

Is “Microeconomics” too Theoretical so That to Lead Managers, in General and Shipping Managers, in Particular, in Maximizing Company’s Profits?

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Abstract

The models of Perfect & Pure competition, and the growth theory of the firm and part of Managerial Economics are analytically presented. Our effort was to help managers to apply the theory, as well the marginal analysis, in managing an enterprise in general & a shipping company in particular (in the areas of production and/or pricing). We believe that marginal analysis is the proper tool for a manager to arrive at the optimal decisions. The model of competition was the one, however, to create serious economic...fluctuations & cycles! As a result win-win policies were recommended: *perfect timing - economies of scale - economies of low age - free depreciation - administered free entry - adequate liquidity in the short run & a well-managed cost of finance...*! Managers nowadays face complex decision problems, where the last 25 years an increase in competition everywhere witnessed! Managers need applied economics! This meant that Managers should be helped by economists to take only right decisions...

Keywords

The Competitive Industry & Its Main Characteristics, The *Perfect* Competitive Market, The Profit Maximization Objective, The Theory of the Firm & Its Shortcomings, The Shipping Industry & Its Exceptions, The “Managerial Economics” Are More Practical than “Microeconomics”?

1. Introduction

Competition is an ambiguous concept in Economics! In addition, the “theory of

the firm” tried to answer the question of how a firm should behave when one assumes different objectives for managers. The most common objectives of the firm are so far: “profit maximization”, “risk avoidance” & “long-run growth”.

We wondered: did Keynes J. (1883-1946), the great British economist, dealt with competition? Indeed, Keynes J. (1936: p. 245) argued that the “degree of competition” can be given—in his famous book of the “General Theory of employment, interest and money”!

Moreover, Smith A. (1776) (1723-1790), no doubt, on the other hand, & 160 years before Keynes J., relied upon *a system of (free) competition*...self-powered & self-regulated! *The state of the invisible hand!* Why? Because, the first economists believed that Economy—like Nature & the Universe—have laws, designed to function in a perfect way! So, it was recommended: Do not touch!

The first economists as a consequence did not believe in free will¹, embodied in humans, though the present day destruction of the climate is nothing but a sad proof of this! Humans, however, cannot respect any, even perfect, model in theory, which will not serve their *personal interest* as much as possible!

Marshall A. (1920) (1842-1924) e.g. did not consider *competition* as the fundamental characteristic of the modern industrial life of his time—though his society was *more competitive* than the ones before, as he wrote! Competition, for British Marshall was...like racing, where one man competes against the other... and proposed a better term: “economic freedom” (p. 8)!

Modern economists (Bilas, 1967: Chapter 8), however, wrote about *pure competition* as a “highly idealized model” at the one end, & *pure monopoly* model, at the other end. Pure competition e.g. stands if monopolies are absent, and there is frictionless resource mobility & a rather imperfect knowledge. Trademarks & labels are excluded. Firms are price-takers. There is no lack of raw materials, & no influence from trade unions & from patents! The policy of OPEC²⁺ and of BRICS³, e.g. nowadays, surely excludes *pure competition* from the important *gas* and *oil* trades, and not only!

For the interest of consumers, of course, the proper model is that which makes production supplied at low prices, though quality is no where mentioned! Scientific research has, however, shown that *perfect competition* is indeed the best, although rare, model, provided enterprises are satisfied in gaining only normal

¹This addressed by Priesmeyer (1992, pp: 174, 238-239), who recognized it of particular importance, making the future un-set. Managers have a free will so that to decide whether to take an action & what kind of action. Managers have a vision. Firms have structural characteristics so that to perform: the methods of purchasing, producing, marketing, managing, financing, contracting with suppliers & customers, defining a firm & determined by its managers!

²A *fragile* cartel of 11 governments, by 2024, specializing in oil exports (est. 1960): Iran, Iraq, Kuwait, S Arabia, Venezuela, Libya (1962), UAE (1967), Algeria (1969), Nigeria (1971), Equatorial Guinea (2017) and Congo (2018). Certain countries joined & afterwards departed (Qatar, Indonesia, Ecuador, Gabon & Angola). The remaining countries control the price of oil by common agreements through the control of total oil supply! Being governments are wrongly exempted, we believe, from any anti-cartel/antitrust legislation!

³Five countries were the initial members—Brazil, Russia, India, China & S Africa, while 4 joined thereafter—Ethiopia, Iran, Egypt & UAE.

profits! But are they? Unfortunately competition is not the king in the economy, as believed, but “Supply & Demand” is!

2. Aim and Structure of This Work—Paper’s Contribution

The aim is to analyze if the institution of “perfect/pure” competition is a fair model of the most important human markets like the “Sea Transport” e.g., & to propose the necessary modifications to model’s unfair consequences, which we have noticed in our empirical research.

We start by accepting the fact that all human economic institutions need improvement! Why? Because humans study carefully the economic theory, and then try to exploit it for their personal interest! The invisible hand of Adam Smith becomes very visible all the time since his epoch (1723)!

This work is cast in 7 parts, after literature review: Part I dealt with the theoretical *preconditions so that to “have” Competitive Firms/Industries*; Part II presented the “Perfect” competitive Market. Part III dealt with “Managerial Economics”; Part IV dealt with the question: *Can indeed Managers maximize Profits in practice?* Part V dealt with the mathematics involved: a clear language; Part VI dealt with the “Growth of the Firm theory”; Part VII dealt with the main shortcomings of the current theory of the enterprise; finally, we concluded.

