

Hedging marine price risk

Traditional risk-management tools like swaps cannot make oil shippers invulnerable to oil price volatility. And they do nothing to mitigate freight risk—the shipping price paid to tanker owners. But new marine risk hedging instruments are reaching market, and they could prove as popular as commodity derivatives

Companies that move oil by sea must manage two different price risks. One is associated with the price of marine fuel; the other relates to the cost of freight. The need to hedge marine risk has become greater as markets for both freight and bunkers—the fuels that drive ship engines—have become more volatile and more susceptible to swings in the global price of oil.

Certain uncertainty

What are the main sources of volatility in each of these two markets?

That oil prices are volatile is well known, even beyond the energy industry. The past few years have been among most volatile on record. Crude prices in 2000 nearly quadrupled from their 1998 lows, primarily as a result of OPEC production cutbacks, and they remain volatile in 2001 despite OPEC efforts to corral prices into a \$22 to \$28/bbl band.

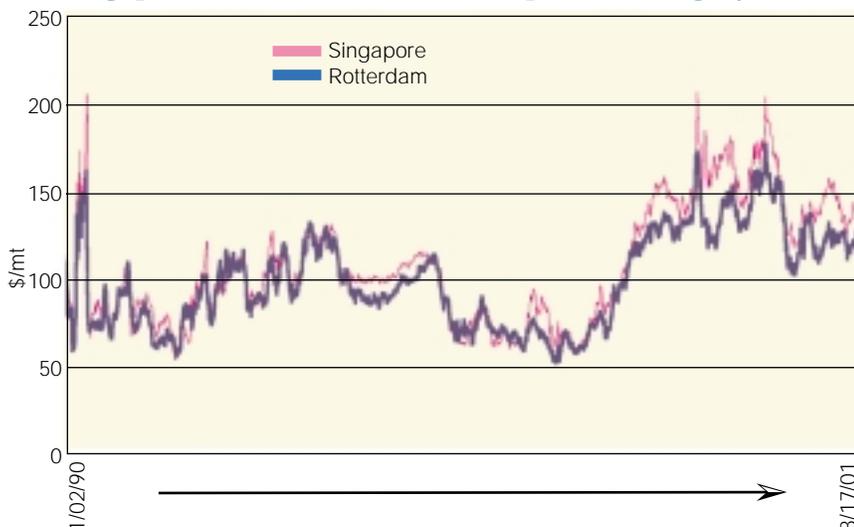
OPEC's cutbacks and subsequent easing of production curbs as crude prices soared to as high as \$35-\$38/bbl had a big impact on fuel oil availability and led to a very volatile fuel oil market in 1999 and 2000. Prices of the product carried on Rotterdam 3.5% fuel-oil barges increased from a low of around \$46/metric ton (mt) in December 1998 to just over \$170/mt in October 2000. In Singapore, the benchmark 180 centistoke (cst) cargoes dropped to \$55/mt in February 1999. Just 13 months later, they stood at close to \$200/mt. It has been a bumpy ride.

This year's attempt by OPEC to control crude prices has been broadly successful; the price of the cartel's "basket" has deviated little from the \$25/bbl price that is the middle of the desired band. But product markets have remained volatile, leading to very erratic refining margins. Rotterdam bunker prices have swung between \$97 and \$136/mt, while Singapore bunkers have ranged from \$114 up to \$155/mt.

Put another way, the lowest prices recorded were 9-11% below where they stood at the start of the year,

BY PETER STEWART

1. Singapore and Rotterdam bunker prices are highly correlated



There is evidence that OPEC cuts have made the price of fuel oils more volatile. With another 1-million bbl/day cut looming, this tendency could become more pronounced

and the highest were 23-24% above.

Traditionally, marine markets have been shielded from the brunt of this volatility by their relative lack of transparency, and because residual products, such as fuel oil, have tended not to be traded as speculatively as light and middle distillates. But there is evidence that OPEC cuts have made the price of fuel oils more volatile. With another 1-million bbl/day cut looming, this tendency could become more pronounced.

