

RISK MANAGEMENT FROM THE SHIPOWNER'S PERSPECTIVE

By Basil Karatzas

Few industries have been as cyclical as shipping, with the business cycle oscillating between peaks of robust freight rates and strong equity creation to troughs of tonnage oversupply and negative cashflows. This cycle, ironically known as the 'champagne cycle' for its jubilant bubbles to hangovers perimeter, has offered great opportunities for wealth creation: both for those who ingress / egress the cycle and for those who managed their risk properly and survived the downturn of the cycle.

The last few years have widely been considered to be closer to the top than the bottom of the shipping cycle. Instead of proferring whether 'it's different this time', shipping companies should emphasize disciplined preparation for the downturn, if and when this arrives. While 'a tide raises all boats', companies fall onto difficult times when they get caught ill-prepared for the unexpected. Companies with a clear risk management strategy initiated and implemented since the days of the ample sunshine, however, have the power to ensure their

survival through the cycle.

Ship-owning companies must utilize financial leverage to compensate for their capital-intensive structure. Financial leverage necessarily translates into high operational leverage (high fixed-to-variable cost ratio) in the form of high mortgage payments. During the up-cycle, meeting financial obligations and generating profits is never an issue. During a downturn, however, low revenue might not be sufficient to meet the previously established high fixed cost structure.

Besides the financial and operational leverage, shipping companies are set to navigate in an ocean of risks just by the nature of their business. Imagine, if you will, the risk factors involved in the following imaginary yet typical voyage: an aframax tanker that is berthed in a terminal in the vicinity of Baton Rouge, Louisiana – a 24-hour non-stop voyage under pilot a few miles within the Mississippi River. The tanker - owned by a company registered in the Cayman Islands, flagged in the Marshall Islands,

financed by a KG fund in Germany, managed by a company in Singapore, operated by a company based in the United States, and currently under the command of a Greek captain and crewed with Filipino nationals laden with 400,000 barrels heavy crude oil on account of yet another offshore trader – is commencing discharge operations. How many contracts have taken place for this vessel to come to be in this situation? How many jurisdictions are involved? How many parties can default or simply fail to perform? How about the weather? How about accidents and pollution? Does human fatigue count? And what if there is a case for criminal negligence for discharge of oily water?

RISK DEFINITION

The fiduciary duty of the firm's management (in this article the firm is narrowly defined as a publicly-traded ship-owning company) is to maximize shareholder value, and thus, it is assumed that all business activity is oriented toward that purpose. Accordingly, the management team develops a business

plan - for the firm's optimal execution of achieving and delivering value, based upon the management's educated opinion about future developments within a certain degree of confidence.

Risk is the prospect that the firm will fail to deliver optimum shareholder value according to its business plan. In more quantifiable terms, risk is the chance of financial loss and its expected negative impact to the firm's value due to changes in underlying model risk assumptions.

A more practical definition of risk is derived by answering the following triad of questions¹: What can go wrong? How likely is it? What are the consequences?

It is increasingly accepted today by risk management professionals that risk can be either the positive or negative aberration from the business model risk assumptions. While negative aberrations (i.e. an oil spill accident) can easily be understood for their diminishing impact on shareholder value, positive

