High Oil Prices: A Non-OPEC Capacity Game

Petter Osmundsen, Bård Misund, Frank Asche, Klaus Mohn
"I am disappointed about the shortfall of investments on the supply side. Large, international oil companies seem to prefer looking for oil at the NYMEX trading floor, instead of exploring for resources around the world. They have a social responsibility, but prefer to buy back their own shares," Fatih Birol, IAE Chief Economist
Key questions and issues

- Why hasn’t non-OPEC supply responded to higher oil prices?
  - Tightened capital discipline (?)
  - Focus on performance indicators (?)
  - Tough demands from financial markets (?)

![Oil price and production growth chart](Source: Deutsche Bank)
Sluggish long-term investments

- Exploration spending has fallen
- A more myopic industry?
- A new investment equilibrium?

**Exploration spending and oil price**

Source: Deutsche Bank
Oil industry dynamics in the 1990s

- Globalisation
  - Politics, economics, technology, communication, financial markets
- Deregulation and liberalisation
  - Privatisation of former NOCs
  - Business principles gained ground in oil and gas
  - The investment universe expanded
- Pressure from financial markets
- Massive restructuring and corporate improvement

Short-term financials at centre stage
### Common key performance indicators

#### Clear and transparent targets

**Financial and operational indicators and targets**

<table>
<thead>
<tr>
<th></th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2004 target</th>
</tr>
</thead>
<tbody>
<tr>
<td>RoACE (normalised)</td>
<td>9.4%</td>
<td>10.8%</td>
<td>12.4%</td>
<td>12.3%</td>
<td>12%</td>
</tr>
<tr>
<td>Production (1 000 boepd)</td>
<td>1 007</td>
<td>1 074</td>
<td>1 080</td>
<td>1 093</td>
<td>1 120</td>
</tr>
<tr>
<td>Reserve replacement</td>
<td>0.68</td>
<td>0.78</td>
<td>0.95</td>
<td>1.01</td>
<td>&gt; 1.0</td>
</tr>
<tr>
<td>Finding &amp; dev. cost</td>
<td>9.1</td>
<td>6.2</td>
<td>5.9</td>
<td>8.47</td>
<td>&lt; 6.0</td>
</tr>
<tr>
<td>(USD/boe)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Production cost</td>
<td>3.00</td>
<td>2.94</td>
<td>2.77</td>
<td>2.96</td>
<td>&lt; 2.7</td>
</tr>
<tr>
<td>(USD/boe)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 Normalised, 2 3-year average.

Source: Statoil
RoACE by company
1997-2002 (average), per cent

Source: UBS Warburg
“Integrated Oils Analyser”
Valuation rewards from RoACE (°)

- RoACE – Return on Average Capital Employed
- EV – Enterprise Value
- DACF – Debt-Adjusted Cash Flow

\[ y = 0.2809x + 2.7889 \]

Data Source: Deutsche Bank

"SELL"

"BUY"
Accounting for financial multiples

\[ EV = \frac{FCF}{WACC - g} \quad \Rightarrow \quad \frac{EV}{FCF} = \frac{1}{WACC - g} \]

\[ FCF = DACF - I \]

where

\[ DACF = EBIT \cdot (1 - t) + DD&A \]

\[ I = LTI + \Delta WC \]

Hence,

\[ \frac{EV}{DACF} = \frac{1 - \frac{I}{DACF}}{WACC - g} \]

EV-Enterprise value
FCF-Free cash flow
WACC-Weighted average capital cost
DACF-Debt-adjusted cash flow
EBIT-Earnings before interest and tax
DD&A-Depreciation, depletion and amortisation
LTI-Long-term investments
WC-Working capital
I-Total investments
Return on Average Capital Employed

- ROACE = Net income/average capital employed
- ACE = shareholder funds and net interest bearing debt

It is of key interest with respect to the oil companies that ROACE can be increased by reducing capital spending.

And ROACE or EV/DACF are often part of managements incentive schemes.
Illustration of ROACE contribution in % over a project’s life cycle
A capacity game in the oil industry?

<table>
<thead>
<tr>
<th>Company 1</th>
<th>Passive</th>
<th>Explore</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passive</td>
<td>125, 125</td>
<td>75, 150</td>
</tr>
<tr>
<td>Explore</td>
<td>150, 75</td>
<td>100, 100</td>
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</table>
Valuation research

Harris, T. And Ohlson (1987) AR. “Accounting disclosures and the Market’s Valuation of Oil and Gas Properties”

Berry and Wright (2001). JBFA “Disclosures: An Assessment of the Market’s Perception of Firm’s effort and ability to Discover Reserves”

Quirin et al. (2001). JBFA. “A Fundamental Analysis Approach to Oil and Gas Firm Valuation”

Cormier and Magnan (2002). IAAT. “Performance Reporting by Oil and Gas Firms: Contractual and Value Implications”

Bryant (2003). RAS. “Relative Value-Relevance of the Successful Efforts and Full Cost Accounting Methods in the Oil and Gas Industry”
How well do ROACE explain EV/DACF?

- RoACE is significant, but wrong sign
- This is true in all cases with more variables then the ROACE and the oil price in the regression

The full estimated model
Oil price, KPIs and fixed effects

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>OP</td>
<td>-0.0994</td>
<td>-1.10</td>
</tr>
<tr>
<td>RoACE</td>
<td>-20.413</td>
<td>-2.34</td>
</tr>
<tr>
<td>PROD</td>
<td>0.0006</td>
<td>0.56</td>
</tr>
<tr>
<td>FDC</td>
<td>-0.0168</td>
<td>-0.82</td>
</tr>
<tr>
<td>UPC</td>
<td>-0.802</td>
<td>-1.84</td>
</tr>
<tr>
<td>RRR</td>
<td>0.170</td>
<td>0.36</td>
</tr>
</tbody>
</table>

**Fixed effects**
- Amerada Hess: 13.279 (6.09)
- BP: 17.470 (5.59)
- Chevron: 16.129 (5.26)
- ENI: 14.658 (6.98)
- Exxon: 18.152 (3.88)
- Hydro: 12.974 (7.94)
- Marathon: 14.255 (6.88)
- Occidental: 15.886 (7.90)
- PetroCanada: 13.117 (7.38)
- RD/Shell: 15.687 (6.25)
- Repsol YPF: 15.874 (7.25)
- Total: 15.687 (6.25)

$R^2$: 0.98
Concluding remarks

- Increased capital discipline is a possible explanation for reduced production growth and exploration spending.

- Can be thought of as a capacity game of the prisoner dilemma type.

- The game is noncooperative, but where the capital discipline can influence the outcome and in a way work as a coordination device.
Concluding remarks

• Is it a problem that accounting information has become more relevant in valuation of oil companies?

• May be more important for manager’s actions then actual company valuation

• The cooperative solution is nonstable