

# **WEFA Energy Conference 2000**

## **Oil Market Outlook**



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October 25, 2000

**Deutsche Bank**  
Deutsche Banc Alex. Brown

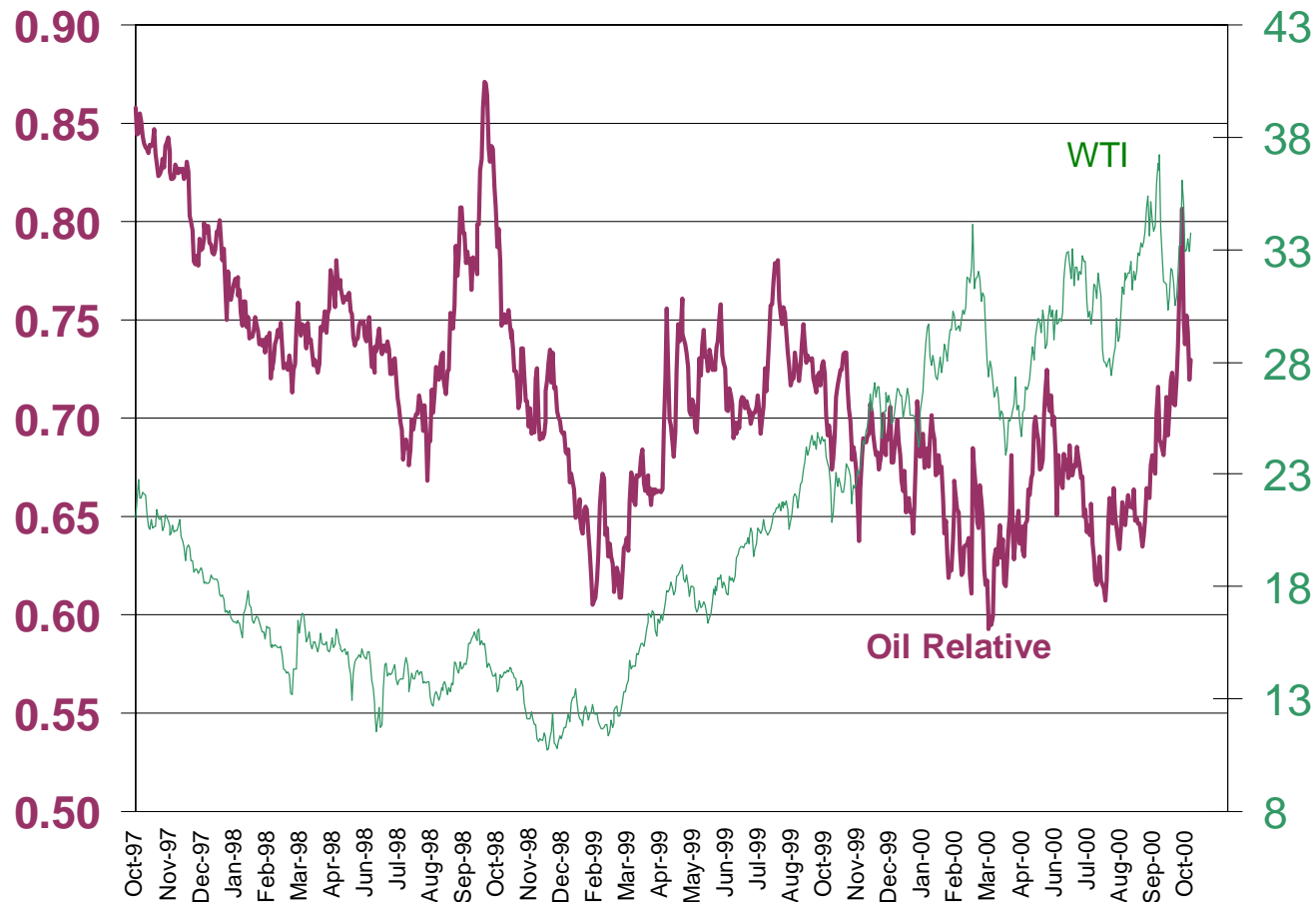


# U.S. oil sector and the oil price since October 1997

...stocks usually move in line with oil prices, except...

Major Oil Index/S&P 500

WTI \$/bbl

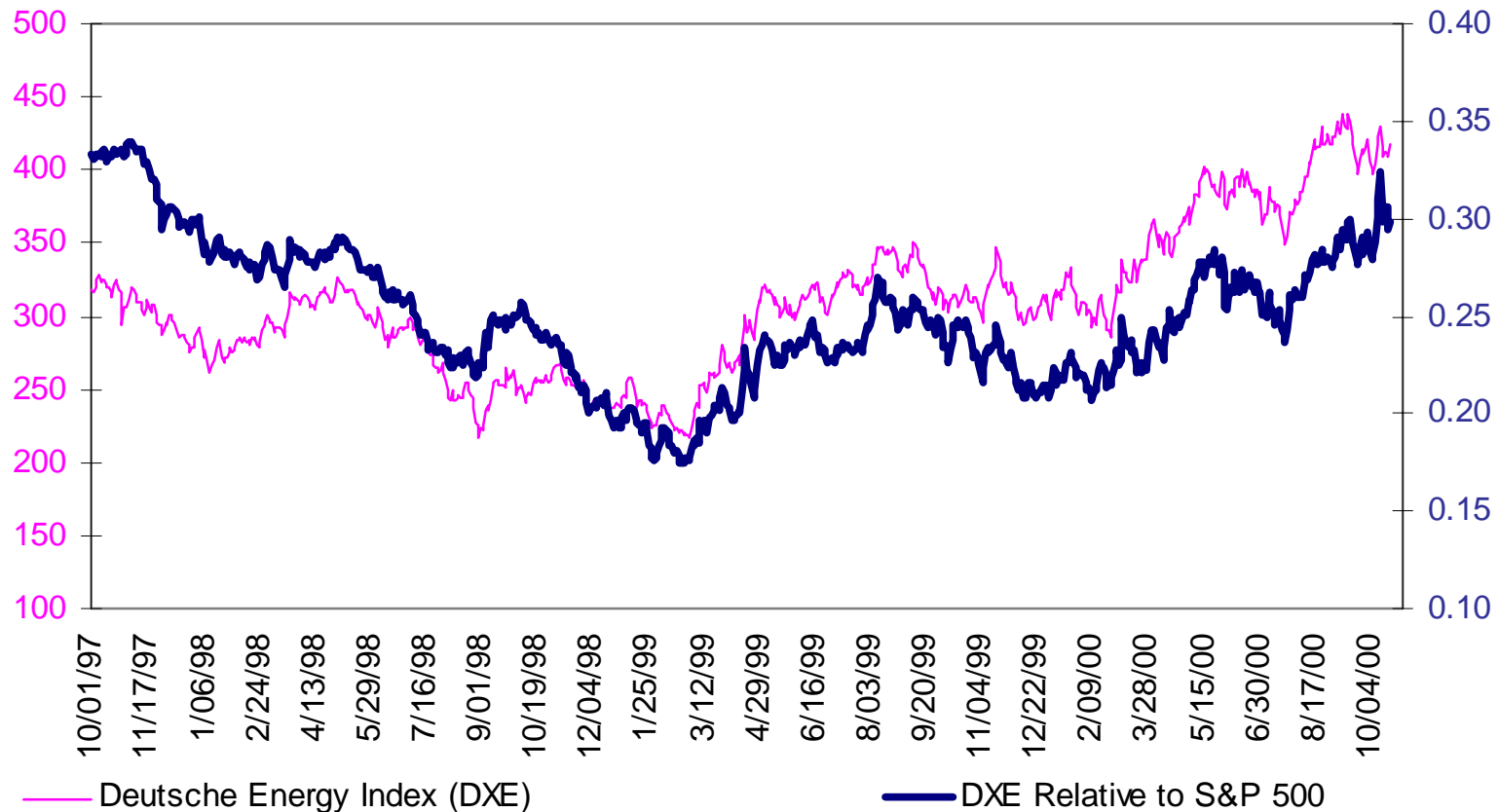


Source: FactSet



# Deutsche Energy Index: DXE versus S&P500

## ...uptrend continues after setback in July

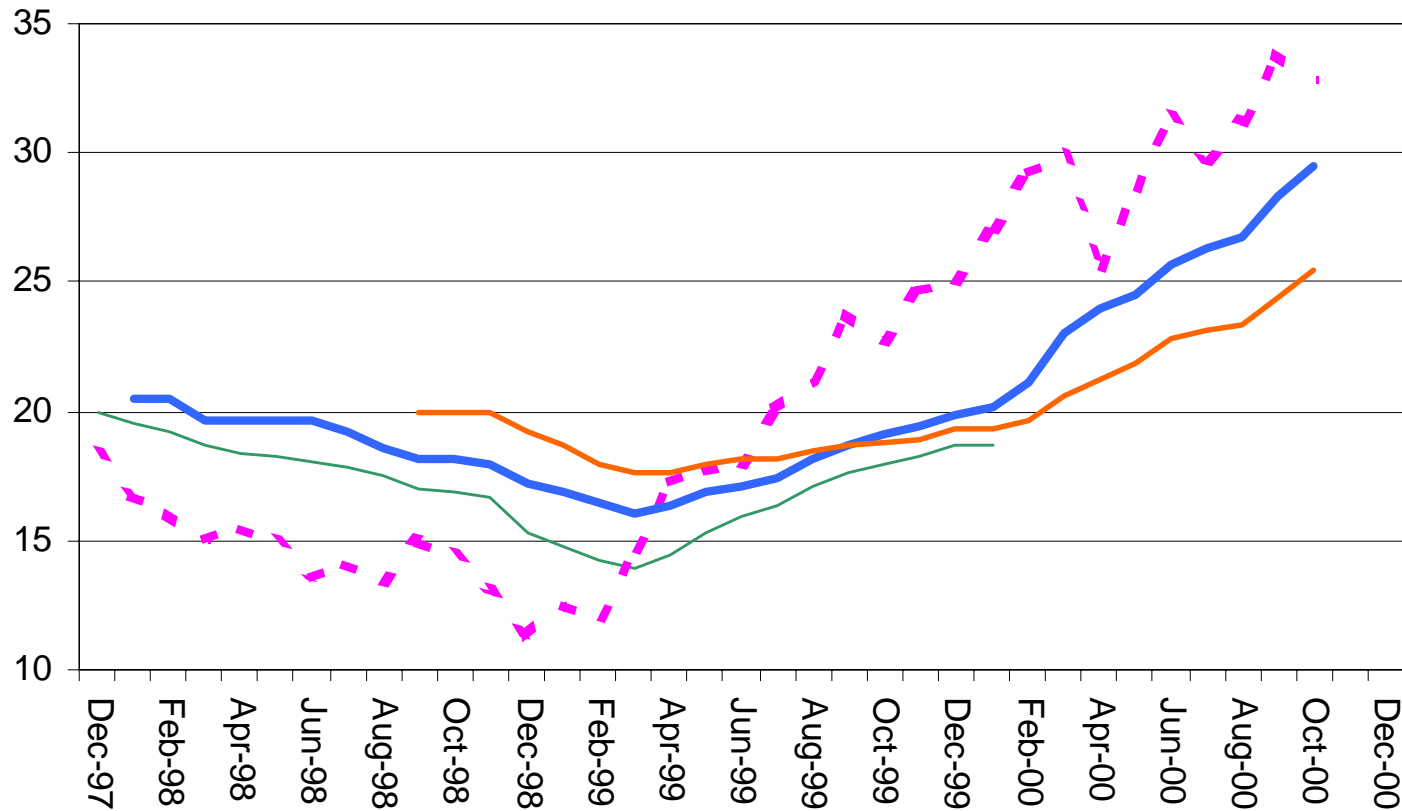


Source: FactSet



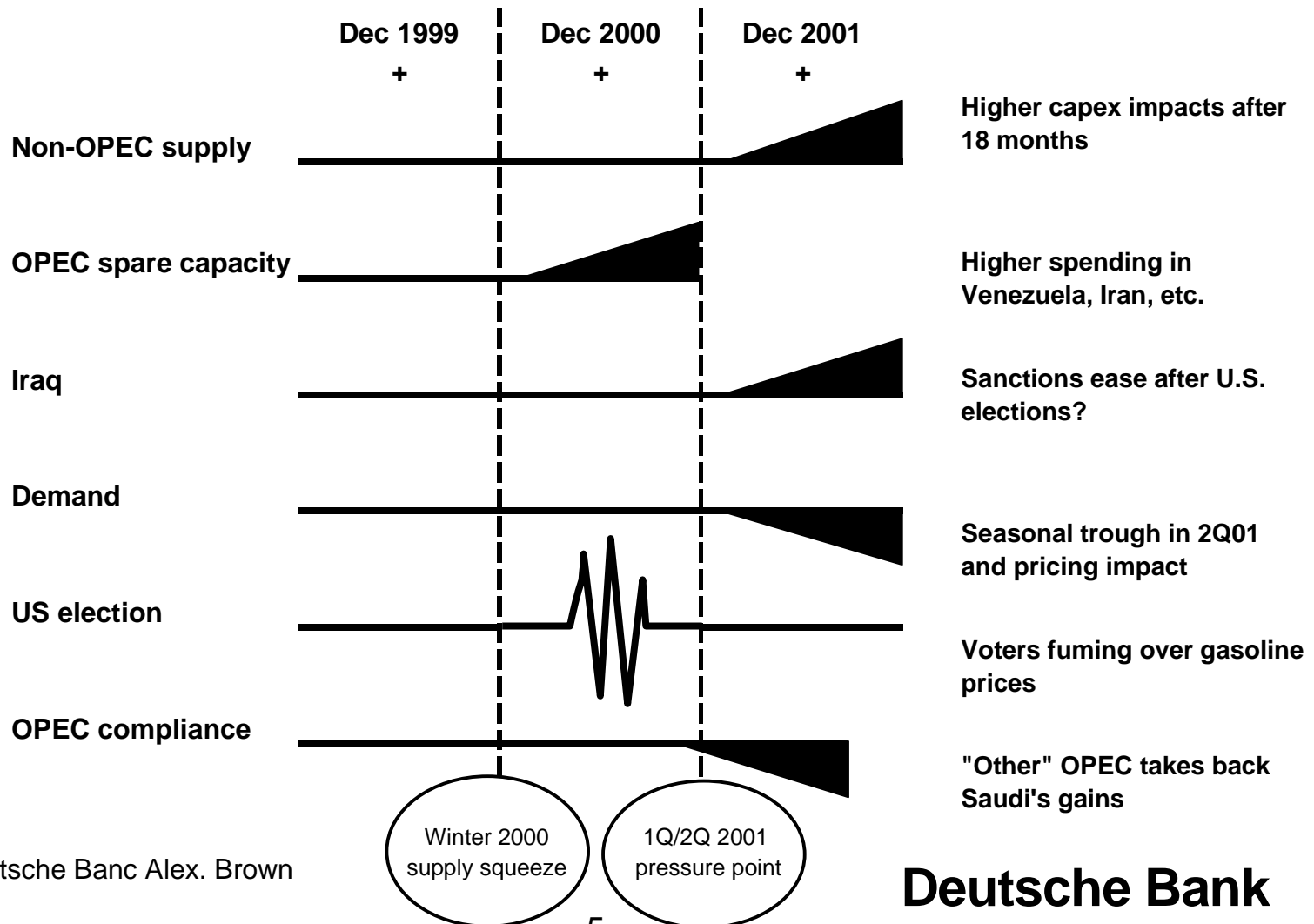
# Oil price forecasts track actual price movement

...so if oil prices rise so should oil price forecasts



# Oil market timeline

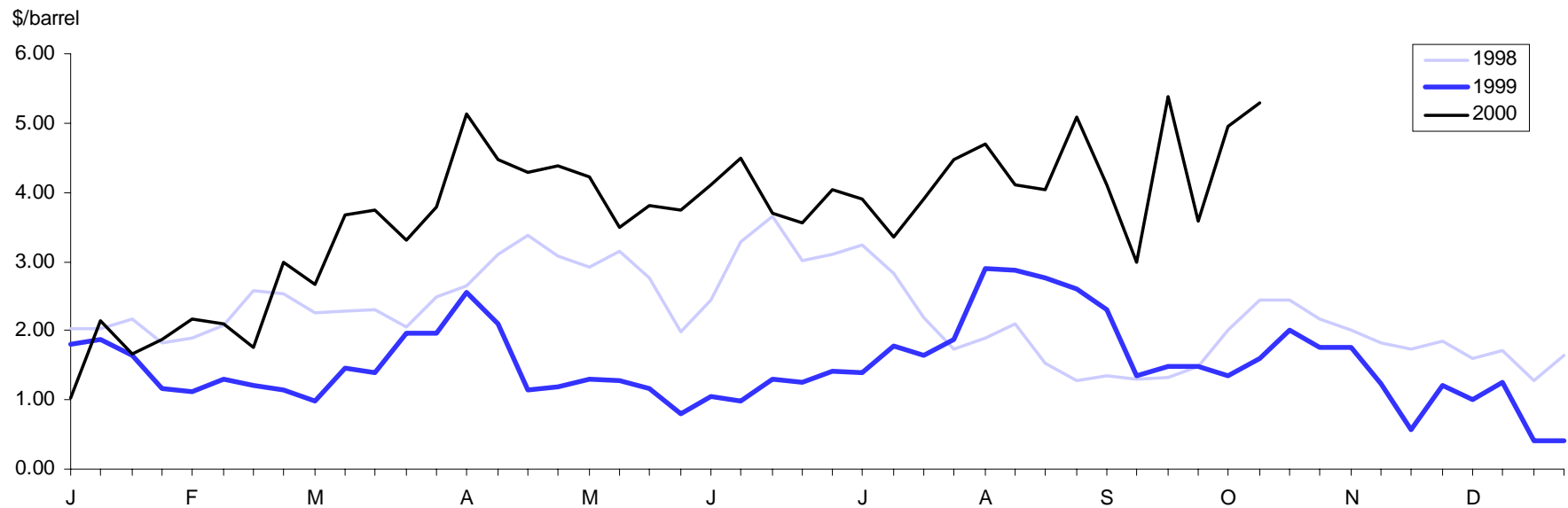
...upside in 2000 but a pressure point in 2Q 2001?



