

# Plan the Business of a Vessel of a Tramp Shipping Company

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## Abstract

We described the procedure, and the importance, of the budget or plan of expenses (cost) of a vessel in a tramp shipping company, and also we addressed the difficulty to plan receipts (revenue). We analyzed the structure of a shipping company in departments and their particular role in spending and collecting money. Leaving, for a while, aside reality, we analyzed the true objective of a vessel, which is to minimize cost. Vessel's half-square isoquant is presented as well her economies of scale. In fact, we revealed seven objectives for a vessel, the first being the rather meaningless in shipping one of maximizing normal profits. For the first time, we proposed planning for a maritime depression, described here as a common feature in shipping (one every 12 years). We have presented Management by Objectives and optimal management by objectives as future candidates for shipping companies. The main contribution of this paper is our attempt to modify the present: *management by distance* by future *management by looking at...*

## Keywords

Shipping, Budget, Depression Plan, Minimize Vessel's Cost, Revenue, Planning, Management by Objectives (MbO), Optimal MbO, Management by Looking at

## 1. Introduction

A manager has to *coordinate* and *oversee* the work activities of others so that to be *efficient* and *effective* [1]. Effective means: *do the "right things"* (to achieve company's goals), something *easy* if... not accompanied by efficiency. Efficiency means: *"do things right"* (economically) or the *cost of a decision to be lower*

*than the income derived from...* Is this the well-known Economic Principle<sup>1</sup>?

The above two principles of management are applicable also to Captains, the managers of the vessels. Economics, however, says that a firm has to “maximize normal profits” (M1), provided one used the best available technology. Technology to a manager promises a *maximum technical* result, and economics promises a *maximum economic result*. Management promises nothing... unless things are done *efficiently* and *effectively*... Economics seem to believe in rather *automatic* economic forces and only requires MC (Marginal cost) to be equal to MR (Marginal revenue). Management believes that the role of manager is to *make things happen*.

*Planning*<sup>2</sup> in a firm is an important *management function*, together with the other three: *organizing*, *controlling* and *leading*. These four functions metaphorically are the feet of the chair on which top-managers sit. Using all four feet managers remove the danger to fall (fail).

However, we suspect that the reader may be surprised from the fact that a *shipping company* can **plan**, doing businesses in a highly **volatile** and **unpredictable** environment! From my, almost 15 years, experience from managing 1 insurance company and 2 departments in a large Greek tramp<sup>3</sup> shipping company, since 1977, I have been taught that the *prime management function*, in a shipping company, is **control**... based on Planning. Planning and control are indeed twin sisters, who manage wisely a shipping company as well company's vessel(s).

The vessel is a floating, and moving internationally, *factory of producing sea transport services*, and if she avoids human error, is the stable value for a shipping company. An *efficient* and *effective* shipping company has to focus, no doubt, on vessels. Moreover, a shipping company will be defined as a **set** of vessels.

The size of shipping companies increased since 1960s from a single vessel, or from few. Shipping always was volatile, but more so since **large** modern ships appeared in horizon in 1960s. “Bigger ships, bigger troubles”, says popular wisdom<sup>4</sup>. Perhaps one may think that studying vessel, her company is ignored. We felt, however, that the vessel, in all papers we read, is taken for granted, she is... literally and really out of sight, while she should be the core subject of the interest of Managers, Captains and Academia.

The more frequent shipping managers had to manage... **by distance**, the more Captains undertook the *highly responsible* role of a local manager. At the

<sup>1</sup>A ship e.g. had to pay \$100 to obtain a missing map (discovered by Port State Control (PSC)). This would entail **delaying ship**, say 3 hours, if her Captain decides to wait for the map to arrive at present port. This decision costs \$875 (the running cost of the vessel for 3 hours). So, the decision to depart immediately, and receive the map in next port, (allowed by PSC), is **efficient**.

<sup>2</sup>To plan means: to **set** goals, **establish** strategies for **achieving** them and **develop** plans to **integrate** and **coordinate** work.

<sup>3</sup>Tramps are the ships that travel from port A to B **on demand**.

<sup>4</sup>Most non-shipping companies were fortunate in the past to act in a stable environment, like e.g. “Publishing Houses”. The current year for them was more or less like last year and so were next years.

same time, the control of the vessel became crucial, as the vessel is producing **out of sight** of top-management. Captains became the **alter ego**<sup>5</sup> of top-managers and their selection, and their (in-house) training, became more essential. From the above is made clear that vessel's Captains have to manage the ship and the crew, **efficiently** and **effectively**.

The last 40 years or so, the world became one village (=globalization), and thus no one can do businesses in isolation. The actions of one company affect the others, and the world became one system of smaller systems, as argued by Chaos and Complexity Theory [2]. This *structural change* means that during **peace** (business as usual; a boom), top-managers must be prepared, and plan, for **war** (*i.e.* for depressions)! Managers should be alert. Planning prepares managers for the next day!

The aim is to show how to plan a **budget** of a large tramp shipping company, to present nine plans, (and one 10<sup>th</sup>), which theory provides and to show which plan is suitable for what. Moreover, to show that in a *tramp shipping* company, **revenue** cannot be planned and to indicate why to plan in general. Finally, to show what a vessel has to minimize; and present MbO and optimal MbO and the novel management by looking at.

The paper is structured in six parts after literature review: Part I, deals with the yearly planning of vessel's Expenses. Part II, identifies the three main departments/sections of a shipping company, which bring-in money. Part III, turns the emphasis from firm's normal profit maximization to vessel's cost minimization. Part IV, deals with Planning. Part V deals with Management by objectives (MbO) and optimal MbO. Part VI, proposes a way of "managing ships by looking at" ... Finally, we conclude.

## 2. Literature Review

Despite their importance, books dealing with *management of shipping companies* are very few. This is due to the fact that a small number knows this subject well, and from inside. This is further so because managers of shipping companies rarely abandon their well-paid positions to follow a University career, pre-requiring also a doctoral thesis. Moreover, those teaching management of shipping companies in Universities, who are few anyway, rarely abandon their post, to become managers in a shipping company<sup>6</sup>.

Downard [3], wrote about (**running**) **costs** of a shipping company. **Budget** was explained as well the management functions of Planning and Control. He wrote that "if you don't know where you're going, any road will take you" there (p. 1) and "all plans require: objective<sup>7</sup>, time scale, implementation, realism with challenge and personal commitment" (p. 3). He also argued that "having a plan,

<sup>5</sup>The times where owner managed on board his vessel are passed forever!

<sup>6</sup>When I was in London in mid-1970s finishing my doctoral thesis in shipping economics, I wanted to work in a shipping company. A famous Greek shipowner called me in his office in the City of London: he had a son, who had a doctoral thesis (in Chemistry), but he did not want to work in his father's company...

