

Robust strategies for rig procurement¹

by

Petter Osmundsen²

University of Stavanger

Abstract

Scarcity of rigs on the Norwegian continental shelf (NCS) has led to a number of interesting changes in the procurement of such units and in the relationship between oil companies and rig contractors. Small oil companies have joined forces to establish a rig consortium, examples can be seen of changes to risk sharing between oil companies and rig contractors, vertical integration has taken place with oil companies owning rigs and rig contractors applying for and securing production licences, and joint ventures are being discussed between oil companies and drilling contractors. The paper describes and analyses these trends from the perspective of an optimum procurement strategy for an oil company. Trade-offs in rig procurement are analysed. Robust provision of rig capacity is required to satisfy drilling commitments to governments and to drill time-critical production and injection wells. These requirements need to be offset against the temporary drop in accounting returns and credit ratings which might result from a potential oversupply or mismatch of rig capacity with a consequent decline in rates.

1. Introduction

In a bid to reduce rig rates, efforts are being made to determine whether new forms of organising the relationship between oil company and rig contractor – including changes to risk sharing and ownership – could increase the supply of such units at affordable rates. In addition to a substantial increase in charter lengths, the scarcity of rigs has prompted a number of interesting amendments to contractual terms and organisational modes for drilling on the NCS. These include new examples of incentives in drilling contracts, small oil companies joining forces to establish a rig consortium, and vertical integration whereby oil companies own rigs. While it is not obvious that all these innovations would survive a downturn in the market for rigs and oil services, they nevertheless represent interesting experiments in alternative contractual and organisational patterns. Very high rig rates on the NCS suggest that such new approaches are welcome.

¹ Thanks are due to a number of specialists in petroleum-related government agencies, the oil industry and the supplies sector for useful suggestions and comments. Correspondence: Petter Osmundsen, department of industrial economics, risk management and planning, University of Stavanger, NO-4036 Stavanger, Norway.

petter.osmundsen@uis.no; www.uis.no/osmundsen.

² WWW.UiS.no/Osmundsen

This paper analyses various rig-related decisions. One decision level is the individual oil company's strategy for procuring rig capacity. This should be robust with regard to time-critical drilling. The oil companies must be able to fulfil their drilling commitments to government and licence partners, drill time-critical wells and exploit high oil prices through a high level of production which is not maintained at the expense of future output.

These considerations must be balanced against possible downsides related to a temporary decline in accounting returns and credit ratings which might result from a potential oversupply or mismatch of rig capacity with a consequent decline in rates. The size of this potential downside depends on what agreement on risk sharing the oil company has with other oil companies in various licences. Oil companies must also be careful to ensure that the chosen rig procurement strategy does not drive already high rig rates even further up.

Several interesting subjects can be raised concerning negotiations between rig contractors and oil companies, including questions of organisation and risk sharing.

Another decision level is the licence. Should rigs be chartered by individual companies or by licences? What is the effect of this decision for the companies and society? Does it yield variations in rig mobility? How are negotiations conducted between the licence and an individual company in possession of a rig charter? Are these negotiations optimum in a socio-economic context? What are the incentives for prioritising rigs between exploration or improved recovery projects? How are rigs prioritised between drilling new wells, maintaining existing ones or permanently shutting in old wells? What is the impact of opportunities to charter on rig capacity?

2. Methods

The empirical background is a study of organisational patterns and contractual structures in the rig sector on the NCS, based on news reports and conversations with a number of specialists at rig contractors, oil service providers and oil companies, and in the civil service and the academic community. The analysis benefits from general theories of procurement, economic organisation, contracts and incentives, as well as from research on the rig sector. See the list of references.

It should be emphasised that the subject is complex and that no clear or simple answers are available. The world swarms with different company and contractual constructions for rigs, production ships and so forth, determined by tax regime, equity interests in the licence, market conditions and the like. Theoretically, people often weigh different considerations against each another when choosing contractual and organisational solutions, and a number of these could exist. Empirically, successful companies with different solutions are found side by side in the same industry. Internationally, a correspondingly large array of options is available for rig procurement. However, a number of interesting general insights of a conditional nature exist. On the basis of

theory and available empirical data, something can be said about the conditions where specific organisational and contractual solutions are most suitable. This will depend on such factors as whether the oil company has time-critical drilling targets, the ability and willingness of partners to bear risk, and the expertise and capacity of the procurer to manage and follow-up procurements.