Source: Deutsche Banc Alex. Brown



# Average world refining margins ...improved outlook for 2001

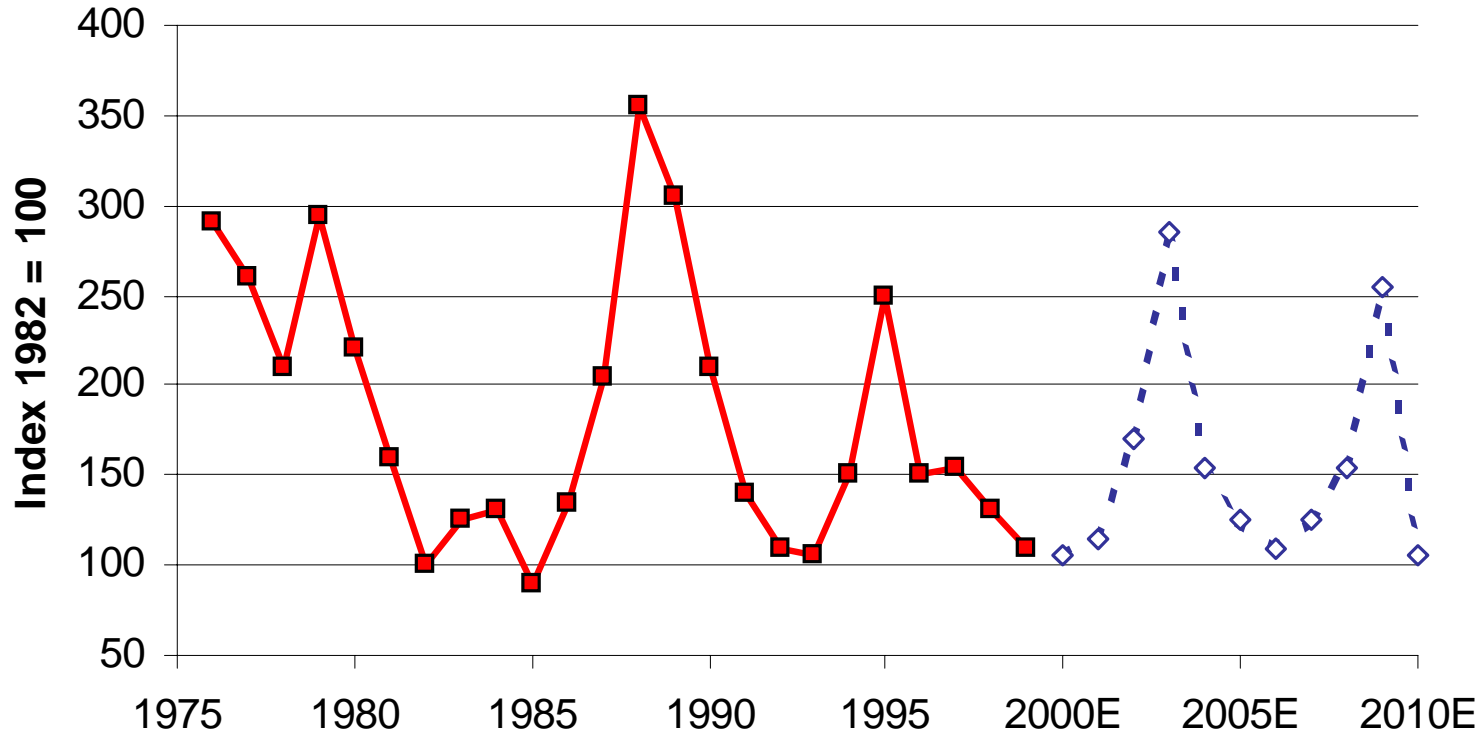


Source: Petroleum Argus, Deutsche Bank



# U.S. chemical industry profitability cycle

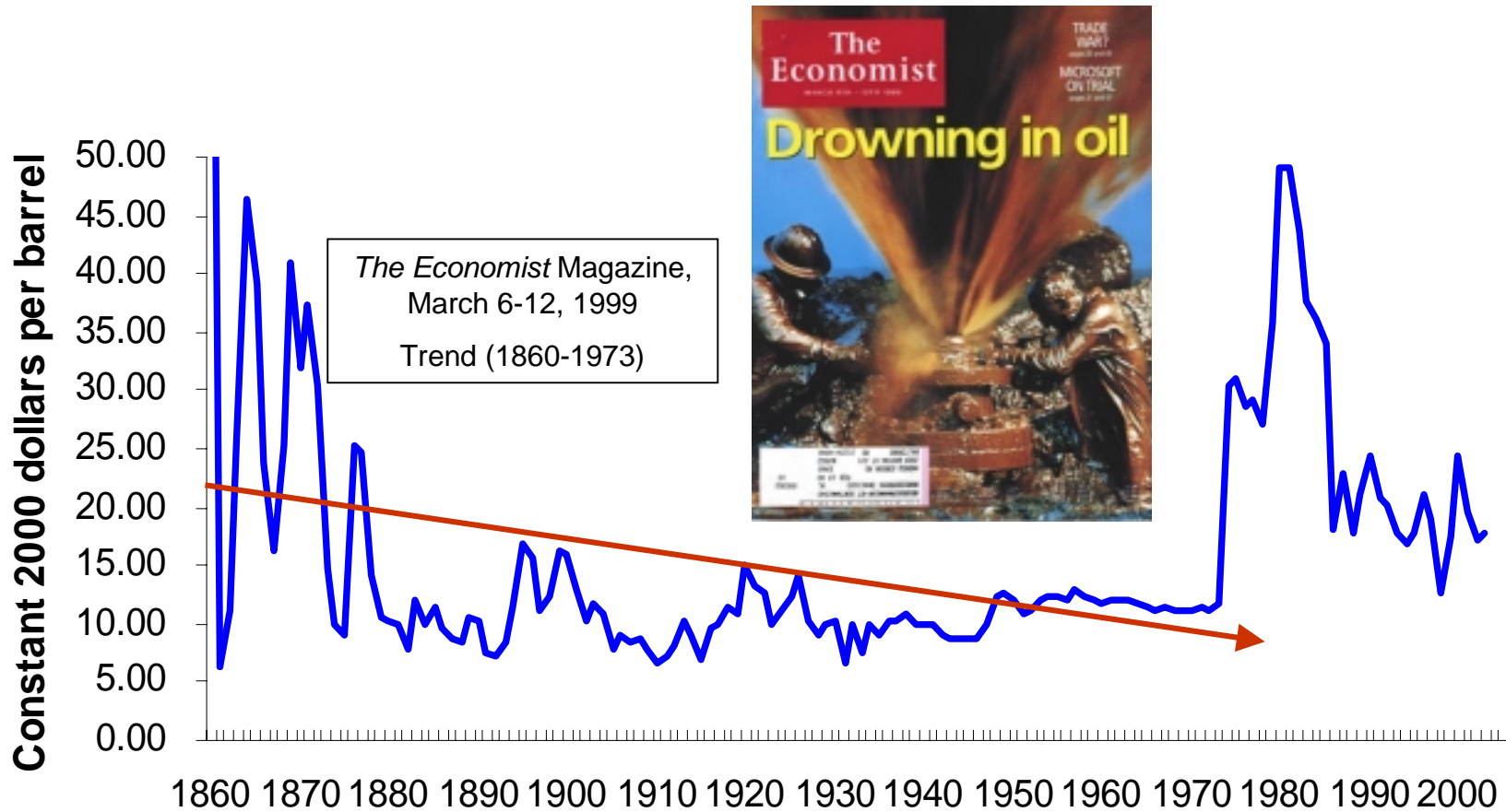
...bottom in 2000?



Source: Chem Systems and Deutsche Banc Alex. Brown estimates



# U.S. oil prices...the long term decline theory popular in early 1999

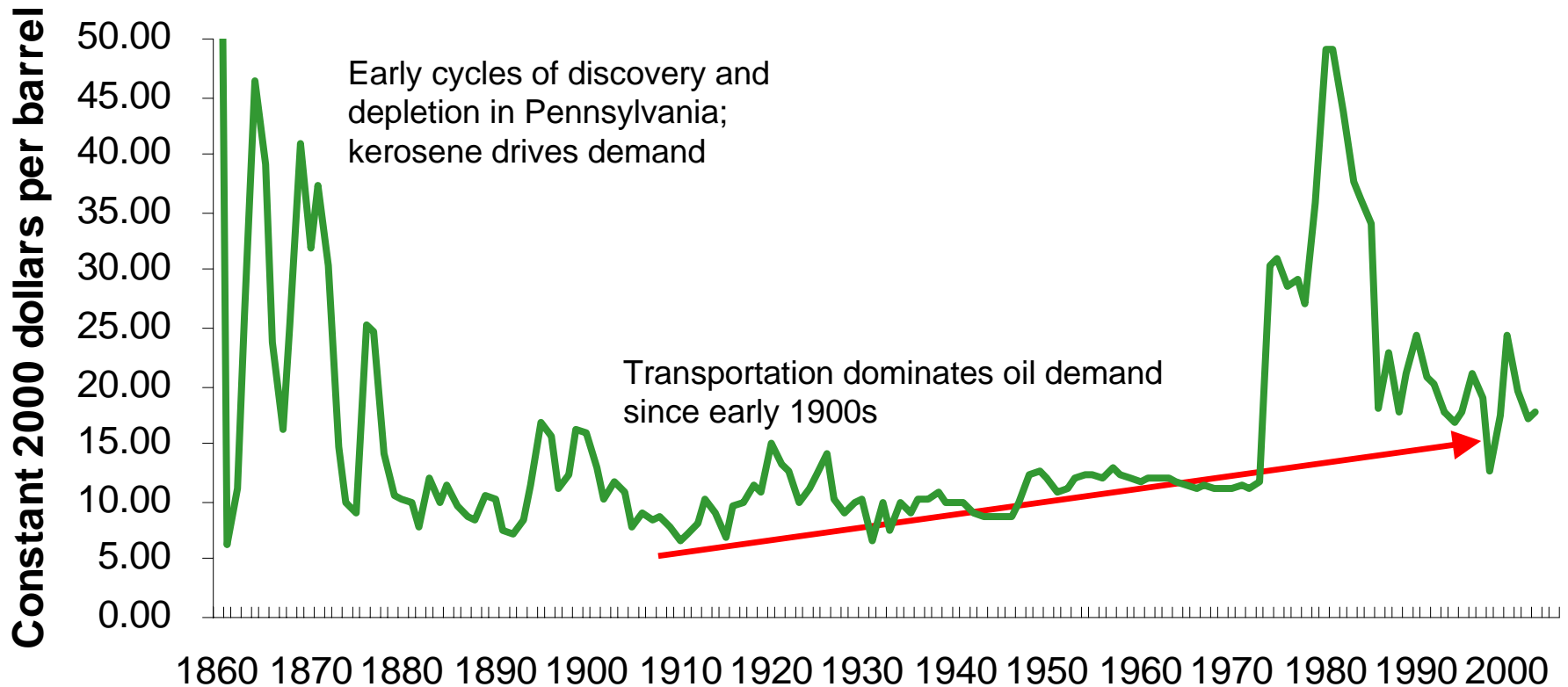


Source: API, DOE, and Deutsche Banc Alex. Brown estimates



# U.S. oil prices since 1860

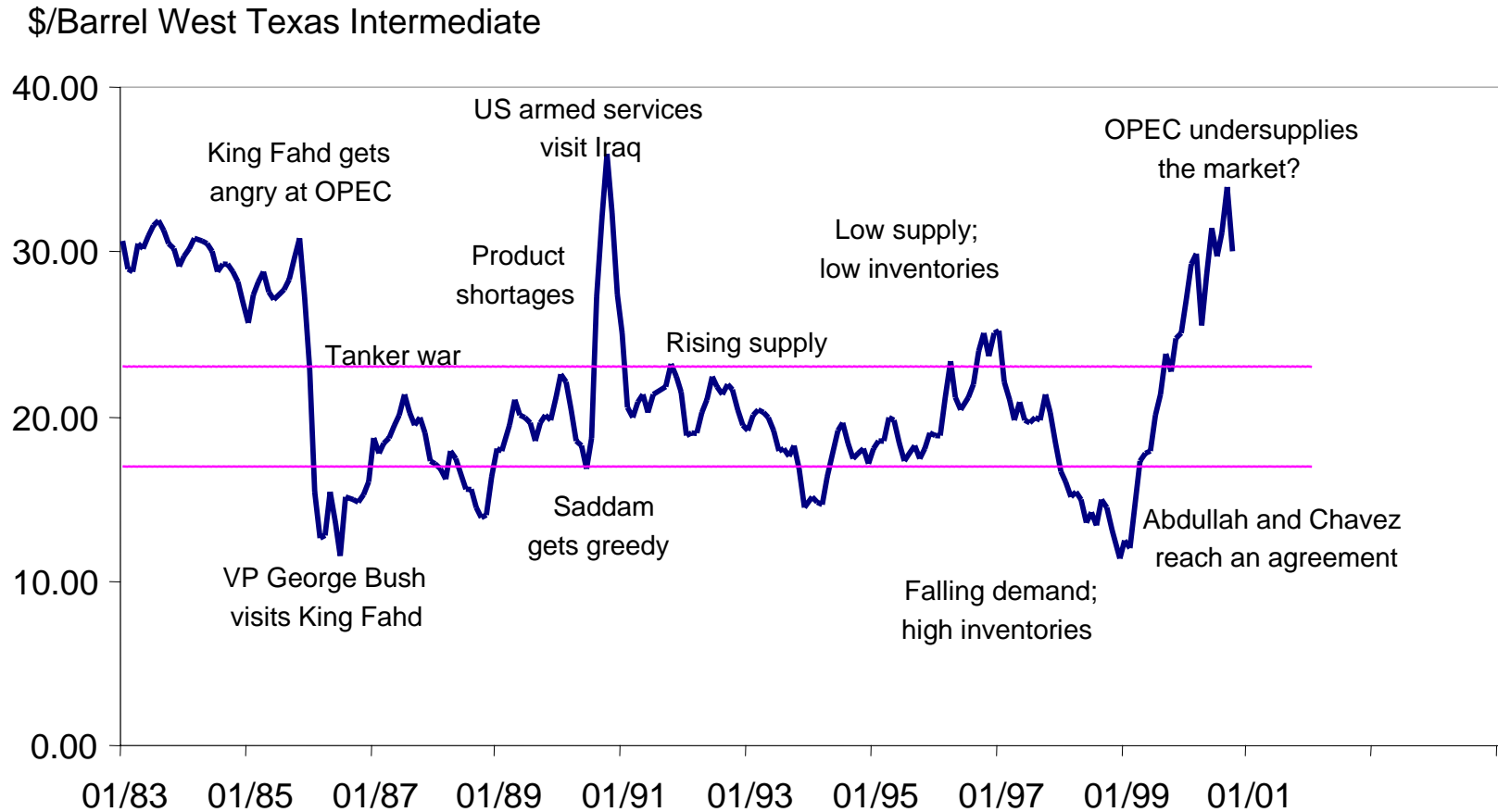
...no downward trend in post-1900 data



Source: API, DOE, and Deutsche Banc Alex. Brown estimates



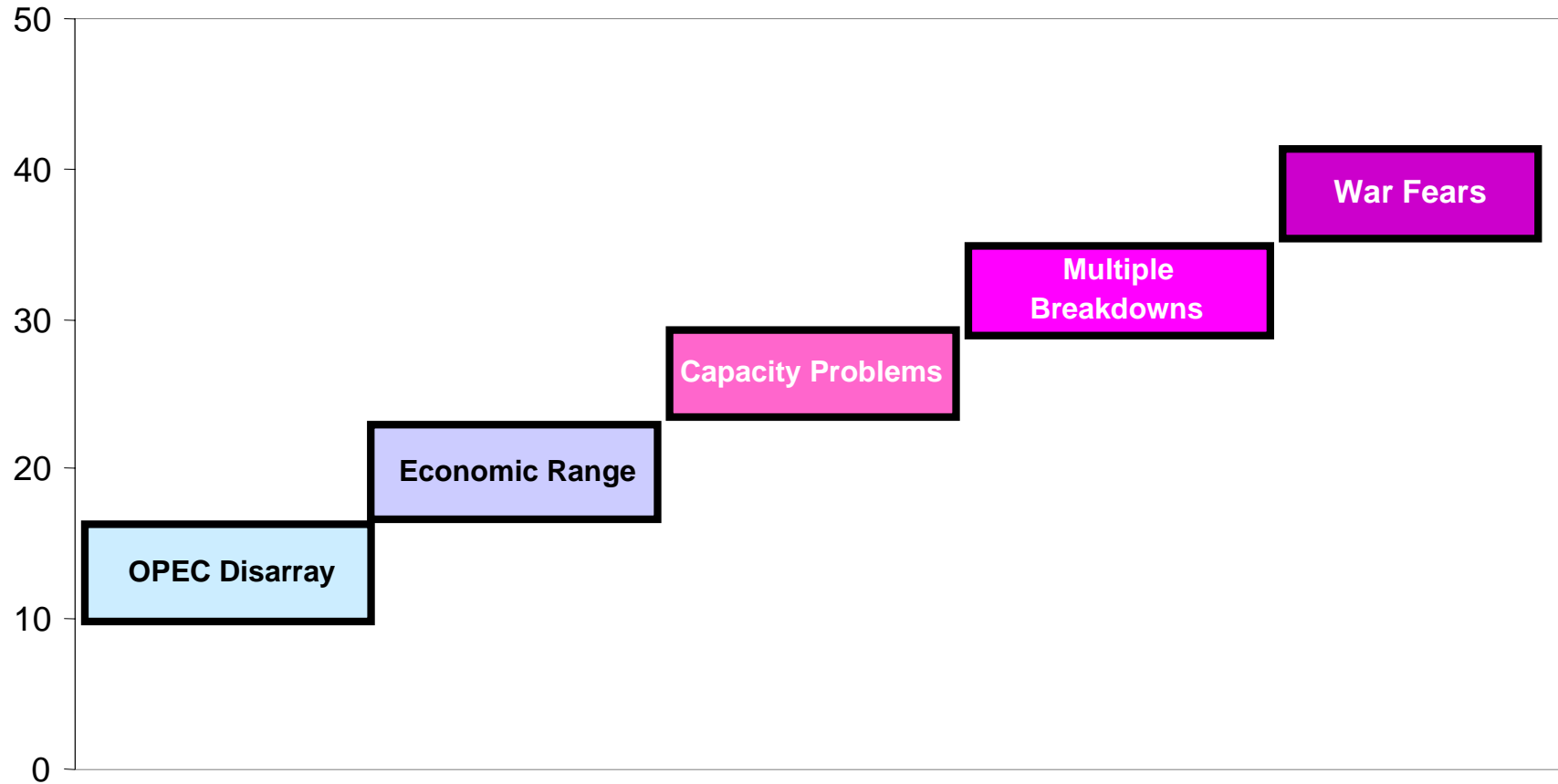
# Oil prices 1983-2000: OPEC compliance induces a recovery



Source: NYMEX; Deutsche Banc Alex. Brown

# Political Prices of Oil

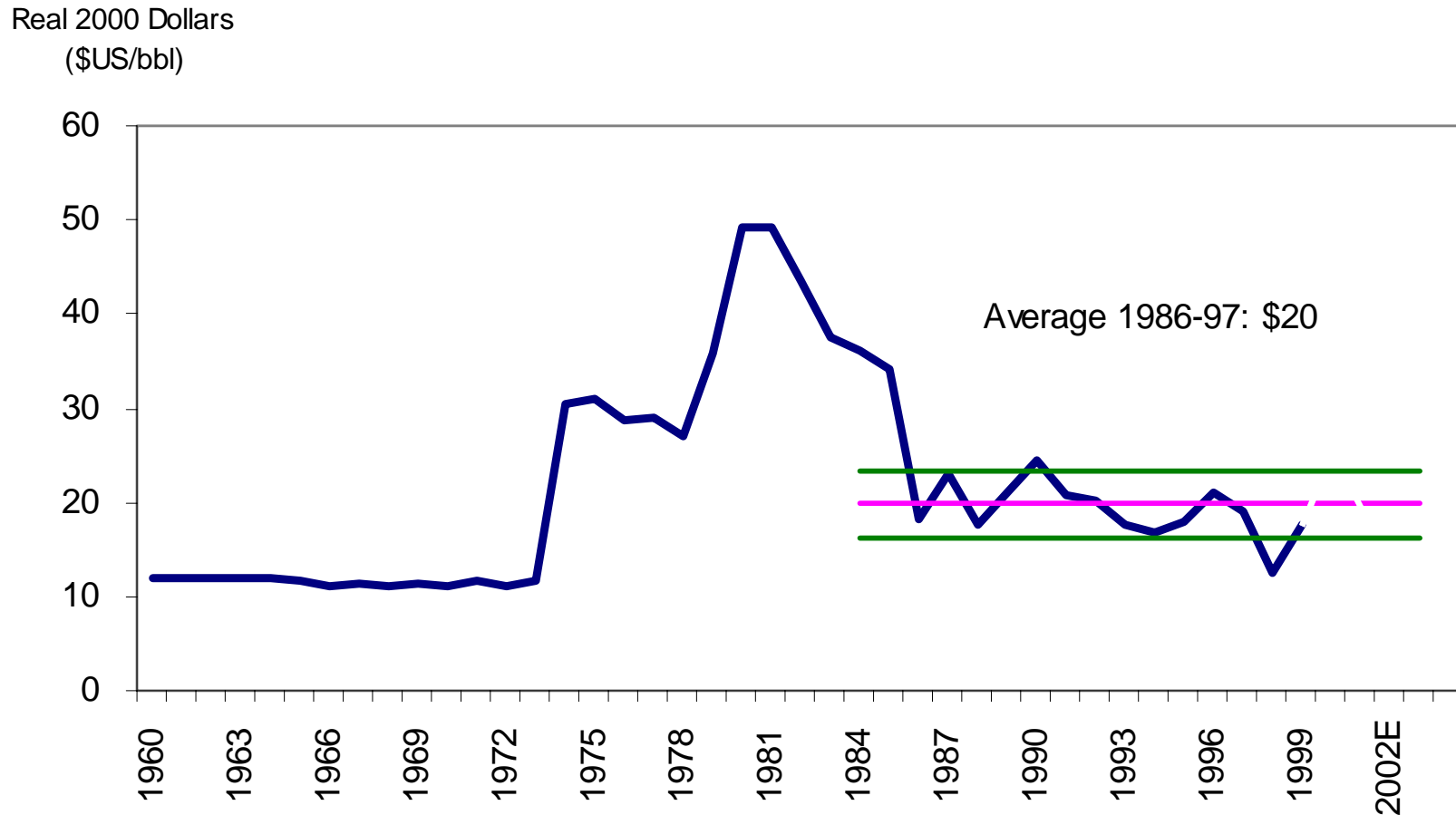
\$/Barrel WTI



Source: Deutsche Banc Alex. Brown



# Oil prices expected to trade near \$20 RAC (\$22 WTI)



Note: U.S. refiner acquisition prices for imported crude oil (after 1972)

