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# Full Cost, Profit and Competition

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## **Abstract**

During the marginalist controversy, full costers failed to convince economists of the superiority of full cost pricing over marginal theory of imperfect competition. The controversy was closed prematurely; various contributions published immediately thereafter in the fifties did not renew the debate despite their relevance. Topics included entry prevention, target rate of profit and the emergence of the market price

The present paper shows that the full cost pricing is not so justified by the need for a rule of thumb than as a rational behaviour aiming at long term profit maximisation, especially in the case of highly competitive markets with few suppliers. The paper focuses also on the relationship between full cost pricing and changes in demand (mostly cyclical). It is also shown that the race for performance deserves a central position in the analysis of competition; it is too often neglected in favour of the sole competition on margins.

JEL classification: D21, D40, D49

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## 1- The marginalist controversy

The marginalist theory of producer's equilibrium is the result of a development that culminates in the impressive work of Joan Robinson "Theory of imperfect competition", published in 1933. It claims that in perfect competition as in monopoly or in oligopoly, the firm will choose to produce the quantity that equates marginal revenue<sup>1</sup> with marginal cost, because that is the way to profit maximisation.

Less than ten years later, this theory will be openly challenged by the economists of the Oxford Economists Research Group (OERG), who confront it with the practice of entrepreneurs consulted during interviews. The main contributions are:

- The article by Hall and Hitch, "Price Theory and Business Behaviour", published in 1939, which is the starting point of controversy.
- Andrews's book, "Manufacturing Business" published in 1949.
- Harrod's essay "The Theory of Imperfect Competition Revisited", published in 1952 but prefigured by an article dating from 1939.

Revelation is that the perception of entrepreneurs absolutely does not match the marginalist analysis. Without going into the details of the argument, or in peripheral ideas and disregarding nuances among stakeholders, we can summarise the essence of criticism by these leading ideas:

- Entrepreneurs ignore the elasticity of their demand, do not know their marginal revenue and marginal cost curves and are not concerned about equalising these two variables.
- Instead of that, they apply a rule of thumb. Price is based on the "full cost". There are two variants: following Hall and Hitch, it results from the addition of three terms: direct cost, indirect cost and profit margin. According to Andrews, who calls it "normal cost", it results of multiplying the direct cost by a factor, which implicitly determines a margin to cover overhead and profit.
- Full cost pricing (FCP) results in some price stability; entrepreneurs are reluctant to change the price as often as maximising short-term profit would require.
- Companies are not trying to maximise profit in the short term but in the long term; so they avoid such pricing that would generate a rate of profit high enough to attract new firms in their market, which would result in a future decline of their individual demand.
- The price being set at full cost, producers will try to sell a production as wide as what the market can absorb, an amount in excess of that which normally equates marginal cost with marginal revenue. The equalisation of these two variables is therefore disqualified.

In his essay, Harrod mentions three reasons for firms to prefer full cost pricing to the marginalist rule:

- Not tempting candidates for entering the market.
- Avoid overinvestment<sup>2</sup> : why bother investing in a capacity when the optimisation rule commands to use it only partially? Harrod strongly fights what he calls "The doctrine of excess capacity."

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<sup>1</sup> In perfect competition, marginal revenue equals price.

<sup>2</sup> In imperfect competition, the tangency between the decreasing demand and the average cost happens normally at the left of minimum average cost.

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- Take out insurance against uncertainty: selling the maximum means occupying the market. Is there a better advertising for a firm than seeing its products widespread in society <sup>1</sup> ? The enterprise is consolidating its chances of future survival.

Proponents of marginalism reply. Thereof follows a debate known as the "marginalist controversy" or the "full cost of controversy." The main contributions to the defence of marginalism are:

- Machlup's article, "Marginal Analysis and Empirical Research", published in 1946.
- The review of Andrews' book by Austin Robinson in 1949.
- The lecture of Heflebower at the "Business Concentration and Price Policy" conference in 1952.

Argumentation follows three main axes:

1. Discrediting the work of rebel economists; these would have a caricatural or oversimplified understanding of the marginalist theory, they accept uncritically the responses from entrepreneurs. According to Machlup, entrepreneurs apply unconsciously marginalist precepts. The fact that the language of entrepreneurs does not match the economists' one proves nothing; it is normal that economists reason at a higher level of abstraction.
2. Arguing about specific points. So, A. Robinson noted two inconsistencies in the book of Andrews:
  - Andrews regularly invokes competition, more intense than is generally admitted- he said-, but he denies the profit maximisation which drives it.
  - The full cost is presented as an alternative to the influence of demand on price, but the vagueness concerning the determination of the profit margin calls it implicitly in the game again.
3. Considering the full cost as soluble in the theory of imperfect competition. Providing some precautions, the profit margin it includes is then assimilated to the difference between price and marginal cost, difference which standard theory of imperfect competition derives from the demand elasticity.

Experts generally consider the Heflebower response as bringing the controversy to its end. It asserts the third line of defence with force and it seems to have convinced the vast majority of neoclassical economists, who turned the page over. We can therefore speak of a victory of marginalism. More recent commentators write in these terms <sup>2</sup> :  
 "By and large, FCP was "marginalized" in both senses of the word" (Mongin, 1992).  
 "The controversy over the normal-cost prices doctrine came to an end with its absorption into the theory of imperfect competition" (Lee, 1992).

In my view, the marginalist victory was due, not to the weakness of the ideas expressed by the full costers, but to shortcomings in their presentation. As often happens during a contest, the ideas have poured first and their ordering did not follow, giving an impression of immaturity. Some ideas have also created a "wrong track" effect; this is the case for the "kinked demand" and for the questioning of profit maximisation. Moreover, the term "oligopoly" comes incessantly in the debate, but as

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<sup>1</sup> Edwards sums it up by the aphorism "Goodwill snowballs" (1955)

<sup>2</sup> Acknowledgement of this victory does not necessarily mean that these authors consider it as theoretically justified.

I will show later, this term is ambiguous and that ambiguity is at the heart of the present issue.

Finally, supreme gap, the explanation of the profit margin is barely sketched, which is unforgivable in the eyes of a profession accustomed to formulas and mathematical proofs. This gap opens up an avenue for those who want to assimilate the mark up of full cost with the one of imperfect competition given by the formula of Joan Robinson:

$$p = \bar{c} \frac{\varepsilon}{(\varepsilon-1)} \quad (1)$$

where  $p$  is the equilibrium price,  $\bar{c}$  is the marginal cost and  $\varepsilon$  is the elasticity of demand.

The page has probably been turned over too quickly and maybe not innocently. When the spotlights on the controversy went off, the closely following years saw the theory of full cost get enriched seriously. The main contributors are Edwards, Bain, Lanzillotti and mostly Sylos-Labini.

Since the sixties, few new arguments have been added to the theory. Instead, the studies adopt the point of view of the historian who tries to understand this episode of economics. Also should be mentioned numerous empirical studies that generally confirm the empirical findings of the OERG<sup>1</sup>, namely the wide use of full cost. Let us also mention two contributions of Baumol not adopting the thesis of full cost but attacking the orthodox theory on parallel trails:

- The proposition that oligopolistic firms maximise, not their profit but their sales subject to a minimum profit constraint.
- The theory of contestable markets telling that when entry and exit of firms in a market are perfectly free and costless, the market assumes the properties of perfect competition, even if it is oligopolistic.

## 2- The theory of full cost improves

As noted above, the mid to late fifties see various contributions complete the full cost theory and fill some gaps of its first generation. Improvement takes three directions:

1. Models of entry prevention.
2. The target return on investment.
3. The switch from the full cost of the individual firm to the market price.