When an oil producer cuts production, he tends to cut back on his lowest value crudes, rather than on the petroleum products with higher market value. Because heavier, higher sulfur crudes tend to be worth less than light, lower sulfur grades, OPEC production cuts have therefore more directly affected the availability of heavy crude oil—which in turn has led to a relatively tight market for fuel oil.

Because bunker fuel costs account for between one quarter and one third of the cost of running a tanker, oil price increases tend to depress tanker activity. But during the economic boom that followed the 1997 Asian economic crisis, this dampening effect did not take place. Indeed, because low oil stocks needed to be replenished, tanker activity was unexpectedly robust for quality tonnage, boosting bunker prices and tanker rates.

As OPEC released more oil onto the market to keep

prices from rising further, more ships were needed to carry the extra barrels, keeping pressure on freight rates. More bunkers were needed to fuel the ships, and this offset the downward pressure on prices because of the greater availability of fuel-oil-rich crudes. Generally positive world economic indicators also helped boost the demand for ships, and therefore ships' fuel.

With the sharp downturn in economic activity in 2001, however, there is the real prospect of a sharp reduction in tanker activity even as new

vessels start to come on the market after the bout of scrapping in 2000. That does not necessarily mean bunker prices will suffer, because supply could be constrained by OPEC cuts. Ship owners could face a double-whammy: higher fuel costs, and less demand for vessels.

What swaps can and can't do

It seems likely, therefore, that the crude price stability desired by OPEC may not reach the end user. The need to hedge price risk is clear. So how do you do it?

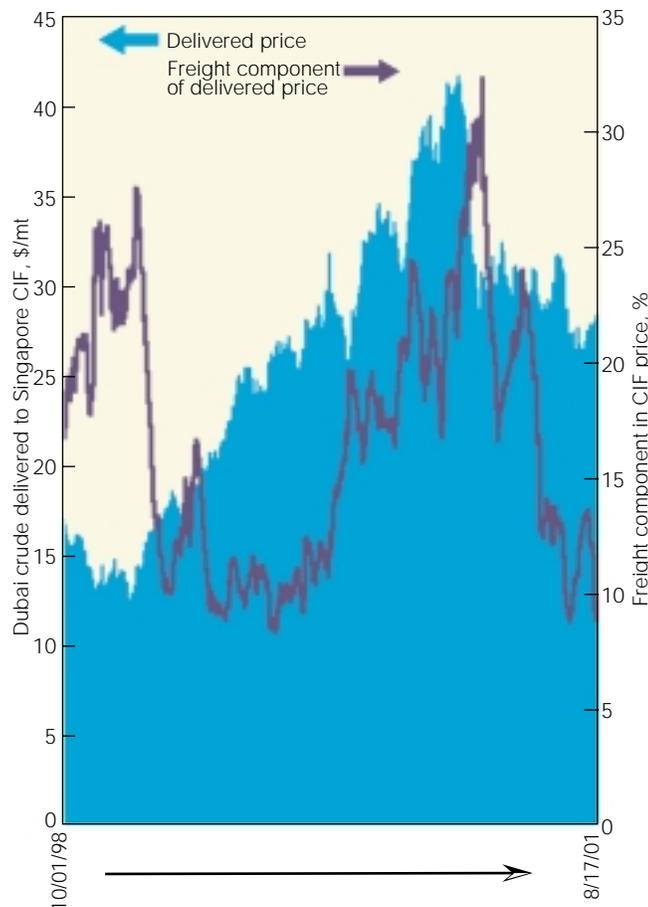
Let's take the bunker price first, because it is an area in which there is a well-established and widely used mechanism to hedge price risk. The swaps market is used by many suppliers and bunker purchasers to lock in prices. Using a traditional swap, a buyer exchanges floating price risk for fixed price risk.

But swaps can only control price risk; they can't eliminate it. While hedging in this way limits risk, it also limits profit potential. No one is going to write you a swap for nothing, because they are taking risk off your hands and expect to be paid.

