

World Oil Overview

2005-2006 Winter Fuels Outlook Conference

National Association of State Energy Officials
US Department of Energy

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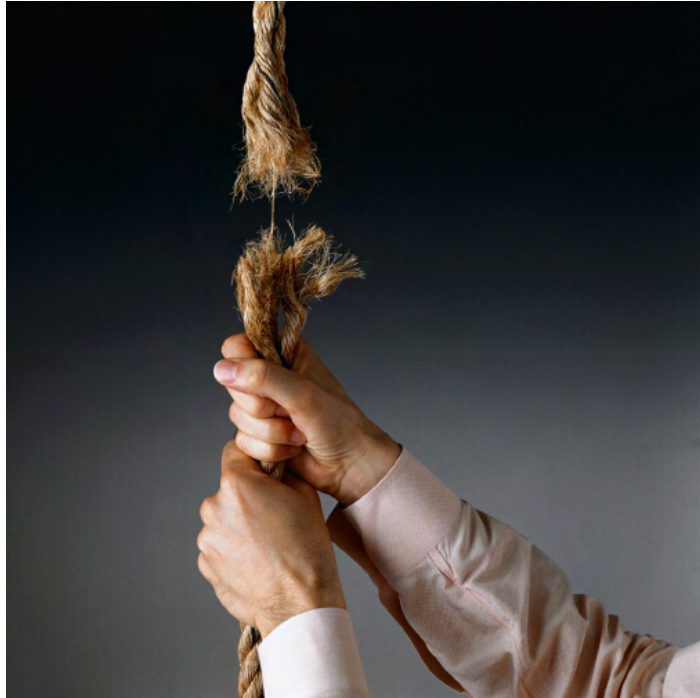
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What Oil Markets Worry About



- **Are We Running Out of Oil?**
- **Will Oil Prices Rise to \$100?**
- **What's to Blame?**
- **Are Major Oils Investing Enough?**
- **Can Nat'l Oil Companies Deliver?**
- **Does "Conservation" Work?**
- **What's the 2006 Oil Price Outlook?**
- **How Can We Reduce Vulnerability?**



The World Is Not Running Out of Oil

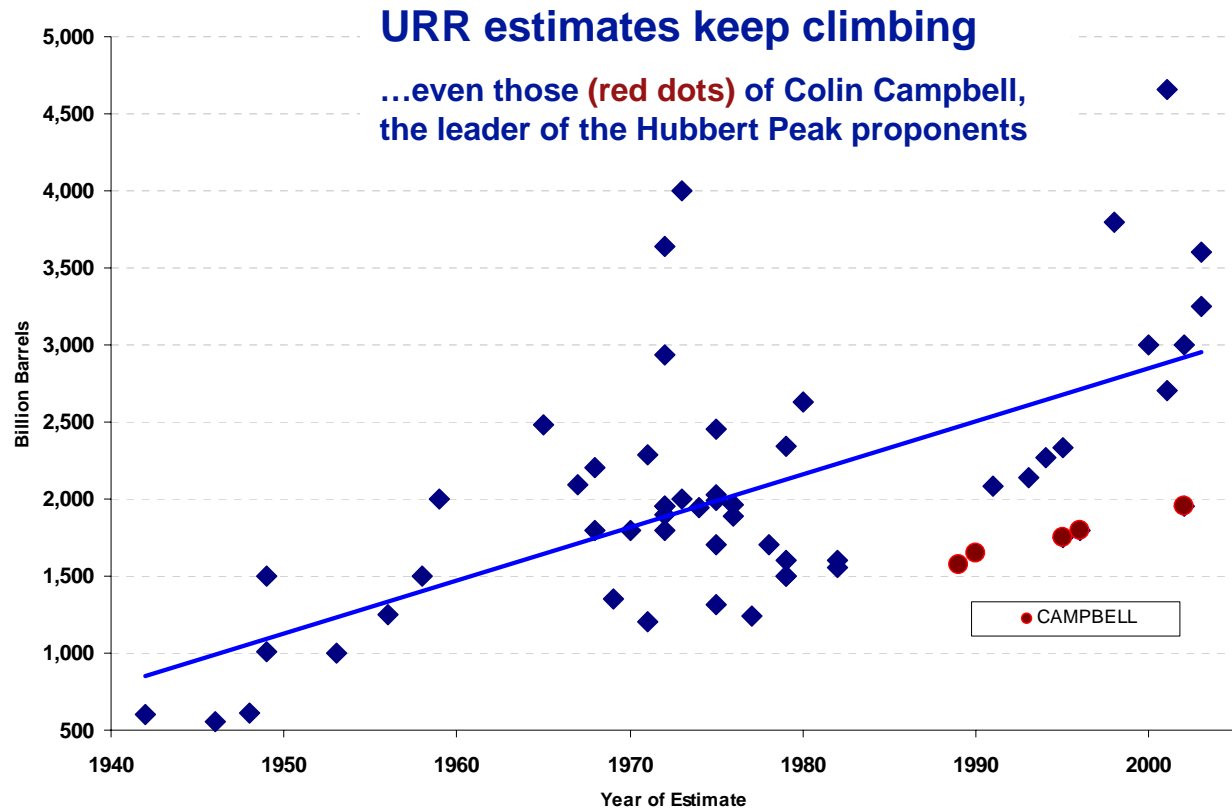
“Peak Oil” Requires a Fixed Value for Ultimately Recoverable Reserves (URR)
...but URR estimates have been steadily climbing for decades
...not time for twilight just yet