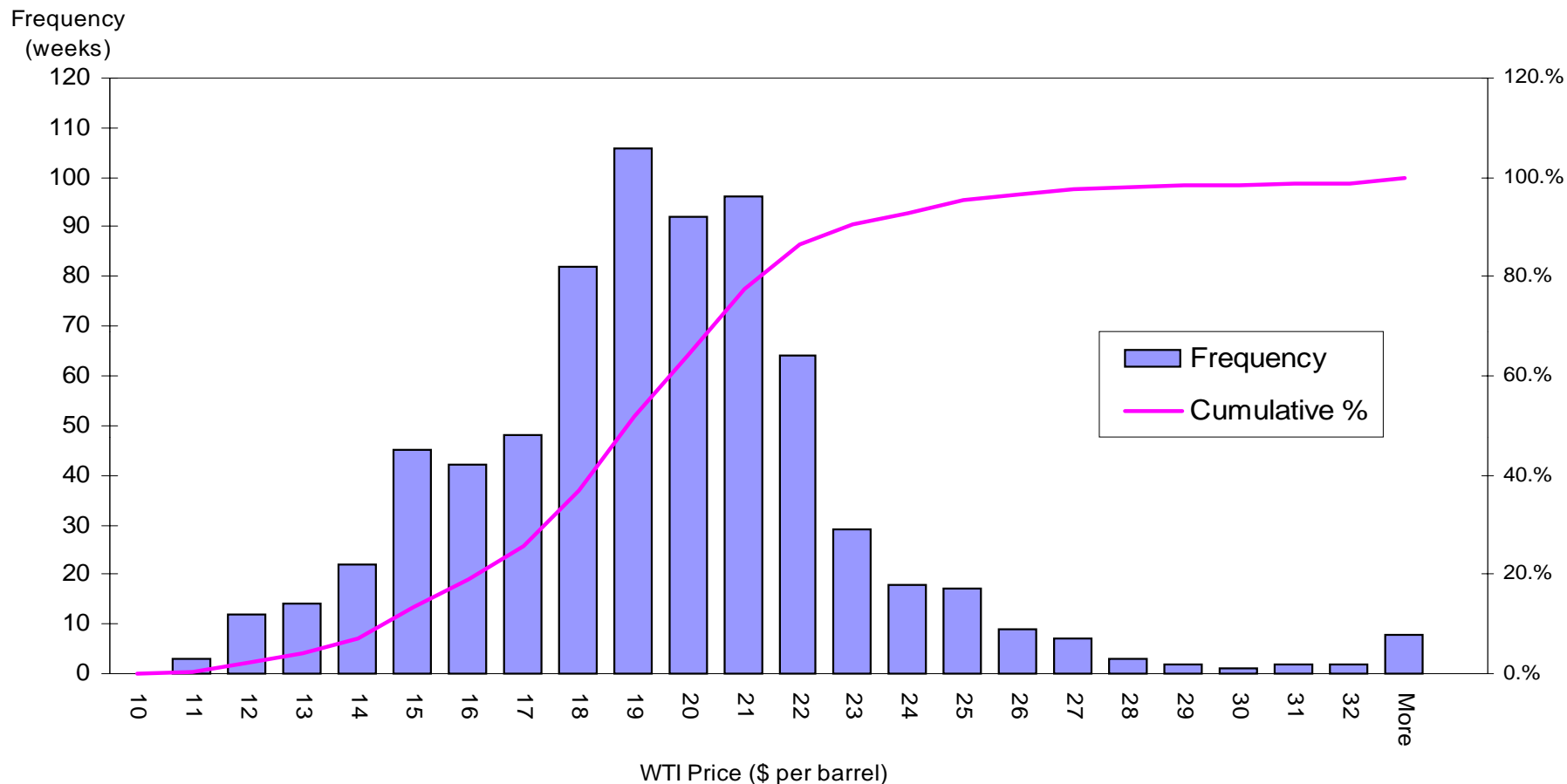
Price about equal to Brent; \$1-2 lower than WTI futures

Source: US DOE/EIA; Deutsche Banc Alex. Brown estimates



# Frequency distribution of crude oil prices (1986-present)

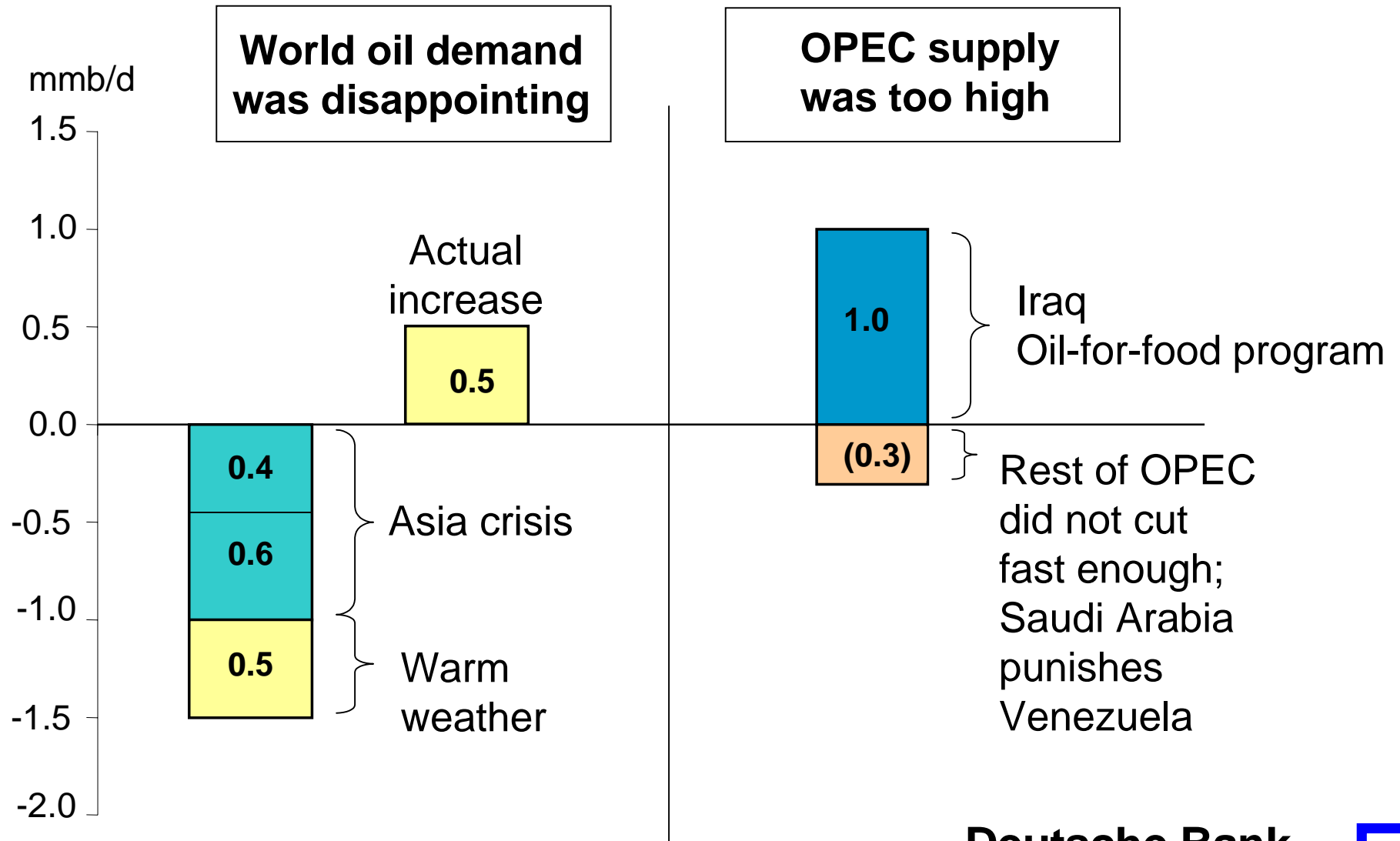
...the central tendency for oil prices has been \$18-\$22



Source: NYMEX and Deutsche Bank Alex. Brown



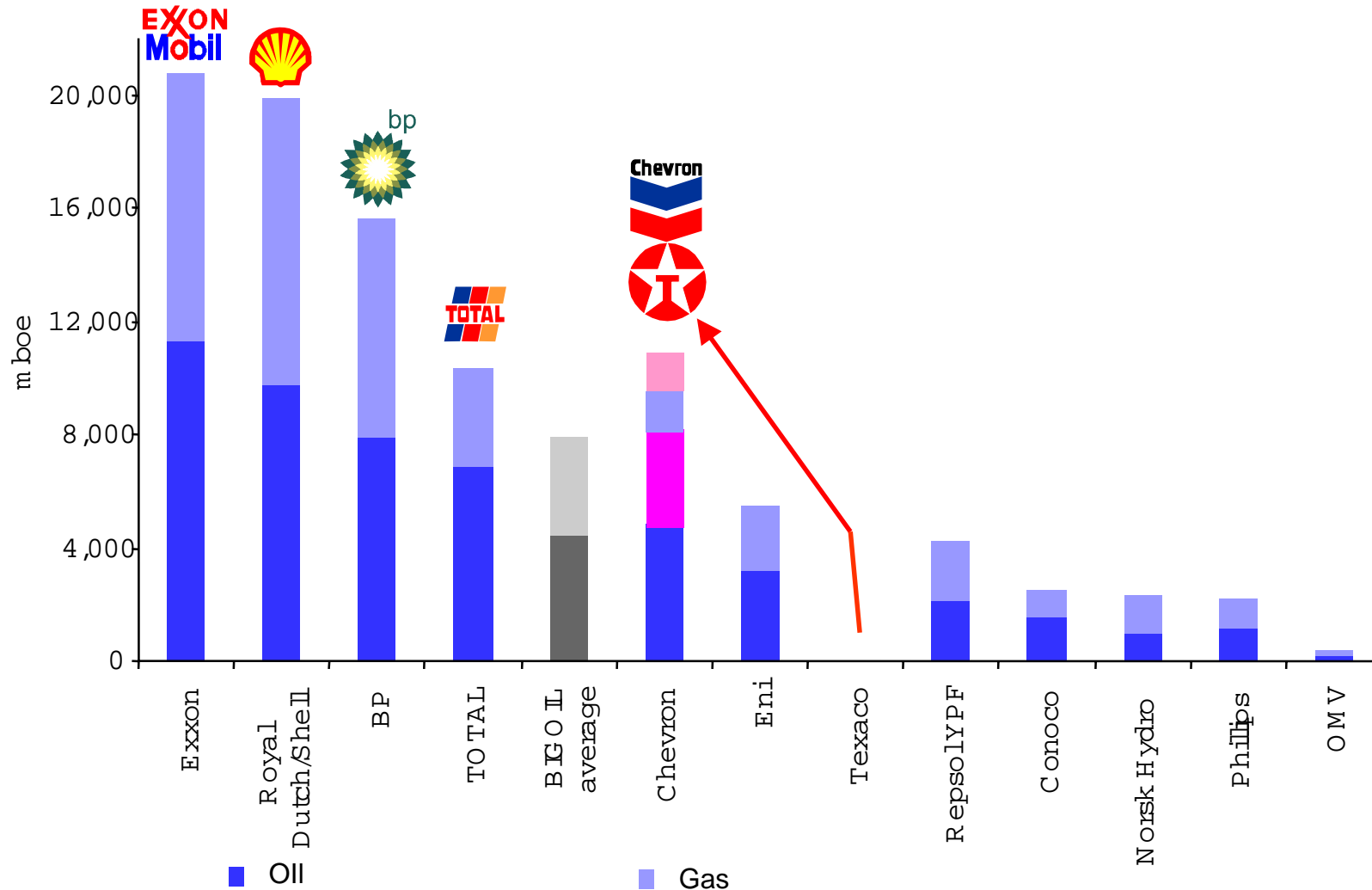
# What went wrong in 1998



Source: IEA; Deutsche Banc Alex. Brown estimates

# How the oil markets changed after 1998

## ...the Four (Five?) Sisters dominate the industry



Source: Deutsche Banc Alex. Brown estimates; company reports – 1999 data



# Lack of investment caused an infrastructure problem

- 1986-96 Oil collapse: Cost cutting and restructuring
- 1998-2000 Oil collapse: Financial discipline
- 2000s Infrastructure shortfalls
  - Wellhead capacity
  - Drilling rigs
  - Sophisticated refineries
  - Product pipelines
  - Electricity generation
  - Coal export terminals
  - Mine capacity
  - Tankers
  - LNG terminals
  - Oil storage capacity





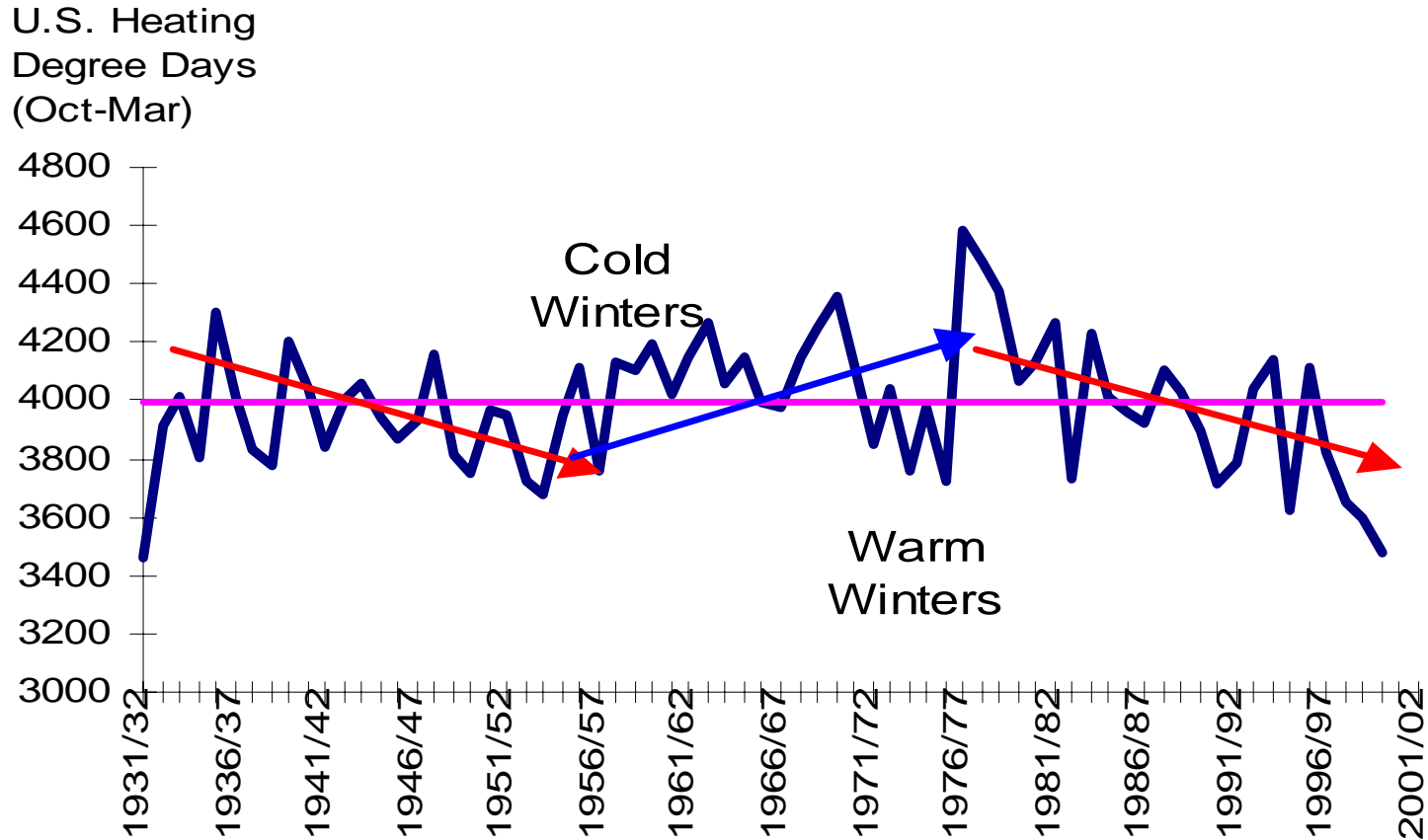
# Missing barrels: The Sequel

mmb/d	1998	1999	2000E	2001E	
Demand	73.6	74.7	75.8	77.6	
Non-OPEC supply	44.7	44.7	45.9	46.8	
OPEC NGLs	2.8	2.8	2.9	3.0	
OPEC crude needed	26.0	27.2	26.9	27.8	
OPEC crude sold	28.0	26.6	28.1	28.5	Assumes OPEC produces near 29 mmb/d in 3Q and 4Q
Implied stock change	2.0	(0.6)	1.1	0.7	Too much ?
	Shock!	Countershock!			This is what is needed to replenish inventories!

Source: IEA and Deutsche Banc Alex. Brown estimates 10-Oct-00

# A recent warm winter trend?

...or are we due for a “countershock” reversion to the mean?



# Non-OPEC production grows strongly in 2000 ...but political risk is rising in 2000-2005

## Key Non-OPEC Oil Producers (mmb/d)

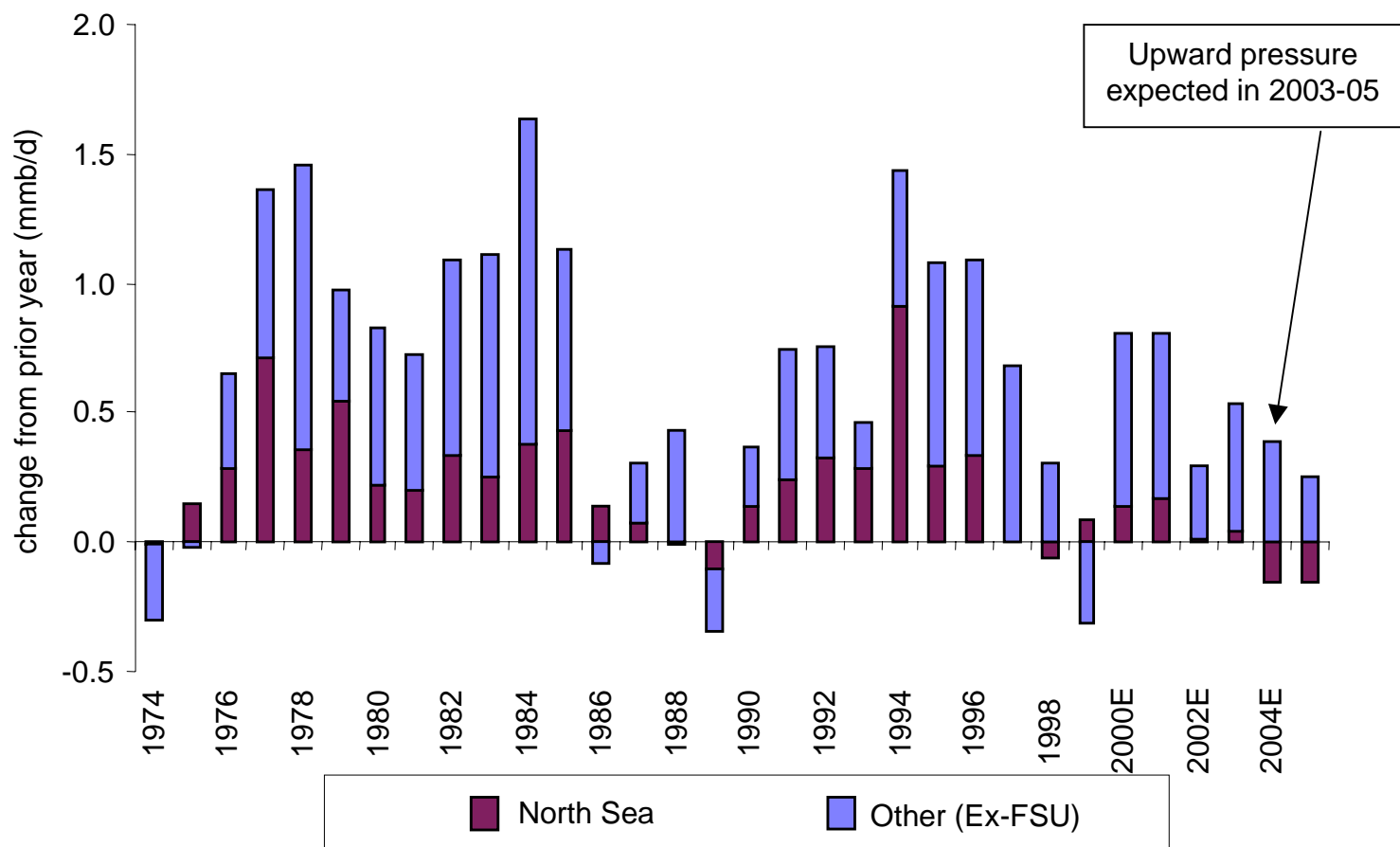
Last Five Years		Next Five Years		Year 2001 over 2000	
Country	Change 95>00E	Country	Change 00>05E	Country	Change 00E>01E
Brazil	0.51	Angola	0.75	Mexico	0.18
Mexico	0.44	Mexico	0.58	Norw ay	0.13
Norw ay	0.43	Brazil	0.46	Brazil	0.12
Russia	0.30	Russia	0.45	Russia	0.10
Canada	0.28	Azerbaijan	0.32	United States	0.09
China	0.24	Kazakstan	0.28	Sudan	0.07
Congo	0.13	Canada	0.16	Canada	0.07
Colombia	0.11	Sudan	0.14	Angola	0.05
Angola	0.11	Yemen	0.12	Azerbaijan	0.05
Yemen	0.07	Chad	0.11	Yemen	0.02
Argentina	0.06	China	-0.03	Kazakstan	0.02
Oman	0.03	Gabon	-0.07	Argentina	-0.02
United Kingdom	0.01	Malayasia	-0.08	Congo	-0.02
India	-0.04	United Kingdom	-0.09	China	-0.03
Malaysia	-0.08	Australia	-0.15	Colombia	-0.03
Egypt	-0.13	United States	-0.17	India	-0.03
United States	-0.44	Egypt	-0.20	Egypt	-0.04
<b>Total Non-OPEC</b>	<b>3.32</b>	<b>Total Non-OPEC</b>	<b>3.08</b>	<b>Total Non-OPEC</b>	<b>0.87</b>
<b>Total ex-FSU</b>	<b>2.58</b>	<b>Total ex-FSU</b>	<b>1.99</b>	<b>Total ex-FSU</b>	<b>0.69</b>