The paper tried to contribute in 5 areas—all belonging to Microeconomics: 1) to question the utility of the distinction of the short & long run—in force since [Marshall \(1920\)](#)—and which, no doubt, has much confused all managers and par excellence the shipping ones! 2) To question the idea that enterprises should have a free entry into the market, when abnormal profits are realized (examined here in the context of shipping industry in 2002-2008)! 3) To add to the requirements of a perfect competitive market the condition that the “size of any investment” of a firm to be such as not to influence total Supply! 4) To “liberate” capital depreciation from its mandatory nature, imposed by the accountants, which “sends” into bankruptcy a number of shipping companies, which otherwise could survive! 5) To suggest as crucial that the short run liquidity to be secured at all costs by shipping firms.

3. Literature Review

[Marshall Al. \(1920: p. 314\)](#) introduced the concepts of short and long run, but he tried to diminish their implications as the distinction he understood it to be *artificial*, and not one met in real economy! [Keynes J. \(1936: p. 292\)](#) made the important remark that prices are determined by demand & supply, but when economists introduce money, prices were also determined, this time, by 5 other (monetary) factors!

[Due & Clower \(1961\)](#), describing also our opinion, argued that the institution, which *is expected* to prevent the exploitation of certain groups in the economy by others, is...*competition!* Competition being a “struggle”, however, of various individuals—*against one another—so that* to increase their *own economic well-*

being (bolds etc. added). Competition thus introduced *individualism*, as central feature in economic societies, & the *personal interest*, as the prime motive of the economic system!

Marris R. (1966) argued that once we suggest that management has a marginal product⁴, we come-up against certain econometric contradictions (p. 88). Kalecki (1939) argued that there are 2 sets of factors by which prices are determined: supply and demand; costs & profits!

Samuelson P. (1965), argued (pp. 88-89) that an enterprise trying to **maximize** profits, in pure (or impure) competition, and at *equilibrium*, has to produce (with a factor combination) so that its total Cost to be at a minimum. Productivity, at the margin, & in \$ terms, must be the same in all uses within the company, & equal to the prices of inputs, in proportion to company's Marginal Cost (MC). Production must be such as to maximize Net Revenue, meaning that MC = Marginal Revenue-MR, and the "marginal value productivity" of each input has to be equal to its price (MR x marginal physical productivity). This means TC (total cost) < TR (total revenue) if a company wishes to stay in business! By assuming free entry, and given that TR = TC, the product of the enterprise is exhausted (sold-out), and the demand curve touches the (unit) cost curve → at a minimum AC (in pure competition) (Figure 1). Free entry for Samuelson P. (1965: p. 87) exists only in real life, and has not to be imposed, a priori, by theory!

In *shipping* economics, the substantial capital required to build or buy a vessel, increasing as time went-by, makes free entry extremely difficult⁵. Moreover, large residual/resale values exist, (2nd hand values or scrap values), & thus the net revenue has at least to be as large as the sale value (or liquidation value), because this is clearly a source of potential profit.

From our experience from being in charge of the shipping finance department of American Express in Piraeus, the banks, which contribute to the majority (40%-60%) of the ship purchase/building prices, will be not willing to help a new starter thus newcomers need adequate funds to be available, and rather rich and willing shareholders!

The same as the above argument of Kalecki (1939), also advanced by Hicks (1976) (1904-1989). Robinson J (1977) (1903-1983) argued that microeconomics have to deal with the formulation of *relative prices*, the *behavior of the individuals* and of *firms & households*, where the cyclical fluctuations etc. are formulated in the greater economy (i.e. in macroeconomics). Macroeconomics, however, presuppose microeconomics, meaning the consistency that has to exist between the two! She also argued that the free entry, and its consequences, are not logical!

Robinson J and Eatwell J (1974: p. 235) argued further that the *traditional* theory is summed up in the proposition that firms *seek to maximize profits*. Robinson J (1977) argued, moreover, that "the dogma that firms *maximize their profits*

⁴The "marginal product of management" is the amount by which total production is profitably, & normally, increased when an additional person of management is hired by the company...

⁵Greek ship-owners from Greek islands lacking, at their early decades, the proper capital, they used to buy mainly 2nd hand ships of a rather advanced age, mobilizing many individual savings (say 100).

does not hold, when one looks in history”, especially in the long run history!

Varian (1990: pp. 315-318) and Pashigian (1995: p. 255) provided full analysis of the concepts of short and long run. In our opinion, however, this distinction, i.e. the short and long run, is better to be bypassed by the managers! In shipping e.g., the long run holds when ships (new or second hand) can be purchased or added to the fleet.

Of course the above 2 decisions, (to add ships to the fleet), have different short and long runs! A new vessel can be built in 1 - 2 years on average, while a 2nd hand one can be obtained within 3 months say, on average, depending on the state of the market! Thus shipping is in 2 runs at the same time! However, whether in the short run, or in the long one, *we suggest the decisions to be such that economies of scale and economies of low age as well perfect timing to be achieved!*

Besanko et al. (2017) focused on the *key economic concepts* for a manager to develop a sound *business strategy*. They tried to use advanced economic concepts applicable to *practical problems, which* face business managers nowadays! Did they understand, as we did, the limited help of “microeconomics” to managers?

A strategy e.g., has to take 4 serious prior decisions: 1) what tasks the firm has to pursue?—What size is proper for the firm to have? 2) What is the kind of market the firm will get-in & what “kind” of competition prevails there? 3) If the firm has to compete, what are company’s competitive advantages? 4) How to pre-organize company’s internal structure, systems, organizing, computers/digitalization, etc., before starting production, as well how to set up company’s external status in sales & distribution channels, advertising & promotion, etc.?

