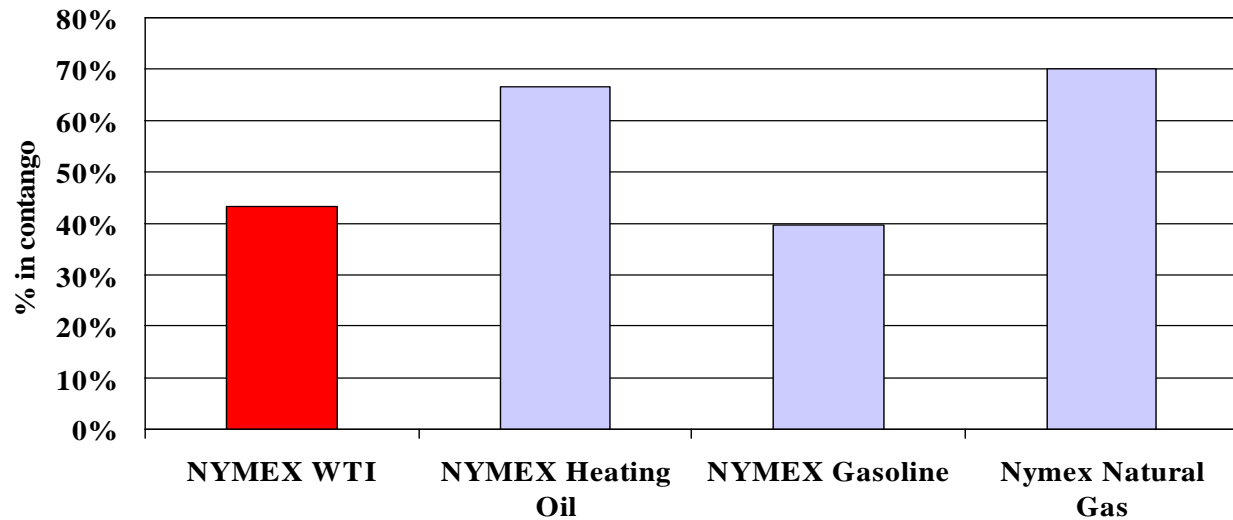
Market Structures in Non-Energy Commodities

% Contango Since 1990



**Crude “normally”
backwardated**

**Less seasonality in
crude and gasoline
markets**





View From OPEC: Views on Stocks, Prices Backwardation

LONDON - (Dow Jones Newswires 09/30/2003)- OPEC fired a rhetorical shot at claims its latest output cut will thwart a much-needed build in oil stocks in consumer countries, contributing to oil market volatility and higher prices.

Instead, the recent price swings are the product of a "new norm" as the industry cuts back on oil inventories to streamline operations and cut costs, the Organization for Petroleum Exporting Countries News Agency said Tuesday.

"Until all market participants accept the new norm for a minimum operating level, the old measure will continue to affect market psychology and increase price volatility," OPEC news agency said.

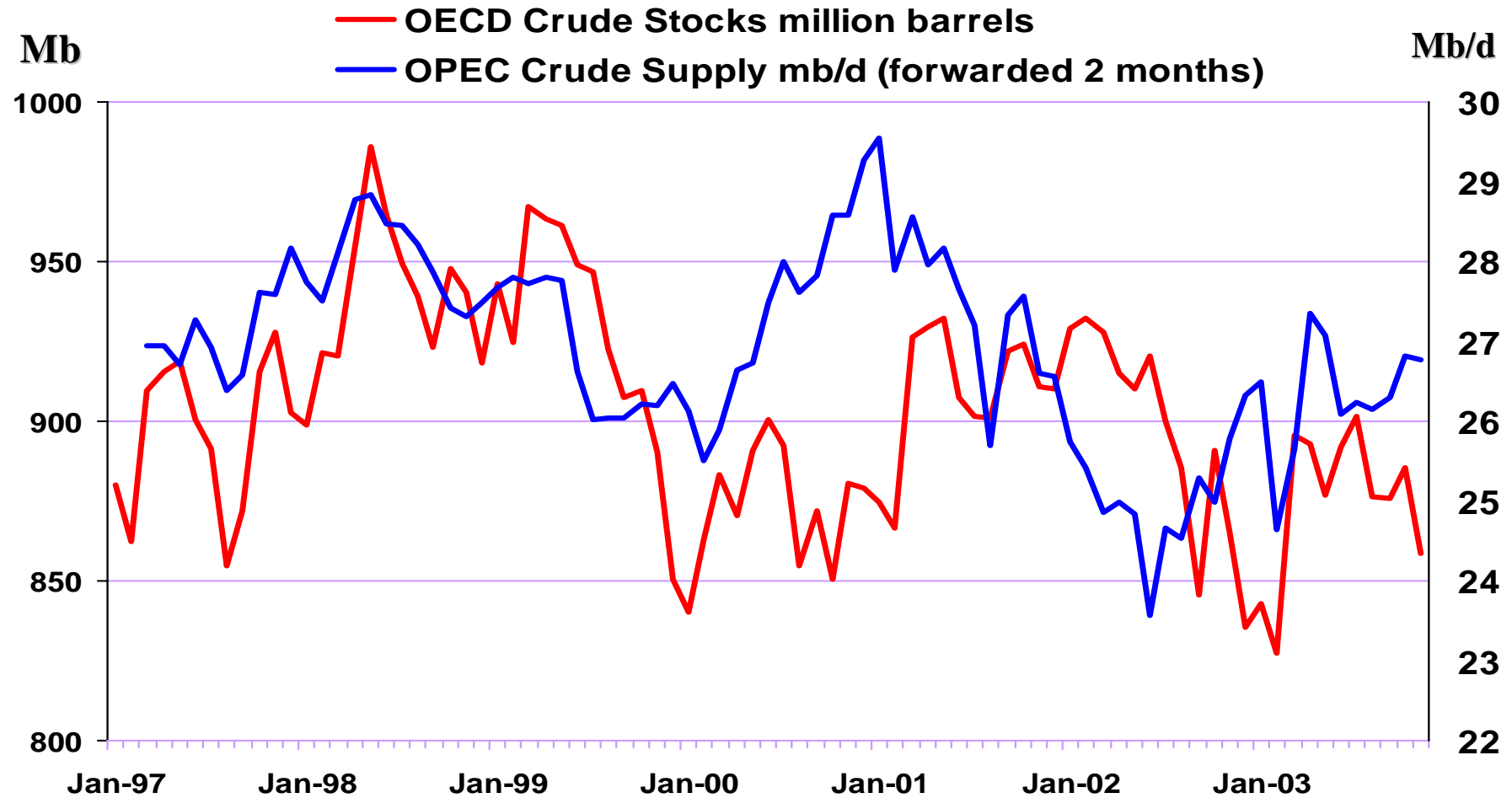
... The U.S. Department of Energy says that 270 million barrels is the minimum needed to keep oil supplies flowing normally. Current levels are around 6 million bbl above that. *But OPEC says that figure could be too high.*

