



Concept Symposium 2016

Governing the Front-End of Major Projects

The petroleum sector in crisis – or business as usual?

An outline of the current situation and the future prospects of the oil and gas activity at the Norwegian continental shelf. The presentation will also present results from research at the University of Stavanger on cost overruns and productivity in the Norwegian petroleum sector.



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The petroleum sector in crisis -or business as usual?

By

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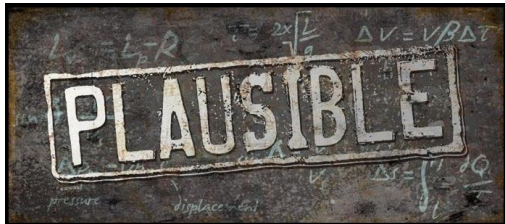
University of Stavanger

The 7th Concept Symposium on Project Governance

Sola Strand Hotel, September 8, 2016

WWW.UiS.no/Osmundsen

MYTHBUSTERS



AGENDA

- Common conceptions of petroleum projects are tested
 - by empirical research on the Norwegian petroleum sector
- Joint with colleagues at the research group of industrial economics at the University of Stavanger

Cost overruns at the NCS are increasing

MYTH BUSTED

- 1970-1984 74%
- 1985-2015 29%

- Last ten years 25%

Lorentzen, S. and P. Osmundsen (2016), "Cost performance on the Norwegian continental shelf". Data: NPD

SYSLA OFFSHORE.no

NYHETER - JOBB - OFFSHORE DATA - KONTRAKTER - ANNONSER - OFFSHORE+

FELT/OMRÅDE NYTT

Oljesprekkene har kostet 174 milliarder

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Overskridelser siden årtusenskiftet.

Av Marit Holm og Glenn Stangeland

<http://offshore.no/sak/62357>
[oljesprekkene har kostet 174 milliarder](#)

Cost overruns at the NCS are higher than in other petroleum regions

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Goliat på feltet i Barentshavet. Floatel superior er nå koblet fra. (Foto: Eni Norge)

GOLIAT

Måtte fjerne 42.000 meter overflødig kabel på Goliat

Massiv opprydding etter Korea-trøbbel.



AV: ROALD RAMSDAL,



LARS TARALDSEN |

OLJE OG GASS |

PUBLISERT: 11. DES. 2015 - 15:24

<http://www.tu.no/artikler/matte-fjerne-42-000-meter-overflodig-kabel-pa-goliat/276274>

North America	51%
Latin America	102%
Europe	57%
Africa	51%
Middle East	68%
Asia-Oceania	57%

Spotlight on oil and gas megaprojects.
Ernst & Young, 2013.

Cost overruns at the NCS are higher than in other industries



Type of project	Mean
Railway	45%
Bridge/tunnel	34%
Road	20%
All projects	28%

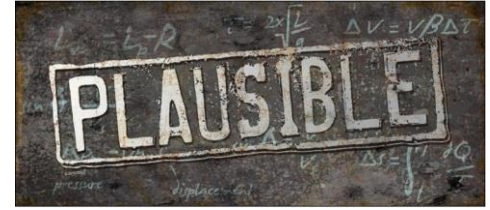
Flyvbjerg, B, Skamris Holm, M K and Buhl, S L (2003). "How common and how large are cost overruns in transport infrastructure projects?", *Transport Reviews* 23 (1), 71–88.

The average cost overrun for electricity development projects is 66%.

Sovacool, B K, Gilbert, A and Nugent, D (2014). "Risk, innovation, electricity infrastructure and construction cost overruns: Testing six hypotheses", *Energy* 74, 906–917.

The image shows a screenshot of a news article from 'upstream', 'THE INTERNATIONAL OIL & GAS NEWSPAPER'. The article title is 'Norway minister raps operators over costs'. The main image is a portrait of a man in an orange safety vest and white hard hat, identified as Norway's oil minister Ola Borten Moe. Below the image, there is a caption: 'Costs: Norway oil minister Ola Borten Moe says operators need to focus on trimming costs.' and the name 'MARIUS FISKUM'. At the bottom left, it says 'By Steve Marshall in Stavanger 27 August 2012 17:33 GMT'. At the bottom right, there is a 'SHARE STORY' button.

Cost overruns are related to the business cycle



- Multi-variate empirical research on cost overruns
- The study considers 80 projects, 2000-2013.
 - Data source: NPD
- Find that the following factors contribute most to overruns:
 - Employment surprise
 - Oil price surprise

Dahl, R.E., Lorentzen, S., Oglend, A. and P. Osmundsen (2016), “Pro-cyclical petroleum investments and cost overruns”.