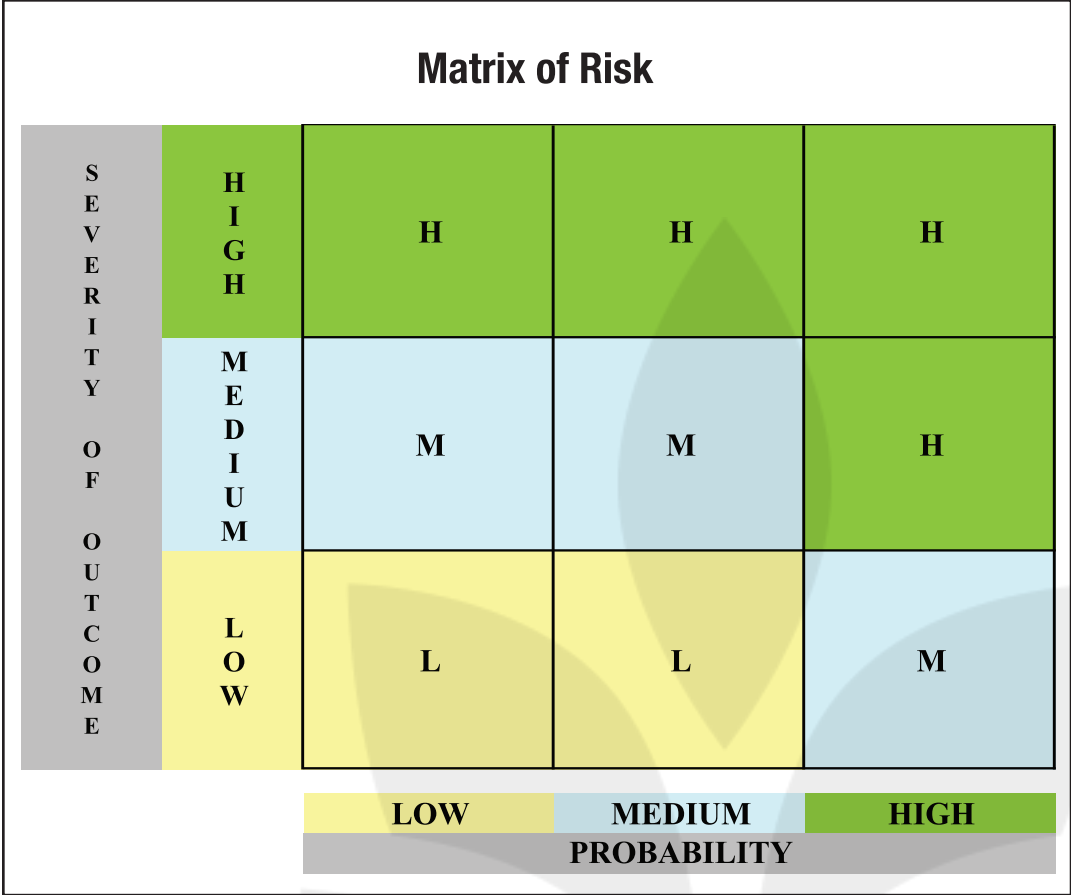


FIGURE 1

aberrations may also have negative implications for the firm delivering value through its business plan. For instance, abnormally high freight rates, as welcome as they might be, will increase asset values, which in turn will cause the cost of the company's growth to be higher.

Upon closer inspection, risk is comprised of two cardinal characteristics: uncertainty and severity. Uncertainty is the probability (likelihood) that an event will take place. Some events are more likely to happen than others, but probability is subject to human belief (bias to over-estimate high probabilities, under-estimate low probabilities, over-weight recent events). Severity can

quantifiably be expressed as the cost of a negative event happening. Some adverse business events might have minimal effect on the firm's value while others can be severe enough to

drive the company out of business (loan defaults, gross negligence, etc.).

Therefore, risk can be depicted in a matrix format as shown in

TYPES OF RISK

Based on their source, risks can be either internally or externally generated. Internally derived risks originate from within the firm (i.e. the organization itself and its people, systems, assets,

Figure 1, on severity and probability coordinates. In most cases 3x3 matrices are used, but for a more assiduous study matrices of 9x9 are utilized. Probability thresholds for each level can be assigned arbitrarily as shown in Figure 2 (i.e. 5% chance of cost of capital increasing by 300 basis points over the next year) or within certain distribution from the mean (plus/minus 1 or 2 standard deviations). Similarly, severity cut-offs can depend on the firm's absolute monetary appetite for risk, where events that can cost USD 10,000 to the firm can be considered negligible on an individual basis (low severity) while events costing more than USD 500,000 are of high severity and should be dealt with at the Board of Directors (BoD) level.

