

Logical Information Machines' *Sandy Fielden* provides an analyst's perspective of new opportunities for freight risk management with a specific focus on the crude (dirty) tanker trade from the Caribbean to the US Gulf

Banking on tankers

★ London's Baltic Exchange has a history of 250 years in the shipping market. Its more than 500 members encompass the majority of world shipping interests. The exchange produces more than 40 different freight indexes each day for both dry bulk and tanker (oil) cargo routes. These include daily assessments for 19 of the world's most important oil tanker routes – the Baltic International Tanker Route indexes (BITR).

BITR indexes are based on the Worldscale nominal tanker freight rate schedule. Worldscale is a non-profit association based in London and New York that publishes an annual list of nominal (flat) oil tanker freight rates between every load and discharge port combination. These rates are then used as the basis for actual tanker freight fixtures, which are quoted and assessed as percentages of the Worldscale flat rates. Every tanker charter is linked back to an underlying Worldscale rate, which itself has fixed and variable elements related to port costs, distance traveled and canal tariffs (Suez and Panama). The oil tanker market is divided into two cargo types – 'dirty' and 'clean'. Dirty cargoes are crudes and heavy fuels, clean cargoes are light products.

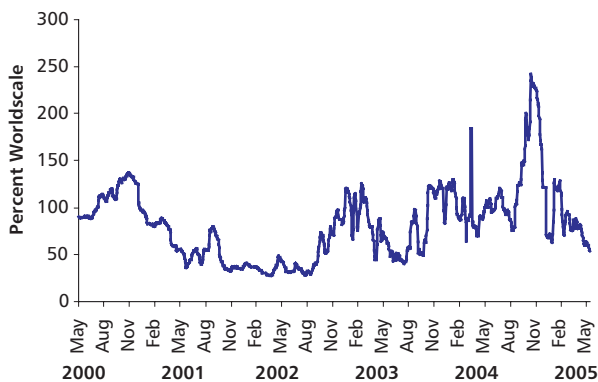
The Baltic Exchange introduced a freight futures market called the Baltic International Freight Futures Exchange (Biffex) in 1985, but this market closed in 2001 because the contracts were not flexible enough. In 1992 over the counter (OTC) derivatives called forward freight agreements (FFAs) were launched, initially in the dry bulk market. FFAs are bilateral OTC agreements that allow ship owners and consumers to fix freight rates for a specified voyage today for a defined future period. The contract settles in cash at the end of the period against the average of the appropriate BITR index. Today FFA arrangements for oil tankers are traded actively against the BITR or Platts spot Worldscale assessments.

FFA derivatives improved on the Biffex freight futures market, because their terms and conditions could be tailored to the specific needs of the two parties – for example, route, cargo size, initiation and length of contract. FFAs can be up to three years in term. They can be bought and sold prior to expiry and don't interfere with the complexities involved in vessel chartering because they are independent cash instruments.

According to the International Maritime Exchange (Imarex),

Source: Baltic Exchange

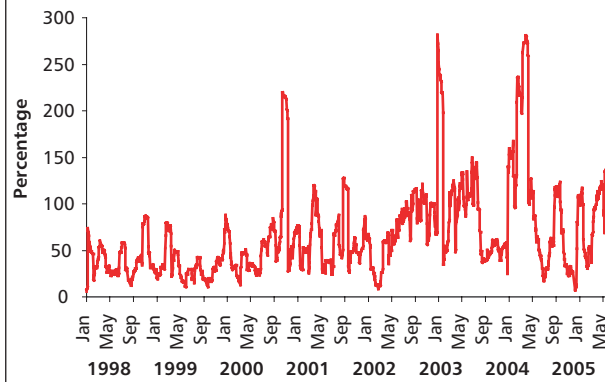
F1. Baltic dirty tanker route TD1 Arab Gulf to US Gulf



Daily spot rates for freight, such as this dirty tanker rate from the Arab Gulf to the US Gulf assessed by the Baltic Exchange, are based on percentages of the annually published Worldscale flat rates.