M. King Hubbert
b.1903 d.1989

Shell Oil & USGS

Geologist who first identified concept of bell curve “peak and decline” for oil

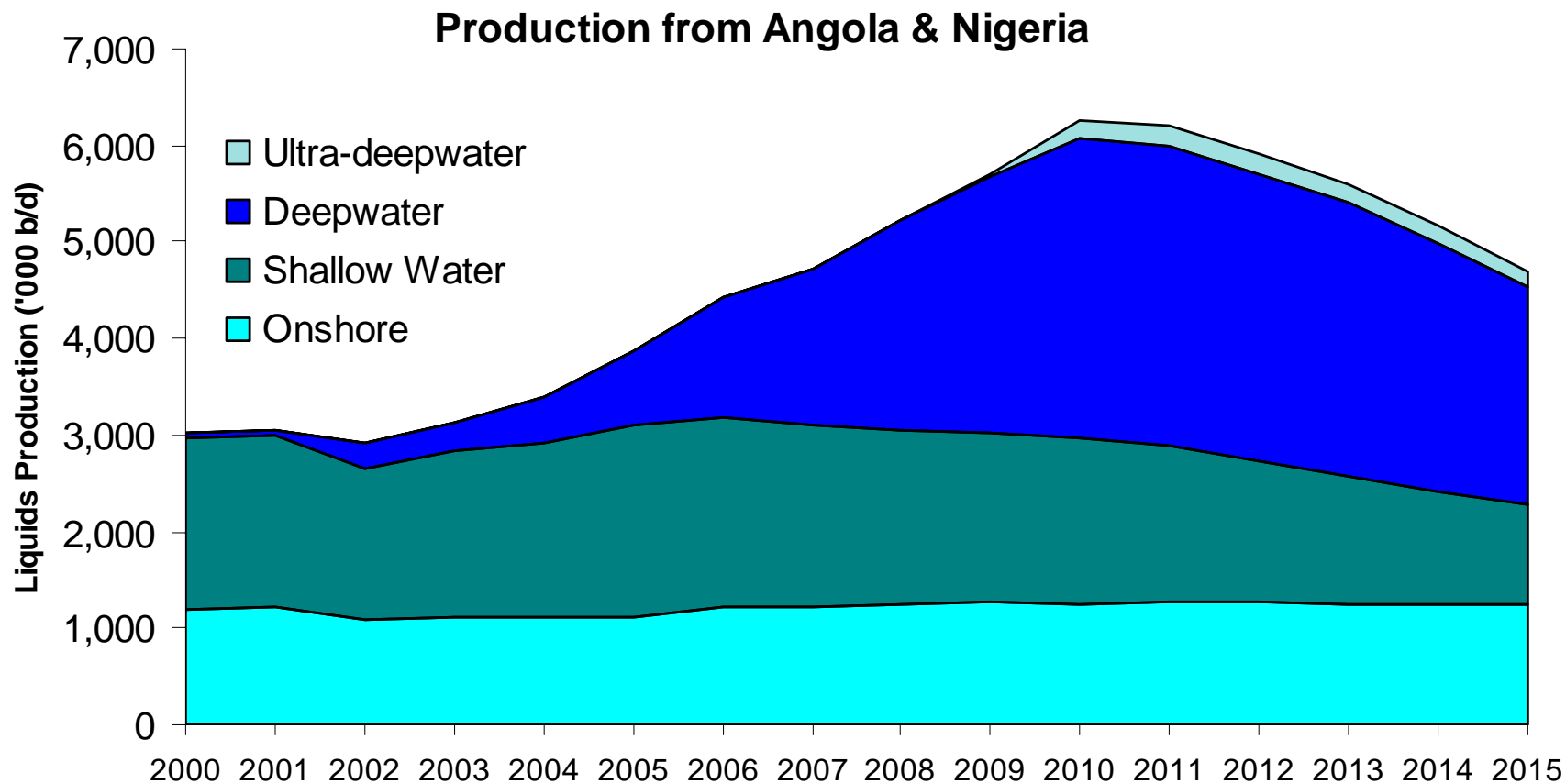


Source: Michael Lynch, Energy SEER Inc.



Deepwater Potential

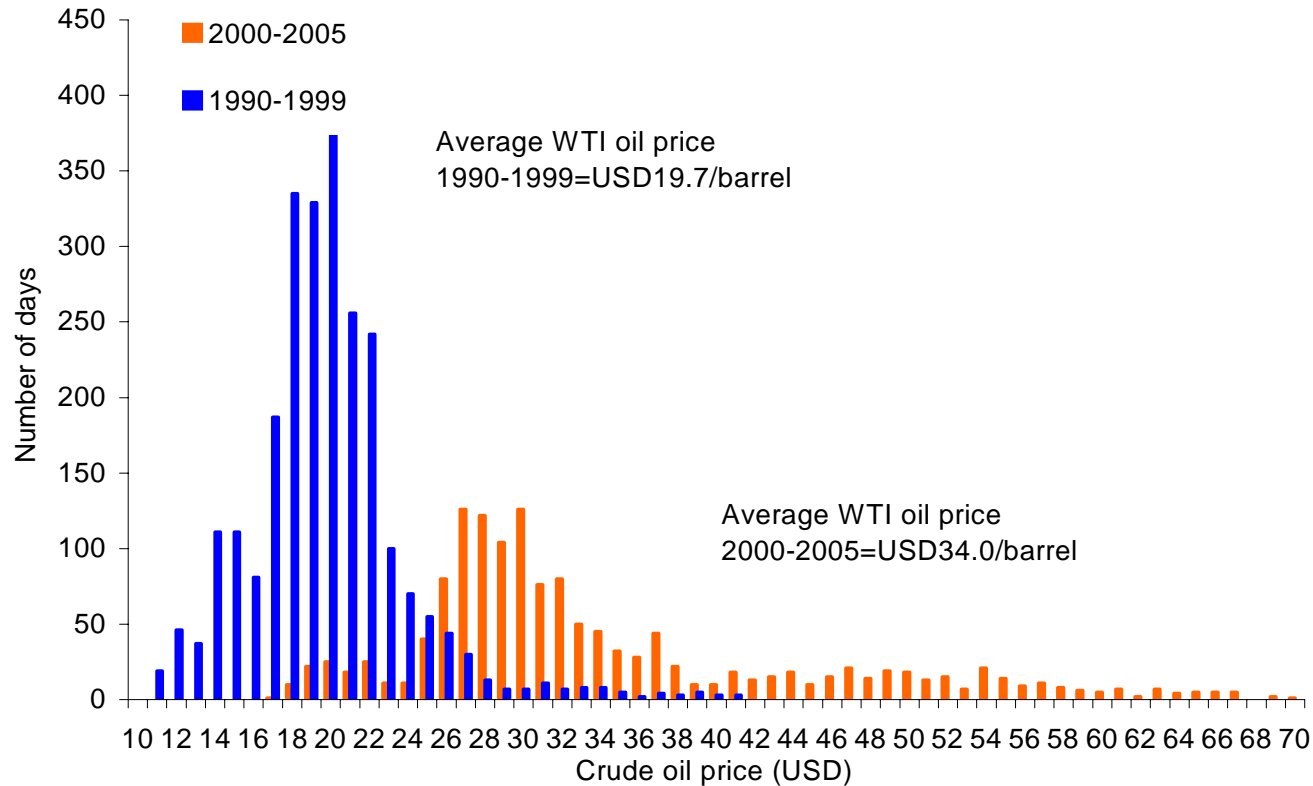
...ability to turn deepwater discoveries into production shows that companies still have growth opportunities



Source: Wood Mackenzie Consultants

New World Order For Oil Markets

- The WTI crude oil prices averaged just under \$20/barrel in the 1990s.
- So far in this decade, the oil price has averaged \$34/barrel.
- We expect oil prices will average \$60 in 2006, and over \$40/barrel during the current decade, or more than double the average of the 1990s.



