



No. 7 – TANKER MARKET OUTLOOK – DEMAND CALCULATIONS

FEBRUARY 6, 2014

This is the fourth of a four part series of Industry Notes regarding McQuilling Services 2014-2018 Tanker Market Outlook.

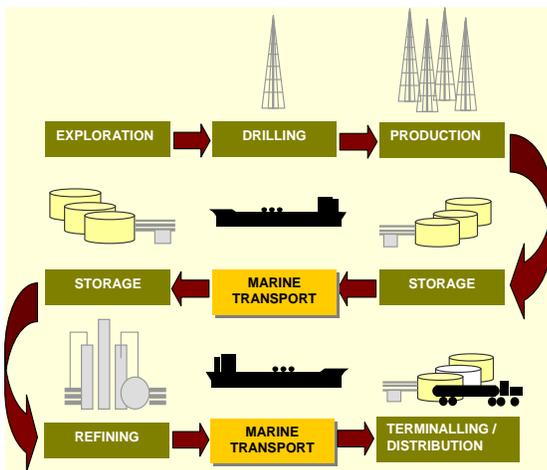
McQuilling Services recently released its 2014-2018 Tanker Market Outlook that forecasts spot freight rates across eight tanker classes and 13 major trading routes. This year's edition also includes an upgraded forecast of asset prices over the same period for newbuilding, 5-year old and 10-year old tankers in these eight classes.

Forecasts are estimations of future activities based on models designed to mimic reality. As such they are abstractions that are highly dependent on data, analytical methodologies, and specific assumptions. Whether complex mathematical formulations or simple projections based on experience and observation are used, forecasting the future in most industries is an imprecise and inaccurate activity. The spot market for tanker freight rates is no exception; however, our methodology has steadily yielded results within 10% of market actuals.

This note discusses an important element of McQuilling's forecasting process, the development of tanker demand.

At a global level, marine transportation demand is related to world trade, which is directly related to the state of the world economy. This means that demand for crude oil and petroleum products grows with an expanding global economy.

Figure 1 – Marine Transportation Integration within Supply Chain



Source: McQuilling Services

Marine transportation demand for tankers is a derived demand. It arises from the energy consumption requirements of regional economies. Petroleum product marine transportation demand arises from matching consumption with refined product production in refining regions. Integrated with the supply logistics chain for petroleum, crude oil marine transportation demand for tankers arises from matching refinery raw materials requirements with crude oil production (Figure 1).

**Demand Characteristics** - Tanker demand can be defined as the requirement to transport by ship liquid hydrocarbons in bulk from origin to destination. The parameters comprising tanker demand are several. Demand is characterized by the *type of cargo* required to be transported and by extension the ships capable of doing so. The *parcel size* of the cargo is a function of the trade and driven by either custom or constraint at the loading port or discharging port. Related to parcel size is the *frequency* of the demand for delivery of the cargo. Finally, cargoes are loaded and discharged in a plethora of *locations* worldwide on numerous trade routes.

Adding to the complexity of calculating tanker demand is the fact that these four parameters are also a function of time. Fortunately, the practical application is simplified by the way vessels, cargoes and trades have collectively evolved over time.

VLCC and Suezmax demand is comprised almost entirely of crude oil transport. Aframax and Panamax tanker demand is made up of crude oil transport and the carriage of residual petroleum products such as fuel oil. LR2, LR1 and MR demand is comprised mainly of the transport of clean petroleum products such as gasoline, jet fuel and diesel.