"There is a need to reevaluate the accepted minimum operating level in light of the recent industry trend," OPEC news agency said.

And it claims backwardation in the market - where earlier-month prices are more higher than later months, deterring inventory builds - isn't caused by an oil shortage, but by the market's misunderstanding the new dynamic.



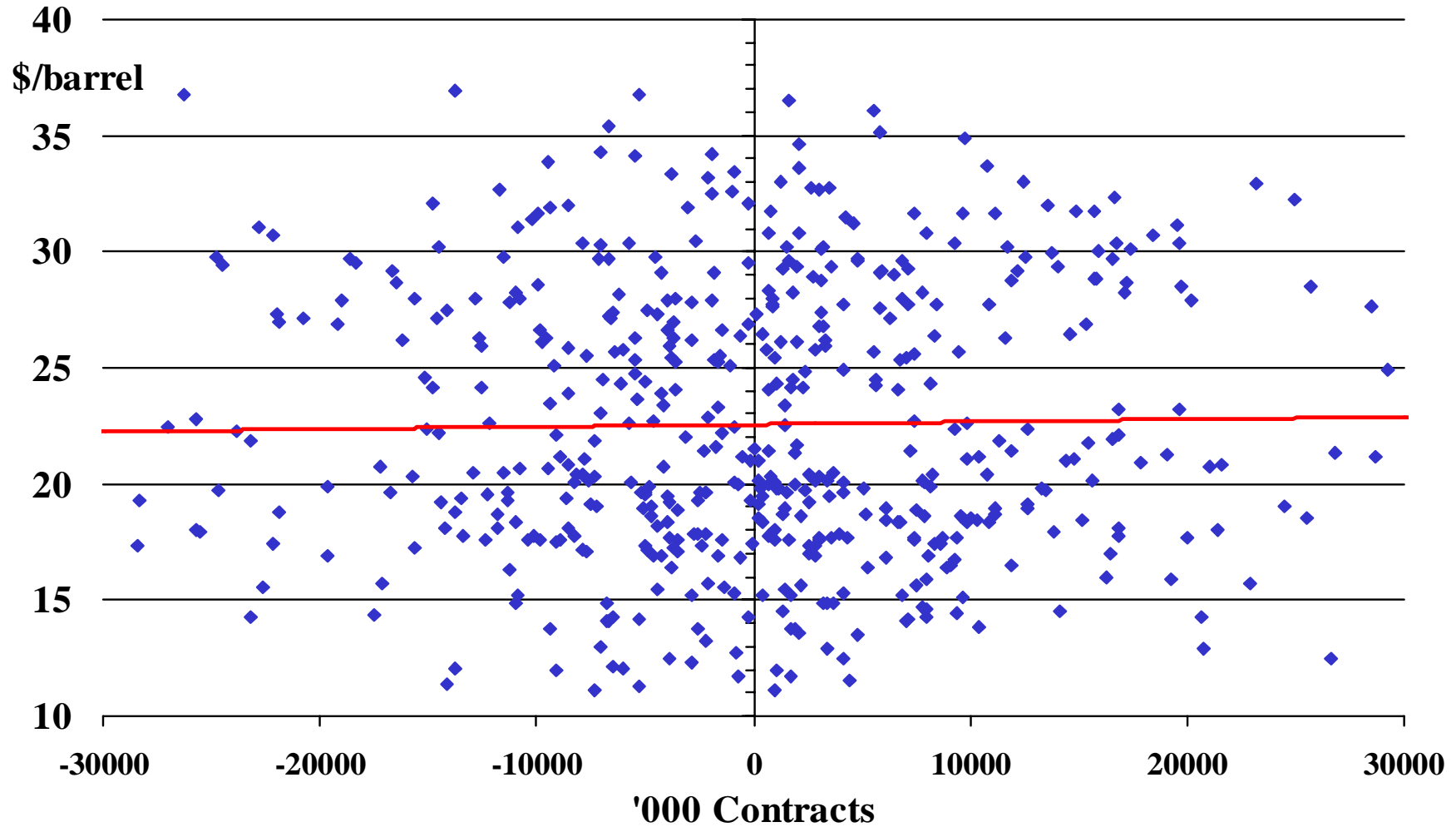
Deflect Attention: OPEC Supply vs. OECD Stocks



OPEC is marginal supplier to the market – stocks obviously related to producer supply management policies – OPEC purposefully managing supply so as to control stocks (backwardation equates to higher average prices)