<sup>7</sup>Modern management replaced objective by objectives.

putting it into action and then continuously monitoring and adjusting it to achieve *the objective*, often to suit changing needs”, is **control** (p. 94). “In ship management”, there are two, both required, goals: “to achieve the *plan* and to achieve the *Budget*” [3]. He mentioned also management by objectives (MBO) as “a technique which is very much part of many of the philosophies on which his book was based” [3].

Downard [4], at age of 56, having a long service at sea on tramp ships and bulk carriers, since 1968, held also various positions in shipping companies, wrote about **managing ships**. He was Managing Director from 1975 to 1979 of the London ship management company of the Fairfield Maxwell Group. On the subject of planning he wrote (p. 10): “once plans and budgets approved at a senior level, they should be adhered as far as possible” and “keeping plans and budgets on target requires the necessary discipline of controls”.

Robbins [5] argued that MbO is a well-known philosophy of management, which assesses an organization and its members by how well they achieve the specific goals. Goals, which the superiors and subordinates, jointly established. MbO represents the ultimate in a goal-oriented approach to effectiveness.

Erskine [6] mentioned seven significant characteristics of MbO, and the difficulties of its implementation. MbO, among others, pre-needs a credible corporate plan. Romani [7] argued that MbO works by using: goal specificity, participative decision-making, explicit time periods and performance feedback.

A wealth of empirical knowledge about shipping and vessels’ management is provided by Buckley [8] aged 58. His book was first written by Kendall L (in 1973), who passed away in 1999. Buckley wrote (p. xi) that the purpose of his book was to “provide the reader with an accurate description of the length and breadth of maritime industry, and an overview of the business side of the commercial maritime field”.

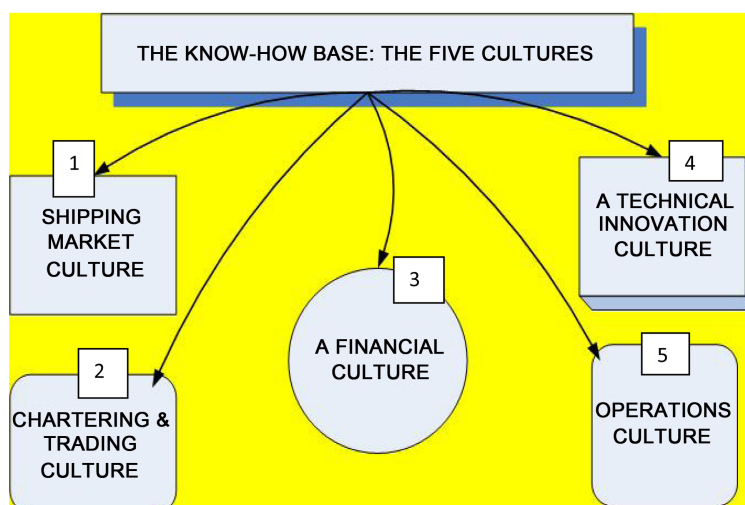
Most shipping management books have a strong empirical content and are less theoretical, if at all. In shipping, we believe, *the balanced combination of theory and practice has to be sought after*. McConville [9], e.g., tried to express maritime economics as an applied branch of Neoclassical Economics.

Professor Lorange P. [10], wrote about shipping **strategies** and the **innovation** for success, who used also to be a shipowner! His book, *written<sup>8</sup> in mid-2008*, had as a target the sophisticated shipping industry practitioner (p. xv). He tried to develop the most relevant critical success factors for shipping business in general, and to identify the various key-shipping-strategies, in particular. Certain of his main views are shown in **Figure 1**.

As shown, five *cultures* are needed by a top-manager to have a *successful* shipping firm, according to Lorange [10]: 1) A keen *understanding* of market (with a good feel for *turning<sup>9</sup>* points). 2) Knowledge of: brokerage, trading, and

<sup>8</sup>He denied the influence that the 5 years of an exceptional shipping boom (2003-2008) had on what he wrote. In fact he sold his company during this very good time. He wrote that the per day spot freight rate for a Cape in June 2008 was \$230,000; while in Nov. 2008 was \$4,000!

<sup>9</sup>How is this achieved?



**Figure 1.** The know-how base. Source: Inspired by Lorange [10].

having expertise to pursue charterer-focused strategies. 3) Ability to manage financial flows and **budgets** (=currencies, interest rates, new instruments and derivatives -FF market trading etc.) (*i.e.* the subjects of “Financial Engineering”). 4) Pushing for better solutions, including **forecasting**. 5) Ability to make something good, or better, by having the necessary know-how for the *operation* and *recruitment* of a ship, focusing on delivering the **best** possible services *at the lowest possible cost*.

Important is company’s customers views about their need for transportation support, given that the configurations of *supply chains* are constantly changing. To this, technological factors contribute, among other factors. In shipping, permanent pre-occupations are: the new navigational equipment, engines with sophisticated fuel injection, new hull designs, more efficient propulsion, and low-friction. Innovations in ships come also from legislation (legal obsolescence) (double-hull tankers, since 2010; more environmental-friendly ships).

Lorange [10] did not distinguish between the existing, for us, two different shipping management styles, though he provided a great amount of empirical knowledge about large international shipping companies. In fact, he was critical against family-based shipping companies (1st style) and in favor of stock-exchange-based ones (2<sup>nd</sup> style).

“*Management by objectives*” (MbO) replaced the method of “*traditional goal-setting*” [1]. This assumed that the staff below top-management was for executing the **goals** coming *exclusively* from the top. The contribution and participation of all others, except top-management, was not necessary. Next the “means-ends chain” introduced, when it was understood that everyone in a company is better to have his/her own goal [11].

*MbO is known as management by results (MbR)*. Drucker popularized MbO, since 1954 [12], but this also applied by companies like: Hewlett-Packard, Xerox, Intel, DuPont and others; it was also adopted by the Japanese. In 2016 emerged the “optimal MbO” (OMbO) [13], giving emphasis to **leader’s support**. He ar-

gued that MbO fails if top-management did not support it (p. 50). When, he argued, top-management's commitment was high, the average productivity gain was 56% (vis-à-vis 6%)!

In shipping, the support to MbO comes definitely from the Economic Manager and Chief Accountant. In Greek shipping companies have a centralized decision-making (in another context: Duffy [14]; Guiso *et al.* [15]. He [13] argued that OMbO borrows elements from the “*field of restructuring and corporate turnaround*”.