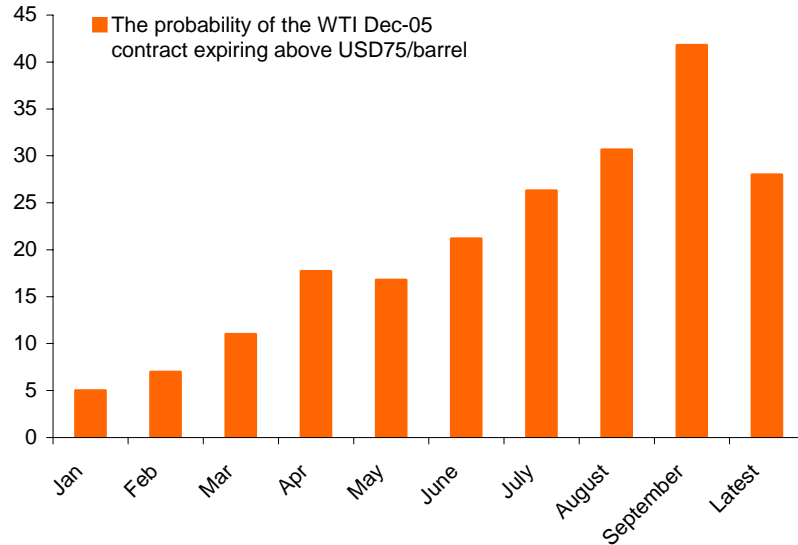
Source: DB Global Markets Research, Bloomberg

The Options Market's View of Oil Prices

...28% chance of \$75 in December
...low probability of \$120 oil; but \$70 in 2006!

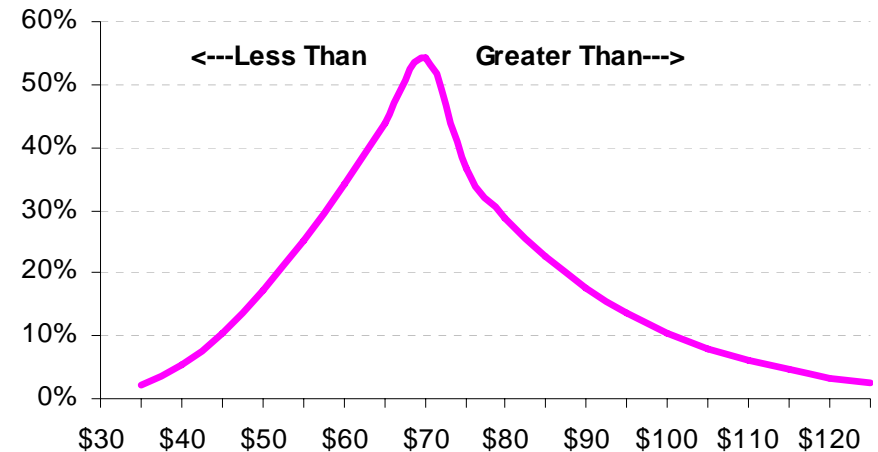
December 2005

...28%+ chance of \$75 oil



December 2006

...50% chance of \$70

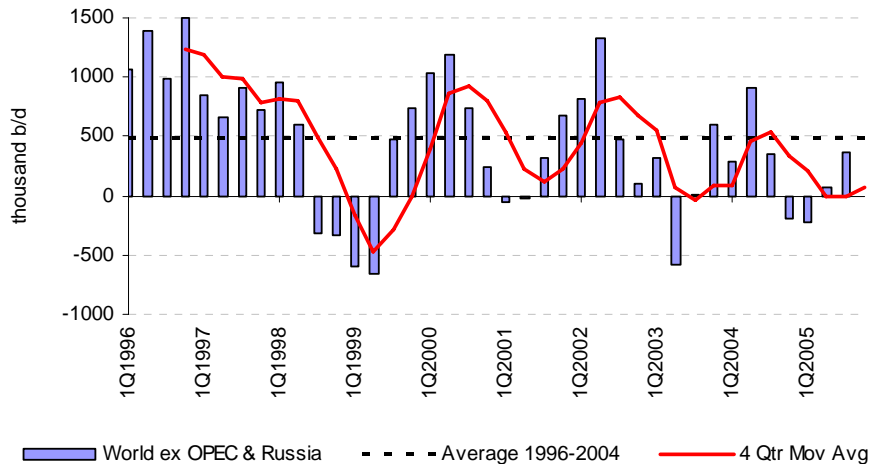


Source: Nymex market data; DB Global Markets Research

Non-OPEC Supply Growth Looks Weak

...disappointing response outside of Russia
...rising taxes and new chilly investment climate in Russia

Non-OPEC Supply Outside Russia (y-o-y growth trending down)