The cost of bunkers is as exposed as any other end-user market to the full brunt of international oil-price volatility. Certain markets in which there are a limited number of suppliers may be sheltered to some extent from the harsh commercial pressures of the competitive market. But in the key price-setting centers of Singapore, Rotterdam, and key ports in the U.S., bunker prices are highly responsive to changes in the bulk spot market. There is a high degree of correlation between bunker prices in two key international bunkering centers (Fig. 1).

For an example of one of the more successful swap mar-

2. Volatilities of freight rates and oil prices are connected



Energy transport

kets for bunkers, consider the 180 cst cargo swaps in Singapore. On bunkers, swaps are typically written against assessments of the spot bulk market supplying the relevant bunkering ports—for instance, 180 cst cargoes in Singapore or 3.5% fuel-oil barges in Rotterdam. The floating-price portion of a petroleum swap almost always uses Platts (www.platts.com) spot assessments as its settlement benchmark. In the tanker markets, swaps are being written against Worldscale rates (see box) in such areas as the Caribbean and certain long-haul routes from the Arabian Gulf.

Because of this high correlation between cargo assessments and bunker prices, bunkers can be hedged directly against the 180 cst swaps. This is an active market. Even though counterparty risk issues can be a barrier to entry for some bunker traders, in practice the use of proxies with a higher credit rating gets around it.

In the professional market, large swaps writers—such as Morgan Stanley, J. Aron—and major oil companies—such as Elf—also write swaps against the 380 cst cargo assessment. Here, the swap functions just as it does in the bulk market where hedging activity is common: It exchanges fixed for floating price risk.

Freight risk

The second risk that marine oil shippers must mitigate is that associated with the cost of shipping. Until recently, tanker charterers saw little need or opportunity to control freight rates, which represent the cost of hiring the tanker. But now there is at least one piece of empirical evidence that the volatilities of freight rates and oil prices are connected, at least in one market (Fig. 2).

This may seem counter-intuitive. But a Platts study of tanker and oil prices over a decade called “Old Oil, New Rules” and published in late 1999 found some degree of correlation between the volatilities of the two. That shouldn’t be surprising. If you believe that oil prices move because of changes in the supply/demand fun-

Tanker chartering procedures and terminology

The days of dominance of tanker shipping by integrated oil companies using their own vessels to move crude from production areas to refineries—and then perhaps to export refined oil products—are long gone. These days, most oil companies charter the tankers they need, often for a single voyage.

Oil majors constitute only a part of the tanker market. They compete with the more infrastructure-light oil-trading houses for tonnage, although most market watchers would say that the criteria used by the large oil companies in the “vetting” process—where they decide upon a vessel’s acceptability—are the tightest.

The process of tanker chartering in the spot market tends, unsurprisingly, to be instigated by oil companies, most of whom employ shipping market specialists. The role of brokers in tanker shipping tends to be greater than, say, in the bulk oil markets. Ship brokers try to track vessel movements, both while the ships are carrying cargoes and in ballast, and regularly circulate to their clients lists of their ships’ positions and tanker “fixtures” that have been concluded.

Once a broker has located a suitable vessel and the negotiations on freight rates have been concluded, the tighter ship-vetting procedures come into play. Oil company sources cite an increasing separation between the chartering and vetting bodies in the chartering process, with the latter regularly vetoing cheaper ships for such reasons as their perceived poor condition. Nearly two years after the *Erika* disaster off the coast of France in December 1999, companies’ acceptability criteria remain more fragmented than before. Indeed, vessel acceptability now varies not

only from company to company but from port to port.

Some useful terminology:

■ **Fixture.** The act of chartering a vessel to carry out a particular voyage from one port or area to another.

■ **Chartering.** The hiring or leasing of transportation.

■ **Time charter.** A vessel chartered by a company for a certain length of time, rather than for a certain voyage. Charges are based on daily rates.

■ **Worldscale.** The tanker industry’s method of calculating freight rates. The non-profit Worldscale Association annually publishes a list of recommended rates (in U.S. dollars) per metric ton (mt) rates between many ports, for example, Milford Haven-Livorno: \$5.12/mt. These are based upon a typical tanker’s size. If a charterer agrees to pay twice the rate published by Worldscale, then what it pays is described as “Worldscale 200” (the 200 is short for 200%).