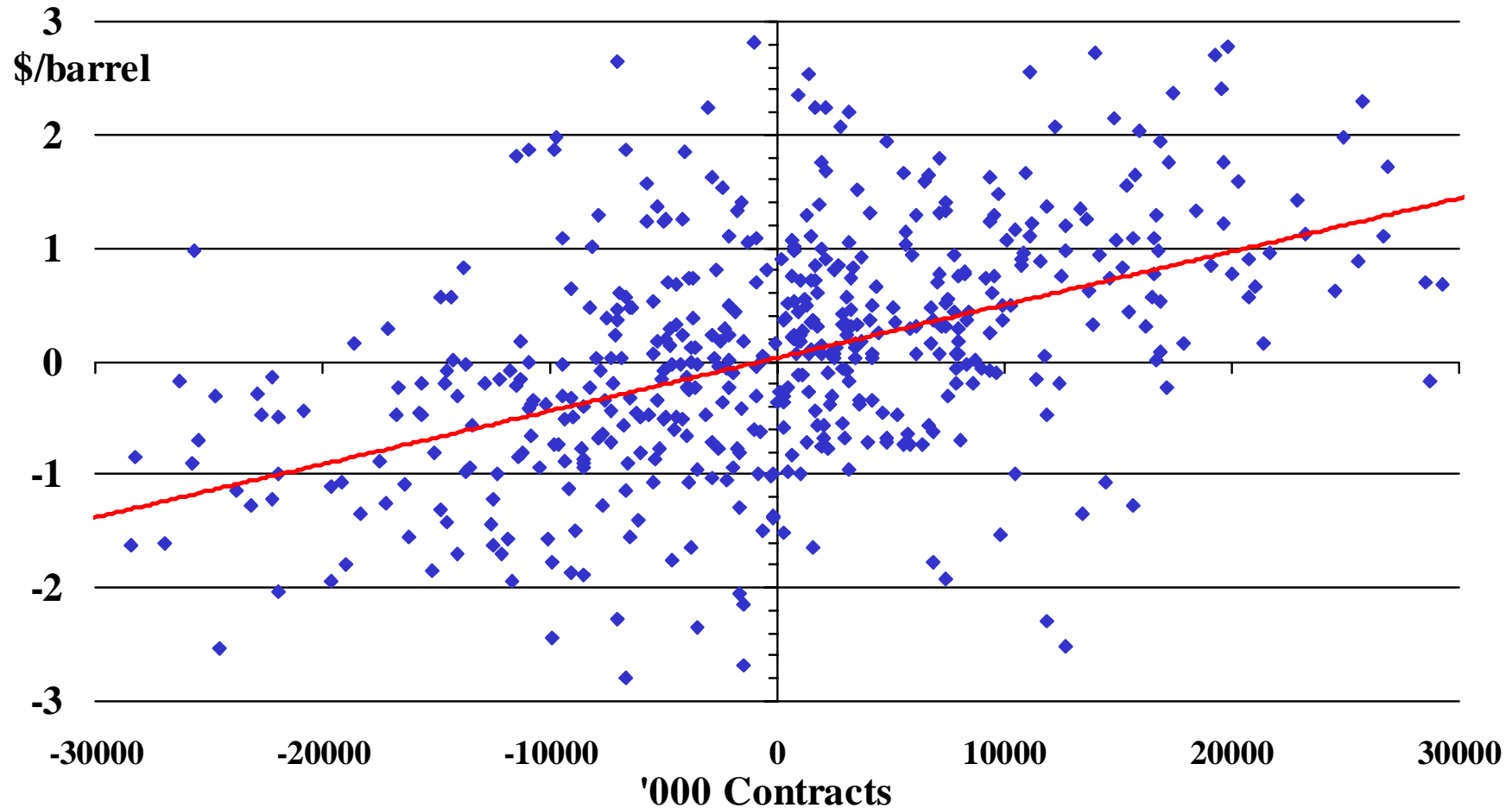
Change in Net WTI Non Commercial Position & WTI Prices



Role of speculators in price formation is uncertain: not bet against fundamental, movement in and out of the market adds momentum



Change in Net WTI Non Commercial Position and Change in WTI prices (\$/bbl)



Contrary to what some pundits might like to think, change in net non commercial positions (+/-) NOT a particularly good predictor of price movements



Granted, Minimum Operating Levels is a Moving Target

➤ *Industry has become more efficient at managing stocks:*

- **Information and scheduling technology**
- **Real-time metering technology**
- **New tank design - set roof on ground to minimize dead stocks, sludge**

➤ *Industry restructuring:*

- **Mergers & acquisitions (remove fence between two refiners; common storage facilities)**
- **Majors shed downstream assets - independents “shallower” pockets, can not afford large capital outlays – banks more reluctant to provide financing & force rationalization of capital employed**

➤ *Liberalization:*

- **Banks benchmark companies on ROCE (inventories represent up to 30% of cash cost) – exacerbate drive to reduce capital outflows**



Minimum Operating Levels is a Moving Target

- *Greater cooperation and industry risk diversification:*
 - Greater cooperation & integration – companies supply each other with products to reduce distribution cost (ie. gasoline) and hedge risk (supply disruptions)
- *Producers have assumed more active role in “drip-feeding” the market:*
 - Increasingly, producers strive to manage seasonality, becoming a more integrated part of the supply chain
 - Producers maintain stocks and are increasingly counted upon to provide “just-in-time” inventories
- *Change in public perception:*
 - Given of role of oil in economy & “national” oil companies, social contract between government & industry to manage “security of supply”
 - With liberalization and commoditization of oil, “social contract” waning
 - “Security of supply” NOT a public good (similar to national defense, national parks), hence greater reliance on government stocks
 - Offload cost, and risk from industry to government