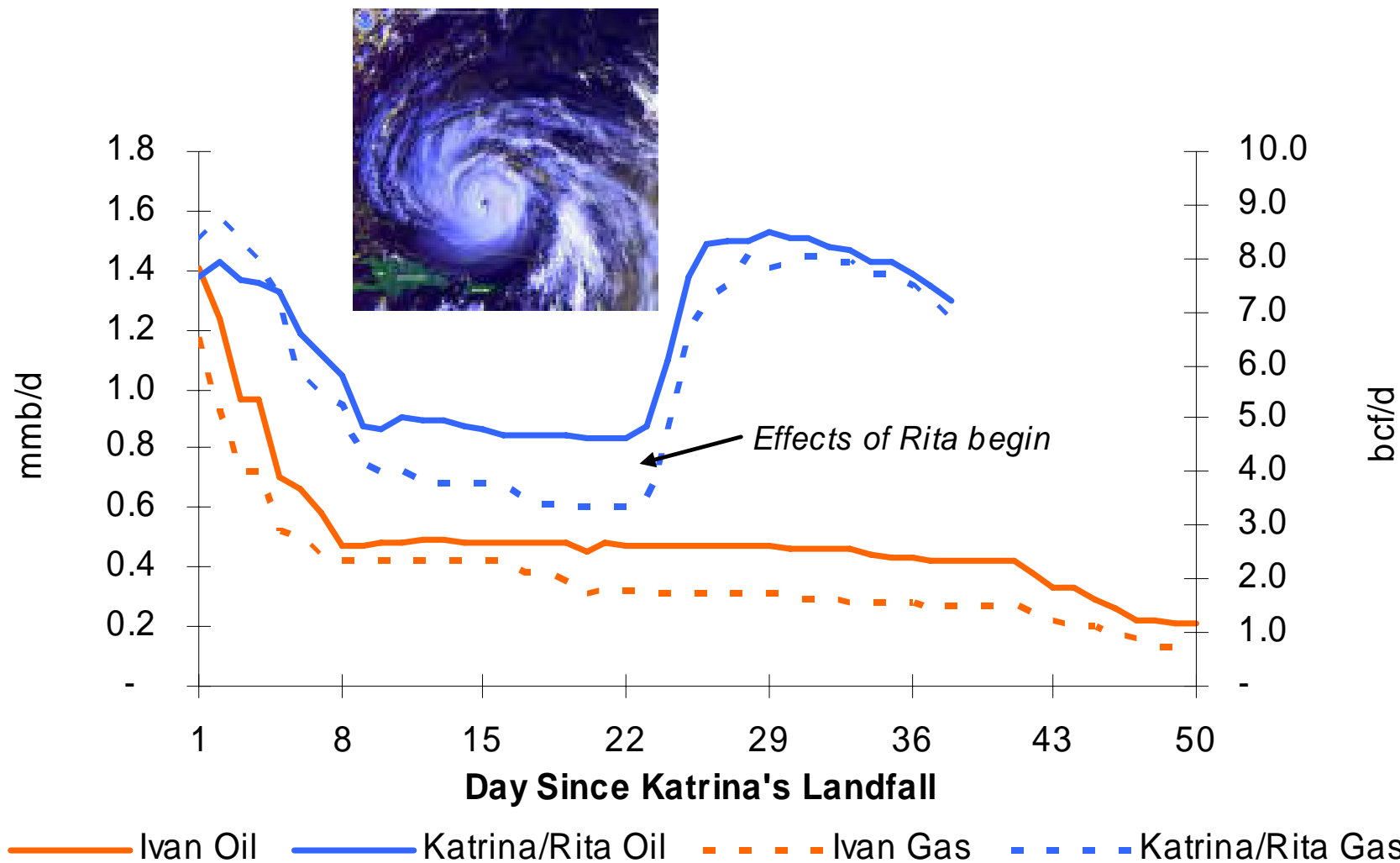
Russian Growth Has Slowed (disappointments since September 2004)