Concluding this part, we saw that almost all famous, and non-famous, economists, adopted the idea that enterprises, in a competitive market, organize production with “profit maximizing target” in mind, and thus they have to be aware of the mathematics involved using “*marginal analysis*” (Part V)! *Economics, before “Marginal Revolution”, seem to have felt as an inferior science, vis-à-vis Physics, as being non-mathematical! Mathematics, however, must describe reality as Marshall has argued and not to believe that what is expressed mathematically is also real!*

Great economists, like the 1970 Nobel winner in economics, and a neoclassical economist, Samuelson P (1915-2009), wrote a book, titled “foundations of economic analysis”, that most economists could not understand (in 1947)! This made him to write-next year-another-book much more readable (?), i.e. Samuelson, P.A. (1948), but the understanding did not improve⁷, showing that great minds cannot write in a simple manner! This 2nd book established itself, however, as the most preferred economic textbook worldwide with multiple publications (over 14 in 1948-1992)!

⁶In a 2012-13 dictionary of economics we counted about 30 terms using the word Marginal!

⁷It has been translated in 40 languages!

Marshall by inheriting to us the distinction of the short and long run, indented, we believe, to make clear that in the economy, certain decisions need time to be accomplished, while others can be fast...Time this way was part of the economic decisions (Goulielmos, 2018), though economists have placed it out, making also another curious assumption: the “ceteris paribus”! This last term is found in economists’ magic hat, we believe, putting into there all existing animals, but getting out only a rabbit (the price)!

Moreover, the free entry dogma of perfect competition is not as automatic as theory supposed, and thus competition for this reason cannot be an ideal model, because prices can be at times very high or very low, and for as much as 7 continuous years (as in shipping in 2002-2008; **Figure 3**)! The model of competition should better be called a “Supply and Demand” model, as this is what it is!

Let us see what are the particular preconditions required by the theory to have one or more competitive industries?

4. Part I: The Theoretical Preconditions to “Have” Competitive Industries

A *competitive industry* has to trade with a very large number of small buyers & sellers—independent one from the other—& where no one can—significantly, influence price”. Economists believe that there are 2 *extreme* forms, A to Z, within which all other types of markets can be accommodated (Besanko et al., 2017: p. 163). At A, is “Perfect competition” & at Z, is “Monopoly”, & then oligopoly & monopolistic competition are in between. Of course the effort of the enterprises is to avoid perfect, or even pure, competition, in our opinion, where profits are only normal (normal profits < super-normal profits)!

Economic science ought apparently to explain: 1) how many large sellers/buyers have to be out there? 2) How small have the small sellers/buyers to be? 3) What the “no *significant* influence on price” means? 4) What the independence among sellers & buyers means⁸?

In economic history of shipping, (Couper, 1999: p. 37; Stopford, 2009), a Japanese company owning only tankers, the “Sanko”, facing the 1st oil, 1979, crisis, decided to order, in 1983, a quite substantial number of dry cargo ships, (125 handy-sized ships, estimated to amount to 3.8m⁹ dwt). The company wanted to compensate the tanker losses *from the expected dry cargo profits!* But the already very low competitive market of the dry cargoes, as a result, collapsed further due to the big size of the Japanese investment!

Sanko assumed that a shipping cycle lasts 4 years with a symmetrical depression of 2 years and a symmetrical boom also of 2 years; perhaps this occurred in the

⁸We are aware about agreements among sellers to charge specific uniform prices, or to withhold supply, so that prices to be increased (see OPEC+) (& Saudi Arabia influence).

⁹To this substantial order one has to add and the orders of the Greeks and Norwegians, who became aware of Sanko’s order, assuming there to be some kind of secret known only by the Japanese! Maritime reality, however, has shown that depressions are much longer than booms, amounting to 4+ years on average.

past. According to its calculations, which proved *this time* to be wrong, when the company would have to employ the dry cargo ships, (in 1985), market was expected by the company to be at its high, but it was in its all times low!

The graphical picture of a “pure competitive industry” is as follows (Figure 1).

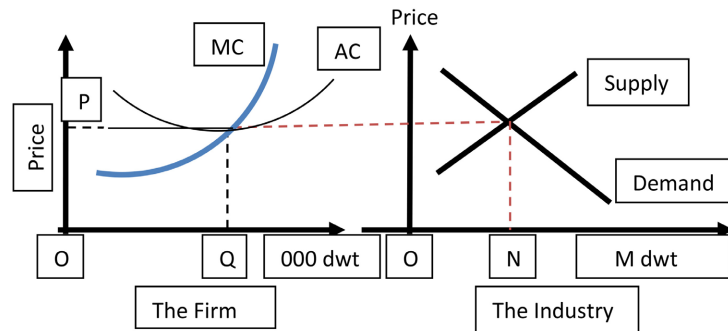


Figure 1. The firm & its competitive industry, at equilibrium. Source: author.

As shown, on the left hand side, there is one small firm, where its OQ production (000's dwt), at equilibrium, is only a small part of the ON production (million dwt) of the industry (right). The enterprise has to accept the uniform price for its services, OP, determined by supply & demand, & which is *given*.

Since the products/services are identical among firms & to the degree that this is true, the single firm cannot charge a higher price than OP, without causing the loss of its sales to its competitors! Similarly, there is no point to charge a lower price... It can be further argued that the firm is at *equilibrium*, if MC (marginal cost) = AC (average cost) = MR (marginal revenue) = Price = AR (average revenue), because it is there where the firm maximizes its (normal) profits! How?

As shown in Figure 2, the firm produces where the difference between its total cost, (which at the beginning is rising, & then falling, and then rising again) & its straight line total revenue, which is the result of OQ times the given OP (determined by supply & demand), is greater. At Q, the MR & the MC are equal, because the tangents to the lines at Q, (shown only one), are parallel, & the difference between the 2 lines is nowhere else *greater!*

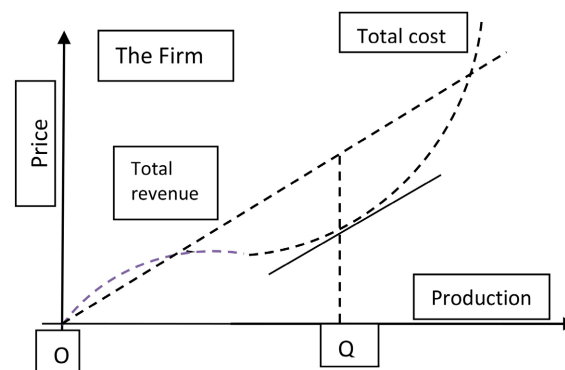


Figure 2. Maximizing firm's normal profit by a single competitive firm. Source: author.

