The Future of Oil Prices: Can the Past Explain the Future?

(High Oil Prices: How we Got here and Future Prospects)

Hong Kong Energy Studies Center, July 21, 2005

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Outline

- Historical Overview of Oil Prices
- Short Term Factors
- Long Term Factors
- Future Prospects
Daily Spot Oil Prices (1998-Present)

Source: IEA, 2005

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Who is Correct?

- IEA: “Irrational Exuberance”
- OPEC: “Speculative Bubble”
- Some US politicians: “OPEC market power”
- Some geologists “Oil Peak”
- Experts and the private sector “Market Fundamentals”
2003 forecasts for 2004 were all wrong

**World Demand (mb/d)**

<table>
<thead>
<tr>
<th>Organization</th>
<th>Forecasts for 2004</th>
<th>Actual in 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OPEC</strong> (Dec. 2003)</td>
<td>79.6</td>
<td>82.00</td>
</tr>
<tr>
<td><strong>IEA</strong> (Dec. 2003)</td>
<td>79.6</td>
<td>82.45</td>
</tr>
<tr>
<td><strong>EIA</strong> (April. 2003)</td>
<td>80.0</td>
<td>82.50</td>
</tr>
</tbody>
</table>
### 2003 forecasts for 2004 were all wrong

**China’s Demand (mb/d)**

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<tr>
<td><strong>OPEC</strong> (Dec. 2003)</td>
<td>5.70</td>
<td>6.40</td>
</tr>
<tr>
<td><strong>IEA</strong> (Dec. 2003)</td>
<td>5.75</td>
<td>6.37</td>
</tr>
<tr>
<td><strong>EIA</strong> (April. 2003)</td>
<td>5.50</td>
<td>6.50</td>
</tr>
</tbody>
</table>
### 2003 forecasts for 2004 were all wrong

**WTI Prices ($/b)**

<table>
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<tr>
<td><strong>EIA (April. 2003)</strong></td>
<td>Base: $24.25</td>
<td>$43.48 in December</td>
</tr>
<tr>
<td></td>
<td>High: $32.00</td>
<td></td>
</tr>
<tr>
<td><strong>Deutsche Bank (Feb 2004)</strong></td>
<td>$25.40</td>
<td>$41.44</td>
</tr>
</tbody>
</table>
Politics and Oil Prices

- Start of Iraq-Iran War
- Invasion of Kuwait
- The Gulf War
- End of Iraq-Iran War
- Invasion of Iraq
- The Asian Crisis
- September 11

Events:
- Saddam became president
- Embargo
- Saudis increase production
- Major destruction to Iraqi and Iranian oil facilities
- Oil-for-Food
- Iraq & UN
- Iraq, Russia, Venezuela
- Oil-for-Food
- September 11
- Terror
- Iraq, Russia, Venezuela
Politics & Oil Prices in 2003

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The Impact of Iraq in 2001

Data source: IEA, 2002
Two Conclusions

- This is the only time in history when oil prices increased substantially without a major political event.

- Minor political events lead to daily price volatility.

- Political events exist even with low oil prices.
Short-term vs. Long-term

- **Short-term factors** are those political, economic, technical, and natural factors that cause short term fluctuations in oil prices **around their average**.
- They do not determine the long-term direction of oil prices.
- They determine the upper and lower limits in the short run.
- Examples: Pipeline explosions, changes in weekly stocks, hurricanes, ..etc

- **Long-term factors** are those political, economic, technical, and natural factors that determine the long-term direction of oil prices.
- They shift the average of prices for an extended period of time.
- They do **NOT** determine the upper and lower limits.
- Examples: Major wars, sanctions, oil market collapse, new technology, ..etc
Short-Term Factors

- Political Factors
  - Iraq
  - Venezuela
  - Nigeria
  - Russia
  - Terrorism
Short-Term Factors

- Economic Factors
  - Economic Growth
  - OPEC
  - Inventories
  - Speculation
  - Price of Natural Gas
  - Labor Strikes
  - The US Strategic Petroleum Reserve
Increase in Economic Growth Rates

Source: International Monetary Fund, World Economic Outlook Database, April 2005.