Summarizing, forecasting is necessary, but how is this achieved? [16] Greek shipowners do not trust forecasting believing it is always wrong... Their decisions come true whatever market does! [17] We agree also that the cost control is a pre-requisite for success. Lorange mentioned only once [10] the utmost crucial role of liquidity for us! Especially if a shipping company undertook expensive new-buildings and next entered into a shipping depression!

### **Part I: Planning Expenses in a Shipping Company**

Planning in a shipping company is carried-out for next 12 months and at the end of prior year. Planning must be saved in company's computer(s) and be ready the **latest** by 31<sup>st</sup> December of the planning year. Large shipping companies have also a *budget manual* to enable their staff to accomplish budget as accurate as possible.

Planning is required for top-management to see **why** plans fail! This is quite important to realize the reasons, for which company's planning tools and methods, were ineffective. This is a procedure, call it: “learning by mistake” (LbM). LbM is something we met in shipping companies, but in operations! LbM should not be unlimited, we believe.

Planning may be combined with learning by doing<sup>10</sup> (LbD). LbD we found in shipping companies, which were able to *learn, adapt* and *change* in a rather permanent way towards higher fitness. LbD is something demanding, causing fatigue; we met it in the best shipping companies: *i.e.* those we call “**champions**”... LbD is also important at ship's level, where senior staff has to teach the ones below. Moreover, learning by tradition (LbT) is the case when traditional wisdom is required in shipping<sup>11</sup>, and it has to be passed on, especially at ship's level.

#### **1) Planning Revenue**

In tramp shipping, **revenue planning** is not pursued, though one has<sup>12</sup> to try. The inability to plan revenue is due to the fact that a shipping company does not

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<sup>10</sup>**Learning** in management means to have any (relatively) permanent change in working behavior; it is expected when one is doing things better, as a result of gaining more experience, or from lessons learned, from the senior and experienced staff.

<sup>11</sup>One Captain by overlooking this truth caused a marine accident with 20 dead under conditions of bad weather. Tradition says that in case of high waves, the holes through which anchor chains pass, are made water proof.

<sup>12</sup>e.g. to create a data base with main particulars of all voyages accomplished by company's ships in last, say one year, and derive any **repeated patterns** of revenue. To use such results so that to derive certain laws, or... algorithms... Another way is to gather, and use, last year's EVR, adjusted for errors by “after chartering control section” (ACCS), for all company's vessels.

know in advance what charter-parties company's ships will take-up during next year. This inability is derived from the definition, and from the reality, to be a *tramp shipping company*. Ships only in time charters have permanent *gross* revenue, *but not a net one*.

**Planning** of what company is going to **spend** is pursued, especially by applying the best available theoretical and empirical means and techniques concerning *applied budgeting*.

## 2) Planning Expenses

### a) Who Has to Plan?

Company's economic manager, and mainly the chief accountant, has to **organize** and supervise the procedure to **plan** entire company's next year expenses. The expenses are **all** those required to **run** company's fleet, and will be planned per vessel, per expense code, per department, per month and for entire company, etc., and be saved in company's computer(s) (following company's accounting plan).

One should not copy blindly last year's expenses, if *not repeated*. He/she may even use last year's budget, adjusted mainly for international inflation, if no better method and data are available (e.g. "zero-base" budgeting). Good economic divisional and departmental managers have, however, to try, for an as far as possible, **accurate budget**.

### b) The Importance of Budget

**The budget** of a vessel is the basis for...her chartering. *I.e.* the *planned daily running cost* of each vessel is compared with the offered *daily freight rate* in order to **accept** a business proposal. This procedure is known as estimated *voyage result* (EVR). So, a lower budget has a chain reaction by accepting voyages that finally result to losses, and vice versa!

A **corollary** is that management of a shipping company is not like playing roulette/throwing dices, but it is a *well-organized* and *planned business*. A plan may be different than reality, but even this is pedagogical, and it triggers the intervention of ACCS and of economic manager. Planning, however, should not be erroneous, even if reality<sup>13</sup> may come out to be different. What is wanted here is to eliminate error in EVR.

### c) The Procedure in Planning Vessel's Expenses

Top-management, divisional managers and certain senior members of company's staff, and all departmental managers, have the authority, (which is better to be written down), to **approve expenses**. So, they have to **plan** them<sup>14</sup>.

## 3) Control using Planning

The deviations of expenses from those in budget, entitles economic division to *manage*, investigating the **reasons** of the deviations. Certain say that top-management has to deal with **only important** matters. But by signing payments, even of small

<sup>13</sup>Chartering dept. calculates EVR, and inserts dues to be paid e.g. for crossing Suez Canal. Assume that after a charter party signed, Suez Canal Authority increased overnight canal fees. This is an **un-expected** change.

<sup>14</sup>Computer provides every month **actual** expenses and **planned** ones; responsible staff has to find out the reason for a deviation.



amounts, top-management...manages and controls<sup>15</sup>.

### Plans versus Reality

Whatever is *planned* has to be **compared** with *actual*. Control without planning has no meaning, and vice versa. Moreover, planning may be **related** to **positive** financial results, according to theory. Personally, we see planning as a *necessary*, but not as a *sufficient*, condition...

In well-organized shipping companies there is a section dealing with the comparison of voyage *actual results* with EVR, as mentioned. **This is important**. We saw frequent and serious differences<sup>16</sup> to emerge between EVR and actual. Due to such mistakes, a supposedly profitable voyage ended *in losses*, and this had to be avoided...if not punished, but surely they have to be investigated.

### Part II: The Revenue-Bringing Shipping Departments

The difficult planning of vessel's revenue does not mean to abandon a *continuous* and persistent effort for it. Moreover, we must have management's focus for revenue **increase**! Top-management has to organize and boost the activities of revenue bringing departments/sections: *i.e. freight collection, chartering, insurance claims and economic division*.

### The Main Functions in a Shipping Company

The **goals** that a shipping company sets are different for each department: *Operations department*, e.g., has to minimize the off-hire time of vessels; this means that **all** vessels must have a **paid** employment for... 365-6 days! This is an ideal **maximum**, no doubt. A more realistic target is **at least** 350 days.

*Chartering e.g.* has to choose the most **profitable** charters as shown by an accurate EVR. This, we believe, is one of company's **top targets**. This decision, however, involves top-management. In-house shipbrokers formulate their opinion, with points, as to why a particular voyage selected and proposed to management as more profitable (when 1-2 others rejected). They have to avoid obtaining top-management's approval to pass responsibility on. A competitive advantage, we saw, was obtained by shipping companies whose top-manager knew chartering well (e.g. Eastern Shipping Co Ltd.).