The secret of competition, or advantage, is, therefore, that “if a company wishes to maximize its normal profits, the only way to do that is to lower eventually its total cost from that high starting one, towards reaching Q”! Competition pushes price down so that to touch marginal cost (=AC). Thus the difference between MC and Price (Price - MC) is zero in pure/perfect competition!

Of course there is a clear & serious social disadvantage in the above kind of market: the free and unlimited variation in the level of price up and down! The level of the Price here has no limit either up or down, but it depends every time on Supply & Demand (Figure 3)!

Moreover, all shipping firms, or all vessels—even of the same size—cannot have the same level of costs—as it is assumed by theory. Thus in practice there is an anomaly, where a firm is allowed to produce at the higher cost of the entire group, if “demand” requires its quantity, & thus the more efficient firms will gain a premium in the short run!

Taking an important actual example from Maritime markets, which are considered, to a certain degree, to be purely competitive, we see (Figure 3).

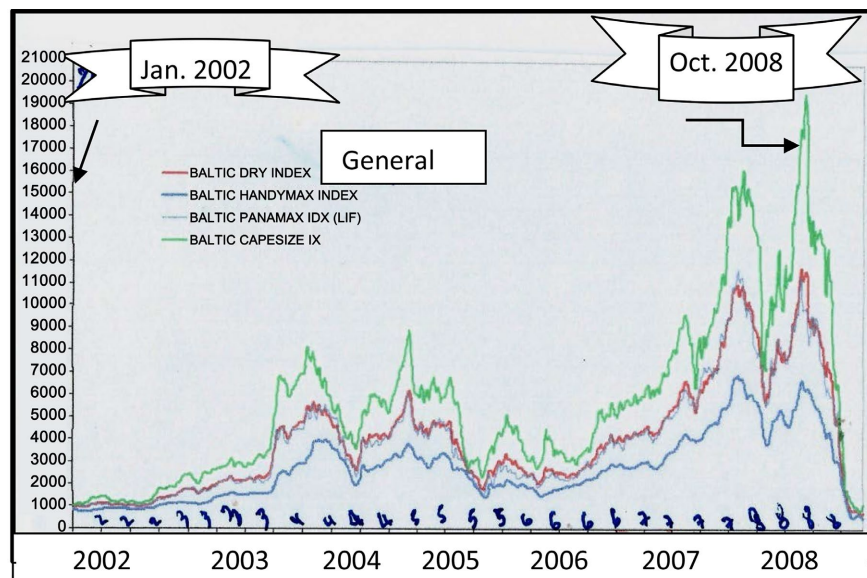


Figure 3. Four quarter freight rate indices, 2002 = 1000, (2002-2008). Source: Baltic.

As shown, the 4 basic indices of freight rates, from 1000 units in 2002, Jan., increased to 19,000 units in Oct. 2008! This, 19 times increase during seven years, characterized indeed one of the *purely competitive markets* (Sea Transport of dry cargoes)!

This competitive market as a result we do not believe to have treated the buyers of the sea services in a fair way, or even the consumers of the transported products, in case where transport cost is a substantial part of the CIF price...! Perhaps also oil has found itself in the same position as dry cargoes in 2002-2008, due to the “Israel-Palestine” war in 2003-4...

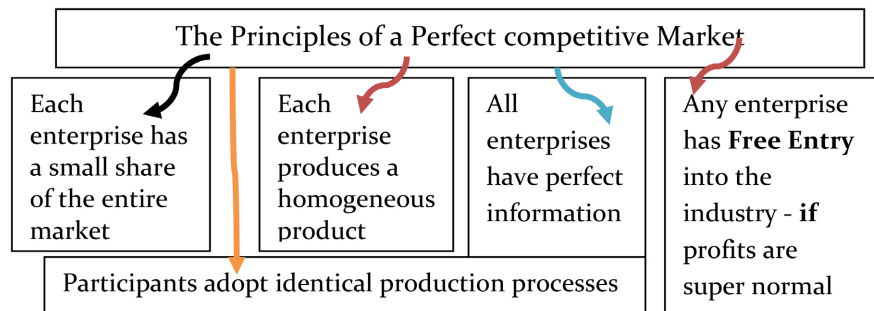
One there is no need to be economist to understand that, at times, the competitive

maritime markets turned into a monopoly...! The above mechanism is clearly a loss of valuable resources! This is why we suggested the modification of the free entry practice into the market so that it to become fairer and work under a “state license” (meaning an Administrative control)!

Concluding this part, the theory recognized a competitive industry as the one consisting of “many” small & independent firms, which equalize their additional cost, of an extra unit of product/service (MC), of an identical one, to the price determined by Supply & Demand (MR). This way they *maximize* their (normal) profit, till Price changes due to the entry, or exit, of certain firms from the industry in the long run.

5. Part II: The “Perfect” Competitive Market

Economics have eventually defined a type of competition, the “perfect” one, as follows (**Graph 1**). But its perfection, we noticed, depends on the managers trying to earn company’s normal profits!



Graph 1. The principles of a perfect competitive market. Source: data from Pearce (1992).

