Deutsche Bank AG

Oil & Financial Markets

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Passion to Perform

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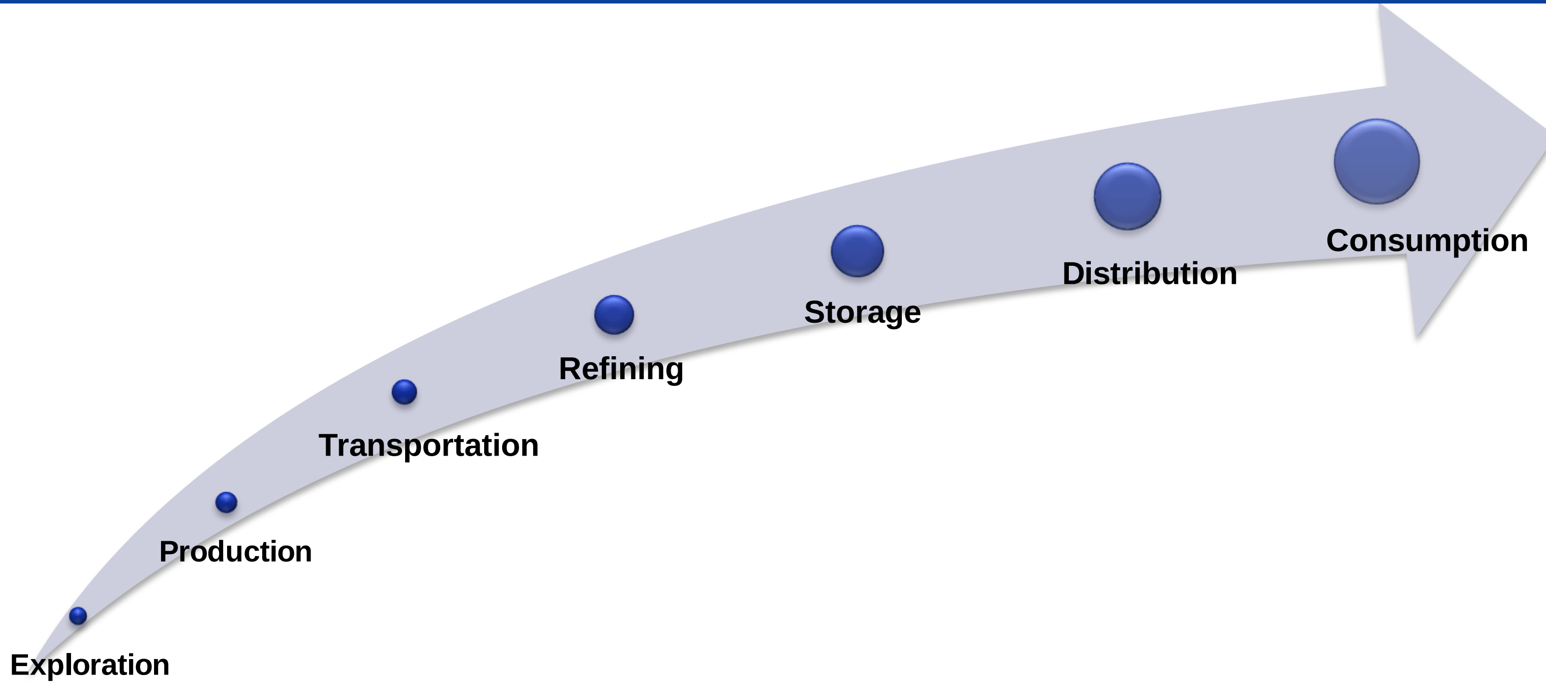
The Role of Banks in Oil Markets

Banks play a role across the entire product cycle



Source: Deutsche Bank

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The Role of Banks in Oil Markets

Banks play a crucial role providing liquidity and capital

Many energy companies do not have high credit ratings, resulting in greater borrowing costs to access the capital markets

Business models are capital intensive with significant investment required for projects such as exploration, production, transportation etc.

Balance sheets of many energy producers are constrained and do not offer excess free liquidity

Energy companies face constrained operating cash flows which inhibit flexibility to make investments and effectively hedge risks

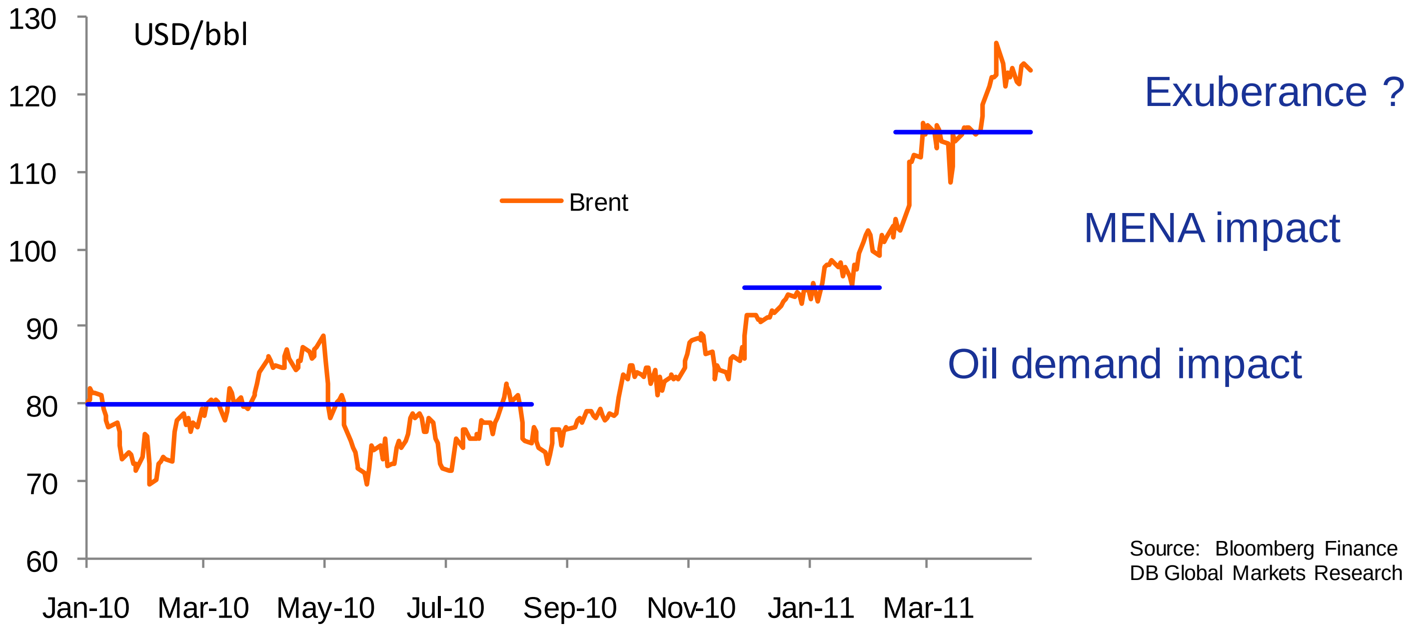
Some energy markets are illiquid (especially for bespoke products) and require hedging to protect capital investment

