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# A New Theory of the Shipping Firm in the Framework of Pure Competition

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## Abstract

This paper came out from one of the great questions—systematically avoided by Maritime Economists: "Is shipping industry working in a perfect competition?" We concentrated on the dry and liquid cargoes. First, we wrote down the theoretical requirements for a Perfect competition and compared them with the actual ones. We distinguished the "free entry" as the most important condition, which however became harder as one LNG-newbuilding may cost $200 m and over. Next, we corrected the existing theory, which wanted to maximize the profits of any entire fleet, and we showed that a shipping company must aim at maximizing ship's **voyage profit**. We mentioned cases where perfect competition was distorted. In addition, a detailed analysis of Demand for ship space and the Supply of it, attempted so that to reach the important interplay of demand and supply, which is the price of shipping services. Moreover, we **rejected** Marshall's theoretical distinctions of the short- and long-periods for shipping companies, and established that shipping companies are **always** in the **long-run**, but simply are unable to build ships. This changes the entire philosophy of shipping company's strategy.

## Keywords

The Pre-Conditions of Perfect Competition, A New Theory of the Shipping Firm, The Demand and the Supply of Ship Space, The Price of Shipping Services, The Short- and Long-Run in Shipping Industry

## 1. Introduction

Worth noting is that when we analyze the market structures, and especially that of the *Perfect Competition*, we remember that even the micro-economists, since long ago, did not believe in its existence! They suggested the "Pure" competition

structure, as more representative of reality (Bilas, 1967). This is a market *free* of monopolies or monopsonies.

The international shipping market was not always free from imperfect structures. The demand for crude oil tankers e.g., used to be managed by a monopsony formed by the 7-major-oil companies. OPEC+ nowadays is a cartel[1] of governments, since 1960, for controlling the price of oil, by controlling its supply. Players very early understood the importance of energy, and par excellence of crude oil, and organized to control its supply, its price and its transportation, using the *microeconomic theory principles*!

It is another thing that Perfect competition is **desirable**. And this, because when there are monopoly profits, the *free entry* of new buildings, within 2 - 4 years, and the re-entry, or the coming back, of the previously laid-up ships, in few months, eliminate them. This way the re-entry, which is not without cost, allows **only** "normal profits" to shipowners. This indicates that the **free entry** is of crucial importance to maintain low prices and competition. But how much free is the entry today in shipping industry and what will happen tomorrow? Who can pay $200 m at least to build an LNG, absolutely required especially in these troubled years?

The **demand** for sea transport is created by the tons waiting in the "Seaborne Trade", which **have to** be carried-out over a certain sea distance, to reach the required importing port, usually through a Canal. Supply is created by the tonnage/space provided by the delivered "newly-built ships", as well by the "*total* ***net*** *dwt*" of the existing *active*[2] fleet. Most important is the interaction of demand and supply: the freight rate (i.e., the price).

There is also the reverse relationship—rarely examined—of the impact of the **freight rates** on *demand* and *supply* for ship spaces! We know that the transport cost, F, is added to the price of the exported product C, plus its insurance cost, I, for the voyage till product reaches its destination, known as CIF price. If transport cost, F, is dominant vis-à-vis C (FOB price), and given the elasticity of demand at destination, it is possible for F to influence demand by influencing price.

Moreover, high freight rates attract additional new-buildings and the prices of the second-hand ships may exceed those of the newly-built, because the former are available when needed (2004-2008)!

Shipowners are not the managers committing no errors. Onassis e.g., was wrong when he chartered his laid-up tankers at low freight rates, in 1956, without waiting for the full development of them by 1957! He was also wrong to assume that the "increasing" demand for crude oil will be there **forever**! It lasted only from 1947 to 1973 (**Figure 1**). This, however, was enough for him to become very rich, but he could be richer...

[1]For private cartels there is a legislation, but not for the governmental ones!

[2]The active fleet, or active supply, is different from "total registered supply" as some ships are lost due to marine accidents, others are: in laid-up, in repairs, in congested ports, in crossing a Canal, in drydocks, in slow-steaming, in detentions, etc., where they cannot produce.

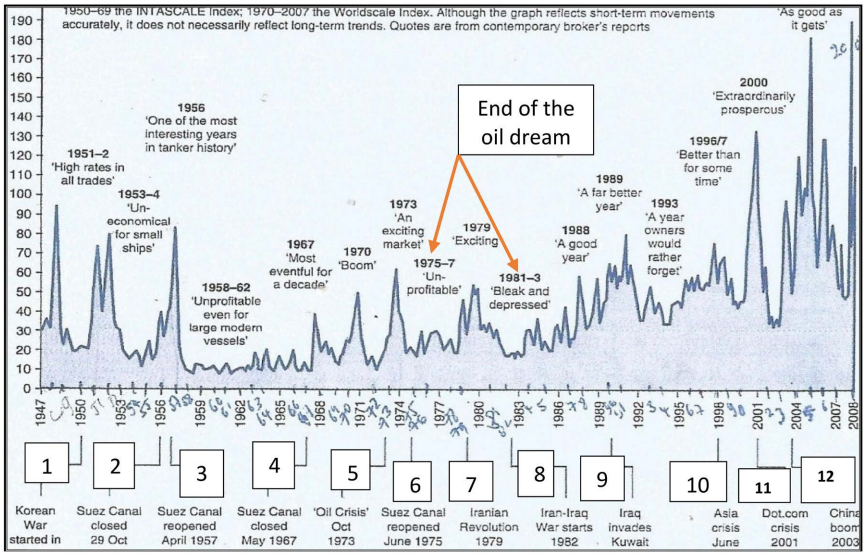



**Figure 1.** Oil tanker freight rates indices, 1947-2008; "MOT", 1947-9; "Intascale", 1950-69; "Worldscale", 1970-2008; 1947 = 30. **Source:** Stopford (2009); modified; crucial development was number 5, and, of course, number 4; important was also China's boom in 2003, number 12!

Onassis died in 1975, not realizing in full the end of his *oil dream*. In 1975, the dream of a cheap and abundant oil ended, by Arabs, forever (Goulielmos, 2021 a, b). Similarly, the cheap and abundant *natural gas* ended, by Russians, forever, after Feb. 24th, 2022. The "innocent" industry of Shipping, once again, pays the price of being international.

**Figure 1** presented the 11 non-shipping incidents as well as that of China's boom in 2003, which occurred since 1947, and till 2008, and greatly influenced the carriage of crude oil. Moreover, the long crisis between 2009 and 2018, the Pandemic from 2019 to 2022, and the Russian invasion in Ukraine, are the 3 additional events to torture Greek and international shipowners, and not only. These were not mentioned by Stopford in his book, published prior to them, in 2009. Shipping suffered from a fall in imports/production/demand due to Corona virus and it will be favored from the war, and especially after the end of it.

**Paper's aim and structure**

Paper's aim is to show that the supposed market structure of "Perfect competition" does not exist in practice in shipping in all of its requirements. For this we have reviewed and analyzed in detail the characteristics of Demand for sea transport, and the Supply of it, providing also a *new theory for the shipping firm*.

Certain **confusing** terms like "short"- and "long"-run as well "ceteris paribus" —introduced by Marshall in 1920—were discussed. Important is for Shipping companies to realize despite the theory that they are **always** in the **long-run,** with only one exception: they **cannot build** new ships due to lack of time for such an endeavor.

The paper is cast in 9 parts, after literature review: Part I, dealt with the market structure of Perfect competition; Part II, dealt with the basic objective of a

firm in a perfect competitive market; Part III, dealt with our theory of the Shipping Firm; Part IV, dealt with certain cases where Perfect Competition in Shipping industry distorted; Part V, dealt with the Shipping Demand and Supply together; Part VI, dealt with the demand for shipping services; Part VII, dealt with the Supply of ship space; Part VIII, dealt with the Marshallian distinction of the Short- and Long-periods; Part IX, dealt with Price and Cost relationships. Finally, we concluded.

## 2. Literature Review

Strandenes (2012) described the freight rate formation in the bulk shipping. In the short-run, the supply curve begins from an elastic part and ends in an almost vertical part (at full tonnage utilization). This is because new ships need time to be constructed (as shown by our **Figure 6**). The demand at the inelastic part of supply—if increases—causes just increases in freight rates. At this conclusion Koopmans (1939) and Zannetos (1966) have also arrived. Moreover, the elasticity of supply depends on the tonnage in lay-up[3] as shown by Tvedt (1997), as well by others (since 1958).