■ **Clean/Dirty.** The two different tanker markets: The clean sector moves “clean” petroleum products such as gas-oil, naphtha, and gasoline; the dirty one mostly moves crude and fuel oils.

■ **Bunker.** A type of marine fuel. Most tankers use heavy fuel oil to power their engines, and lighter fuels, such as diesel or gas-oil, to power the generators that run their lights and other electrical loads.

■ **FOB** stands for “free on board.” FOB prices exclude all insurance and freight charges. Most oil is sold either FOB (effectively priced at the loading port) or CIF.

■ **CIF** stands for “cost, insurance, freight” and refers to the delivered price.

By COLIN HALLING

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damentals, it should be clear that a change in supply or demand for oil will also be reflected in a change in the tonnage required to move it.

After it published that study, Platts conducted another one to see whether

freight rates themselves had become more volatile over time. No evidence was found to suggest that that was true. However, the study did reveal the existence of periods of cyclical volatility.

There is reason to believe that the growing role of the Middle East in the share of world supply could lead to more volatile freight rates

For example, Platts estimates that when oil prices were low in late 1998, freight volatility accounted for as much as 15% of delivered (CIF) outright price volatility. There is also reason to believe that the growing role of the Middle East in the share of world supply could lead to more volatile freight rates. According to forecasts by econometricians, world trade in oil will rise sharply in the period to 2010, and trading patterns will change as consumption growth surges in Asia and other developing areas, such as Latin America, but remains relatively steady in Europe and the Americas.

Because there is a correlation between tanker demand and oil demand, the forecast moderate growth in oil prices should encourage the use of oil—and oil tankers—rather than that of competing fuels. Growth in oil production will be strongest from the lower-cost field, and net oil export will be strongest in areas where production growth is strong and population low.

In terms of shipping, the bulk of demand growth will therefore come from the Persian Gulf and the Caspian basin. These two regions are geographically well placed to supply the Asian area, although for political and economic reasons, producers and consumers will seek to maintain diversity in their business partners. This change in consumption pattern means that the average time oil spends in transit is likely to become longer. This, in turn, will impact the demand for tonnage required to transport the oil. Because backhaul opportunities are limited on Asian routes, a tanker is full only on its outbound journey, so the number of extra tankers needed is proportional to journey time.

The *Erika* effect

Recent volatility in freight rates has been caused by large-scale scrapping of old tankers after the *Erika* incident. In December 1999, the tanker *Erika*, carrying 30,000 mt of fuel oil, broke up off the French coast, leading to a catastrophic oil spill. Scrapping of older tankers that represent an environmental risk was therefore accelerated, and time charters of new vessels left even fewer tankers for spot chartering. The result: Freight rates soared. In the clean market, ships were chartered at as high as Worldscale 500. Usually, the scrapping of ships is a response to a medium-term decline in tanker rates.

When scrapping happens in the middle of a boom cycle in rates, however, there is a very strong chance that the upward trend in rates will continue, putting pressure on tonnage. That said, the spell of high freight rates seems to have already prompted a spate of new building activity which could hit the market just as recession strikes. Therefore, a low-freight scenario cannot be ruled out.

In the longer term, conventional wisdom was that the tanker market will face surplus tonnage, particularly of very large crude carriers (VLCCs). This has been predicated partly on the anticipated construction of long-distance pipelines, such as those planned east from the Caspian region. But if, as seems likely, politics make such pipelines infeasible, tankers will

be the only way to move the oil. Because of the anticipated higher dependence on the Middle East, long-haul journeys are likely to be favored, and this will mean VLCCs and ultra-large crude carriers (ULCCs) carry the bulk of the oil.

Thus, there is the potential for conventional wisdom to be stood on its head. Even if there is no actual shortage of ships, transportation seems likely to become a bigger component of delivered costs. If journey times are longer, the cost of transportation is likely to become a more volatile ingredient in the delivered cost of a commodity, the FOB price of which is already highly volatile. A hedge for that exposure will become a pressing need if transportation costs do rise relative to the value of the underlying commodity.