Source: IEA; Deutsche Bank

The Impact of Hurricanes

...slow recovery from Katrina and Rita compared to Ivan

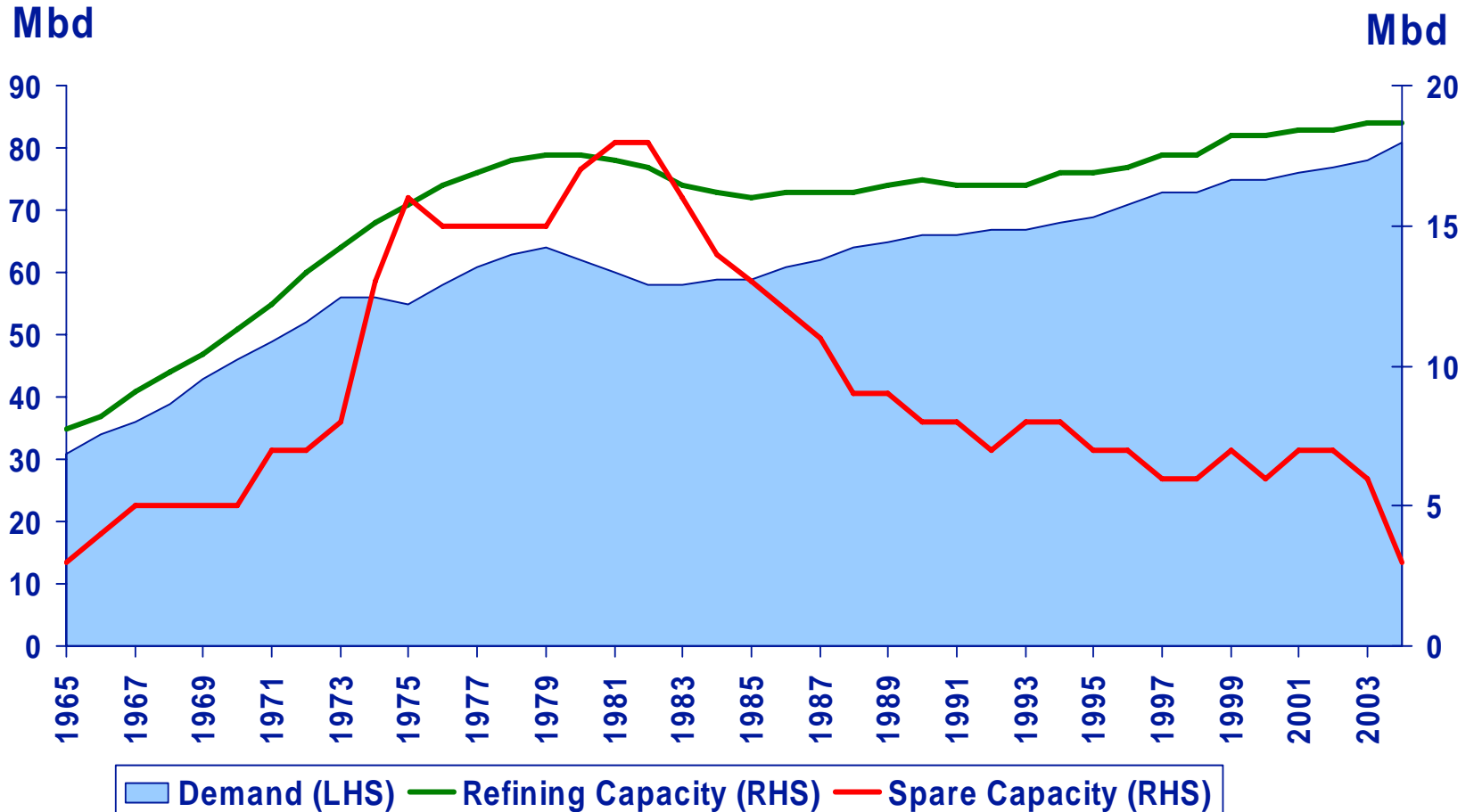


Source: US Minerals Management Service ; Deutsche Bank



Global Refining Capacity and Demand

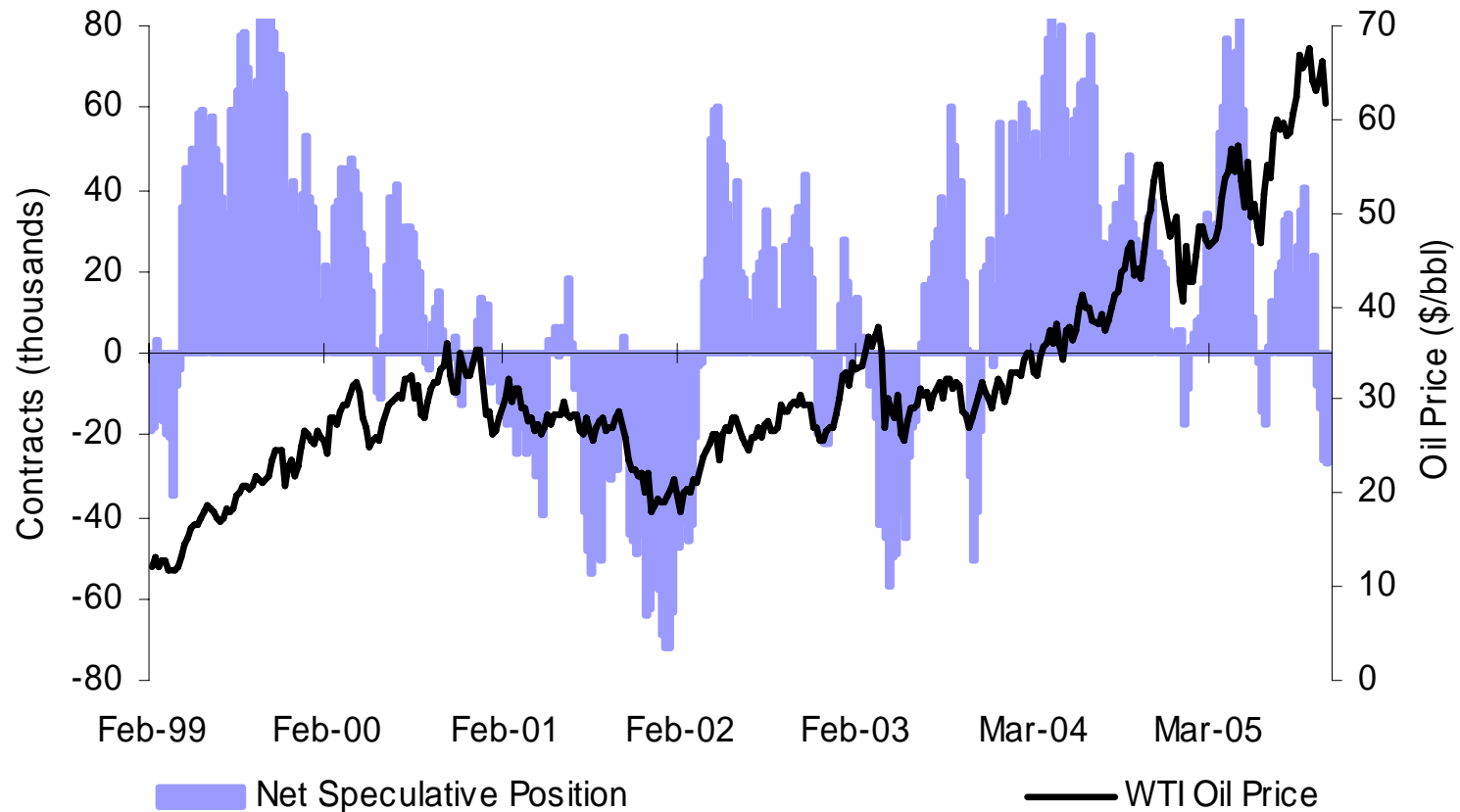
...spare capacity has tightened significantly in the last two years