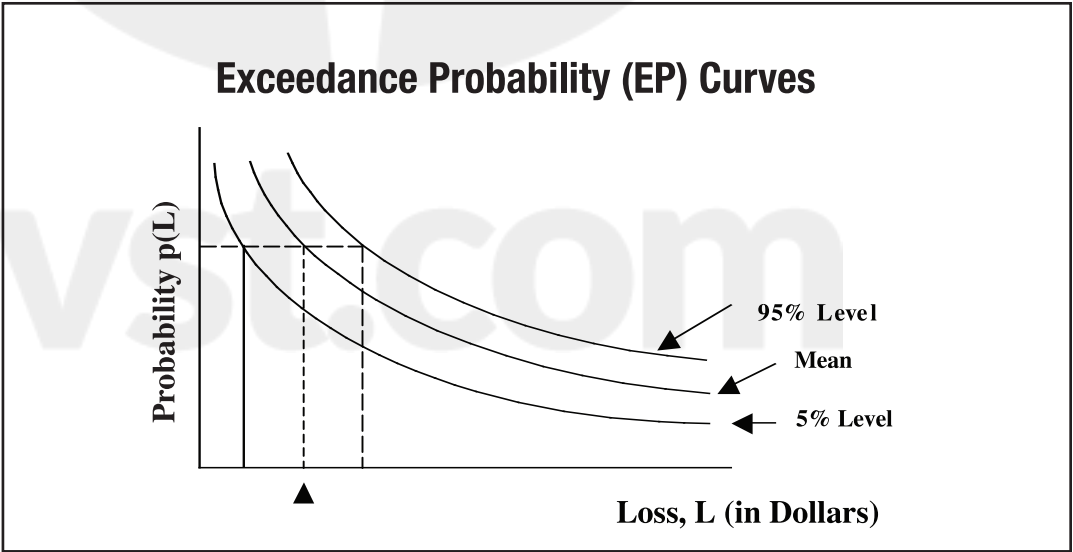


FIGURE 2

Types of Risk

INTERNALLY-DRIVEN	EXTERNALLY-DRIVEN
HAZARD RISK	FINANCIAL RISK
<ul style="list-style-type: none"> • Marine Hull & Machinery • Perils of the Sea, Assailing Thieves (Piracy) • Fire & Explosion • Accidents (Pollution, Collision, etc) • Acts of War, Confiscation, Detainment, Revolution • Barratry of the Master, Employee Negligence, Human Error 	<ul style="list-style-type: none"> • Credit & Counterparty Risk • Interest Rate Risk • Foreign Exchange Risk • Liquidity & Cash Flow Risk • Funding & Growth Risk
OPERATIONAL RISK	BUSINESS (STRATEGIC) RISK
<ul style="list-style-type: none"> • Human Capital • Recruitment, Employees (incl Crewing) • Knowledge Management • Legal & Regulatory Environment (Corporate, such Sarbanes Oxley Act 2002) • Intellectual Capital • Safety, Quality & Assurance • Health & Environment 	<ul style="list-style-type: none"> • Tonnage Demand • Change of Global Macroeconomics • Changes in Charterers Profile • Industry Changes • Legal & Regulatory Environment (Maritime, such as US Pollution Act of 1990, etc) • Competition • Image & Perception • Political & Country Risk

FIGURE 3

processes, culture, etc.), and they are risks that are allegedly under the firm's control. Usually such risks can be easily modified, adjusted and controlled, and they can be passed to a great extent to third parties through an insurance policy.

External risks spring from outside the firm's domain and therefore they are less susceptible to management's control. External risks can be deemed market forces, political risk, financial risk, etc. Although the firm cannot directly influence such risks, it can adjust its policies in order to minimize the potential impact of these factors.

Depending on the area of most impact, risks are typically classified through a quadrant system:

Business, Hazard, Financial and Operational. Hazard and Operational risks are deemed to be internally driven while Business and Financial Risks are externally driven, as shown in Figure 3.