Heaver (2012) argued that the interest of maritime economists in market behaviors reflected in their studies of what, he called, "near-perfectly competitive charter market". What really the word "near" means?

Lyridis & Zacharioudakis (2012) argued that an extensive study, which has been conducted by Zannetos (1966) showed that the (tanker) market is **perfectly competitive**. Zannetos, we believe, what he argued was that a part of the demand for tanker space by the oil companies satisfied by private agreements -as mentioned below- and **what was left** formed the freight rates for tankers…in a **competitive** manner!

But, we believe, that one cannot characterize the tanker market **perfectly competitive**, when the great majority of demand and supply are removed from the market. Could the tanker freight rates be different if the total demand and the total tanker-space-supply were present and competing? We believe, yes. As shown below, they would be higher, ceteris paribus.

Summarizing, it is remarkable how maritime economists avoid to be clear about **what exact** market exists in the 3 main shipping markets (dry, liquid and containerships).

## 3. Part I: The Market Structure of Perfect Competition

We will first **assume**, in the transport of **crude oil** and **dry cargoes**, that the **perfect** competition prevails, in both "Demand and Supply". But what exactly Perfect Competition requires (**Table 1**)?

[3]In theory, the non-profitable firms shut-down in the long-run. In shipping, non-profitable vessels are temporarily removed, in the short-run, from production, and they are kept idle, but capable to come-back! This explains the small risings and fallings of the freight rates, till demand gets stronger. Shipowners must be careful because inexperienced managers take these small improvements as **permanent** ones. Experienced managers look always at the laid-up statistics to see if many ships are expected to return!

**Table 1.** The pre-conditions of a competitive market structure, where a shipping company is a price-taker.

| Assumption 1 | 2 | 3 | 4 |
|---|---|---|---|
| Any[4] one shipping company does not manage a **substantial quantity** of tonnage. | All shipping companies produce **homogeneous**[5] services. | Every shipping company uses **identical (*)** production processes. | Every shipping company possess **perfect**[6] **information.** |
| 5 | 6 | Condition 1 | 2 |
| There is a **free entry** into shipping industry, in the long-run with a newly-built ship or with a 2nd-Hand one in the short-run **(**).** | No shipping company can **increase** the freight rate (***). | The demand curve for ship services is drawn **horizontal** in the long-run. | The demand curve touches the lowest point of the LRAC (****) curve, where MC (*****) = Freight rate = MR (******). |
| 3 | 4 | 5 | SOURCE |
| Companies aim at **maximizing** the short-run profit, when MC = MR = freight rate, reaching a **single & equilibrium** point. | (****) LRAC = long run average cost; (*****) MC = marginal cost. | (******) MR = marginal revenue; in the AC a normal profit is included. | Author aided by **Pearce's** dictionary of modern economics (Pearce, 1992). |

Note: What exactly are the "normal" profit? Some defined it as the salary a manager is entitled to. Or a logical % of money for him/her; the % is not defined (say 15% - 20%?). In shipping, variations of the short-run profits may be substantial, like in 2004-2008. The above definitions for normal profits are apparently subjective, as they should say to produce at the "minimum cost" in the long-term. Notable is that "super-normal profit" is **allowed** in **perfect competition**, but it appears only in the short-run! It is defined as the one "exceeding all opportunity costs"…If economists could define clearly business profits, and how much each factor of production **creates** them, they would avoid such theories like that of Marx. (*) **Not entirely true**, as some companies are more effective & efficient, in the same sector, than others. **(**) Free entry** is allowed, but at an **increasing cost, due to economies of scale, global inflation, currency parities & ISM code.** This is a **crucial mechanism** in order to reduce "monopoly" profit. Below, we mentioned cases where the crude tanker supply influenced.

[4]The term substantial must be defined. We assume, arbitrarily, that this concerns any shipping company owning **1m dwt & over** in the sectors of liquid or dry cargoes. Greek shipowners in early 2020, owned about 135 m dwt of tankers and thus 1m dwt for each means 135 companies. One of them-Procopiou G e.g., owned about 15 m dwt, in the 4th position, in end-2018. Another definition may be the amount of dwt **on order** if it is **1m dwt or over**, assumed by us this to affect total supply. Consequently, this condition is valid only for **medium** and **small** shipping companies.

[5]Charterers e.g., avoid to charter tanker ships of 15 years of age, and over, and dry cargoes ships of 20 years of age, and over, out of the fear to have a marine accident…So, **homogeneity** does not hold. After the appearance of the ISM Code, all ships are assumed to be safe…In cases of acute demand *homogeneity* is bypassed.

[6]This is not possible. Shipping companies hide many times their purchasing preferences of 2nd hand ships as well the prices they paid. In addition, new building prices are also kept secret most of them. Shipping industry is frequently assumed as keeping secrets. It has been observed that certain small companies followed the large successful ones in their buying or building ships! **Management by copying**!

In Greek-owned shipping it is estimated to be there, by 2022, about 100 large shipping companies, out of about 1300, owning from one million dwt and up to 20m each! If one company of them decides to build 1m dwt say, surely this will influence total Supply, and the freight rate, given demand and distances. Important is to note that the size of the individual shipping companies and the Greek ones, **increases** (in dwt) from year to year (Chrzanowski, 1985).

## 4. Part II: The Basic Objective of a Firm in a Perfect Competitive Market

The basic assumption of the microeconomic theory is that a commercial firm **aims** at getting the maximum profit. This statement is **misleading**, however, if it is taken to mean that a commercial firm, and a shipping one, not only **aim at**, but also, they are achieving it. A graphical proof is given concerning the mathematical requirement that maximizing profit by a shipping firm, its MC must be equal to its MR (**Figure 2**).

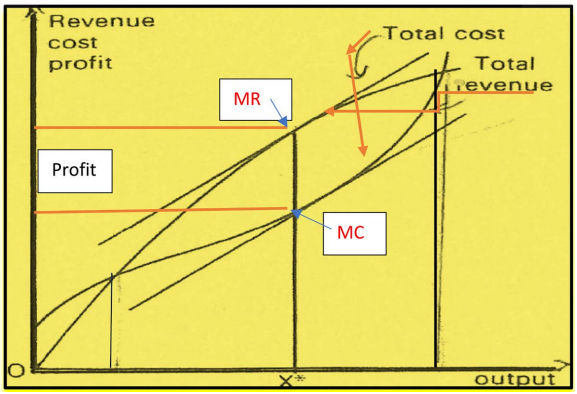


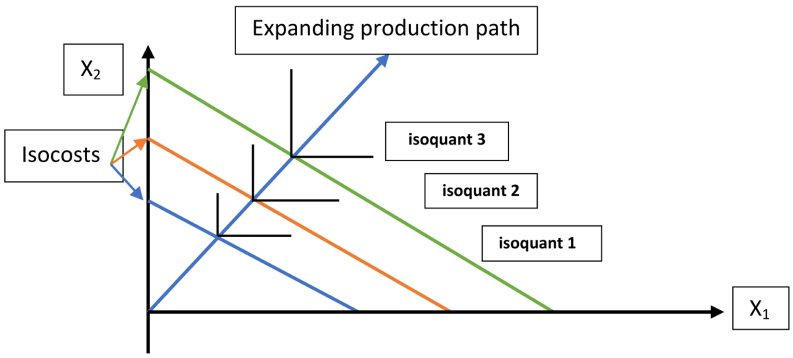

**Figure 2.** MC = MR is required to maximize profit.
**Source:** author.

**Figure 2** shows the curves of the total revenue-TR and of total cost-TC. It also shows the Marginal cost and the Marginal Revenue, in the form of tangents, at a specific point[7]. We see that when MC = MR, the tangents are parallel, (equal **slopes**), and more important is that the difference between TC and TR is only there maximum, and thus profit (at X*) is at maximum. Of course, the strange remark here is that there is a part of 1/3 of the potential production that has to be left unused (right of X*)! This is shown also by the mathematical example we created shown below.