3. Optimum rig chartering

Rig requirements often vary. Different types of units are required at different times. Furthermore, it is often difficult to calculate when a rig will be available. Under such conditions, flexibility will be important. An individual licence does not have that many instruments here. Major oil companies can achieve economies of scale and flexibility by having a rig portfolio, which provides better capacity and utilisation. However, big companies on the NCS appear to be cautious about ordering rigs on their own account for several reasons.

A number of general considerations must be balanced against each other when an oil company determines how much rig capacity to acquire.

- 1) Drilling requirements, including time-critical resources.
- 2) Oil prices, not only the present level but also expectations for the future.
- 3) Opportunities for allocating rigs to licences, which reduce the company's exposure.
Excess rig capacity could cause rates to fall and lead to losses. How big these are will depend on how far the company has allocated the rig charter to licences.
- 4) Rig rates, not only the present level but also expectations for the future.

These balances can be elaborated. The choice of robustness in the procurement strategy for rigs influences and is influenced by many detailed conditions. It is appropriate to distinguish here between effects on operations (real effects), regulatory factors, and financial effects.

- 1) Real effect 1. Flexible rig availability means that on-going drilling requirements can be met, including time-critical production and injection wells. Important for maintaining production and reserves.
- 2) Real effect 2. Negotiations on rates. Postpone chartering in order to drive down rates?
Exercise of purchasing power.
- 3) Real effect 3. Reputation with the licensing authorities. Shortage of rig capacity could make it difficult to fulfil specific commitments and more general expectations of the companies on the NCS.

- 4) Regulation 1. The provisions of the acknowledgement of compliance (AoC) obstruct the companies in utilising portfolio advantages across continental shelf boundaries.³ Shell, for example, could have brought in a rig temporarily from the UK sector.
- 5) Regulation 2. Licence regulations. Should a company offer a rig to a licence at a contract price above the prevailing spot price, the licence will demand that it pays the spot price. That would mean a loss for a company which has entered into a long-term rig charter. If the contract price is lower than the spot price, however, the company can offer the spot price to the licence and secure a gain. In principle, this is symmetrical and consistent with the principle of “no loss, no gain” for the operator. But the question is whether symmetry actually prevails in practice here. This depends on the negotiating strength of the company in the various circumstances. Are there aspects of the negotiations which weaken incentives to enter into long-term charters with a view to chartering on the licence?
- 6) Finance 1. Mark to market. The oil company must recognise the paper loss for the whole remaining term of the charter in the current accounting period if the spot rate is lower than the agreed contract rate. It will have to bear the whole loss, but only to the extent of its licence share were the rig allocated to or chartered by the licence instead. This is only a paper loss, which will be reversed when spot rates rise again. Is the paper loss relevant to the shareholders in value terms, or do they regard this as an extraordinary condition and analyse profitability primarily on the basis of operations (higher up the accounts)?
- 7) Finance 2. Credit rating. When a long-term charter is entered into for a rig, the rating agencies treat the whole commitment (over the full contract term) as a liability without a corresponding entry under assets. This makes no sense in financial terms, since they are not valuing the upside. A company with rig capacity safeguards production and the maintenance of reserves, and is accordingly worth more. But that is how the rating agencies operate. Within reasonable limits, a reduced rating only has consequences for new borrowing and many oil companies have a high equity ratio and good self-financing. On the other hand, their credit rating is also important in other contexts. Following the accident in the Gulf of Mexico, regulators and partners have become more conscious of the capital adequacy and liquidity of the oil companies, and a lower credit rating could consequently shut some doors.
- 8) Finance 3. Does the financial crisis make it harder or more expensive to secure financing? Financial considerations could then have a greater impact.

An oil company can make two types of errors when acquiring rig capacity, which carry different costs in different circumstances.

³ See the rig commission (2012).

- a) Too little capacity. This poses a particular problem if the company is unable to carry out the work required with time-critical resources. It stands to lose production, reserves and reputation. The production loss will be particularly expensive if oil prices are high.
- b) Too much capacity. This must be viewed in relation to the level of rates. A second-hand market exists for rig charters, so overcapacity is only a problem if rates fall. Rates are extremely volatile, so the losses on long-term charters can be substantial. These could be reversed if rates rise again. Accounting rules play a part – companies must recognise large short-term accounting losses on rig charters if rates decline.