*Technical department*, e.g. has to minimize off-hire time of ships due to technical reasons<sup>17</sup> (dry-docking; breakdowns; black outs; repairs after a marine accident), within department's budget. *Supply department* has to satisfy the *reasonable* needs of the vessel with *best quality* provisions, bunkers, paints, lubricants, chemicals, stores, water, laundry, spare parts etc., at lowest<sup>18</sup> cost and quantity. *Port Captains Dept.* e.g. has to load/unload vessels **properly**, and fast, following the principles of a good and safe stowage. As a result, loading/unloading

<sup>15</sup>There are also traps when the payment of the same amount can re-appear a month after, due to bad organizing, and paid twice! Computers are there!

<sup>16</sup>Frequent mistakes are made in calculating ship's days in port and at sea. The one is due to using erroneous speed for vessel, weather excluded. The time spent in ports is important and may be miscalculated due to **old** information about port's facilities, congestion, strikes or weather (e.g. snow), working hours and days. Frequent mistakes are committed in Canal dues, port dues and agencies fees. Freight taxes are also wrongly calculated, if at all. Personal computers can help.

<sup>17</sup>**Planned maintenance** is a strategy for one to be ahead of technical problems.

<sup>18</sup>Efficient shipping companies maintain lists of ports that a particular item in provisions is cheaper; certain times due to season.



means and hatch covers should be properly functioning; holds have to be clean.

*Marine* HRM (human resources management) department has to select the **best** Captains, officers and ratings, who respect vessel's safety and security and minimize her off-hire time, satisfy the *reasonable* needs of the charterers and minimize the cost of the vessel. These should manage the ship with due diligence, *i.e.* as if the ship was owned by them!

*Insurance* department has the ship insured for all sea risks and in a P+I club, following the instructions of economic manager concerning cost of insurance<sup>19</sup>. This department also **collects** the money for company's **claims, in time**, from insurers, and cleverly determines the "deductible"<sup>20</sup> amounts for company's vessels (strategic matter).

*Management* eliminates trans-departmental antagonisms, which harm company. Management supervises by *priority* Chartering (Sales dept.) and Operations (Production dept.), due to their **particular importance**.

**Table 1** summarizes the main information about the departments of a shipping company.

As shown, most of the shipping departments **spend**; others spend and collect, and three or four only collect. All departments, however, should **save** money and this is what top-management and economic manager have to implement! Spending departments should be **strictly** and **closely controlled**, first by their **manager, secondly** by economic manager and **thirdly** by top-management. The first **best** way is to approve their spending before actual spending, and the second best is spending to be in line with budget! The third, but not best, is to investigate spending after it has been done.

Large shipping companies have organized sections of **cost control**, and/or for watching company's rights on payments made by appointed persons on company's behalf, like e.g. Captains (e.g. Master's General Account, MGA) and Agents. Great economies can be achieved here. There are also companies **that the cost control** is not in their philosophy. Surely a shipping company has to compare the cost of... a cost control system (with) and the cost (without) it! In shipping companies are **many** those who want to **benefit personally**<sup>21</sup>, from inside and

<sup>19</sup>Our ship-model shows that \$190,000 p.a. had to be spent for insurance.

<sup>20</sup>Deductible is the \$ amount of a claim excluded from cover (self-insurance). The higher the deductible, the lower insurance cost. These claims are of a small value and of a high frequency, which insurance companies avoid for their high cost of administration. It is the same mentality when banks avoid giving many small loans instead of one big. Imagine the benefit to a bank of a loan of \$100m vis-à-vis 10 loans of \$10 m each...

<sup>21</sup>1) A meat supplier delivered to a vessel, in Rotterdam, *half* the amount of meat ordered by the company! The supplier, when checked by a company's person having the relevant invoices, "obliged" him to bring the missing amount. He argued that his delivery would be executed in two halves! 2) One person managed to receive part of chartering commissions in his personal account by charging company with a higher amount. 3) A partner and co-shipowner deposited all freights in his personal account; eventually company run out of cash! 4) A person in charge of disbursement accounts succeeded in buying... a Lamborghini car. 5) Many shipowners reported to have given loans or money (or bought shares getting back nothing) that they were never returned. 6) Foreign people believe that a 3% commission on orders is legal, but certain Greek shipowners do not. E.g. commissions are paid by shipyards to company's engineer supervising a new building; for order bunkers; for insuring ships and for supplies. 7) A Captain once replied to his company confirming receipt of paints: "I confirm the receipt of x amount of paints, which I have asked, and y amount sent by you"...

**Table 1.** The spending and collecting money shipping departments.

<p><b>Operations</b> dept.: spending &amp; <b>collecting</b>; it collects the (accurate) amounts due to company via the “Freight Collection Section” (FCS); the disbursement accounts control section (DCS) monitors &amp; reduces the cost of company’s appointed Agents</p>	<p><b>Chartering</b> Dept.: <b>collecting</b>; bringing-in the freights &amp; hires in time; freights sometimes are lost or not paid (cases passed on to Legal dept.) (*); attention should be paid for who receives the commissions and what a/c has to be credited with freights and hires; for ship-model, chartering had to accept a freight rate per ton greater than \$10.36 to cover <b>total cost</b> and have a profit of ~12% p.a.</p>	<p><b>Supply</b> Dept. = a <b>par excellence</b> spending dept.; it draws management’s attention for <b>cost control</b>; a prudent and honest ^^ manager(**) must be appointed; important here is to specify who has to receive commission on company’s supplies! \$95,000 for stores, supplies and equipment is spent for the ship-model</p>	<p><b>Technical</b> Dept.: is heavy spending (**); to draw the attention by priority of top-management; to have control especially of the amounts of lubricants and bunkers consumed by main engine etc.; the control of spare parts etc. is absolutely necessary</p>
<p><b>Marine</b> HRM Dept. = spending (****); in our ship-model, crew cost is \$1,470,000 p.a. for 26 persons under USA flag; 15% of total cost; the flag choice is a strategy, as well crew nationality</p>	<p><b>Port Captains</b> Dept. = spending</p>	<p><b>Insurance</b> Dept. = spending &amp; <b>collecting</b> via claims and P &amp; I clubs; it needs <i>dexterity, experience &amp; knowledge</i> to achieve the lower possible insurance premiums and collect the <b>higher possible</b> claims! It cares for cargo claims</p>	<p><b>Administration</b> Division = spending; caring for office <b>staff recruitment</b>^ &amp; training, and for <b>Secretariat</b> dept. caring for office equipment etc. at best prices. ^it cares to pay wages comparable with the rest of the industry</p>
<p><b>IT</b> dept. = spending; it cares to adopt the <b>latest</b> and <b>best</b> available technology in communications, computers and networks</p>	<p><b>Economic</b> Division = spending (*****), <b>saving and collecting</b></p>	<p>(*) <b>Legal</b> dept. (collecting) pursues lost or unpayable freights and hires among other legal matters in various legal international regimes; claims have time bars which have to be observed</p>	<p>(**) It cares so that expenses for crew provisions per head or per day to be equal or lower than other shipping companies; ship-model spends \$ 50,000 for crew subsistence p.a.</p>
<p>(***) Large companies have a <b>performance engineer</b>, who <b>saves</b> money from the proper function mainly of main engine; money is saved here</p>	<p>(****) it cares to pay comparable wages among other companies</p>	<p>(****) It cares to achieve best loans, to protect company from foreign exchange risks; to secure high interest rates for company’s deposits; it cares for company’s liquidity and maintains good public relations with banks etc.; <b>important</b> dept.</p>	<p>^^ honesty is the most sought after in connection with this dept.; important is (at this time) the fuel cost of \$1,980,000 p.a. ~20% of total cost of the ship-model; economize on this cost is important</p>