Source: Deutsche Banc Alex. Brown estimates 10-Oct-00



# Non-OPEC supply (ex-FSU)

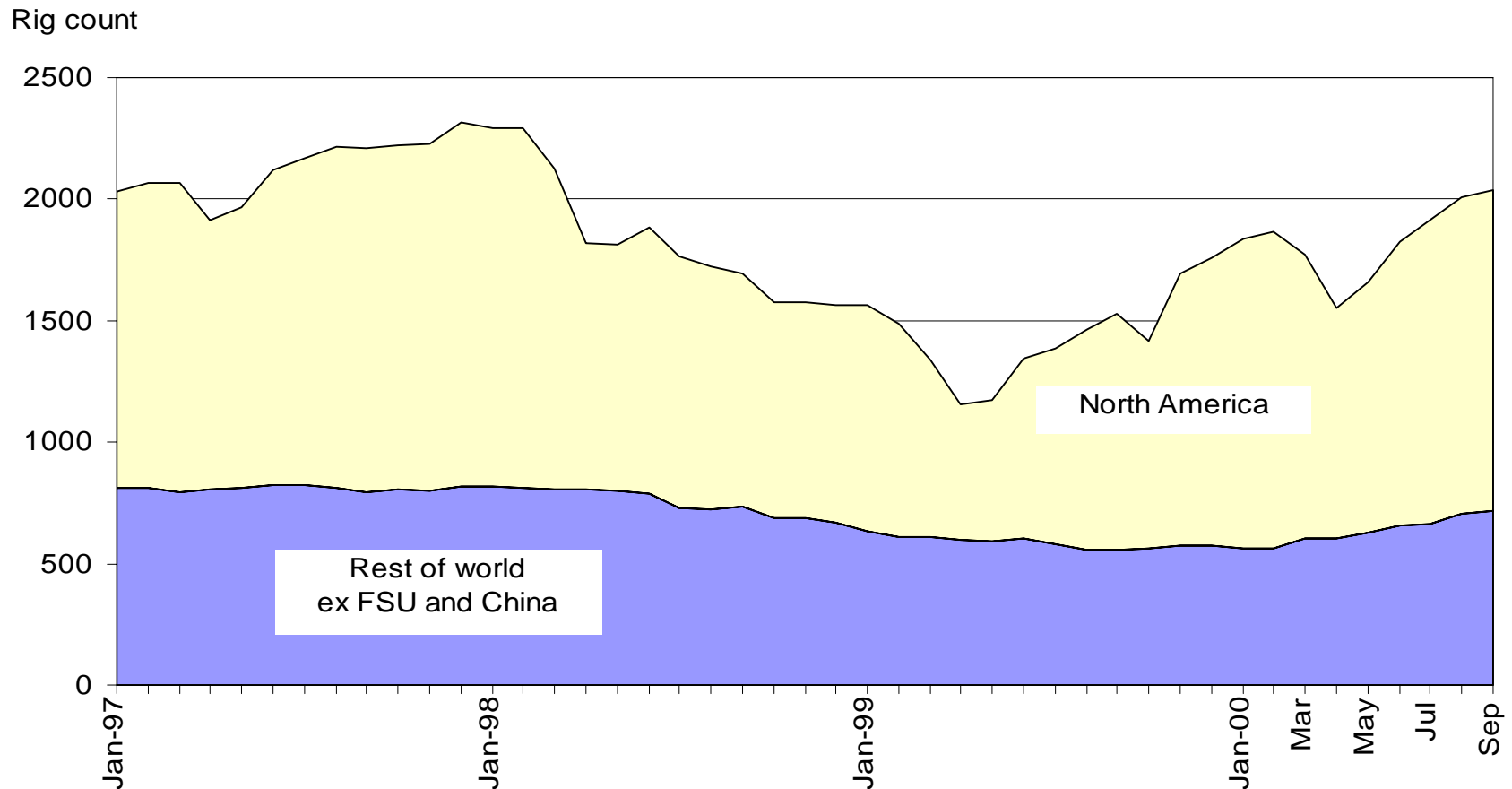
...tends to respond to price changes with a 1-2 year time lag



Source: IEA; Deutsche Banc Alex. Brown estimates



# Rebound in drilling points to future rise in supply ...active drilling rigs 1997-2000

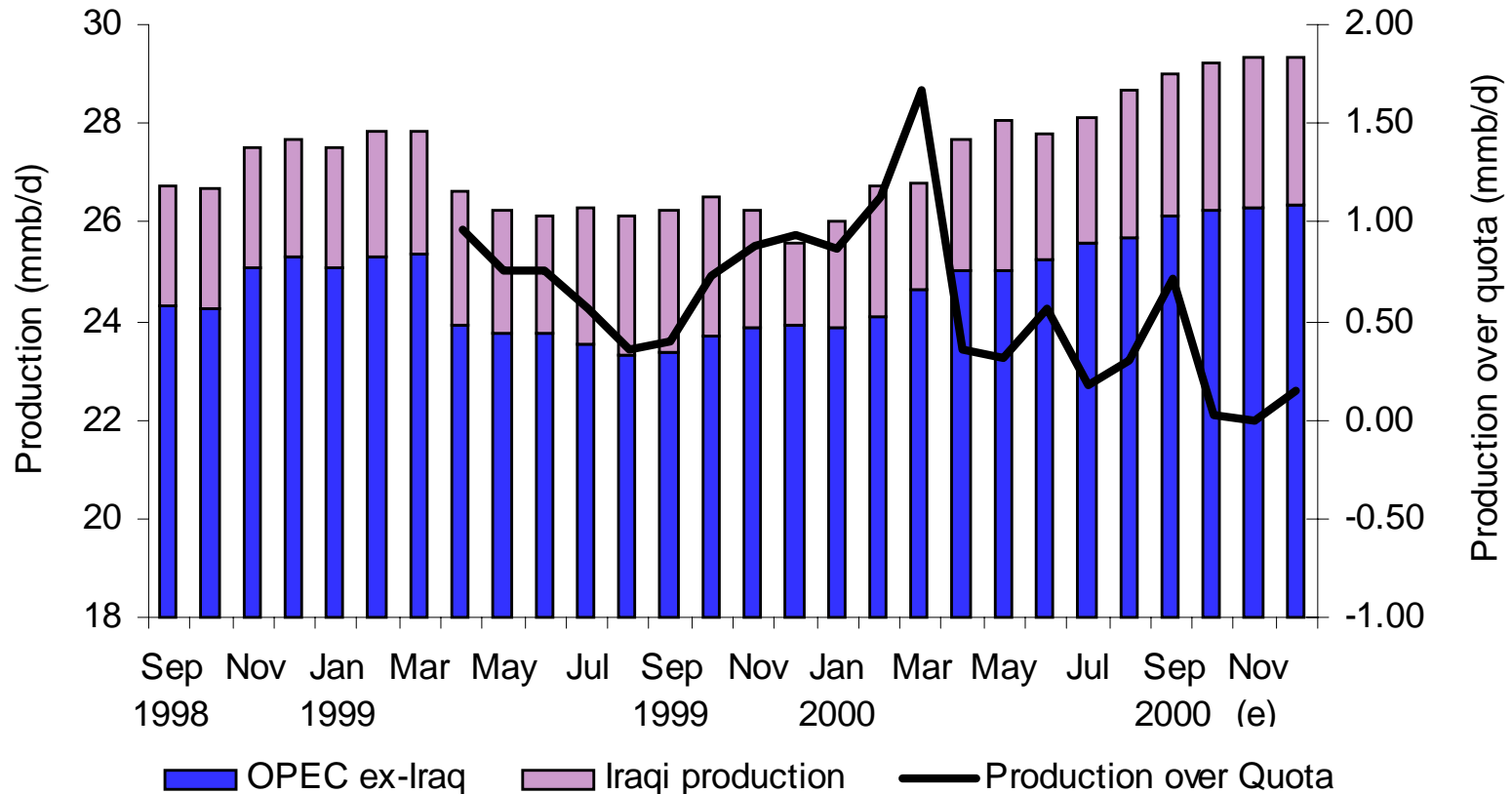


Source: Baker Hughes



# OPEC production rising since end-1999

## ...quotas may have to be lowered in 1H 2001



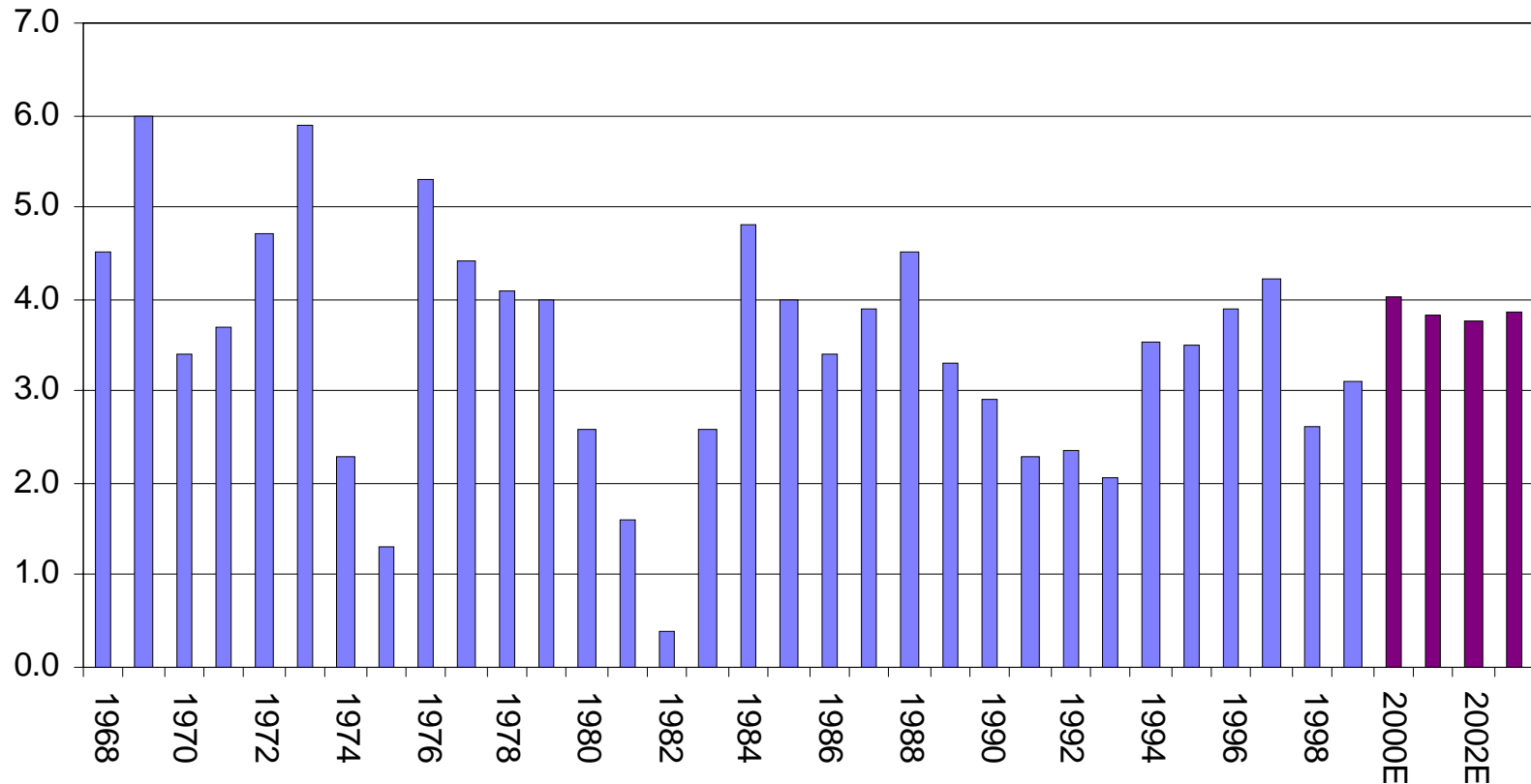
Source: IEA; Deutsche Banc Alex. Brown estimates



# The economic cycle drives expectations

## ...the world economy is recovering

Real GDP (% change  
from prior year)

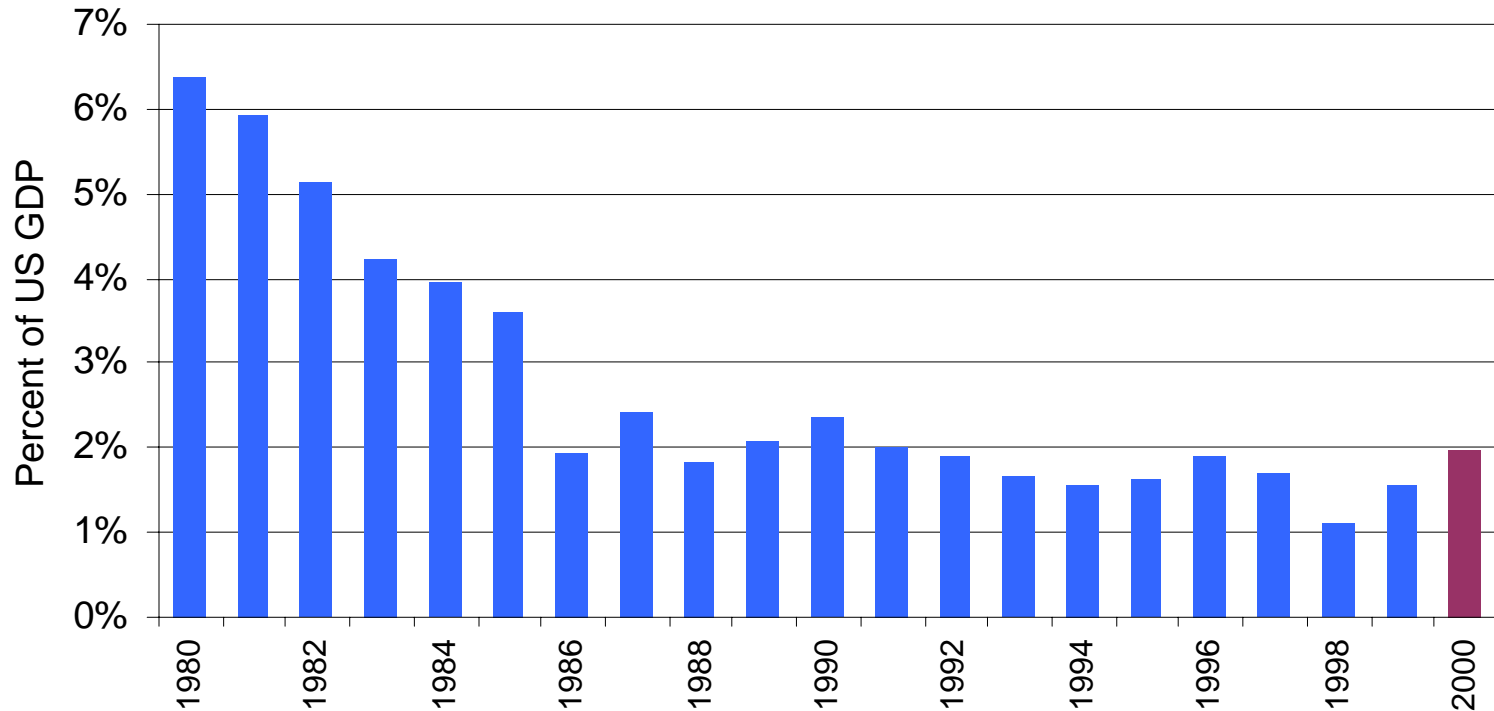


Source : IMF, Deutsche Banc Alex. Brown estimates



# Value of oil as a percent of GDP

...oil's importance to the U.S. economy has declined



Source: US EIA/DOE and Deutsche Banc Alex. Brown estimates





# Evolution of world economic growth projections

...IMF forecasts for 1999-2000 are moving up

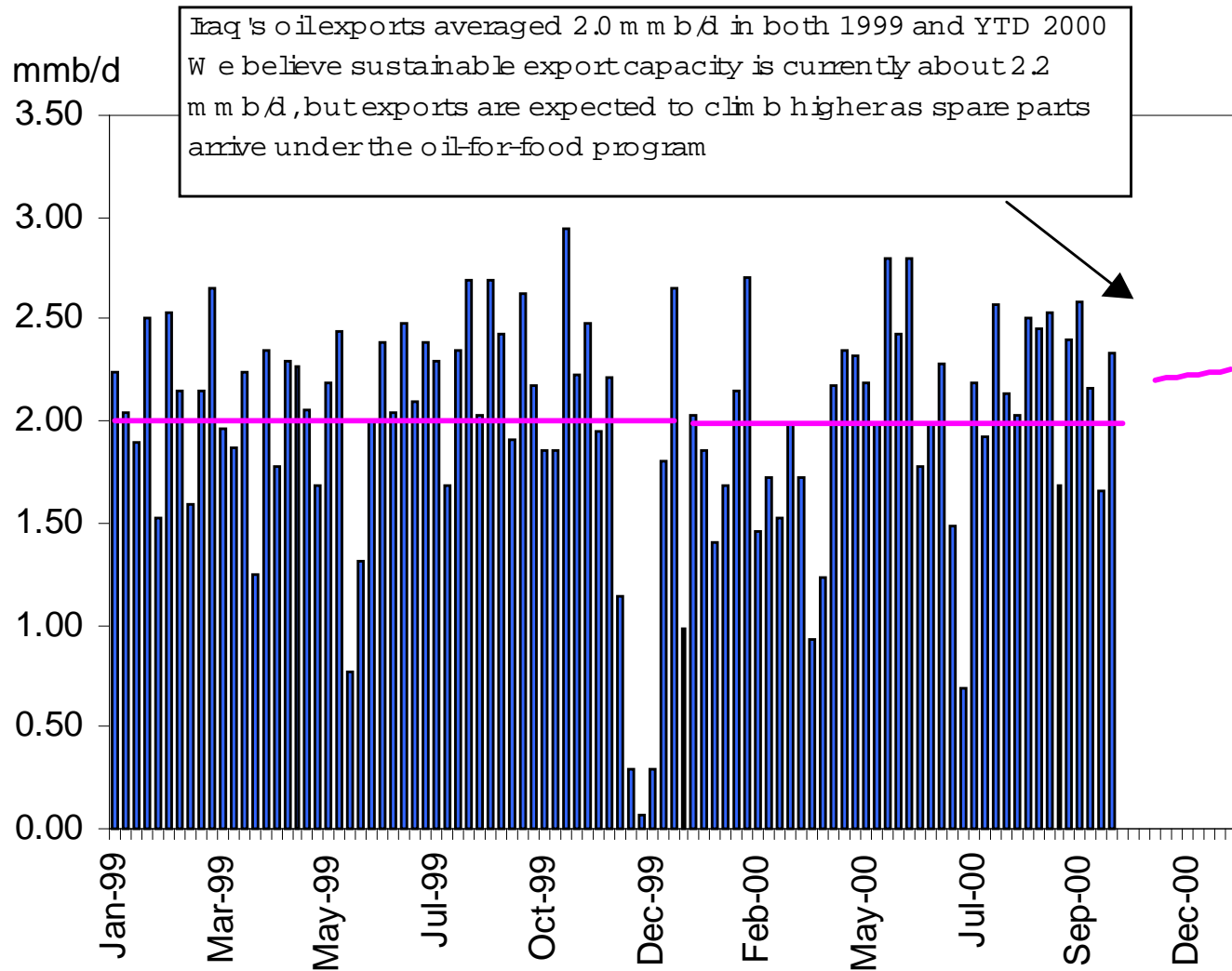
	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000E</u>	<u>2001E</u>
October 1997	4.2	4.3	4.4	4.6	
December 1997	4.1	3.5	4.1	4.4	
May 1998	4.1	3.1	3.7	3.8	4.5
October 1998	4.1	2.0	2.5	3.7	4.1
December 1998	4.2	2.2	2.2	3.5	4.1
May 1999		2.5	2.3	3.4	4.1
October 1999			3.0	3.5	4.0
April 2000			3.3	4.2	3.9
October 2000				4.7	4.2