Source: Wood Mackenzie Consultants

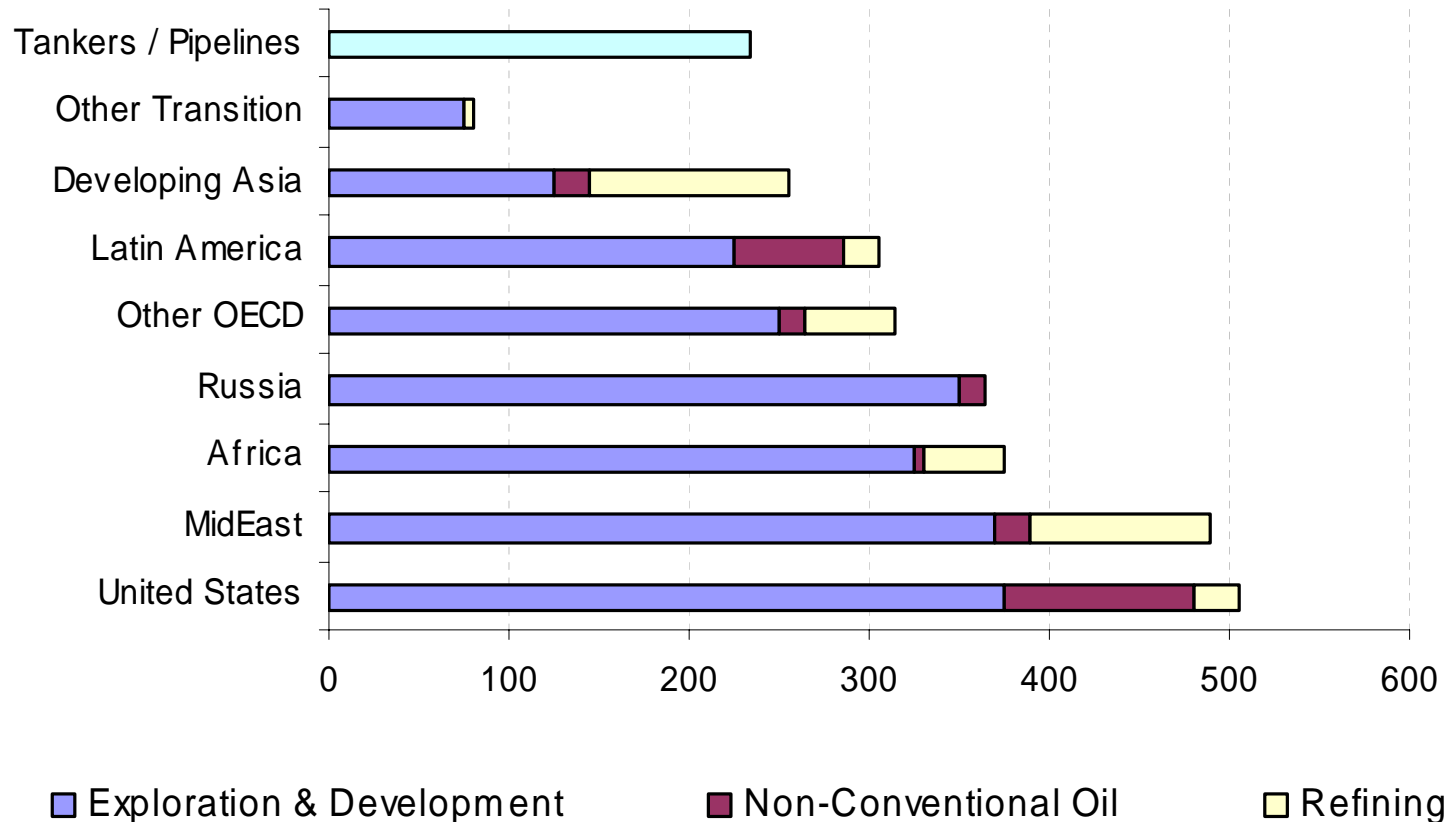
Speculative Activity

...data suggests little relationship to oil price



Global Oil Investment Required 2005-2030

...the cumulative oil spending required is enormous



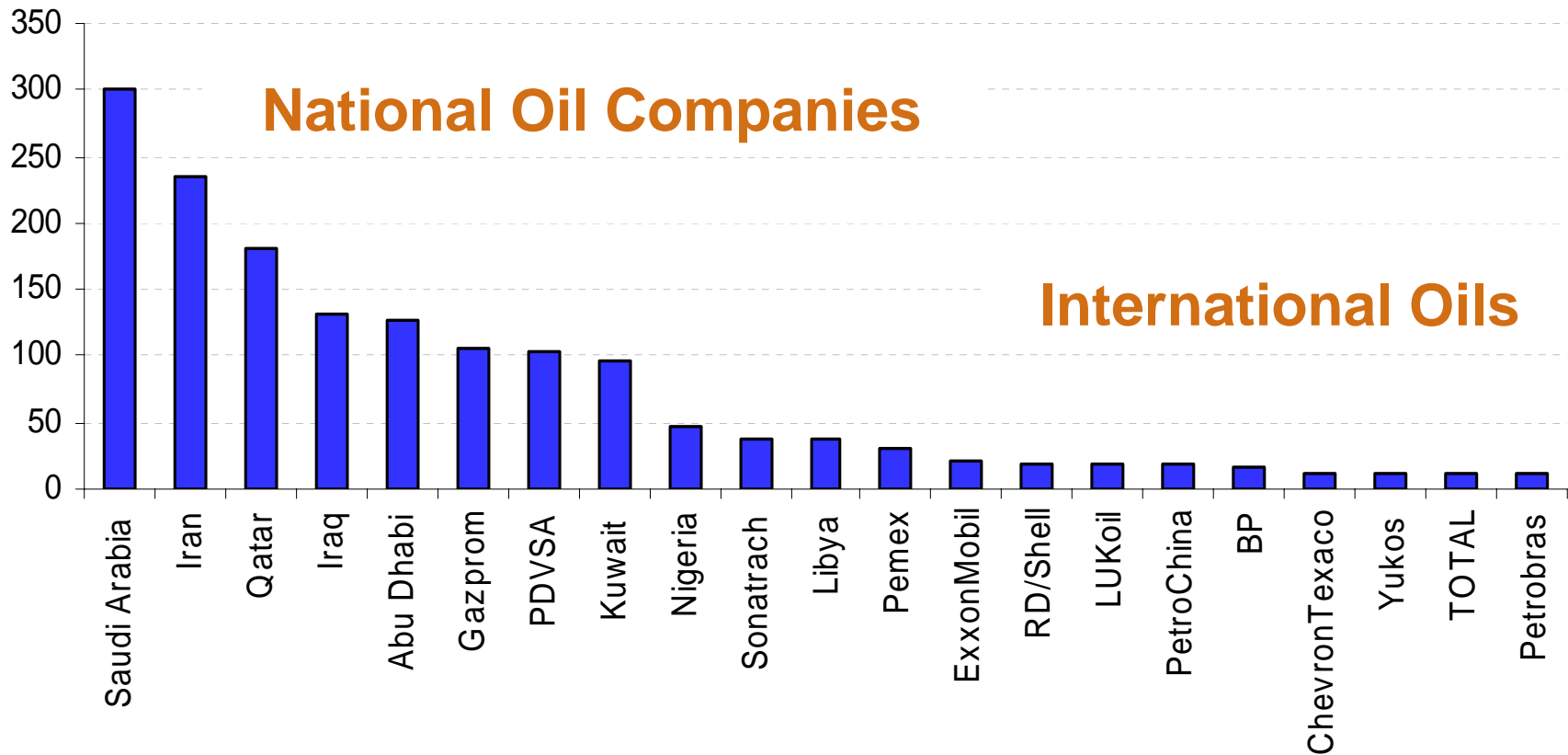
Source: IEA World Energy Outlook 2004; Deutsche Bank

Cumulative oil (excluding gas) investment needed (billion constant 2000 \$)

Reserves in Hands Bound by Politics

...what happens if investment lags the requirements?

Oil & Gas Reserves (billion boe)