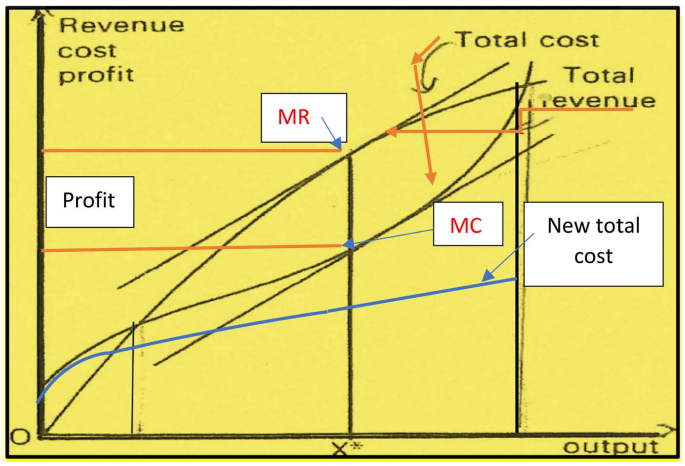
### Minimizing Cost

One may argue that a shipping company, in particular, has to *minimize cost* rather than *maximize* profit! Is this different? A shipping company after all is a price-taker. Let the *cost* of one, of say 3 productions, be C1. This becomes a parameter (**Figure 3**), and is fixed.

[7]The MC and the Marginal Revenue differ from point to point as the TC and TR lines are curves.




(a)




(b)

**Figure 3.** (a) A family of 3 isocost and quadrant lines. **Source**: author. (b) A new total cost curve permits a higher production at the right-hand side of X*. **Source**: author.

**Figure 3(a)** gives the picture of the *maximization of* production by **minimizing cost**. Firms' minimum cost is achieved, if the relevant isocost line is *tangent* to its nearest isoquant!

Inputs' fixed prices times the quantity X1 and X2 of the 2 inputs hired, indicate the *total outlay 1*, in a linear combination (=the *isocost* line 1). This is required by the firm to **perform** one of the 3 production levels (=the *isoquant* curve 1). By the way, the substitution[8] of capital by labor, and the reverse, **is not possible after a vessel has been built**! This is like a Catholic marriage. This explains why a shipping firm has right-angle isoquants.

## 5. Part III: Our Theory of the Shipping Firm

### 5.1. Maximizing Voyage Profit

Our basic, and new, assumption is that the Shipowner aims at maximizing profit

[8]Despite this statement, shipowners can replace a main engine, make the ship larger and replace her loading-unloading means with stronger and faster ones, provided this is economical and their cost is <than income. We worked with shipping companies, where labor quantity was above the levels specified by law, especially in tankers.

from every ***voyage*** *performed by* ***each ship*** *in company's fleet*. This differs from the current theory. *The current theory, and practice, aims at maximizing the* ***year*** *profit of the* ***entire fleet***, *in* 12 + 3 *months*.

First, we have to define Gross Revenue, per voyage, for vessel s: $GR_{is}$, where $i$ = 1, 2, 3, …, $n$ voyages. $GR_{is}$ is derived if one multiplies "ship's s net dwt"[9,10], used in voyage $i$, by the (fixed) price of ship's services, or freight rate $p_i$ per dwt (less chartering commission). Therefore: $GR_{is} = p_{is}q_{is}$ (1), where $q_{is}$ stands for the quantity of net tons of cargo carried over a specified distance, from port A to a port B, through Canal x.

Profit, $\pi_{is}$, comes, if from $GR_{is}$ one subtracts the voyage cost, $C_{is}$, where $C_{is} = r_{i1s}X_{i1s} + r_{i2s}X_{i2s} + F_{is}$ (2), where $r_{i1s}$, $r_{i2s}$, are the (fixed) prices of the inputs 1 and 2 hired, $X_{i1s}$, $X_{i2s}$ are their quantities used in voyage $i$, and $F_{is}$ is a portion of the total "fixed" cost of the company, for voyage $i$.

$F_{is}$ comes from the costs that occur, or occurred, independently of whether the ship made a voyage or not (ship's depreciation, part in the administration cost, her possible interest charges, etc.). *Frequently, fixed cost is taken for granted* ***or ignored***, *but its* ***minimization*** *is a persistent strategic job of the clever shipping companies*!

We must not, however, deny that "the **more** profitable voyages[11] a ship performs, the **more** profit accumulates for her company" over the formal accounting period of 12 + 3 months. This emphasizes the **role** of voyages and the **time** spent in shipping performances. **Faster** voyages, mean **more** voyages, at the unit of time.

Economists replace $q_{is}$, by the production[12] function[13] $f(X_{1s}, X_{2s})$ [3]. So, profit $\pi_{is}$ becomes $p_{is}f(X_{i1s}, X_{i2s}) - r_{i1s}X_{i1s} - r_{i2s}X_{i2s} - F_{is}$ (4). Setting, now, the *partial derivatives* of (4) w.r.t. $X_{i1s}$, $X_{i2s}$ to zero, to get the maximum profit, from voyage 1: $\partial\pi_{1s}/\partial X_{1s} = p_{1s}f_{1s} - r_{1s} = 0$ (5) and $\partial\pi_{1s}/\partial X_{2s} = p_{2s}f_{2s} - r_{2s} = 0$ (6) and: $p_{1s}f_{1s} = r_{1s}$ (7)

[9]The ship's dwt contains items which provide no income, like bunkers, water etc. A good strategy is to **minimize** the quantity of these, and maximize the quantity of cargo, which pays. Another good strategy is **to minimize** the off-hire time of the ship. Ship's time, which is not devoted to carry cargo, is wastage of company's resources. The third good strategy is to **minimize** all voyage costs like the number of tugs and agents' fees and so on and so forth that company pays. A serious cost comes from various inspectors that arrive on board from Class, port state control, surveyors and so on.

[10]The revenue for a year is the sum of all revenues from the voyages performed by the ship. This indicates how important is **speed**, and the minimal stay in ports and Canal crossings, which provide either no income—but high cost—or low one (for the days beyond demurrage).

[11]Our experience from shipping companies showed us that to lay a ship up, because of her losses, depends on **how many voyages** the shipowner will let this go. Shipowners with dependence on banks, or stock exchanges, avoid to lay- ships -up for the psychological impact it may have. So, they prefer to subsidize, so to say, the unprofitable vessels with the profits of the efficient ones.

[12]Goulielmos, Samprakos, & Giziakis (2021c).

[13]The "production function" is an essential tool in the theory of shipping firm, because it pre-assumes "**technical efficiency**" in shipbuilding, and **states** the **maximum** output to be obtained from any possible combination of capital and labor. **Technology** thus is the **first non-economic** factor in the theory of a shipping firm. When maritime economists introduce into the picture the *price of the services*, and *the prices of capital and labor*, the whole issue **passes** from the **shipbuilders** to **economists**. The **technical** effectiveness and efficiency are basic **pre-conditions** for a maximum profit. Few shipowners have paid attention to this important factor with the exception of those coming from the engineering profession.

and $p_{2s}f_{2s} = r_{2s}$ (8). (8) means that a *shipping company has to equalize* (*the* ***value of*** *the marginal product of each input to its price* $r_{is}$, *so that to* ***maximize profit***[14]. This further means "to get back what you have paid" at the margin.

Talking about marginal cost, many managers not only do not understand what this is, but also, they do not know how to calculate it! To be honest a shipping company knows only ship's Average Cost, which at equilibrium only is equal to MC. This way knows ship's marginal cost indirectly. The Marginal cost for a vessel is the cost paid by the vessel, and **added** to vessel's total yearly cost, in accomplishing an *additional* voyage, loaded at 95% of her dwt, from port A to port B, through Canal x.

### 5.2. A Mathematical Example for Profit Maximization

Following Jacques (2018), let the voyage demand function be: $P_1 + Q_1 = 30000$ (1) and the voyage cost be: $1/2Q_1^2 + 6000Q_1 + 7$ (2). We may ask: "How many ton-miles the vessel needs to maximize total revenue?" "What is the maximum profit, and at what ton miles?" "Do we have to have MC = MR for a maximum profit?"

We know that the total revenue from voyage 1 is equal to $P_1Q_1$, and $P_1 = 30000 - Q_1$. So, $TR_1 = (30000 - Q_1)Q_1 = 30000Q_1 - Q_1^2$ (3). To get a *stationary* point we put $\mathrm{d}(TR_1)/\mathrm{d}Q_1 = 0$ and we get $30000 - 2Q_1 = 0$ (4) and $Q_1 = 15000$-ton miles. This **production maximizes voyage's** total revenue. This does not maximize profit however.

