# *does design affect utilization? An empirical study of the market for offshore support vessels*

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#### **Overview**

Offshore Support Vessels (OSVs) are a key part of the upstream supply chain for oil and gas, and provide support services for offshore exploration, development and production activities. The OSV fleet can be divided into platform supply vessels (PSVs) and Anchor Handling Tug Supply (AHTS) vessels. PSVs are designed to transport supplies and equipment between onshore bases and offshore rigs and AHTS vessels are used to tow offshore installations and their anchors into position. Furthermore, each vessel type can operate in two market segments - the spot or the term market.

The objective of this paper is to identify how vessel design and technical specifications impact the probability of obtaining a contract, and thus the vessel utilization, in the North Sea offshore supply markets between 2007 and 2016. To reveal potential differences in the determinants for obtaining contracts, the analysis is conducted for each vessel segment and contract type.

#### **Methods**

To investigate the impact of design and technical specifications on the decision to allocate a contract to a vessel, we use a logit model for each market segment (AHTS and PSV, spot and term contracts) and each year in the sample, as well as a panel logit model to pool the information across different years. The indicator of whether a vessel is fixed or not on a given day is the dependent binary variable. An OSV’s ability to obtain a contract is assumed to be a function of its technical specifications, age and fuel expenditure, as well as the market condition as proxied by overall fleet utilization. The empirical results are based on data for 20,454 OSV fixtures in the North Sea for the period January 2007 to July 2016, in addition to detailed specification data for each vessel, sourced from ODS-Petrodata and Clarksons Platou Research Ltd.

#### **Results**

#### We find that vessel age, vessel size and technical specifications are important determinants for obtaining contracts though there are significant differences across vessel segments and contract types. For PSVs, younger vessels with large deck area built in Northwest Europe are preferred for both spot and term contracts. Additional complexity such as advanced dynamic positioning systems (DP2) is rewarded in both spot and term markets, while large bulk capacity is more attractive for the spot market. In general, the probability of obtaining spot contracts is highly sensitive to vessel specifications, while employment in the term market is less sensitive to vessel specifications.

#### The preferences for AHTS vessels differ significantly between the term and spot markets. While younger and more powerful vessels built in Northwest Europe are more likely to obtain spot contracts, the term market is a two-tier market where either a less powerful and less complex vessel, or a more powerful and more complex vessel, is required to obtain contracts. Vessels with high complexity are significantly more likely to obtain spot contracts, with DP2 and ROV-capable being rewarding features. While having the most suitable set of technical specifications increases the probability of obtaining contracts in both markets, it is particularly crucial in the spot market. Vessel age and size are less important determinants.

#### **Conclusions**

We have shown that technical specifications play a different role across vessel segment, contract types and years with regards to the probability of obtaining a contract. The impact of ship design and market conditions on vessel unemployment is of crucial importance for several stakeholders in the offshore support vessel industry. For ship designers, it enables a cost-benefit analysis of adding or changing certain vessel attributes such as advanced dynamic positioning systems or carrying capacity. For shipowners and their financing banks it enables a more realistic assessment of cashflows from operation when subject to both the risk of vessel unemployment and volatile freight rates for contracts.