Source: Deutsche Bank

Banks with their liquid assets are therefore uniquely positioned to play a crucial role in commodity markets, offering various liquidity and capital solutions

Three Stage Increase in Brent Oil Prices ?

Steady near $80/bbl, then jumps to $95/bbl, followed by $115/bbl



Source: Bloomberg Finance LP, DB Global Markets Research

Outlook

- The first $15 leg up (from $80 to $95) coincided with the market starting to feel the pinch of the huge global demand increase that took place in 2010. At the start of 2010, the consensus view was world demand would grow by 1.4mmb/d, and now the IEA estimates a whopping 2.8mmb/d. World economic growth of 5%, coldest winter in 30 years, French oil labor strike, China coal halt at end-2010.
- The second $15 leg came with the Q1 events in MENA. The Libya export interruption... worth another 1.4mmb/d... probably causing at least half of the second leg (or maybe more) given that it is very low-sulfur crude in high demand for light products and hard to replace (without some logistical changes) by Saudi spare capacity which is higher in sulfur content.

What Is Volatility?

To Fly Away

"Oil and energy price volatility is poorly defined with no accepted conceptual frame work for analyzing or interpreting it...

…not to mention designing policies and policy instruments to mitigate or reduce its effects."

Ali Aissaoui
APICORP
personal communication
October 2009
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Chemistry: Evaporating readily.

Economics: Percent change in price over a given period.

Trading: Historical Volatility is the annualized standard deviation of percent changes in futures prices over a given period. Implied volatility from options market prices.

Politics: The price going in a direction you don't like

…usually reserved for UP rather than DOWN.

Source: Deutsche Bank

Positive Aspects of Higher Oil Prices

Higher prices may simply be providing the proper signals to the market

- More non-OPEC oil supply
- Better economics of renewables and alternative fuels
- Demand efficiency

Source: Deutsche Bank

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A Primer On Oil Prices

A bidirectional system of causality

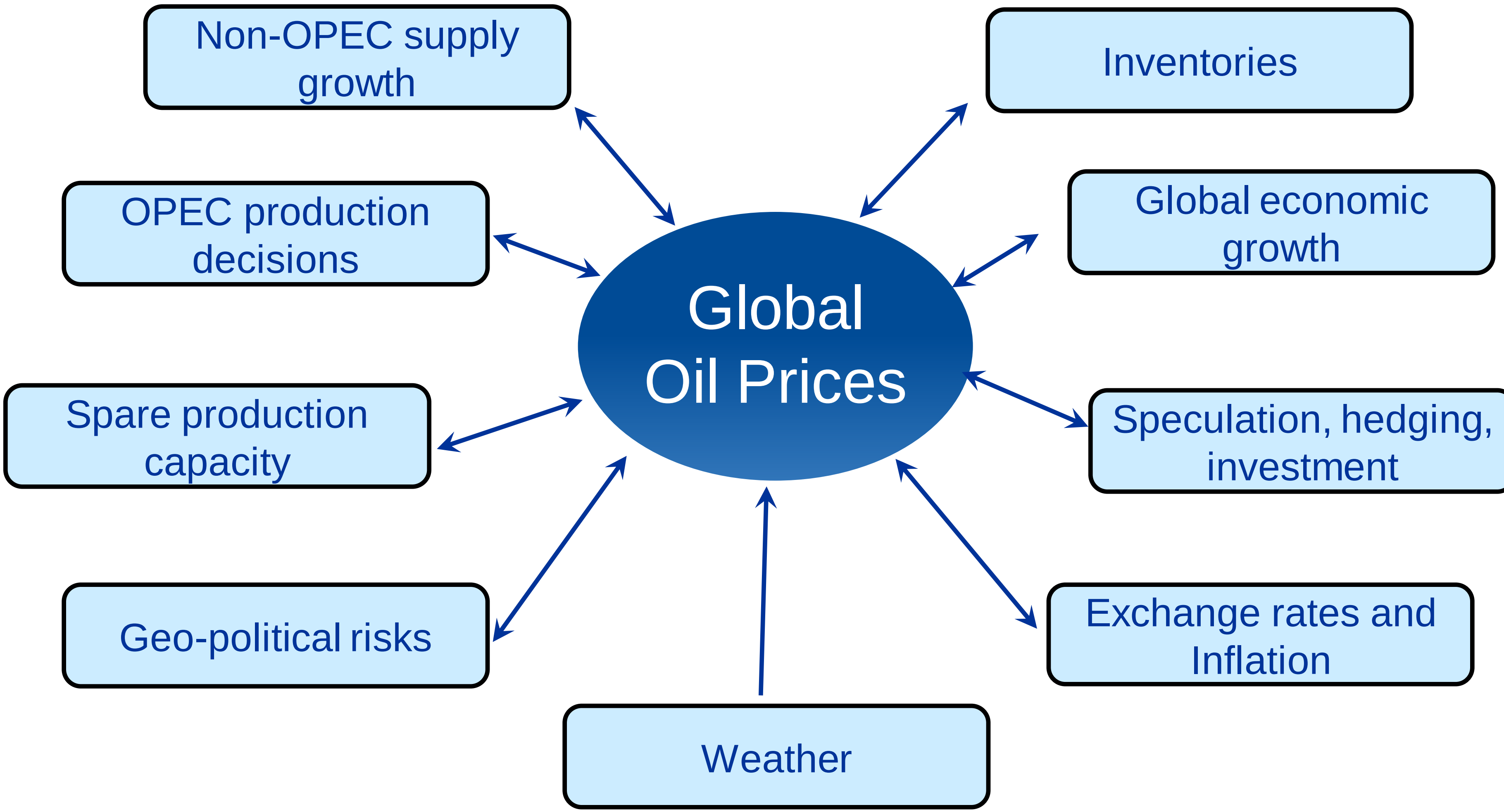
Product prices determine crude oil prices and crude oil prices determine product prices. Here are the things that really matter:

- Volume and characteristics of alternative crude oil types offered for sale (not all the same!)
- Capability and capacity of the world refining industry to process these crudes
- Government-mandated specifications for oil products marketed by refiners
- Characteristics and volume of global petroleum demand
- Available storage capacity for crude oil and petroleum products
- Flexibility of the world transportation system for getting petroleum from the point of production to the point of sale

Source: Philip Verleger, PKVerleger LLC, "A Primer on Oil Prices", 2009 manuscript used with permission

Oil Prices Relate To Many Uncertain Factors

Volatility in oil prices is often attributed to events and uncertainties in the markets



Source: Richard Newell, EIA Administrator, US DOE, NASEO Winter Fuels Outlook, October 2009

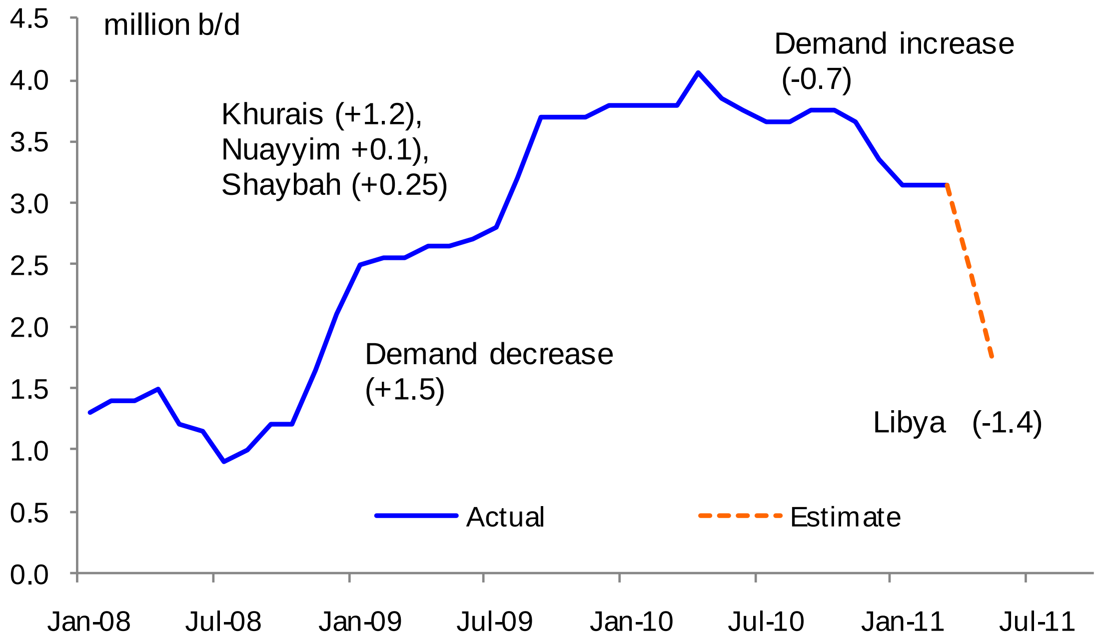
Current Assessments and Future Expectations

Price formation in the oil sector is complicated by future expectations

Source: Dean Foreman, Chief Economist, Talisman Energy, personal communication, September 2009, used with permission

Saudi Spare Capacity Is a Key Indicator

Currently 2mmb/d lower than it was last summer; still above the lows of summer 2008