To maximize now the voyage **profit**: $\pi_1 = TR_1 - TC_1$ (5); we place $TR_1$ and $TC_1$ analytically, and $\mathrm{d}\pi_1/\mathrm{d}Q_1 = 0$. So, $\pi_1 = 30000Q_1 - Q_1^2 - 1/2Q_1^2 - 6000Q_1 - 7 = -3/2Q_1^2 - 24000Q_1 - 7$. For a *stationary* point $\mathrm{d}\pi_1/\mathrm{d}Q_1 = 0$. The maximizing profit is at $-3Q_1 + 24000 = 0$ or $Q_1 =$ **8000 ton-miles**. *This is almost the* 53% *of the potential maximum production of* 15000 *ton-miles*! This we believe depends on the shape of total cost curve, as revenue cannot be influenced. A different total cost curve will permit a higher production. We showed this in **Figure 3(b)** above.

Now, $TR_1 = 30000Q_1 - Q_1^2$ and $MR_1 = 30000 - 2Q_1$ and for $Q_1 = 8000$, $MR_1 = 30000 - 16000 = \$14000$. Given that $TC_1 = 1/2Q_1^2 + 6000Q_1 + 7$ and $MC_1 = \mathrm{d}TC_1/\mathrm{d}Q_1 = Q_1 + 6000$, then $MC_1 = \$14000$ at $Q_1 = 8000$ for a maximum profit. Thus $MC = MR$.

We may also form: $Z_{1s} = C_{1s} + \lambda_{1s}[q_{1s} - f(X_{11s}, X_{21s})]$ [9] of voyage 1. We set the partial derivatives of $X_{11s}$, $X_{21s}$ and $\lambda_{1s}$ to zero to get a maximum, and we finally arrive[15] at this result: "the ratio of the marginal products of the inputs" has to be equal to the ratio of their "prices". Again, get what you have paid for the productivity at the margin.

[14]Talking about only capital and labor we have not to forget **all** inputs like the cost of bunkers, port costs, maintenance, insurance etc. For simplicity we talk only about capital and labor. In fact, economists replaced the term "factor/coefficient of production" by the term "input" to escape from the traditional reference to capital, labor and land. Shipping has no need of land, but of Sea, which is free, except for the Canals and Ports.

[15]For simplicity reasons we omitted all the second-order conditions (Henderson & Quandt, 1958).

### 5.3. Why a New Theory of the Shipping Firm Was Required?

Our different approach above caused by the fact that large, (meaning the companies owning more than 1 vessel, and thus concerning almost **all** shipping companies), shipping companies aim at maximizing profits from **all** their **vessels** from **all** their **voyages,** during a specific accounting period of 12 + 3 months. The **exact** outcome[16] of this policy is seen as late as 3 months after the end of the year (in company's balance sheet, required to be verified also by external auditors)!

This, i.e., the maximization of profit per voyage, could increase company's efficiency, given that in a fleet there are ships that bring losses, others bring nothing, and others bring various amounts of profit! If the market is good, and similar ships among competitive fleets earn a net profit, the ones providing losses or nothing, they must be laid-up, we reckon, as soon as possible! This is why maximizing profit per voyage is the more efficient aim, and the result of it has to be reported immediately to the shipowner (at the end of the voyage).

## 6. Part IV: Certain Cases Where Perfect Competition in Shipping Industry Distorted

In the past, and up to end-1973, the 7 major oil companies, chartered ships from the independent-owners (private firms) to supplement their transport needs of crude oil to their customers (the refineries). Thus, they had to pay the market freight rate. Oil companies were obviously interested in a *low transport cost*. The production of crude oil was controlled by them (so, the buyer of oil transport services was **one** group of buyers, i.e., the 7 major oil companies, a monopsony).

Moreover, oil majors controlled the price of oil, together with the other oil producing and exporting countries, (mainly OPEC+, a cartel of governments, which emerged in 1960, starting with 6 members and increasing to 13 by 1992, and further thereafter). OPEC controls the oil price by controlling its supply. Nowadays, the importance of oil has been reduced and that of natural gas has increased. This has caused for EU to be trapped into the dependence on it, from Russia, at a serious %.

The major oil companies knew that by increasing the supply of tonnage, they would achieve a lower transport cost for crude-oil, first by tough bilateral agreements, and then by an increased supply (**Figure 4**), when ships would be free-of-charter, given demand and distances!

The 7 major oil companies signed charter parties, (the contracts of affreightment[17]), of a long tenor of 15 - 20 years, with the "independents", on the understanding of **building** the required ships, which in order to become profitable[18] exploited the economies of scale on the one hand, and on the other, they used

[16]We know that the shipowner is informed for the expected results from a planned voyage, but rarely is informed for the **actual** result of the voyage, if the company has the practice to report it.

[17]A contract to carry goods by sea specifying only the quantity to be transported from an area to another per annum. The shipowner had to build the appropriate ship in size and speed so that to do the job efficiently.

the flags of convenience! The banks gladly provided the required 60% - 80% finance. Thus, supply of tankers expanded, and the transport cost of crude oil fell, say from OF1 to OF3 (Figure 4)!

Shipowners who wanted to obtain newly built ships, where the banks would finance them immediately, as the Charterers were of first class, could but fall in the trap voluntarily. Figure 4 and Figure 5 represents the **end result** when ships after 10 to 15 years compete in the market free from any chartering obligations. This *increased* supply, something which will no doubt diminish the freight rate from OF1 to OF3, given demand and distances at that time.

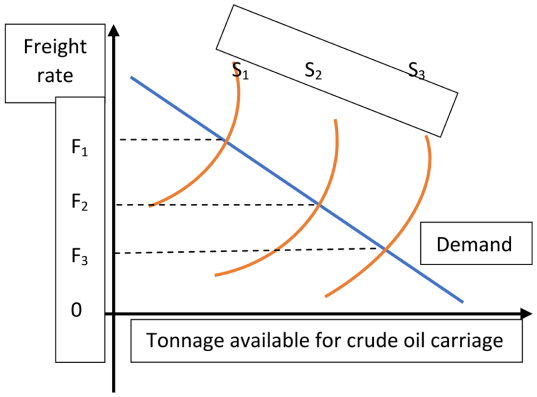



**Figure 4.** The expansion of supply of tonnage to carry oil causes the fall in its transport cost. **Source**: author.

To be clearer there is a negotiation between major oil companies and major private shipowners, as mentioned which we may represent graphically (Figure 5).

In Figure 5, the total demand 1 intersects with total supply 1 and forms the freight rate OF1. The major oil companies remove part of the demand from the market to $D_2$ and increase supply to $S_2$. This allows them to reduce $OF_1$ to $OF_2$. Maritime economists who saw it assumed that $OF_2$, determined by Demand & Supply as it did and under perfect competition.

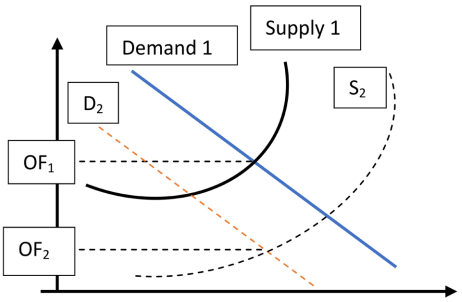



**Figure 5.** The operations of the major Oil Companies. **Source**: author.

[18]There is no doubt that in negotiations, oil companies tried to achieve the lowest possible hire. Independents surely were more efficient than oil companies, who were also shipowners of say a 33% of global tonnage. Oil companies benefited in 2 counts: low freight rates now, and for 15 - 20 years, and low freight rates in future. What they could not control was the global demand for oil. Oil companies shut their transport departments and focused on oil extraction and trade after 1973.

In the next case, a shipping company's action influenced the supply of tonnage, but without intention. This was the extraordinary order of 120 dry cargo ships of about 3.6 m dwt in 1983, by the Japanese company Sanco (Stopford, 2009), on the wrong assumption that market will improve in 1985. Stopford (2009) argued that such counter-cyclical ordering[19] occurred also in 1905-6.