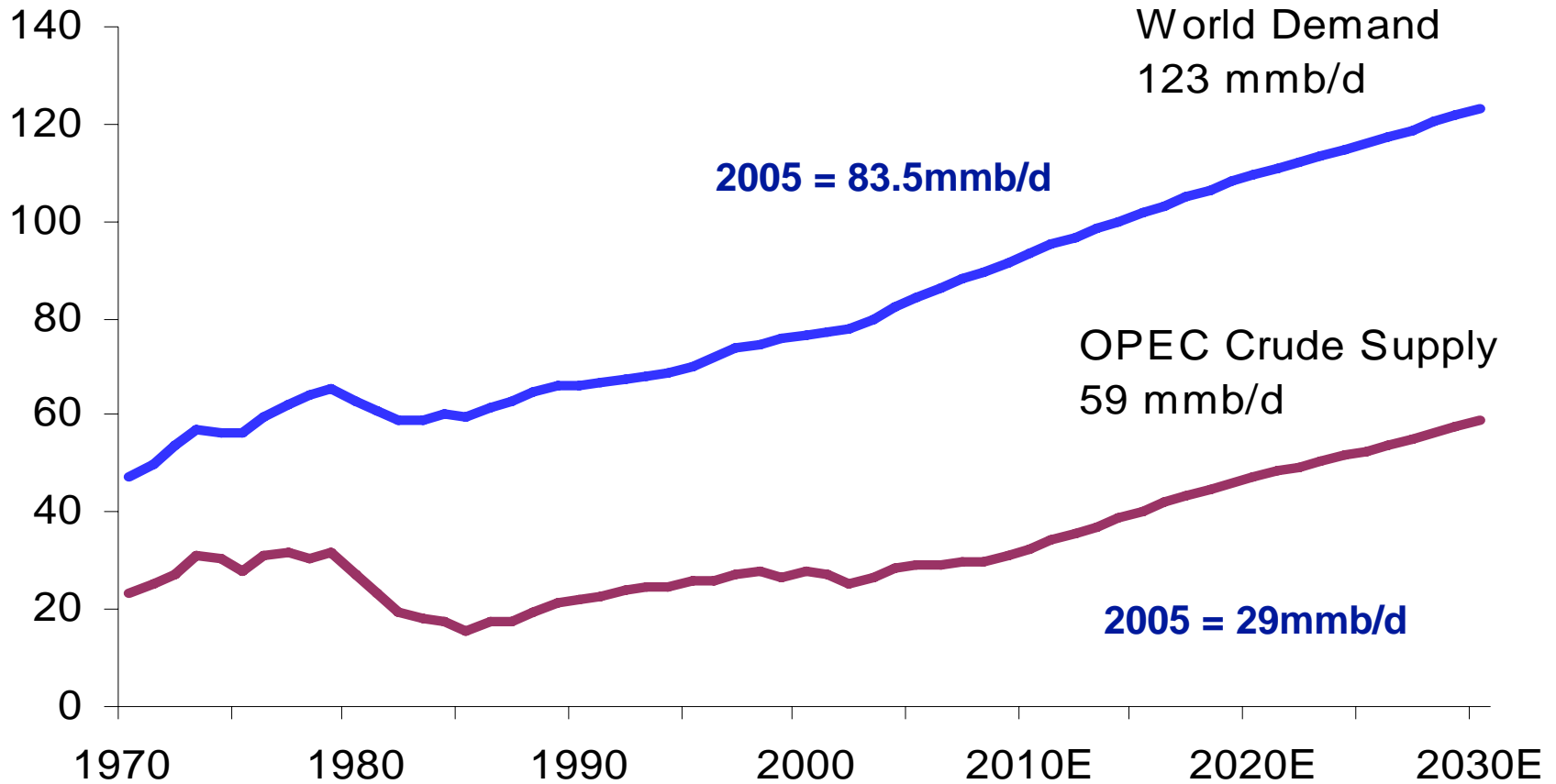


Source: *Oil & Gas Journal*; BP; IEA; Deutsche Bank

Oil Demand and Required OPEC Supply

...meeting this “consensus” level of demand may be impossible

Million barrels/day



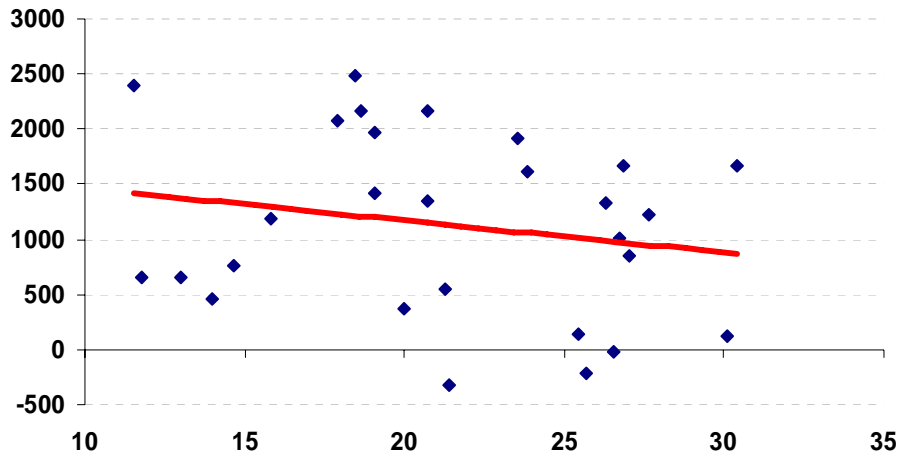
Source: IEA; Deutsche Bank

Conservation and Behavior Change

...evidence that price elasticity can reduce oil demand

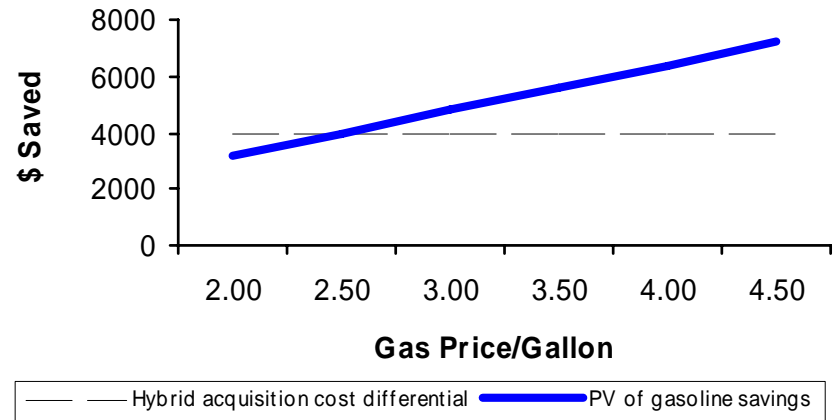
Annual Global Demand Growth vs. Oil Price

(Quarterly data from 1996 to 2002)