Discreetly, the concepts of full cost have been refined and it is now possible to build an alternative to marginalism which is perfectly credible. To be sure, there is still some way to go. Various clarifications are still desirable. The opinions of full costers are not always consistent, which, at this stage, is fortunate, because unanimity may cause sterility.

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<sup>1</sup> The reader will find more precisions in Nubbemeyer (2010) and Lucas (2003).

## 2.1- ENTRY PREVENTION

Of the three themes, this is the one which has raised the most abundant literature. Following Harrod who initiated the topic, the price must be set so that no profit is generated; otherwise the profit would be wiped out by the arrival of new competitors. The price so established thus equals the cost of production because it cannot include profit. This view is not unanimous. "Much of Andrews's writings suggests, however, that some premium in the form of a profit margin in excess of normal profits (...) can be secured where entry is not easy" (Bhagwati, 1970, p. 302). This idea will be developed by Bain and Sylos-Labini in several books and articles and by Modigliani (1958) who will formalise their approach. Bhagwati (1970) provides an excellent overview of this debate.

The central concept in this context is what Modigliani called "entry preventing price" and Bain "limit price": this is the highest price that the incumbents think they may ask without causing the arrival of competitors.

Modigliani's model defends ardently the existence of the said premium and analyses mathematically the factors that influence it. It is based on two pillars:

1. As oligopoly suppliers are not negligible elements on their market, the arrival of a new firm will reduce the market price; it is this reduced price which must allow the newcomer to achieve profitability, a condition that he should normally have expected. Understanding this game therefore gives incumbents a safety margin.
2. The basic assumption of Modigliani's model is what he calls the "Sylos postulate." Sylos-Labini, analysing the entry of new firms, considers that incumbents do not change their production and comply with the price reductions resulting from the enlargement of supply<sup>1</sup>.

Modigliani comes to the following formula which gives an approximation (i.e. the maximum) of the entry preventing price ( $P_0$ ):

$$P_0 \approx P_c \left( 1 + \frac{1}{\epsilon S} \right) \quad (2)$$

$P_0$  is:

- higher when the average cost curve is steeper;
- lower when the market size ( $S$ ) is larger<sup>2</sup>;
- lower when the elasticity of demand ( $\epsilon$ ) is higher around the competitive price ( $P_c$ ), which corresponds to the minimum average cost.

Bhagwati reckons that the premium as shown in the SBM model (Sylos-Bain-Modigliani) is overestimated. On the one hand, the existence of this premium makes entry more attractive and thus stimulates attempts, which has the effect of reducing the premium. The risk of failure will be more readily accepted if the potential benefit is greater. On the other hand, this model assumes too confidently that existing firms will survive first. The investors often see initial losses as inherent in the investment. As entrants are often multiproduct firms active on adjacent markets, they usually have

<sup>1</sup> He explains this behaviour by the will to dissuade entrants and the fear of a rise in unit cost due to the falling of production.

<sup>2</sup>  $S$  is the ratio of the quantity taken by the whole market at price  $P_c$  on the output minimizing the average cost of the firm.

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reserves which allow bearing these losses. Bhagwati also mentions the case where market demand is growing as being favourable to the premium reduction.

Sylos-Labini and Modigliani find it natural to assign the new comers almost no part of the existing demand. Edwards ventures the following rationalisation: goodwill ties customers to their usual supplier, especially in the area of capital goods. However, he admits that if the incoming lets those customers discover they were "exploited" before his arrival, he would easily take up most part of the demand.

Edwards notes that in addition to profit, inefficiency among incumbents is also an incentive to entry. If the entrant is more efficient, its success is assured.

## **2.2- TARGET RATE OF PROFIT**

In 1958, Lanzillotti revives the investigative technique of interviewing entrepreneurs about their practice. The purpose of the article "Pricing Objectives in Large Companies" is to remedy the "inadequate state of knowledge of the price-making process" (1958, p. 921). Twenty companies were surveyed among the 200 largest American industrial companies, who faced a variety of competitive environments. The questions were designed to identify the objective that guides pricing but also to understand procedures.

The most frequently cited goals are:

1. Pricing to achieve a target return on investment.
2. Stabilisation of price and margin.
3. Pricing to realise a target market share.
4. Pricing to meet or prevent competition.

Target rate of profit comes first. A common strategy is to tolerate fluctuations in profit rate from year to year, at the condition that the goal should be achieved over a longer period. Price calculation is based on a standard activity level, to prevent that fluctuations in the real rate of activity unduly affect the price.

Lanzillotti assimilates the second goal to "cost-plus" methods which include the full cost pricing. He believes that the distinction between the first two goals is difficult to define and concludes: "Cost-plus, therefore, may be viewed as one step on a road to return-on-investment as a guide" (1958, p932).

Lanzillotti also believes that "target-return pricing implies a policy of stable or rigid pricing, even though exceptions are found within particular product lines" (1958, p 940).

Sylos-Labini, on his side, has presented the formula for determining the profit margin and price. He gave several versions and kept improving it after the publication of his famous book "Oligopoly and Technical Progress." Such as it appears in the article « La théorie des prix en régime d'oligopole et la théorie du développement » published in 1971, it clearly fits the target rate of profit:

$$p = v + \frac{k}{x_n} + r \frac{K}{x_n} \quad (3)^1$$

$p$  is the price,  $v$  is the variable unit cost,  $k$  is the total fixed cost,  $x_n$  is the annual production,  $r$  is the target profit rate and  $K$  is the capital. As Lanzillotti, Sylos believes that « les grandes entreprises qui jouent le rôle de ‘price leaders’, ont l’intention de réaliser un taux de profit non dans chaque année isolée mais sur une série d’un certain nombre d’années<sup>2</sup> » (1971, p 250).

According to Sylos, the target rate of profit is somehow « le taux permis par les barrières de protection dont jouit l’entreprise. Et puisque celles-ci sont différentes entre les divers marchés et même à l’intérieur de chaque marché, les taux de profit pris comme objectif seront différents<sup>3</sup> » (1971, p. 256).

### 2.3- THE MARKET PRICE

Each company calculates its own full cost to determine the price it will quote. But if buyers are rational, there can be only one market price. How will this be established?

Traditionally, full costers use the concept of "price leadership" to solve this problem. Andrews, followed by Sylos-Labini, sets the paradigm as follows: the firm with the highest output size has a lower production cost, which makes it the price leader, because inevitably it will attempt to impose a price based on that cost.

In an article titled "Price Competitive Leadership: a Critique of Price Leadership Models" published in 1957, Lanzillotti shows the shortcomings of traditional models of price leadership and attempts to promote a new conception.

In these models, roles are codified and the price leader is clearly identified: he rings the bell and the followers automatically apply the rises and falls in prices which he decides. Lanzillotti criticises these models for their static nature. Dynamic forces at the source of these behaviours are ignored. “Moreover, the models appear to be based largely on highly institutionalised structures wherein interfirm price relationships are essentially settled, under which circumstances price leadership emerges as a type of collusion with the ringleader clearly identifiable” (1957 p55). According to Lanzillotti, markets in the real economy are rather characterised by instability; weakness of traditional models to account for the working of these markets is obvious. They are relevant only for a very particular type of case.

Lanzillotti proposes a new model he calls "Competitive Price Leadership" (CPL), because “the prices set are those which materialise from the operation of competitive

<sup>1</sup> In fact, Sylos is more interested in the dynamics of price fluctuations than in the statics of price formation. To him, equation (3) aims at allowing an oligopoly industry to go through cost variations without falling in a price war. According to Sylos, demand fluctuations produce output adaptation and cost fluctuations generate price adaptation. This last one tends to be softened; on the long run, the target return will nonetheless obtain because the factors of production prices are thought to fluctuate cyclically.