Source: International Monetary Fund

The IMF expects this to fall to 3.8 if high oil prices persist

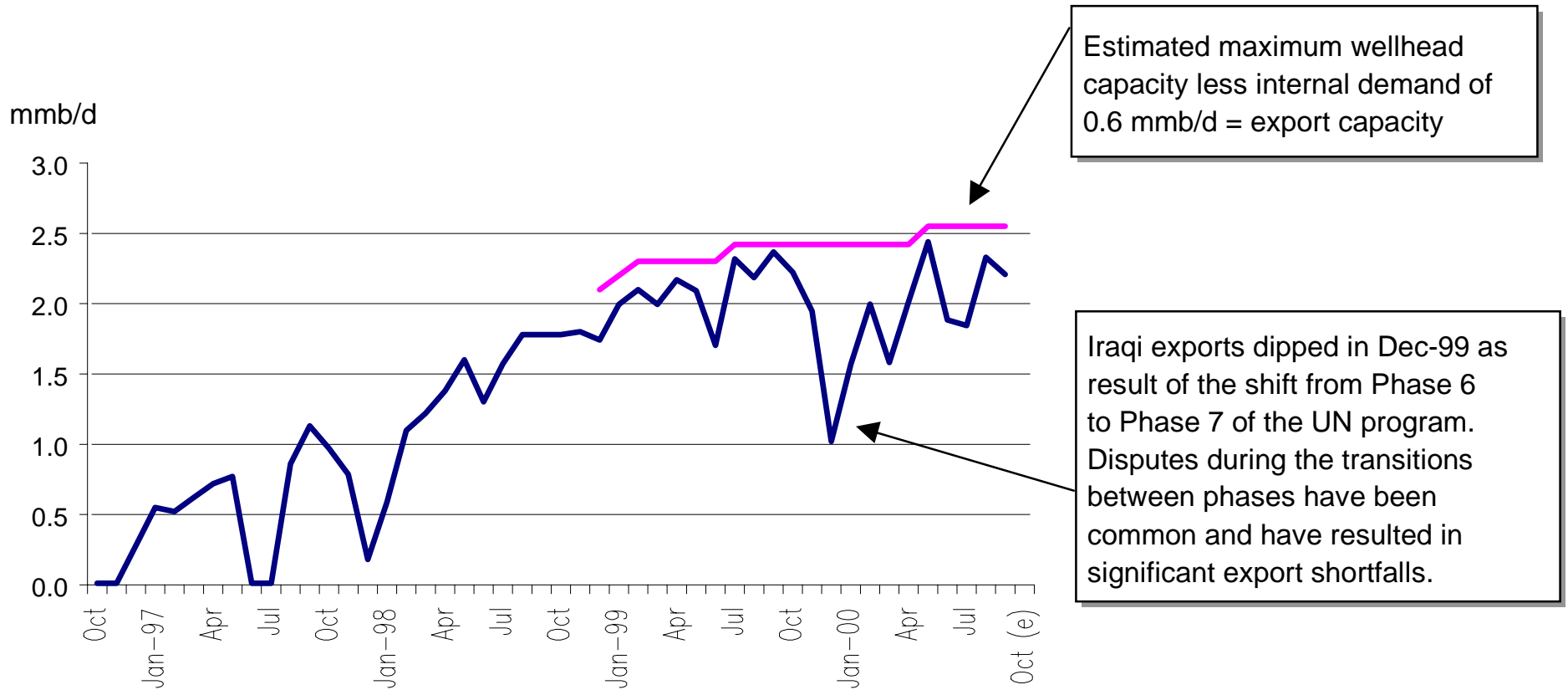


# Iraq's weekly oil exports in 1999-2000 (mmb/d)



Source: UN Office of the Iraq Programme; Deutsche Banc Alex. Brown

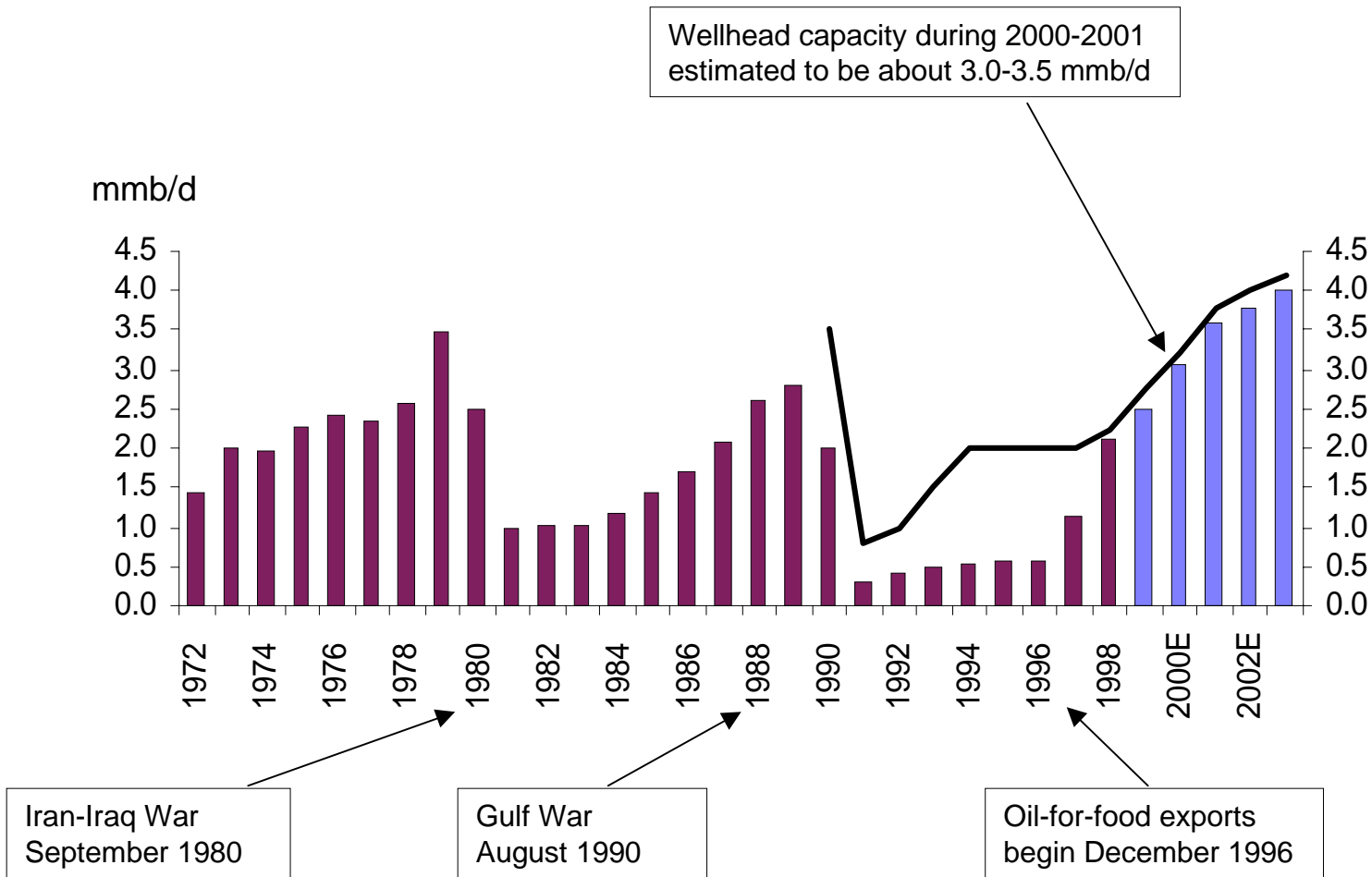
# Iraq's monthly exports have been volatile



Source: IEA and Deutsche Banc Alex. Brown estimates



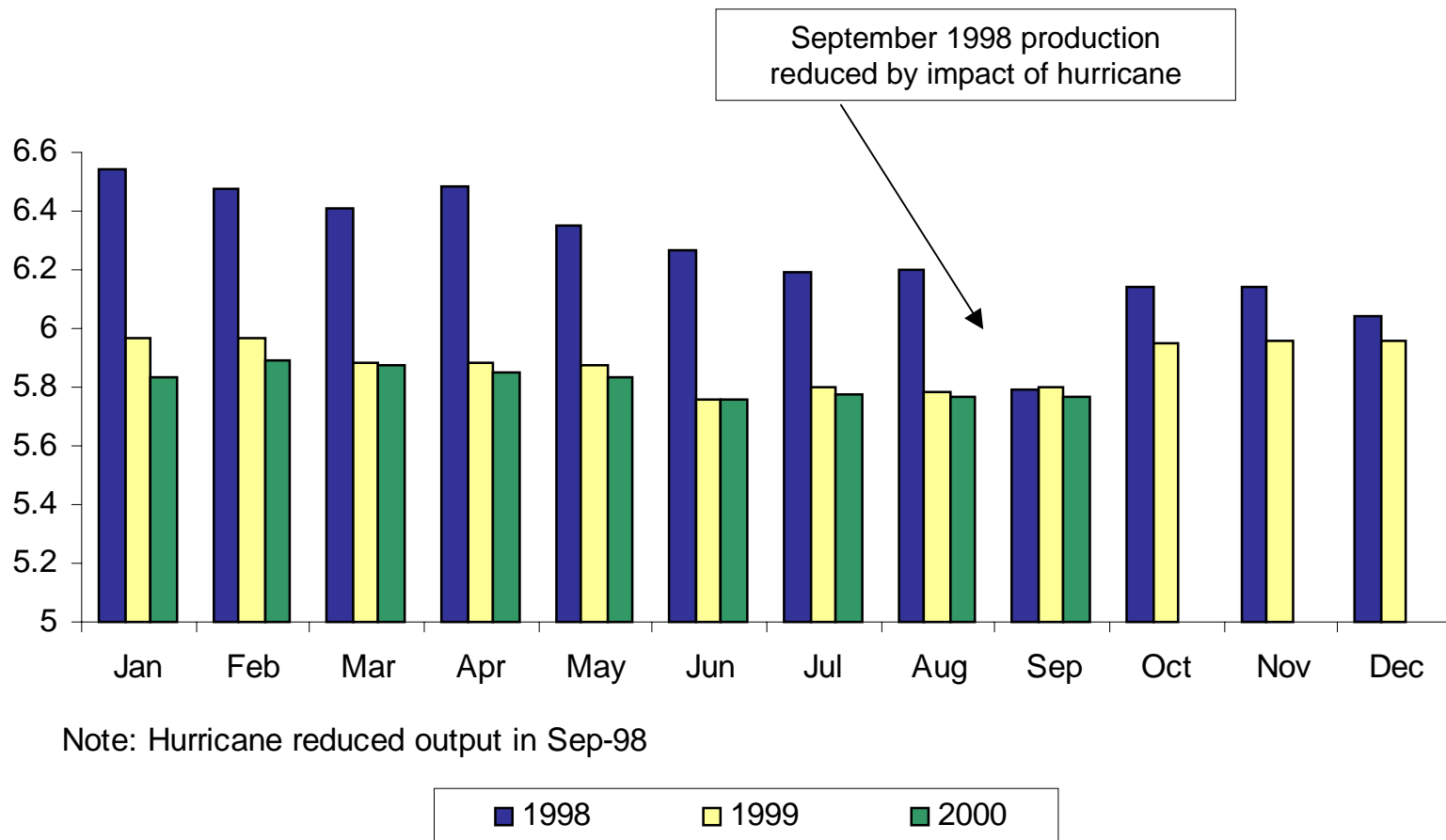
# Iraq's production seen moving above pre-war levels ...if investment flows are allowed by the UN



Source: US DOE and EIA; Deutsche Banc Alex. Brown



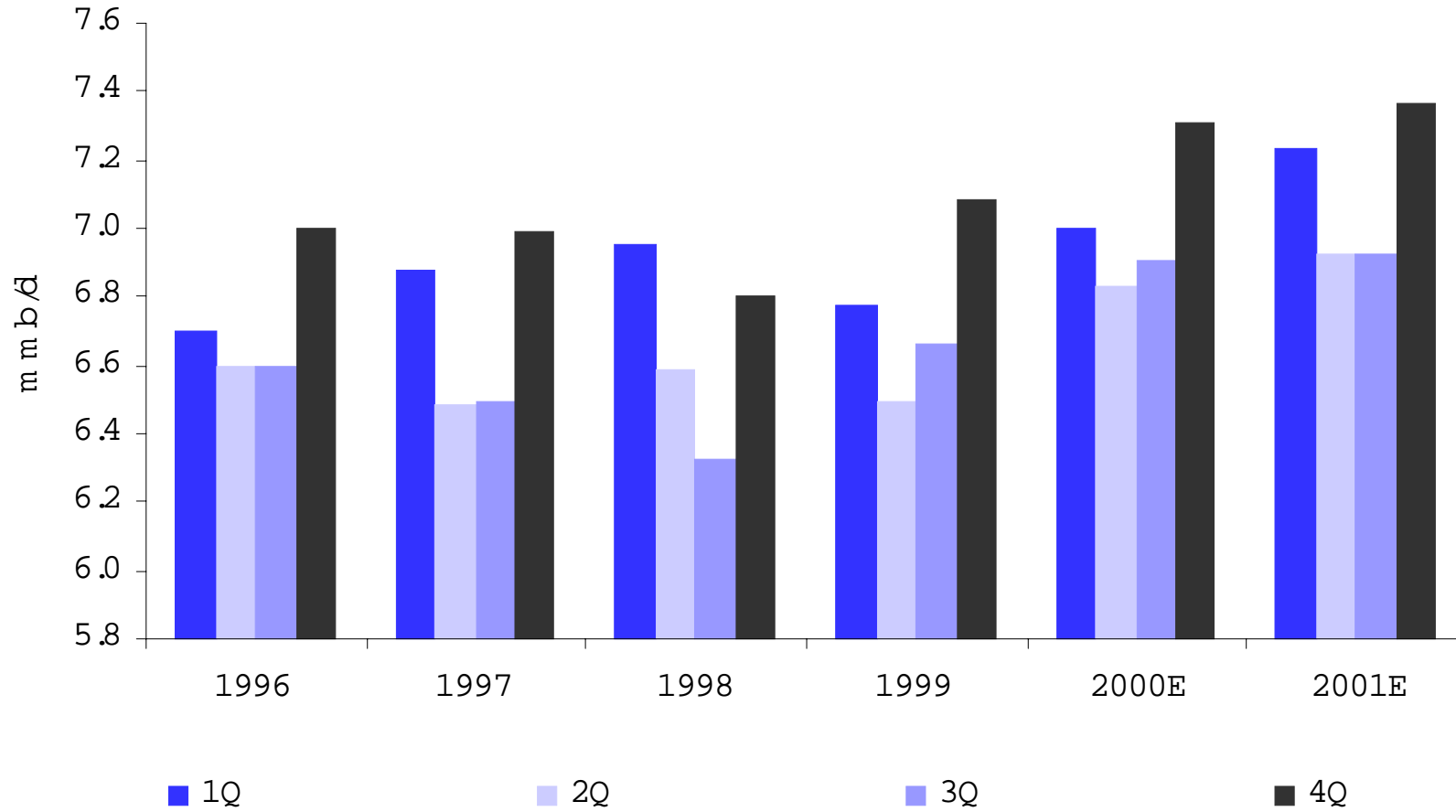
# U.S. crude oil production dropped significantly in 1998 ...but DOE reports steadier output in 1999 ...followed by further weakness in 2000



