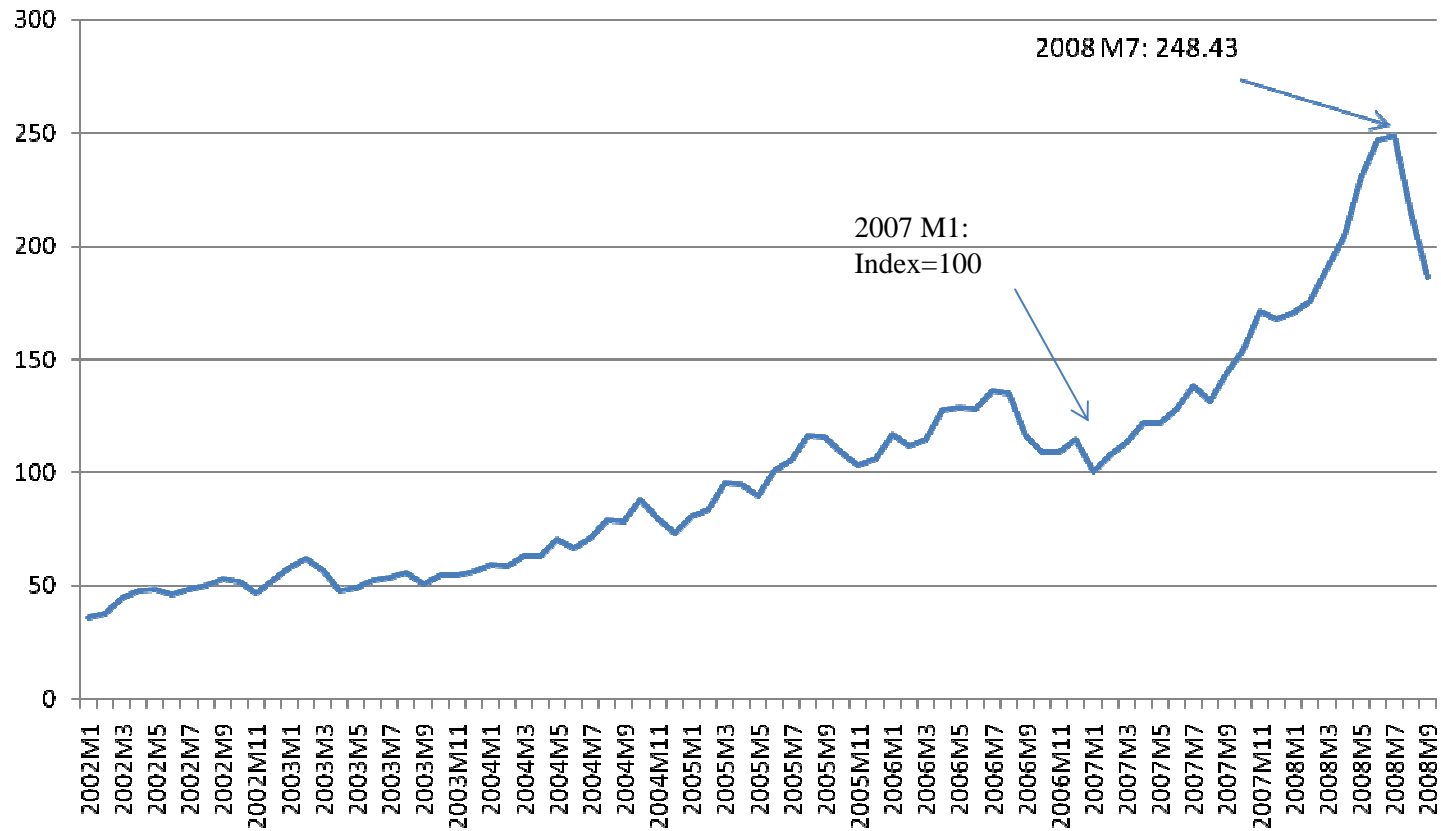


# An Oil Market Looking for Some Direction

Dr Bassam Fattouh  
Oxford Institute for Energy Studies  
21 October 2008

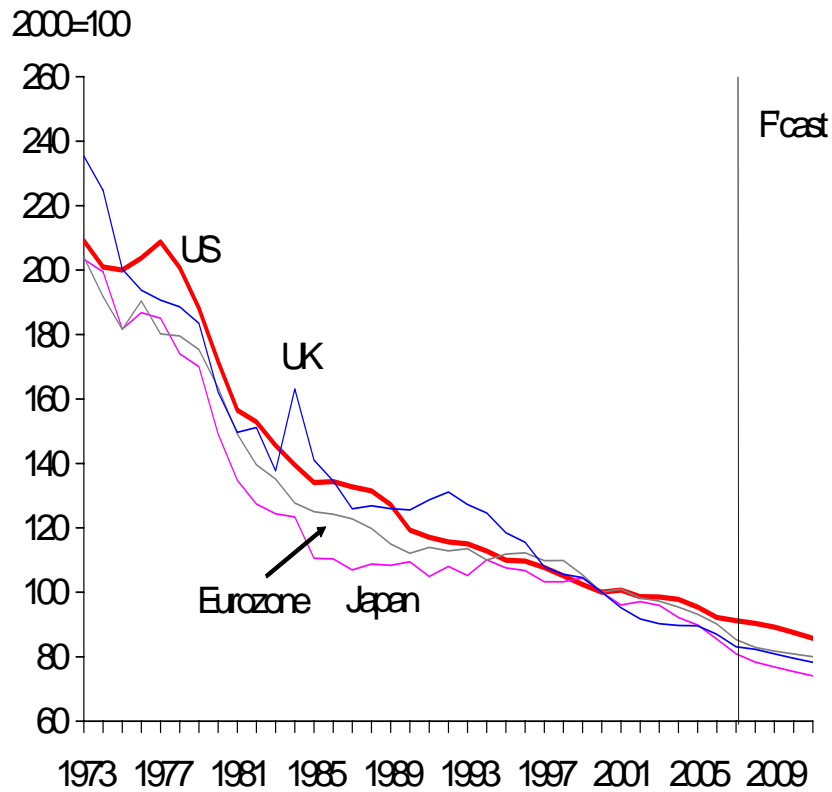
# The Sharp Rise in Oil Price

Price index, 2005 = 100: Simple average of Dated Brent, WTI, Dubai Fateh



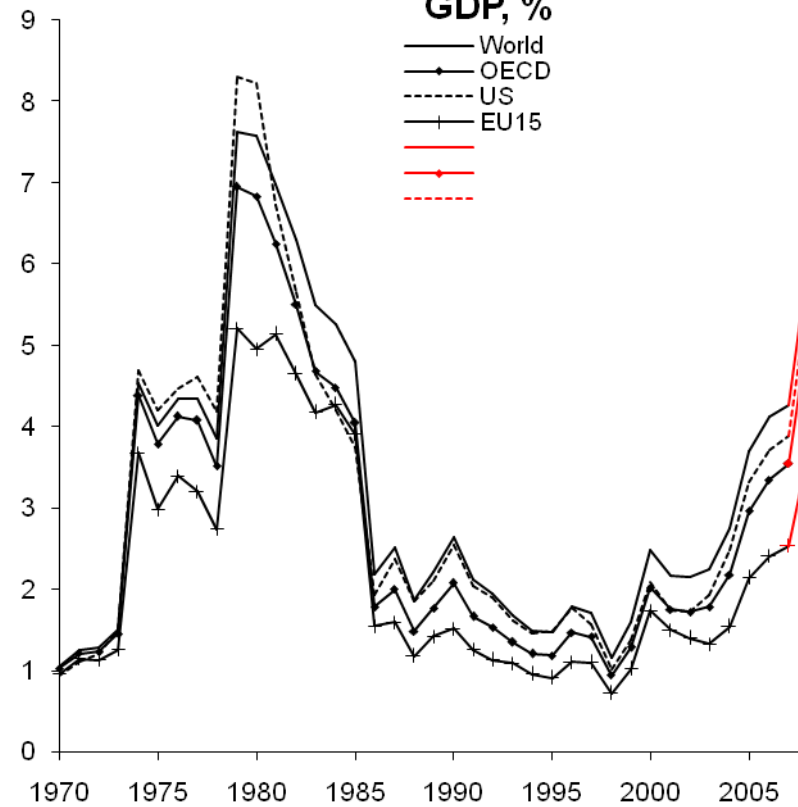
# Oil Shock Large despite fall in share of oil expenditure

