

The Value-Relevance of Accounting Figures in the International Oil and Gas Industry: Cash Flows or Accruals?

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Background

- Analysts want to successfully predict the future financial performance and future valuation of oil companies
- They need to forecast:
 - income statement figures
 - balance sheet figures
 - cash flows
 - valuations
- However, there is a debate with respect to the reliability of accounting measures
- Moreover, analysts often use relatively simple models

Background

Analyst equity research: example

BP Plc (BP.L)

Summary	2002A	2003A	2004E	2005E
EPS	0.40	0.57	0.72	0.62
EPS (GBP)	26.42	34.53	39.47	34.71
EPS growth (%)	(32.6)	43.5	25.6	(12.7)
DACF per share	0.54	0.54	0.65	0.61
DACF growth (%)	0.9	(1.3)	21.9	(6.5)
CFPS	0.78	0.86	1.14	1.07
Dividend per share	0.23	0.26	0.28	0.30
Dividend yield (%)	3.1	3.7	3.2	3.4
RoACE (%)	12.8	16.5	20.0	17.9
Shares	22,379	22,429	21,697	21,537

Valuations	2002A	2003A	2004E	2005E
EV / EBITDA	8.3	6.0	6.3	6.8
EV / EBIT	15.7	9.7	9.1	10.5
P/E	19.3	12.0	12.5	14.3
DACFM	15.8	14.4	14.8	15.7

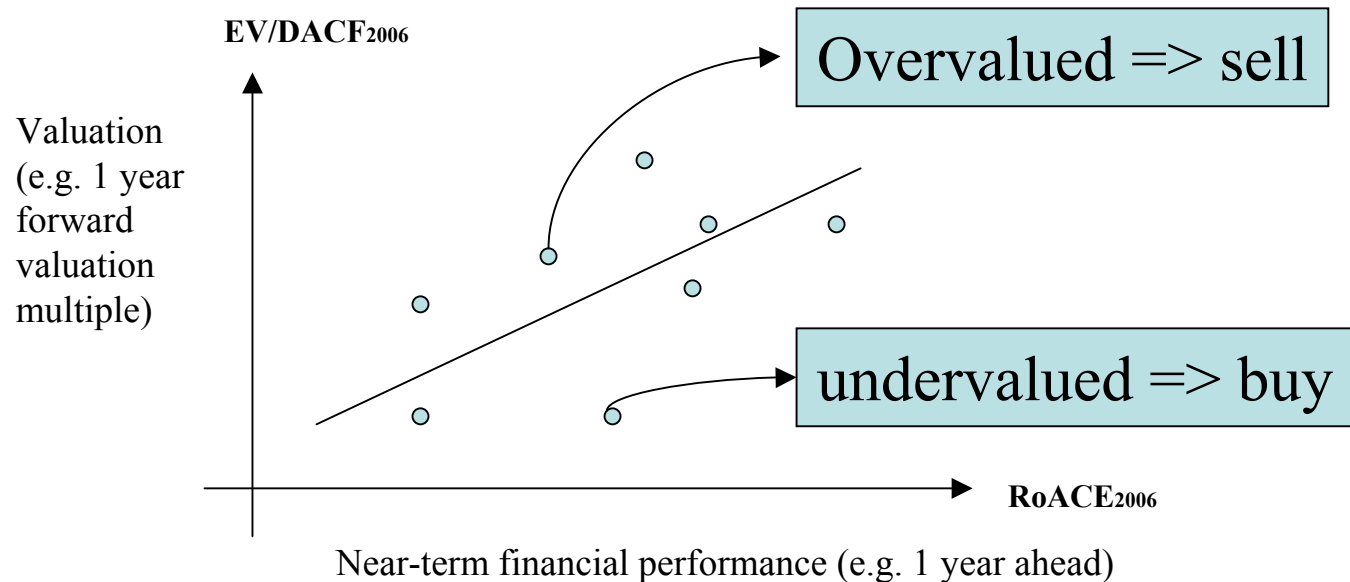
Source: Deutsche Bank Major Oils 2004

- Analysts typically consider many different accounting figures
 - Financial performance measures
 - Valuation multiples

⇒ Which are most value-relevant?