Source: DOE/EIA and Deutsche Banc Alex. Brown; 9/27/00

# North Sea oil production up in 4Q 1999 and 1Q 2000

## ...but flattening after year end 2000

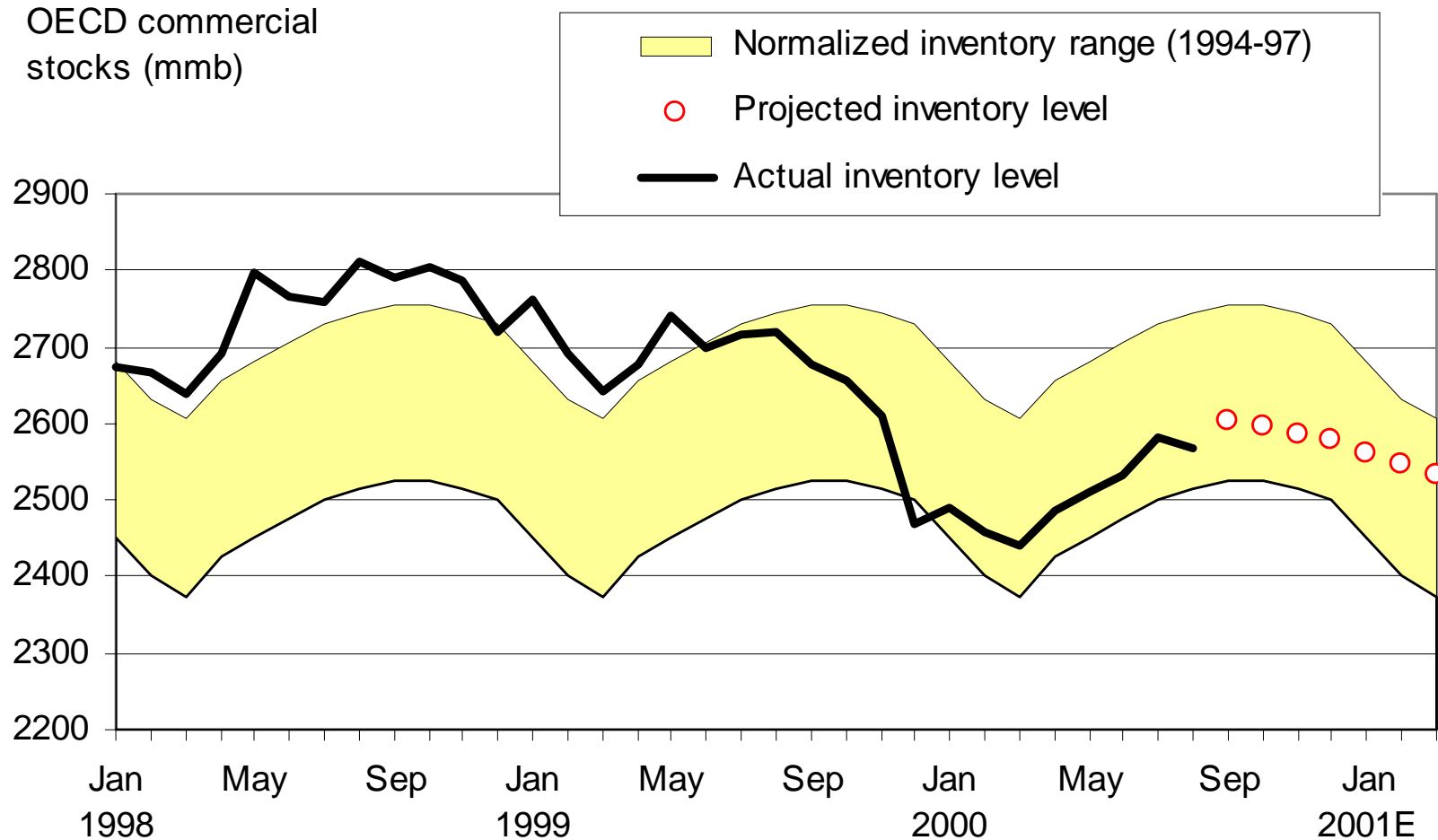


Source: IEA historical data; Wood Mackenzie; Deutsche Banc Alex. Brown estimates



# OECD inventories remain key to next move in prices

...the base case forecast pushes stocks back into the normal range

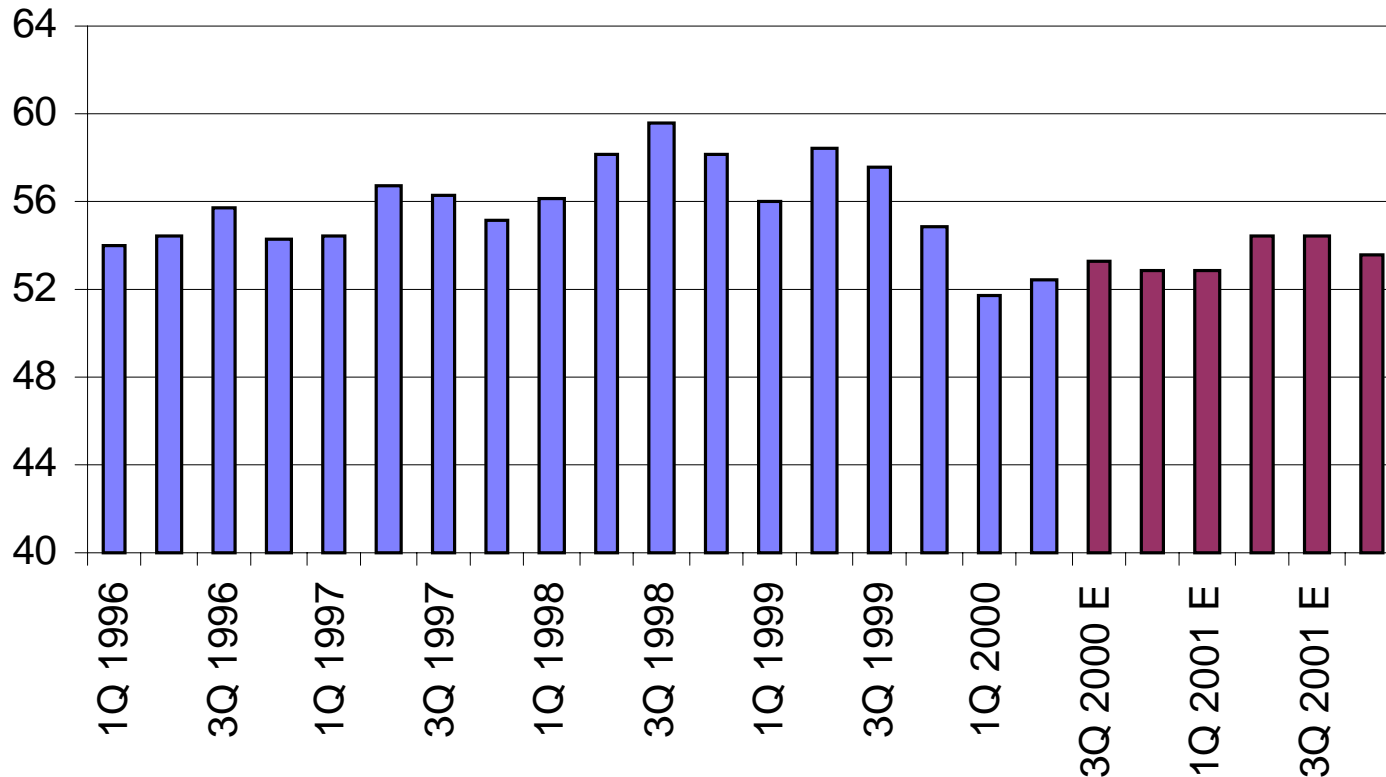


Source: IEA; Deutsche Banc Alex. Brown estimates



# Days supply of OECD industry inventories

## ...forecast levels headed below 1996 lows



Note: Company-controlled stocks at start of period

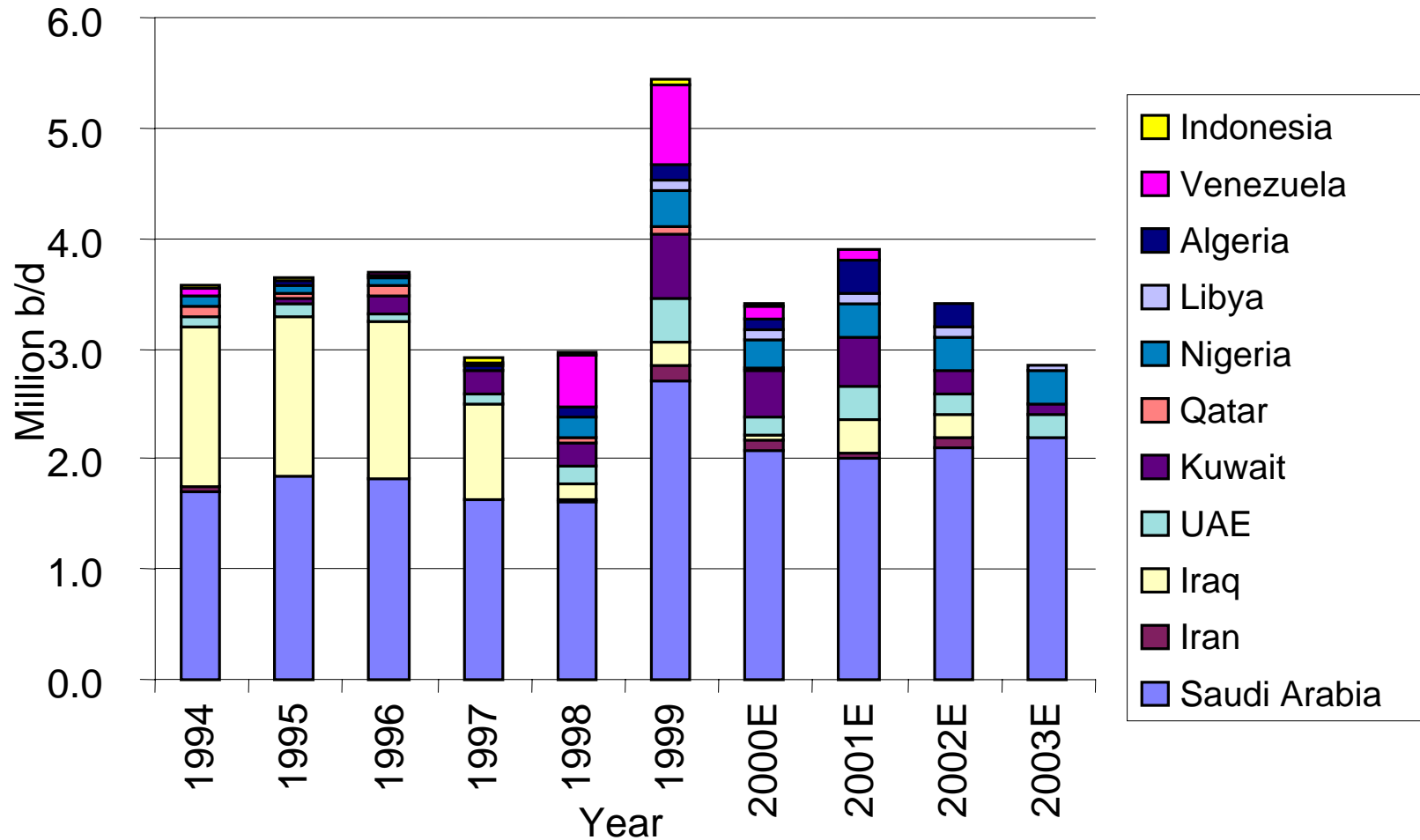
Source: IEA and Deutsche Banc Alex. Brown estimates





# OPEC excess capacity

## ...a striking dependence on Saudi Arabia

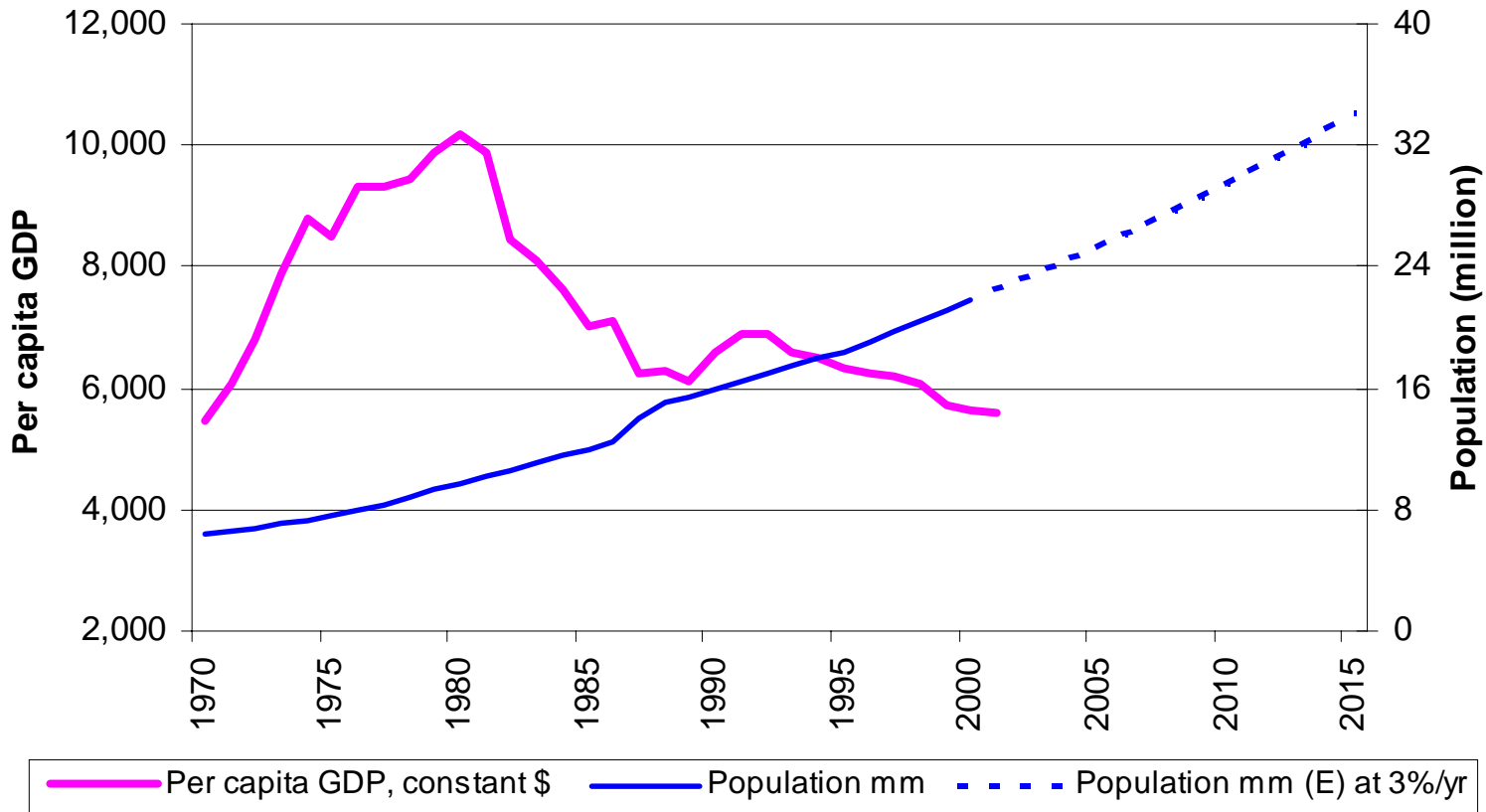


Source: Deutsche Banc Alex. Brown estimates



# Saudi population and per capita GDP

...economic reform needed to fund population boom



Source: IMF and Deutsche Banc Alex. Brown estimates



# **\$22-\$28 OPEC price band**

...imperfect structure casts doubt

## **Recipe for success**

- **Floor price is competitive**
- **Cartel has 80-90% market**
- **Punishment system**
- **Buffer stocks**
- **Votes linked to production**
- **Low national dependence**

## **Versus OPEC's position**

- **Non-OPEC in profit at \$18-\$20**
- **OPEC market share just 37%**
- **No formal system (wars, cheating!)**
- **Stocks held by *non-OPEC***
- **1 country = 1 vote**
- **Oil typically 80% of export revenues**

***Expect \$22-\$28 volatility...and ultimately the failure of band***

Source: Colorado School of Mines; Deutsche Banc Alex. Brown



# Where production growth comes from in OPEC

## ...Saudi this year, Iraq in the future?

### OPEC Members (mmb/d)

Last Five Years		Next Five Years		Year 2001 over 2000	
Country	Change 95>00E	Country	Change 00>05E	Country	Change 00E>01E
Iraq	2.17	Iraq	1.78	Iraq	0.28
Qatar	0.44	Venezuela	0.63	Kuwait	0.13
Saudi Arabia	0.29	Nigeria	0.51	Venezuela	0.11
UAE	0.16	Algeria	0.51	Algeria	0.10
Venezuela	0.15	Iran	0.48	Nigeria	0.09
Algeria	0.12	Kuwait	0.46	Iran	0.08
Nigeria	0.11	Libya	0.24	Qatar	0.07
Kuwait	0.05	Saudi Arabia	0.19	Libya	0.03
Libya	0.03	Qatar	0.17	UAE	0.02
Iran	-0.03	UAE	0.14	Indonesia	-0.01
Indonesia	-0.08	Indonesia	-0.06	Saudi Arabia	-0.35
<b>Total OPEC</b>	<b>3.40</b>	<b>Total OPEC</b>	<b>5.03</b>	<b>Total OPEC</b>	<b>0.57</b>

**Note:** Non-OPEC and OPEC production growth figures include crude oil, natural gas liquids, and other fuel liquids output

**Source:** Deutsche Banc Alex. Brown estimates 10-Oct-00

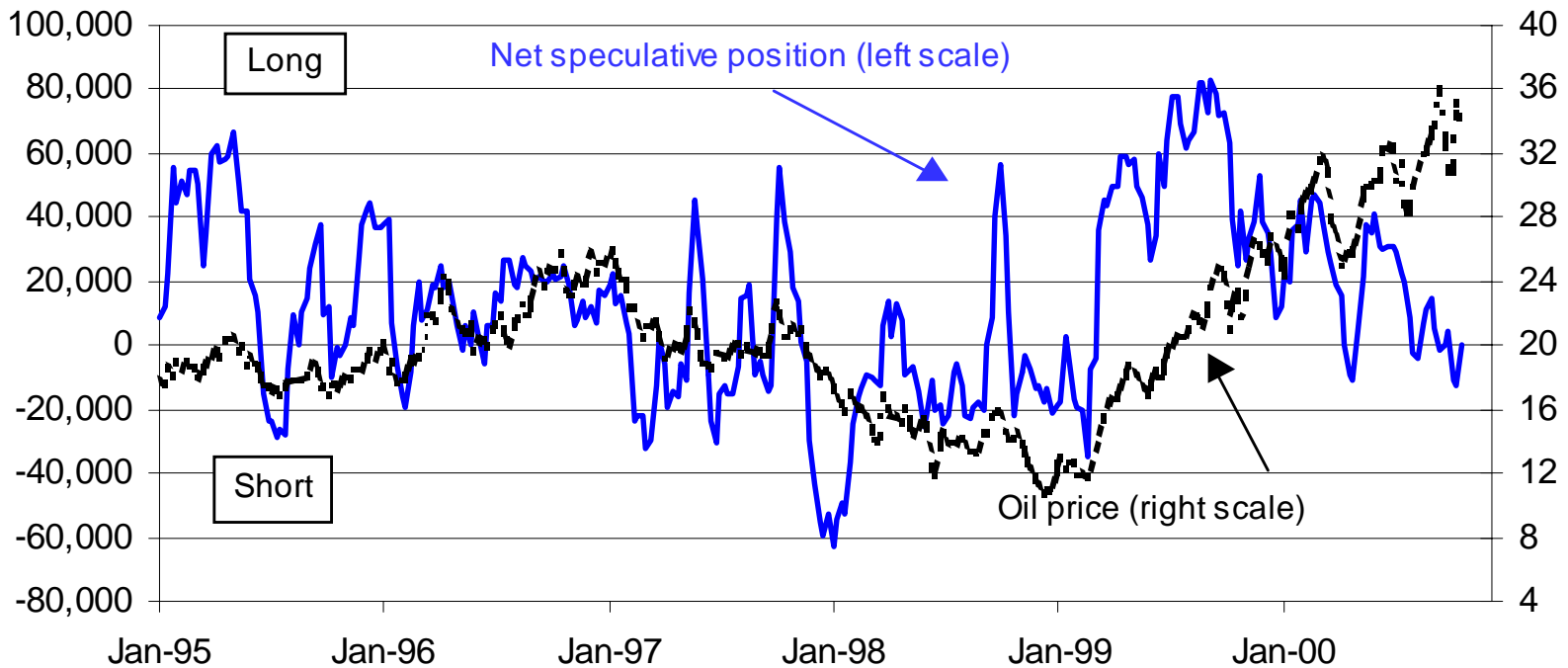


# Speculative position of oil traders

...has now fallen well below prior highs

Net non-commercial  
oil contracts

WTI \$/bbl



Source: NYMEX; US CFTC

— Net Position

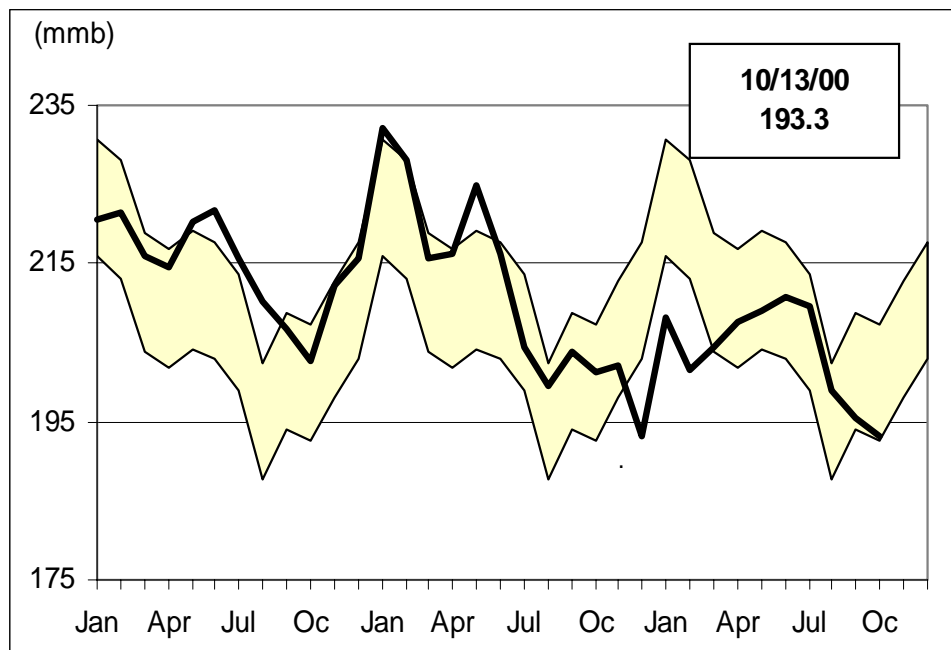
- - - WTI Price



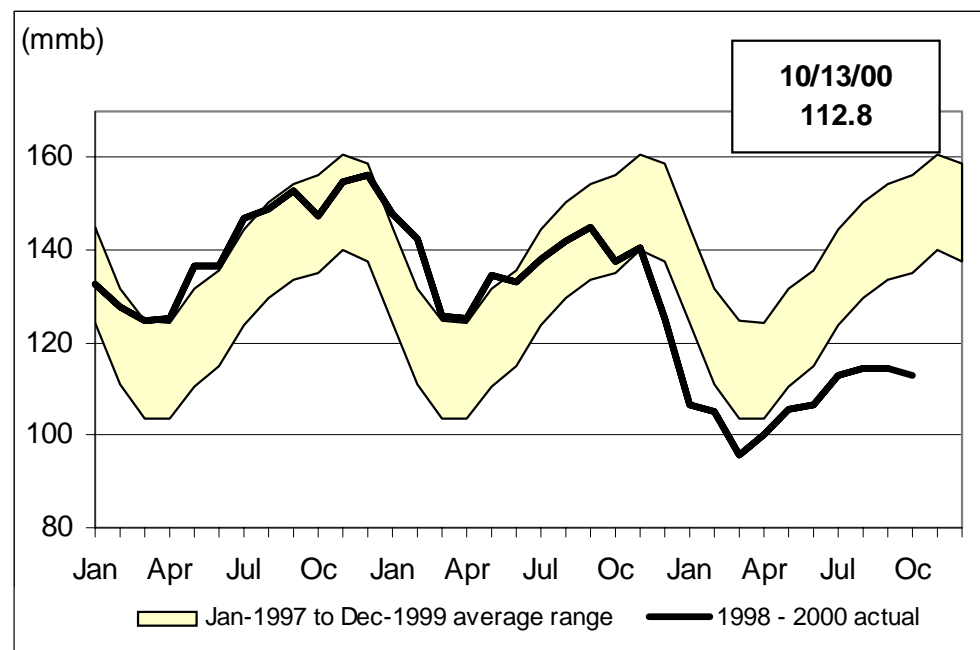
# U.S. inventories look much lower than OECD data