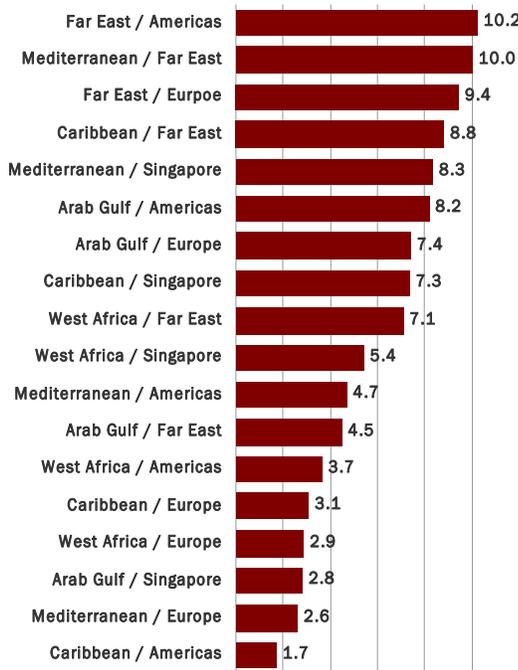
**Trade Logistics** - The evaluation of tanker transportation demand reduces to the understanding how much of what type of cargo is transported on what type of ships over what geographic trade routes. This latter spatial element is critically important to the proper evaluation of transport demand. This is because it takes more of the same sized vessels to deliver an equivalent stream of crude oil or products on a longer voyage between load port and discharge port than on a shorter voyage.



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Figure 2 illustrates this point. In the figure, the various bars represent the number of Suezmax vessels required to deliver 100,000 barrels per day over trade routes of various lengths. These results are based on round trip voyage assumptions, transporting cargo from load port to discharge port and traveling back to the load port empty (in ballast). Clearly, the trade dimension to tanker demand must not be neglected.

Figure 2 – Number of Suezmax Tankers Required to Deliver 100,000 Barrels per Day



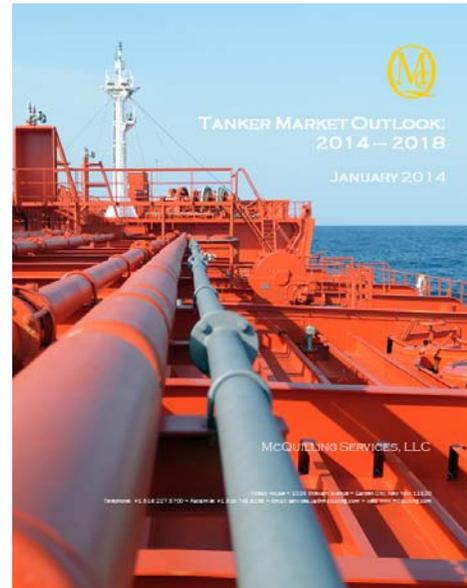
Source: McQuilling Services

Tanker demand, with this spatial dimension included, is referred to as a demand matrix or *trade matrix*. This trade matrix is characterized by different sized vessels carrying different types of cargoes of crude oil and refined products on voyages between loading regions and discharging regions around the world. Each of these voyages consumes a specific amount of time directly related to the length of the voyage. The sum of all of the cargoes requiring transport over all of these distances collectively represents the global demand for tankers at a given point in time, represented in units of *ton-miles*.

A cargo of 280,000 metric tons of crude oil transported from Ras Tanura in Saudi Arabia to LOOP in the US Gulf represents 3,461,080,000 ton-miles of tanker demand.

If the characteristics of the trade matrix change in any way, demand for tankers will also be impacted. Changing trade patterns may elevate or reduce tanker demand. Shifting volumes, even if offsetting, may give rise to substantial changes in underlying tanker demand by virtue of the trades on which the volumes exist. In practice, when trading patterns are stable, cargo volume fluctuations lead directly to transportation demand fluctuations. However, if new trades emerge or old patterns change, the demand effect may be substantial and must be considered.

In the McQuilling Services Tanker Market Outlook, we start with bilateral marine trade of crude and refined products between countries and transform this information into global ton-mile demand by vessel class.



Visit [www.mcquilling.com](http://www.mcquilling.com) or contact us to obtain your copy of the McQuilling Services 2014-2018 Tanker Market Outlook publication.

- The 120+ page report also includes:
- Global Economic Outlook
  - Tanker Market Fundamentals
  - Previous Freight Market Performance
  - 5-Year Outlook for 13 Major Trades/8 Vessel Classes
  - Asset Market Outlook
  - Investment Attractiveness
  - Operating Cost Structure
  - Comprehensive Analytical Appendix
  - 80+ Figures/20+ Tables