This type of market is identified in certain USA markets, (e.g. the Chicago Wheat Market), & elsewhere, in large commodity markets/trade exchanges! As shown, for one market to be competitive, “perfectly”, needs 5 very important preconditions. Certain of them, like e.g., having “perfect information” over one’s competitors, or to apply “identical production processes”, are hard to find in real life, we believe. Important, however, is the pre-condition that the product/service has to be *homogenous!* *This we consider to be the all times key characteristic!*

Thus market’s perfection *in practice* cannot be fully met, & the companies in order to comply with something “equivalent or near” as the above (**Graph 1**)—they apply the so called “business intelligence” (Robbins & Coulter, 2018).

The Latest Technology?

Moreover, certain companies prefer to follow the *latest* technology in their production line, which makes them more competitive, we believe, except for shipping!

The latest technology in shipping is quite expensive & does not help in the intra-

firm competition—clever ship owners buy ships 5 years of age, or even 10, instead of newly built ones! This e.g. 5 year ship used to cost ~\$15m in 2002, while the near newly built cost ~\$19m—(using the regression line in **Figure 4**).

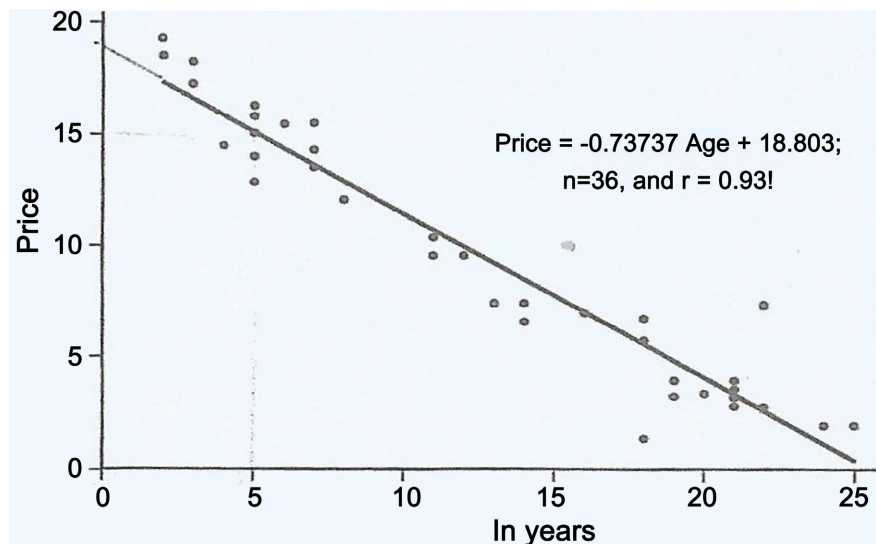


Figure 4. The price of a Panamax bulk carrier sold in 2002 (modified from that in [Stopford, 2009: p. 239](#)) using a Regression Line (thee ship to be scrapped at 25 years of age).

Managing a ship 5 years old, one has saved 4m, taking also into account that 2002 was a rock bottom year (**Figure 3**) as far as freight rates are concerned! These 2nd hand ships are also readily, or shortly, available and for this having an advantage (a prompt delivery premium) important in good markets. The regression shows also her residual value of \$370,000, but the market has paid as much as 2m for scrap.

This regression tool, we reckon, is quite useful as we may use it also for predictions. Every company is recommended to plot regression lines in all basic variables, and especially in 2nd hand prices of ships, to help managers in their decision-making. The results are more reliable if $r \rightarrow 1$ and... $n \rightarrow \infty$!

We understand, however, that for a company to start to produce for an “over-excess demanded” service—having also to be itself small—needs time! This is another discount to the degree of “perfection”, concerning the time/speed needed for a reaction! Shipping markets e.g., required 6 years to “absorb” their “monopoly” profits₂₀₀₂₋₂₀₀₈ (**Figure 3**)!

But are, at the least, the “normal” profits defined? No. We believe that the concept of the “*super-normal*”, or *monopoly*, profits, have also to be defined! Thus market’s perfection in practice is further reduced for a lack of 2 clear definitions!

Worth noting is that, as it has been observed, not only by us—companies grow from year to year & thus the degree of competition reduces! One has to take into account that small companies *become medium* & medium companies *become large*, & large companies *become larger*!

Thus, the degree of competition has to be considered as something variable

in one & the same market over time! We saw, almost all, shipping companies, e.g. to increase their size in dwt/number of ships from year to year in a rather continuous manner! The only mechanism to stop their growth is a depression/recession.

Concluding this part, we saw that perfect competition is an ideal, than a real, model, because, of, & in particular, for the requirements to have perfect information and identical production processes, which are indeed 2 unrealistic assumptions! In shipping companies try to know what the other companies pay for salaries e.g. to its departmental managers, the cost of feeding the crew etc., so that to be more competitive, as shipping is a cost-based industry and not a revenue-based one!

6. Part III: Managerial Economics versus Micro-Economics

The impressive emergence of “Managerial Economics”, we believe, means that... its brother “Microeconomics” was too theoretical to help managers in their (economic) management! It is rather true that Economists proved unable to help *effectively* and *efficiently* the international managers.

Samuelson et al. (2022: pp. 20-86) argued that the firm can predict the revenue & the cost consequences of its price & output decisions...with a certainty, within the requirements of the *profit maximizing simple model (competition)*! *We believe that this is not possible for shipping at least, which moreover is unpredictable!*

It is true, we believe, that if you ask a manager what is company’s marginal cost, he/she most probably will fail to answer..., though marginal cost has a simple definition: “MC is the amount by which firm’s total cost increases, when an extra unit is produced”.

Competition obviously requires somehow for the consumers to have the relevant information (press; TV; sites etc.?). Managerial economics noticed that though marginal cost is hard to be understood, or even it is un-known, by the managers, average cost is not...! Average cost is the outcome of dividing total cost by the units produced, or the ton-miles covered, in a year, or the total cost run *per day per vessel*! In addition, the average cost is equal to marginal cost at equilibrium! Thus average cost reveals to managers firm’s marginal cost!