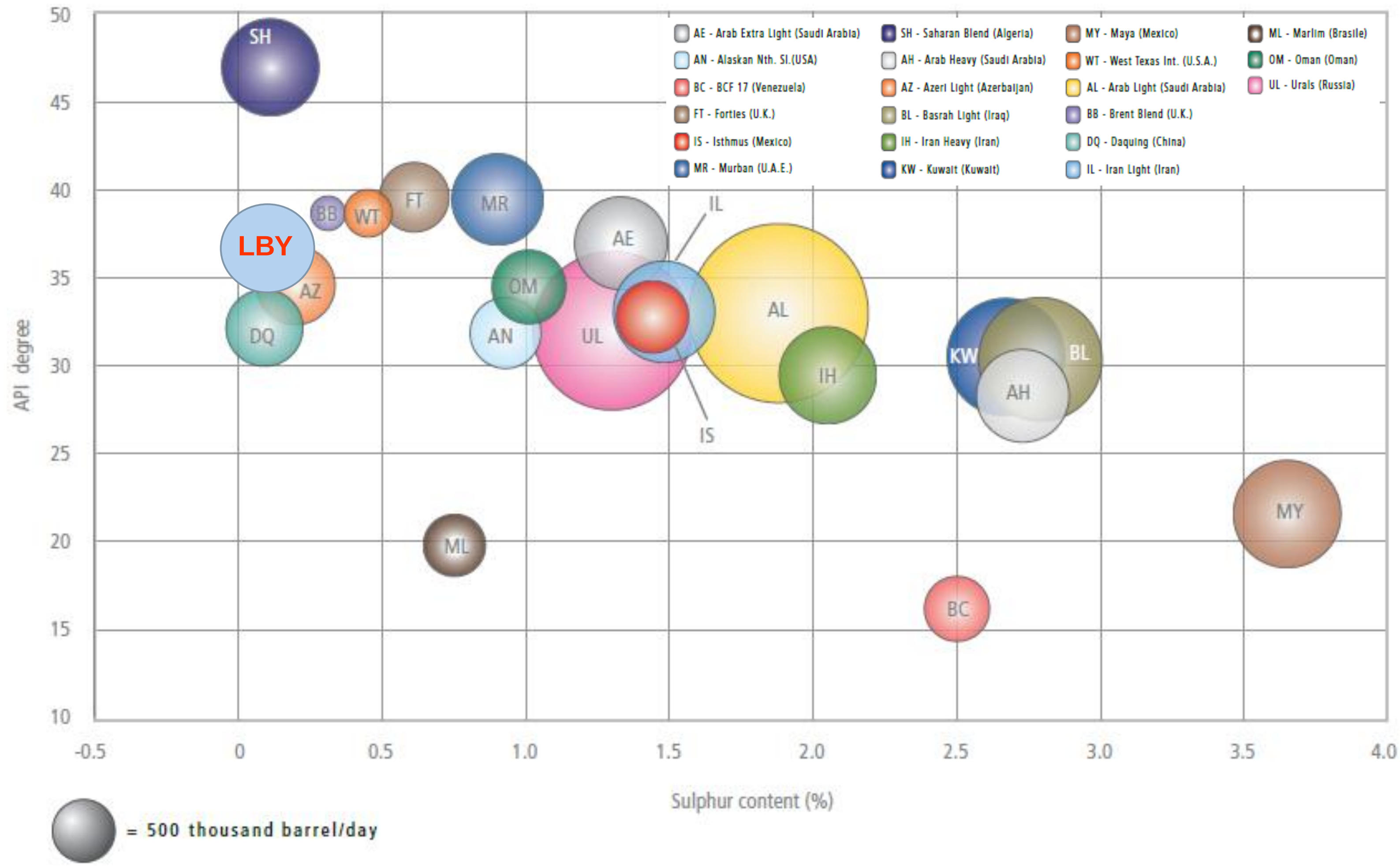
Source: US DOE/EIA, OPEC Secretariat, Deutsche Bank

Outlook

- The low of about 1mmb/d was reached in Jul-2008 as Saudi Arabia production rose to 9.7mmb/d in an effort to quench the 2008 price rise. The rise to 2.5mmb/d by Jan-2009 was a function of the drop in needed OPEC crude caused by the economic recession.
- During 2009, Aramco completed three new upstream projects (Khurais, Nuayyim, and Shaybah), adding over 1.5mmb/d of capacity.
- As the economy recovered an oil demand rose in 2010, the US DOE/EIA estimates that by early 2011 Saudi spare capacity was down to about 3.15mmb/d (with Kuwait, Qatar, and the UAE accounting together for a bit less than 1mmb/d more).
- Assuming that the Saudis make up 1.4mmb/d of the lost Libyan production, their spare capacity will be under 2mmb/d in May.

Saudi Crude Is NOT a Substitute for Libyan Blend

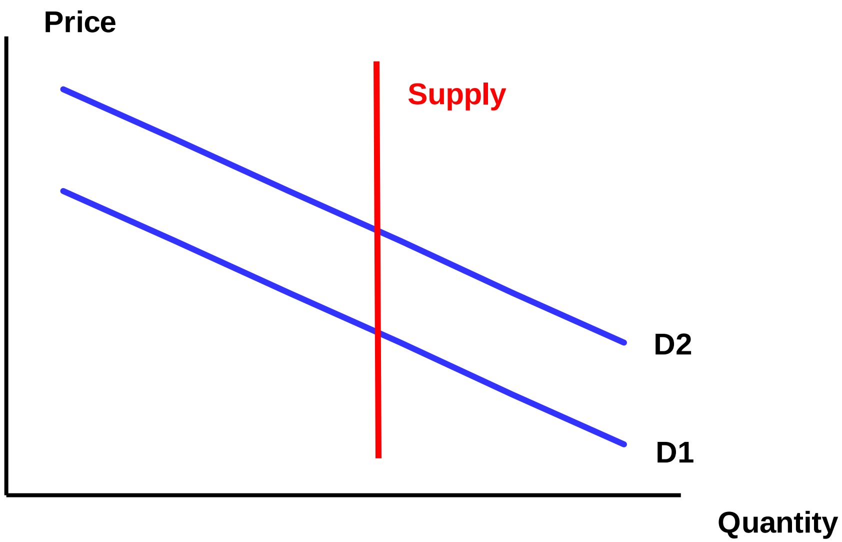
Very low sulfur content of Libyan crude makes it nearly impossible to directly replace with Saudi



Source: ENI

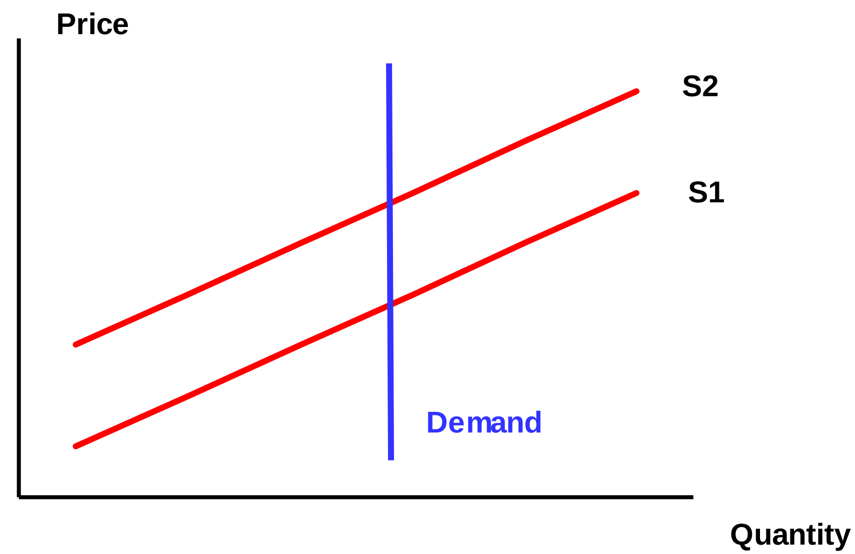
Inelastic Short-Term Supply and Demand

Peak Oil (Inelastic Supply)