<sup>2</sup> The large firms which act as price leaders intend to get a profit rate, not in each isolated year but on a series of a certain number of years.

<sup>3</sup> the rate allowed by the barriers protecting the enterprise. And as these vary from market to market and even inside each market, the profit rates aimed at will be different.



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forces" (1957, p 55). This contrasts with the collusive behaviour in previous models. He enumerates the characteristics of these markets. We miss the place to list them here, but I can sum them up in a few words: a real competition, but with a limited number of firms.

"Competitive Price Leadership" is the title of the paper written by Ante Farm (2014) where he ventures on the path traced by Lanzillotti. He analyses the process of price formation in the market that he so summarises: "In this model, the market price goes down if and only if a price cut appears profitable for a firm even if its competitors follow suit, while the market price goes up if and only if a higher market price is profitable for every firm. Thus, the market price is determined by the lowest market price preferred by a firm..." (2014, p.1).

The "collusive price leader" attempts to maximise the benefit of the industry, the "competitive price leader" is guided by maximising its own profit. The competitive price leader is simply defined as the firm which prefers the lowest price. "If there are many such firms, the choice of a price leader among these is immaterial and may be expected to vary randomly or depend on which firm is assumed to have the best information on market conditions" (2014, p10).

In Farm's model, businesses watch the prices of their competitors to imitate or to counter them. Such a practice would be blameworthy in the case of tenders, but it is perfectly legitimate when prices are set without negotiation by the seller, as is the case of consumer goods, to which Farm limits its analysis.

My opinion is that what Lanzillotti and Farm describe is simply competition as it works, not in economic literature but in the real world. The attribution of the label "price leadership" seems to me unnecessary and even confusing. Cases certainly exist where suppliers are split between a leader who has the initiative and followers, but the economic literature seems to see price leadership wherever there is oligopoly. Notwithstanding this observation, the Lanzillotti-Farm model is a remarkable achievement.

Farm's rule was applied implicitly by Sylos-Labini some decades sooner (1962, pp 41-50). I say "implicitly" because Sylos' model works with specific hypotheses: there operates on the market, three groups of businesses- small, medium and large- with unit costs decreasing in that order. The question is to determine towards which price and which distribution of firms among the three groups we are moving, given the total demand of the initial situation and the different cost structures. Of course, the big companies have the privilege to set the price and thus to determine, according to their benefit, which categories of firms will survive at their side. The issue of competitors elimination combines with entry prevention. Sylos' conclusion reads as follows: "the price tends to settle at a level immediately above the entry preventing price of the least efficient firms which it is to the advantage of the largest and most efficient firms to let live" (1962, 50).

### 3- Full Cost, competition and oligopoly

To which market structure is full cost pricing dedicated at? Economists do not seem unanimous. Before answering this question, I will take a step back and identify the market structures, because the theory on the subject seems to me incomplete.

#### 3.1- CRITERIA

The first task is to highlight the criteria underlying market structures. I distinguish five of them. To facilitate the presentation, the following tables affect a formal notation to each criterion and to their possible values .

##### *Number of suppliers (Ns)*

1	1 supplier
n	> 1 but not sufficient to prevent individual influence on the price
$\infty$	sufficient to prevent individual influence on the price

##### *Market access (A)*

F	Free and absence of handicap for entrants
B	Existence of economic or intentional barriers

##### *Collusion (C)*

C1	Culture of the competition
C2	Cartel or implicit agreement

##### *Number of demanders (Nd)*

1	1 demander
n	> 1 but not sufficient to prevent individual influence on the price
$\infty$	sufficient to prevent individual influence on the price

##### *Differentiation of products (D)*

D1	homogeneity
D2	heterogeneity

Usually, applications of criterion A and of criterion C are converging. The existence of a cartel is often accompanied by entry barriers. But there are exceptions in both directions: a cartel may be unable to filter the entries despite his attempts. More often, the absence of collusion does not preclude the existence of barriers of economic nature, such as the need to master complex technologies or the level of investment necessary to enter the market.

### 3.2- TYPOLOGY OF MARKETS

Combining these criteria, we can establish a typology. The full combination of all these criterion values results in 72 kinds of markets. In reality, they are less numerous because some associations are inconsistent.

In fact, market structures subject to the attention of economists are not numerous. The table below shows the main ones:

*Table 1*

Market type	Ns	A	C	Nd	D
Perfect competition	$\infty$	F	C1	$\infty$	D1
Monopoly	1	B	n.a.	I	n.a.
Imperfect competition	>1	I	I	>1	I
Monopolistic competition	>1	F	C1	>1	D2
Oligopoly	n	I	I	>1	I

I = indifferent

n.a. = not applicable

When a market structure is indifferent (I) regarding one or more criteria, it may be considered as a gathering of some subordinate forms. For example, imperfect competition includes monopolistic competition and oligopoly.

Table 1 lists the typology I would call "mainstream." A hierarchy of criteria is implicitly underlying any typology. Mainstream hierarchy of criteria gives the prime role to Ns and particularly the distinction between  $Ns = n$  and  $Ns = \infty$ . Since Chamberlin, criterion D has gained some recognition, but at a lower level. Criteria A and C are considered secondary.

I would view favourably a reversal of the mainstream hierarchy (except for the distinction between  $Ns = 1$  and  $Ns > 1$ , which remains essential). It is tailored to highlight perfect competition. This market structure captures a major part of the attention of economists. Of course, they admit that the criteria combination in the first row of Table 1 is uncommon in the real world. But as its name suggests, perfect competition is erected in a theoretical perfection which the competitive sector of the economy is supposed to approach. As such, it is a sublimated representation; otherwise the effort of analysis that is devoted to it would be disproportionate.

However, situations are known where thousands of bakers apply prices recommended by their professional association and sell their bread at a higher price than supermarkets, which are fewer but engaged in fierce competition. The criterion Ns seems overvalued.

Is perfect competition really a simplified and sublimated representation of a vast reality? Some of its properties make it doubtful. For example, the long-term equilibrium of the producer makes him work at his optimum size; in consequence, an increase in market demand can only be met by a change in the number of firms. Is this, even if simplified, a representation of real economy?

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In my opinion, perfect competition is representative of a very specific markets type: organised markets, such as those of some raw materials. Other situations deviate. Ideally, the term "perfect competition" should even be replaced by that of "organised markets". In fact, what is "perfect" in this market structure is not the competitive combativeness of protagonists but its adaptation to the needs of economic modelling.

### 3.3- A HOLE IN THE CLASSIFICATION?

Organised markets and monopoly are defined by relatively clear boundaries and are relatively consistent sets. Between these two extremes lies imperfect competition, especially oligopoly if product differentiation is disregarded. Is his intermediate structure also a coherent whole? Table 1 above considered criteria *A* and *C* as irrelevant in the definition of oligopoly. Does it not offend common sense that so important factors as freedom of access or the practice of collusion are not discriminating?

Let's take the oligopoly row in Table 1; if we assign the value *F* to Criterion *A* and the value *C1* to criterion *C*, a subset is defined which admittedly is radically competitive. In contrast, the remaining part of the oligopoly set is only weakly competitive. The border between the competitive camp and the non-competitive camp crosses oligopoly. Accordingly, logic commands to divide this block. Such a split must resonate up to the terminology. The bringing to light of a competitive oligopoly is all the more necessary when we limit the sphere of perfect competition to organised markets.