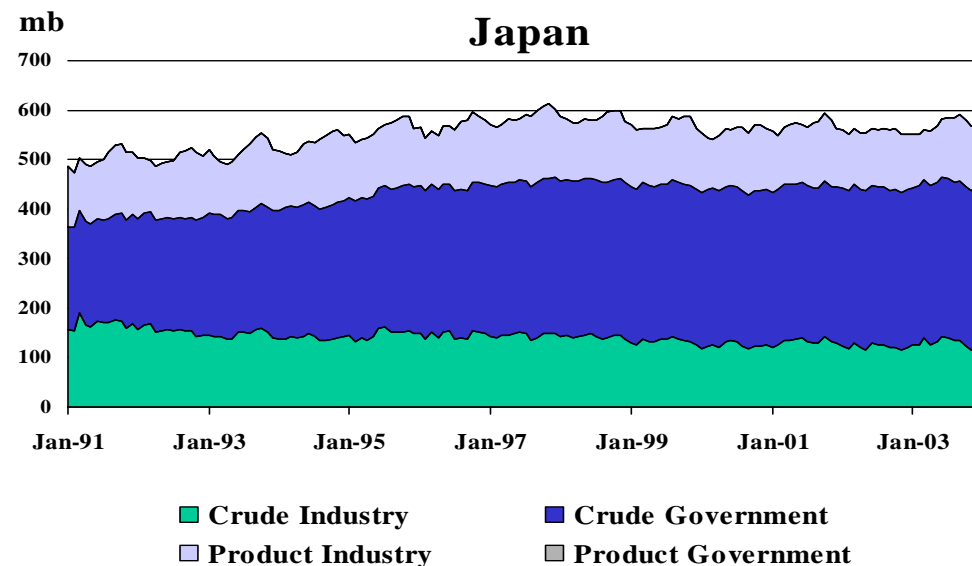
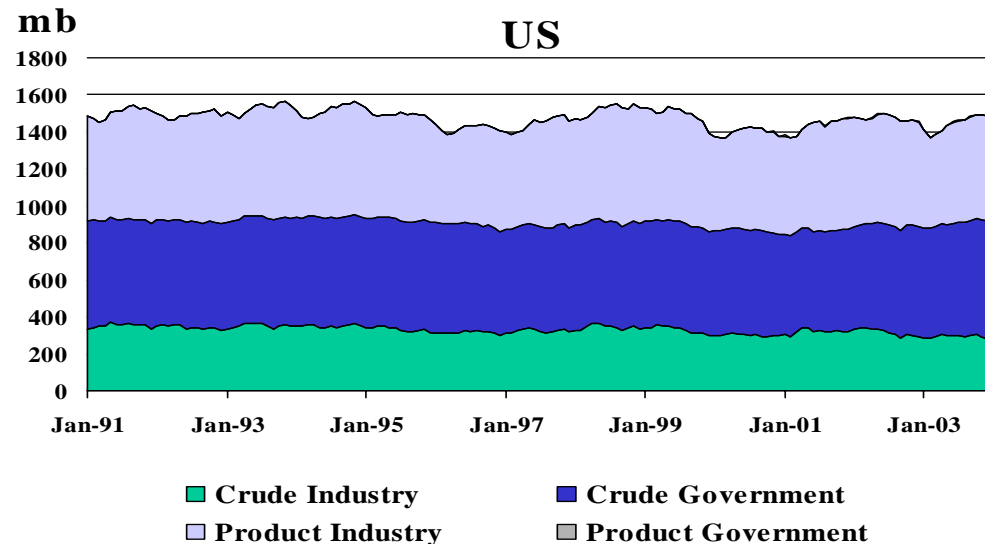
Industry Plus Government Strategic Stocks

Reductions in industry stocks, for the most part have been offset by increases in government agency strategic stocks

Overall stock levels have remained fairly constant over the last 15 years for major OECD governments

Somewhat misleading, since demand has increased over same period, therefore *lower* on a days of forward cover basis

For the most part, the market ignores Agency stocks in its daily dealings (off the radar screen).

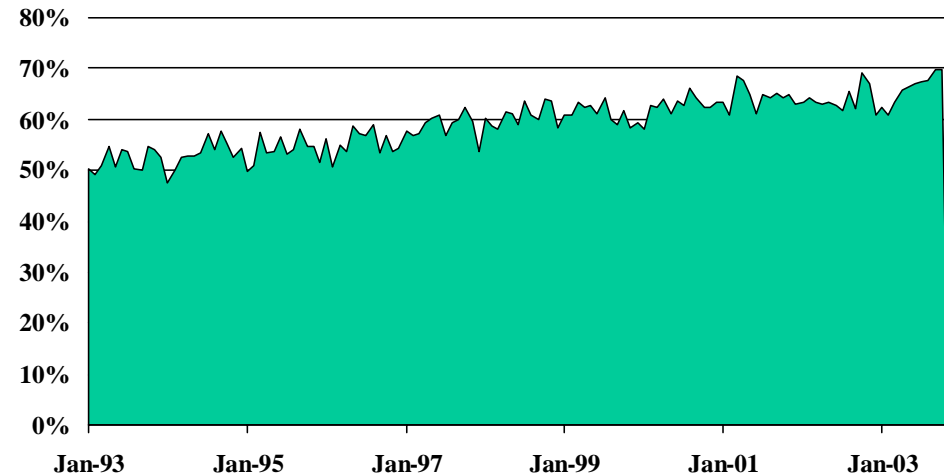




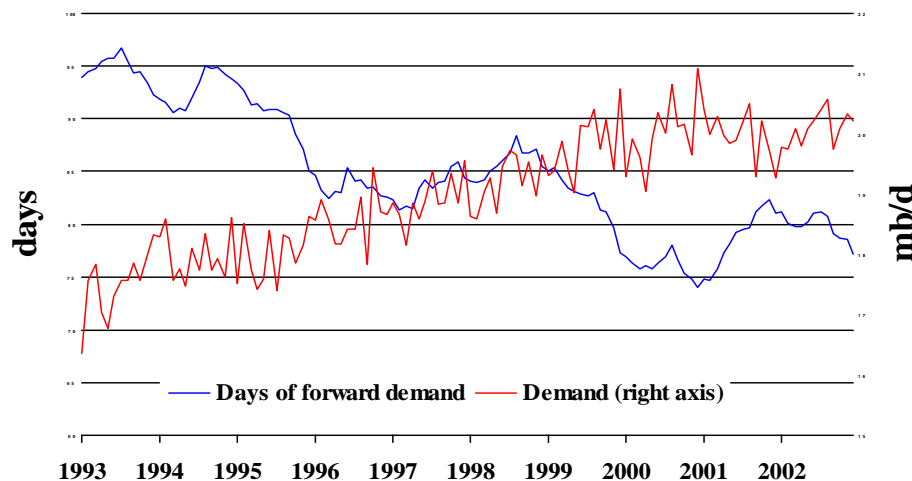
Mitigating Factor: Increased Risk Exposure