Source: Deutsche Bank

Insatiable China (Inelastic Demand)



Source: Deutsche Bank

Volatility is high because the underlying demand and supply curves are so inelastic

- Demand is inelastic due to long lead times for altering the stock of fuel-consuming equipment; supply is inelastic in the short-run because it takes time to augment the productive capacity of oil fields.
- Price volatility provides incentives to hold inventories, but since inventories are costly, they are not sufficient to fully offset the rigidity of demand and supply. This fact means that shocks to demand or to supply can help to explain the high level of volatility in oil prices.

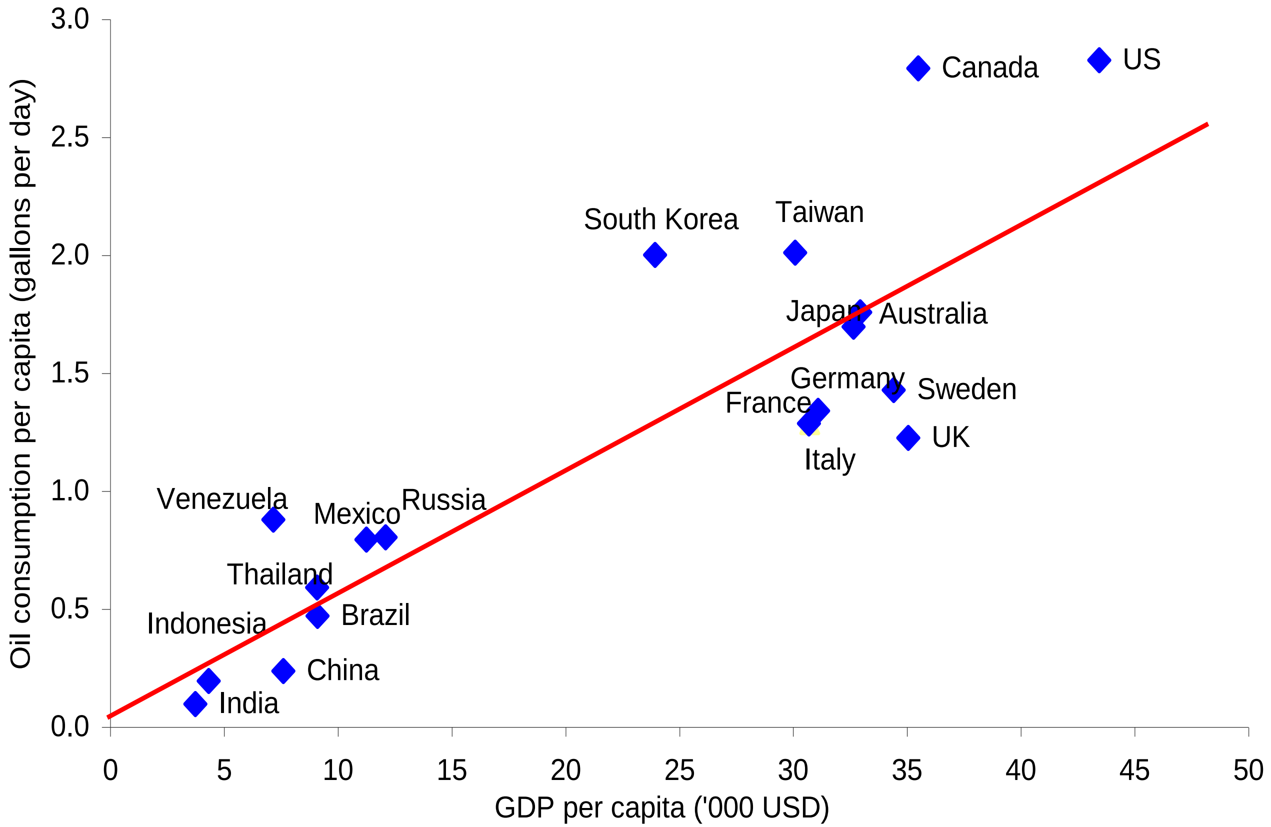
Source: James L. Smith, Southern Methodist University, “World Oil: Market or Mayhem?”, MIT/CEEPR, September 2008

Income Elasticity of Demand is Strong

Contributing to a view that demand is highly inelastic

Twenty five years ago, South Korea and Taiwan were where China and India are now.

One third of the world's population is just entering the middle class and want the oil-consuming lifestyle that goes with that.



Source: IMF, IEA, Deutsche Bank

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A Proliferation of Hubbert's Peak Books!

Contributing to a view that supply is highly inelastic

"…doomsayers hard at work fanning the flames of hopelessness and pessimism"

