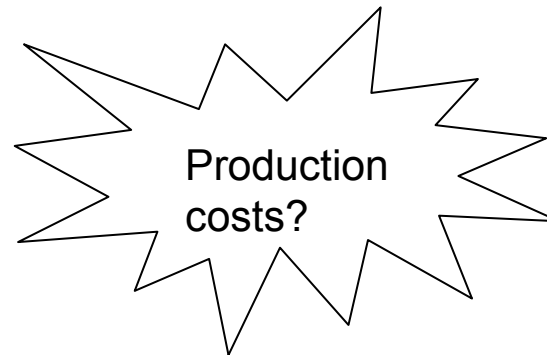


Estimating a country's oil wealth: Finding the right metrics

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What is the right metric to assess a country's oil wealth?

1. Reserves
2. Production
3. Exports
4. Revenues
5. **Oil rents = Revenues - costs**



Data limitations pose a challenge to calculating oil rents

Crude prices

- Many crudes are not traded publicly
- Prices for crudes vary by quality
- Crude prices vary significantly across time

Production costs

- Oil companies do not publish cost data
- Production costs vary across fields based on:
 - Geological differences
 - Crude quality differences
 - Risk differences
- Production costs vary significantly over time

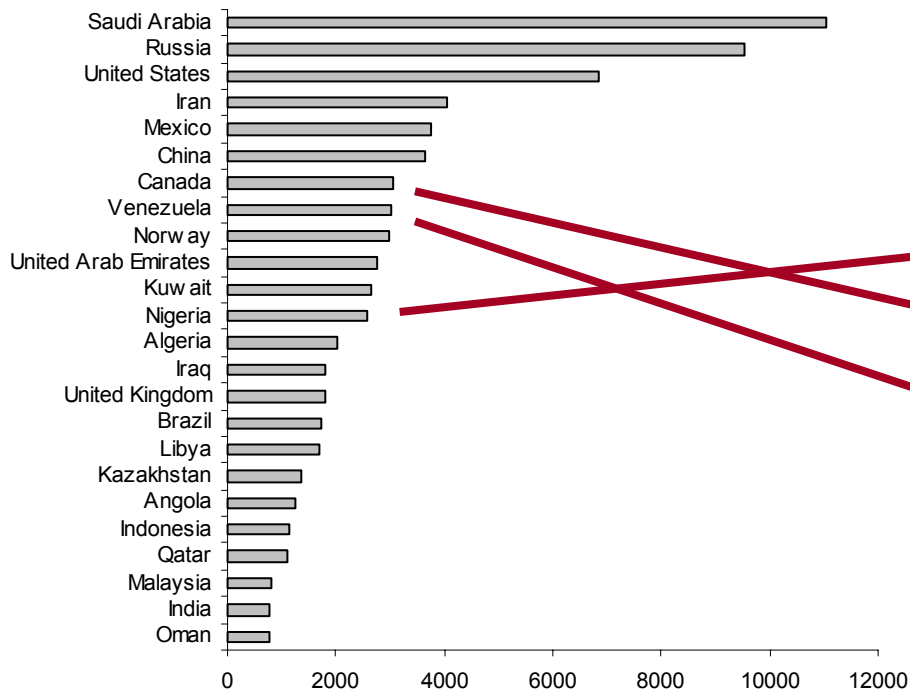


Econometric models can help us estimate the unknowns

Oil rents give a different picture about a country's oil wealth than production volume alone