Background

- How is financial performance linked to valuation?
 - Practitioners prefer valuation multiples (P/E) and accounting returns (RoACE)





Background

- Accounting figures in the oil and gas industry : Are they value-relevant?
- The relevance of historical cost in accounting for oil and gas asset has been questioned (i.e. FASB, 1982)
 - Extensive lead times
 - Legacy assets
 - Different accounting methods for petroleum assets (Successful efforts vs Full cost)
 - M&A accounting: purchase method or pooling of accounts



Previous 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"



Previous research

Findings change over time

Recent papers indicate that:

- Accounting information *is* Value-Relevant. In contrast to the common perception that historical cost accounting provides limited information on oil firm performance
- Cash flows are more value-relevant than earnings (net income)

Aim of this paper

Determine the value-relevance of different accounting figures

Income statement

Revenues
- COGS
- SG&A
- G&G
- exploration expense
= Earnings before interest, taxes and depreciation (EBITDA)
- DD&A
= Earnings before interest and taxes (EBIT)
-interest
-taxes
= Net income (NI)

Cash flows

= Net income (NI)
+ interest (1-t)
= Net operating profit after tax (NOPAT)
= Net income (NI)
+ DD&A
= Funds from operation (FFO)
+ other non cash elements
= Cash flow from operations (CFO)
+ interest (1-t)
= Debt adjusted cash flow (DACF)

Model

- Theorists prefer DCF
 - cash flow forecasts ($t=0 \rightarrow t=\infty$)
- Practitioners prefer valuation multiples
 - near-term forecasts
 - comparison of firms
 - theoretical justification?

How to link these two approaches?

Model

- Ohlson (1995, 1999) and Feltham-Ohlson (1995, 1996) developed the Residual Income model (from the DCF model)
 - links valuation to contemporaneous financial performance
 - Market value is a function of abnormal earnings, book equity and 'other information'

$$P = f(NI^a, B, v)$$



Econometrics

- Feltham-Ohlson (1995, 1996): Linear information dynamics

$$MV_{it} = \beta_0 + \beta_1 NI_{it}^a + \beta_2 BV_{it} + \beta_3 v_{it} + \varepsilon_{it} \quad (1)$$

- The linear information dynamics can be preserved while testing accounting figures other than net income:

e.g. $NI = CF - \text{accruals} \Leftrightarrow CF = NI + \text{accruals} \quad (2)$

- Our model becomes:

$$MV_{it} = \beta_0 + \beta_1 YR_t + \beta_2 X_{it} + \beta_3 (NI_{it} - X_{it}) + \beta_4 BV_{it} + \beta_5 OGR_{it} + \varepsilon_{it} \quad (3)$$



Data

- 10-K reports from SEC (US-GAAP figures)
- 15 largest international integrated oil and gas firms
- 1990-2003 (14 years)

Firm
ExxonMobil Corporation
BP Ltd
Royal Dutch Petroleum Company / The Shell Trading and Transport Company
ChevronTexaco Corporation
Total S.A.
ConocoPhillips Corporation
Eni S.A.
Repsol S.A.
Statoil ASA
Occidental Petroleum Corporation
Hydro ASA
Petro-Canada
Marathon Oil Corporation
Amerada-Hess Corporation
OMV A.G.

Results

- All accounting figures are value-relevant
- Oil and gas reserves are value-relevant

Value relevance: Rank

1. Debt-adjusted cash flow (DACF)
2. Cash flow from operations (CFO)
3. Net operating profit after tax (NOPAT)
4. Earnings before interest, tax and depreciation (EBITDA)
5. Earnings before interest and taxes (EBIT)
6. Funds from operations (FFO)
7. Net income (NI)

Results

- We then divided the sample in two: 1990-1996
- Structural break
- Very large differences between the parameter estimates in the two subsamples
- The importance of the different measures changes over time



Conclusion

- Historical cost accounting figures do provide value-relevant information
- Pre-depreciation figures are more value-relevant than post-DD&A figures
- The relationships appears to be substantially more complex then comparisons of ratios
- The relationships are not stable over time
- More work is need to uncover the structure of the valuation