MARITIME

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Speed Matters
The Impact of VLCC Fleet Speed on Effective Fleet Size

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GENSCAPE™

Speed Matters
The Impact of VLCC Fleet Speed on Effective Fleet Size

Genscape Vesseltracker is a global leader in providing near-real-time and historical AIS ship tracking data through its online platform and/or by bespoke data feed.

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GENSCAPE WHITE PAPER

EXECUTIVE SUMMARY

One of the most critical issues affecting tanker market rates is well known to be speed. Whilst one owner or manager can make decisions for one's own vessel(s), it is the whole fleet that affects rates. And while an owner can decide to slow or accelerate, this decision is going to be driven by optimizing operating efficiency or returns based on rates, costs, and of course, charterer requirements. Therefore, Genscape set out to examine the relationships between aggregate fleet speeds and the prevailing prices of bunkers and spot charter rates.

In this white paper, data obtained by Genscape Vesseltracker shows the relationship between ship speeds and bunker prices, as well as prevailing shipping rates. Additionally, this paper expands on the relationship between VLCC fleet speed and the effective size of the VLCC fleet.

METHODOLOGY

To explore the relationship between speed and spot charter rates, Genscape compared 2.5 years of AIS history from Genscape Vesseltracker against spot bunker prices at Singapore and Fujairah, and spot rate on the Baltic TD3 route.

For the purposes of this research Genscape considered "TD3" to include voyages from the Middle East Gulf (MEG) to Japan, as well as northern China and Korea. This widens the available voyage data to all long haul eastern destinations from MEG.

Vessel information from Genscape Vesseltracker was used to identify VLCCs and position data to determine if a TD3 voyage, as defined above, was completed. Genscape found that 2,901 laden voyages and 2,437 return voyages were completed between 1 November 2012 and 11 April 2015. For each of these voyages, all speed data points were recorded.

In order to calculate a more accurate cruising speed for the TD3 voyage, the typical voyage was segmented into three deep-sea legs. By eliminating the speed data in restricted waters, such as the Malacca Strait, data where vessel speeds may be constrained was eliminated, focusing the analysis on true deep-sea cruising speeds.

For every day in the data set, Genscape calculated an average daily speed for each VLCC and then aggregated those into an average daily speed for the fleet in each of our "TD3" legs. Genscape then averaged these values across all three legs for a daily average deep-sea cruising speed across the VLCC fleet.

Finally, a simulation of Genscape's "TD3" supply route was created to determine how many vessels would be needed to supply this route assuming various speeds. Using Vesseltracker historical data including 2,901 laden voyages over 892 days, Genscape inferred that the average demand for oil along this route was 6.5 million barrels per day, which was assumed to be the steady state. The number of ships needed to service that level of flow depends upon the speed of the fleet and turn-around times at ports.

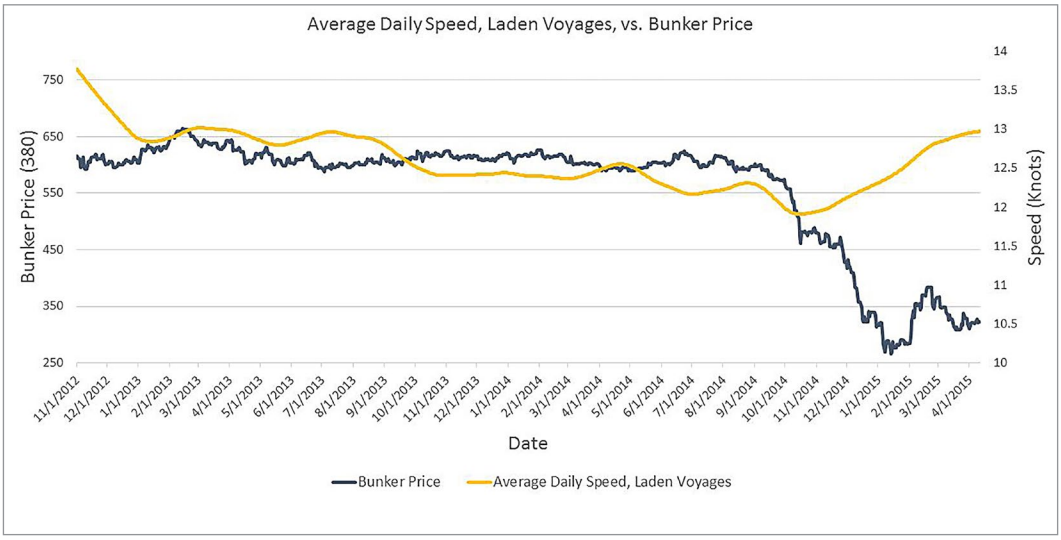
Based on Genscape Vesseltracker data, the average turn-around times for VLCCs in the Middle East Gulf were found to be 6 days and the average turn-around time at discharge ports in Japan, South Korea, and northern China were found to be 2.5 days.

LADEN SPEED FINDINGS

Genscape found no clear correlation between prevailing rates and the average daily speed of the VLCC fleet on outbound, laden voyages. Vessels on the "TD3" route tended to travel in a narrow speed range that is driven mainly by operational constraints and cost optimization.

