Norwegian oil and gas activity

Market forces matter

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Hubbert’s peak

The geophysical approach to oil exploration and production

Source: Hubbert (1962), Mohn (2008): "Elastic oil: A primer on the economics of exploration and production".
As economists, we know better

Modifying factors for the geophysical approach

- Exploration and production governed by profit-maximising companies
  - Technology and unit cost
  - Market developments
  - Policy constraints
- Hubbert approach augmented with economic models and variables
- Integrated models provide better explanations

Elastic petroleum

The economic approach to exploration and production

Cumulated discoveries
Stylized example

Oil production
Stylized example

Source: Hubbert (1962), Mohn (2008): "Elastic oil: A primer on the economics of exploration and production"
Selected research

How markets affect oil and gas activity - and the macro economy


More research: http://www.uis.no/Mohn
Efforts and efficiency in oil exploration

A vector error-correction approach

- Exploration output:
  \[ R(P, X) = D(P, X) \cdot S(P, X) \cdot M(P, X) \]

- Three channels of impact
  \[ \varepsilon_p^r = \varepsilon_p^d + \varepsilon_p^s + \varepsilon_p^m. \]

- Simultaneous econometric approach (VEC)

The oil price matters...
.. for producing fields, for field developments, and for exploration

Source: Statistics Norway, Reuters EcoWin, Norwegian Petroleum Directorate.
The oil price matters…

… for NPD expectations

Outlook for NCS oil and gas production
NPD forecast by year of release (mboepd)

Source: Norwegian Petroleum Directorate.
Unimpressive shareholder returns

Source: Statoil.com
Oil boom arrested by market concerns

Increasing focus on cash-flow management and capital discipline

- Equity market in disbelief
  - Production short of targets
  - Sky-rocketing costs
  - Erosion of returns
- Investors worry for price outlook
  - Weak economic growth
  - New floods of supplies
  - Policy uncertainty looms
- Business model under pressure
  - Scarcity and access dilemmas
  - «Carbon bubble» challenge
- “Cash is King!”
Investment choked by financial markets
Where NPV may fail, Cash will prevail

From disappointment to disbelief: Production falls short of promises

Planning prices are up, ... but so are costs

Reality bites: the comfort zone is narrowing

Source: Enskilda Securities (Oil companies’ E&P budgets, 20 August 2013).
The Statoil example

Cash flow 2013

NOK bn

- Cash flow from operating activities: 219
- Taxes paid: (114)

- Dividend paid: (22)
- Proceeds from sale of assets: 27
- Cash flows to organic investments: (114)

Net: (4)

Source: Statoil (4Q 2013 presentation of financial results).
Industry changes and challenges
A race between scarcity and innovation

• Innovation and cooperation
• Changes in OPEC behaviour
• Uncertainty over gas prospects
• Break-up of monopoly in transport
• Quality in capital allocation
• Re-direction to Asia
• Energy and climate policies

Concluding remarks
Build resilience, prepare for change

• Bets are off for bullish energy demand
• Oil price outlook is extremely opaque
• Gas prices will converge, gradually
• The oil price matters for activity

• Oil boom arrested by market concerns
• New shocks and cycles in the cards
• IOC business model under pressure

• The macroeconomic impulse from oil is in decline