Industry may be able to operate with lower inventories, but increased demand, falling supply and higher import dependency translate into greater risk exposure. One would expect more, not less inventory cover

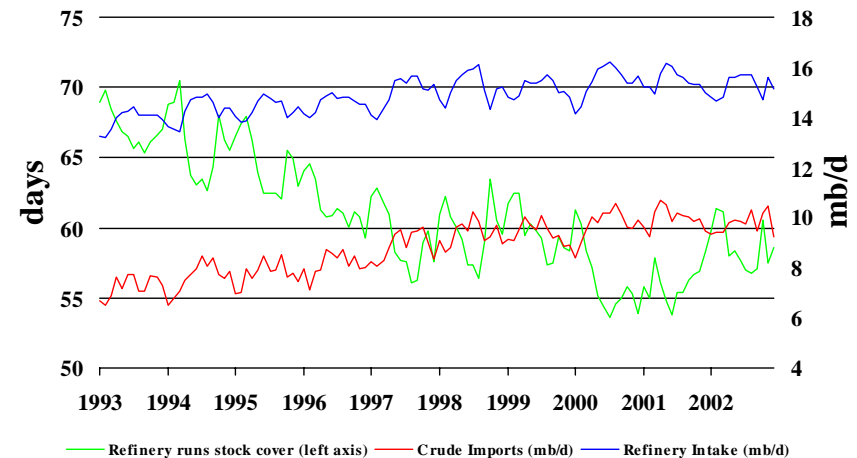
Net Crude Imports Share of Refinery IntakeUS



Crude Demand vs Crude Stock Cover US



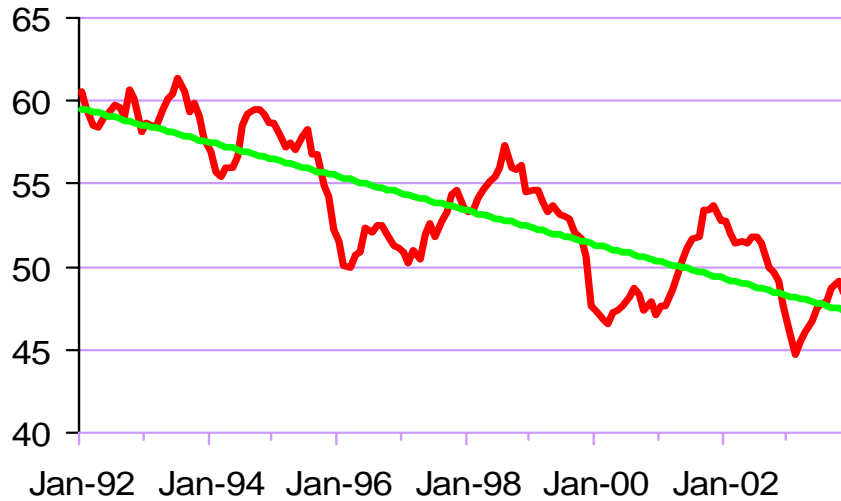
Demand vs total stock cover US



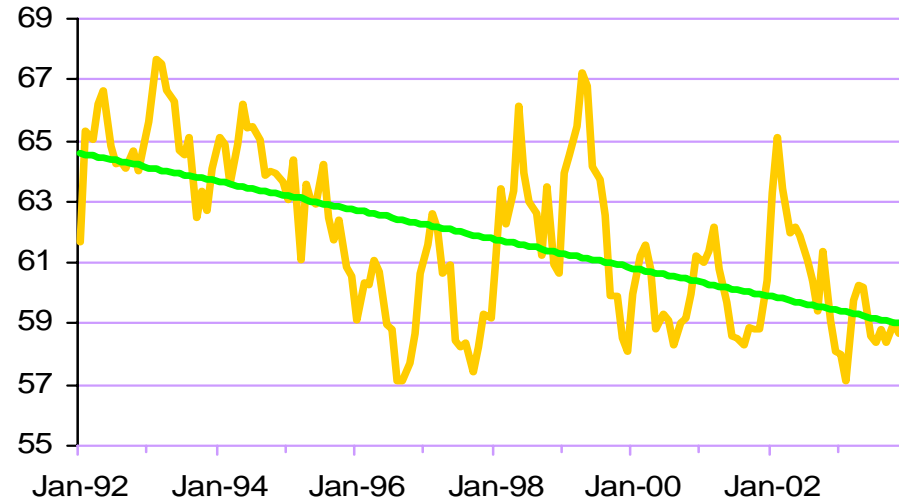


OECD Days of Forward Demand by Industry Total Oil Stocks

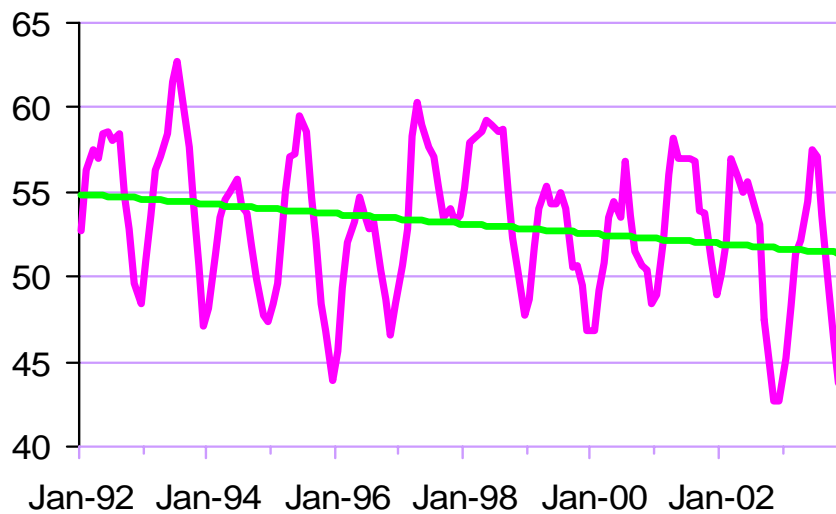
— OECD North America Days of Forward Demand



