Oil Prices & Markets:
Ten Observations

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1. Spare Capacity and Prices

- Lack of spare capacity affects the dynamics of oil prices
- One major change in recent years has been the gradual erosion of spare capacity
Rapid Decline in OPEC Spare Capacity

- Spare capacity around 2% of global oil demand in 2004 despite increase in OPEC production capacity

Source: IMF; BP
Spare Capacity

- Saudi Arabia holds 55% of OPEC spare capacity in 2006
The Impact of Loss of Spare Capacity Cushion on Prices

- Accelerating Global Demand
- Low Non-OPEC Supply Growth
- Cycle of Underinvestment

- OPEC Spare Capacity Reduced
- Bottlenecks in Downstream

- Global oil system’s ability to respond to shocks weakened

- Accelerated rise in oil prices
- Volatility in oil prices
- Occasional spikes in oil prices

- Impact of shocks magnified in absence of spare capacity
  - Geopolitical shocks
  - Weather shocks
  - Refinery fires
  - Speculators
2. Rise in Long Run Oil Prices

Source: Paul Horsnell, Long term oil prices and the capital market.
3. Contango Situation

Figure 2- WTI Forward Price Curve (as of 21 September 2006)
Peak Oil?

- Transition to contango due to a greater acceptance of peak oil
  - Hypothesis predicts oil production will reach a peak soon after which production would start to decline
  - In face of an expected growth in global demand implies oil prices for future delivery should rise faster than prompt prices
  - Implies a contango structure widening at later segments of forward curve as impending shortages become more acute further ahead
- Implication not supported by data
  - Term structure of futures contracts for long term maturities is in backwardation
Precautionary Demand

- Current price structure signalling need for precautionary inventories
- Greater demand for precautionary inventories cause price of oil for prompt delivery to rise causing backwardation
  - Holds as long as there is available storage capacity enough crude oil available in the market
- Participants meet precautionary inventories by buying futures contracts creating a contango
- Implies a fundamental shift in behaviour of market participants away from just-in-time inventory policy
- Shift has important implications on return on capital employed
  - Given pressure to maximize shareholder value unlikely private companies keep inventories when makes commercial sense to scale down
- Should be shown how precautionary inventories would maximize shareholder value
Security Premium

- Contango explained in terms of investors’ expectations of tighter crude oil market conditions in the future
- Not driven by irrational factors but by the future fundamentals of supply and demand for crude oil
  - Expectations of growth in global demand, supply response from OPEC and non-OPEC, the probability of hurricanes, geopolitical uncertainties (Iran, Iraq, Nigeria)
  - Thin spare capacity made bets on potential supply shocks extremely attractive
  - Probability of supply shock might not have changed compared to previous years or might have increased slightly upside potential in the event of such a shock can be extremely high
  - Although inventories risen, investors believe that in case of such a supply shock current level of inventories would not be enough to absorb the price rise
Contango Helping the Market

- Contango creating incentive for market participants with storage facilities to accumulate inventories, stock up their tanks, lock a profit by selling futures contracts

- Inventories then shorted in the futures market contango

- Effect of keeping the prices oil for future delivery lower than would have been in the absence of a contango
4. Contango this time associated with upward trend in oil prices
1998 Reinforcing Contango

- 1998 market entered in prolonged contango (which lasted more than 12 months)
- Contrary to current situation, 1998 contango associated with decline trend in oil prices.
- Market fell in reinforcing contango
- Contango encourage those with physical facilities to accumulate inventories
- Interpreted by market participants a sign of an oversupply
- price of oil for immediate delivery would go down
- widen differential between the oil price for future delivery and prompt price increasing the size of the contango
- In turn induce traders with physical capacity to augment their stock further
- Goes on and on
- Contango associated with falling oil prices and large accumulation of inventories
5. Inventories and Oil Prices

- Associated rise in inventories occurring together with an upward trend in oil prices
- Conventional wisdom that building up inventories would depress oil prices
- Some argue that conventional wisdom may no longer be valid
  - High levels of inventories no longer seen as necessary sign of oversupply and hence do not exert downward pressure on prices
  - Current levels of stocks (although high by historical standards) do not imply that markets are oversupplied
More Plausible Interpretation