In shipping, companies pay much effort to budget accurately at the end of each year, and for the next one, the non-voyage costs of every vessel they own/manage (i.e. the so called “running costs”)! The voyage costs cannot be pre-known till a charter party is signed. Clever shipping companies are organized so that to know beforehand the *profit* or *loss* to be expected from a voyage, & thus to accept or not an employment/charter party (the so called “estimated voyage results”)!

Obviously shipping companies have nothing to maximize (!), but only to choose the more promising undertaking, (the more profitable or less bad voyage), given prevailing freight rates! Moreover, the even cleverer shipping companies compare the results calculated with the results achieved to find-out where & why company’s

calculations failed to copy reality!

We must warn the reader, however, that a shipping company is not a single firm, but a multi-company (vessel) firm, as every ship...is indeed a company, & the majority of shipping companies nowadays have more than one vessel! So, shipping companies are nowadays a set of vessels and their total profit is the sum of negative, positive & neutral results achieved by every and each vessel!

A shipping company's sales department is chartering, where the brokers of every vessel, (brokers of the ship-owner), try to fix the most profitable charter in co-operation/negotiation with other brokers, (brokers of those having the cargo). What economic *principles have to be followed here?* First, each vessel has to maximize her production of ton miles—given demand & her capacity utilization—per year, meaning as many profitable voyages as possible, minimizing the unpaid time (the off-hire time)!

Managerial shipping economics suggest here that the variable inputs' (bunkers, lubricants, port and agent costs, stores, maintenance, loading/unloading costs, including & all other voyage costs not mentioned) marginal cost has to be equal to input's marginal revenue product (MRP). Another basic principle, on which managers may count, *ceteris paribus*, is the empirical law of demand: "the higher the unit price of a good/service, the fewer the number of units demanded by users (consumers), & as a result sold by the firm".

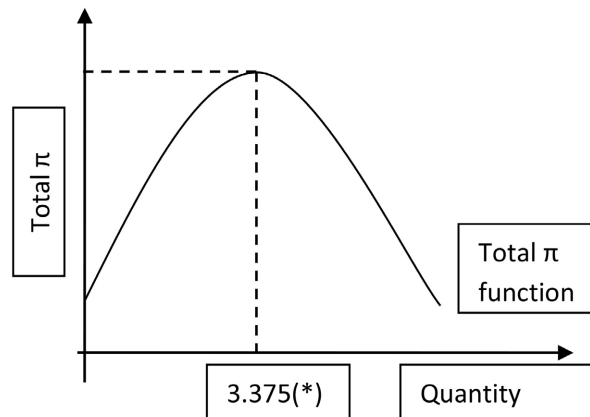
Shipping companies surely have the option to have a vessel laid-up so that to minimize her cost, when she has to accept unprofitable employment for a foreseeable future. Also they have the option to sell the unprofitable vessel, usually in the long run, or even to scrap her! Shipping companies, however, subsidize the unprofitable vessels by the profits of the profitable ones, especially if unprofitable ships may cause anxieties in company's banks...in case were laid-up.

Another managerial economic suggestion is that the marginal product_{t_{input}} over cost_{t_{input}} across the company has to be equal. Moreover, marginal products have to be equal among vessels so that to maximize their production. Finally, profits are maximized, if the marginal profit_{t_{input}}, per unit of each input, is equal among all vessels.

The "marginal profit" now—is a new concept from managerial shipping economics—which can be defined as the change in total profits resulting from an extra voyage or mathematically: $M\pi = d\pi/dQ = (\pi_1 - \pi_0)/(Q_1 - Q_0)$ (1), where $M\pi$ stands for marginal profit, π for total profits, Q for production & d the symbol of differentiation. This concept is used when the manager has to find-out what amount of ton-miles maximizes company's profits! First, we have to take into account the profit function $\pi = \text{Revenue less Costs}$ or $\pi = R - C$ (2) (**Graph 2**).

Let us take a mathematical example of the marginal profit. Let $\pi = -150 + 135Q - 20Q^2$ (3) and $M\pi = d\pi/dq = 135 - 40Q$ (4) and for a maximum $M\pi = 0^{10}$ and $Q = 135 - 40Q = 0$ (5) and $Q = 3.375$ (6).

¹⁰This requirement is not always applicable!



Graph 2. The profit function. Source: author. (*) optimal output/optimal ton miles.

Concluding this part, we saw that managerial economics have shown to managers the way to determine their marginal cost, at equilibrium, as well suggested to use the tool of marginal profit! Shipping companies, however, are not in a position to pre-estimate their *revenue* unlike its total and average cost. As a result tools based on revenue & profits are not applicable...in shipping managerial economics, unless the employment of ships is in time charters¹¹, where the hire of the ship is fixed (if there is no hire escalation clause).

7. Part IV: How Managers Maximize Company's Profits?

It is accepted in theory that any manager can change the level of his company's costs, & its production, so that to look forward in maximizing company's profits (Henderson & Quandt, 1958: p.53), given demand. The way the principle of *competition* is stated, apparently, means that the "*profit maximization*" by firms is a target! The distinction of short & long run has to be taken only as meaning that the major changes in firms need time to be accomplished!

Firms, however, have a continuous life till they abandon the market, & their decision-making is also a continuous process having to obey the rule: "*the total cost of any decision must be always less than its total revenue*"! Of course, the short run is not the same as the long run, because, in the short run any company cannot change, but only its labor force, and other inputs like energy etc.

The capital (machinery; plant; Ships—if a shipping company) cannot be increased or diminished in a time of say less than 3 months! Companies have to cover the cost of obsolescence & that for repairs and for their planned or unplanned maintenance as well other costs due to the voyages undertaken. The repair cost moreover e.g. is affected by the state of the market in shipping!