However, a modest inverse correlation between laden speed and bunker prices was found. As prices get higher, speeds lessen. This inverse correlation held when bunker rates dropped significantly at the end of last year.

Bunker Price Compared to Laden Speed

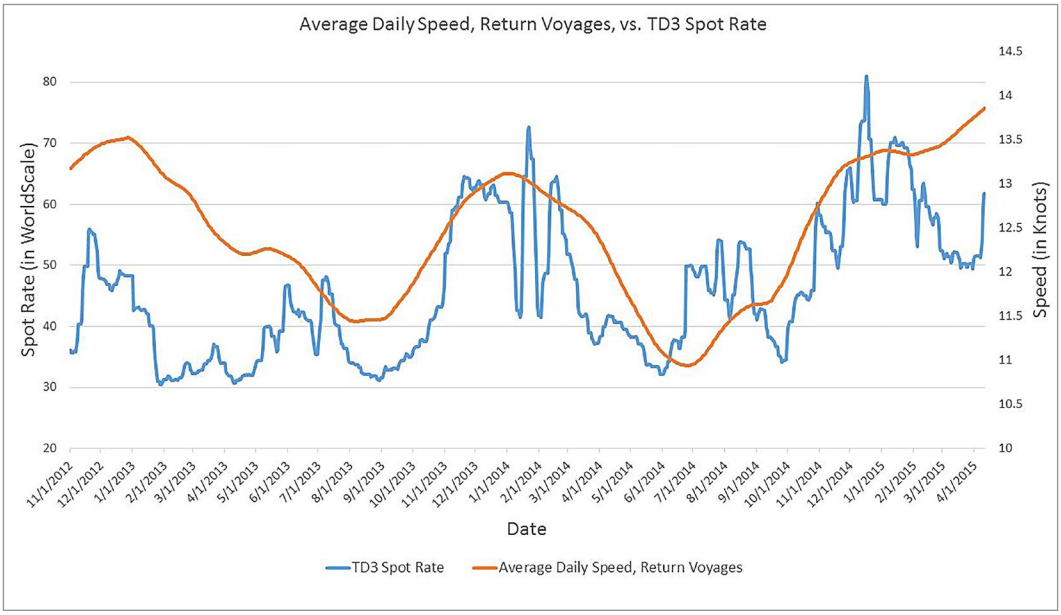


Average daily speed, laden voyages vs. bunker price

BALLAST SPEED FINDINGS

Genscape found a clear correlation between the TD3 spot rate and the average daily speed of the VLCC fleet on ballast, inbound voyages.

TD3 Spot Rate Compared to Ballast Speed



Average daily speed for return voyages vs. TD3 spot rate. This correlation holds across multiple years and multiple rate increases and decreases.

EFFECTIVE FLEET SIZE

Over the period of this research, the actual size of the VLCC fleet increased by only three percent, from 623 to 644 vessels. Thus, the absolute size of the VLCC fleet through new builds and demolitions changed slowly. The most significant source of change in VLCC supply is the "effective" fleet size due to changes in speed.

To measure the impact speed has on effective fleet size, Genscape created a "TD3" steady state simulation, assuming a constant demand of 6.5 million barrels per day. Table 1 demonstrates that any increase in speed results in fewer VLCCs necessary to satisfy the considered oil import demand, leaving a number of vessels surplus to this supply requirement (Table 2), and creating an effective increase in the size of the overall VLCC fleet.

At the extremes, an increase in speeds on both Ballast and Laden voyages from 11 knots to 14 knots results in a decrease of 33 VLCCs (18 percent) necessary to satisfy the considered requirement. Smaller changes in speed will result in changes in the required fleet size as indicated in Table 2 below.

BLOG

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Minimum number of VLCCs to transport 6.5 million barrels per day from MEG to Far East

TABLE 1 - VLCC FLEET SIZE FOR TD3				
	VLCC speed laden			
VLCC speed ballast	11 knots	12 knots	13 knots	14 knots
11 knots	183	176	171	166
12 knots	176	170	164	160
13 knots	171	164	159	154
14 knots	166	160	154	150

Number of VLCCs available for other routes as speed on TD3 route changes

TABLE 2 - EFFECTIVE FLEET INCREASE OF VLCCS FOR TD3				
	VLCC speed laden			
VLCC speed ballast	11 knots	12 knots	13 knots	14 knots
11 knots	0	7	12	17
12 knots	7	13	19	23
13 knots	12	19	24	29
14 knots	17	23	29	33

CONCLUSIONS:

AIS data from Genscape Vesseltracker contains fundamental data that was used to investigate how ship speeds are related to bunker prices and prevailing shipping rates. Both laden and ballast speeds are reactive to prevailing bunker price and shipping rates rather than predictive of either. Laden VLCCs adjust speed in response to bunker prices and ballast VLCCs adjust speed in response to shipping rates.

VLCC speed, which determines the effective size of the fleet, can be far more significant than new builds and demolitions, which affect the actual size of the fleet.