Leonardo Maugeri

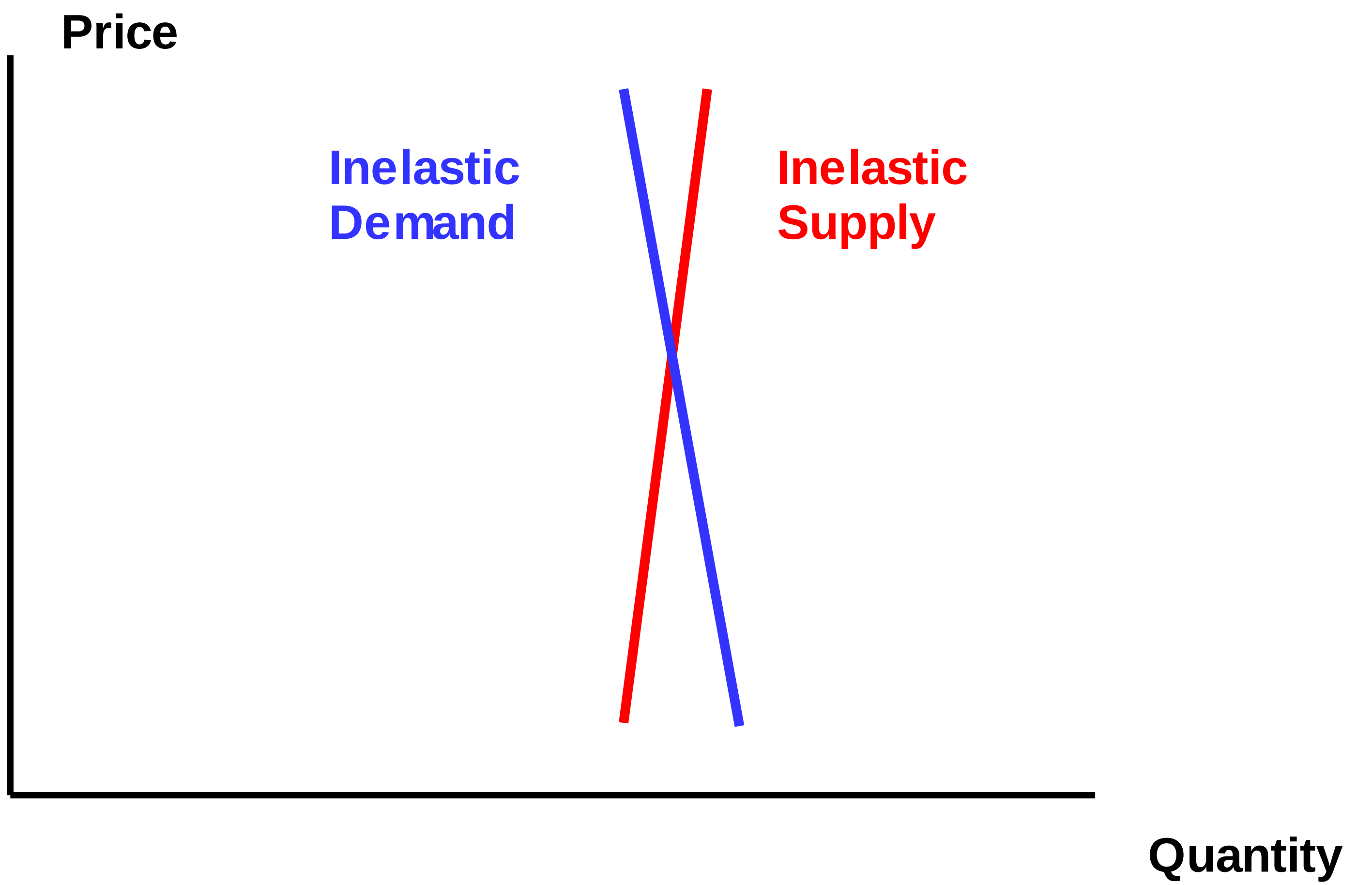
"The Age of Oil"
Praeger, 2006

- **Hubbert's Peak: The Impending World Oil Shortage**
  Kenneth Deffeyes, 2001-2003
- **The Party's Over: Oil, War and the Fate of Industrial Societies**
  Richard Heinberg, 2003-05
- **Out of Gas: The End of the Age Of Oil**
  David Goodstein, 2004
- **Twilight In the Desert: The Coming Saudi Oil Shock**
  Matthew Simmons, 2005
- **The End of Oil: On the Edge of a Perilous New World**
  Paul Roberts, 2005
- **Peak Everything: Waking Up to the Century of Declines**
  Richard Heinberg, 2007

Source: Deutsche Bank

Inelastic Short-Term Supply and Demand

Oil markets are characterized by inelastic supply and demand (with respect to price)