...gasoline is ok but crude and distillate still below normal

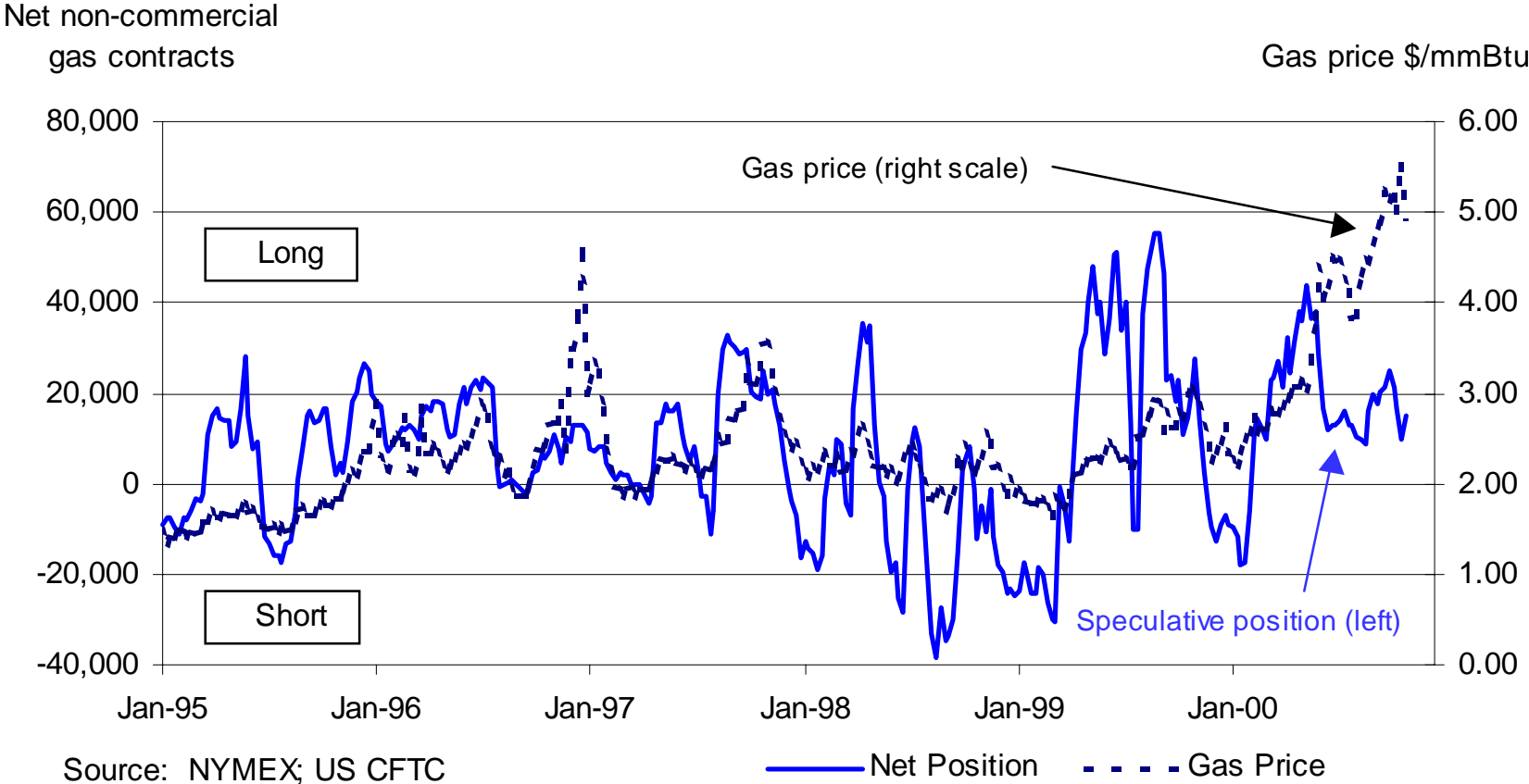
## U.S. Gasoline Inventories



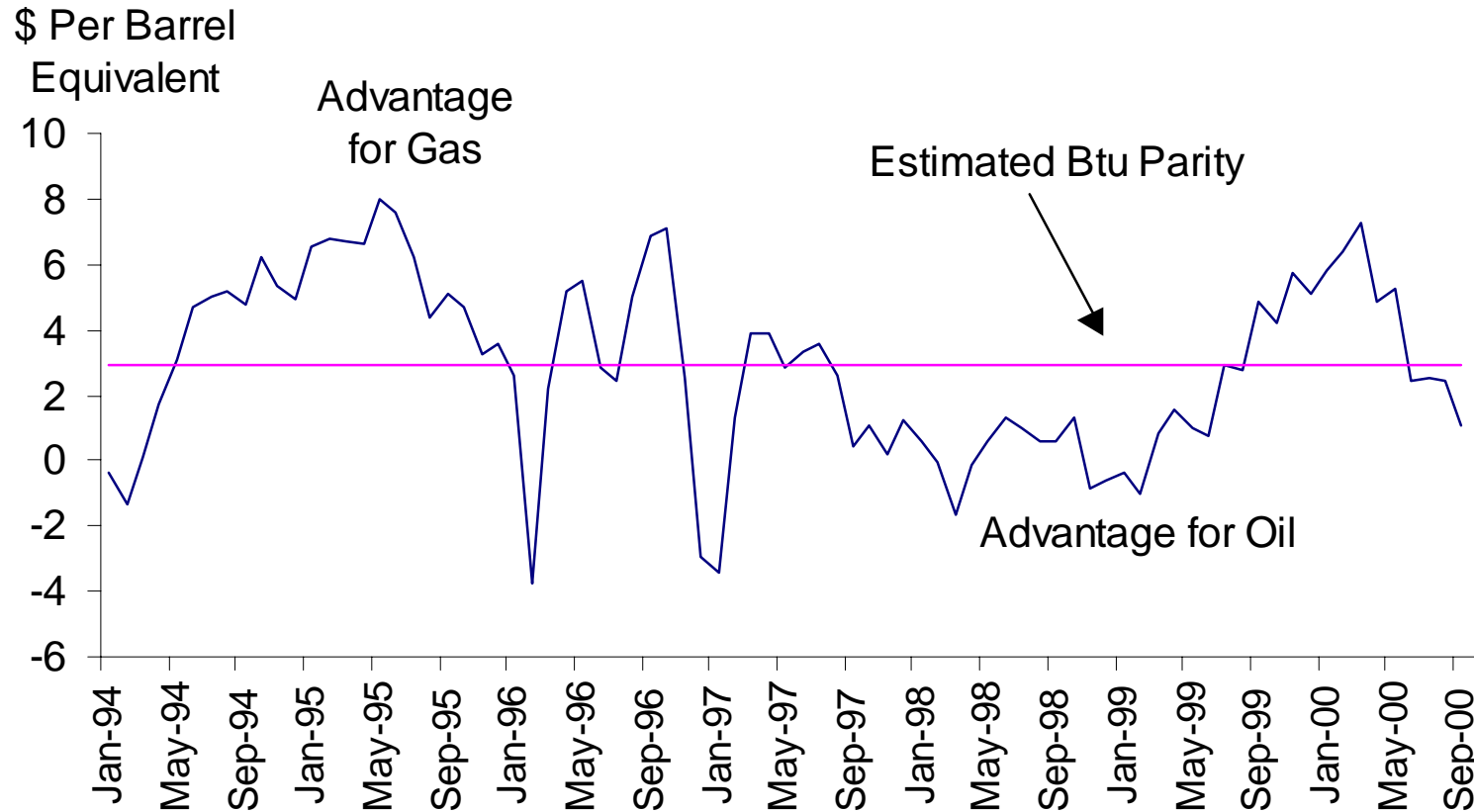
## U.S. Distillate Inventories



# Speculative position of gas traders



# Natural gas competes with oil on a Btu basis



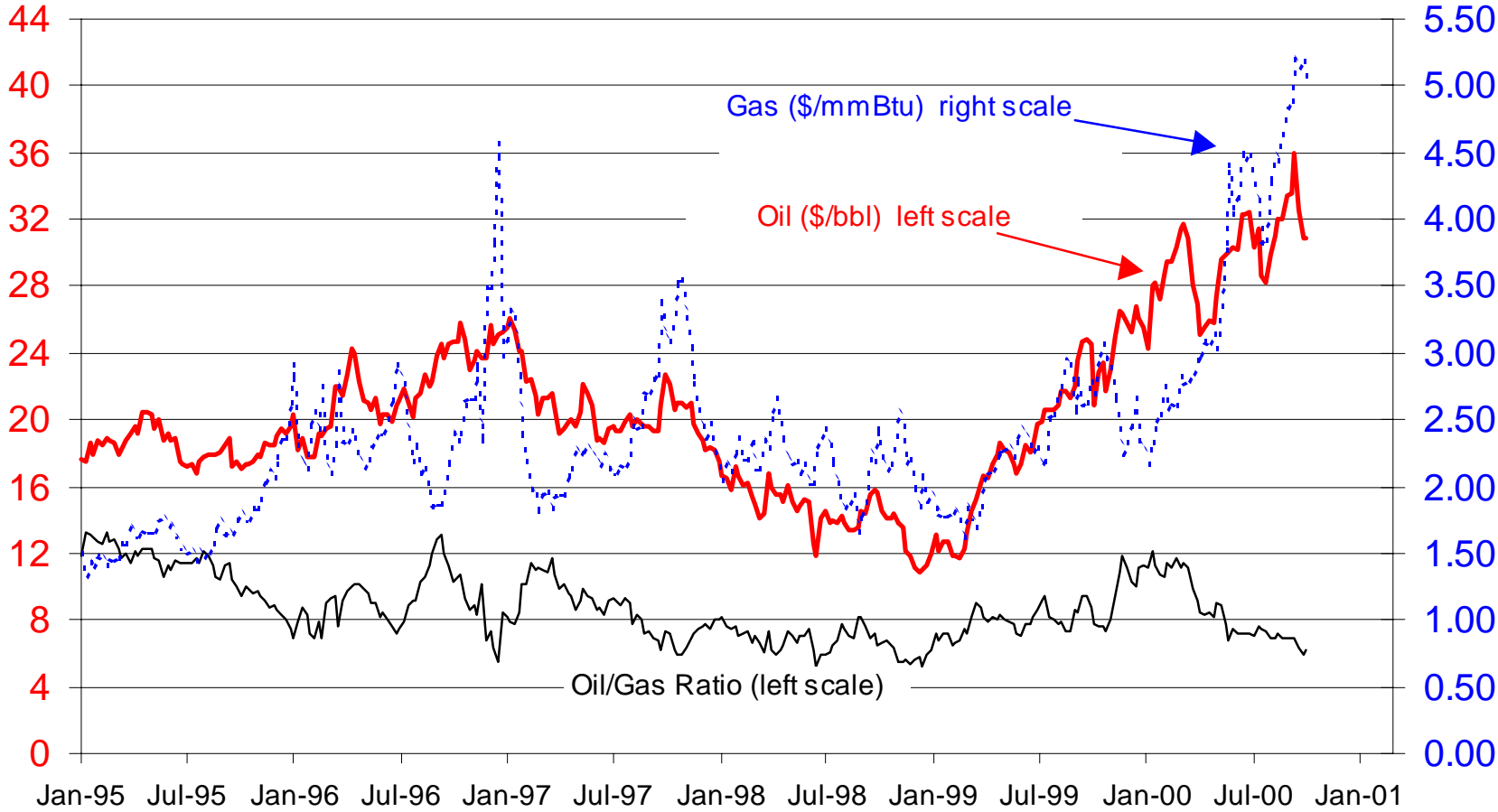
Note: Gulf Coast 1% sulphur resid (minus) gas spot price x 6

Source: Oil Market Intelligence; Natural Gas Week;  
and Deutsche Banc Alex. Brown estimates





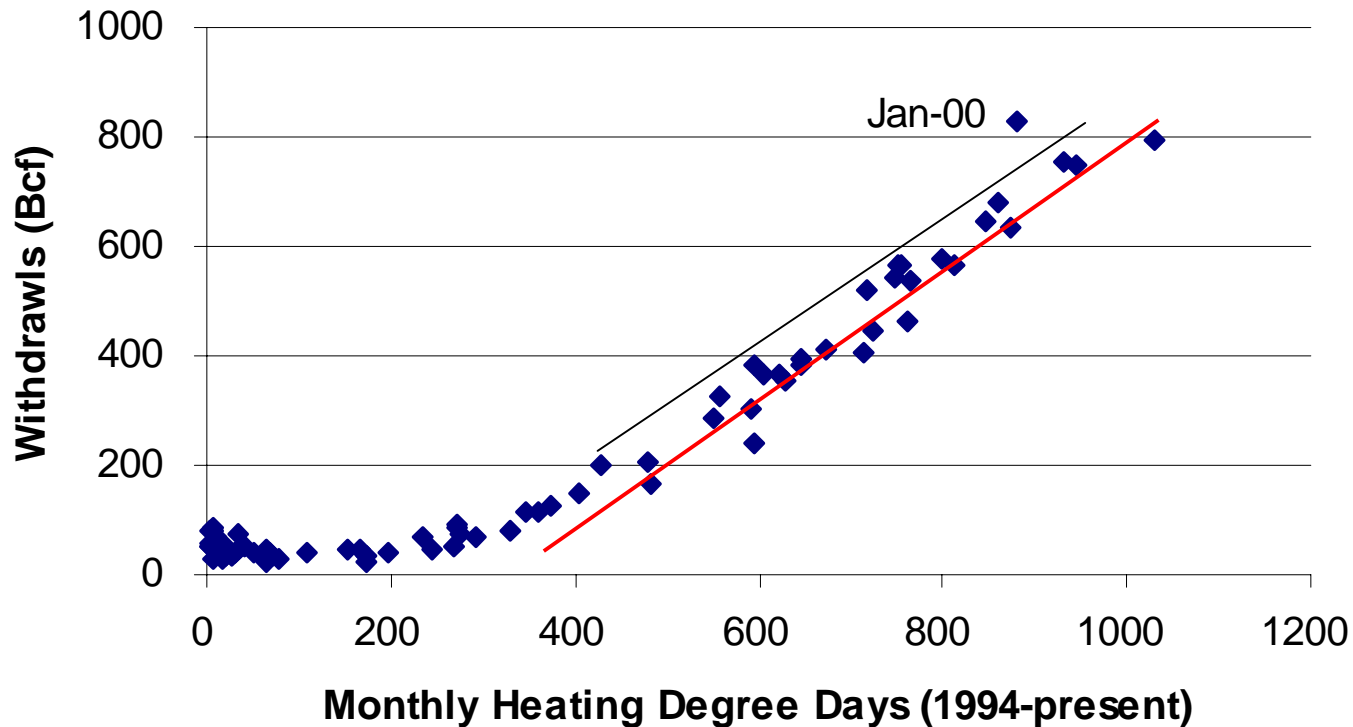
# WTI and natural gas prices



Source: NYMEX, Bloomberg

# Gas storage withdrawals versus heating degree days

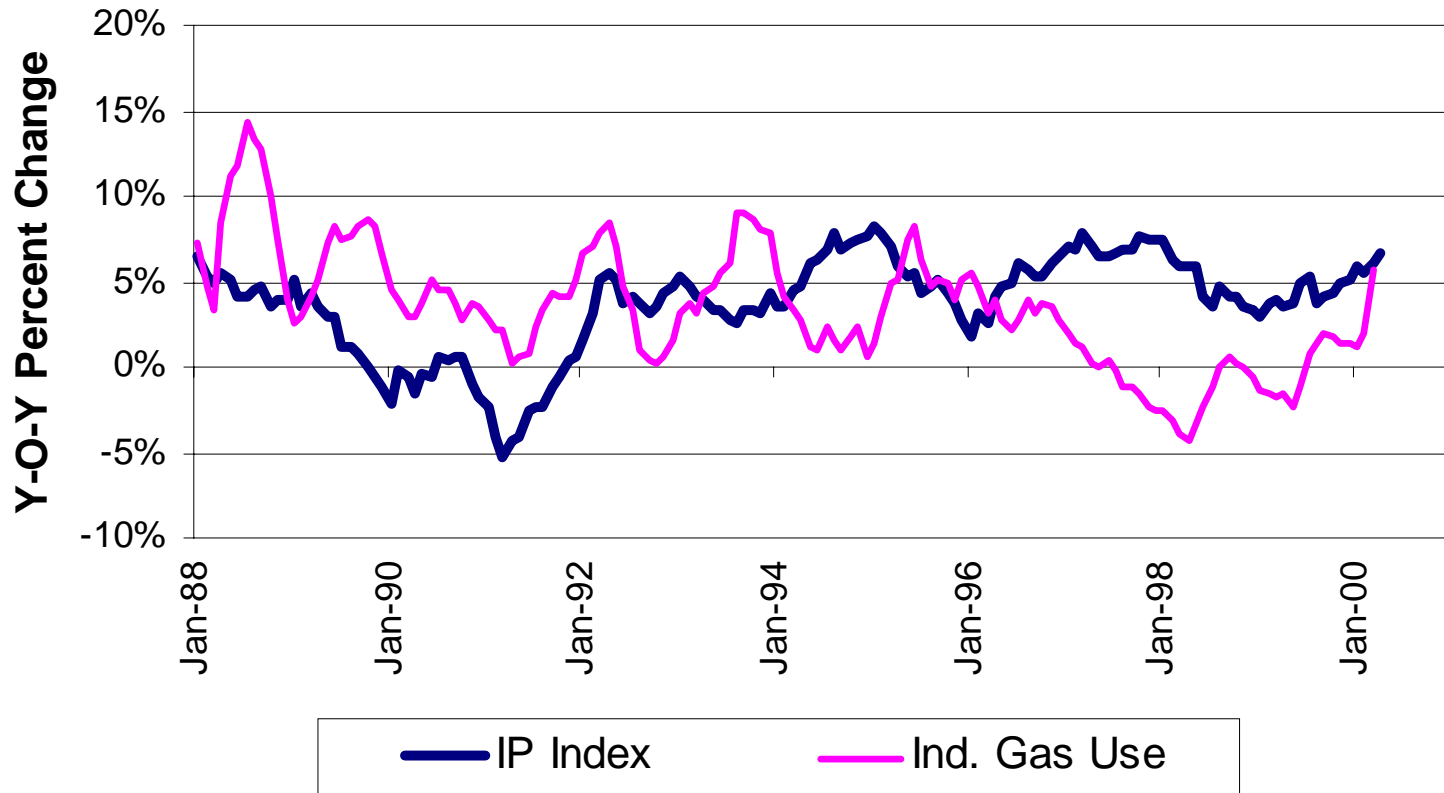
...a typical mid-winter month requires 700 Bcf from storage



Source: U.S. DOE/EIA; NCDC; Deutsche Banc Alex. Brown

# Manufacturing index versus industrial gas use

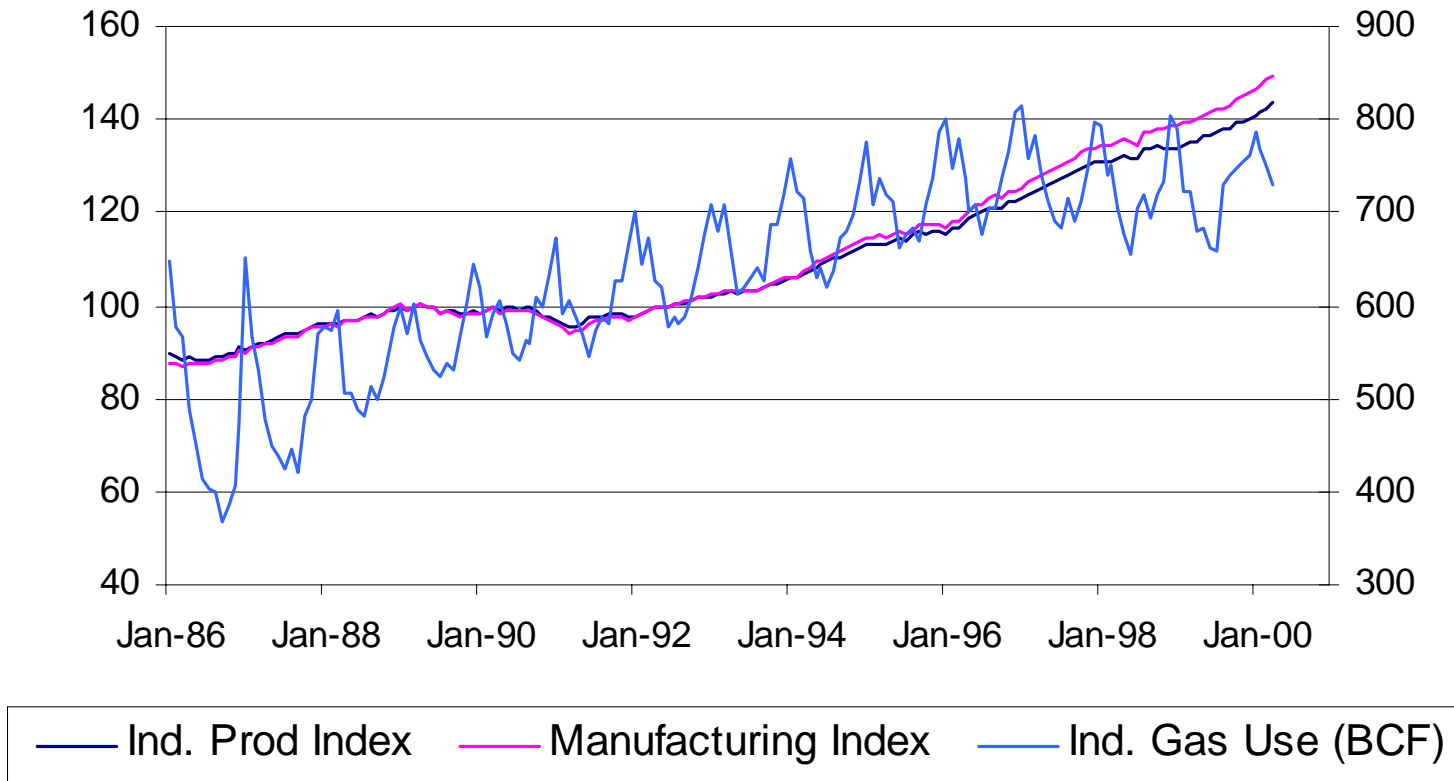
...industrial gas demand catching up with manufacturing index