In the already mentioned essay, Harrod regrets that the horizontality of individual demand curve is established as the supreme criterion to determine the types of markets and that, therefore, all markets with a downward curve are classified together in the non-competing sphere. About terminology, he writes: "We lack a vocabulary that is both well established and appropriate" (1952, p.171). Above, I put facing each other the competition camp and the non-competition camp. The first one includes perfect competition and a part of oligopoly; the second one includes monopoly and the other part of oligopoly. Speaking of the first of these two camps, Harrod proposes the following terminology:

"Free competition" is an expression often used in popular literature, and it might be convenient to adapt this for technical purposes. It would be natural to use it for all cases where there is unrestricted (or relatively unrestricted) entry, and these would be divided into those of free competition with a perfect market and those of free competition with an imperfect market (downward-sloping short-period particular demand curve (1952, p.179).

"Free competition with imperfect market" is his proposal to designate the firmly competitive subset of oligopoly. Of the four basic market structures to be considered after breaking the oligopoly block, this one – I think- is the most widespread in real economy. Competition is the norm in our economic system and organised markets are in minority. This structure deserves thus better than such a convoluted name while others have simple and direct labels. In the rest of this article, I call it "oligopolistic competition".

As a corollary, we have also defined another structure: the non-competitive oligopoly, which I will call "monopolistic oligopoly."

Oligopolistic competition is defined as follows:

**Table 2**

<b>Criterion</b>	<b>Value</b>
Ns	n
A	F
C	C1
Nd	>1
D	I

In the economic reality, collusion and barriers to entry are often a matter of degree. Many markets lie probably very close to the boundary between monopolistic oligopoly and oligopolistic competition. Yet important parts of the real economy are currently closer to oligopolistic competition, due to some recent developments:

- World globalisation of trade has brought down many national monopolies.
- The high turnover of managers and executives (sometimes even between competitors) leads them to accept more easily the risks of competition.
- Antitrust legislation becomes stronger; consumer unions are watchful, and so are the media. Collusion has bad reputation.

Temptation of collusion certainly still exists. Here comes criterion *Ns*. His influence is indirect, because a system of collusion is more difficult to build when suppliers are numerous.

### **3.4- WHICH IS THE PREDILECTION AREA OF FULL COST PRICING?**

Probably neither organised markets nor monopoly. The remaining candidates are monopolistic oligopoly (MO) and oligopolistic competition (OC). As economists generally do not distinguish between these two structures, it is difficult to find the answer to our question in the economic literature. Here are response elements found among some economists:

Hall & Hitch	MO+OC	"Most businesses take into account in their pricing the probable reaction of competitors and potential competitors to their prices. Where this element of oligopoly is present and in many cases where it is absent, there is a strong tendency among businesses to fix prices at a level which they regard as their full cost" (1939, p. 33).
Andrews	OC	He insists strongly on competition and repeats that it is usually more widespread and fiercer than supposed by the economists.
Harrod	OC	Entry prevention is the ground of his argumentation and it is more representative of OC than of MO.

Sylos-Labini	MO	He devotes the whole introductory chapter of “Oligopoly and Technical Progress” to industrial concentration, responsible for a weakening of price competition.
Lanzillotti	OC	The description he gives of competitive price leadership is very close to our definition of OC (1957, pp55-56).

The rationality of full cost pricing in the case of oligopolistic competition was proved by full costers and the following sections of the present paper will argue further in this direction. I therefore consider it is its favourite field. The case of monopolistic oligopoly, meanwhile, can be understood in two ways:

1. Either, we consider that full cost pricing is not characteristic of it and that the behaviour of suppliers is correctly described by the theory of imperfect competition,
2. or we adopt Sylos' view, that the presence of barriers to entry affects the full cost only in such a way that the target rate of profit exceeds the normal rate.

Let us go back to the rationality of full cost pricing in oligopolistic competition. To give up short-term profit, the entrepreneur must obviously find a compensating benefit. This advantage is triple:

1. Securing its market: avoiding the risk of shrinkage due to new entrants. In Harrod's words, firms make themselves *vulnerable* by asking a price higher than full cost.
2. Reducing uncertainty. Harrod speaks of an "insurance against future uncertainties". He explains: "...present sales improve future prospects and have their own importance on this account" (1952, p.174). We also find this argument in Andrews (1949, p.92). Let us illustrate this with an example: if during my travels, I see many Volkswagen, I'll think about this brand when I shall have to buy a car. Occupation of the market is an efficient and free advertising.
3. Avoiding waste of overcapacity. The arrival of new firms attracted by profit reduces the particular demand of the firm; hence the equilibrium output falls below capacity level. Harrod shows that full cost pricing avoids this waste.

The question must be asked if the fear of outlet shrinking refers only to a danger coming from potential entrants or if a scenario à la Bertrand, a price war between incumbents, induces the same behaviour. The argument mentioned above, which explains the sacrifice of profit as a response to uncertainty, keeps its relevance when incumbents act behind a closed door. Occupying the market remains an advantage. Not to maximise production reinforces the risk of being left behind by competitors. The outdistanced firm, lacking recognition and economies of scale, can be eliminated from the market. In balanced duopoly, it is unlikely that a firm can increase production quickly enough to satisfy all the customers of its rival and grab them. However, with, say, ten firms, it only takes each to increase moderately its production to have one of them, less dynamic, become superfluous. Internal competition is added to the external threat to persuade enterprises to exploit their full demand. There is a further reason: companies are not necessarily satisfied with their market share. Economic theory considers them as mere numbers devoid of past (and age) and of own objectives.

However, their market shares result of their history and provide contrasted gratifications. Dissatisfaction of some suffices firms is all it takes to prevent market supply following a quiet path.

## 4- Framework, definitions, assumptions

In the fifth and sixth sections, I will present my version of the full cost pricing in oligopolistic competition. Beforehand, it is necessary to clarify the definition of certain concepts and to expose the assumptions I rely on.

### 4.1- FORMS OF COMPETITION

What is the object or what are the objects of competition? According to Chamberlin, firms handle three parameters to get a place on the market:

- price,
- product quality,
- marketing spending.

It has become common to oppose "price competition" and "nonprice competition", the latter including the last two categories of Chamberlin.

When firms compete on price, the adjustment variable can be either cost or profit margin. In the real economy, costs cutting is omnipresent. Yet most models of price competition give prominence to profit margin adjustment. Among the first ones to be open to other forms of competition, Chamberlin is however unable to distinguish between these two types of adjustments and to grant costs competition its rightful place.

I would classify the forms of competition according to their object as follows:

object		price effect		nature	
profit margin	<b>M</b>	price direct	PD	strategy	St
cost	<b>C</b>	price indirect	PI	performance	Pe
quality	<b>Q</b>	non price	NP	performance	Pe
image	<b>I</b>	non price	NP	performance	Pe

In fact, there is an important difference between *M* competition and all others. Competitions *C*, *Q* and *I* consist in a race to performance. Firms try to be more productive than competitors, to offer better products or to create brand preference. By contrast, we cannot say that enterprises pursue the objective of better pricing. *M* competition planes prices and profit margins to a level to be explained by economic models. It has a standardising effect. On the contrary, *C*, *Q*, *I* competitions offer businesses the opportunity to shine. In my opinion, the essential distinction is the one which opposes *St* vs *Pe* competitions. The hegemony of *M* competition in the economic literature is paradoxical regarding the importance of various forms of *Pe* competition in the real economy.

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## 4.2- COST CURVES

Microeconomic theory attributes to average and marginal cost curves the famous U-shape. Regarding the long run cost, Wicksell initiated the notion that the growing firm meets economies of scale at smaller sizes than diseconomies (1934, p.129). The "U" provides the advantage of easy tangency with a straight line.

Marginalist theory assigns the same U-shape to short-term cost curves. It is generally admitted that this form originates from the productivity of the variable factor that is first increasing and then decreasing. Another perspective is the one of Viner who draws the average variable cost curve entirely increasing; it is then the addition of this growing curve with the hyperbole of the average fixed cost that produces the U-shape.