## Global: Oil intensity



Source: Oxford Economics

## Petroleum expenditure as share of GDP, %



World  
OECD  
US  
EU15

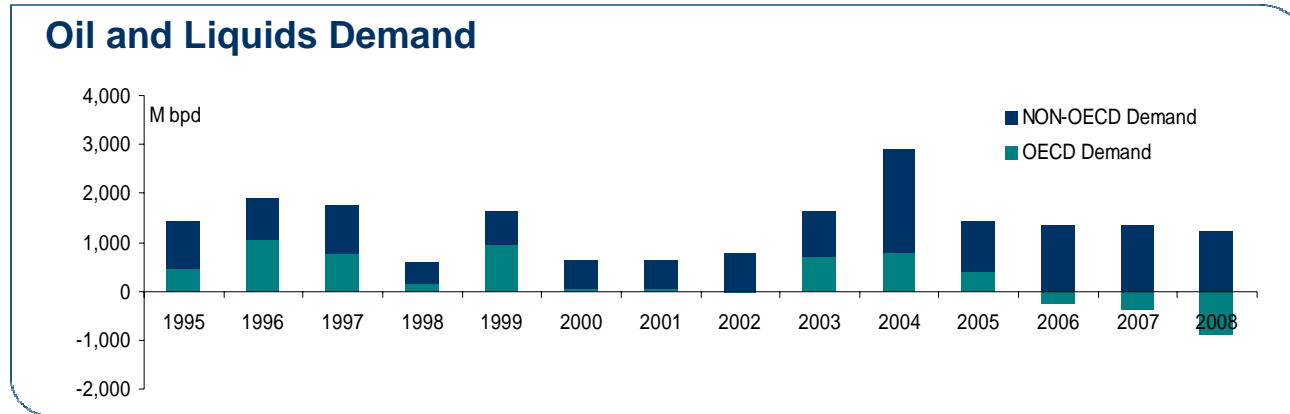


# Is the Conventional Framework Still Relevant?

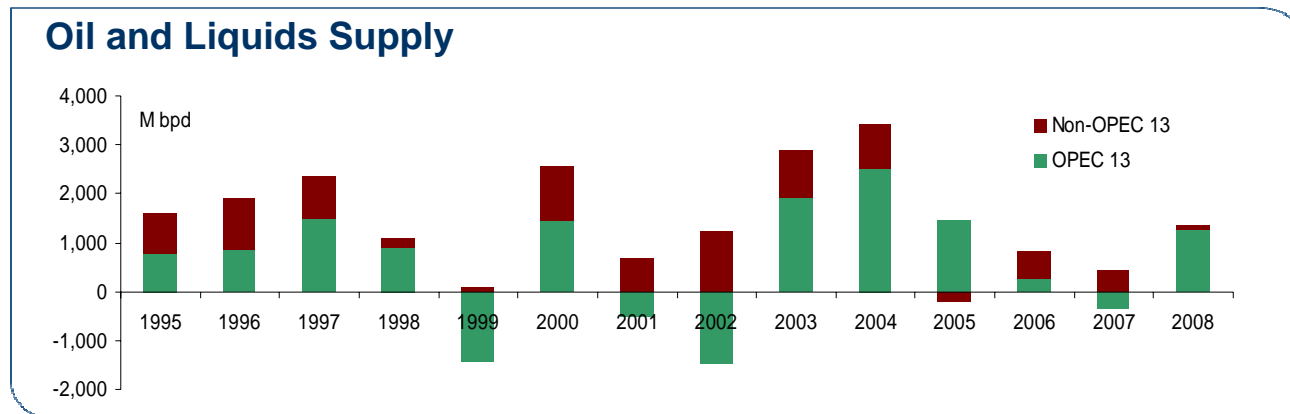
- Demand
  - High oil prices will have an adverse impact on demand and economic growth
  - High oil prices induce inflationary pressures that require tightening of monetary policy
  - High oil prices will induce efficiency and conservation policies
    - Feedback: Reduced global oil demand or slowdown in oil demand growth
- Supply and Investment
  - Non-OPEC supply
    - Feedback: High oil prices induces greater investment and supply response from non-OPEC countries
  - Entry of substitutes
    - Feedback: High oil prices will encourage substitution at the margin
  - OPEC response
    - Feedback: OPEC imposes a price ceiling on the oil price
    - Avoid demand destruction for its oil in the long term and limit entry of substitutes
- Spare capacity
  - Feedback: Cushion against adverse supply/geopolitical shocks
- Implications
  - High degree of determinacy in the future oil price based on supply/demand 'fundamentals'
  - Back end of crude oil futures curve very rarely strayed outside \$20 - \$22 range and governments and financial market thought in terms of that range
  - Relationship between current price of oil and expected change in prices

# Global Oil Balances

Growth in Global Demand is a non-OECD Phenomenon

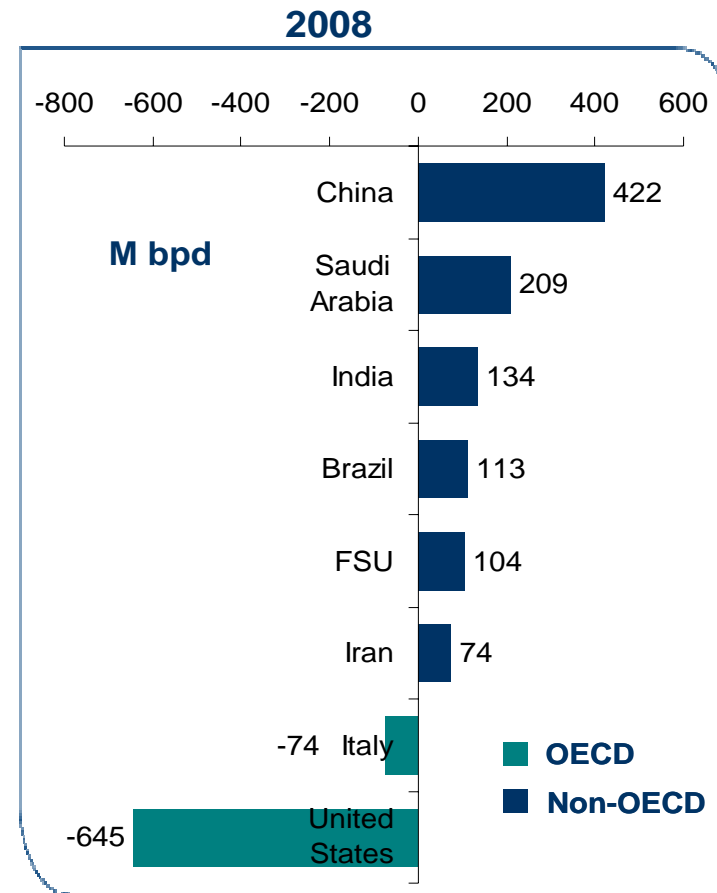
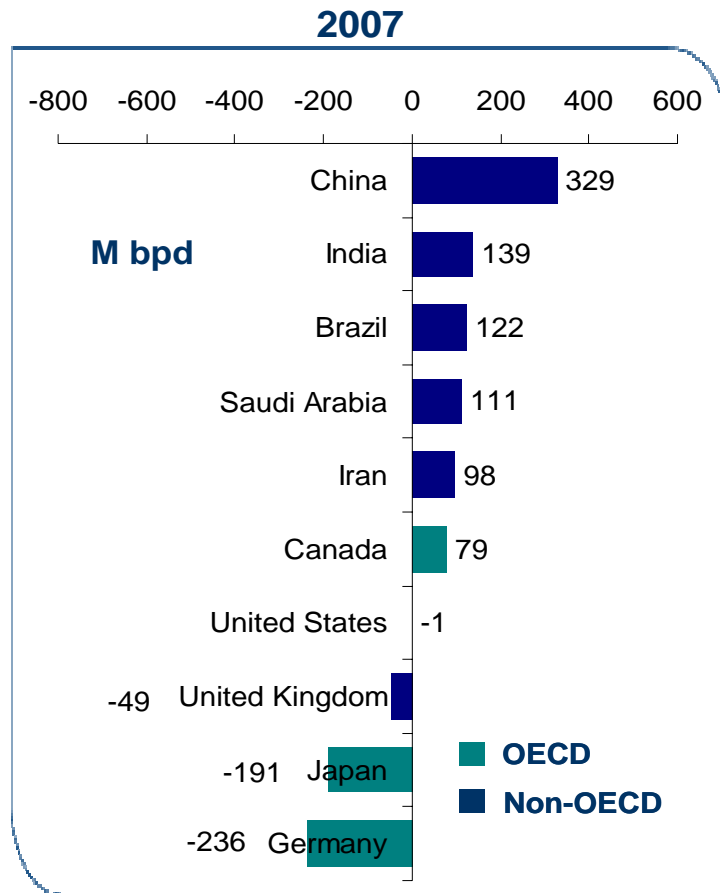


