The Future of World Oil Prices: Some Keys to the Puzzle

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A New Era of Permanently High Oil Prices?

Figure 1
World Oil Prices (1970-2006)

Refiner Acquisition Cost of Imported Crude

Nominal Price

Sources: Energy Information Administration, New York Mercantile Exchange
Four Distinctive Characteristics of the World Oil Market

- World Oil Market is one big BATHTUB
- Short Run Supply & Demand
- OPEC Cartel
- Emergence of China and other Asian Countries
1. The World Oil Market is one big BATHTUB
2. Short Run Supply & Demand

Economists’ Jargon: Very Price “Inelastic”
3. OPEC Cartel
OPEC’s Market Power is the Greatest in a Tight Market

Figure 2
OPEC Production vs. Production Capacity (1973-2006)

Source: Energy Information Administration
Enter China and India as Major Oil Consumers

Figure 3
Worldwide Growth in Oil Consumption (2000-2005)

Source: BP Statistical Review
Three Keys to the Future Oil Price Puzzle

1. Can and Will OPEC expand capacity?
2. What is the Long Run Price Elasticity of Oil Demand?
3. What is the Supply Responsiveness from Non-OPEC Sources?
   - Conventional Oil Outside OPEC
   - Oil Substitutes – Oil Sands, GTL, Ethanol
Key 1: Can and Will OPEC Expand Capacity?

- Possible Constraints
  - Physical Limits of Resource Base
  - Access to Technical Expertise
  - Investment Funds Necessary
    - Paradox of Riches
  - Geo-political Constraints
    - Iraq, Iran, and Venezuela
  - Wealth Maximization
The Problem is Not the Limits of the Resource Base

Figure 4
Physically Possible Saudi Production through 2050
# The Supply Potential of Six OPEC Countries

## Table 1

<table>
<thead>
<tr>
<th>Country</th>
<th>Reserves+</th>
<th>Estimated Undiscovered</th>
<th>Total</th>
<th>Years Remaining*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saudi Arabia</td>
<td>263</td>
<td>87</td>
<td>350</td>
<td>86.9</td>
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<tr>
<td>Iraq</td>
<td>115</td>
<td>45</td>
<td>160</td>
<td>240.9</td>
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<tr>
<td>Iran</td>
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<td>53</td>
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<td>125.9</td>
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<tr>
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<td>20</td>
<td>97</td>
<td>88.4</td>
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<tr>
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<td>99</td>
<td>4</td>
<td>103</td>
<td>106.8</td>
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<tr>
<td>The United Arab Emirates</td>
<td>98</td>
<td>8</td>
<td>106</td>
<td>105.6</td>
</tr>
</tbody>
</table>

+In billion barrels as of 2005; *Assuming current production rate

Sources: British Petroleum Statistical Review, United States Geological Survey
Response to Doomsdayers

- **Some Interesting Arithmetic:**
  - Oil Reserves in 1975: 386 bil bbl
  - Cumulative Oil Production
    - (1976-2006)
  - Current Oil Reserves: 1317 bil bbl

- **MIT’s Workshop on Alternative Energy Strategies (1977):**
  - Peak between 1983 and 1993

- **Hubbert Curve for 2000:**
  - 50% of actual

- **Bar room talk with Saudi Aramco folks**
Keys 2 & 3: The Long Term Effect of Prices
High Oil Price Scenario

Figure 5
The Supply/Demand Balance Under Continued High Prices
Keys 2 & 3: The Long Term Effect of Prices
Low Oil Price Scenario

Figure 6
The Supply/Demand Balance Under Reversion to Low Prices