Source: Author<sup>22</sup>.

outside the company, and from inside and outside the vessel. Since human greed is without a limit, shipping companies have to control their cost, and more so their revenue, we believe.

Departments and sections bringing money obviously must be helped, by priority, to bring-in more money<sup>23</sup>. Departments that only spend **must learn to save**, especially during a depression. In large well organized companies there is a *manual* of how to **save** money, mainly by the vessel, during a depression, like the ones in 1981-1987 for dry cargo ships, in 1979-1992 for tankers and the latest from 2008 to 2016.

### Part III: What Vessel Has to Maximize?

#### 1) Maximizing Normal Profits (M1)

<sup>22</sup>Author used to be a departmental manager in two departments in a large Greek Tramp Shipping company from 1977 to 1990. One department was that of Internal Control.

<sup>23</sup>This means to select staff carefully, train it, organize them properly, and provide them with all means (computers & programs).

This comes from Microeconomics. However, vessel's revenue is not known! Microeconomics further says: equalize MC (marginal cost) with MR (freight rate). But a shipping manager ignores how to calculate MC...Moreover, when we say M1 we must mean it for **all vessels** in a company's fleet!

For the above reasons, we wish to change the focus of microeconomics from *maximizing normal profits* (M1) to *minimizing vessel's cost* (M2), so that to *adapt theory to practice*. Moreover, M1 can be misleading for a shipping manager, as it makes him to *tolerate* unprofitable vessels in the fleet. Imagine the **entire** company to perform well by having an **overall** positive annual profit say of \$20m (vessels' cross-subsidization). This though unwise, we saw it to happen in practice.

Surely, the vessel (new or second hand) proves her ability to earn profits after plying in the market. To be fair, we have to give a second chance to ships which brought **once** a loss, due to *market conditions*... But a vessel *used to bring* losses has subsequently to be laid-up or sold or scrapped the soonest possible.

### 2) Maximizing Vessel's Carried Tons (M3)

Given that the freight rate is **fixed**, another proper objective for the manager should be: *maximize the tons carried* (M3), call it T, (or better expressed in ton miles to include distance); and this every time ship is chartered: *i.e.* TR = total revenue = Tonnage, T, hired/chartered times freight rate, F, overvoyage1 from A to B. So: Max.

$$TR1 = T1 * F1 \quad (1)$$

where F1 is paid to individual vessel for her particular voyage. The rule M3 is simple: a vessel carries... tons of cargo for which **she is paid**; so the higher, (up to her dwt mark), the amount of tons she carries, the higher her receipts out of a voyage, given distance. This has a **corollary**: a ship carries more tons, the more voyages she does, in full, (up to 365-6 days and nights or 350 min.) p.a.

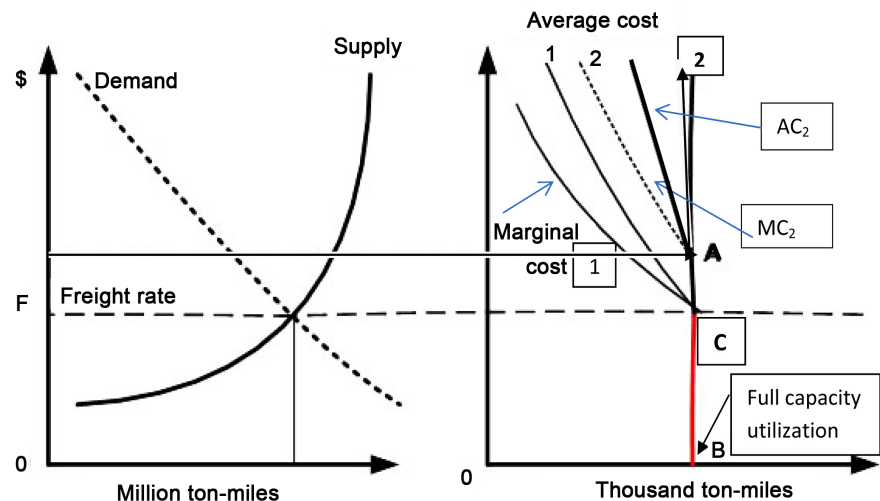
Can a shipping manager maximize tonnage carried-out with vessel's **given** economic *speed*, and space, and with ship's given capacity and speed of unloading/loading means? There is a number of ways, few are mentioned below, but the obvious one is: cut down vessel's **off-hire** time (M4), *i.e.* time **when** vessel **pays without being paid**.

Another way is to increase vessel's speed by *changing* ship's main engine! And still another is to increase the capacity of her loading/unloading means by... *replacing* them. These interventions mean to change ship's isoquant! There are quite a number of methods to increase ship's production (= **ship's performance**) after construction, but this goes beyond our scope.

### 3) Vessel's Equilibrium

**Figure 2** shows that the price (spot freight rate, OF) payable to a ship is determined by Supply and Demand. This holds for a specific cargo and voyage, from known ports, A and B, with a fixed date of departure, at certain speed, etc., given also possible competitors in port A!

As shown, if vessel's average cost is BA (RHS), and MC2 = AC2, but greater



**Figure 2.** Vessel's price determination in short-run. Source: Author.

than  $OF$ , vessel brings-in *losses*. At  $OB$ , the vessel is **fully loaded**, and this is the reason for her cost curves, ( $MC$  and  $AC$ ), to rise *vertically* beyond  $B$ , where no more cargo can be received (100% capacity utilization). If a vessel produces at a lower level than  $OB$ , the loss will be even greater, or the revenue lower, because the tonnage carried will be less than the maximum dwt *she can* carry. There is a capacity % where the total cost of the vessel will be greater than the total income from a charter, and this will lead to *losses*.

What then a vessel has to do to avoid next future loss, given that freight rate remains at  $OF$ ? The vessel has to **reduce** her **cost** from  $BA$  to  $BC$ ...