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Change in World Petroleum Consumption

Source: IEA, 2005
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Why Demand Increased?

- **China**
  - Economic Growth
  - Migration of IT Companies to China *(transferred demand)*
  - Electricity Sector and Private Generation

- **United States**
  - Economic Recovery
  - Rise of Price of Natural Gas
  - SUVs
  - SPR
Why Demand Increased?

- **Japan**
  - Maintenance of Nuclear Power plants

- **Europe**
  - Economic Recovery
  - The Increase in the Value of the Euro.
Oil Prices in Dollar and Euro


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Oil Prices in Dollar and Yen


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Short-Term Factors

- Technical Factors
  - Refinery Outages
  - Adjustment for New Environmental Laws
  - The UN Shipping and Port Security Code
Short-Term Factors

- **Natural Factors**
  - Storms in the US and Europe
  - Hurricanes in the Gulf of Mexico
  - Sandstorms in Iraq
  - High wind in the North Sea
In the Long Run

- Major Political Events
  - The Iraq-Iran War (1980-1988)
  - The Iraqi Invasion of Kuwait (1990)
  - The Gulf War (1991)
  - The War on Terrorism (2001-present)
  - The US Occupation of Iraq (2003-present)
  - Economic Sanction on oil producing countries (Iraq, Iran, Libya, Myanmar, Sudan, and Syria)
In the Long Run

- Major Economic Events
  - The Price Collapse of 1986
  - The Price Collapse of 1998
  - Dollar Depreciation (2002-present)
World Excess Capacity Vs. Oil Prices

The Iranian Revolution
Emargo
Invasion Of Kuwait
Economic Sanctions
Strengthening the Sanctions

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Excess Capacity/Price Ratio

The Lowest In History

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The Future???????
Interest Rates & Oil Prices

Discount Rate  Federal Fund Rate  Oil Prices

Changes in Government Expenditures Vs. Changes in Oil Prices

Source: IMF, 2005 and EIA 2005
US Per Capita Income vs. Oil Prices

Source: EIA and BEA, 2005

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Current and Real Oil Prices ($2000)

Source: EIA, 2005 and the author's calculation

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Saudi Real Per Capita Income ($1999)

Source: EIA, 2005

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OPEC’s Current and Real Oil Revenues

$ Billion

Source: EIA, 2005

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OPEC’s Real Per Capita Oil Revues ($2004)

Source: EIA, 2005

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Saudi Real Per Capita Revenues

Source: EIA, 2005

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Saudi Real Economic Growth (1970-2006)
Saudi Crude Oil Production (mb.d)

Source: EIA, 2005
Future Prospects

Short-term

Fundamentally Tight Market

- No marketable excess capacity
- Demand still growing, though at a slower rate.
- Hurricane Season
- Demand will grow if China revalue its currency.
- Concerns regarding the adequacy of heating oil in the US during the 4th quarter.

Stock build is not enough to avoid price spikes:

- 2 days of demand cover for crude (stocks and capacity)
- 1 day for products
- Not evenly distributed
- Crude mostly heavy
Future Prospects

Medium-term

- Fundamentally Tight Market with Possibility of Downturn.
  - Planned Capacity Expansion is not Enough
  - Slow growth in Russian Production with possibility of decline.
  - Continued decline in US crude oil production
  - Continued decline in north Sea production.
  - Continued maintenance and the planned shut down of nuclear reactors in Asia (Japan) would increase demand for oil.
  - More nuclear reactors in Chian will increase its demand for oil
  - The role of new technology and renewables will be very limited
But......

- Has the war really ended in May 2003?
Wars, Oil Crisis, and Economic Growth

Real GDP per Person in the US Economy

Year

Real GDP per person (1996 dollars)

Great Depression

World War II

Korean War

Vietnam War

First Oil Price Shock

Second Oil Price Shock

Gulf War

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So....

- Can the past explain the future?