A significant factor in an oil company's calculations on rig chartering is the way the stock market weighs up the two types of losses. The signs are that the market's primary interest is production, particularly in the event of high oil prices. It pays less attention to extraordinary losses – providing they are actually perceived to be extraordinary by shareholders. Since rig rates fluctuate up and down, that should not be a problem in this case. These conditions argue for a robust rig strategy, particularly if acceptable oil prices are envisaged and especially if ambitious production goals have been communicated to the stock market. This is countered by the consideration that rather more attention gets paid to credit rating. However, that is assessed as secondary to production targets. Shareholders have reasons for not becoming fixated on the credit ratings and stand-alone financial performance targets which are given weight by some analysts. See Osmundsen et al (2006, 2007). They presumably see the overall picture and the long-term character of the industry. This is about maximising the value of the resources available to the company, including time-critical projects. A robust strategy for rig acquisition is important in this context. Such a recognition probably underlies the sharp increase in chartering on the NCS, although that has also been helped by several large new discoveries.

4. Optimum risk sharing and ownership in drilling

Day rates represent the typical compensation format for rig hire, and are differentiated by operational status – operation, stand-by and moving. See Osmundsen et al (2008). If the rig contractor cannot provide a rig which meets the technical requirements at the agreed time, a zero rate applies. The contractor would then stand to lose a sum in the order of USD 500 000 per day, which provides very strong incentives to ensure uptime. Under the charter terms, the oil company will also normally be able to cancel after start-up has been delayed by a specified number of days. Downtime poses a big risk to the contractor's portfolio. On the other hand, the contractor is also

best placed to influence the rig's operational status. However, the associated costs of delayed drilling – which can be high – are not transferred to the contractor.

A typical feature of model contracts negotiated for offshore development and modification projects is that contractors want to limit their financial exposure.⁴ Similarly, oil companies primarily carry the oil price, foreign exchange, reservoir and production risk in the drilling sector. However, contractors also bear considerable risk, particularly associated with newbuilding of units (cost overruns and delays) and uptime.

Current rig rates on the NCS are so high that new rigs – which will operate for several decades – are paid off within a few years. The contractors often have long charters, so that their risk exposure is limited. In such circumstances, it is hardly surprising that the oil companies are considering other options. In an effort to increase rig availability at affordable rates, new ways of organising the relationship between contractor and oil company are being investigated – including changes in risk sharing.

According to incentive theory,⁵ optimum risk sharing between the parties must be weighed against the need to provide the contractor with appropriate incentives when drawing up a rig charter and when choosing the ownership model for the unit. Optimum risk sharing normally requires the oil company to accept the risk associated with the charter since, compared with the rig contractor, it normally has a higher equity and more diversified risk through participation in licences on many different fields. By comparison, a contractor which wholly owns a rig could have a high level of exposure related to the individual unit. Long charters mean that the oil companies bear a great deal of financial risk. This suggests that a contractor, on the basis of a long charter, should be able to secure financing for and build new rigs for the NCS. However, a not insignificant operational risk also accrues with regard to cost overruns and delays. In existing charters, the contractor bears the full operational risk, and a number of examples exist of companies which have found themselves in big financial difficulties despite a long-term and apparently lucrative rig charter. The point is that the money does not begin to flow until the rig is in operation. Shortage of capacity at yards with experience of building rigs to Norwegian standards has created a not inconsiderable execution risk.

The other consideration is incentives. From an incentive perspective, it is appropriate that the rig contractor – who is best placed to influence outcomes related to construction costs, delivery date and uptime – bears a not inconsiderable share of this risk.

Incentive theory recommends a sharing of risk between rig contractor and oil company, so that considerations related to risk sharing and incentives are balanced against each other.

Transferring a great deal of the risk to the contractor could result in an unnecessarily high risk

⁴ See <http://www.norskindustri.no/article228.html>.