#### Corollary

A shipping manager cannot be evaluated on the grounds of not attaining a maximum normal profit! Shipping is a special case<sup>24</sup>, where the level of the net revenue achieved by other, *similar*, companies ( $M5$ ), is the fair criterion. *Similar* companies are those with the same number, type, size of ships, as well other factors (e.g. depreciation for net profit), **leaving-out only** top-management! Shipping companies and vessels are in market to seek profits, no doubt.

#### 4) Vessel's Cost Minimization (M2)

*Cost minimization* is the realistic economic objective for a vessel, which has to excel in competing other vessels performing same voyages. This is so especially if vessel's cost is above market price, as we saw.

##### a) Vessel's Production

Assume that a vessel produces uses only *two* factors:  $X1$ , standing for **all** inputs, except capital, including labor (crew), and  $X2$ , standing for Capital, embodied in vessel. The vessel is a **special case** in *microeconomic production theory of the firm*, because vessel's **inputs quantities** are *fixed*. In other words, vessel's isoquant is represented by a half *square* (Figure 3).

<sup>24</sup>We saw in practice that companies with same vessels etc. earned less than others. So a shipping manager will be evaluated because his/her colleague, with the same capital (fleet etc.), earned \$40 m in a year, while he/she earned only \$20m!



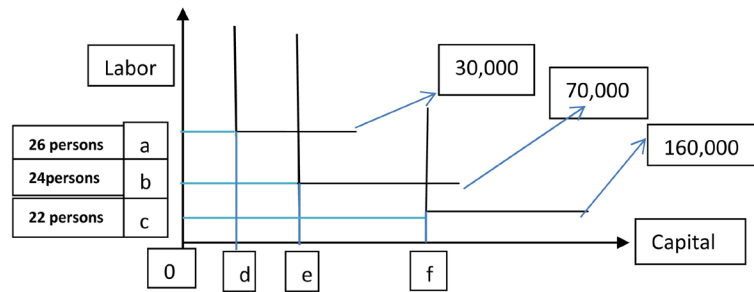


Figure 4. Economies of scale in vessel's production.

particular combination<sup>29</sup> of  $x_1$  with  $x_2$ , as mentioned. This combination, out of  $\infty$ , is selected by ship owner. Economics, however, to complete production, needs prices of inputs (cost of inputs; freight rate), or “isocosts<sup>30</sup>” lines (Figure 3), so that to introduce *economics* into *technology* [18].

### c) Vessel's Cost Minimization in Rigorous Terms

To minimize vessel's total cost:

$$C = r_1 x_1 + r_2 x_2 + b^{31} \quad (3)$$

where  $r_1$  is the price of capital<sup>32</sup>,  $r_2$  is the price of labor<sup>33</sup> and  $b$  fixed cost, we have to subject it to production function (2). All prices are constant in perfect markets. So, we form: Min.

$$Z = r_1 x_1 + r_2 x_2 + b + \lambda [f(x_1, x_2)] \quad (4)$$

and equalize the three partial derivatives of  $Z$  with respect to  $x_1$ ,  $x_2$  and  $\lambda$ , to zero to obtain a minimum. The result is that RTS (the ratio of technical substitution) has to be equal to the ratio of prices of capital and labor:

$$RTS = r_1 / r_2 \quad (5)$$

Equation (5) means that Figure 3 needs an “isocost” line –IC, to be complete. So, the **optimum** combination of capital and labor is given at the point of tangency of isocost line, IC, with isoquant,  $q^0$ .

### 4) The Efficient Shipping Manager

The efficient shipping manager tries, always, to do three actions, before market conditions (Figure 5): 1) to control vessel's and company's cost; 2) to decide fast within best-timing, and 3) to choose the most profitable from available charters.

Doing the above, the top-manager is the **king among** his/her **colleagues**, but

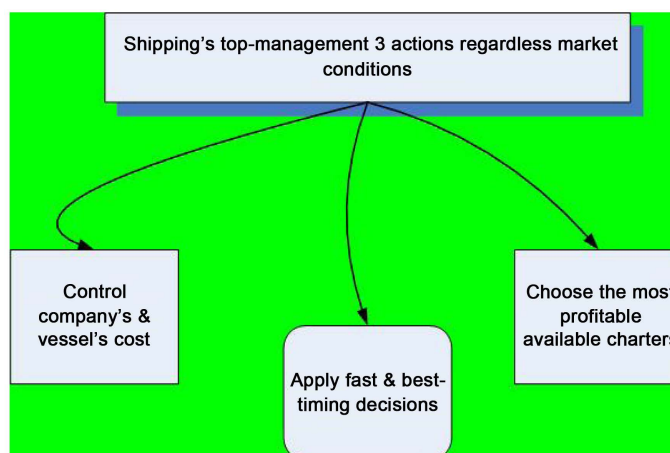
<sup>29</sup>The \$ capital embodied is determined by ship's size mainly; the size of crew is then determined by flag. It counts what automations the ship has, but the trend is for less crew. This is so as crew in advanced shipbuilding countries is expensive. Ships have a laundry on board as well hot water.

<sup>30</sup>An isocost line is the locus of input combinations that may be purchased with a specific total cost.

<sup>31</sup>There are certain inputs, which do not change with changes in output (=b).

<sup>32</sup>Capital cost comes from vessel's price amortized over say 20 years (=ship's life) or 7200 days (a 360(\*) days year assumed) aiming at a yield of ~12%. For the vessel-model having a price of \$42.4m, her capital cost is \$4,980,000 p.a. and given that the vessel performs 34.7 voyages per year, then her capital cost is \$143,516 per voyage. (\*) A more realistic year is that of 350 days; also the vessel must have a residual (scrap) value not mentioned.

<sup>33</sup>Labor stands also for all other inputs, like e.g. bunkers etc.



**Figure 5.** Actions required by top-management for a shipping company and a vessel to excel. Source: Author.

he/she *cannot* secure<sup>34</sup> a higher spot freight rate for company's vessel! So, **it is better for top-management** to achieve one or all of the seven objectives, which we set, excluding profit maximization: M2: minimizing vessel's cost; M3: maximizing vessel's tons carried; M4: minimizing vessel's off-hire time; M5: excel vis-à-vis competitors; M6: plan for next depression and M7: create depression reserves.

#### Part IV: Plan and Then Plan Again

##### 1) Available Plans

Nine different plans are provided by theory [1]: strategic, operational, long term, short term, specific, directional, single use, intermediate and standing. We added also a 10<sup>th</sup> plan for maritime depression, because shipping companies face a crisis every 12 years on average [19]. The many plans, for us, simply indicate the **need** of companies for an *efficient* and *effective* planning. The above plans indicate the **agony** of management to be of real assistance to modern managers! We believe that there is an illusion that with a **plan**, and with no **accurate forecasting**, a shipping manager can excel. But it is sure that without a plan, market will trouble this manager... **Thus** we believe a shipping plan to be **necessary**, but not a **sufficient** condition for a successful management...