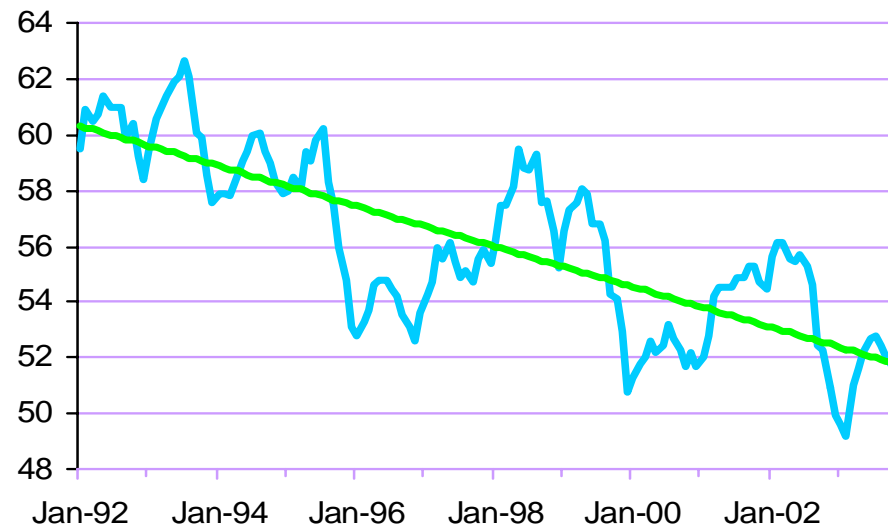
— OECD Europe Days of Forward Demand



— OECD Pacific Days of Forward Demand



— OECD Days of Forward Demand





How Low is Low?

- **Greater import dependency would suggest more, not less reliance on industry and strategic stocks (India, China, Thailand, Korea)**
- **Even more important given:**
 - **Tight spare production capacity – cost money to develop and maintain**
 - **Tight infrastructure (tankers, refining, pipelines)**
- **Compounded by heightened geopolitical risk – unlikely to go away**
 - **International terrorism**
 - **Production and demand shift from more stable OECD to non-OECD**
 - **Iraq, Venezuela, Nigeria, Indonesia, Russia ... list goes on**
- **Bottom line, we expect tighter supply-demand balances in the future, which when combined with low spare production capacity, low transportation, refining, distribution infrastructure AND LOW INDUSTRY STOCKS, supports prices and price volatility**



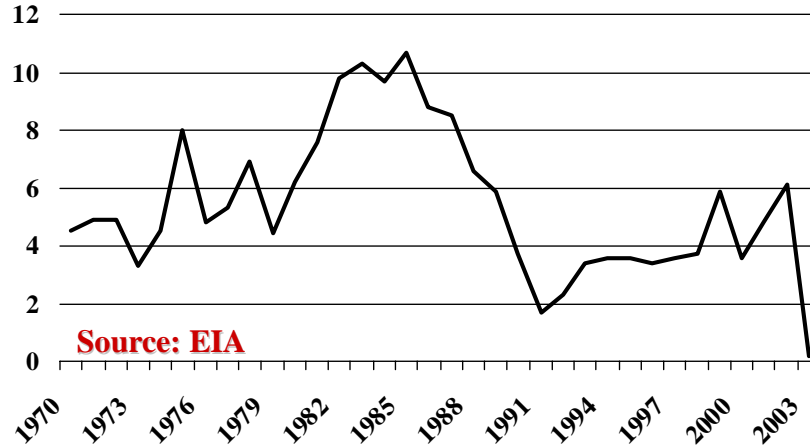
Current OPEC Spare Production Capacity

- Capacity Reached in 30 Days, Sustained For 90 Days -

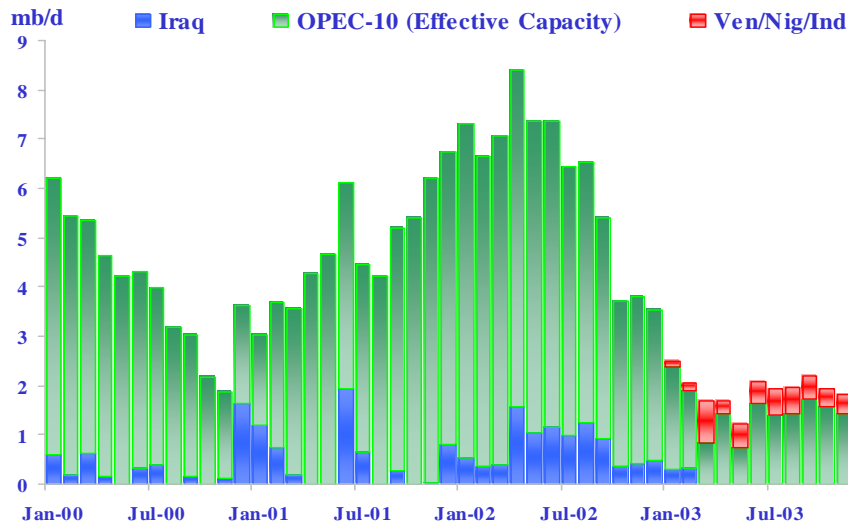
Spare production capacity is tight!

Who can replace Iraqi, Venezuelan or Nigerian production?