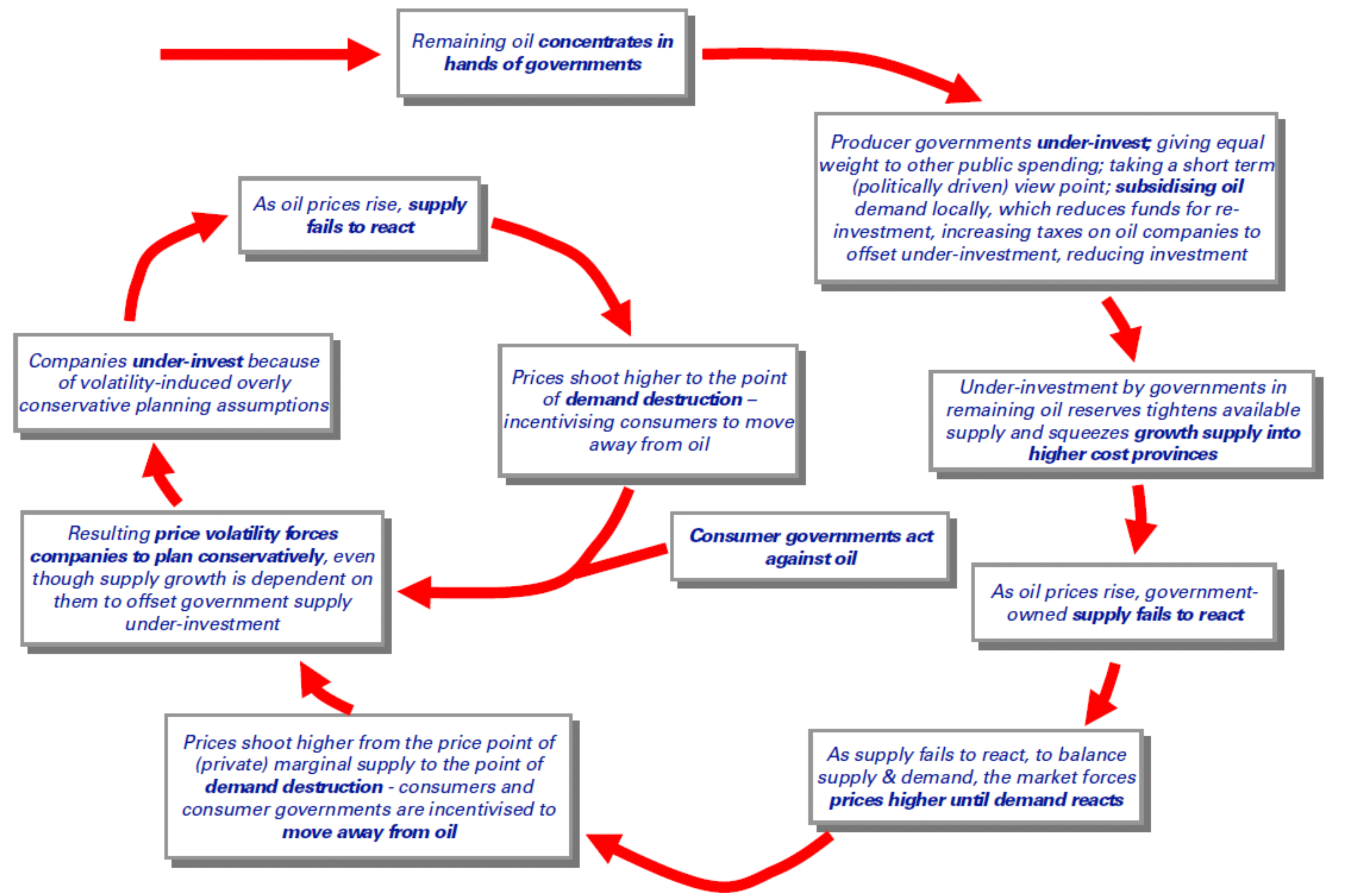
Source: Deutsche Bank

The Oil Under-Investment Cycle

Part of the volatility in oil prices is explained by investment cycles

As governments (producer and consumer) take more control of oil, supply is constrained and the under-investment cycle is exacerbated.

Paul Sankey



Paul Sankey, “The Peak Oil Market”, Deutsche Bank Securities, October 2009

Speculation Is NOT Manipulation

Fitting speculation into a scale of market activity

INVESTMENT: Placing funds with a conservative expectation of earning a return through dividends more than appreciation.

HEDGING: A financial strategy designed to reduce risk from price changes by taking a position in a futures market opposite to a position held in the cash market.

SPECULATION: Placing funds with the understanding that the deal entails high risk. Speculators tend to rely mainly on price changes to generate profit.

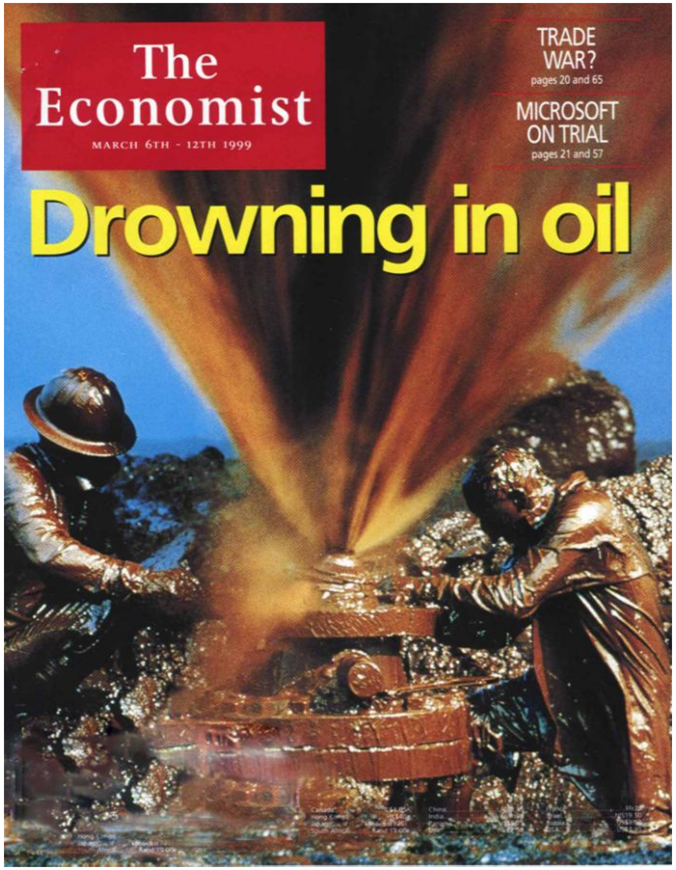
GAMBLING: Risking money on an outcome that depends mostly on chance.

MANIPULATION: Deliberately misleading other investors to artificially inflate or deflate market prices.

Source: Deutsche Bank

Expert Opinion Can Change Rapidly and Significantly

March 1999	October 2003



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Did Speculators Drive Oil to $147/bbl in 2008?

Main Street blames Wall Street

Why Don't They Look Here?

- Extraordinarily strong (unsustainable?) global economic growth from 2002-2007.
- Constrained oil supply from key producers like Russia, Venezuela, Nigeria, Iran, Iraq and others.
- Lack of OPEC spare production capacity and untimely cutbacks by OPEC at the end of 2006 that were not reversed until late 2007.
- Changes in oil product specifications (low sulfur fuels)
- Lack of spare refining capacity to handle heavy sour crude oil.
- Subsidies on oil consumption in many rapidly growing countries (economy, population or both) in Asia and the Middle East.
- Untimely strategic petroleum reserve purchases by both China and the US in 2007 and 2008.
- US dollar depreciation.