Most of demand met by OPEC Supply



Source: IEA

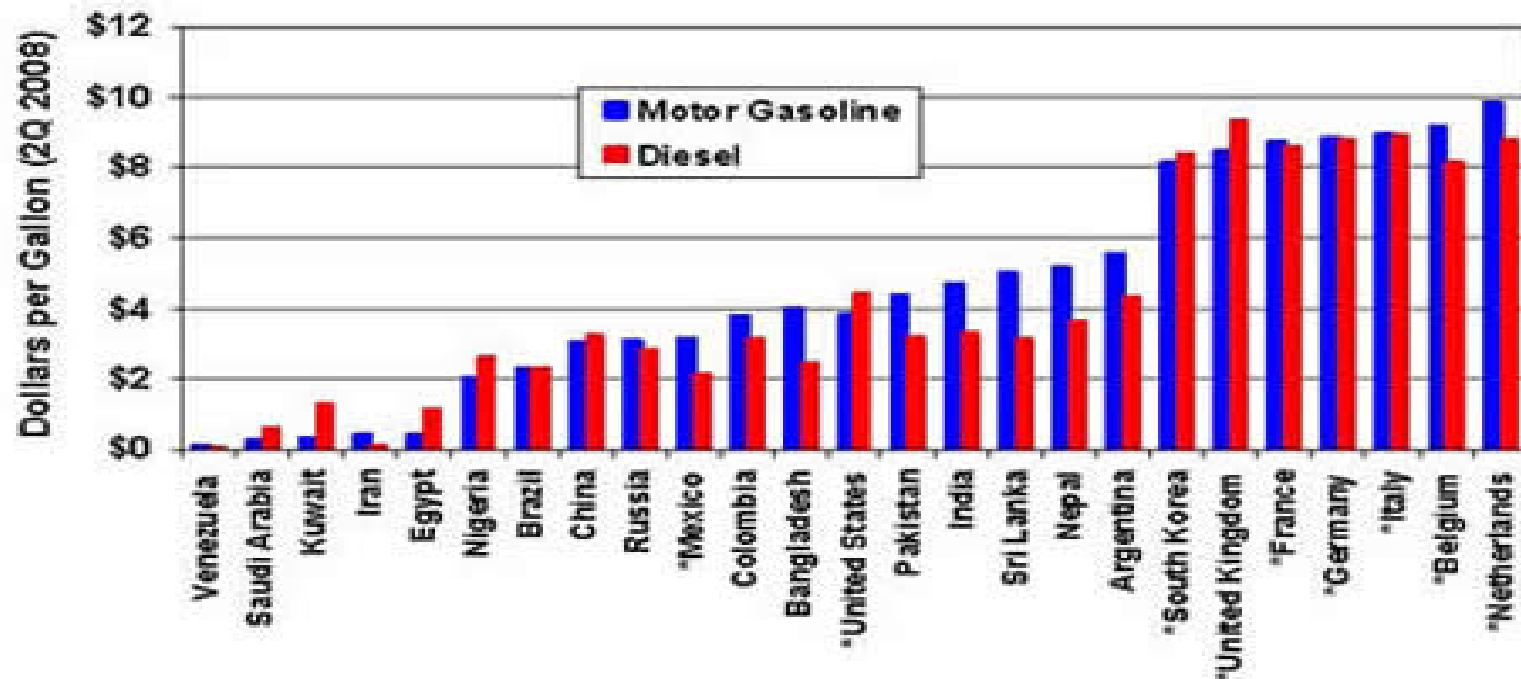
# Demand Change



Source: IEA

# Less than Full Pass-Through to Retail Prices

## Retail Gasoline and Diesel Prices Vary Greatly Across Countries

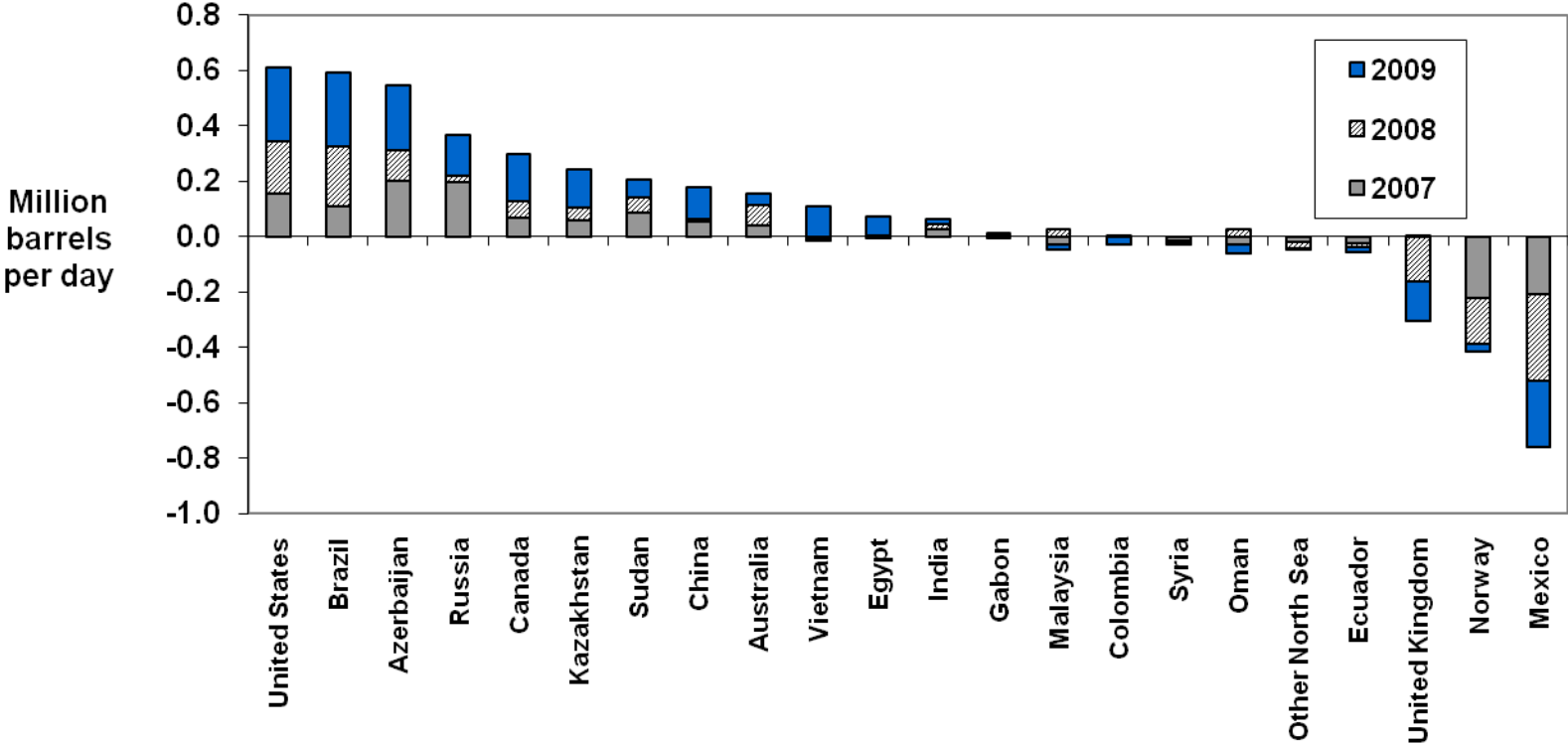


Note: \* denotes countries belonging to the Organization for Economic Cooperation and Development.

Sources: Energy Information Administration, International Energy Agency, and Cambridge Energy Research Associates.

# Non-OPEC Oil Production

## Non-OPEC Oil Production Growth (Change from Previous Year)



Source: EIA

# Sources of US Production Growth

Corn Ethanol Component Main Contributor to Production Growth

	Crude	NGLs	Other	Total
2005	5,178	1,717	440	7,335
2006	5,102	1,739	498	7,339
07Q2	5,161	1,776	603	7,540
07Q3	4,941	1,782	631	7,355
Dec	5,056	1,828	682	7,566
07Q4	5,039	1,851	659	7,549
2007	5,064	1,783	615	7,462
Jan	5,093	1,783	692	7,568
Feb	5,113	1,830	718	7,661
Mar	5,139	1,847	747	7,734
08Q1	5,115	1,820	719	7,654
Apr	5,162	1,880	745	7,787
May	5,166	1,908	794	7,868
Jun	5,109	1,810	764	7,683
y/y	13	30	158	201
08Q2	5,146	1,866	768	7,780
2008 to date	5,131	1,843	743	7,717
y/y change	-9	94	160	245

Source: Barclay's Capital

# The Top Decliners: Mexico

Figure 42: Oil output and 12 month average (mb/d)

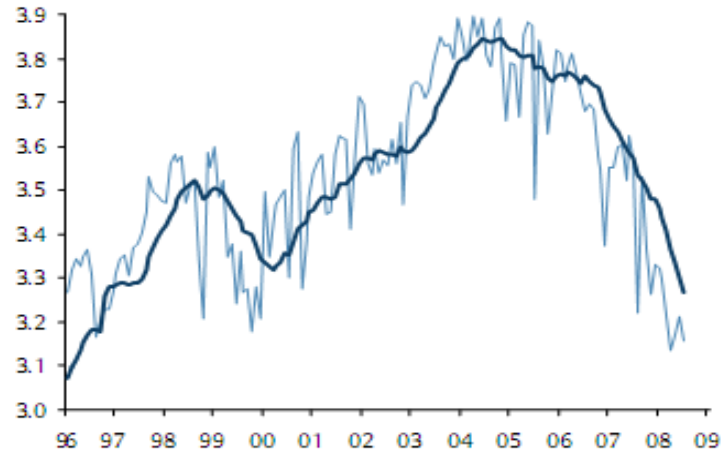


Figure 43: y/y change in oil output (thousand b/d)