Source: Baltic Exchange

F2. 21-day historic volatility of Baltic TD9 freight index



The Baltic Exchange TD9 Index is a daily assessment of the crude oil route from Puerta La Cruz in the north-east of Venezuela to Corpus Christi in the US Gulf. Historic volatility has increased since 2001 to an average of 81% with a maximum of 280%.

based in Oslo, Norway, the total market for FFAs in 2004 had a value exceeding \$25 billion, of which dry bulk derivatives accounted for 60% and oil tankers the remaining 40%. Dry bulk FFAs have been traded since 1992 as a bilateral market between large players. The FFA market in oil tankers has become significant only since the end of 2002 when Imarex launched the first regulated freight futures exchange. Imarex users trade with the security of counterparty risk provided by the Norwegian Futures and Options Clearinghouse (NOS), which clears all the transactions. Imarex claims a 30% share of the tanker derivatives market (\$3 billion in 2004). Much of the exchange's business is now conducted electronically.

Volatility

Closely associated with the take-off in the Imarex market for tanker freight derivatives has been a parallel increase in freight rates and the volatility of freight rates. On the major crude tanker route from the Arab Gulf to the US Gulf, Baltic tanker index 21-day historic volatility between 2000 and 2002 was an average of 34%. Since the beginning of 2003, that volatility has jumped to 90%. Over the same period, Worldscale percentages on this route averaged 66% before 2002 and 98% since then (see figure 1). For risk managers, FFAs can offer an effective way to reduce this price and volatility exposure. To assess the benefits, LIM analysed one specific BITR index route, known as TD9.

The Baltic TD9 Index tracks freight fixtures for crude shipments between Puerto La Cruz on the north-east coast of Venezuela and Corpus Christi in the US Gulf of Mexico (see figure 2). The vessel size for this freight route is 70,000 metric tonnes, in the Aframax category. Aframax tankers serve oil trade routes over medium- and long-haul distances. The route from

Puerto La Cruz to Corpus Christi is a round trip of 15 days. The shallower draft and short length of Aframax vessels enable them to enter a greater number of ports than larger tankers.

Venezuela is the world's sixth largest exporter of crude oil, and most of its output normally finds its way to US refineries in the US Gulf or further up the east coast. Production in the east of Venezuela, most of which flows to the export oil terminal at Puerto La Cruz, is around 1.5 million barrels a day.

Freight rates on the TD9 route have definitely experienced high volatility in recent years. Between January 1998 and December 2000, 21-day historic volatility in the TD9 index averaged 44.6%. Since January 2001, volatility has risen to an average of 81% with a maximum of 280%. Rates reached historical highs in excess of 450% of Worldscale during October 2004. That translates to a daily freight cost of over \$65,000 for an Aframax vessel (see figure 2).

But were these high rates a 'flash in the pan' caused by local conditions, that do not merit risk managers getting involved in freight derivatives? Analysis of the local situation suggests otherwise. At the same time that TD9 rates reached historic highs, the level of US crude oil imports from Venezuela was actually down following that country's oil strike at the end of 2002. According to a report by Poten and Partners¹ on the run-up in freight rates in October 2004, there was no shortage of vessels available at the time, and the annual number of fixtures in the Aframax market between 2002 and 2004 fell from 5890 to 5830. Freight-rate volatility was not caused by traffic congestion on the TD9 route.

The Poten report pointed to Aframax tankers operating in other markets besides the Caribbean. Several routes compete with TD9 for the Aframax vessels available. Shifting trade patterns have kept freight levels high by pulling Aframax vessels out of the Caribbean: there has been a shift away from short-haul Caribbean crude to the US and towards longer-haul voyages – of Arab Gulf products and crude to Asia, and North Sea crudes to the US Gulf. Overall, the biggest underlying driver in the freight market is the expanding demand in China, which experienced economic growth of 12% during 2004. China's imports of crude rose 34.8% in 2004, making it the second largest importer of crude oil after the US.