Source: Deutsche Bank image library

Source: Deutsche Bank

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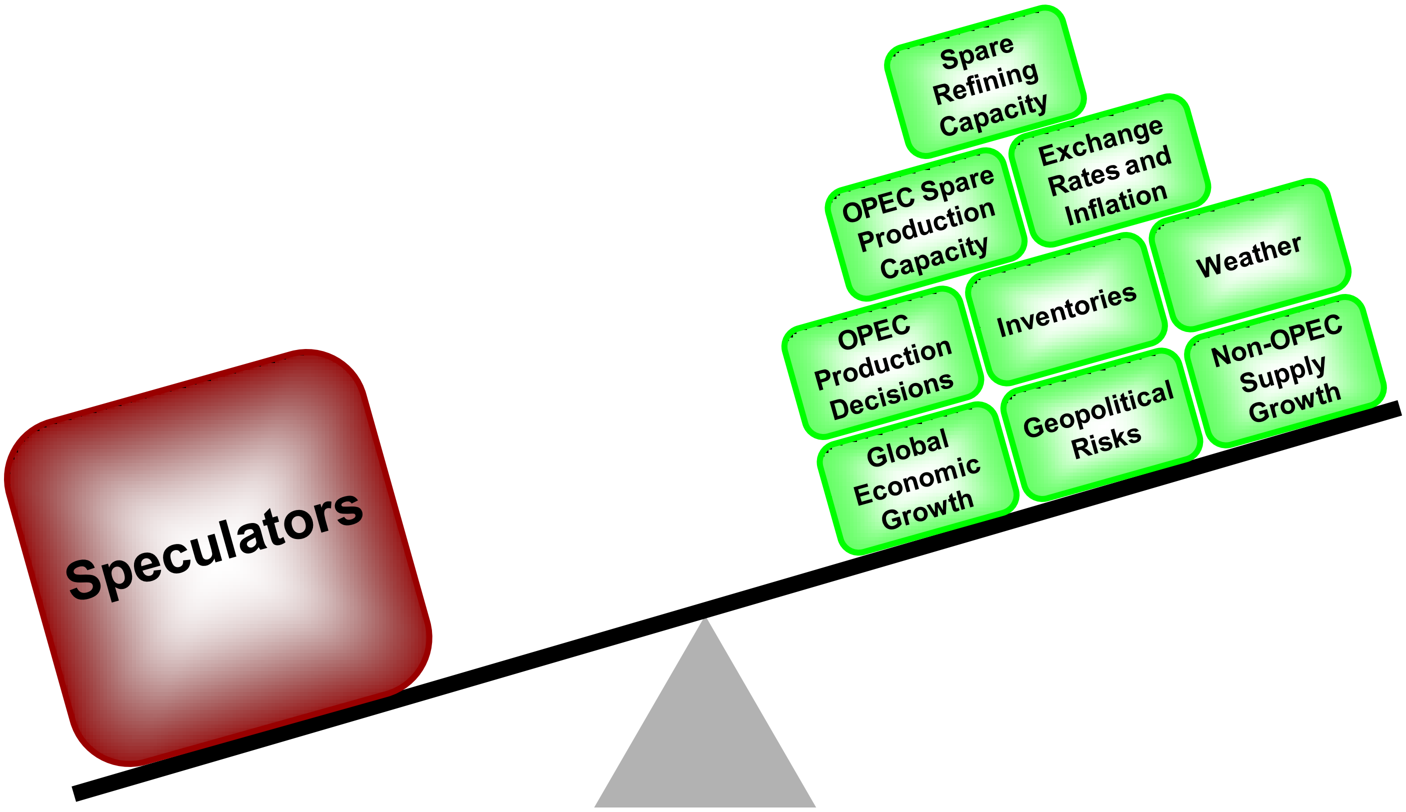
Headline Perception of Factor Weights

Blaming speculators generates great 30-second sound bites, but does it reflect reality?



Source: Deutsche Bank

Where Does That Leave Us?

"Forcing passive investors out of the oil derivative markets will reduce contango and inventories, and ultimately push prices up."

Philip Verleger, *The Petroleum Economics Monthly*, August 2009

A Final Thought: Rare Events

Explaining occurrences that have seemingly low probabilities

Capacity to understand our world still has limits

Computer models work best with good data sets

Recent events loom large

Non-rational behavior is commonplace

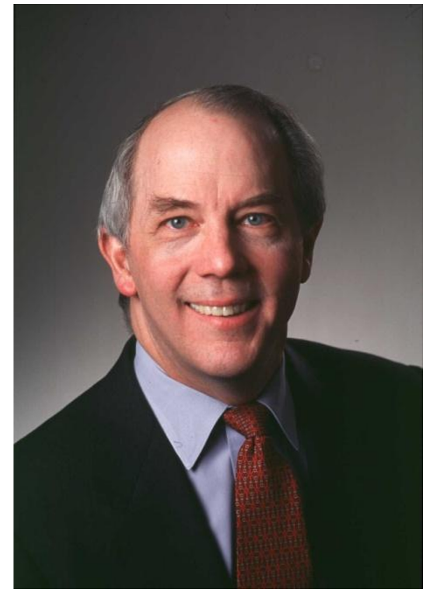
Accidents happen

Some events are random

Source: Jonathan Adelman, University of Denver,

Private lecture in Los Angeles, September 2009, used with permission

Adam Sieminski



Adam is the Chief Energy Economist for Deutsche Bank, working with the Bank's global commodities research and trading units.

Drawing on extensive industry, government and academic sources, Mr. Sieminski forecasts energy market trends and writes on a variety of topics involving energy economics, climate change, politics and commodity prices. From 1998 to 2005 he served as the energy strategist for Deutsche Bank's global oil & gas equity team. Mr. Sieminski was the senior energy analyst for NatWest Securities in the US during 1988-1997, covering the major US international integrated oil companies. He received both his undergraduate degree in Civil Engineering and a masters in Public Administration from Cornell University.

He has been president of the US Association for Energy Economics and the National Association of Petroleum Investment Analysts. He is a member of the US National Petroleum Council, an advisory group appointed by the US Secretary of Energy. He also acts as a senior advisor for the Center for Strategic and International Studies, a nonpartisan policy think-tank in Washington. He is a member of the London, New York and Washington investment professional societies, and holds the Chartered Financial Analyst (CFA) designation.

Appendix 1: Analyst Certification

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Adam Sieminski

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