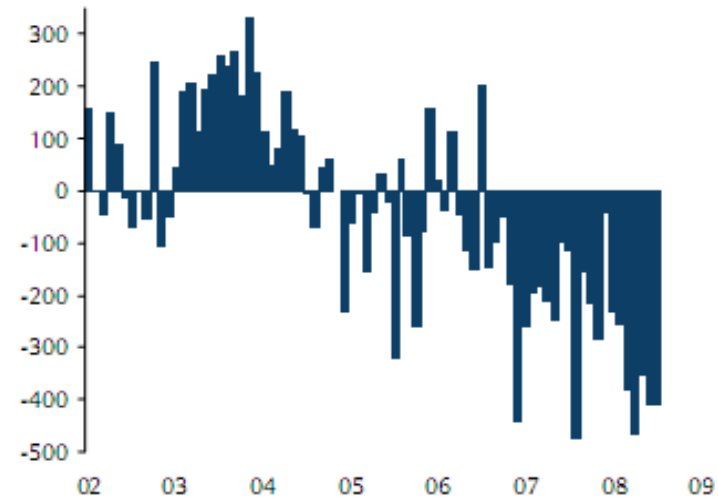
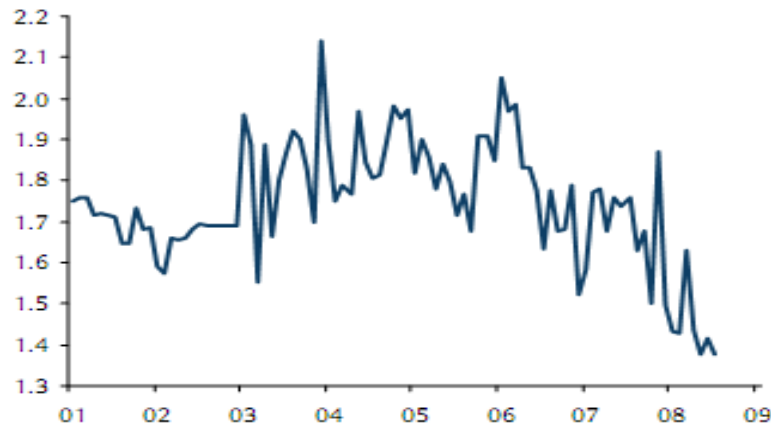


Figure 44: Crude oil exports (mb/d)



# The Top Decliners: UK

Figure 32: Oil output and 12-month average (mb/d)

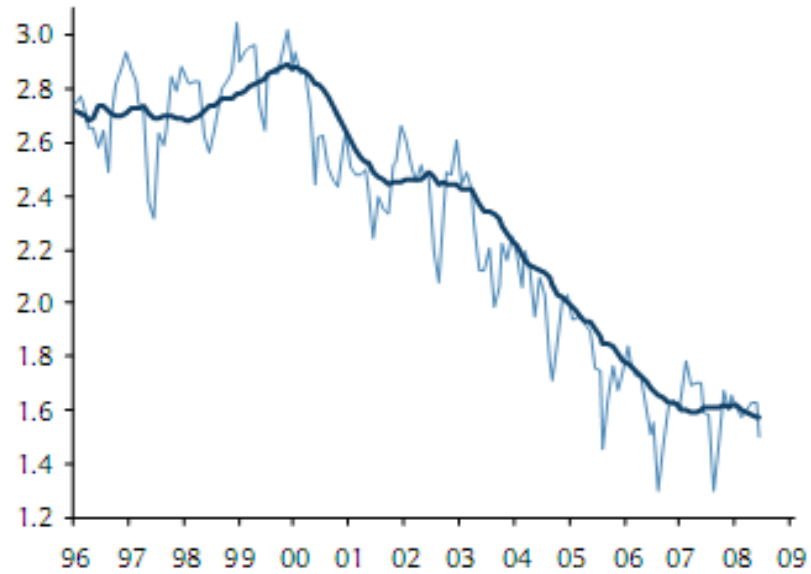
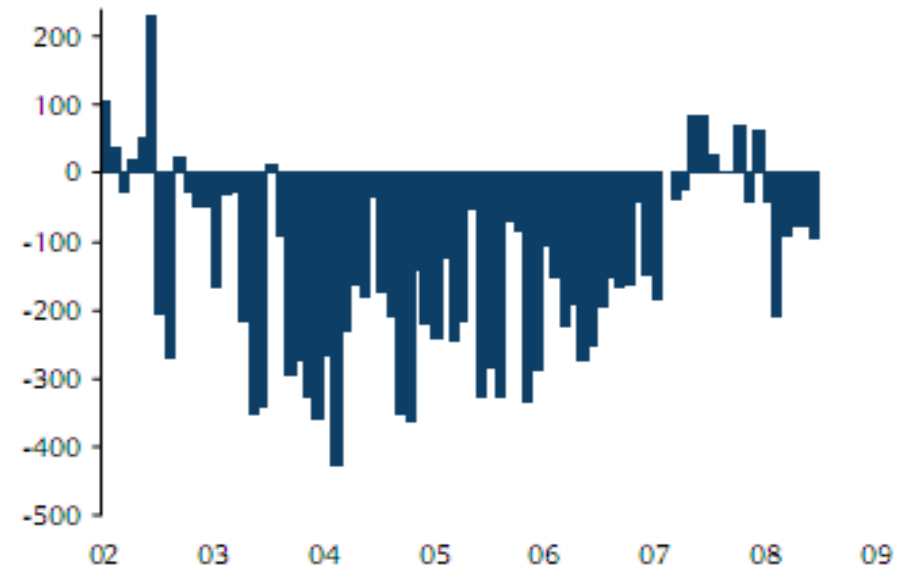


Figure 34: y/y change in oil output (thousand b/d)



# The Top Decliners: Norway

Figure 84: Output and 12-month average (mb/d)