All economists start with the model of perfect competition (Martin, 2010: p. 17), though they admit it to be not so common in real life! The term implies... rivalry, no doubt, between entrepreneurs, as mentioned! Our time, however, is

¹¹The ship in a time charter is known as being in a fixed hire and thus her "price" is expressed in \$ per day in a fixed manner.

one indeed of abundant electronic information, provided one avoids fake news & faulty prices etc. Another benefit of perfect competition is that firms cannot earn super normal profits, but only in the short run, as it is assumed that profits, above normal, act as a magnet for new firms to be attracted, provided the free entry is...free¹². This of course is the main shortcoming of the model, as a short run may last 7 years (**Figure 3**)!

As one may understand, perfect competition is the model of normal profits, whether defined or not! Thus any firm wishing to earn more than normal profits it has to avoid competition & its pre-conditions!

The firms are today indeed very well educated in microeconomics, & during recent decades also in finance, as the cost of finance became substantial, & especially in shipping, where a vessel (gas carrier) can cost \$200m!

It is thus apparent if a firm can produce, (or modify an existing product or service), a non-homogeneous product/service, it has done the first step to raise its price, “introducing” its product into the differentiated ones! This can easily be done by advertising & other marketing tools.

Strangely, the term “homogeneous” is not an economic, but a psychological, or even, a marketing one! Take e.g. a beer that uses exclusively the waters of the passing-by river! Is this beer like all the others? Surely not! So, it is entitled to a higher price...

In managing ships, since 1993 (R A741 (18)), (modified several times in 2000-2013, last being in force since 2015), IMO (the international maritime organization) published a standard, called “international safety management code” (ISM Code¹³), mandatory for almost all shipping companies since 1998 (01/07/1998), the application of which is checked by national sea authorities (the port state controls). This is one legal effort to commit the management in the endeavor of the safety of the ship, the cargo and the crew as well to avoid sea pollution!

Given this code, though obligatory, shipping companies *tried, through promotion, to “differentiate”, by arguing that their services are the only safe*, but they failed to gain an extra dollar from the charterers! Charterers argued that they do not have to pay for something that it is a clear obligation of the shipping companies!

Surely the ISM Code increased the budget of the shipping companies & all stopped then to hold Captains responsible for the responsibilities of their management (controlling the resources), when Captains have applied the code at the best of their ability!

Concluding this part, we saw that competition requires companies to *maximize normal profits in the short run*, where their whole destiny is in the hands of Supply and Demand! Companies’ efforts to present their sea transport services as the only safe, & gain an extra dollar or an extra charter party, failed, though the “Port State

¹²This has to be verified by the conditions prevailing in each industry.

¹³The 11th of September created also another international code, the ISPS one, (Goulielmos & Anastakos, 2005) following the destruction of the twin NY towers. People started to look after safety of ships and ports and cruises since then.

Controls” indicates every year what flag complies better to Code’s requirements (Paris memorandum of understanding—PMU)!

8. Part V: Mathematics, a Clearer Language

Mathematical economists (Jacques, 2018) start first with the demand function, & this is indeed the right procedure: let demand function be: $Q = 30 - P$ [1], where P is the market price, and let Q be the total production. A total cost function can also be: $TC = 1/2 Q^2 + 6Q + 7$ [2].

What is then the level of production that maximizes profits?

First we need, obviously, the profit function: $Pr = TR - TC$ [3] (where TR = total revenue and TC = total cost). Let TR be $30Q - Q^2$ [4] from (1) multiplied by Q . So, $Pr = -3/2 Q^2 + 24Q - 7$ [5]. To get the maximum profit, we have to: $dPr/dQ = 0$ and so $Q = 8$. Next we have to proceed to a 2nd differentiation. So, $Pr = -3/2 (8)^2 + 24 (8) - 7 = 89$ [6].

It holds that the price of labor (wage) etc. should be equal to the value of its marginal product. It can be also shown that at the point where MC (marginal cost) = MR (marginal revenue) profits are there only maximized (Figure 2). The profit maximization in the long run is of course different from that in the short run, because all inputs—contributing to production—can change, & the ships e.g. that have delivered losses the whole previous year, should perhaps be sold or scrapped... The value of the marginal product of each, & of all inputs must be equal to their cost: $PMP_{1,2,3} (x_1^*, x_2^*) = w_1, w_2, w_3$, & so on [7].

We arrived now to our most interesting part which is to criticize the existing theory & propose alternatives in the hope to enable companies’ managers to think, & decide, efficiently & effectively!

9. Part VI: The Main Shortcomings of the Current Theory of the Enterprise

The distinction between short and long run, we asked already shipping managers to ignore it. A company must be first in the short run in order to be also in the long run! Decisions of today may have future implications, sometimes very serious, & thus managers must consider in advance the repercussions of even under the most extreme scenarios!

Also, the managers when buy ships, or order them, they are not sure for their actual performance—apart from the market conditions which are unpredictable—till the ships are employed, especially for the second hand ones! The inspection that company’s engineers may carry out on the 2nd hand ships to be purchased, does not guarantee the ship’s commercial success, but only her superficial, technical, ability. This is a rather trial & error situation!

Further, depreciation has to be free in our opinion. Depreciation is a requirement of the capitalistic system, (a corporate saving), for the companies to achieve profits, & place them aside, so that to be able to replace its worn-out capital (machinery-plant). This obviously is against shareholders’ interests! Depreciation is

the elixir of capitalism, however, defective. It works for the next generation at the expense of the present one requiring profits—at any rate!

For a shipping company—with substantial profit fluctuations—a steady depreciation is rather dangerous. Thus, depreciation must be analogous to the freight market (Goulielmos, 2021a) and to follow a strategy encouraging primarily the liquidity of the company, especially during low markets.

In low markets one must remember that neither the banks, nor shareholders, will provide the required funds to rescue the company from low revenues! Naturally, the depreciation of the newly-built vessels may be substantial—managers thus must be careful!