Masters in the anti- or counter-cyclical policy are the Greek shipowners, who buy larger and younger 2nd hand ships first, but soon after they sell ships smaller and older. This means to cause a rather limited impact on total supply, including also their scrapping and their new-buildings!

## 7. Part V: Shipping Demand and Supply: A King and a Queen of the Shipping Industry!

In shipping industry, the most important relationship is the one existing between **Demand** for, and the **Supply** of, ship space for sea transport (**Figure 6**). There is, however, not one shipping sector. The sectors are distinguished by the product they are designed to carry: crude oil, oil products, dry cargoes, chemicals, gases (LNG, LPG) etc., all products carried in **bulk**, by tramp[20] ships. Containerships have a different market (Goulielmos, 2018).

As shown, the demand for ship space for hire, and the supply of it, determine the price (OF1) to be paid to ships taking part in the sea transport, given distances, or P = f (D, S). Notable is the **vertical** part of the supply curve of the ship space at the higher freight rates, when no new ships can be delivered (real short-run).

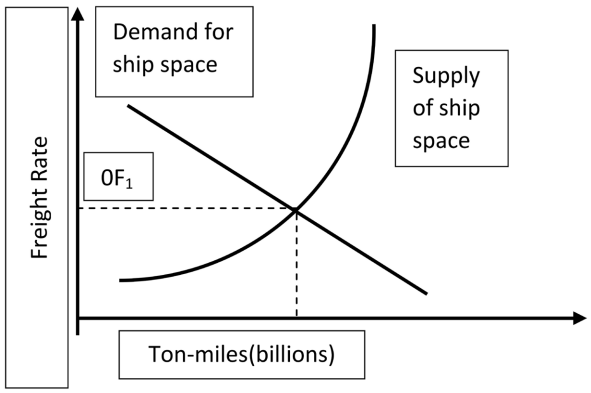



**Figure 6.** Demand for, & Supply of, ship space (short-run).
**Source**: author.

## 8. Part VI: The Demand for Shipping Services

This is the key-variable determined by the disposable incomes spent on interna-

[19]Orders are pushed-up: if companies get-out from a boom (1980; 2004-8) and are pretty liquid; if technology and shipyards offer something really competitive and cheap, if banks have an accumulated liquidity due to petrol-$ etc., if the parity of the shipbuilding currencies vis-à-vis $ is favorable and if expectations for a higher seaborne trade exist.

[20]This term characterizes the ships devoted to serve all other markets which containerships do not. This means ships of a simpler construction, of a lower speed, a minimal or no office infrastructure, of low capital, no need for advertisement and no schedule of departures and arrivals. Ships in which Greeks specialized called "the cargo taxis of oceans".

tional seaborne imports (exports). By reducing tariffs, and by reinforcing seaborne trade, by increasing the production to be exported (imported) by sea, one boosts finally shipping. Globalization, no doubt, favored shipping.

Demand for exporting-products, classically, depends on their price at destination (CIF), and its elasticity. Supply of exporting-products depends on the quantity produced as well on the cost of production. This is made-up by the quantity of oil used and its price, and the quantity and the price of fertilizers for agricultural products and other inputs.

Maritime demand, however, has a number of important dimensions: *volume*- in billion metric tons, and *distances*- in 000' of nautical miles. Demand is also determined by the import policy of the various governments (import restrictions, quotas, sanctions, tariffs, embargoes, climatic reasons, etc.).

Economic growth needs certain **raw materials**: steel (iron ore), oil, cement, coal, natural gas, etc. Growth, however, is mainly accomplished by the cargoes transported by containerships (products of craft industries and from industries/manufacturers).

Important is to remember always that the demand for ship spaces (Figure 7) is a **derived** demand! It is created from the need to transport cargoes from the places of production/extraction to refineries and to the places of consumption. Of course, ships have to cross certain sea and Canal distances (plus Canal fees), and spending some time, and adequate money, in ports of loading and unloading. Crucial factors are involved like the ship and port speed.

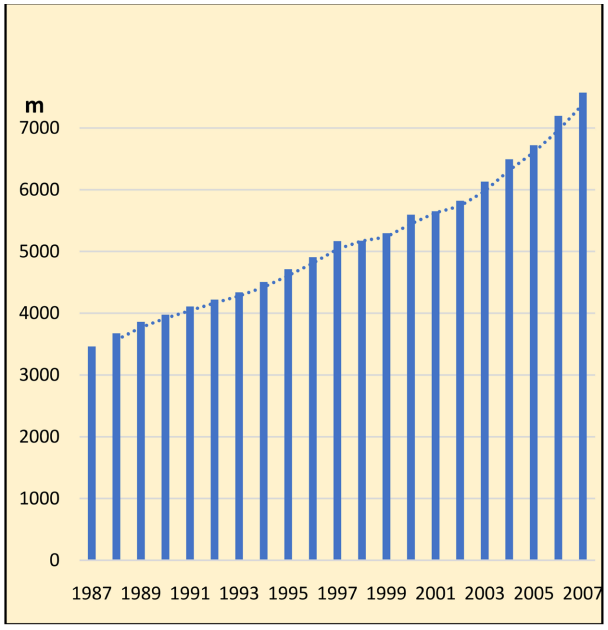



Figure 7. Seaborne Trade, 1987-2007. Source: data from the Institute of shipping Economics & Logistics (ISE&L).

As shown, the demand for ship space more than **doubled** (214%) from 1987 to 2007, from 3.5 billion tons to 7.5, in about 20 years. This is a **normal period,**

where a dry cargo shipping depression passed over, between 1981-1987, and a 2nd longer one was about to occur in 2009 (to 2018). In addition, global population continued to increase, especially in China and India.

The exact numbers are show in Table 2:

Table 2. Seaborne Trade in million tons.

| Year | Total trade | % ≥ 5 from previous year | Year | Total trade | % ≥ 5 from previous year | Year | Total trade | % ≥ 5 from previous year |
|---|---|---|---|---|---|---|---|---|
| 1987 | 3461 | - | 1988 | 3675 | 6.2 | 1989 | 3860 | 5 |
| 1990 | 3977 | - | 1991 | 4110 | - | 1992 | 4221 | - |
| 1993 | 4339 | - | 1994 | 4506 | - | 1995 | 4712 | - |
| 1996 | 4906 | - | 1997 | 5168 | 5.3 | 1998 | 5172 | - |
| 1999 | 5296 | - | 2000 | 5595 | 5.6 | 2001 | 5653 | - |
| 2002 | 5820 | - | 2003 | 6133 | 5.4 | 2004 | 6493 | 5.9 |
| 2005 | 6720 | 5.9 | 2006 | 7195 | 7.1 | 2007 | 7572 | 5.2 |

**Source:** as Figure 7.

As shown, serious growth rates of the Seaborne Trade occurred in 1988-1989, 1997, 2000, 2003-7. These last 5 years were exceptional for profitability, ending in 2008.

## 8.1. Statistical Models of the Seaborne Demand

Certain economists (namely: Stopford, 2009) related the demand—the seaborne trade for ship space—to: 1) the growth of the global domestic product-GDP and 2) the world industrial production. In our opinion, important is the demand for **sea exports** and **sea imports**, the **distances** involved, the Canal transit time and its fees. Important, of course, is the personal (disposable) income of the world citizens and the rate of inflation which is devoted to buy imported goods crossing the oceans.

Stopford (2009) formed the following regression between seaborne trade ST and the world GDP: ST = −26.289 + 30.9013 GDP, with a high coefficient of determination: $R^2$ = 0.99! He predicted almost accurately the 2005 seaborne trade to be 6.8b tons (rounded) at an average GDP of 3.5% p.a. for 1995-2005, or for 11 years, with a = 4650b tons to start with, in 1994.

## 8.2. Seaborne Trade and the Energy Crisis in 2022, and Thereafter

In 2022, the global economic situation became harder than in 2009 and thereafter till 2018, due to the lower growth rates expected almost everywhere (Table 3).