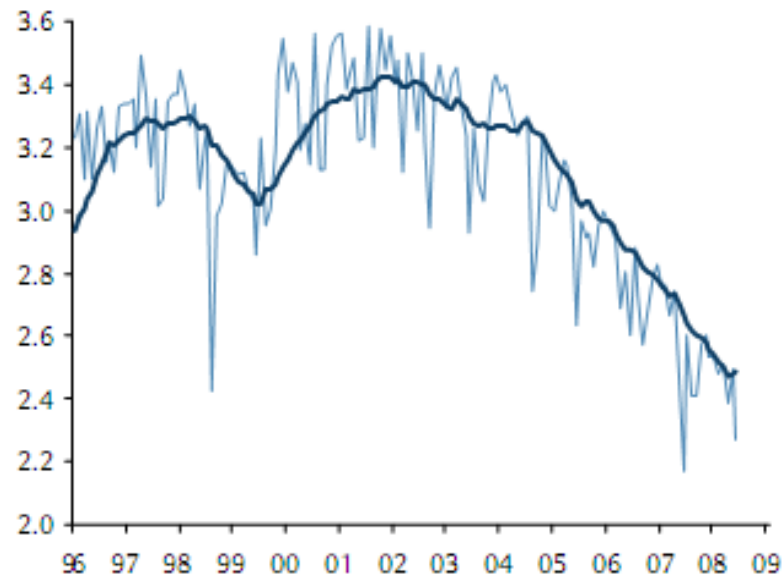
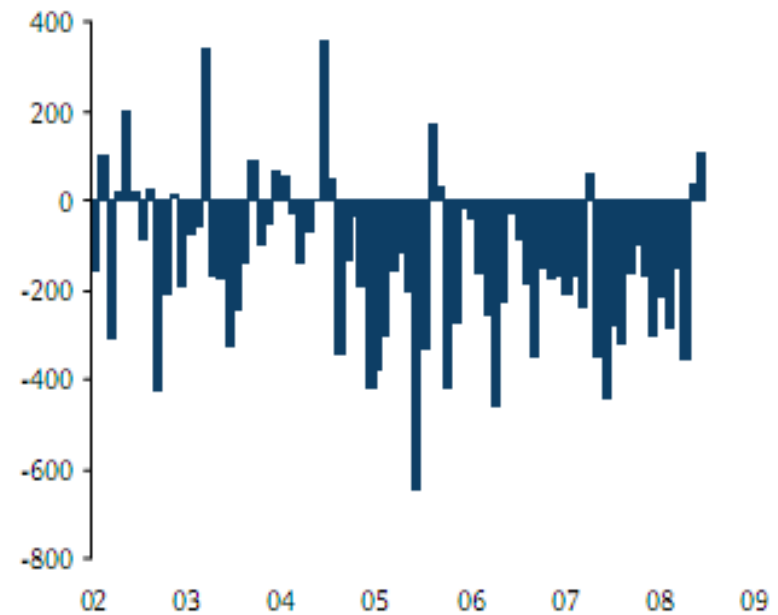
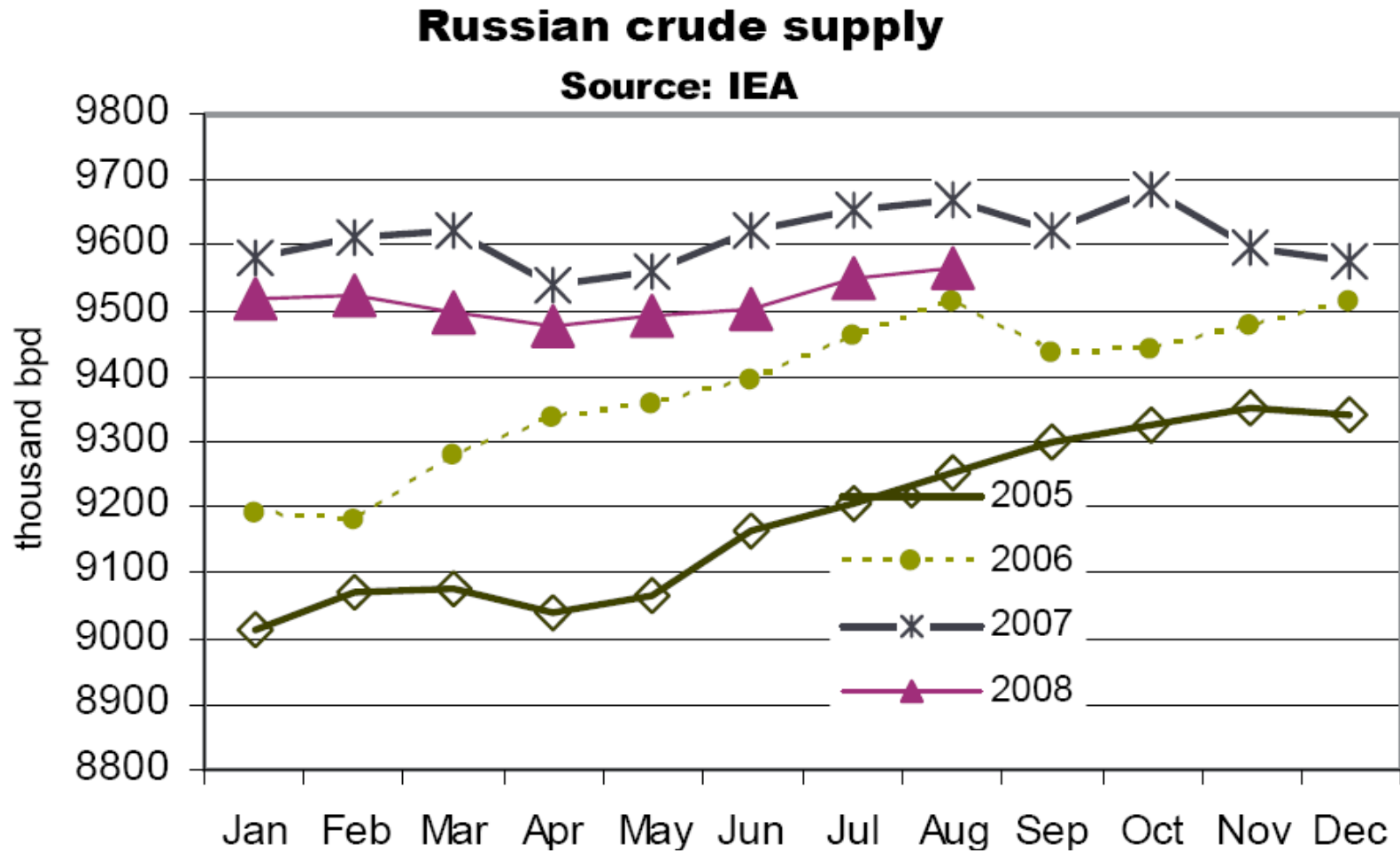


Figure 86: y/y change in oil output (thousand b/d)



# Russian Crude Oil Supply



# International Oil Companies

Year-to-Year Change in Oil Output, Thousands b/d

	Q107	Q207	Q307	Q407	2007	Q108
BP	-87	-82	-130	53	-61	7
Chevron	-8	-31	-112	-81	-58	-118
Exxon	48	-34	-110	-161	-65	-272
Shell	-5	11	-180	-348	-131	-121
Total	-9	9	-4	17	3	-41
ConocoPhillips	117	-162	-198	-143	-97	-156
6 companies	56	-289	-734	-663	-409	-701

Part of this due to harsher fiscal terms

# Decline in Oil Production Within OPEC

Figure 11: Estimates of Venezuelan output (m/d)

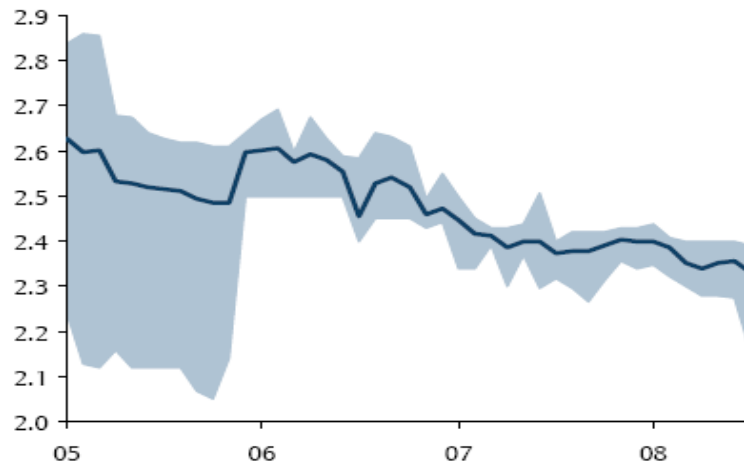


Figure 14: Estimates of Nigerian output (mb/d)

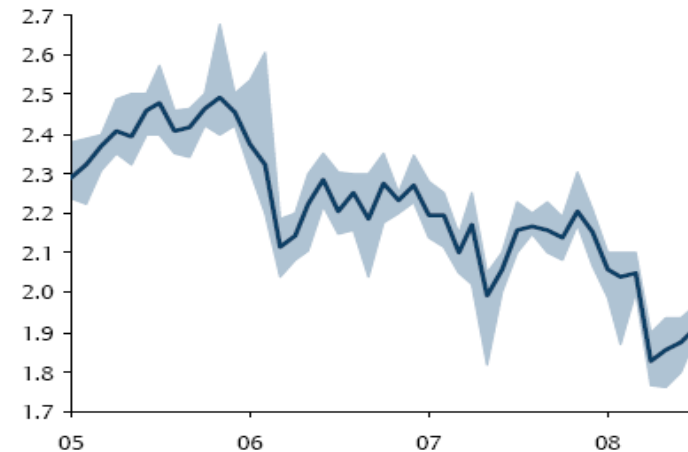
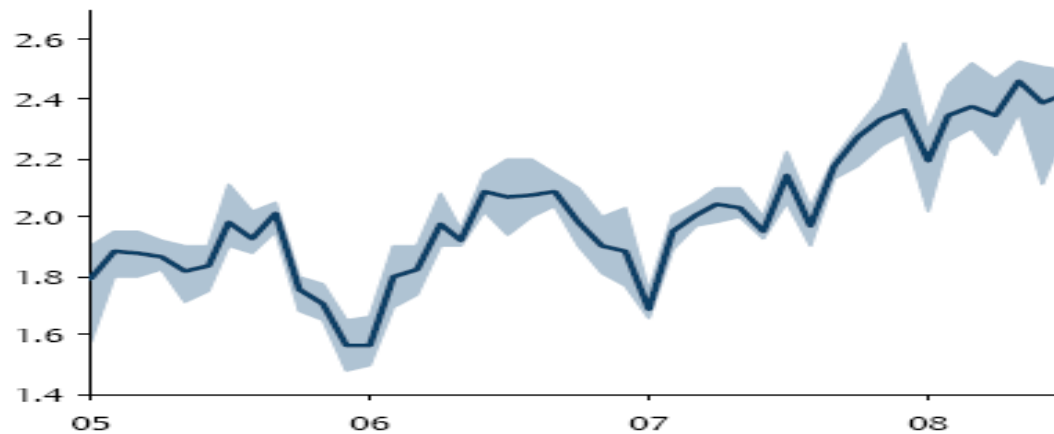
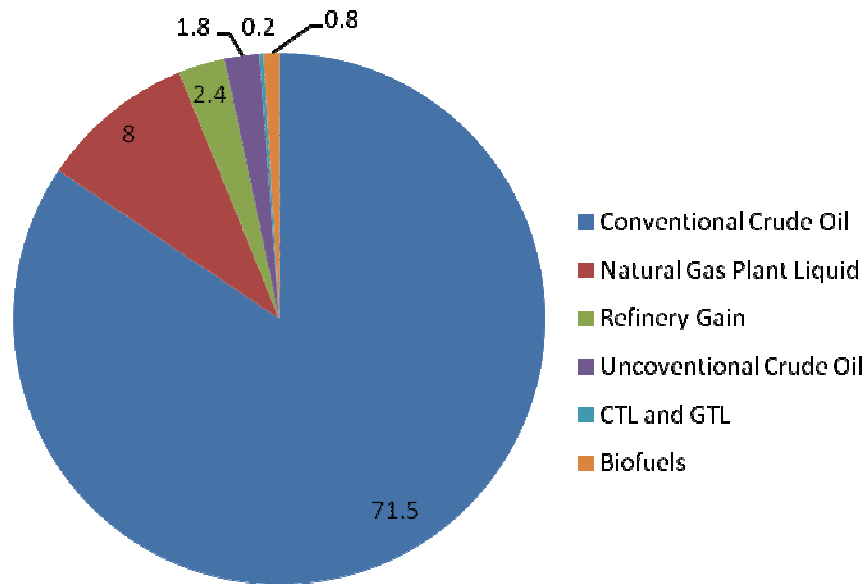