In addition, the “free entry” market practice in an industry—which has provided profits above normal—is responsible for eliminating certain of the existing companies in the short run! Though some may find this sound for competition, we reckon that these eliminated companies could survive in the long run, if “allowed”! Thus managers have to be aware of this important possibility & behave in such a way so that to have it!

Concluding this part, we may say that short-run is the most crucial period, because if a company can pass it profitably, it can also be in the long-run! Moreover, depreciation of capital goods obliged companies to...bankrupt, & here is our suggestion to managers to depreciate in proportion of company’s freight rates.

In addition, companies are recommended not to rely heavily, or at all, on the assumption that free-entry is there next day, as it may require 7 years to appear! Finally, companies have better to estimate the impact of their orders—and those of their competitors—on total Supply to avoid surprises!

10. Part VII: The Growth of the Firm—the Theory

Penrose E.T. (1959) at the time of stock exchanges, argued that corporate managers have the discretion to choose objectives, & pursue a time path for their firms so that the firms to grow (Figure 5).

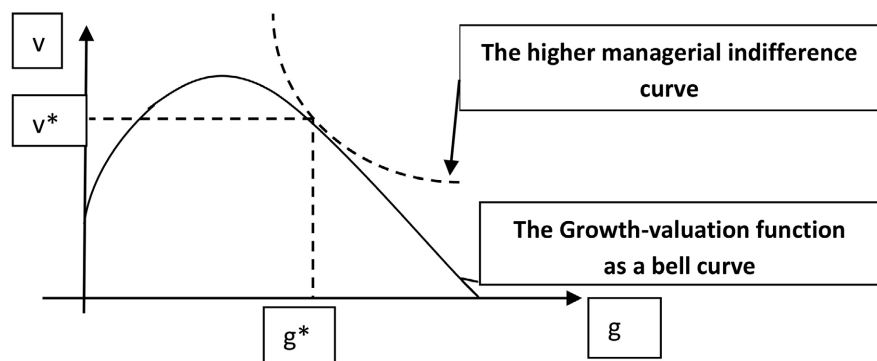


Figure 5. The bell curve. Source: author.

There are out there (Goulielmos, 2021b, 2021c, the Onassis cases) managers’ *instincts of power* to be satisfied, *dominance & prestige*, while the motives like

security & professional excellence, induce managers to achieve firm's *valuation ratio*¹⁴, v , in a stock exchange!

The “managerial utility function” is to be maximized by firms, not normal profits, but subject to $v \geq I$ during their growth (g). The I is a constraint imposed by capital markets (*where mergers & takeovers can take place!*). The optimum is then achieved at $g^* v^*$ (Figure 5); v can also be negative vis-à-vis g , beyond some level of g .

The above model (Figure 5) has not so wide application to Greek shipping as only 35 or so companies, out of 1300 or so, are listed (Goulielmos, 2021d). For Greeks, ship management is a way of life rather than a profession, & also a personal endeavor & one-man show! In stock exchanges there is the risk to “loose” management together with the shares of the company, as the above model has clearly assumed!

The growth of a competitive firm can be carried-out, if capital can be increased, or, in shipping, more ships to be obtained (new or used). This is what economists mean when they talk about investment. Existing ships can also be made larger by increasing their medium section!

Of course one is interested to know if the increasing size of firm's capital will bring a lower cost, or what is known as the case of “increasing returns to scale”, or mathematically: $f(tx_1, tx_2) > tf(x_1, x_2)$ [8] for all $t > 1$.

In shipping the above is quite easy if management chooses to buy, or build, ships, larger than the ones to be sold! So, managers must seek for economies of size (or scale). There are also two further principles: “economies of low age” & “economies derived from a shipping cycle!”

The economies of size or scale (Goulielmos, 2021e) are well understood by the shipping managers, provided the larger sizes are supported by current or future demand. Even Onassis, an un-educated in maritime economics, person, applied this principle.

The economies of *low age* are also self-understood if the lower age vessel has a lower cost than the older one *of about the same size...* However, good principles as the above, being win-win, cannot make a manager successful if applied in the wrong time... This means that the shipping cycle is a blessing than a curse, allowing a perfect timing to be applied each time by those who know (Goulielmos, 2021f).

Concluding this part, we saw that economists tried to model the growth of the listed firm, threatened to be taken-over or be merged, at the time of the stock exchanges! The theory assumed that the normal profit maximizing objective is not unique, or even present, for the listed enterprises...

11. Conclusion

We have to inform the reader that this section contains only the conclusions

¹⁴This is the stock market valuation of the firm, v , to the book value of assets, K . Or $v/K = (1 - r)p/i - g$, where p is the profit rate, r the retention rate (determined by the retained profits out of the net profits) & i the discount rate.

which have not appeared at the end of each of the parts preceded.

Economics as a science created when humans realized that they have quite a number of needs, but limited resources (means)! First, humans studied the Universe & Nature, & were impressed by their perfect operation, working with effective laws, in an impressive free manner! This led Marshall (1920) to talk about the “economic freedom model”, meaning competition!

Certain economists remarked, however, that unlike the Universe & Nature, humans have a free will! What a free will means? It means that profits will be pursued by human enterprises to a maximum possible extend! Economists then created a model where profits pursued by the enterprises had to be as normal as possible, & named it “Perfect” or “Pure”! This model was hoping for the price to be equal to Marginal cost & allow for a normal profit only! Their hopes, however, are at times not realized & profits are below Marginal cost, & at other times hopes are over-realized, & profits are super in the short run!

Thus the competitive model allows for economic fluctuations & cycles & enterprises have to be prepared to face such a reality by win-win policies as recommended in this paper: *perfect timing - economies of scale - economies of low age - free depreciation - controlled free entry - adequate liquidity in the short run & controlled cost of finance!*

Conflicts of Interest

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

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