⁵ See, e.g., Milgrom and Roberts (1992).

premium – in other words, rates are higher than they need to be. Today's rig charters strike a balance between these two considerations, as the theory prescribes, but fail to differentiate between them adequately. Since rig charters are standardised, they are not adapted to any extent to the financial position of the contractual parties. The establishment of a number of new oil companies on the NCS means that it is no longer necessarily the case that the licence is better able to bear risk than the rig contractor, so that greater variation will be needed in the contractual area and the contractors may have to accept more risk in some contexts. Viewed from the perspective of the big oil companies, the opposite position could prevail in today's economic boom. It could be desirable for them to bear more risk in an effort to reduce what they regard as unreasonably high rig rates. In one way, it might appear that the risk premium for the rig contractors increases in good times. That could be an argument in favour of the oil companies accepting more risk. At first sight, a positive correlation between the rig contractors' risk premium and the business cycle might seem counter-intuitive. The explanation is probably not to be found in the underlying risk preferences, but in changes to negotiating positions. In good times, the contractors acquire a substantial backlog of charters, which puts them in a strong negotiating position. They can exploit this to dictate the terms for new rig assignments. We see, for example, that charter lengths increase when oil prices are high. See Osmundsen et al (2012). Similarly, the contractors can dictate that their risk exposure in the compensation format should be low.

That risk exposure can vary with economic conditions in the industry has been touched upon in the literature before. Moomjian (1999) discusses important issues of principle related to risk sharing in drilling. He notes that this follows an erroneous and abnormal pattern, where the contractors can negotiate good terms – for both rates and risk sharing – in a seller's market, and vice versa. This means that in bad times, when the contractors need risk exposure to be low, it is typically high. On the other hand, their exposure is low when rates are high and they can afford to bear a high level of risk.

Incentive theory recommends a larger degree of contractual tailoring than can be observed in the rig market. So the possibility that new organisational and contractual forms could be favourable cannot be excluded. In principle, the division of risk can be managed both through contracts and thorough sharing of ownership, and these two instrument can basically appear equal. However, incentive theory maintains that ownership, which ensures a life-cycle perspective on the business – is significant in a number of cases and cannot be fully replaced in incentive terms with contracts.⁶ In that context, this is perhaps most relevant for maintenance – ownership of the rig provides the best incentives to maintain it. Some equity interest in the rig for the contractor is accordingly to be

⁶ Hart (1995).

recommended. Other arrangements could undoubtedly also be established here, with maintenance outsourced, but ownership is preferable.

One way of achieving an optimum balance between risk sharing and incentive considerations is through joint ownership of a rig by oil company and contractor. Various forms of joint ventures have been discussed, but the idea appears to have been abandoned. There are several possible reasons for this. Negative feedback from the authorities is one. They are concerned that eliminating the buyer and seller roles would make it easier to set rates which undermine the Norwegian tax base. Another factor is objections from oil companies that a joint venture could help to weaken the clear division of roles and responsibilities required by incentive considerations. A third possible reason is that contractors are less interested in such joint ventures in a strong rig market.

On the other hand, examples can now be seen on the NCS of solutions at the opposite end of the spectrum – oil companies owning rigs themselves. Full capacity utilisation of rigs approved for use on the NCS and high rates for newbuilt units means that the difference between the cost of building for own account and chartering is perceived to be too large. Viewed in isolation, that could argue for oil companies ordering their own rigs. But this runs into a number of well-known objections. Oil companies would normally want to devote capital and scarce human resources on their core business, and rig ownership is not usually defined as part of this. Since it is difficult in practice to introduce existing foreign rigs to the NCS, that is achieved by some oil companies building units for their own account. They must then use scarce procurement and project management capacity which could have been better deployed on field development and modifications. With the ordering boom envisaged in coming years, the oil companies must tread carefully in opting for procurement solutions which call for a lot of follow-up and internal expertise. That must be weighed against the anticipated savings from cutting out the rig contractor.

Another question is whether the organisational and incentive-related savings which can be achieved through joint ownership of rigs might not be obtained in other ways. Imagine that the idea of a new ownership model could have arisen in a dialogue between a licence and a rig contractor. The licence complains that it is unreasonable for the contractor to demand that a newbuilt unit be repaid within five years when it has an economic life of several decades. In response, the contractor points out that the oil companies must remember that construction costs, completion date and uptime also pose a substantial operational risk and justify a risk premium. The licence might meet the contractor halfway by suggesting that it could take on part of this risk through a joint venture in exchange for a lower rate. Alternatively, the licence could adjust risk sharing for specified classes of costs through the compensation format in the rig contract – by meeting part of possible cost overruns incurred when building a new rig, for example. However, that would weaken the

contractor's incentives. Another approach is for the licence to guarantee the construction loan taken up by the rig owner. That could overcome possible borrowing constraints for the rig contractor (which have been particularly severe during the financial crisis) while also reducing the interest rate on the loan.⁷ However, this would not deal with the operational risk discussed above. Adjustments to the contractual terms could also reduce some of the operational risk while retaining sufficient incentives.