The Business (or Strategic) Risk refers to the long-term objectives of the organization and requires strategic business decisions of the senior management. For example, a global economic stagnation will drive down demand for world trade and thus freight rates, while changes in trading patterns can increase demand for certain types of vessels at the expense of another sector of the shipping industry.

Financial risk concern the effective control of the firm's

finances, including its ability to receive monies and meet payment obligations. For example, placing an order for a new-building entails financial risk of exchange rates and interest rates, while a charterer's failure to honor a long-term charter-party can have adverse financial implication for the shipowner.

Hazard risks are those risks that are traditionally insurable and can be passed on to a large extent to third parties through an insurance policy. A collision accident is usually compensated by the P&I Club above a certain deductible limit.

Finally, Operational Risks are concerned with the daily operations of the firm such as recruit-

ing and retaining qualified employees, including crewing increasingly difficult offshore positions.

To claim that these classifications of risk are absolute and exclusive in nature would of course be a misnomer. Sources of same risk can be found both inside and outside the firm and can affect the firm in more than one area. For instance, the fact that the firm's Chief Commercial Officer opted to leave the firm and join a chartering brokerage office might be because the market is booming and s/he's better off with a commission-based compensation package or might be because the firm and its human resources department plainly failed to retain a well-qualified

Risk Management Process

RISK MANAGEMENT PROCESS	
1. INVENTORY OF RISKS	
<div> IDENTIFY RISKS DESCRIBE RISKS LOCATE SOURCES OF RISKS </div>	
2. RISK ASSESSMENT & RANKING	
3. RISK TOLERANCE ASSESSMENT	
4. RISK REPORTING & COMMUNICATION	
5. STRATEGY SELECTION & IMPLEMENTATION	
6. MONITORING, EVALUATING & ADJUSTING	

FIGURE 4

senior manager. Moreover, the departure of the Chief Commercial Officer could only affect commercial operations, or it might also affect the firm's

finances if the replacement is not up to the challenge. A pollution accident, although an insurable risk and covered by the CFR (Certificate of

Financial Responsibility), will affect the shipowner financially (deductible), operationally (management's preoccupation with damage control and the aftermath and possibly legal or financial obligations if shipowner's employees were at fault) and strategically (the 'Prestige' accident precipitated a new round of regulations with industry-wide repercussions). Therefore, risks are also inter-dependent.

RISK MANAGEMENT PROCESS

Risk management is the systematic, proactive approach to set a best course of action under uncertainty in making business decisions that will achieve business objectives. Risk management should be strategic rather than tactical in the sense that

the firm should have anticipated the risks with a ready action plan instead of simply acting with a general crisis management plan, as shown in Figure 4. Here a generally accepted rule of thumb is applicable: developing a solution for an issue once it occurs is ten times more expensive than developing a contingency plan beforehand.

BUILDING A RISK MANAGEMENT SYSTEM

1. INVENTORY OF RISKS

Naturally, in order to proceed with a risk management plan one needs to start with a basic inventory of all the hazards and possibly negative outcomes that could face the firm. Figure 3 can serve as the template for management brainstorming to identify all risks and their

Ranking of Risks

SEVERITY OF OUTCOME	HIGH	- Severe Accident with Oil Pollution	- Legal & Regulatory Changes (Maritime)	- Tonnage Demand
		- CharterHire Counterparty Risk	- Industry Changes	- Trading Patterns
	MEDIUM	- Human Capital & Retainment of Key Employees	- Competition	- Increases in Finance Cost
		- Legal & Regulatory Changes (Corporate)	- Funding & Growth Risk	- Interest Rate Risk
		- Changes in Operating Cost & Structure	- Global Macroeconomic Changes	
	LOW	- General Liability	- Foreign Exchange Risk	- Delays Due to Bad Weather, Minor Mechanical Problems, Repositioning, etc
		- Industry Image & Perception	- Non-criminal Employee Negligence	
		LOW	MEDIUM	HIGH
		PROBABILITY		

