

Strategic Considerations in Designing a Revenue Hedging Policy for Non-Financial Companies Using the Example of the Oil Tanker Industry¹

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Risk management theory prescribes a few legitimate reasons for management to hedge corporate revenues and reduce income volatility: 1) reduce the expected direct and indirect cost of financial distress by mitigating the impact of possible negative market conditions; 2) minimize tax expense by avoiding higher tax brackets due to high income volatility; 3) optimize capital structure to lower the cost of capital; 4) decrease the total risk for large undiversified shareholders and stakeholders; 5) avoid underinvestment in otherwise profitable projects due to lack of, or high cost of, external financing². Simply put, companies should use revenue hedging when they face a progressive tax scale, have the ability to reduce the cost of capital by lowering return volatility, can reduce transaction cost by lowering the probability of default, or have a portfolio of profitable new projects that can be jeopardized by the poor performance of the existing business. Of course, hedging can be value-destroying and done for the wrong reasons, such as corporate hubris (the “company size” hypothesis) or, even worse, an entrenched management’s excessive aversion to valuable risk-taking³.

In practice, management cannot design and implement a successful hedging strategy only because one or more of the positive reasons listed above apply to the company’s conditions. The final decision has to integrate management’s assessment of four factors: 1) market environment (e.g., under conditions of significant basis risk and changing volatility hedging can do more damage than good); 2) technical capabilities (e.g., depending on the complexity of the hedging

¹ The content of this paper represents the views of the author only.

² Stulz, René M., *Risk Management and Derivatives*, 1st edition, Thomson Southwestern Publishing Company, 2002.

³ Lookman, Aziz A., “Does Hedging Increase Firm Value? Comparing Premia for Hedging 'Big' Versus 'Small' Risks” (July 23, 2009). EFA 2004 Maastricht Meetings Paper No. 5174.

strategy, management has to have confidence in the analytical and execution capabilities of the trading desk); 3) the implementation plan to achieve value creation based on the theoretical reasons for hedging (e.g., increase financial leverage and reduce cost of capital); and 4) industry specific strategic considerations outside the general hedging framework.

The reality in many non-financial firms is that management is still claiming a learning curve on the proper use of hedging. As companies gain sometimes painful experience in implementing hedging policies, they master more than technical intricacies, margin calls, and reporting requirements. How well management is able to integrate these four factors in its decisions can make all the difference between benefit or harm in a hedging policy. The decisions should be dynamic and subject to regular review. As the recent case with the gold mining company, Barrick Gold, illustrates, management can revise its view and completely reverse corporate hedging policy⁴.

In this paper we will use the oil tanker industry to illustrate some of these strategic considerations and how management can account for them in their decisions regarding whether and how much to hedge. Further work is needed to incorporate these considerations into a broader theoretical framework.