##### 2) Plan for a Depression

Given that our theory about a shipping manager, and his/her Captain(s), is to minimize vessel's cost, we expect it to be adjustable, percentage-wise, in line with market conditions<sup>35</sup>. This plan has to be prepared and be the alternative in ship's computerized year (boom) plan. If market falls, and especially below ship's cost,

<sup>34</sup>This can be done by avoiding the market; i.e. by negotiating with cargo owners directly.

<sup>35</sup>If freight rate falls, say by 20%, meaning for the ship-model a lesser annual income of ~\$1.97 m (\$9.83 m \* 20%) and given that **capital cost, fuel and insurance** of \$7.15 cannot be reduced, then the remaining cost of \$2.68 m **have to be reduced to \$0.71**. So, we change flag, and reduce: crew salaries by **60%** (to \$0.588 m); subsistence of crew by **20%** (to \$0.04 m); stores etc. by **50%** (to \$0.0475 m); maintenance and repairs by **99%** (\$0.0345 m) (given that vessel is new). As shown the reduction in freight rate by 20% requires a **greater % reduction in certain** cost items **mainly crew**. If the above cost reduction is not possible then capital cost (yield) has to be reduced by ~40%.



then ship's depression plan to be applied for now on; expenses to be determined by this plan. Shipping companies **know** how to reduce costs. This plan is advisable to be planned in consultation with company's Captains.

### 3) Planning

**Planning** requires to set **goals**, and to establish **strategies** for achieving the goals set; to develop plans so that to **integrate** and **coordinate** work activities. Managers must specify **what**, and **how** to **plan**, *i.e.* to specify the **ends** and **means** of planning.

Planning is easier when changes are mild or revenue is stable or increasing. However, in shipping, par excellence, demand may change abruptly, unlike supply, due to a sudden depression -like the ones in 1981-1987 and in 2009-2016 for dry cargoes, and in 1974-1987 for tankers, and the one in 1929-1933 [16].

No shipping manager could ever **forecast** a shipping **depression**, making industry, as a result, unpredictable. This is the reason we recommend shipping managers to create **depression reserves** (M7) from boom profits (e.g. 2003-2008) to face depression (e.g. 2009-2016). Many shipping managers say: "We know that a shipping crisis will eventually come, but we do not know **when** and **how long** it is going to last"...Our suggestion is: "plan for next depression" (M6) and (M7)!

### 4) Questions Related to Planning

**a) Why to plan?** Planning provides *direction* to all, including top-management. It is important for the departments to know what their goals are. Also, more important is to know how each department will *contribute* to company's goals, how this to be *coordinated* and whether this needs *co-operation* from other departments. Planning has to indicate *how* company's goals are accomplished.

Planning is preferred to no-planning, because it helps control. Planning reduces **uncertainty**. Planning concerns future and thus makes managers to look forward. It anticipates possible planned changes; it considers beforehand the impact of a change and applies planned proper responses. Planning may reveal inefficiencies or inconsistencies in departmental plans.

Management via planning of expenses controls the daily running cost of each and all vessels, and compares this with that of last year and how much **less competitive** company became, and what to do about it. Planning is needed for control, especially if it establishes **goals** and **standards**. In shipping, expenses are planned at their reasonable levels, and should not be exceeded during planned year. If this happens, economic manager has to investigate how and why. This is surely a way of managing a company. With no expenditure planning, control has no basis.

**b) Does planning improve performance?** Planning is **related** to **positive financial results**, according to theory, *i.e.* higher profits, higher returns etc. Further, trying to implement planning, one may improve the targets or learning by implementing the plan (LbIP).

Imagine now a Government to approve a 30% rise in seamen's wages retrospectively. This will destroy the plan of the MHRM department. Imagine a sud-

den decision from OPEC to raise oil price from \$50 a barrel to \$75. Imagine a rise in international repair cost of 30%. Imagine also an unexpected rise of insurance premiums by 20%, let alone the possible and inevitable payment of back calls by P + I clubs. So, there are many unexpected factors that may destroy a plan! So, plans must have *flexible* and *adjustable to reflect reality*.

Notable is the fact that budget is done during working hours and one may not pay the proper attention to it, because it prevents him from his current, sometimes urgent, targets. But planning is equally important.

**c) Types of shipping plans:** In a shipping company **standing** plans are most common, meaning *ongoing plans providing guidance for activities performed repeatedly* (e.g. via company's circulars). Less common are the **long term** plans, which need a time **of over 3** years. Worth noting is that in the more stable past, companies **could** plan for **7** years! Common are also the **short term** plans for one year, as is budget.

**Intermediate** plans are those between 1 and 3 years. For the revenue of a shipping company we may use the **directional** plans, which are flexible, and set *general guidelines*. For the vessel, the **specific** plans are **better** as being clear, and leave no room for personal interpretations. For the vessel also a **single-use** plan may be used, which is *one time* plan specifically designed to meet the needs of a unique situation (e.g. a major repair; a dry-docking).

Finally, the **strategic** plans apply to entire company and establish company's overall goals in a long future. These come from top-management. Top-management decides a company's strategy especially in building ships or buying/selling ones. Moreover, **operational** plans encompass a particular operational area of the company, like e.g. Operations or Chartering Departments.

Suppose now that an operator has to reduce vessel's yearly off-hire time by 10%, *i.e.* about 35 days. This requires a more **careful voyage plan** as hitherto by paying attention to times spent by the ship, for which she is **not paid**: when ship arrives at anchorage; the speed applied; broadcasting properly the notice of readiness; shifting from berth to berth; breakdowns in loading, or unloading; delays; bad planning for the repatriation of crew, or receiving replacements on board; await for class/PSC inspectors to come from a far away and expensive port; await receiving missing charts; awaiting for tugs, and their number etc.

Captains must realize that revenue earned by the vessel is divided by ship's year working time, expressed in days. There are surely **justified** certain off-hire times, in theory this is 15 days per year, when also insurance premiums have to be reduced (if e.g. vessel is in repairs), but as we have mentioned already, cost in shipping **runs**, even when vessel does not **earn**, or when ship is **laid up**. **Only the sale or scrapping** of the ship terminates **the** expenses!

Operators, we think, do not pay attention, to the importance of ship's time **lost in vain**. Operators must realize that a ship can earn additional \$27,218 per day, **if not in off-hire**, (using our ship-model), and for 15 days this equals \$408,270 p.a.!