Table 3. OECD predictions of the Growth rate of certain countries (June, 2022).

| Country | Growth rate % expected | Country | Growth rate % expected | Remarks<br>All countries -as predicted- will have a reduced growth rate from 0.1% to 2.2% in 2022 |
|---|---|---|---|---|
| USA | 2.5 | China (*) | 4.4 | Target 5.5, actual 2+; inflation 2.1 |
| Germany | 1.9 | France | 2.4 | |
| Italy | 2.5 | Japan | 1.7 | |
| UK | 3.6 | India | 6.9 | |
| Canada | 3.8 | **Eurozone** | 2.6 | |
| **OECD countries** | 2.7 | **World** | **3.0** | |

**Source:** "Kathimerini" weekly journal, 19/06/2022. (*) Greek shipowners must study the growth rates of the Chinese economy, because its imports favor mainly the Capes, where also the distances are longer. China achieved 11.7% p.a. average growth rate since 1980 (to 2019), but hit hard by the COVID-19 not only in 2019, but also in 2022.

As shown, the global GDP will fall by 0.5% in 2022, with an expected inflation of 7%. This means that for an estimated seaborne trade of about 10 billion metric tons in 2021, the reduction will be 50 m mt. Five hundred (500) ships of 100,000 dwt each will become redundant!

Certain economies reacted to inflation by increasing interest rates. But this is an unnecessary, we believe, policy, because the job of the increased interest rates is done by the higher prices of gasoline, electricity, natural gas and of certain other basic products. The interest rates have to be increased when inflation is caused by increased incomes and a high demand vis-à-vis a slow adapting supply, we believe. China e.g., in contra, speaks for further infrastructural works to be done by extra spending by the Government, and **lower** interest rates, especially for house loans! In our opinion economies must maintain low interest rates for all investments for cheaper and greener energy, and for projects achieving the independence from oil and gas sources owned by enemies.

### 8.3. Big Economies Determine the Seaborne Trade!

Large economies, or groups of them, like the ones shown in Table 2, have a stronger impact on sea imports, and exports, than others. Interesting is whether they adopted restrictions on them (imports). Important is also their stage of development. Growing economies need machinery, transport means and other ready products to be able to build factories, roads, railways, ports, infrastructure, etc.

The future entrepreneurs must be aware that the mature economies give emphasis on services. Thus, they need airline companies, fast railways, safe highways, banking and investment services, effective police, coastal ships and cruisers, luxury hotels, yachts, high-level touristic services, entertainment, body-building centers, good health and medical systems, winter sports, etc.

Demanding will be the care for the old, as population gets older. Old-age houses will be needed in an increasing rate, and nurseries will close-out as well primary and secondary schools. The profile of the demand for services will change and digitalization will soon be common in all advanced countries. The smart phone will be the exclusive weapon of tomorrow's citizen.

The "family size" will be a function of the disposable income of father and mother, and families of above 3 members will be rare, by intention. The purpose of life will be to satisfy exclusively all body needs, and the abortions will become legal everywhere, and not only in certain USA states (2022). The "social cell" will not be anymore the "balanced family", living all together (Father, Mother, 5 children maximum, the grandfather and mother), but the "One—me". Thus, life, and businesses, will be organized round the one person, who will care exclusively about his/her self.

## 8.4. The 1970-1989 Developments

Maritime economists used—in the past—the GNP of the OECD countries to express what happened in shipping industry in 1970-1989 (Figure 8).

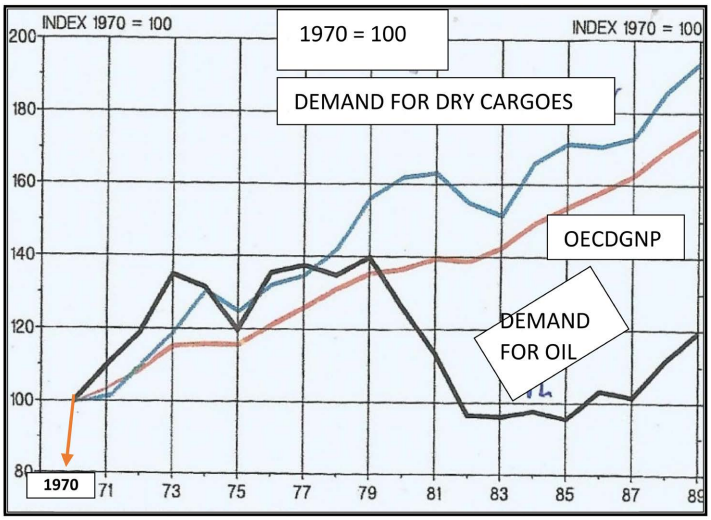



Figure 8. Global seaborne trade of oil and of dry cargoes related to GNP of the OECD countries, 1970-1989. **Source:** The "Platou" report, 1990, modified.

As shown, the seaborne trade (index) of oil, reduced between 1973 and 1975, and between 1980 and 1987, due to the 2 oil crises. Despite the crises, the GNP of the OECD countries **did not reflect them**! Economists at the time did not believe that the demand for oil will be ever reduced, considering an elasticity of demand very inelastic (<1). They never expected that the price of oil will increase several times! The Dry cargoes demand also reduced in 1975 and in 1983.

## 8.5. The Effect of Distances on Demand

In addition, a shipowner will be unable to estimate properly demand, if he/she does not take into account the distances involved, as shown in Figure 9.

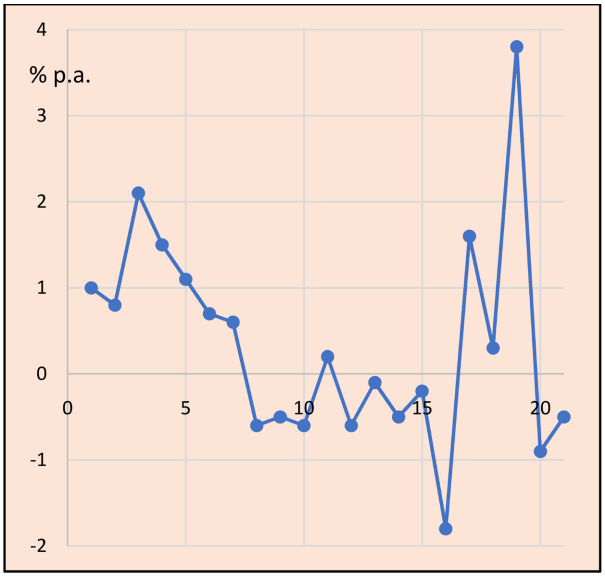



**Figure 9.** The effect of distances on demand, 1987-2007. **Source:** Author; data from ISE&L.

As shown, distances **add** or **subtract** from demand a certain % p.a. of the total trade (1987-2007). Distances e.g., multiplied demand by 4.4 times in 2005, meaning 22,878 m extra tons!

Seaborne trade has a network-pattern determined by the ports developed by nations to import and export their dry products and crude-oil. This pattern, however, is changeable, as new export markets emerge (North Sea; Alaska; for oil), and new import ports are used. Distances do change. Classical example is the export of iron ore from Brazil to Japan, which changed to exports from Australia to Japan.

Classical is also the example of the location of refineries, which changed from Middle East to Europe, for political reasons, after the end-1973. Important example is the development of China and India and the expansion of imports by these vast countries recently. The location of these two densely populated countries of about 2b citizens from the countries producing raw materials etc. played a crucial role for shipping industry!

## 9. Part VII: The Supply of Ship Space for Sea Cargo Transport

In **Figure 10** the development of the global merchant fleet is presented. As shown, the impact of the 1981-1987 depression is apparent.

Between 1981 and 1988, the global fleet was either stagnant from year to year by 0% (1988) or falling by a negative % (1983-1987), or grew by a very low one (1981-1982: from 0.2% to 0.9%). This was a serious shipping depression (1981), till end-2008. Another depression took place between 2009 and 2018. The fleet performed high growth rates from 1966 to 1977 (12 years; peaked with 9% in 1969 and 9.9% in 1975). High growth performed also in 2007 (6.9%) and in 2008 (7.4%). Negative growth occurred in 1999-2000 (−0.6%).