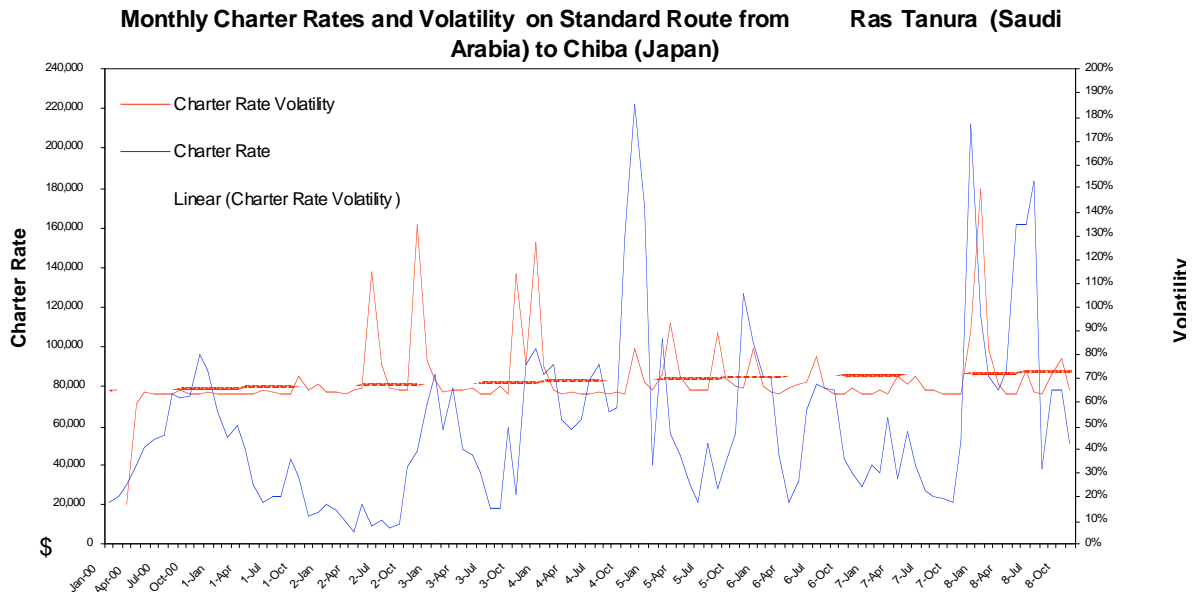
The Tanker Industry: A Brief Overview

Oil suppliers, users and traders hire (charter) vessels from ship operating companies at a charter rate to transport oil and other oil-based products. Oil tankers are fairly standardized pieces of equipment, which are divided into vessel classes. This makes a tanker good collateral for a loan and the industry is heavily dependent on external financing for building new vessels as well as for purchasing existing ones. However, the spot charter rates in the industry are extremely volatile. Over the last eight years, the average monthly rate volatility has been around 70% with occasional bursts to much higher levels (Figure 1). Sometimes there are a two-to-three times

⁴ “Barrick Gold is to raise up to \$3.5bn through a share offering that will eliminate most of its remaining gold hedging contracts, giving the world’s biggest gold producer full exposure to changes in the precious metal’s market price”, Barrick Gold Plans to Raise \$3.5bn , *Financial Times*, September 8, 2009.

difference in those rates within a few months. Under these market conditions, finding ways to reduce the volatility of future revenue streams can be an important part of obtaining financing.

Figure 1. An Example of Monthly Charter Rates and Volatility on a Standard Route



Traditionally, there have been two types of hiring contracts: 1) spot contracts for a single voyage; and 2) time charter contracts for a period of time lasting from a few months to a few years. So, ship operating companies have always had the option of hedging portions of their revenues by putting part of their fleets on time charter contracts with fixed prices versus utilizing spot contracts with fluctuating prices.

Over the last ten years, freight derivatives contracts have emerged and grown more popular in the industry. A Forward Freight Agreement (FFA) is a futures contract on the charter rate of a standard-size vessel to carry cargo on a standard voyage between two locations. For many freight futures, liquidity is still thin and varying. The most liquid futures contract is the TD3 (Tanker Dirty Route 3). It is a voyage from the port of Ras Tanura (Saudi Arabia) to the port of Chiba (Japan)⁵. The use of options on the rates for the same standard voyages has grown as well. These futures and options contracts are interesting derivatives as they are contingent claims – not on

⁵ See the Appendix for a brief description of the TD3 futures contract.

storable commodities, but on services. There are no storage costs, convenience yields or spot/future rate non-arbitrage requirements. To hedge, a company does not have to put a vessel on a time charter contract. It can operate a vessel in the spot market and hedge a portion of its revenue with FFAs. As most tankers perform multiple voyages on different routes during a time period, there is an issue of significant basis risk in using standard voyage derivatives. As a result of a peculiar industry structure, the shipping sector goes through phases of relative over-capacity and under-capacity with corresponding significant changes in the levels and volatilities of charter rates. Taking a position on the vessel class rate volatilities for a future period is one of the key decisions for designing a hedging strategy. There are many interesting questions regarding basis risk and the use of historical and forward data for hedge optimization. However, these questions are beyond the scope of this paper.

Examples of Strategic Considerations

We call strategic considerations industry specific issues that management should take into account while contemplating hedging. These issues are not currently accounted for in narrowly mathematical hedge optimization methods or the broader theoretical framework arguing for, or against, hedging. In the oil tanker industry, such strategic considerations are vessel optionality, operations management versus portfolio management, shareholder expectations, shareholder profile and competitive advantage.