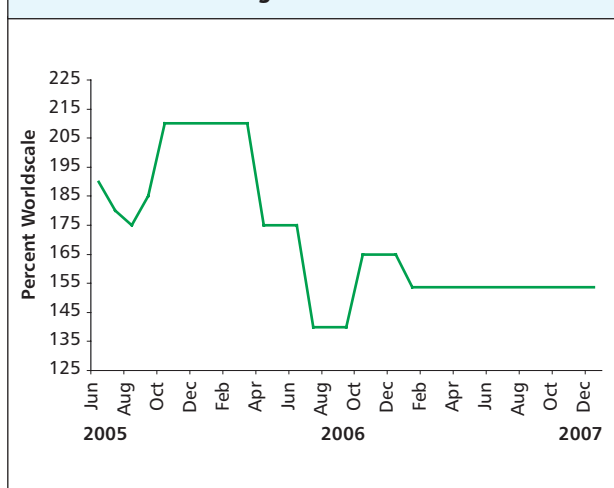
In general, world freight rates have risen in the past few years because demand for oil is rising and it typically has to travel further to market. More vessel miles are needed. New vessels are not being built quickly enough to meet demand. What's more, environmental concerns have driven down the age of the tanker fleet and made older tankers, which do not have safety features such as a double hull, obsolete.

All of this illustrates the risks of price volatility in the freight market. Politics, weather, worldwide supply and demand as well as environmental regulation make shipping oil every bit as risky as extracting it from the ground. In this environment, how effective can using FFA derivatives be?

The Imarex FFA contract for TD9 freight offers four forward

Source: International Maritime Exchange

F3. Imarex tanker freight derivatives TD9 forward curve



Forward freight agreements (FFA) pricing for route TD9 for crude-oil freight from the Caribbean to the US Gulf – shown as a forward curve out to 2007 – as quoted on the International Maritime Exchange.

1. Poten & Partners 'Aframax Runup – Myth or Reality?', October 2004

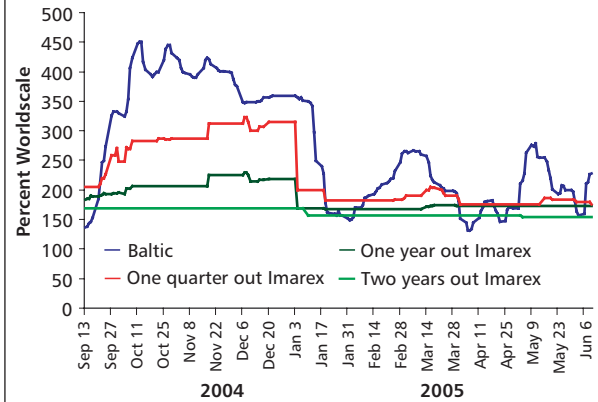
months, six quarters and two calendar years. The forward curve of freight prices for June 9, 2005 shows prices falling through August 2005 before rising again in the final quarter of 2005, holding high for the winter, and then falling off again sharply in the second and third quarters of 2006 (see figure 3). Just by providing daily visibility in forward pricing, the Imarex market has immediately improved price discovery for freight buyers and ship owners.

A comparison between spot prices and longer term forward freight rates that can be locked in on the Imarex exchange (see figure 4) shows that further out, rates are considerably less volatile. Spot Baltic index rates have had 21-day historic volatility of 72% since October 2004, while Imarex's reported first-quarter-out settlement price reduced the volatility to 37% over the same period. Choosing the longer-term, two-year-out Imarex contract would have reduced volatility to a little over 3%.

Although oil tanker freight derivatives are still a young market, the Imarex data for TD9 rates in the Caribbean indicate how the risks associated with freight rate volatility can be better managed with FFA instruments. Because Imarex is European, it has not attracted much interest from the US market to date. But the launch of FFA contracts by the Nymex in May 2005 and Imarex's recent listing of the world's first freight options indicate that freight derivatives are here to stay. Demand pressures on the world oil market led by China will also ensure continued volatility in underlying freight rates. [ER](#)

Source: Baltic Exchange and Imarex

F4. Baltic Exchange TD9 rates vs Imarex forward prices



Baltic TD9 Index rates (reflecting the daily spot market) compared with the FFA rates available from Imarex over the same period. The further out the Imarex rate, the lower the 21-day historical volatility with the two-year-out rate virtually flat at 3% compared with the spot Baltic rate at 72% volatility.

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