However, the reign of the U curve is not undisputed. The first criticisms happened during the marginalism debate, but other criticisms followed. Here are some examples:

**Andrews** criticises the thesis of the increasing ineffectiveness of management. He sees the unit cost constant or slightly decreasing.

**Harrod**: "it is quite possible that, even if there is an eventual upward slope, the long period curve has a flat bottom for a considerable range of outputs" (1952, p.180).

**Eiteman** having surveyed entrepreneurs on their perception of this curve, notes the pre-eminence of the downward curve along its entire length.

**Heflebower**: "... the conclusion seems clear that there is a substantial volume range within which marginal costs, particularly as viewed by managements, are approximately constant, given constant factors prices" (1955, p.372).

**Stigler** notes that the U curve has a corollary: if the output of an industry grows, this will happen due to the increased number of firms rather than to the increase in their individual production, because individual output is restricted by the existence of an optimum size. However, his empirical research shows that industry expansion is usually performed through the rise of individual productions.

**Simon**: "...for the observed data make it exceedingly doubtful that the cost curves are in fact generally U-shaped" (1978, p.348).

**Baumol**: "Rather, these investigators tell us, the AC curve of reality has a flat bottom..." (1982, p.9).

**Nubbemeyer** reports a study of **Blinder** et al. (1998): "In an extensive questionnaire on pricing behaviour, they found that only 11 per cent of firms report that their marginal cost curves are rising. In contrast, 40 per cent stated that they are facing falling marginal costs, and for 48.4 per cent marginal costs were constant" (2010 p. 57).

It can be observed that the arguments are empirical rather than theoretical. It could be deplored that these authors do not generally specify whether they consider the short term or the long term cost curve. Anyway, it seems easy to explain theoretically the horizontal and the decreasing shapes for both.

The charts presented in this paper therefore contain no U-shaped cost curve; all will be designed horizontal.



### 4.3- DEFINITIONS AND NOTATION

The developments contained in sections 5 and 6 that follow, will operate on the usual categories of microeconomics: total revenue, average revenue, marginal revenue, total cost, average cost, marginal cost and profit. However, I find it necessary to make further distinctions about profit and cost:

- **Normal profit** is the annual return on capital that produces no incentive for the capitalist and the entrepreneur to invest or to disinvest. It includes a risk premium that varies from one enterprise to another. The ratio of normal profit on capital represents the rate of return expected by financial markets.
- **Gross profit** is the total annual profit earned by the company.
- **Net profit** is gross profit from which the normal profit is deducted.
- **Normal profit margin** ( $\pi_m$ ), **gross profit margin** ( $\pi_g$ ) and **net profit margin** ( $\pi_n$ ) are the margins included in price, to secure corresponding profit.
- **Gross cost** ( $C_g$ ) is the sum of all costing elements of the firm.
- **Net cost** ( $C_n$ ) is gross cost minus normal profit margin.

Our notation mentions in this order:

- dimension: total (T), average (A) or marginal (M)
- category:  $C_g$ ,  $C_n$ ,  $\pi_g$ ,  $\pi_n$ , R (revenue) ...
- subscript st or lt to specify *short term* or *long term*, if necessary.

For example,  $AC_{g_{lt}}$  is the average long-term gross cost.

### 4.4- ASSUMPTIONS

- H1: We are in oligopolistic competition. Accordingly, the criteria characterising the market have the values in Table 2 above.
- H2: Firms have no individual influence on the price of the factors they buy on the markets
- H3: The objective of the firm is profit maximisation; profit opportunities will never be neglected for non-rational reasons.
- H4: Firms are subject to risk aversion.
- H5: Available information, both technical and commercial, is important. Firms use it intensely and even conduct surveys to enlarge it (in the limits of an acceptable cost); they competently form their expectations and estimates.
- H6: Consumers are rational. They pay more, only for superior utility.

Heterodox economists, group to which full costers belong, usually attack the dogma of perfect rationality and that of perfect information. In neoclassical economics, perfect rationality goes with profit maximisation. This assumption is challenged by the Herbert Simon School and its critique was to be found in the article by Hall and Hitch. My hypothesis H3 indicates that I do not share these doubts, or at least that I do not consider that the assumption of perfect rationality leads microeconomic theory in the wrong direction. What I believe is that enterprises favour long-term profit rather than short-term profit and I do not doubt that most economists share this view. The real dividing line is between those who think that maximising short-term profit is the way

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of maximising long-term profit and those who believe that the pursuit of short-term profit maximisation can hamper long-term profit maximisation. It is the latter position that this paper defends.

The assumption of perfect information is more harmful because it removes one of the essential dimensions of the real economy: uncertainty. H5 hypothesis states that I find it wrong, however, to fall into the opposite exaggeration. The affirmation of Hall and Hich, widely adopted by their successors, that producers have no idea of their demand curves, and marginal cost or revenue curves is excessive, even if it comes from empirical investigations. As these variables are an intuitive knowledge, its expression is naturally more difficult.

## 5- Determination of full cost

### 5.1- THE HANDICAP OF ENTRANTS

Which is the target rate of profit that must intervene in the formula of full cost? Logically, it should be the rate of profit that we called "normal" and which some call "cost of capital". As pure product of the competitive process, it seems justified to retain it in the context of oligopolistic competition, although it is clear that the monopolistic sector of the economy can expect a higher rate.

We saw in Section 2.1, that according to some authors, the handicap of incomers results in inflating the margin that incumbents can get. This thesis becomes dubious when we consider the whole economy. Let us not forget the context: competition plays unhindered and not only from outsiders. In these circumstances, profit rate falls necessarily down to the requirement from capital market. An increase of this rate can only occur in a protected industry: it cannot be general. In most cases, the abovementioned premium tends to zero.

Bhagwati's criticism of SBM model seems very relevant (see above). On the contrary, the "Sylos postulate" looks disputable. The SBM model makes the mistake, so common, of limiting competition to  $M$  competition. Obviously, an entrant only dares to venture if he has some reason to be confident in his ability in technological or commercial matters.

Of course, the incumbents have advantages due to their presence in the market: customer relationships, trained personnel, routine, technical expertise... These assets are not all closed to incoming candidates, but these ones have to make more effort. On his side, the incomer may also enjoy advantages: plant designed according to the most modern standards, reputation of being a price cutter, spin-off related to a university... Business models should logically assume that the entrant's general situation is as favourable as that of its installed competitors; simply, otherwise he would not have come<sup>1</sup>. As a corollary of the equal ability of incomers, incumbents will suffer an erosion of their market share, unless the sector is growing strongly.

As observed by Harrod, incomers are not necessarily small businesses condemned to achieve a breakthrough to have the same strengths as incumbents. Often very large companies are investing in new markets to diversify their production; diversification is even not necessarily a step into the unknown: technology evolution sometimes brings together productions previously far apart. Think of Apple's entry into telephony,

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<sup>1</sup> With such a requirement, attempts are less frequent, but their success is more likely

Sony's coming in computer industry... Edwards and Bhagwati point out that an incomer already present on adjacent markets is more able to withstand the initial losses resulting from the price war eventually provoked by his arrival.

### 5.2- FULL COST PRICING IN FORMULAS

Let us take the formula (3) of Sylos (see above) and express it differently:

$$p = c + \pi \quad (4)$$

$$\pi = c \frac{r}{V} \quad (5)$$

where  $c$  is the net unit cost that I shall clarify below,  $\pi$  is the normal profit margin ( $\pi m$ ),  $r$  is the normal rate of profit (including risk premium) and  $V$  is the speed of capital ( $K$ ) turnover in the cost of annual output ( $C$ )<sup>1</sup>.

$$V = \frac{C}{K} \quad (6)$$

A same rate of profit can be obtained either by a high turnover of capital coupled with a small margin, either by slower rotation coupled with a higher margin.