Figure 19: Estimates of Iraqi output (mb/d)



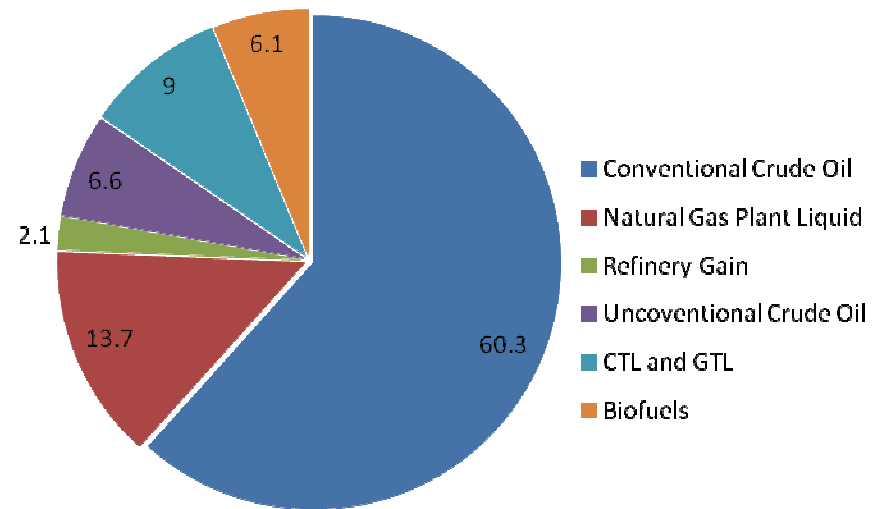
# Entry of Substitutes

**2006**



**2030**

**High Price Case**



Conventional Crude= Crude oil and lease condensate

Unconventional Crude Oil = Oil sand production, extra-heavy crude oil, and shale oil

# OPEC and Market

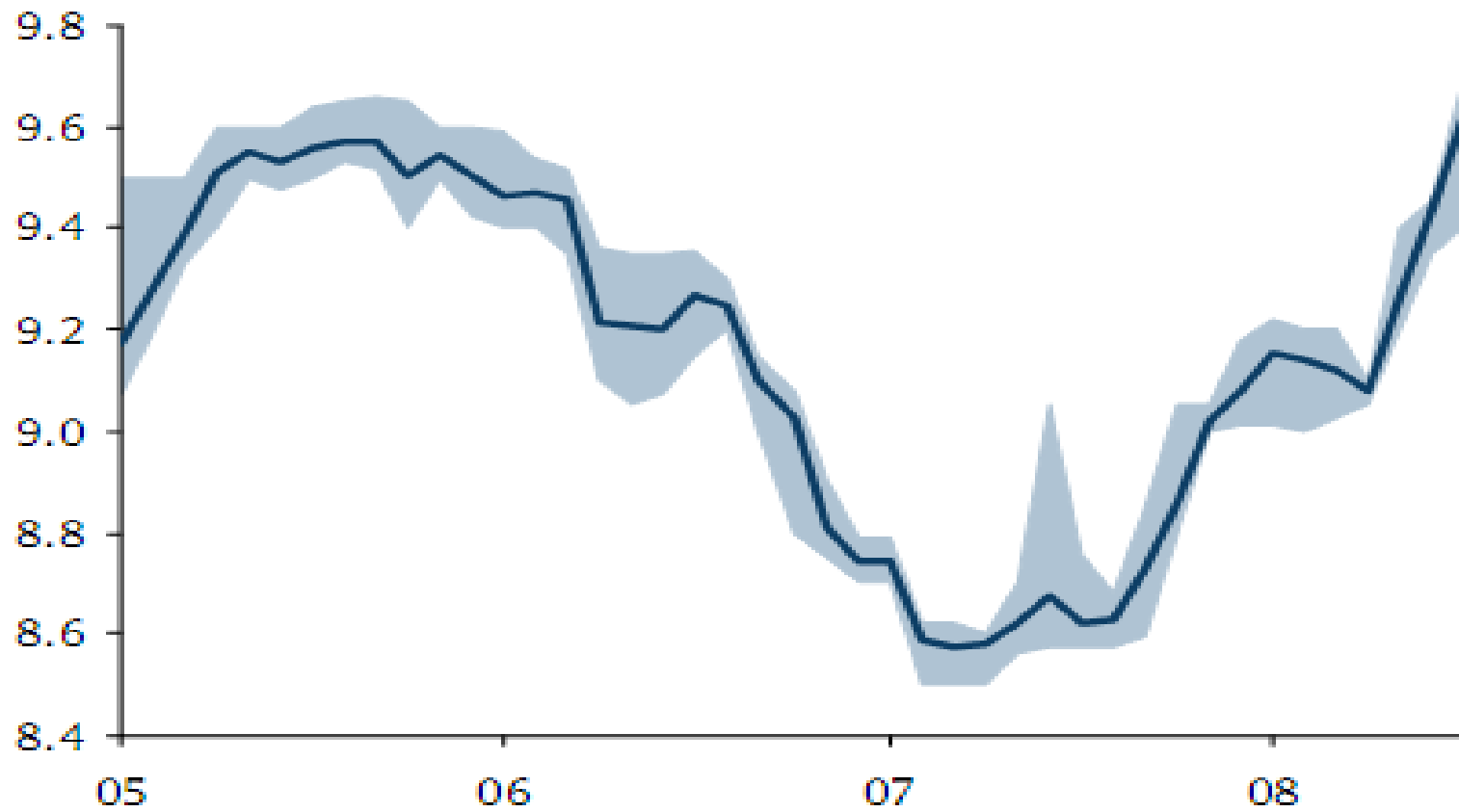
- Conventional wisdom
  - OPEC puts a floor on oil price
  - OPEC puts a ceiling on oil price
    - Avoid demand destruction for its oil in long term
    - Limit entry of substitutes, technical change, etc.
- Reinforced by OPEC price band
  - Production adjustments if OPEC basket prices above \$28 or below \$22
- Implication
  - From 1986 to 2002 back end of crude oil futures curve very rarely strayed outside the \$20 range
  - Governments and financial market thought in terms of that range
- Objective to defend oil prices from falling below some level
  - Policy tool to achieve objective is simple
  - Degree of success depends on market perception
- OPEC's role is passive when oil prices rise
- Learning process
  - Increasing oil prices did not affect growth in oil demand
- OPEC's position:
  - Will increase output but in response to customers' requests (at current prices)