Whether it is reasonable to achieve rate reductions through this type of negotiation will depend on pricing behaviour in the market. With normal rig capacity and adequate competition in the rig market, the market price can in principle be set relatively independently of cost structure and risk. However, several exceptions to this rule exist. The cost structure plays a role at particularly low rates – these must as a minimum cover operational expenditures. Construction costs can also play a part when acquiring a new rig. Those ordering such units want to ensure that they get their investment back.

5. Results

Organisational and contractual arrangements often follow a conventional pattern in the rig sector. The rig is owned and operated by the contractor, for example, which bears the operational risk, while oil companies carry reservoir and oil price risk. From the perspective of large oil companies, it might be interesting to discuss other types of ownership or risk sharing which reduce the contractor's risk exposure if they can thereby secure a reduction in the rig rate. New and small oil companies less able to carry risk, on the other hand, might want the rig contractors to bear even more of the risk. Greater diversity in organisational and contractual arrangements is thereby required.

6. Conclusions

A more diverse contractual and organisational structure is needed in the drilling sector, since this may secure better risk sharing and an improved incentive structure in a context with heterogeneous oil companies. In particular, oil companies vary in their ability to carry risk. However, contractual and organisational design is subject to several constraints. First, accounting rules and the practice of credit rating companies limit the financial risk exposure which oil companies can accept. Second, the decision of rig contractors to register rigs in tax havens means

⁷ Substantial savings can be made with such guarantees. An article on "Høyere rente for Røkke-rigger" (Higher interest charges for Røkke rigs) on page 18 in Oslo business daily *Dagens Næringsliv* of 1 February 2013 reports that Aker Drilling has a bond loan of Nibor plus seven percentage points, while a corresponding loan guaranteed by the Aker group has an interest mark-up of only four percentage points.

that governments in oil-producing countries may wish to restrict the potential for joint ventures between oil companies and rig contractors, since this could undermine revenues from oil taxation. Third, insurance policies often assume a clear division of risk in order to ensure clear and objective responsibilities for the contracting parties.

References

- Bajari, P and S Tadelis (2001), "Incentives versus Transaction Costs: A Theory of Procurement Contracts", *RAND Journal of Economics*, vol 32, no 3, 387-407.
- Bolton, P and M Dewatripoint (2005), *Contract Theory*, MIT Press.
- Corts, K (2000), "Turnkey Contracts as a Response to Incentive Problems: Evidence from the Offshore Drilling Industry", working paper, Harvard University.
- Corts, K S, and J Singh (2004), "The Effect of Repeated Interaction on Contract Choice: Evidence from Offshore Drilling", *Journal of Law, Economics, and Organization* 20 (1), 2004, 230-260.
- Hart, O (1995), *Firms, Contract, and Financial Structure*, University Press
- Hillier, B (1997), *The Economics of Asymmetric Information*, MacMillan Press Ltd, London.
- Laffont, J-J and J Tirole (1993), *A Theory of Incentives in Procurement and Regulation*, MIT Press.
- Milgrom, P and J Roberts (1992), *Economics, Organization, and Management*, Prentice Hall, Englewood Cliffs, NJ
- Moomjian, C A (1999), "Contractual insurance and risk allocation in the offshore drilling industry", *Drilling Contractor*, January/February, 19-21.
- Olsen, T and P Osmundsen (2005), "Sharing of Endogenous Risk in Offshore Construction", *Journal of Economic Behavior and Organization*, 58, 4, 511-526.
- Osmundsen, P, T Aven and J E Vinnem (2008), "Safety, Economic Incentives and Insurance", *Reliability Engineering & System Safety* 93, 1, 137-143.
- Osmundsen, P, A Toft and K A Dragvik (2006), "Design of Drilling Contracts – Economic Incentives and Safety Issues", *Energy Policy* 34, 2324-2329.
- Osmundsen, P, T Sørensen and A Toft (2010), "Offshore Oil Service Contracts – New Incentive Schemes to Promote Drilling Efficiency", *Journal of Petroleum Science and Engineering* 72, 220-228.