A final, potential source of volatility is collectively represented by the choke points in the world's oil supply chain. Almost half the world's oil passes through a handful of relatively narrow shipping lanes and pipelines; they are called choke points because of their high potential for closure. Disruption of oil flows through any of these export routes could have a significant impact on world oil prices, and tanker routings as well. The Strait of Hormuz is the best known of these choke points. But the Strait of Malacca, the Suez Canal, the Bab el-Mandab, the Bosphorus, and the Panama Canal are other important channels whose closure—either from conflict or a collision in the overcrowded shipping lanes—would change the entire world's supply pattern for a time.

Life preservers

All these sources of volatility, both actual and potential, underscore the need to hedge freight risk. The good

The spell of high freight rates seems to have already prompted a spate of new building activity which could hit the market just as recession strikes

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Energy transport

news is that help is available. Tanker brokers are looking at new instruments that would allow them to do freight hedging, including swaps that are settled over agreed time frames either against brokers' assessments of spot tanker rates, or assessments of spot tanker rates made by independent parties, such as Platts.

Dry bulk derivatives have been available since 1985 through trade in Baltic International Freight Futures Exchange futures on the London International Financial Futures Exchange, with settlement made against the Baltic Freight Index (BFI). No similar exchange-traded contract is yet available for the oil tanker market. However, an increasing number of over-the-counter (OTC) derivatives have become available. Among these, there is a growing market in forward freight agreements (FFAs).

A FFA is an over-the-counter agreement between two principals which sets a freight rate for a specified volume of cargo and vessel type on certain routes, at a date in the future. The FFA is a paper instrument, usually negotiated through a broker. The development of FFAs has been facilitated greatly by the existence of viable settlement mechanisms.

Since 1998, the London-based Baltic Exchange has published Worldscale rate assessments for 11 key tanker routes. The exchange's body of data is called the Baltic International Tanker Route Assessment (Bitra) and often forms the basis of settlement in the freight swaps mentioned. Prices for each of the 11 routes are set daily based on rates submitted by a panel of recognized shipbrokers, with maximum and minimum assessments excluded and the remaining assessments aggregated to produce the index.

Among the large brokers who have been writing such derivatives products are companies such as Clarkson's, Drewry & Simpson, and Spence & Young. The Internet is also opening up new freight hedging opportunities. Among the dot.coms, LevelSeas.com has backing from oil majors, brokers, and trading compa-

nies and is planning on-line trading of freight derivatives in both the dry and wet bulk market. Other freight chartering Web sites include laycan.com, charteringsolutions.com, and ship-IQ.com. Oslo (Norway)-based Imarex.com is also planning an on-line exchange for freight derivatives, and will start with several key routes for crude tanker shipments.

Platts' tanker rate assessments are also increasingly being used in settlement. It publishes many specialist services for the marine sector, including *Platts Clean and Dirty Tankerwire*, *Platts Bunkerwire*, and *Platts Marine Alert*, each of which provides daily assessments of market activity. These services use a methodology that is somewhat different from that of the Bitra. Platts seeks to capture the actual traded or tradeable market levels on the routes it assesses, under tightly defined methodologies.

At present, the use of such hedging instruments is still rather limited, but the extremely firm freight rates in evidence in 2000 could prove to be a catalyst to their growth. Certainly this is likely among charterers and cargo owners. Half a dozen of the oil majors are believed to be using FFAs/swaps to hedge their cargo risk, and interest has also been seen from the financial community. In the oil and petrochemical industry, long-term swaps are used in structured finance deals for large projects, and a similar need exists in the shipping industry. Banks are much more likely to make a loan to a shipbuilder if it has a way to lock in the revenue it expects from its ships once they set sail.

As the oil market itself becomes more familiar with hedging techniques, it seems very likely that both owners and those shipping the oil will increasingly see a need to safeguard profits against volatile freight market movements. Extending their domain beyond energy commodity trading and risk management, derivatives—of the marine variety—could become a big growth area, particularly in Asia, where oil dependence on long-haul Middle Eastern oil is increasing. ■