# Different Cycles

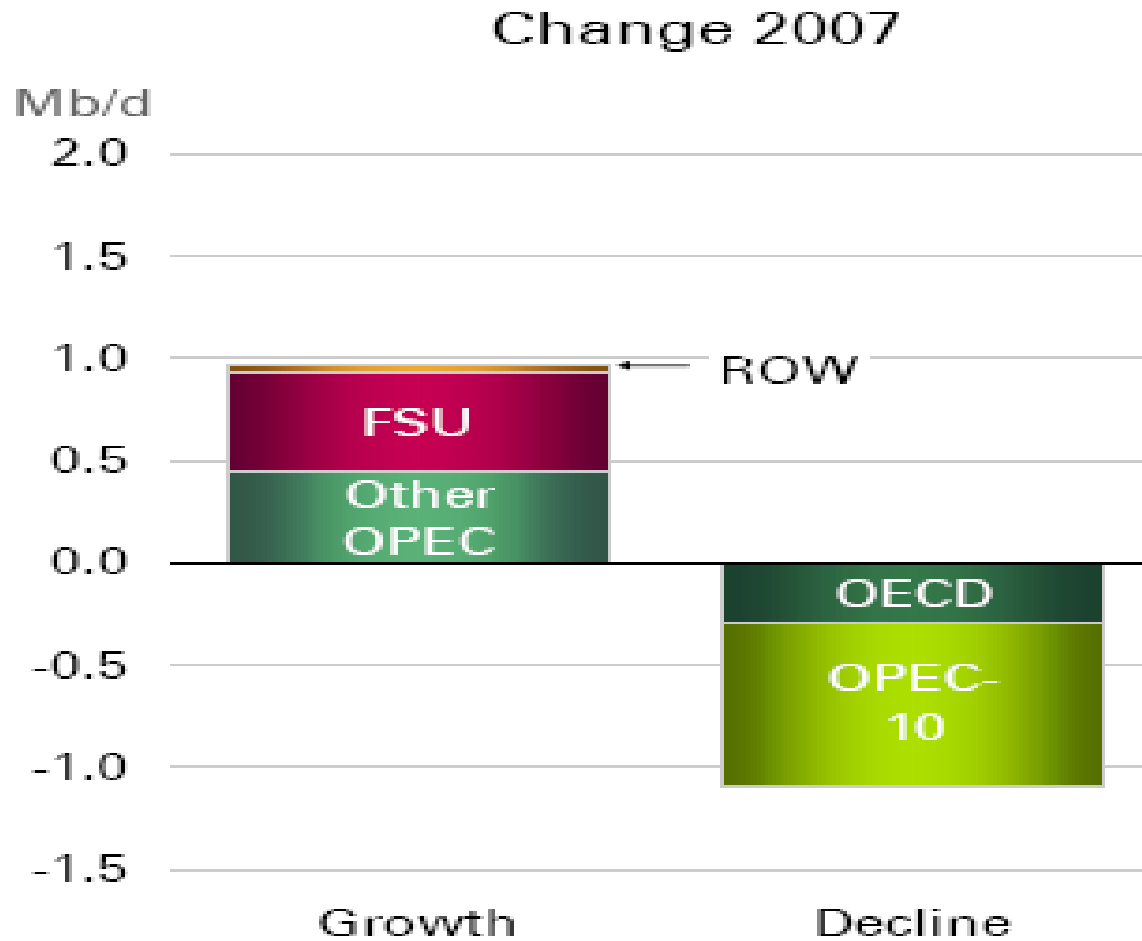
- Active in controlling inventories
  - Rapid accumulation of crude oil stocks not desired by OPEC
  - Fears sharp oil price declines if physical traders decide to unwind their position and flood the market with supplies
  - OPEC adjusted its supplies and in the process absorb part of the rise in inventories, cause spot prices to increase and change the shape of the futures curve
- Passive when oil prices were rising
  - OPEC resumed a passive role supplying the market upon demand at current international oil prices
  - No attempt to bring down prices by auctioning its spare capacity or offer discounts for refineries to lift its heavy sour crude.
- Active when oil prices reached above \$145
  - Jeddah Meeting
- Active again?

# Saudi Arabia Output

Estimates of Saudi Arabia Output (mb/d)

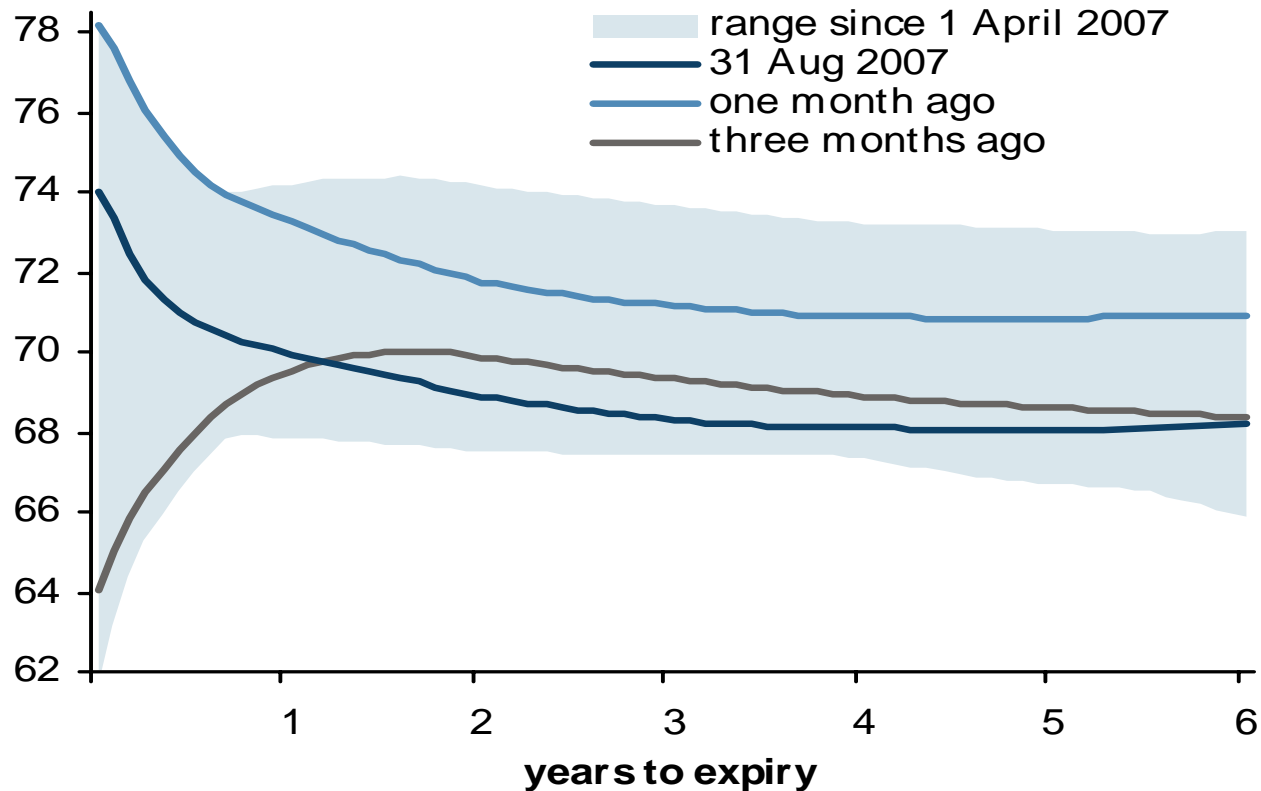


# Change in OPEC Supply in 2007



# The First Cycle: Shift from Contango to Backwardation

WTI forward curve \$/b



Source: Barclays Capital

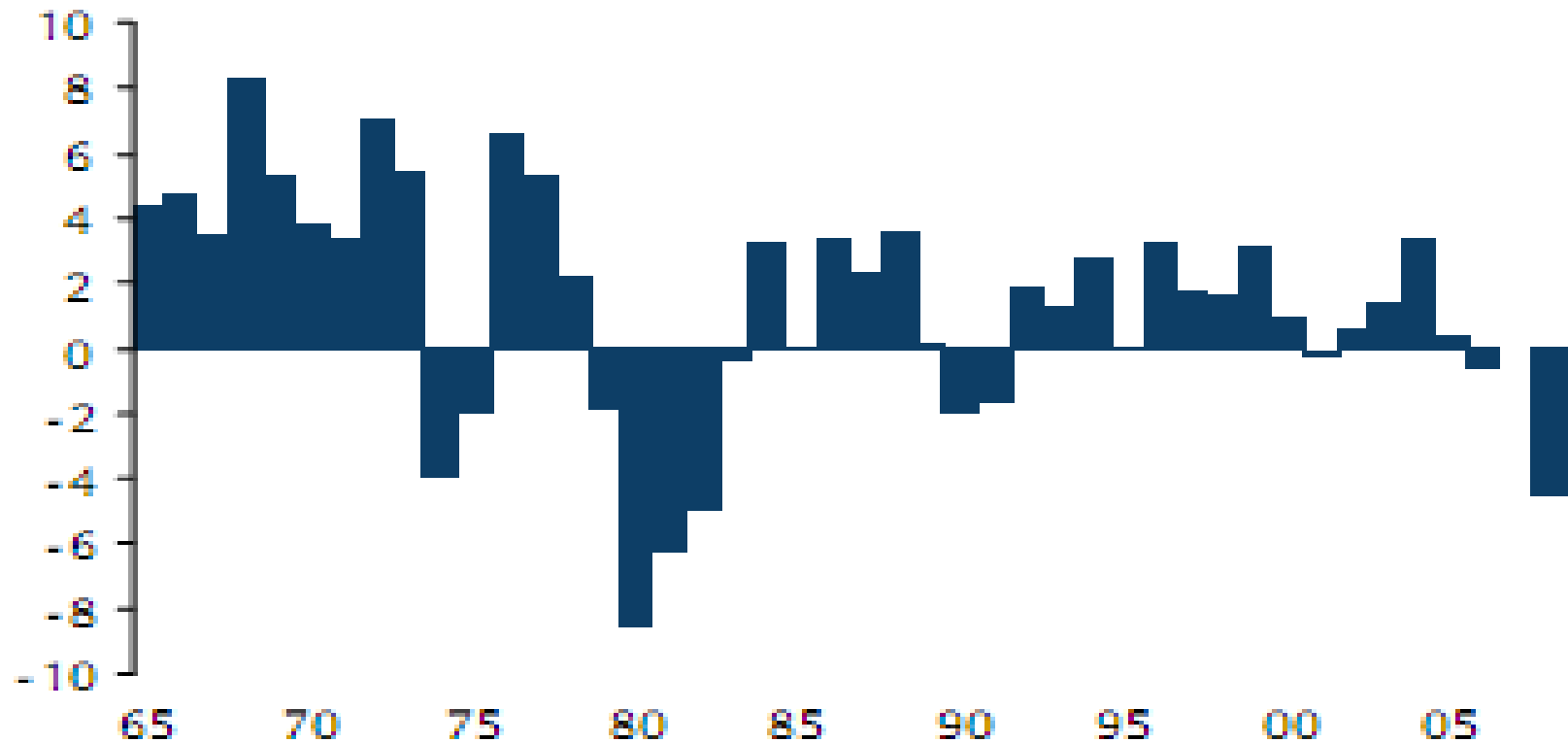
Change in shape of the curve with the back end of the future curve remaining fixed