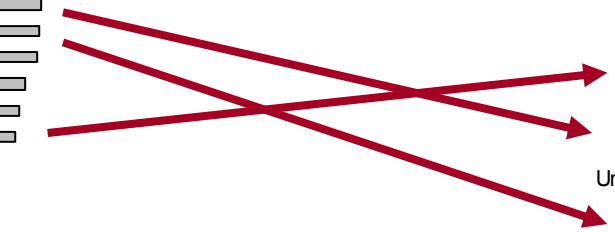
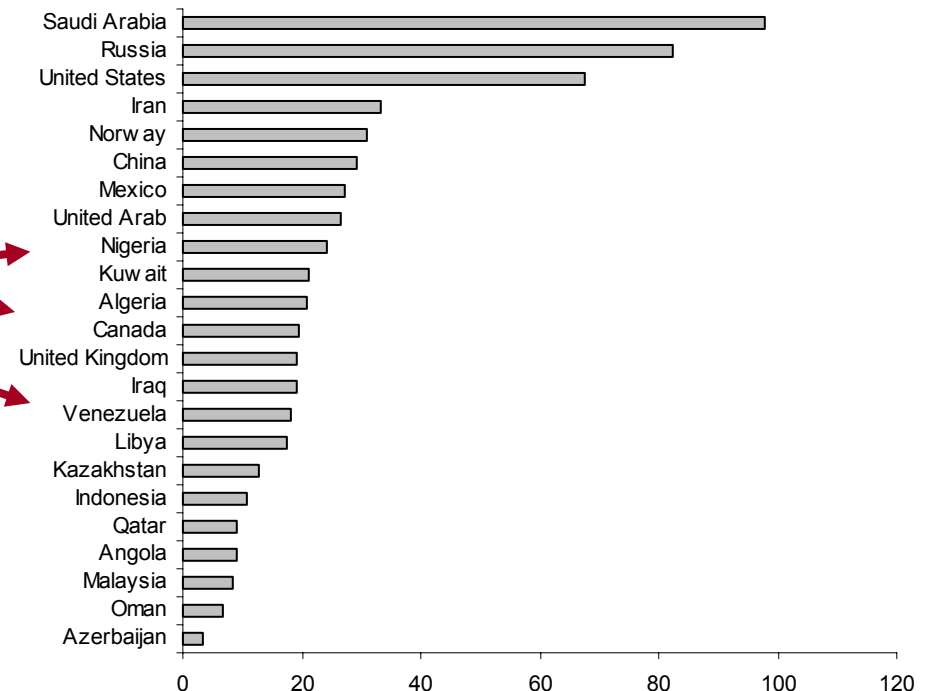
Oil production

Thousand barrels per day, 2005



Oil rents

Billion \$, 2000



Oil prices and crude cost are estimated using econometric modeling

Crude prices

Production costs

Key inputs

- Quality attributes:
 - API gravity
 - Sulfur content
- Global price trend

- Field specifics:
 - API gravity
 - Depletion rate
 - Age
 - On/offshore location
- Country risks (political., environmental)

Dataset

- 11,000 data points
- 629 crudes
- 33 countries
- 1987-2006

- 238 fields
- 25 countries
- 1987-2005

Estimation method

- Feasible Generalized Least Square (FGLS)
- Separate model for 1987-98 and 1999-2006

- Ordinary Least Square (OLS)

| cost | Coef. | Std. Err. | t | P> t |
|-------------|-----------|-----------|-------|-------|
| log_api | -2.066665 | .4702778 | -4.39 | 0.000 |
| depletion_2 | 311.9363 | 62.21629 | 5.01 | 0.000 |
| age | .0125331 | .0048777 | 2.57 | 0.012 |
| pol_risk | .9383196 | .2351255 | 3.99 | 0.000 |
| hazards_2 | .0121682 | .005309 | 2.29 | 0.025 |
| offshore | -.8544448 | .5558769 | -1.54 | 0.129 |
| mena | -2.618376 | .7116578 | -3.68 | 0.000 |
| ssa | 1.563932 | .479871 | 3.26 | 0.002 |
| _cons | 14.26408 | 1.559703 | 9.15 | 0.000 |

Our oil rents model can enhance our understanding of NOCs

1 Profits

How big are an NOC's profit potentials given the quality of its fields?

2 Operational efficiency

Are reported profits as high as one would expect given the quality of an NOC's fields?

3 Industry structure

Are reported oil rents (company profits and government oil revenues) as high as one would expect given the quality of a country's fields?