The Value-Relevance of Accounting Data: Cash flows vs Earnings

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Research

Broader topic

- This research addresses the topic of Oil&gas company reported earnings (Financial reports), and the relevance of this information for investors

Specific topic

- Effect on value-relevance of competing methods for accounting for oil&gas exploration activities
  - Full cost versus Successful efforts

Background

- For more than 40 years, oil&gas companies have been able to choose between 2 competing methods for accounting for oil&gas exploration expenses

- A result of intense lobbying by oil&gas companies
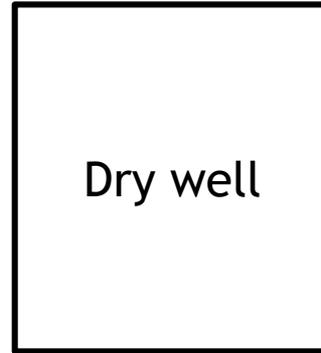
- Full Cost Method

- Successful Efforts Method

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Full cost vs. Successful efforts

Exploration activity

Successful
Well drilling

Dry well
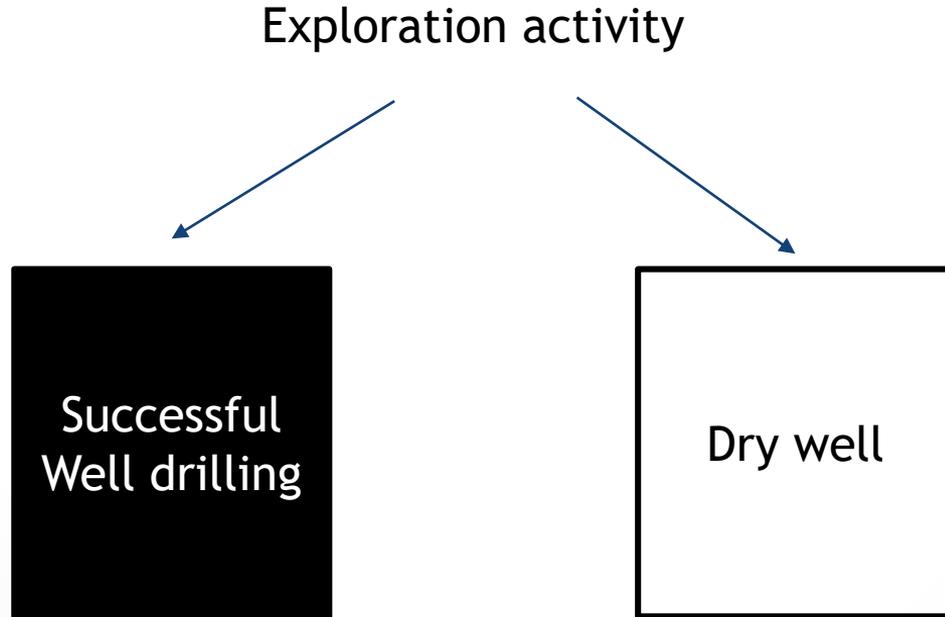
Successful efforts

Only expenses incurred from successful wells are capitalized

Successful Well drilling	Dry well

Oil&gas Asset
(expensed over time)

Expensed immediately
(reduces Earnings)

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Full cost

All expenses incurred from successful wells are capitalized

Successful Well drilling → Oil&gas Asset (expensed over time)

Dry well → Oil&gas Asset (expensed over time)

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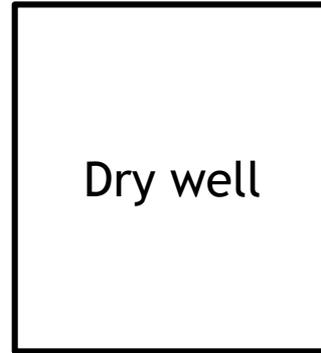
Successful efforts vs. Full cost

Successful Well drilling

Dry well

Volatile earnings

(largest o&g companies)
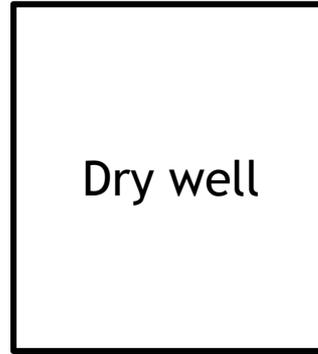
Smoother earnings

(smaller o&g cmopanies)