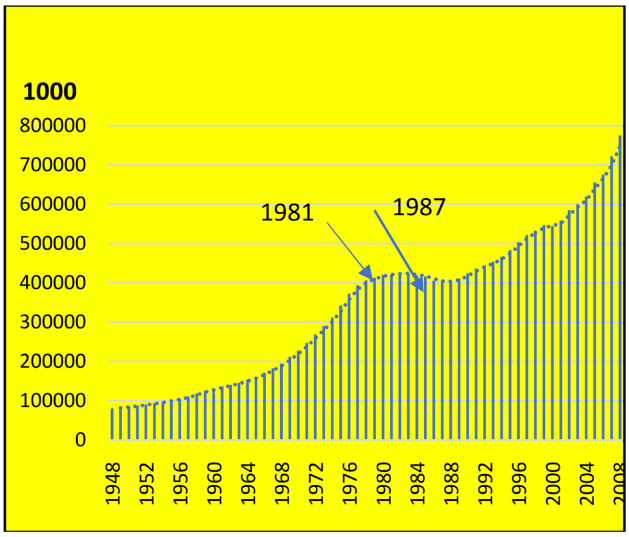



**Figure 10.** Global Merchant fleet, 1948-2008 (ships: 100 gt and over).
**Source:** data from the Institute of shipping Economics & Logistics.

The above fleet of almost 800 m dwt is of course there to carry-out the seaborne trade, which is 7.3 times higher (in metric tons)! This means that 7300 million metric tons of trade can be carried-out by 1000m dwt of ship space. This is "fleet's productivity" estimated for 2007 (Stopford, 2009). This has been improved over the decades due to various technological advances, like those occurred in the speed of the vessels and in economies of scale. The fleet productivity reduces, if the prevailing distances increase, and the time spent in ports and Canals also increases. We all remember the two Suez Canal closures, and its recent 2 short stops of functioning with the containerships stuck in it.

The supply of ship services is also determined by the global volume of producing ships, and the total time of construction in world shipyards, as well by the finance provided for building ships. The finance is provided by the banks, the shipyards, the governments, and from own past savings, as well from Stock exchanges. Unfortunately, the finance to build ships is cyclical following the shipping cycle.

Finance is the necessary condition in shipping business, but not the sufficient one. A first-comer in shipping industry must have a 40% of the price of the vessel new or used plus working capital for at least the 1st voyage.

An activity on the side of supply is also the **scrapping** of ships, the price of scrap, the demand for scrap, etc. Scrapping is the activity which reduces supply **permanently**. In shipping industry there also cases where supply is **temporarily reduced**. Lay-up is one of them, and the others are the time spent in repairs, modifications, drydocks, storage, slow-steaming and in ports and Canals.

Supply is also blocked temporarily by the duration and the volume of ships already in production, which is distinguished mainly between voyages (spot market) and time charters (long-term). This means that there are times when ships free of charter parties may get the best freight, if demand suddenly increases (the Onassis case).

## 10. Part VIII: The Marshallian Distinction of the Short- and Long- Run Periods

In Figure 6, we presented the interplay of demand and supply in the **short-run**. But what is short-run? Economists introduced it following Marshall (1920). This is one of the other 2, **confusing**, **we believe**, theoretical terms; that of the *long-run* and that of the *ceteris paribus*. "Ceteris paribus" means that all influential factors in a case are not mentioned, but assumed to remain unchanged during the analysis of only 2 of them, which determine a third one!

Apparently, the above is a theoretical construction facilitating the presentation of the economists by *simplifying reality* (reductionism). This is a method of **isolating** two factors in studying the behavior of a third one, depending on them. We believe it would be better for shipowners to **ignore** short-run and **assume to be always in the long-run, but not to be able to build ships…!**

The Short-run is a chronological time period, used in the *production process*, where the quantity of certain factors of production **cannot change**, due to short time. Time? This is in ceteris paribus (Goulielmos, 2018). Basically, and par excellence, the coefficient of production that cannot change for the firm—**except in shipping**—is capital! This way economists introduced the distinction between **fixed** and **variable** factors, and costs.

One important variable factor is labor. Production is also variable, but limited in the short run by the potential of the variable factors/inputs to produce, given their equipment. In shipping, bunkers, maintenance, lubricants, stores, chemicals, provisions, spare parts, paints, water, provisions, etc. are also **variable** factors.

In Table 4, we present what happens in the short- and long-run in the shipping **industry**, which is something **different** of what happens in the shipping **company**!

**Table 4.** Situations where the Shipping Industry and the shipping firm are in the long- or in the short-run.

| Shipping Industry | Run? | Shipping company | Run? | Remarks |
|---|---|---|---|---|
| When a "newly-built ship" is **delivered** to her owners. | Long; an increase in capital & potential production. | When a newly-built ship is **added** to company's fleet. | Long (an increase in capital & in potential production). | A process ranging from 2 to 4 years, depending on he phase of the shipping cycle. |
| When ships are **scrapped**. | Short; permanent reduction in capital. | When firm's ships are **scrapped.** | Short. | A **permanent** reduction in capital. |
| When ships are **lost**. | Short; (permanent reduction in capital). | When a company's ship is **lost.** | Short (a **permanent** reduction in capital). | Due to a marine accident. |
| When ships are **laid-up**. | Short; temporary reduction in capital. | When ships are **laid-up.** | Short (a **temporary** reduction in capital). | |
| When ships are **sold**. | No influence on industry's capital. | When ships are sold. | Short | **Change** in firm's capital |
| When ships are **bought**. | No influence on industry's capital. | When ships are bought. | Short | Company's capital **increases** |
| When ships get larger; a new engine is installed & new gears are fitted. | Short; influence on industry's capital. | When ships get larger; a new engine is installed & new gears are fitted. | Short (permanent increase in capital). | |

**Source:** author.

Marshall defined short-run (Table 5), called it a "short period", "when the stock of appliances of production are practical fixed" (Marshall, 1920). Moreover, "the supply of specialized skill, and the ability of suitable machinery, and of other material capital, and of the appropriate *industrial organization*[21], have no time to be fully adapted to demand" (Marshall, 1920). "In the short run, supply means what can be produced for the price in question, with the existing stock of plant, in a given time" (Marshall, 1920).

Table 5. Cases when shipping production changes with the **same capital** in the short-run.

| | | | |
|---|---|---|---|
| When ships are **slow-steaming.** | Short-run (temporary reduction in production) | When ships are detained, arrested or in piracy. | Short-run (temporary reduction in production) |
| When ships are trapped in **congested ports**, or in not functioning Canals. | Short-run (temporary reduction in production) | When ships are in dry docks or in repairs. | Short-run (temporary reduction in production) |
| When ships **wait** to load or unload, or for tugs, inspectors etc. | Short-run (temporary reduction in production) | | |

**Source:** author.

Marshall recognized, however, (Marshall, 1920) that this term of the short-period, and that of the long one, is a theoretical construction, because he wrote: "Nature has drawn no such lines in the economic conditions of actual life". Consequently, we suggest to the shipping companies to feel as being always in the long-run, but unable to build ships!

## The Comparative-Statics

Given that economists work in the 2 dimensions, they were obliged to put time, and other factors, in the…exile. Fortunately, there is a graphical technique, called "comparative statics[22]", to show the impact of changes in the "anonymous" factors when they change (Figure 11), but also if demand or supply changes.

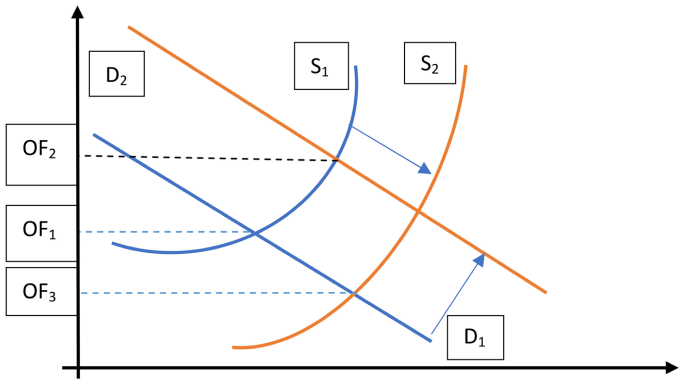



Figure 11. Shifting demand and supply curves in the long-run. **Source**: author.

[21]This is not mentioned by economists.

It is clear that if the demand increases (shifts to D2) in the **short-run**, due e.g., to increased distances, the price will become higher (OF2). Similarly, if supply increases to S2, in the **long-run**, due to oversupply, the price will fall to OF3.

As shown in Figure 11, the long-run is shown by allowing the "short-run" supply curves to **shift-up** or **down**. The time for the demand to shift may be **shorter** than that of the supply[23], but its fall may be unexpected (e.g., the 1975 demand for crude oil; Figure 8), and it may be due to a war, or when distances get longer due to a Canal closure.