Vessel Optionality and Hedging

Industry Context: A tanker company's service model and asset base are highly modular. In many other industries the final service or product provided is an output of a complex value chain with a corresponding portfolio of unique and integrated assets (e.g., pipelines, electrical grid and communications networks, high-end manufacturing, banking, pharmaceuticals). In the tanker industry, a client is served one ship and one voyage at the time. A ship operating company can easily add or remove a vessel from its fleet. Vessels are highly standardized and easily movable pieces of equipment with active and fairly liquid secondary markets. This makes a vessel ideal loan collateral.

Under normal market conditions, ship operating companies in the oil tanker industry can finance their vessel acquisitions in different ways, depending on their size and tenure. Smaller and younger companies with limited cash reserves usually have to obtain a secured loan against each vessel in addition to the equity in the vessel. A company can also take a secured loan against existing paid off vessels and use it to acquire new vessels. Large and established companies with strong balance sheets and larger fleets are usually able to obtain significant non-secured financing without mortgaging specific vessels. These non-secured loans have cash flow coverage covenants that could steer the company to hedge a portion of its total revenue. Bond rating agencies also use “% revenue from long-term charters”⁶ as one of the factor in their credit worthiness assessment of the companies in the sector. So, by hedging a portion of its revenue, a company can help maintain a certain credit rating and a corresponding cost of borrowing in the bond market.

In many other industries in which revenue hedging is feasible, even large companies like upstream oil producers, electricity generator, and gold or iron ore mining concerns are exposed to a single commodity price. For example, at Barrick Gold management has to decide only how much of a single exposure (to the gold price) to hedge. In shipping, each vessel class has a significantly different volatility and optionality – and, therefore, management has multiple exposures from which to choose to hedge. Under optionality we understand the occasional jumps in charter rates to very high levels and the options a spot traded vessel provides to take advantage of these opportunities. Because vessels are mobile, in addition to their regular revenue generation, they have features analogous to a peak load capacity in the power generation sector. When a capacity shortage generates pick charter rates, vessels can move in and provide capacity.

Strategic Consideration: In shipping, management has to decide not only what percentage of the total revenue to hedge, but which vessels to use. What vessel portfolio transfers minimum optionality for peak market performance to a counterparty through a hedge, while satisfying the level and cost of financing objectives? The answer to this question depends on the specific fleet and the conditions for each company.

⁶ Rating Methodology, *Moody's Global Corporate Finance* (Internet Edition), December 2009.

Because of the modularity of vessels both as tradable assets and separate revenue streams, the acquisitions of new vessels can be financed by a company almost independently of its existing fleet's revenue volatility. For example, currently Liquefied Natural Gas (LNG) vessels are built and deployed on long-term fixed rate contracts with high investment grade gas producers or suppliers. The fixed, low-risk revenue streams allow for high-leverage and lower cost financing secured by the LNG vessels and backed by the rating of the charterer and not the owner. In such cases, no rational company would use its existing borrowing capacity to finance such projects.

Operations Management versus Portfolio Management and Hedging

Industry Context: The cyclical nature of charter rates drives strong cyclical volatility in corresponding vessel prices. Over the last ten years, vessel prices for some classes have peaked at two and a half times the bottom of the cycle. As modern tankers are multimillion dollar investments, such fluctuations in prices represent a key profit opportunity/risk for participants in the industry.

While management can use hedging to secure a revenue stream from a vessel, currently there is nothing it can do to eliminate price volatility. Of course, "buy low and sell high" sounds great, but consistently following the oldest market mantra has never been easy or even feasible. There is natural tension between commercial and operational performance on one hand and active buying and selling of assets on the other hand. A vessel that is sold no longer can serve a client and a vessel that is acquired takes time to integrate into the fleet.