The cost  $c$  is full, including direct costs, both fixed and variable, and the margin covering indirect costs. Selling expenses are included as well as production costs and overhead. Only the cost of capital is excluded.

Full cost price includes thus depreciation of equipment. Some authors question the validity of this imputation on the grounds that the equipment, once acquired, costs nothing to the enterprise. Neoclassical theory has always been wary of historical cost. The marginalist price must not look to the past. By denying the past, this theory deprives the firm of a future, since the renewal of equipment is normally financed through depreciation, which is a guarantee of its continuity.

### 5.3- ESTIMATE OF FULL COST

In the above developments, full cost is considered as a perfectly available datum. Obviously, the reality is quite a different matter. Full cost should be estimated by the producer. In this matter, there is no absolute rule to refer to. Each company builds its estimation formula. Excluding the objective differences between firms (technology, size, organisation ...), their estimates may still vary for methodological reasons: the methods of allocating indirect costs and even the boundaries between direct and indirect costs vary. This will be especially true when firms are multiproduct.

To properly handle this issue, we need to distinguish between the theoretical full cost (FCT) and the estimated full cost (FCE). What has been defined in previous sections is FCT. FCE, meanwhile, is plural; managers reckon it in a rather intuitive way and simple enough not to make their task impractical. In the marginalism debate, one of the most used expressions was "rule of thumb", to describe the full cost pricing procedure. In the present perspective, the rule of thumb regards FCE. FCT, for its part, is a product of rationality.

<sup>1</sup>  $C = q.c$  where  $q$  is the annual output.

Given hypothesis H6, the market accepts only one price. Without the Walrasian auctioneer, it will need a period of trial and error before the single price arises<sup>1</sup>. How does it emerge? The answer differs depending on whether one considers the objective differences (differences in costs) or subjective (related to the estimation). The first ones will be analysed in Section 6.5. Waiting to address this section, let us assume that the costs of competing firms coincide. In this case, what will happen when the FCE diverge between competitors?

Firms price on the ground of their own FCE; this process results in a plurality of prices. Each firm can compare its price with those of competitors and buyers also do perform this comparison. Two opposing forces act simultaneously: the most expensive firms will be tempted to lower their prices to avoid losing customers. Cheaper firms understand they can increase their margins with little risk. When a firm plays the role of market leader, its price serves as a reference for the other suppliers. Otherwise, the equilibrium price will be partly a result of chance, within the range between the extreme estimates of full cost.

Participants in this tâtonnement may have the impression (not wrong, but excessive) to have to suffer the price as if they were in perfect competition. Harrod reports that many entrepreneurs complain that even outside the conditions of perfect competition, “the market does dictate a price” (1952, p.158) ; we may conjecture that this feeling comes from the tâtonnement to achieve a market price from divergent FCE’s.

## 6- Equilibrium of the producer

### 6.1- SUPPLY CURVE AND EQUILIBRIUM

Firms’ equilibrium is given by the intersection of its individual demand curve with its individual supply curve. What about the latter? The short run supply curve is simply a horizontal line at the level resulting from the confrontation of FCE’s, as set forth in Section 5.3. In the long run, the supply curve must take account of economies and diseconomies of scale. This curve is determined only if the ACglt curves of different suppliers have sufficient similarity. Otherwise, only the short term supply curve is determined. Our provisional hypothesis of identical productivity among competitors does not mean that their cost curves are similar. Neither its average cost curve nor its marginal cost, in the short or in the long term, are eligible to be the supply curve of the firm, because this one must take into account the behaviour of its competitors. Supply curve has an exogenous part. In the absence of objective cost differences, the short run supply curve will establish at a level close to the full cost. And this one matches the level of ACglt curve for the firms’ target size<sup>2</sup>. In most cases, this curve is a good approximation of the short term supply curve and even of the long run supply curve when it is horizontal. It makes more sense to relate the supply curve to ACglt than to ACgst, because the rate of capacity utilisation is not an adequate parameter: it can vary greatly from competitor to competitor.

Our explanation of equilibrium matches this comment of Edwards: “there is an equilibrium of price, but not a determinate price-output equilibrium in the usual sense. In a word, the ‘right’ (equilibrium) price is independent of the planned or achieved output of the firm” (1955, p 113).

<sup>1</sup> Walrasian tâtonnement is badly named, because only one agent gropes: the auctioneer. Buyers and sellers are content to be price takers. But in the search for equilibrium in oligopolistic competition, they are the groping agents.

<sup>2</sup> Hence Keynes’ opinion that price is governed by long run average cost (1939 p.46).

In Figure 1-A, point E represents equilibrium. The meeting of supply and demand for the individual firm may be a tangent, but then it is a special case.

Is our rule that firms must aim at "exhausting" their individual demand always valid? The case where owners follow particular objectives, such as company control or a preference for external investments, seems to be an exception, because then firms deliberately limit their size. However, this case does not imply rewriting of our optimisation rule, because demand curve includes this dimension. In fact, this curve is the resultant of three factors:

- A first exogenous factor: total market demand.
- A second exogenous factor: the relative performance of the firm in attracting customers.
- An endogenous factor: when a firm deliberately limits its supply, it encourages demanders to turn to its competitors, which increases their individual demand and therefore reduces the demand of the firm in question.

## 6.2- ADVANTAGE OF FULL COST PRICING: GRAPHIC ACCOUNT

Before explaining why it is the advantage of the firm to produce the quantity PQ, for which marginal cost is greater than marginal revenue, a preliminary remark is necessary. Orthodox theory institutes profit maximisation as the business motivation, but as normal profit is included in cost, it is by deduction net profit that is to be maximised. This idea is not credible. In the long run, net profit is close to zero; it cannot thus serve as the remuneration specific to an agent; it must be a supplement to another remuneration. In fact, the dividend of shareholders includes indistinctly normal profit and net profit. Capitalists are not interested in this distinction proper to economists. It is thus maximisation of gross profit which motivates decisions and not that of net profit.

Let us compare the gross profit earned by the firm which applies full cost pricing (Figure 1-A) with the one obtained by the marginalist firm (Figure 1-B). On the left, market price equals full cost (OD); it will produce OQ. The shaded area indicates gross profit. Net profit is obviously zero. On the right, the firm maximises its net profit. To this end, it equates marginal revenue with marginal cost<sup>1</sup>. It will thus produce O'Q' and set the price up to the demand level which is OI. The shaded area represents the gross profit. It is cut by the  $AC_{gst}$  curve; the upper part FGHI is the net profit. The existence of a net profit prompted new firms to enter the market, which translates into a demand shifted to the left in Figure 1-B. Despite the presence of net profit, gross profit is lower, which is showed by the comparison of surfaces IFKJ and EBCD.

<sup>1</sup> Due to the lack of consistency between the worlds of full cost and of marginalism, the graphical comparison is possible only under some assumptions. So, as explained in section 6.1, we associate the supply curve, the full cost level and the horizontal cost curves  $AC_{glt}$ ,  $AC_{gst}$  and  $MC_{gst}$ .