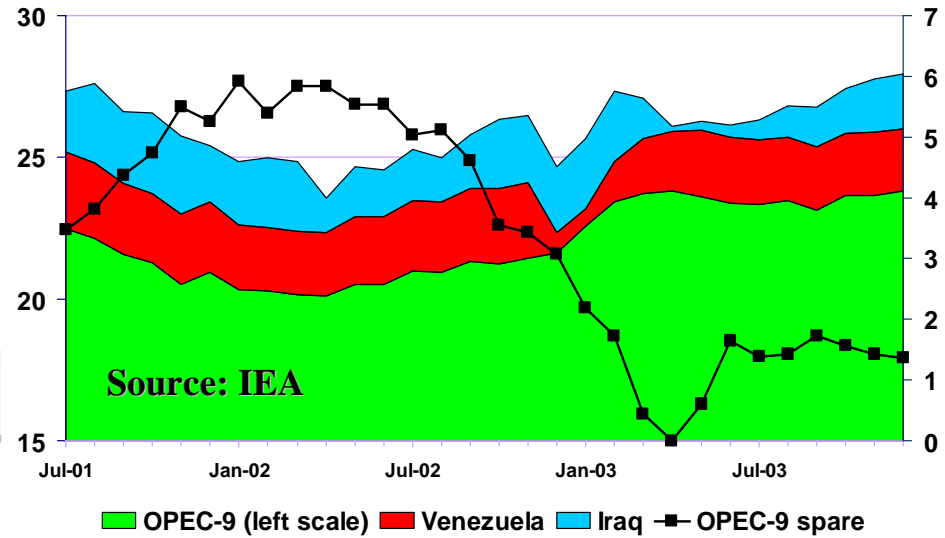
World Excess Oil Production Capacity, 1970 - 2003 (mb/d)



Source: EIA



Source: IEA

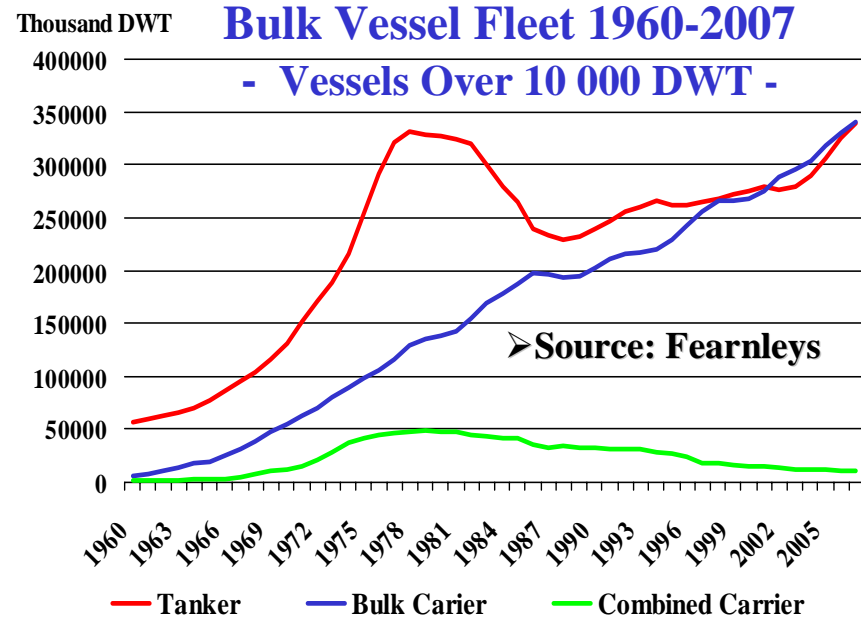
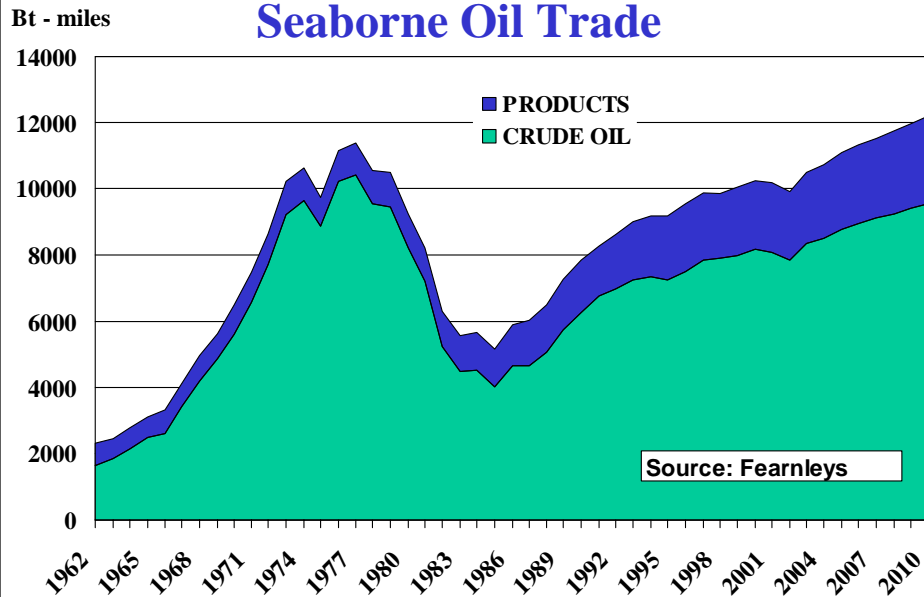
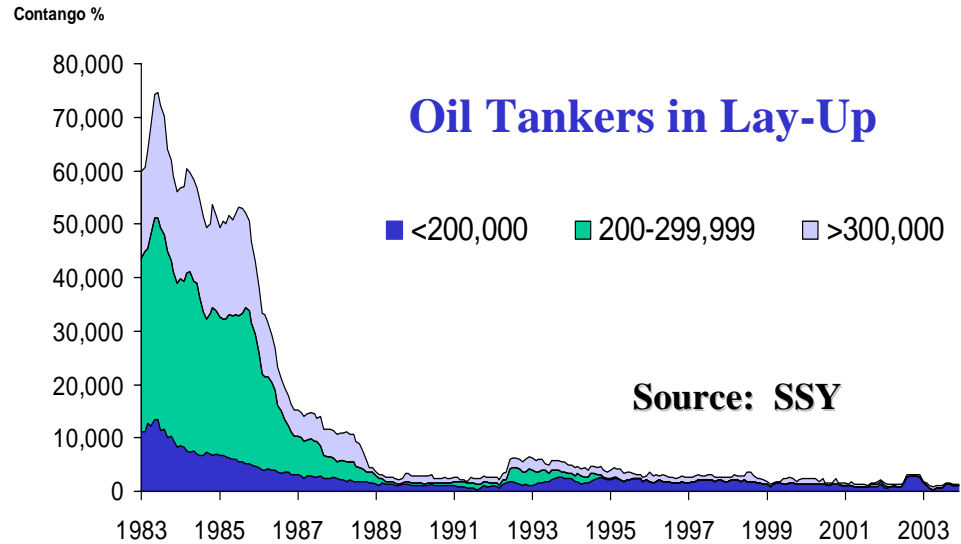