Strategic Consideration: A company has to decide how actively it will manage its portfolio and attempt to time the trading of vessels. This decision should depend on the company's view of the cycle and its commercial and operating strategy. A vessel that is hedged through a long-term time charter contract can be harder to sell. A vessel that is hedged through FFA futures, if sold, leaves the company with an unhedged exposure. For these reasons, vessel selling considerations should play a key role in management's decision how much, and what type of, hedging the company should employ.

Shareholder Expectations and Hedging

Industry Context: From an investor's perspective all companies in the industry can be classified by two fundamental characteristics: 1) market exposure; and 2) cash distribution. Due to the wide difference in the degree to which companies hedge their charter rates, market exposure and revenue volatility can differ significantly. This corresponds to a difference in their risk/reward profile. Putting a vessel on a time charter contract is a relatively slow process of matching a specific vessel with a specific charterer. With growing liquidity in the FFA market, it has become faster and easier for a company to hedge or un-hedge a significant portion or all of its charter revenues. Companies also vary in the methods they use to return cash to shareholders and the degree to which they do so. At one end of the spectrum are companies that pay a fixed dividend and have significant retained earnings. At the other end of the spectrum are companies that distribute all of their operating cash flow to the shareholders and need to raise new funds even for vessel replacement acquisitions. Companies that provide flexible dividends or a combination of fixed dividends and share buybacks fall in the middle.

Strategic Consideration: Shareholders form strong expectations about the stability of the cash flow they receive from a company based on the distribution model it follows. As in other industries, a reduction in the fixed dividend is interpreted as a strong negative signal by investors. Management needs to assess shareholders' cash return expectations and the likely consequences of a failure to meet them. To assure the expected level of cash flow stability, management needs to apply an appropriate level of hedging given the expected volatility and cyclicity of the tanker market. Fixed dividend companies have to secure a higher level of hedged revenues – everything else being equal.

Shareholders also form expectations about the risk profile of the company based on its historical hedged revenue levels. Those expectations are reflected in the variety of forward-looking volatility and correlation metrics investors use to optimize their portfolios. The fast-changing spot rate environment in the industry and the increasingly liquid FFA market create a strong temptation to quickly alter a company's hedge profile and take advantage of perceived opportunities or minimize feared losses. In addition of the significant probability of being wrong

about expected rate changes, management has to exercise caution in altering a company's risk profile too quickly and too frequently. Confusing the investors about the risk profile of the company can be damaging to its market value.

Shareholder Profile and Hedging

Industry Context: The cash distribution model and other company characteristics tend to have a significant impact on the type of investors a company attracts. Here we will not discuss more detailed investor segmentation. Instead, we'll focus on the general fact that companies with lower cash component in their shareholder returns tend to attract primarily large institutional investors, while companies with larger cash component in shareholder returns tend to attract more small retail investors. With the maturation of the freight derivative market, institutional investors could be active participants in this market themselves.

Strategic Consideration: In designing a revenue hedging policy, management will do well to identify the predominant investor profile. If the company is owned by sophisticated institutional investors with access to the freight derivatives market, an active hedging policy may be redundant or even damaging as the company would be trying to accomplish something that investors can do themselves. As pointed above, institutional investors usually hold shares as part of a carefully crafted portfolio and based on expected company risk/reward profile. So companies with low cash component in their returns and dominant institutional investors should be especially careful in altering their hedged revenue levels.

Competitive Advantage and Hedging

Industry Context: Oil tanker shipping is a highly commoditized industry in which companies have high fixed costs, provide standard perishable service and compete mostly on price. Every bit of additional advantage is very valuable. At the same time, this is a deal-by-deal, broker-driven business. Incremental knowledge and better relations with your counterparts can make all the difference in getting a cargo or not getting a cargo and having your vessel left to idle. Putting a large portion of the company's fleet on a long-term fixed rate contract with other ship operators

means losing interaction and therefore, knowledge and relationships with customers and brokers. Using freight derivatives to hedge revenue allows a company to operate its fleet on the spot market while maintaining knowledge and relationships. However, the FFAs have a limited time horizon and do not allow for longer term hedging.

Strategic Consideration: When deciding on the time horizon of the hedge and the tools to achieve it, management has to weigh the potential impact on its market knowledge and customer/broker relationships. As long as a meaningful portion of its fleet remains in the spot market, a company can maintain its relationships advantage.