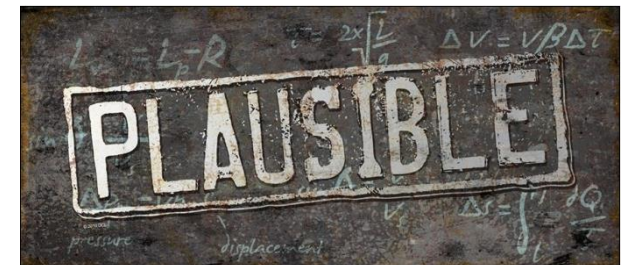
Spot oil prices affect investments

Metric used for project rankings

Breakeven price, P

$$NPV = \sum_{t=0}^T \frac{(x_t P - C_t)(1-s)}{(1+r)^t} = 0$$

Emhjellen, M. and P. Osmundsen (2016), "Oil project selection by metrics", proceedings, 39th IAEE International Conference, Bergen, June 19-22, 2016. International Association for Energy Economics.



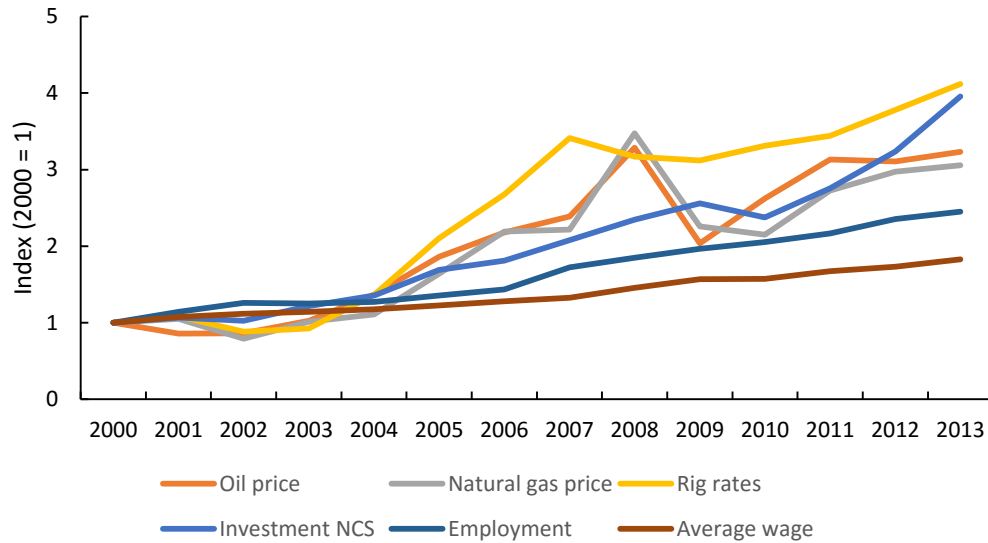
Cost overruns at the NCS are due to the tax system



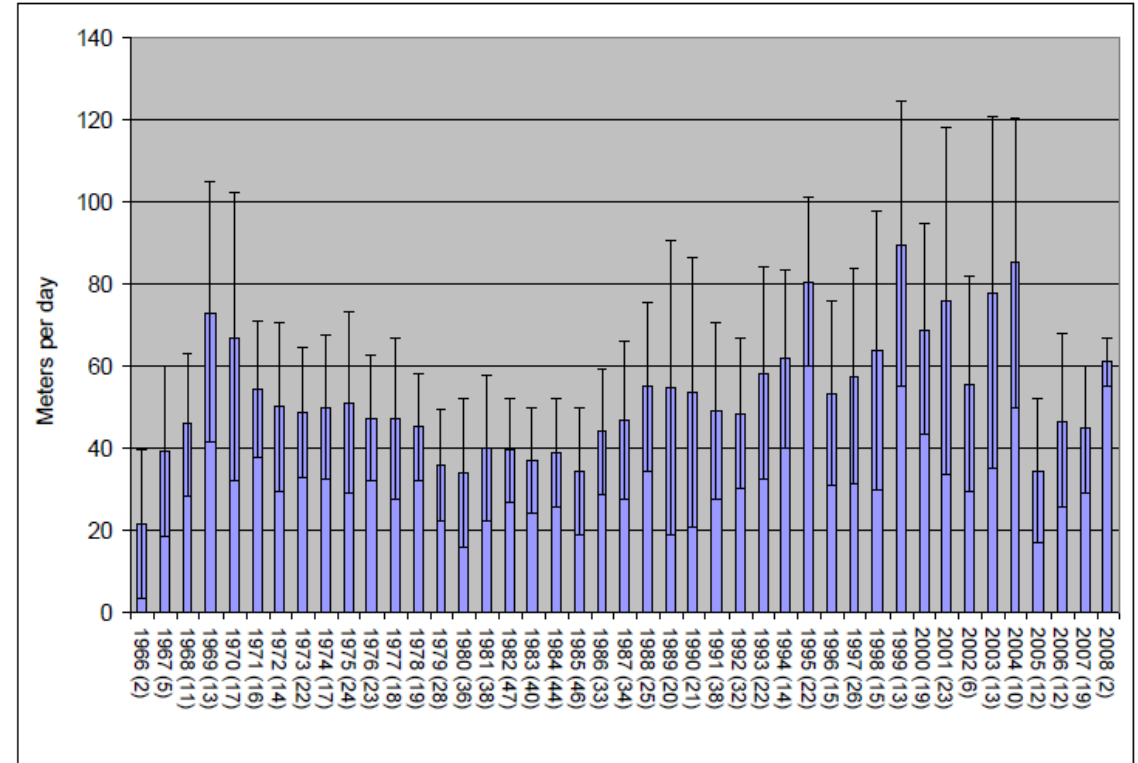
- Reference: neutral tax
 - Same IRR before and after tax
- **Model field results**
- IRR before tax 15.3%
 - 11.3% after tax
 - Current tax system
 - Effective tax rate of 83%
 - Considerably higher for companies out of tax position
 - Incentives for underinvestment
- Tax system is not neutral
 - Underinvestment
 - Even worse for projects with lower IRR before tax
- Cuts in tax depreciation will generate an effective tax rate over 100%