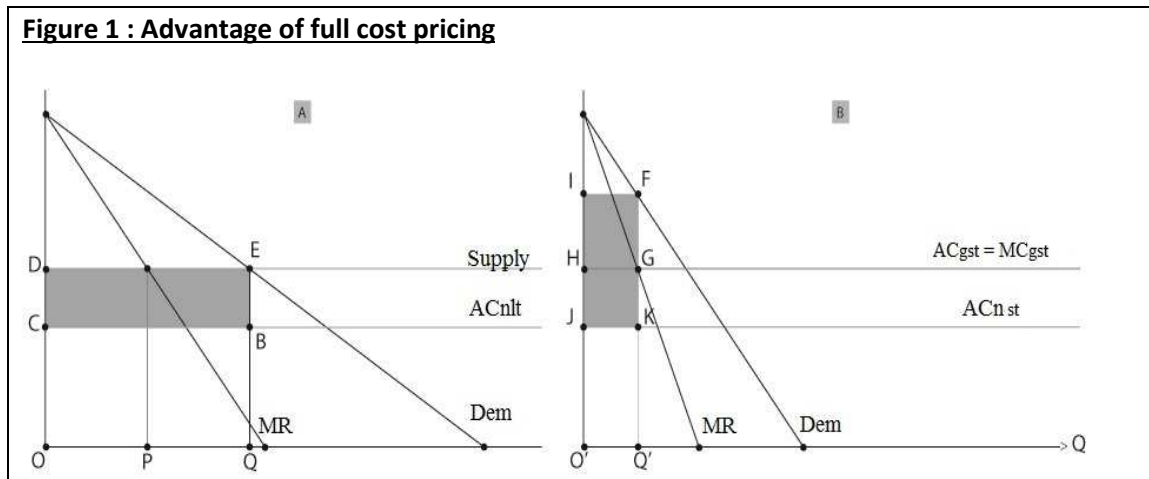


Figure 1-B represents a moment in a dynamic process of progressive narrowing of demand and production. If the average cost curve is U-shaped, this narrowing ends when demand becomes tangent to it; if the cost curve is totally horizontal, the limit is zero production.

Marginalist rule provides thus less profit than full cost pricing and is therefore not optimal. This raises two paradoxes:

- Empirical studies (from the OERG) were needed to cast doubt on the marginalist optimisation, while its theoretical inadequacy was obvious.
- The evolutionary theory of the firm came to the rescue of marginalist theory, while the firm which aims at respecting its recommendations would weaken itself. Evolutionary theory should rather be invoked to explain the preponderance of full cost in empirical surveys.

### 6.3- DEMAND VARIATIONS

Changes in the firm's individual demand may be attributable to the following causes:

- Long-term trend, usually characterised by an expansion.
- Cyclical fluctuations.
- Seasonal fluctuations (for a limited number of products).
- Accidental variations (natural disasters, climatic, political conditions).
- Change in the number of competing firms or in their respective market shares.

Unlike the latter, the previous four involve a variation in industry demand.

Faced with these changes, the firm must react; it has choice between two policies:

- Price-reaction: keeping production steady and adjusting price.
- Quantity-reaction: keeping price steady and adjusting production.

In the short run, a rising quantity-reaction is impossible when production is running at full capacity. According to Andrews, Edwards and Sylos, large companies commonly take care to have capacity reserves available.

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Price-reaction expands or decreases deliberately the profit margin. Price may also vary in case of quantity-reaction, when cost is depending on quantity produced (long term average cost not horizontal).

Given the close relationship it establishes between price and cost, full cost theory implies that the quantity-reaction is preferred whenever possible. Full costers have advanced several justifications for this behaviour, especially the permanence of a trust relationship between the firm and its clients. Another reason is - in my view- not given enough attention: the reliability of forecasts. For a given change in revenue, the profit with a fixed quantity and variable price is more volatile than his alter ego with variable quantity and fixed price<sup>1</sup>. Now, the reduction of uncertainty is a major concern for entrepreneurs.

This behaviour could be related to the empirical discovery of some price rigidity by Rotemberg (1982)<sup>2</sup>, itself already confirming an earlier study by Godley and Nordhaus (1972).

In the case of depressed demand, the quantity-reaction may involve:

- The laying off of some part of previously active factors of production.
- The retention of factors combined with a loss of productivity.
- Stockpiling of unsold finished goods.

Business cycle is the main cause of fluctuation in demand. It deserves thus special attention. Many economists have studied empirically the cyclical changes in prices and profit margins. And these studies come to different conclusions. The three theses, procyclical, stable and contracyclical prices and margins, are each widely reported. By contrast, the pro-cyclical variation in the rate of profit does not seem challenged.

That those changes could be contracyclical may surprise. But Spiegel and Stahl (2014) draw attention to the influence of the cycle on market structure. Market entry tends to be stronger during the boom. According to these authors, the pricing policy is therefore intended more dissuasive in booms. Moreover, if creations and liquidations of companies let the number of firms increase during booms and decrease during depressions, the variations of the number of firms affect individual demand in the opposite direction to the fluctuations of the sectorial demand.

The margin focused by most empirical studies is that of price over marginal cost, not over average cost. Their findings are applicable to full cost pricing with caution. In addition, the estimate of marginal cost is problematic; it is an abstract concept that does not appear in any accounting and that economists have to infer from macroeconomic data. The study by Machin and Van Reenen (1993) is an exception since it is based on data from the microeconomic level and it identifies the margin with the ratio of profit to revenue. This study, more in line with our purpose, finds a procyclical margin variation. Anyway, to satisfy, full cost theory must be compatible with the three possible cycle forms, because all markets do not necessarily behave identically.

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<sup>1</sup> If we assume a quasi-stable unit cost, price minus cost will vary more widely than price.

<sup>2</sup> The results of Rotemberg, like those of other empirical studies, do not operate the distinction between oligopolistic competition and monopolistic oligopoly which is essential in the present paper. Comparisons between these studies and our object must be treated cautiously.

In formulas (5) and (6), if we enter, not the variable  $C$ ,  $V$  and  $r$ , but their average over the cycle, we get acyclical margin and price, with a profit rate fluctuating cyclically around its average. On the whole cycle, the rate of profit reaches the long-term target. The higher rate of profit during the boom will not encourage the entry of new firms; the lower profit in depression will not incite the incumbents to retire. Entrepreneurs understand that the pendulum will bring compensation sooner or later. They do not expect the normal profit at each stage of the business cycle.

The intensity of business cycle differs greatly between sectors and is generally larger in those supplying investment than in those feeding consumption. In sectors subjected to the most intense fluctuations, the market may force an enterprise to complete the quantity-reaction by a price-reaction<sup>1</sup>.

Thanks to the compensation between the good and bad times, this price-reaction does not undermine the achievement of normal long-term profit. Reduced prices in depressions do not encourage disengagement, nor do the high prices in the boom attract incomers. The resulting profit margin meets thus the criteria of full cost. It therefore seems reasonable to consider the result of this price-reaction as a cyclical component included in the margin of the full cost. The margin formula (5) is replaced with:

$$\pi = c \frac{r}{V} + \gamma \quad (7)$$

where  $\gamma$  is the cyclical component.

When procyclical, the cyclical component is positive in booms and negative in depressions. The signs are reversed in the case of a contracyclical component.

#### 6.4- RELATION WITH THE EQUILIBRIUM OF IMPERFECT COMPETITION

During the controversy, one of the marginalist arguments was to consider full cost, not as an explanation but as a simple procedure of pricing. In this role, the full cost is subordinated to the pricing explanation proposed by the theory of imperfect competition. The idea is this: the profit margin included in the full cost must vary to adapt to demand fluctuations. A fraction of the full cost is thus function of demand. Confusion of this variable part with the profit of imperfect competition given by the formula (1) of J. Robinson leads easily to the hackneyed conclusion that full cost theory does not bring anything new.

This argument is admissible only in the special case where price varies procyclically and where demand fluctuations are very pronounced. It is founded only if our above model enables a component of full cost to behave like the margin of formula (1). This element cannot be anything but the cyclical component, the only element that is responsive to demand<sup>2</sup>. In fact, this assimilation is impossible.

Firstly, the cyclical component is positive when times are good but negative when they are bad. The net profit of imperfect competition can become negative only in very specific circumstances as a drop in demand particularly violent.