Cost Savings for Hybrid Vehicles

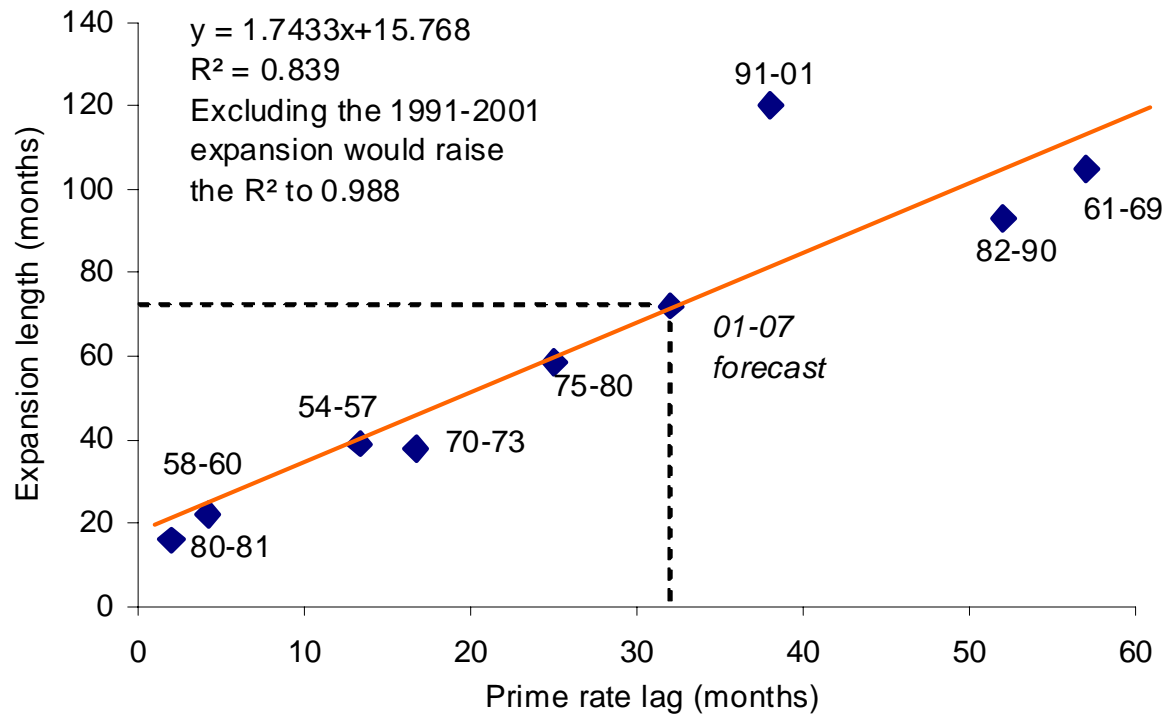
(Heavy driver – NPV over 5 years)



Source: IEA; Nymex; Deutsche Bank

Timing The Next US Recession

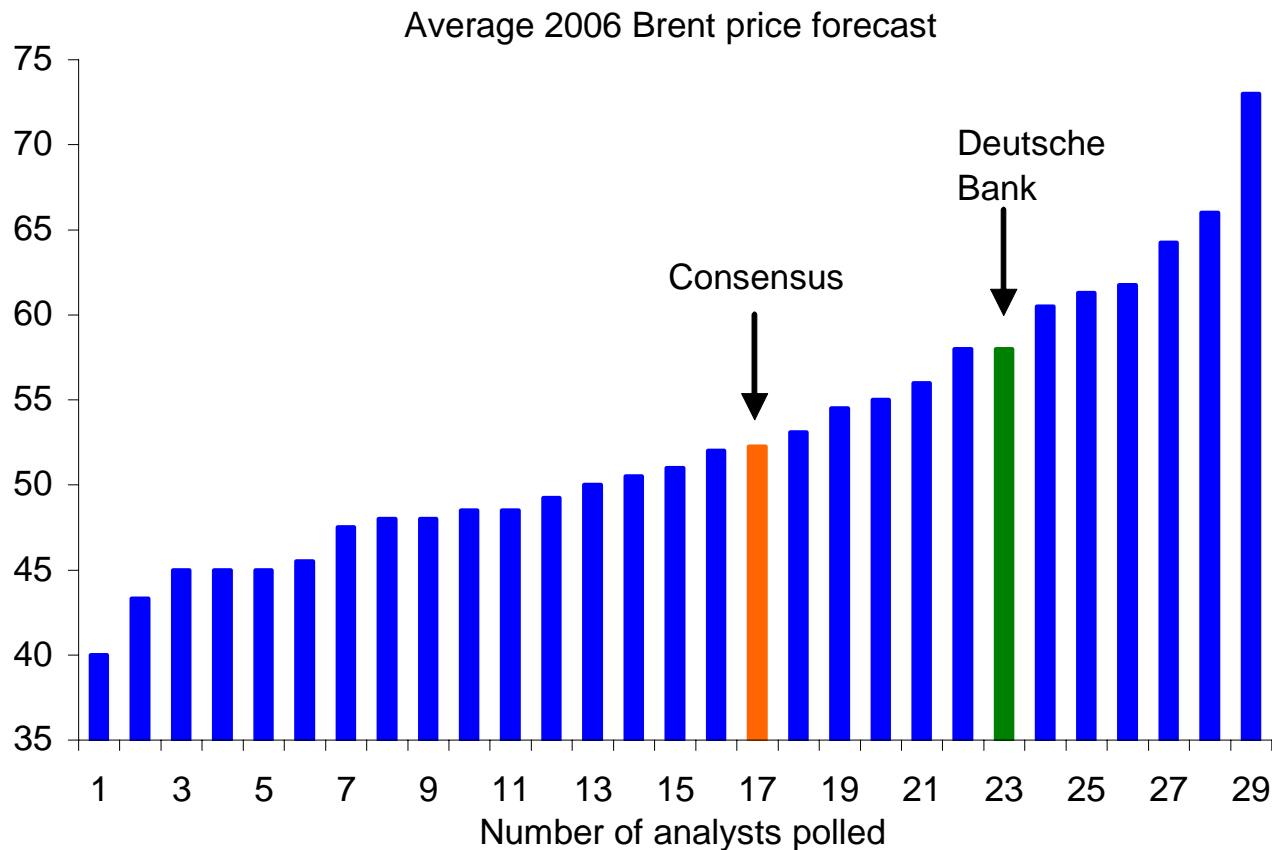
- Since 1954 we find that the longer the US Federal Reserve keeps monetary policy on hold after a recession, the more durable the eventual US expansion
- The last US economic recession bottomed in November 2001, but the US prime rate did not start rising until June 2004 (32 months later). This would imply the next US recession will begin in 72 months after the US moved out of recession in 2001 or December 2007



Source: DB Global Markets Research, Columbia University

Oil Price Forecasts For 2006

- The consensus Brent crude oil price forecast for 2006 stands at \$53/barrel
- The range between the most bearish to the most bullish now stands at \$30, a record high.



Source: Reuters, Deutsche Bank

Churchill's Law

Safety and certainty in oil lie in variety and variety alone.

Thatcher's Law

The unexpected happens. You had better prepare for it.

Palmerston's Law

We have no eternal allies and no perpetual enemies. Our interests are perpetual and eternal.

Source: Deutsche Bank

Vulnerability

- Rise in import quantity and balance of payments / currency issues
- Disruptions / market failures
- Political turmoil (ME, Africa, SA)
- Price spikes / market pressures
- Homeland infrastructure

Traditional Responses to Energy Security (*risk management*)

- Demand restraint (security of demand?)
- Supply diversity
- Surge production (location?)
- Strategic stocks (when to use?)
- International co-operation / IEA
- Flexible markets (futures; technology)



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[Adam Sieminski]

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