FIGURE 5

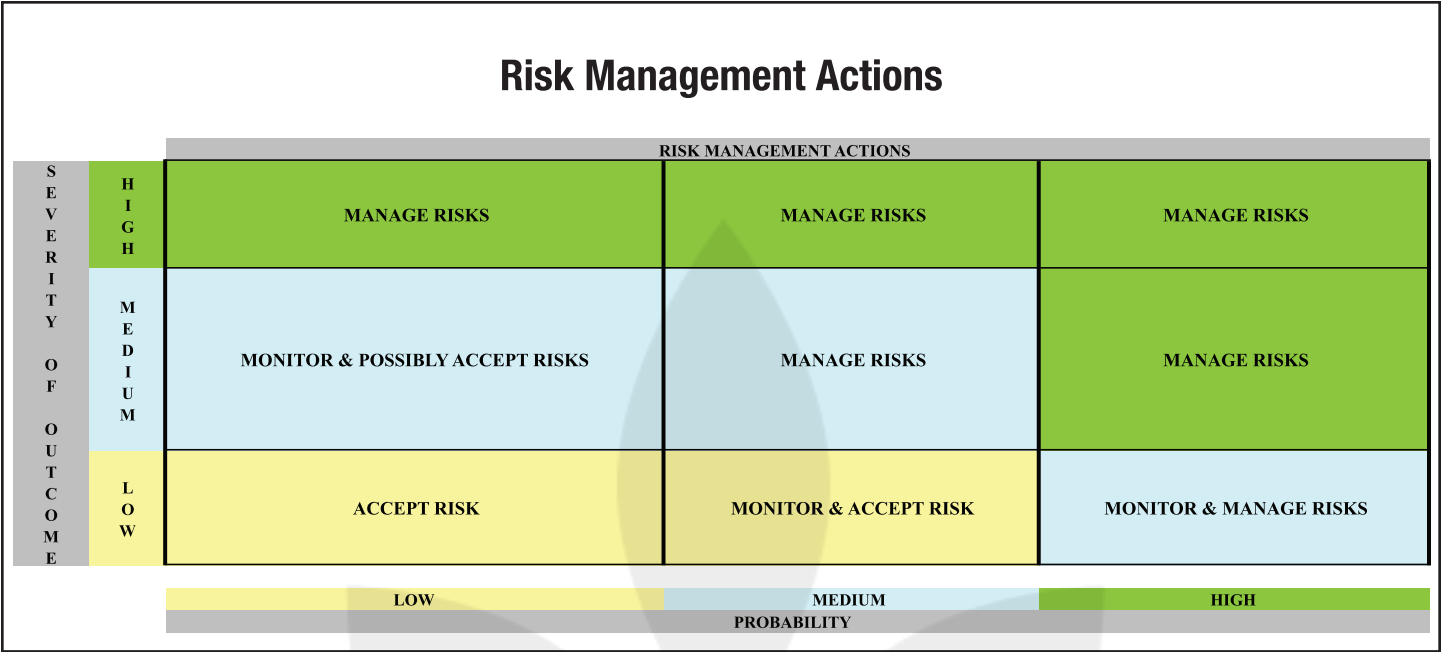


FIGURE 6

sources that the firm can anticipate. Input from employees is encouraged as they are experts in their fields. The risk register can be developed by methods of brainstorming sessions, industry checklists, post-mortem reports of previous accidents/events and careful analysis of all the assumptions in the business plan. In 1999, Microsoft had identified no fewer than 144 separate risks, from market share and pricing wars to industrial espionage and workforce skill-sets².

In risk evaluation, available benchmark data on the firm's position relative to other organizations in the same sector. This perspective can generate risk-improvement strategies in line with the industry. Usually annual reports and prospectuses contain long lists of risks facing the firm, normally classified under industry or company-specific classifications.