<sup>1</sup> This price-reaction is generally procyclical, although the opposite is possible in special cases

<sup>2</sup> On Figure 1-A, the cyclical component is not discernible. Its existence affects the altitude of ACglt and the size of the gap between it and ACnlt.



Secondly, the rationale for integrating the cyclical component into the full cost was precisely that it does not participate in attraction and repulsion forces that affect the number of suppliers in the market over the long run. Does it make sense to say that the profit of imperfect competition does not attract new entrants? Of course not, and J. Robinson conceived it so, she who characterised this equilibrium as being of short run, as opposed to the "full equilibrium" where profit was gone.

### 6.5- PRODUCTIVITY DIFFERENCES BETWEEN COMPETITORS

We may at last abandon the simplification introduced in Section 5.4 and take account of cost differences between competitors.

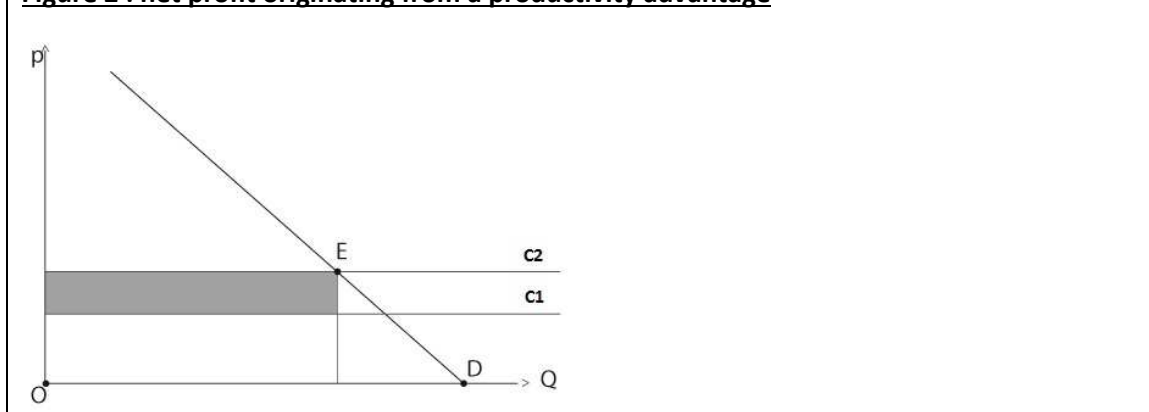
There is no unanimity among economists about pricing in situation of differentiated costs. According to Knight, Andrews and Edwards, the cost of the most efficient business makes the price. Instead, J. Robinson believes it is the price of the marginal firm. In fact, it is Farm (2014), who provides the most correct answer to this problem (see section 2.3).

The most efficient firm enjoys a privilege: it can set the price as it pleases at any level higher than its full cost and not higher than the full cost of its competitors.

It should choose a price near its own full cost when it wants to eliminate competitors from the market. But it seems rational that the most efficient firm prefers the other option. Indeed, this is a unique opportunity for firms to achieve a net profit without the risks that are usually associated. Maximising long-term profit prohibits net profit when available to all, but recommends it when it is a privilege.

Let there be  $n$  firms  $F_1 \dots F_n$ , with  $C_1 < C_2 \dots < C_n$  where  $C_i$  is the full cost of the firm  $i$ . If firm  $F_1$  chooses a price equal to  $C_m$  where  $m > 1$ , each firm  $F_2 \dots F_{m-1}$  could impose a price lower than  $C_m$ , that firm  $F_1$  must accept. But they have the same interest as  $F_1$  to take advantage of net profit that is the reward for their performance.

**Figure 2 : net profit originating from a productivity advantage**



In Figure 2, where  $C_1$  is the full cost of the most efficient firm and  $C_2$  a higher price it chooses, the net profit is represented by the grey rectangle.

The market price will tend towards the full cost of the marginal firm or rather of the "normal" firm. By normal firm, I mean one which does not enjoy exclusive advantages, which is subject to management within the standard and that exploits

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publicly known technologies. But an aggressive competitive strategy may reduce the level of the market price.

Let's consider now the case of a market with non-homogeneous products. Absolute cost differences are only significant relatively to product quality. The type of product differentiation that interests us here is that where there is an objective hierarchy of quality between products<sup>1</sup>, for example, motors of different powers. Generally, the best quality implies a higher cost of production. Figure 2 remains valid for this case. Suppose that product 1 is of better quality than product 2 and that their absolute production costs are identical. The horizontal axis represents, not units of product, but units of abstract utility for consumers. The cost of a unit of utility is lower in firm  $F_1$ . This firm can so achieve a net profit by setting its price on the ground of the conditions of production of firm  $F_2$ .

Differences in productivity may come from patents, from an advantageous location, from better management or from a larger size if returns to scale are increasing. And also from sharper specialisation. This last advantage benefits rather to small firms, which possibly enables them to withstand large businesses even in the presence of economies of scale. Economists commonly overestimate, not economies of scale themselves, but their impact on competition because they perceive small businesses as the miniature version of the large companies. For example, if the small business is aimed at a market segment where consumers are particularly demanding, the higher cost will be offset by higher revenue.

Economic theory, following Viner (1932, p.25) believes that in the long run, net profit due to a productivity advantage tends to disappear, because it is absorbed by a remuneration adjustment of the factor generator of this efficiency. This is probably true for the factor land and sometimes for certain employees in specific functions. But this law that excess profits are transferred to the remuneration of a factor does not generally hold. Often the surplus of productivity originates in the department of R&D. In this case, the surplus cannot be transferred to the remuneration of researchers, but only partially. The firm pays them for their possible future inventions, not for the past ones. And such remuneration may not anticipate innovations that remain uncertain as they have not yet taken place, because past inventions do not guarantee future inventions. Only factors of which the productive advantage is permanent can claim obtaining a rent or a quasi-rent. It is also doubtful that the factor can retrieve the benefit after it has been incorporated the stock value.

## 7- Conclusions

The dominance of full cost pricing is confirmed by numerous empirical studies. Orthodox microeconomic theory got out of this difficulty by relegating it to the status of "rule of thumb". Sylos wrote: "Far from representing only a rough and approximate rule for behaviour a 'rule of thumb', the full cost principle can be fully rationalised" (2007, p. 96). The present paper aims at contributing to this project. By the late fifties, this rationalisation was already quite advanced and it has received little attention since then. It is therefore useful to get it again on track.

The theoretical elements on which I insisted were:

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<sup>1</sup> As opposed to the type where only differentiated consumer tastes establish a system of preferences. It is of course a simplification to consider that a hierarchy of preferences can have a perfectly objective basis.

1. Specification of the market structure concerned by full cost. Highlighting of oligopolistic competition.
2. Equilibrium analysis using cost curves which are not U-shaped
3. Reaffirmation of profit maximisation. But this process happens mainly at the level of  $P_e$  competition and not of  $M$  competition.
4. The firm can maximise its gross profit with a zero net profit. The desire to maximise net profit would lead it on highly risky paths and to a likely reduction in gross profit.
5. Relation of full cost theory with the literature that analyses the effects of the business cycle on prices and margins.
6. Clarifying of the algebraic formula of full cost established by Sylos.
7. Distinction between the two levels of full cost that are its rationality and its estimate.
8. Re-value of forms of competition based on performance and loss from its pedestal by competition on margins.

The topic of producer's equilibrium is not naturally a controversial opposition between *cost of production* thesis and *demand* thesis, although it has evolved in this way. The basic question is not: is it either cost or demand that makes the price? Some role may be assigned to both. But it is: how does it work? For this issue, equalisation of marginal cost and marginal revenue is not the right solution.

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