Source: U.S. Federal Reserve; U.S. DOE; Deutsche Banc Alex. Brown calculations

# Natural gas consumption versus industrial production

## ...breaking thru the 800 Bcf barrier in early 2001?

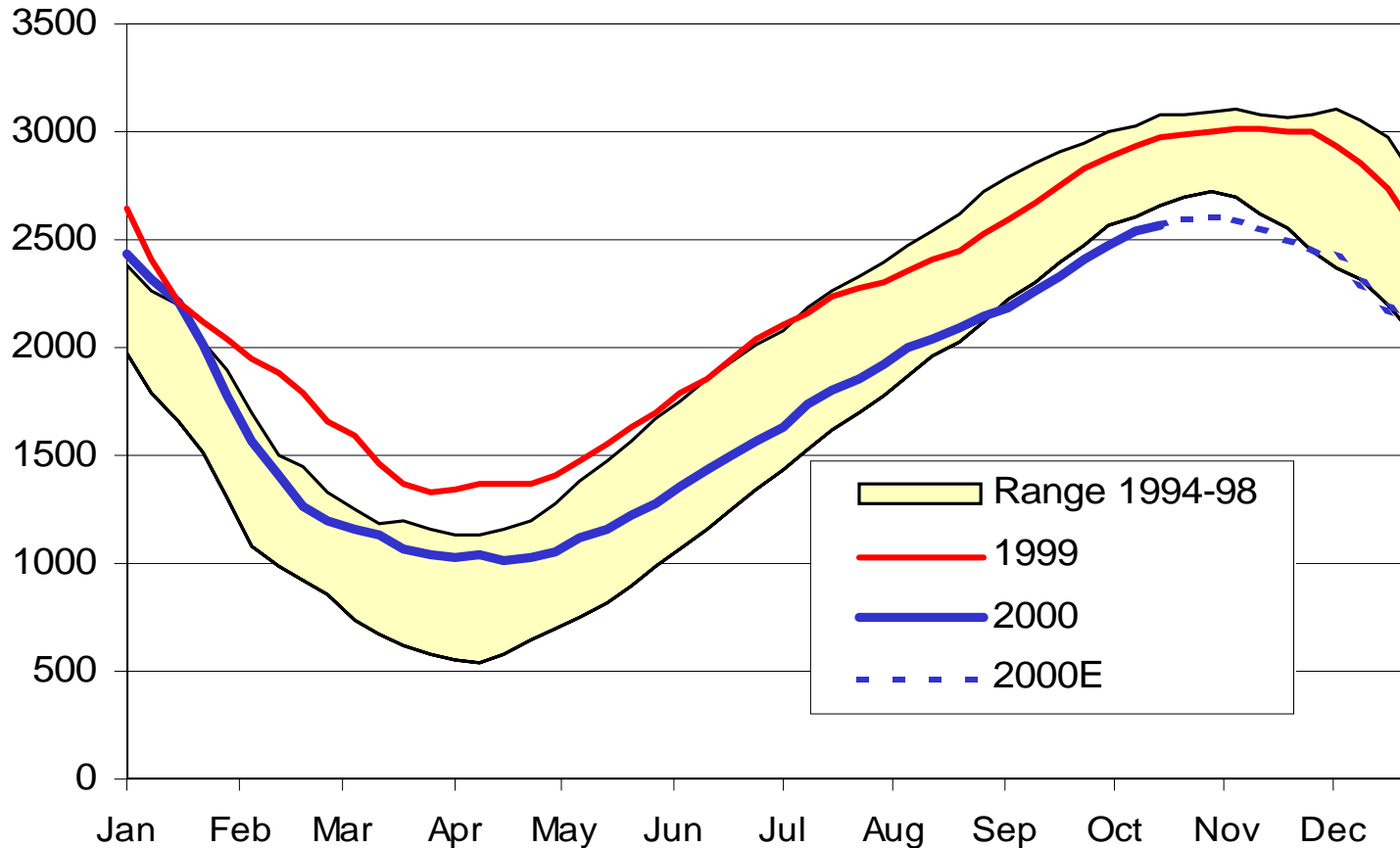


Source: U.S. Federal Reserve; U.S. DOE; Deutsche Banc Alex. Brown calculations



# Total U.S. natural gas storage

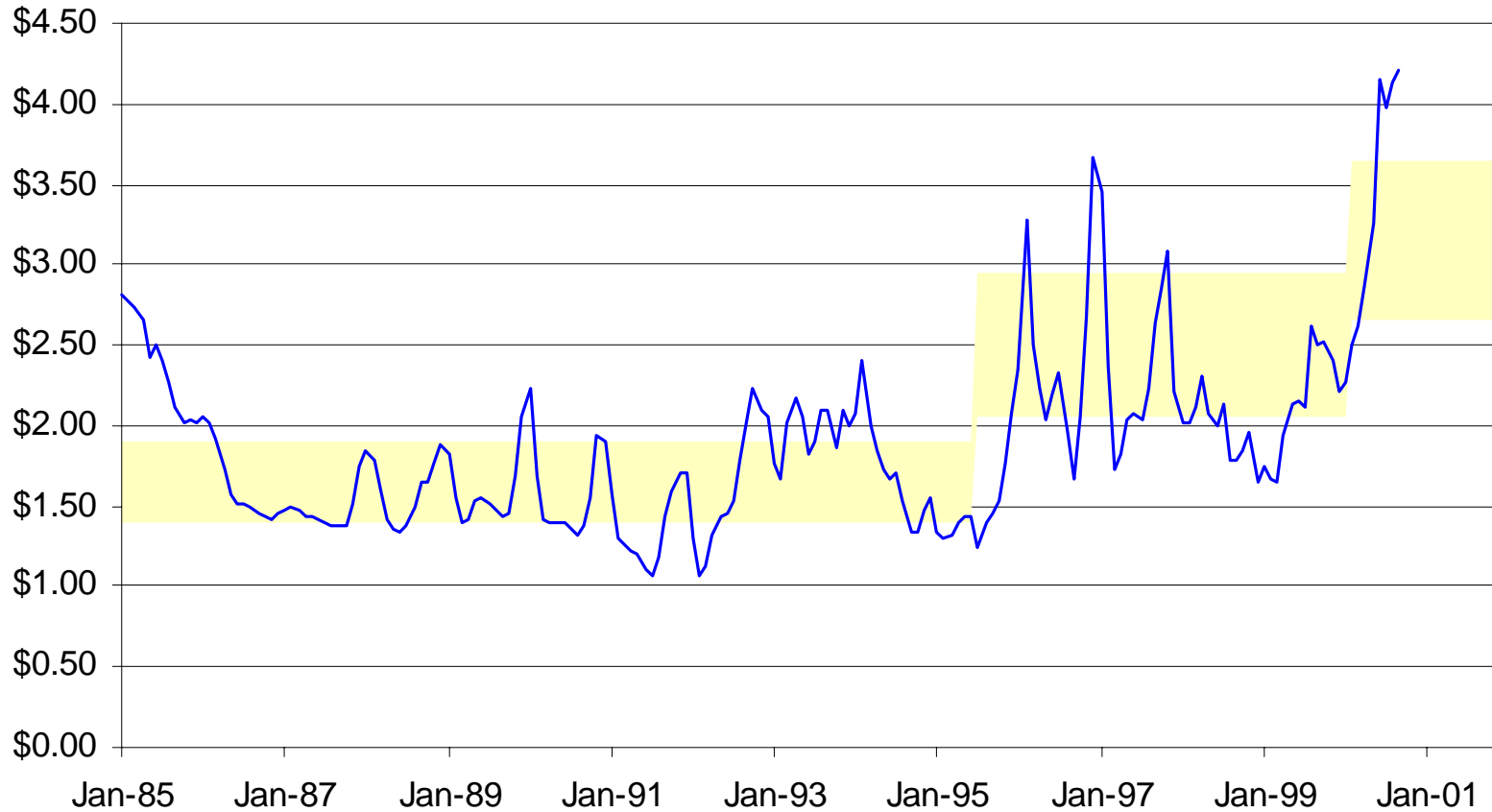
...below normal now, could be worse in November



Source: American Gas Assoc.; Deutsche Banc Alex. Brown estimates



# A new trading range for natural gas? ...wellhead price near \$3.00 per mmBtu



Source: Natural Gas Week and Deutsche Banc Alex. Brown estimates



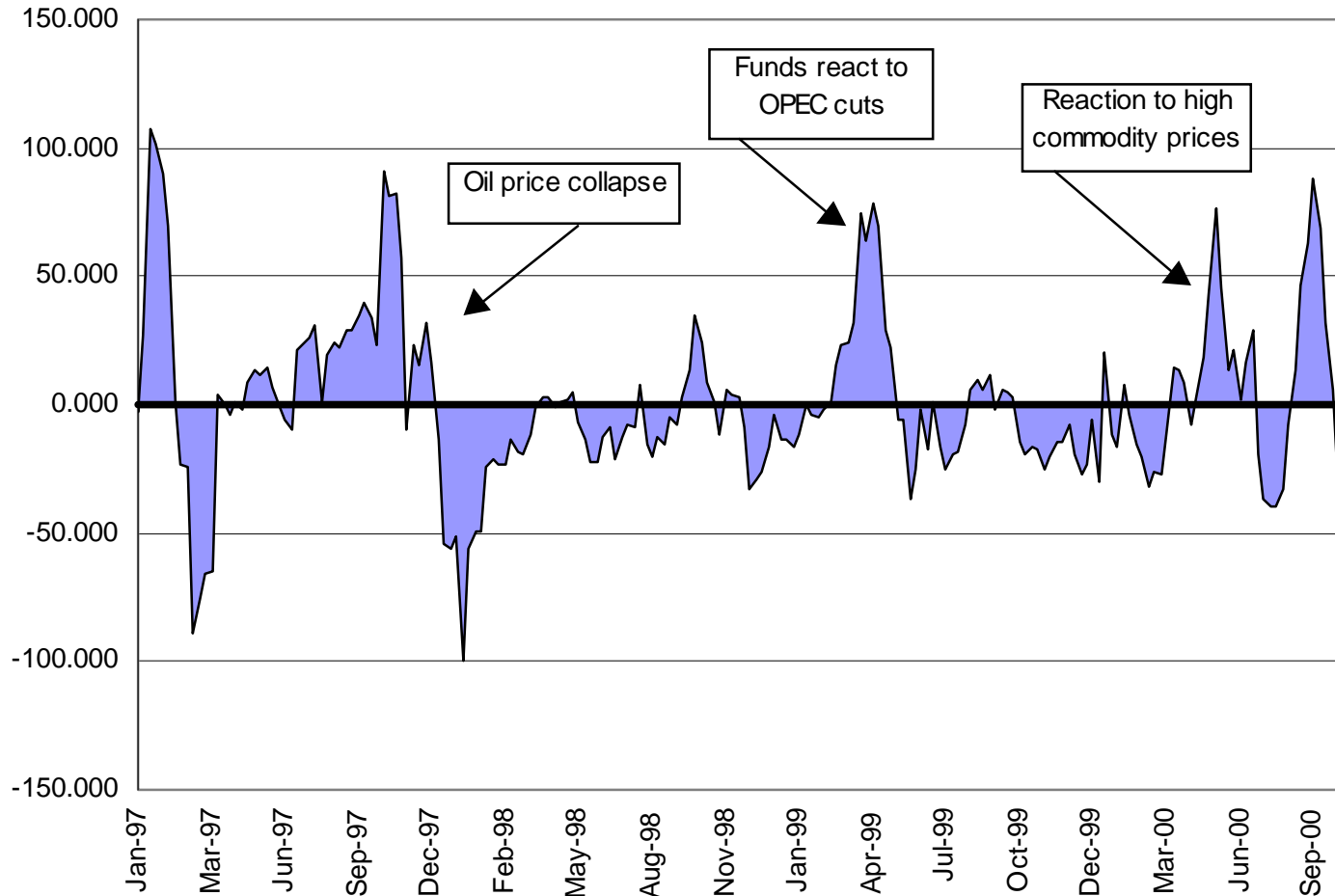
# Gas price forecast

- Tightness likely to manifest itself in winter of 2000/2001
- \$3.40 (NYMEX) & \$3.25 (wellhead) average estimates in 2001
- Equilibrium expected to be near \$3.15 (NYMEX) in 2002 and beyond

Source: Deutsche Banc Alex. Brown estimates

# Energy equity mutual fund flows

(4 week moving average, \$ in millions, 1/1/97 - 10/18/00)

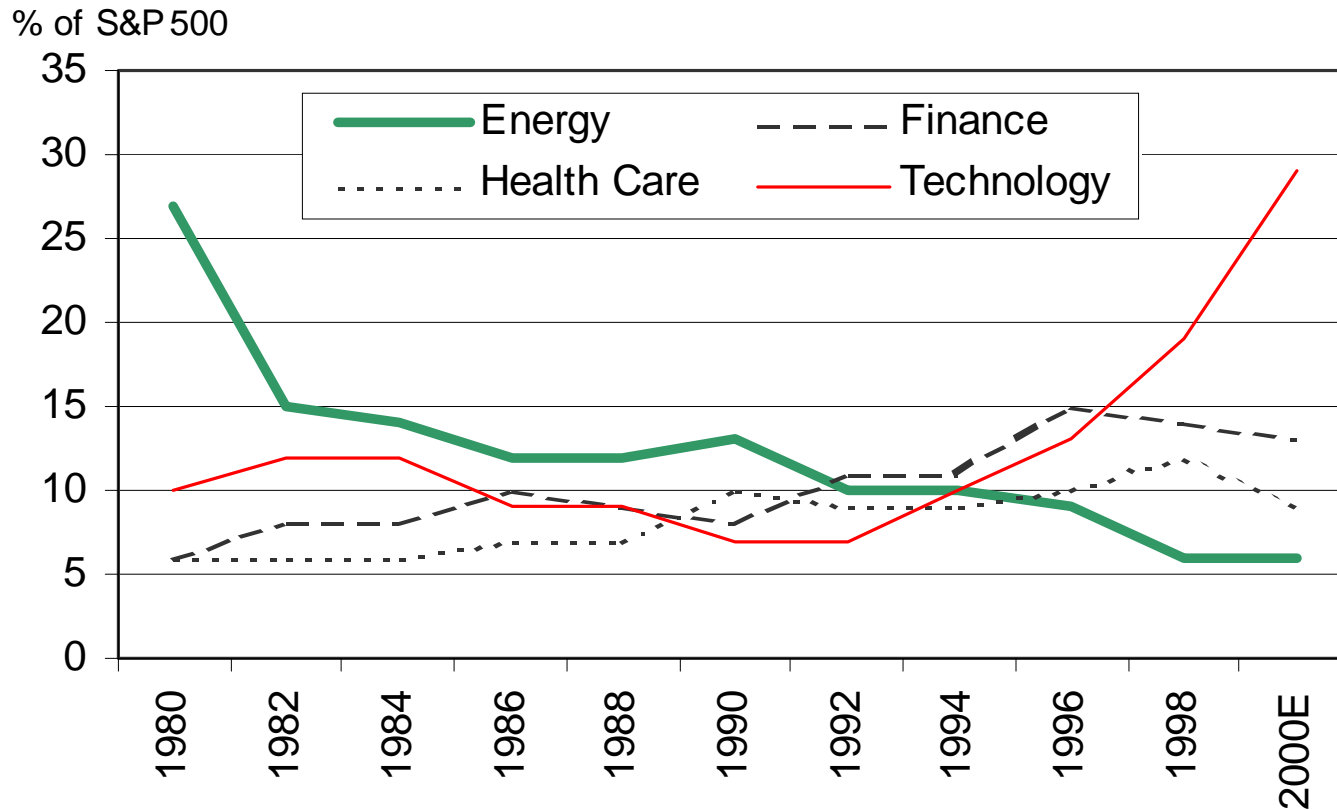


Source: AMG Data Services





# Energy weighting comes up short as investors shift to other industries

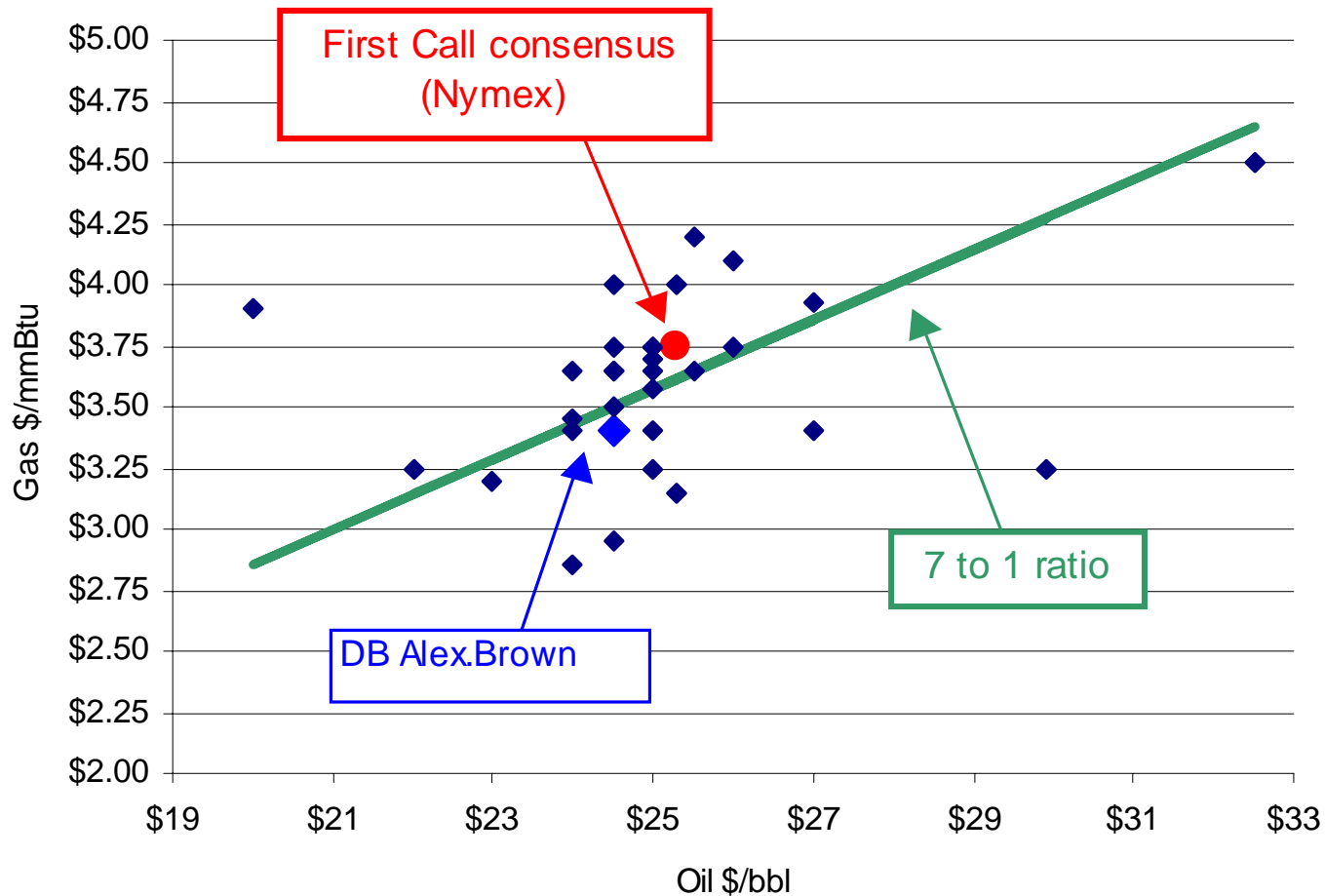


Source: FactSet

Additional information available upon request.



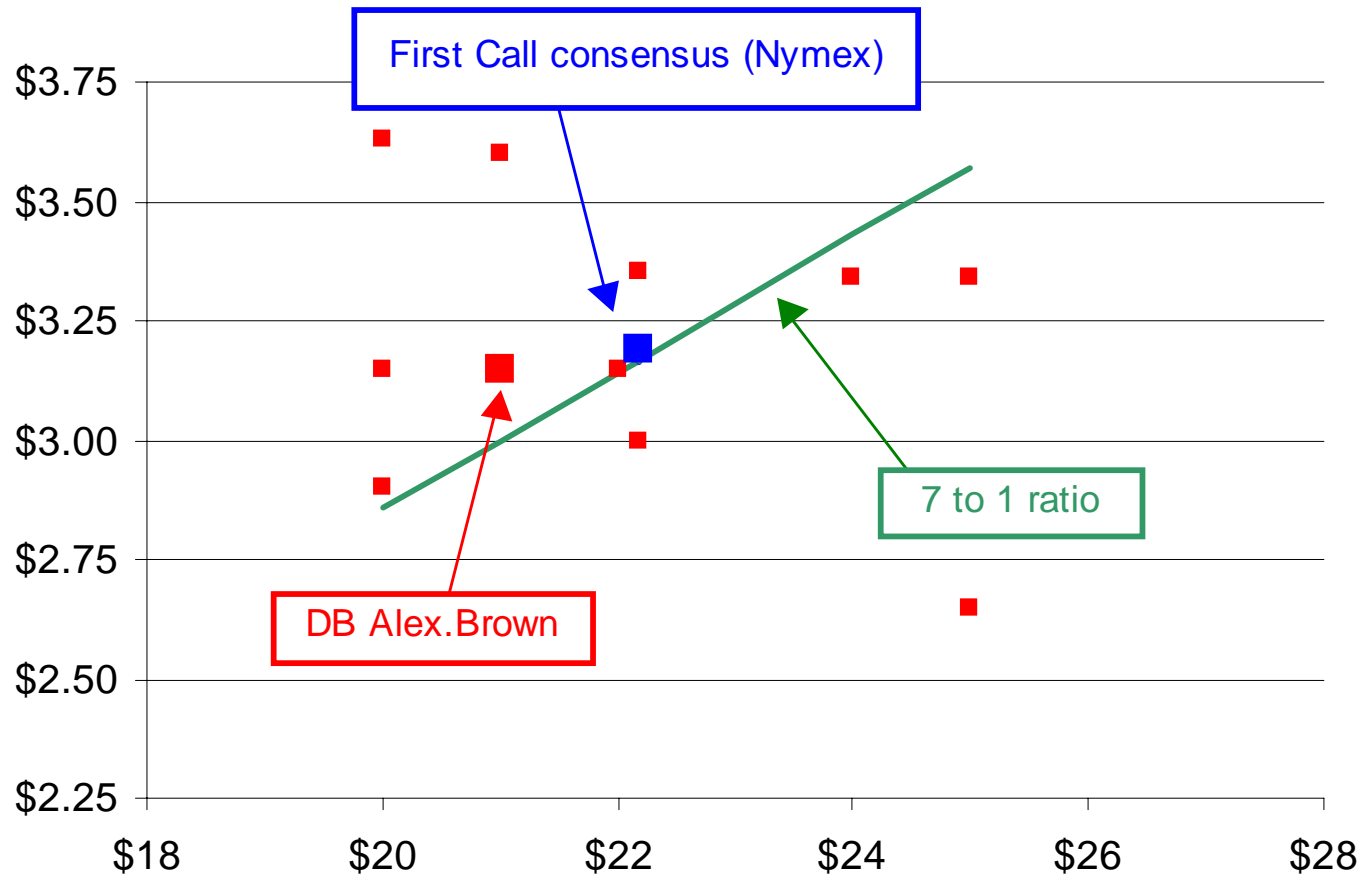
# Oil versus natural gas price forecasts for year 2001



Source: First Call, October 9, 2000; Deutsche Banc Alex.Brown estimates



# Oil versus natural gas price forecasts for year 2002



Source: First Call, October 9, 2000; Deutsche Banc Alex. Brown estimates

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