

Oil and Gas Price Drop Offers Reduced Cost Overruns

By Roy Endré Dahl, Atle Oglend and Petter Osmundsen*

Development projects in the oil industry often have cost overruns. With the recent regime shift in oil and gas prices, petroleum projects are re-evaluated and cost control is emphasised in the industry. Through analysis of data from Norwegian offshore development projects, Dahl et al. (2015) investigate the effect of the oil and gas prices on cost overruns. The results show that managers in the industry have an opportunity to invest in a downturn with reduced cost and according to our results, reduced cost overruns.

The recent regime shift seen in oil and natural gas prices confirms the difficultness of price forecasting over longer periods (Hamilton, 2009), and due to the long lead-time from investment commitment to production start, income uncertainty is high for any project in the petroleum industry. By using oil and natural gas prices as an indicator for expectations of future income, our study considers the possible cyclical nature of oil investment strategies. Our aim is to capture a common driver for cost overruns in petroleum projects, linked to the business cycle. However, cost overruns also arise due to project specific factors not captured by a common factor such as the business cycles. Cost estimates are adjusted throughout the project due to updates on technical solutions and increased complexity and functionality. Further, uncertainty about subsurface conditions, reservoir quality, the fields size and reserves, may result in delays and increased complexity.

If the cost estimation accuracy of megaprojects initiated in the domestic oil and gas industry depends on exogenous business cycle drivers, the industry may have a pro-cyclical effect on the domestic economy. Because of major investment in infrastructure and production facilities, the oil and gas industry provides growth opportunities in extraction countries. This is particularly true for Norway, where the petroleum industry is a dominant industry and the government is heavily invested in the exploration

through tax depreciations and later high tax revenues, the state's direct financial participation in the perceived most profitable fields, and in Statoil through ownership.

There has been oil and gas drilling on the Norwegian Continental Shelf (NCS) since the early 1970s. Figure 1 shows yearly oil and gas production on the NCS. Oil and gas output from the NCS increased steadily until it peaked in 2004 at 264 000 million Sm³ oil equivalents (o.e.). Recent years have seen a reduction in output and in 2014 production was 219 000 million Sm³ of o.e.. This reduction has come from lower oil production, down from 181 000 million Sm³ in

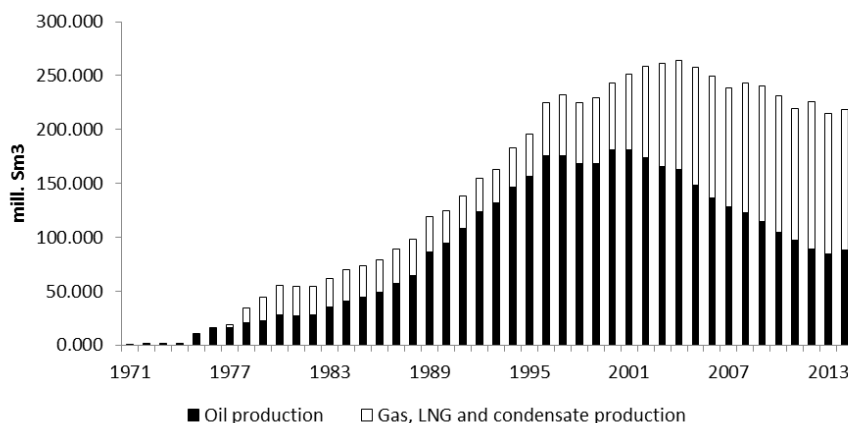


Figure 1 – Yearly oil and gas production on NCS in mill. Sm³

2001 to 88 000 million Sm³ in 2014.

Previous research finds that cost overruns is typical for megaprojects (Flyvbjerg et al. 2003), and according to Merrow (2011, 2012), the petroleum industry is particularly poor at delivering at budget and on time. The success rate in the petroleum industry is only 25% and Merrow (2012) argues that one key reason is the petroleum industry's high turnover in project leadership. For the NCS, a report written on behalf of the Norwegian Petroleum Directorate (2013), evaluates 5 megaprojects¹ on the Norwegian continental shelf and find several cost overruns, similar to the previous report in NOU (1999). Moreover, Mishra (2014) confirmed the poor results for the NCS.

Unrealistic ambitions and too optimistic estimates are likely correlated with the current business climate and a

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failure to incorporate the total cost effect of aggregate industry demand for services related to projects when making individual project decisions and projections. Clustering of investments at times when the oil price is increasing, prove to drive up costs. This is confirmed in our empirical analysis of key variables. According to Table 1, correlation is high between key investment cost variables and oil and gas prices.

	Oil price	Gas price	Rig rates	Investments	Wages	Employees
Oil price	1					
Gas price	0.9734	1				
Rig rates	0.9498	0.9259	1			
Investments	0.8963	0.8754	0.9318	1		
Wages	0.8804	0.8435	0.9101	0.9789	1	
Employees	0.9003	0.8640	0.9321	0.9701	0.9946	1

Table 1. Correlations between key investment cost variables

Note: 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: Norwegian National Statistics; SSB). Wages are for employees related to Norwegian petroleum activities (source: SSB), and employees are related to Norwegian petroleum activities (source: SSB).

License holders/operators on the Norwegian continental shelf are required to provide a yearly report on actual cost and cost estimates for development projects to the Ministry of Petroleum and Energy. While there are several reasons to make adjustments to the initial budget, Dahl and Osmundsen (2014) find that most projects is finished at a higher cost than predicted and in addition, that larger projects seem to have a higher relative cost overrun compared to smaller projects.

In Dahl et al. (2015), we investigate projects going back to 2000, and compare their cost overruns to our proxies for the business cycle. Our main finding is that cost overruns are higher, in relative terms, when oil and natural gas prices are high. As such, the industry may be pro-cyclical. Although we are able to identify these energy prices as common factors for cost overruns, there is significant heterogeneity in overruns. For instance, large project overruns depend more on price levels than smaller projects.

Our results show that managers in the industry have an opportunity to invest in a downturn with reduced cost and according to our results, reduced cost overruns. We find significant reduction in cost overruns because of oil and gas price drop. This is especially true for megaprojects, where cost overruns are even more vulnerable to the business cycle. Consequently, managers with the opportunity to invest in a downturn have extra incentives, as they will experience reduced cost overruns according to our results. In practice, and contrary to our results' advice, during a downturn period the industry often ends up trimming their project portfolio, thus contributing to the current business cycle. However, by exploiting excess capacity and expertise in the supplier market, projects reduce cost overruns and increase profitability.

Footnote

¹ Skarv, Yme, Valhall redevelopment, Tyrihans and Gjøa.

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