### Part V: Management by objectives

MbO is suitable for a large shipping company (20-30 vessels or more), we believe. MbO is a process of setting *mutually* agreed-upon goals, which are then used to...evaluate staff's performance. It is true that MbO adopted by many large international companies [1].

Shipping companies, according to our experience, apply MbO in a modified way by giving bonuses, when individual projects are carried-out successfully. This bonus, however, is recommended by departmental managers ex post and is not in the system as permanent.

The secret of MbO we reckon is to plan for each and every one; *i.e.* every one to have and know well its *personal plan*, and know how to implement it successfully. **Table 2** shows the steps in an MbO program.

As shown, MbO mobilizes all levels of authority in a company: top-management, divisions<sup>36</sup>, departments and staff. Each one has his/her plan and it is explained, and agreed also, how to achieve the specified objectives. Control is necessarily applied, and good action is rewarded. The procedure is similar in general terms to that followed by large shipping companies for expenses, except for 8<sup>th</sup> step. This procedure uses elements from motivation theory<sup>37</sup>. To incorporate budget into MbO is easy; to incorporate M1-M7 objectives faces more difficulties.

For budget, we need the names of the responsible persons for expenses and then we may reward them with a letter of recognition—if not with a bonus—if they retained expenses within budget's limits or even below. Research has shown that MbO can increase staff's performance and company's productivity [1] [20].

**Table 2.** Can MbO be applied to large shipping companies?

<b>Formulate</b> company's overall objectives & strategies by top-management (1 <sup>st</sup> step)	<b>Allocate</b> major objectives to company's divisions & departments by economics division (2 <sup>nd</sup> step)	Departmental managers to <b>set specific objectives</b> for their departments in collaboration with the divisional managers (3 <sup>rd</sup> step)	Departmental managers to <b>set</b> specific objectives in collaboration with all departmental staff (4 <sup>th</sup> step)
<b>Write down</b> specific action plans to define how objectives are to be achieved & agreed upon them by dept. managers with employees (5 <sup>th</sup> step)	<b>Implement</b> action plans (6 <sup>th</sup> step)	Progress towards objectives to be periodically reviewed and a <b>feedback</b> to be provided (7 <sup>th</sup> step)	Successful achievement of the objectives is reinforced by performance based <b>rewards</b> (8 <sup>th</sup> step)

Source: Author inspired by [1].

<sup>36</sup>Divisions in a shipping company, if at all, are few: 1) Administration with Office personnel dept., public relations dept. as well Secretariat; 2) Economic with Accounts, Internal auditor-if any, and IT.

<sup>37</sup>A theory determining the process by which a person's efforts are energized, directed and sustained towards attaining a goal.

## Part VI: Management by Looking At

Let us visit the future “operations room” of a large tramp shipping company. We have organized it so that data from ships to come in 24 hours a day. This is company’s *Global Operations* and *Control Center* (GOCC), where numerous computer screens relaying video and data keep watch on company’s ship operations round the world ports<sup>38</sup>.

Operations manager, operators and port captains and others can get information on ship’s loading/unloading using ship’s cameras; by installing a number of cameras we enjoy a close monitoring of ship’s activities. In other words, we have replaced *management by distance* (MbD) with *management by looking at* (*MbLA*)! Cameras are installed in all places of interest in a vessel (engine room; bridge; decks; holds etc.).

## 3. The Practical Significance of Research

Almost all academics and researchers, outside shipping companies, ignore management of a shipping company and of a vessel. This paper—from inside shipping—helps people to understand shipping industry and especially tramp shipping. This is addressed to prospective shipowners and to those small ones to see what have to expect when they grow. Also we stressed that cost (and budget) is the king in shipping along with timing, and we showed that there is a hope through “distance surveillance”<sup>39</sup> innovations to manage by looking at vessel’s operations, and not only. This last novel innovation—which we will further elaborate in future papers—will change structurally the management of a ship as we know it. The whole ship management is based on an obligatory alter ego (Captain), who is continuously and closely controlled from a distance, involving a cost and creating cases of disobeying office’s instructions at a great cost!

## 4. Concluding Remarks

Notable is that there are two management styles in shipping: 1) when company’s **manager** is a different person than **owner**, and 2) company’s **manager** and **owner** are the same person (Greek style). Managing a shipping company nowadays is *management by distance*<sup>40</sup>. The vessel is really managed, more effectively, by her Captain due to his/her closeness.

Moreover, to have a budget, a high degree of formalization<sup>41</sup> and a continuous control, are the necessary tools to manage by, and due to, distance. In addition, the *effectiveness* of communications, as well of their cost, etc., is now important. The novel idea of this paper is to introduce *management by looking at the ves-*

<sup>38</sup>Most shipping companies kept a world map and put pin-flags to show where company’s ships are.

<sup>39</sup>Applied already by other large companies to look at the operations of their factories from a distance!

<sup>40</sup>Certain large Greek shipowners (Eastern Sh. Co Ltd.) have applied also “**management by walking around**”, which describes the case when a shipping manager is out in the work area interacting directly with his/her employees.

<sup>41</sup>How much *standardized* vessel’s jobs are and the extent to which crew behavior is guided by clear rules and procedures (office circulars).

*sels.*

To take decisions, as fast as, or faster, than the market, is necessary; but more necessary is **best-timing**. The fast decision-making is not automatic! It must be organized! Thus a simple organizing with few- and computerized-hierarchical levels, where top-management decisions travel fast down, and executed immediately, and where *one* single top-manager decides (Greek shipping style) are essential.

We showed planning in a large tramp shipping company and the benefits of planning during a depression. We mentioned the **goals** in a shipping planning, and warned top-management not to be misled by economists requiring “normal profits maximization”, when market denies it! We established in shipping management the motto of ancient Greeks: “Be better than all the others (excel)”; this is what Achilles’ father Peleus said to his son Achilles, when he departed for Troy War, though he was considered to be a semi-God!

A shipping company’s prime goal is not only to keep off-hire times at a minimum, but also this to be a goal of every shipping department, as the case may be. The departments that bring-in money need every support to bring-in more money, by priority, and the departments that spend money to control their cost or increase their **saving**.

We showed that from the nine plans provided, we distinguished one from the other, and indicated the usefulness of each. Management has to know what and how much a shipping company can derive a benefit from planning, and the reasons why, and again to know that a good planning, however good, cannot beat the market. He/she has to beat his/her competitors.

A good plan may reduce company’s psychological uncertainty, it may save time to act, but it cannot bring-in money... I expect managers to understand the old panacea called management by objectives (MbO), or optimal MbO, and formulate an attitude towards it, as one may be called to apply it... as a manager of a shipping company.

## Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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