## 11. Part IX: The Price and Cost Relationship

Moreover, an essential relationship for shipping industry is between the Cost of the ship and the Price she is paid. Crucial is to remember that the **cost** in **shipping industry** is **more important** than the **price!** Because the price is determined by Supply of the ship space, and the demand for it, as we showed. This means that, in theory, any individual shipping company cannot **influence** the freight rate for its ship, so that to be higher than that determined by the market. Of course, we mentioned cases when this **was not true.**

Always certain principles hold: the Average gross revenue-AGR (net[24] Dwt x freight rate per ton less chartering commission) less the Average Total Cost-ATC = Profit per ton, which must be >0 [1]. The Average Total Cost-ATC must be < than the net dwt x freight rate per ton [2]. This means that the ship will stop supplying her services, if the freight rate to be paid, is so low, that the loss is lower if the ship is laid-up over an equal time of being in the market.

The above further means that the *prevailing* freight rate per ton times the tons allowed by the net dwt of the vessel, must be above the total cost of the vessel, including profit. The freight rate is exogenously determined and the cost must be **adapted** to it. In the short run, a shipping company can operate its ship by covering only her average variable cost-AVC, and thus suffering losses equal to its average fixed cost-AFC. This proves the importance of the fixed cost.

Clever shipping companies should adopt a computerized mechanism, so that vessel's total cost to be adapted to the prevailing freight rate, in a continuous manner, and not only during a shipping crisis, as hitherto! This means that every vessel has a budget, which has to be reduced proportionally as her freight rate is decreasing, and her Captain is also aware of, as well the appropriate office staff. As Drucker said: "by walking inside any company, I manage to reduce its cost by 20%"!

## 12. Paper's Contributions

1) The departure from the classical analysis, in which a shipping firm aims at maximizing profit from its **entire fleet,** over an accounting period of 12 + 3

[22]The term means to set two static pictures in different time each, and compare them.

[23]The supply of ships depends on the productivity of the world shipyards, on the orders placed (demand for ships) by the shipowners, on the availability of finance, on building price, on the capacity utilization of shipyards etc.

months. Profit maximization pursued here **per voyage per vessel**.

2) We believe this paper to be a contribution towards a clearing-up of this confusion! It is remarkable how maritime economists avoided to be clear about **what exactly** market exists in the 2 main shipping markets (dry, liquid).

3) The stress on the fact that a sound knowledge of microeconomics helped, and help, certain players to exploit Capitalism, like the 7 major oil companies, the OPEC+, the Soviets in the past, the liner conferences, etc. Naturally, the thorough knowledge of the relationship between Demand and Supply in forming the freight rate, even in a volatile industry like shipping, is of **prime importance** (Goulielmos, 2022).

4) To assume that a shipping company is **always** in a "quasi"-long-run. This is important as its capital, and capital cost, can change faster than in the shore companies, where production is locked-in fixed buildings and in machinery, and the sacking of thousands of workers, according to law, can take a long time.

5) The flexibility to be always in the long-run, hides a crucial **competitive strategy** (Goulielmos, 2022). This means that the shipping companies can adapt faster to market developments, and exploit capital opportunities, than other shore companies, provided there are **properly** prepared. In shipping, company's capital **can change** fast, in the **short-run**, by buying or selling a used ship!

## 13. Conclusion

The structure of the Perfect competition is a desirable one, but more theoretical than real, which anyway does not hold in the short-run, and in shipping also in the long run (2004-2008), with one exception!

The clever shipowner has to recognize which pre-conditions are in force *in every voyage*, and act accordingly. The number of shipping companies globally are estimated to be 10000, and this is a precondition of perfect competition in Supply. There are, however, small, medium and large shipping companies…and this makes the difference, as the large ones can modify supply!

All commercial firms, and the shipping ones, aim at achieving a **normal profit**, which unfortunately is not clearly defined. This is not always obtained from **all** voyages by all ships in a fleet. According to one opinion, normal profit is the *net profit* that will enable, financially, the vessel to produce the required services, also **tomorrow**. This responsibility clearly rests on the buyer of the services (the Charterers), who manage demand. Demand and supply determine the price.

Perfect or Pure competition provides a number of motives for the enterprises to **survive** and **exist**, but this is not realized fully by the managers! **Depreciation** is a mean for firms to replace their capital—the most essential production input—if they are efficient! Depreciation thus is the "medicine" which "guarantees" an **eternal life** for the efficient firms (in business paradise). Profit is **saved**

[24]The "net dwt" is the weight carried by the ship and paid for only, excluding the amounts of bunkers, water, crew and crew belongings, paints, spare parts, portable machinery, lubricants, chemicals, provisions etc. that are transported free, for the needs of the vessel and her crew. The clever Captain **minimizes** this amount, of several tons, and accepts any extra cargo informing his/her office.

to replace capital goods when they become obsolete by age or demand and when ships are at rock-bottom prices.

However, the Perfect, or pure, competition cannot **protect** firms in the short-run from potential losses, except for the provision to (free) **exit** from the market (shut-out production, or laying-ships-up, at a cost, including fixed one). Apparently, **companies** have to **protect** themselves when market is unable to. The protection means to keep profits aside to change capital in rock-bottom prices. It is wrong to consider a company **successful**, which provides the maximum possible dividends and the lowest possible depreciation of ships!

**Short-run** is the **period** when **fatalities of firms occur!** In the short-run, dominant, is not competition, but the **balance** between **supply** and **demand**. Competition in the **long term only** "guarantees" the cheapest possible production, and allows firms to adapt to demand by organizing their capital to fit the post-short-run situation. Important is that the short-run is different for the individual firm vis-à-vis its industry in shipping! The shipping firm is "always" in the long-run, and must think this way!

The maritime activity is a chain, quite complex, where external factors determine also the whole game, as being an international industry. Such factors are: the Canal closures for years or months, the wars, the embargoes, the port congestions like the Nigeria's port of Lagos in 1975, the Piracy. Important factor is also the ship technology, as well that technology embodied in ports. The proper technology in shipping industry is the one reducing ship's "work" time, increasing the speed of the vessel, including a decreasing and cheaper port stay. The faster[25] ship collects the maximum profit per annum provided there are cargoes to carry in full capacity.

Ships need globalization, meaning to be free to select the flag they want, the cargo, and the sea labor they deem suitable, while matters of safety and of working conditions on board to be determined by international bodies, above the strict interests of ships (IMO, ILO, EU, MOU, MLC etc.).

There are a lot of actions reducing, or increasing, production in the short- or long-run, both for the industry and for the shipping company. The transactions when ships simply change hands (buying and selling ships) **do not interest industry,** but the company! A company can change its capital[26] by selling or buying ships in a time say of 1 - 3 months. This is very important as past mistakes can be corrected and this is an opportunity to increase capital with more efficient ships!

The basic prerequisite to be and stay in the quasi-long-run in shipping, is the maintenance of company's proper liquidity! We saw companies (e.g., Kulukundis Em.) to sell their profitable ships, because they were achieving higher prices, when company had losses, and shareholders could not cover these losses. This is

[25]In maritime business parlance this means: to "minimize the ship time without a profitable employment".

[26]Plants-ships in shipping can be shut down quite fast by laying them up due to losses in the short-run.

a disaster.

Shipowners, it is well recognized that are, and were, unable to **read** the future. Onassis in particular was wrong when he assumed that Suez Canal will be closed for years, upon its 1st closure in end-Oct. 1956! This mistake was committed by almost all ship-owners, and they **caused the long tanker shipping crisis (1958-1966)**, due to oversupply of large, especially, tankers. Clever shipowners always study the seaborne trade per product per route, and read the **predictions** about it, and speculate on the distances involved, as well the situation in the world ports (mainly for congestion).

Certain shipowners adopt a general assumption, like the one of Onassis about oil, meaning that oil will be needed for ever at an increasing pace! Shipowners were, however, unable to foresee wars, embargoes and the resulting shipping crises! Shipowners were also unable to forecast how many ships the other shipowners were about to build! The war between Russia and Ukraine—when finished—will greatly favor shipping industry for the need of reconstruction of an economy with 40 m citizens.

## Conflicts of Interest

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

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