2. RISK ASSESSMENT AND RANKING

Once risks have been accounted for, each risk should be assigned a priority number as a function of the probability of occurrence within a certain interval and their cost in absolute pecuniary terms. Probability should be estimated on the scenario that each event can happen independently or jointly with other negative events.

In measuring the severity for risk one asks the question what it is at risk and how much it will cost to the firm should such event occur. This can be accomplished either by:

a. Scenario Analysis - In scenario analysis, changes in risk factors determining firm value are postulated, and the value of the firm is revalued based upon such changes. A typical procedure, often called stress testing (looking at the impact of

extreme events) "what-if" analysis, is to use a scenario based on an historically adverse market move. Analyzing 'fat tails' in the distribution can reveal consequences that can have an effect on firm value.

b. Alternatively, Value-at-risk (VaR) Analysis finds the maximum loss the firm stands to suffer should a certain event happens. VaR has been a risk management tool widely utilized and studied, especially in the financial industry. VaR can be accomplished by the analytical or historical methods and the Monte Carlo Simulation. Further, Cash Flow at Risk (CFaR) and Earnings at Risk (EaR) apply same methodology to quantify maximum loss to the firm from changes in cash flows and earnings parameters.

By identifying and ranking risks, Figure 1 can be updated to Figure 5 below, a typical

matrix for a shipowner operating in today's shipping environment.

3. RISK MANAGEMENT – RISK TOLERANCE

Having identified and quantified individual risks, the firm ideally should establish its own tolerance level toward risk. Finding the efficient risk frontier is a process unique to each firm based on its unique business model and business objectives. Avoiding risk altogether is cost prohibitive and it defeats the purpose of a firm to undertake risk and generate profits. At the other extreme, ignoring the possibility of catastrophic risk is an open invitation to disaster and lawsuits.

Efficient risk frontier the point the firm optimizes the balance between risk taken and risks transferred where the organization can afford to pay the costs of any outcome. A conservative

firm might look for a policy that minimizes exposure to risk and has set guidelines to safeguard. Inversely, certain firms can be more risk tolerant in search of higher returns.

Also, establishing risk tolerance has to be evaluated under the cost benefit analysis: what is the cost of per unit of risk reduction which is of course a function of the firm option set for action. As in insurance where the first losses are the most expensive to insure, therefore the deductible, getting rid of a unit of risk might be too expensive.

Risk Reporting And Communication

Outside the banking sector where usually there is a risk management officer, risk management is under the control of the finance department and the chief financial officer. Their function is to collect and coordinate the response, by no way it means that are the only concerned parties.

At the highest level, the Board of Directors (BoD) is ultimately responsible for the risk management plan. All risks of high severity impact should be addressed at the BoD level. A softening freight market is definitely one of the agenda items on the BoD meeting even it might not be classified as a 'risk management' item. The BoD should ultimately supervise and determine the firm's policy for dealing with risk. Also, BoD is responsible for overseeing that risk management plan is being properly implemented with regular updates and cognizant for

the residual risk after all strategies dealing with risk.

At the Business Unit Level, risk can be monitored and addressed in each unit as this is the resident expert unit to supervise individual employees and risks. Usually risks in the middle of the matrix can be addressed at the business unit level.

Individuals have the responsibility to oversee that situations within and outside the company are properly monitored, reported and addressed. They should implement the company's sets of rules and abide by internal controls. Usually, risks positioned closer to the left bottom quadrant can be dealt at the employee level, assuming of course that risks have properly been identified and dutifully belong there.

4. STRATEGY SELECTION AND IMPLEMENTATION

Risks in the top-right quadrant are likely events of severe impact, and therefore should be incorporated in the firm's business plan. Risks in the bottom-right quadrant require contingency plans. Risks in the top-left quadrant should be grouped together and managed for overall protection against joint impact. Risks in the bottom-left quadrant should be monitored and they don't need to be handled straight away.