Issue

- Companies are allowed to choose between these two methods

- This choice affects earnings

- Two identical firms will report two separate earnings figures under the two methods

- Can confuse investors

Research question

- Hypothesis:
- Accounting method choice will confuse investors, who will have reduced confidence in accounting earnings
- Investors will rely more on non-accrual accounting numbers (i.e. cash flows instead of accounting earnings)

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Theoretical model

- Ohlson (1995)

- MV = f(BV, E, v)

- MV: Market value of equity
- BV: Book value of equity
- E: Earnings
- V: 'Other information'

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Empirical methodology

- Divide into two subsamples
    - Full cost (FC) firms
    - Successful efforts (SE) firms

- Run 2 models:

- Earnings model
- Cash flow model

- Determine best model using Vuong (1989) statistic

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Empirical model (Earnings)

$$R_{it}$$
$$= \beta_0 + \beta_1 \frac{E_{it}}{MVE_{it-1}} + \beta_2 \frac{\Delta E_{it}}{MVE_{it-1}} + \beta_3 \frac{\Delta NPV_{it}}{MVE_{it-1}} + \beta_4 MRP_t + \beta_5 SMB_t + \beta_6 HML_t$$
$$+ \beta_7 MOM_t + \beta_8 \Delta OP_t + \beta_9 \Delta GP_t + \boldsymbol{\theta FE_i} + \boldsymbol{\pi FE_t} + \varepsilon_{it}^3$$

Variables:
- R = returns
- NPV = net present value of oil&gas reserves (='other information'),
- MRP/SMB/HML/MOM = Fama-French-Carhart risk factors,
- OP = Oil price, GP = gas price,
- FE = fixed effects

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Empirical model (Cash flow)

$$R_{it} = \beta_0 + \beta_1 \frac{CF_{it}}{MVE_{it-1}} + \beta_2 \frac{\Delta CF_{it}}{MVE_{it-1}} + \beta_3 \frac{\Delta NPV_{it}}{MVE_{it-1}} + \beta_4 MRP_t + \beta_5 SMB_t + \beta_6 HML_t + \beta_7 MOM_t + \beta_8 \Delta OP_t + \beta_9 \Delta GP_t + \boldsymbol{\theta FE_i} + \boldsymbol{\pi FE_t} + \varepsilon_{it}^4$$

Variables:
- R = returns
- NPV = net present value of oil&gas reserves (='other information'),
- MRP/SMB/HML/MOM = Fama-French-Carhart risk factors,
- OP = Oil price, GP = gas price,
- FE = fixed effects

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Results

Earnings not significant Neither for full cost nor successful efforts firms

Earnings not significant Neither for full cost nor successful efforts firms

Vuong (1989) statistic confirm result

	Earnings model for Full Cost companies	Earnings model for Successful Efforts companies	Cash flow model for Full Cost companies	Cash flow model for Successful Efforts companies
E	-0.060 (0.418)	0.184 (0.190)		
ΔE	0.013 (0.519)	0.124 (0.293)		
CF			0.638 (<0.001)	1.218 (<0.001)
ΔCF			0.084 (0.154)	-0.572 (0.034)
ΔNPV	0.020 (0.188)	0.057 (0.030)	0.011 (0.193)	0.060 (0.008)
MRP	0.687 (<0.001)	0.680 (<0.001)	0.775 (<0.001)	0.773 (<0.001)
SMB	1.475 (<0.001)	1.011 (<0.001)	1.545 (<0.001)	1.002 (<0.001)
HML	0.803 (0.022)	0.266 (0.306)	0.298 (0.358)	0.059 (0.802)
MOM	-0.110 (0.609)	0.029 (0.857)	-0.044 (0.840)	0.224 (0.078)
ΔOP	0.449 (<0.001)	0.398 (<0.001)	0.527 (<0.001)	0.380 (<0.001)
ΔGP	0.393 (<0.001)	0.124 (<0.001)	0.287 (<0.001)	0.095 (0.011)
R^2-adj (within)	0.190	0.148	0.245	0.226
F-statistic	44.192 (<0.001)	37.264 (<0.001)	61.808 (<0.001)	63.852 (<0.001)
Vuong test (z-statistic)			-2.425 (<0.001)	-1.629 (0.052)

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Conclusion

- Stronger association between cash flow and market values than between earnings and market values

- Can conclude that Cash flows are more value relevant

- Result independent of accounting method

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