- Higher than expected levels of inventories still cause oil prices for prompt delivery to decline
- Other factors pushing prompt prices in the opposite direction shadowing the impact of inventories on oil prices
  - Decline in oil price caused by rising inventories continuously being dominated by other factors causing oil prices to rise
Notes: Spot Price in Log Scale (left scale); Net long term positions in millions of contracts (right scale)

Source: IMF, World Economic Outlook, 2006
Speculation and Oil Prices

- **Three broad generalizations**
  - Prices appear less volatile than speculative positions
  - No common trend between prices and speculation: no persistent pickup in net long non-commercial positions when oil prices were trending upward (IMF, 2006)
  - Changes in non-commercial traders’ net long positions may coincide with changes in oil prices
    - This evidence does not establish that speculators influence oil prices
    - Could be the result of changes in fundamentals that affect both oil prices and speculative positions of traders
7. Crude Oil Price Differentials

Arab Heavy Discounts to Spot WTI

[Graph showing the price differentials over time]
Features of Crude Oil Price Differential

- WTI which is a sweet/light crude variety trades at a premium compared to Arab Heavy which is considered as a sour/heavy crude variety.
- Price differential can reach very high levels
  - For exporters of low quality crude oils, this has important implications on their revenues.
- Rise in the price differential in last few years
- Large variation in price differential between two crude oils over time, especially in the last three years of the sample.
  - Between December 2003 and January 2005, discount of Arab Heavy to WTI increased from $6 to over $14 and then fell back to $9.45 in July 2005; by November 2005, the discount rebounded to $14.50, but then declined to 11$ in February 2006.
Refining Constraint

- Discounts have responded to changes in the relative prices of petroleum products
- Explanation based on the following three elements
  - an increase in demand for light products
  - changing mix of crude production towards higher incremental volumes of sour and heavier crudes
  - Constraints on refining conversion capacity
Refining Constraints Affect Differentials but Not Levels

- Least complex refineries forced to run heavier slates producing lower proportion of light petroleum products and higher proportions of heavy petroleum products
- Price elasticity of heavy products high since can be more easily substituted; demand for gasoline more inelastic because of lack of substitutes
- Increase in demand for gasoline widened differential in products market between light and heavy petroleum products
  - fed back into the crude oil market resulting in a higher spread between heavy/sour and light/sweet crude oils
8. OPEC and Prices

- Two questions:
  - Will OPEC respond to recent slide in oil prices?
  - Will OPEC be effective in inducing production cuts?

- Conflicting signals
  - OPEC’s president “The price is very low and it’s not good for investors... Something needs to be done to steady the price”
  - Saudi Arabian Monetary Agency official: oil prices at $60 a barrel provide a "healthy situation" for exporters
OPEC Pricing Power

- OPEC pricing power is not constant
  - OPEC can lose its influence oil prices
  - Such instances can emerge both in weak and tight oil market conditions but for entirely different reasons
- OPEC alone can not determine the oil price
  - Depends on other players’ behaviour
- OPEC influence on prices complicated by participants behaviour in the futures market
  - Quota decisions can be viewed as signals to market about OPEC’s preferred range of prices
  - Signalling mechanism may or may not succeed, depending on how the market interprets these signals and whether it attach credibility to these moves
This Time Round?

- Which oil price to defend?
- Who would share the burden of cuts?
- Direction of market would depend primarily on Saudi Arabia
9. Oil Prices and Growth

- Oil price hikes often preceded global recessions
- IMF: a 10$ rise in crude prices reduces global growth by 0.1 to 0.5 percentage points
- Asian Development Bank: Escalating oil prices could cut economic growth across Asia by at least 0.6%
- G8: "Overall global growth remains solid and this is expected to continue in 2006. Risks remain, including high and volatile energy prices"
- Samuel Bodman, the U.S. energy secretary: "Am I concerned about the impact of high oil prices on the economy? Sure. Having said that, it hasn't happened yet in a meaningful way."
Global Expansion Continues Above Trend

Source: IMF, World Economic Outlook, 2006
Oil Price and Inflation

Oil price and OECD CPI

- Oil price (LHS)
- Consumer prices (RHS)

1973-76
1978-81
2002-06
10. Demand For Oil Responds to Price, but...
# Global Oil Demand by Region

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<th>Region</th>
<th>2005</th>
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<th>2007</th>
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<td><strong>World</strong></td>
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Source: IEA, September 2006