Companies have three realistic ways of implementing risk management objectives: modifying the firm's operations – enter a new sector, mix of

spot/tc mix, adjusting its capital structure and employing targeted financial instruments (including derivatives)³. There is always the possibility of total risk avoidance when risk cannot be mitigated and outright risks outweigh any possible benefits.

Financial risk can be mitigated by use of derivatives for the 'usual' financial risks such as interest rates and foreign currency rates through the use of swaps and forward contracts. The area of increased recent interest is the use of Forward Freight Agreements (FFAs) or even Bunker options that make sense in today's high bunkering cost. Variation on the theme include the use of options on FFA and diminished counterparty risk by 'clearing' the transactions through a clearing house.

Ideal candidates for risk reduction are leveraged firms, especially if leverage is of significance. Financially-levered that carry a relatively large amount of debt will likely have difficulties meeting consequences of risk. Risk management by reducing risk should be high for shipowners and are operationally-levered firms with high-fixed-to-variable cost ratio.

Another approach to risk management could be to transfer the risk to a third party. Any risk that the firm cannot afford to absorb as part of your normal operating expenses or finance from a 'rainy day' fund should be transferred to one or more third parties. A commonplace

example is purchase of property insurance (i.e. hull and machinery): for certain premium, a third-party insurance company can undertake the risk or in several instances a mutual Protection & Indemnity (P&I) Club can mitigate the potential risk by spreading it around to multiple member owners.

5. MONITORING, EVALUATING AND ADJUSTING

Once risks have been identified, ranked and proactively handled, the function of the risk management department has not yet been completely fulfilled. As conditions in the marketplace are in a flux of constant change, risk (and risk management) is a moving target. Industry benchmarks can be utilized at regular intervals to assess whether the firm's risk strategy meets the original targets as well the new targets as these have been formed by the new market conditions.

A few interesting questions to be posed: have any new products evolved since the last assessment that can contribute to risk management at a more cost-efficient rate? How about the pricing of the old risk management methods: is it cost-efficient to pass along for a premium any unwanted risks? For instance, just a few short years ago, a shipowner's hedge to freight markets would have been to sign on long time-charters or contracts of affreightment (COA). In the last years, the development of the paper freight market has been offering hedging alternatives that can be

more cost efficient and flexible than the standard long-term timecharter.

SUMMARY

The tools for risk management have significantly improved since the days of early Value-at-Risk (VaR) model at JP Morgan in the late eighties. Today's tools available to risk management professionals can range from likelihood-impact matrices, risk-registers, scenario and sensitivity analyses, simulation analysis, criticality and cruciality indices, contingency budg-

ets, Value at Risk and cash flow and earnings at VaR, Monte Carlo simulations, decision tree, faulty tree analysis, probabilistic risk assessment.

The least expensive loss is the loss you don't sustain, but an old adage says that 'No pain no gain'. Modern portfolio theory states that expected returns are contingent on the level of risk taken. Although risk is to be managed, reduced, hedged or sold to others, loss-aversion is not a way to win in the long run. A firm that builds a risk

averse culture and attempts to sell off all risks will be unprofitable in the long run. The firm needs to look at risk, identify its consequences and define its own tolerance to risk. Risks that are too costly to bear should be dealt with. In free markets, profit is and should be subject to assuming risk. The firm must understand the risks that is undertaking, whether intentionally or inadvertently, pass on not necessary risk and have contingency plans, crisis management plans and risk management plans. Companies that

distinguish noise from sound, that can mitigate downside (catastrophic) risks while being prepared to embrace acceptable risk and make the most of its opportunities it represents, will thrive and succeed.



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¹ Probabilistic Risk Assessment Procedure Guide for NASA Managers & Practitioners, 2002; <http://www.hq.nasa.gov/office/codeq/risk/risk.htm>, last visited Jan 14, 2008.

² Maffei, Gregory, Microsoft CFO, Interview; CFO.com October 1999, last visited on Jan 08, 2006.

³ Integrated Risk Management for the Firm: A Senior Manager's Guide, Lisa K Meulbroek, Harvard Business School, 2002.

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