Source: IEA



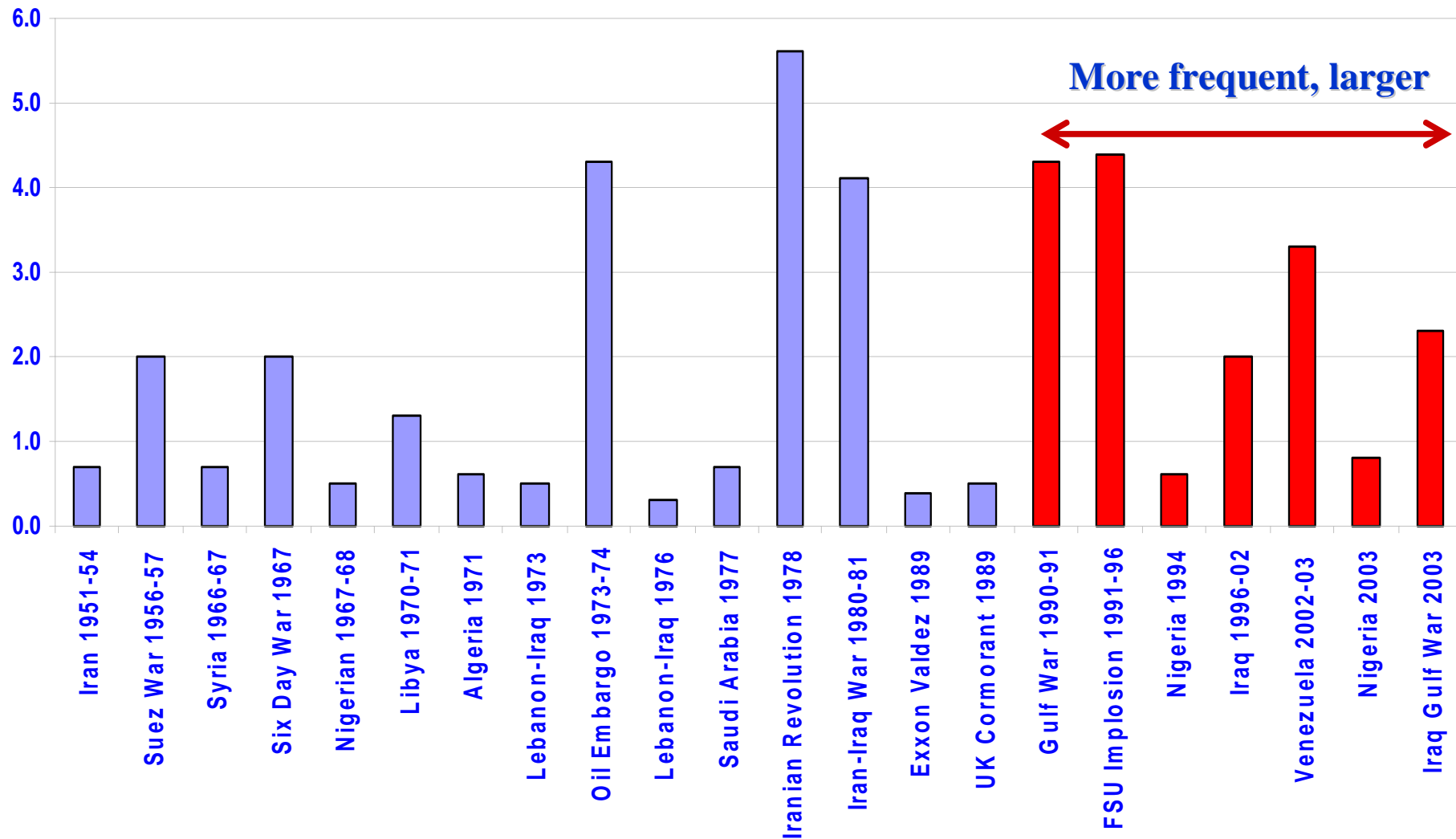
Seaborne Oil Trade

Limited spare capacity – like stocks, who benefits and who pays of maintaining spare capacity?





Major Supply Disruptions 1950-2003 - Peak Loss in Mb/d -



Analysts are incorporate “undetermined” supply disruption into their balances



Conclusion

OECD industry crude oil stocks are low:

- Trend is understandable in a liberalised market
- Will result in higher average prices and price volatility
- Need to revisit both minimum operating levels & security of supply
- Someone benefits, someone pays

Risk exposure of low stocks is exacerbated by:

- Limited effective spare production capacity
- Tight supply-demand balances
- Tight refining and distribution infrastructure
- Uncertain economic growth
- Geopolitical risks

Speculators add momentum as they shift in/out of the market, they do not bet against fundamentals