Osmundsen, P., Emhjellen, M., Johnsen, T., Kemp, A. and C. Riis (2015), "Petroleum taxation contingent on counter-factual investment behavior", *Energy Journal* 36, 1-20.

Project cost at NCS will remain permanently high



Rig rates refer to average rig rates for floaters, USD per day, on the Norwegian continental shelf (source: RS Platou). Investments are total petroleum related investments on the Norwegian continental shelf (source: SSB). Wages are wages for employees related to Norwegian petroleum activities (source: SSB), and employees are number of employees related to Norwegian petroleum activities (source: SSB).



Osmundsen, P., K.H. Roll and R. Tveterås (2012), "Drilling speed - the relevance of experience", *Energy Economics* 34, 786-794.

Osmundsen, P., Roll, K., and R. Tveterås (2010), "Exploration Drilling Productivity at the Norwegian Shelf", *Journal of Petroleum Science and Engineering*, 73, 122-128.

Dahl, R.E., Lorentzen, S., Oglend, A. and P. Osmundsen (2016), "Pro-cyclical petroleum investments and cost overruns".

Projects at the NCS will no longer be profitable



Statoil øker verdien av Johan Sverdrup, opplyser selskapet mandag. Her er Statoils konsernsjef Eldar Sætre. Foto: Elin Høyland

Energi Statoil

Statoil øker verdien av Johan Sverdrup

Nullpunktprisen er nå på under 25 dollar per fat for fase 1.



Kathinka Hartwig

Publisert: 29.08.2016 – 07:03 Oppdatert: 29.08.2016 – 08:18

<http://www.dn.no/nyheter/energi/2016/08/29/0703/statoil-ker-verdien-av-johan-sverdrup>

<http://www.dn.no/meninger/debatt/2015/09/14/2156/Oljemarkedet/gjentar-feilene-fra-igr>

MYTH BUSTED

NCS production and tax revenue in steep, permanent decline



DNs søsteravis Upstream påpeker at 2013-prognosen fra Statistisk sentralbyrå ikke tar hensyn til hverken Sverdrup-funnet, Castberg-funnet, Pil og Bue eller Alta-Gotha.

Forskningsjef Ådne Cappelen i Statistisk sentralbyrå medgir at tallgrunnlaget for 2013-rapporten ikke er oppdatert. Han sier byrået leverte arbeidet som grunnlag for Holden-utvalgets arbeid. Siktemålet for Holdenutvalget var å studere inntektsdannelsen i Norge og finne ut hvilke effekter for eksempel oljeprissjokk kunne ha på reallønnene. Byrået baserte seg da på Oljedirektoratets ressursanslag. Cappelen mener det aldri var byråets intensjon å komme med en forventningsrett prognose for oljeinntektene. Han er ikke så glad i de politiske metaforene om oljens svekkede rolle

<http://www.dn.no/nyheter/energi/2015/06/12/2150/Olje/satser-alt-p-ny-oljeopptur>

<http://www.upstreamonline.com/live/1402878/norway-painting-overly-bleak-market-picture>

Cappelen, Å, Eika, T. og J. B. Prestmo (2010), «Nedbyggingen av petroleumsvirksomheten – Hvor store blir virkningene for norsk økonomi?», SSB, Rapporter 46/2010, på oppdrag fra Finansdepartementet.

Osmundsen, P. (2015), «Prognoser for oljenæringen – fakta eller skremselspropaganda?», *Norsk Sokkel* nr 1, 2015, s. 36-38

<http://npd.no/Publikasjoner/Norsk-sokkel/Nr1-2015/Prognoser-for-oljenaringen/>

MYTH BUSTED