Conclusions

These examples of strategic considerations that management faces while deciding on a revenue hedging policy in a particular industry illustrate the limitations of both the current theoretical framework and the standardized approach to hedging as a risk management tool. Incorporating the industry specific strategic considerations into the risk management theory and practice has important implications.

Implications for Risk Management Practice

Success or failure in designing a hedge policy depends on management's ability to assess and integrate the four key factors mentioned above: 1) market environment, 2) technical (analytical and execution) capabilities, 3) the implementation plan to achieve value creation based on the reasons for hedging, and 4) industry specific strategic considerations. The design process has to be thorough and logical, but not formalistic, and account for multiple quantifiable and unquantifiable subtleties. No level of mathematical complexity for hedge optimization can substitute for a careful study of a company's specific characteristics and its market environment. The examples above also illustrate the obvious, but hard to follow, truth that a company should consider and implement hedging only after it has clarified its strategy and business model. After all, the hedging strategy of a company is just an extension of its business strategy. The latter

provides both the constraints for hedging and the tools to translate it into higher shareholder value.

Implications for Risk Management Theory and Empirical Research

Financial theory today focuses mainly on the reasons for hedging. “Good” reasons, like tax reduction or avoidance of underinvestment in profitable projects, should motivate hedging and lead to increases in shareholder value. “Bad” reasons, driven by agency problems with management, explain inappropriate (without good reasons) or excessive revenue hedging. Industry-specific, strategic considerations act more as potential, additional constraints for a hedging strategy. Broadening of the theoretical framework to incorporate these constraints should be a worthy effort.

A significant amount of empirical research in the field is done to test the validity of good and bad reasons in corporate hedging practice. Many times different studies support or reject the same hypotheses or simply prove inconclusive. This suggests that there may be missing considerations for management’s decision whether and how much to hedge. Identifying and incorporating these considerations in empirical studies should improve their consistency and validity.

Appendix

Description of a TD3 futures contract from the web site of the International Maritime Exchange (IMAREX) at www.exchange.imarex.com:

TD3 - Very Large Crude Carrier (VLCC) 260.000 tons - Ras Tanura (Saudi) to Chiba (Japan)

The most frequently traded tanker FFA contracts are future derivatives of the TD3 (Tanker Dirty Route 3), which is the most common trade route into Asia for a Very Large Crude Carrier (VLCC) carrying 260.000 metric tons of Non-Heat Crude from Saudi Arabia to Japan.

The VLCC - Very Large Crude Carrier

A VLCC is a crude oil tanker with a size ranging from 160,000 - 319,999 dwt with a carrying capacity of between 200.000 - 285.000 metric tonnes of crude oil. The standard 260.000 tons carried on TD3 is approximately 2 million barrels of oil.

Tankers are measured by their DWT = Dead Weight tonnage or the displacement weight of the ship, which denotes the actual total weight of the vessel.

You can analyse every TD3 contract traded since 1 Jan.2004 using the IMAREX CurveDirector. Daily freight rate assessments of the physical TD3 market are done by the Baltic Exchange (www.balticexchange.com) in London. Assessments are based on input from participating ship brokers according to fixtures and market sentiment concluded on the day. Baltic spot rates aim to be "Fair Value" assessments of the market on any day.

The Baltic International Tanker Rate assessment (BITR) is used as the daily settlement price for all TD3 futures and FFAs (Forward Freight Agreements). Futures are traded at IMAREX, and FFAs are traded OTC (Over the Counter).

TD3 futures are monthly, quarterly and calendar year contracts for the future price of freight on the AG-Japan VLCC route. At IMAREX traders can buy and sell 6 monthly, 6 quarterly and 2 calendar year contracts in sizes from 5,000 tons upwards.

All futures and FFA contracts are settled on the average of the BITR spot price on the index days of a period. For example, a TD3 SEPT07 contract will settle on the average of the daily BITR assessments for TD3 on the 20 index days of that month. In case of public holidays observed by the Baltic Exchange, the number of index days in a period will vary.