### 3. US Demand Dynamics and Market Sentiment

- US demand weakened in last 3 years
  - 2008 weakest year for oil demand since 1982 (see Figure)
- Fall in US oil demand not cause for recent decline in oil price
  - US oil demand fallen year on year in every month since August 2007 (see Figure)
  - Recent reversal in oil price does not correspond to fall in US oil demand
- But once market reached turning point US demand intensified and maintained the negative sentiment
  - Main factor driving the market

# Largest US Fall in Oil Demand Since the Early 1980s

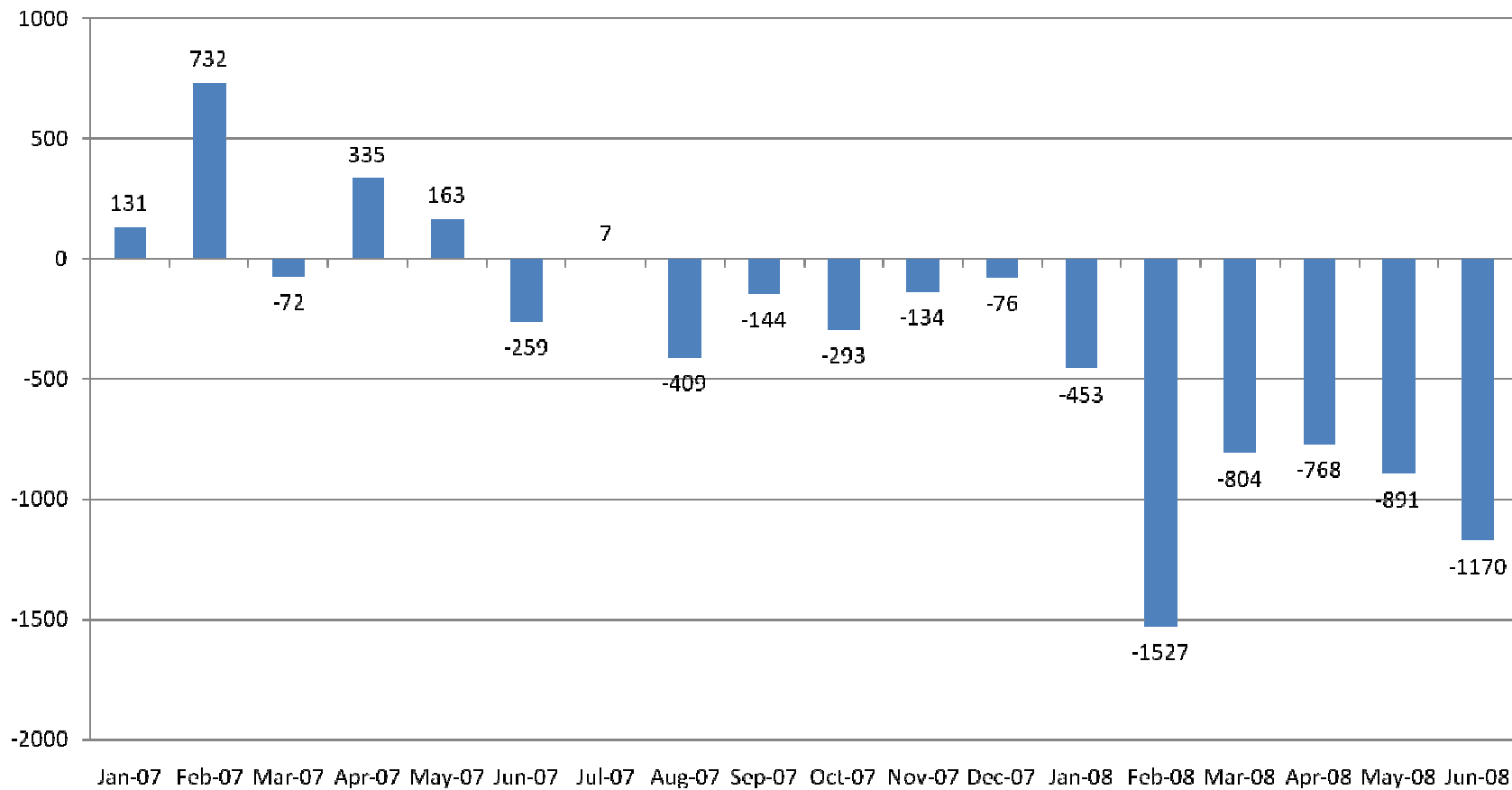
Annual Percentage Year on Year Change in Total US Oil Demand, 1965-1998



Source: Barclays Capital

# The Turning Point in Demand Does Not Correspond to the Turning Point in Oil Price

Year on Year Change in total US Oil Demand, Jan 2007-June 2008



# US Demand by Product

	Jan to Jun	y/y	%	y/y changes					
	2008	change	change	Jan-08	Feb-08	Mar-08	Apr-08	May-08	Jun-08
Natural Gas Liquids and LRGs	2149	-102	-4.5	-122	-257	12	-251	59	-84
Pentanes Plus	90	-12	-11.8	13	4	5	-107	41	-32
Liquefied Petroleum Gases	2059	-90	-4.2	-135	-261	7	-144	19	-52
Ethane/Ethylene	757	31	4.2	7	45	104	-47	94	-20
Propane/Propylene	1220	-76	-5.9	-75	-294	-17	-75	-50	30
Normal Butane/Butylene	80	-40	-33.4	-54	-7	-66	-37	-28	-46
Finished Petroleum Products	17663	-713	-3.9	-326	-1155	-620	-337	-770	-1099
Finished motor gasoline	9023	-181	-2.0	-71	-164	-109	-99	-219	-421
Reformulated	3098	58	1.9	33	217	85	110	40	-132
Conventional	5924	-239	-3.9	-105	-382	-194	-209	-259	-289
Finished Aviation Gasoline	16	-2	-9.1	-3	-1	0	-1	2	-6
Kerosene-Type Jet Fuel	1560	-61	-3.7	-70	-97	-18	-54	-54	-74
Kerosene	35	3	10.0	-21	2	11	-1	14	13
Distillate Fuel Oil	4061	-196	-4.6	-47	-331	-194	-106	-132	-386
15 ppm sulfur and under	3223	468	17.0	584	569	258	531	561	314
> than 15 ppm to 500 ppm sulfur	243	-345	-58.6	-239	-371	-223	-351	-392	-500
> than 500 ppm sulfur	596	-319	-34.9	-392	-529	-228	-286	-301	-201
Residual Fuel Oil	638	-115	-15.2	-87	-394	-152	1	-30	-45
Petrochemical Feedstocks	574	-46	-7.5	40	-59	-8	-11	-180	-59
Naphtha for Petro. Feed. Use	249	-39	-13.5	-53	-42	-5	16	-77	-72
Other Oils for Petro. Feed. Use	325	-7	-2.2	92	-17	-3	-26	-103	13
Special Naphthas	46	4	9.5	-24	12	29	-1	23	-16
Lubricants	138	-7	-4.7	-19	3	-8	0	-15	1
Waxes	9	-1	-13.9	-4	2	-7	0	3	-2
Petroleum Coke	430	-54	-11.2	65	-227	-87	45	-95	-30
Asphalt and Road Oil	382	-54	-12.4	-51	24	-75	-95	-62	-56
Still Gas	681	-12	-1.7	-23	40	3	-27	-37	-22
Miscellaneous Products	70	8	12.2	-10	35	-4	12	11	5
<b>Total</b>	<b>19781</b>	<b>-925</b>	<b>-4.5</b>	<b>-453</b>	<b>-1527</b>	<b>-803</b>	<b>-768</b>	<b>-891</b>	<b>-1170</b>

Source: Energy Information Administration, Barclays Capital

## 4. Conclusions: Where are Oil Markets Heading?

- State of the world economy
  - How deep is the recession?
  - Will Asia decouple?
- Has the fall in US oil demand reached a bottom?
  - Not yet
- OPEC reaction
  - Is there a new oil price floor that OPEC wishes to defend?
  - Will OPEC be able to defend oil price in face of global recession?
- All other dynamics such sluggish performance of non-OPEC supply, investment constraints, geo-political situation, spare capacity still in play
  - Will any of these change dramatically in the near future?
- Don't underestimate the shift in sentiment (either way)