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**Classical vs. Neoclassical Conceptions of
Competition**

Lefteris Tsoulfidis

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Department of Economics, University of Macedonia, 156 Egnatia str, 540 06
Thessaloniki, Greece, Fax: + 30 (0) 2310 891292
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Classical vs. Neoclassical Conceptions of Competition*

By

Lefteris Tsoulfidis

Associate Professor, Department of Economics

University of Macedonia

156 Egnatia Street, 540 06, Thessaloniki, Greece

Tel. 2310 891-788, Fax 2310 891-786

Homepage: <http://econlab.uom.gr/~lnt/>

Abstract

This article discusses two major conceptions of competition, the classical and the neoclassical. In the classical conception, competition is viewed as a dynamic rivalrous process of firms struggling with each other over the expansion of their market shares. This dynamic view of competition characterizes mainly the works of Smith, Ricardo, J.S. Mill and Marx; a similar view can be also found in the writings of Austrian economists and the business literature. By contrast, the neoclassical conception of competition is derived from the requirements of a theory geared towards static equilibrium and not from any historical observation of the way in which firms actually organize and compete with each other.

Key Words: B12, B13, B14, L11

JEL Classification Codes: Classical Competition, Regulating Capital, Incremental Rate of Return, Rate of Profit, Perfect Competition.

1. Introduction

This article contrasts the classical and the neoclassical theories of competition, starting with the classical one as this was developed in the writings of Smith, Ricardo, J.S. Mill and more explicitly analyzed in Marx's *Capital*. The claim that this paper raises is that the classical conception of competition despite its realism was gradually replaced by the neoclassical one, according to which competition is an end state rather than a description of the way in which firms organize and actually compete with each other. In fact, most of the phenomena commonly associated with real life competition, such as for example aggressive price cutting, concentration of capital, uncertainty, and the like, are theorized in the neoclassical approach as deviations from what competition ought to be, which is identified with perfect competition. Perfect competition, is always in the background, when neoclassical theory addresses issues

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of industrial organization or government regulation of industry. By contrast, classical theory views these “deviations” as precisely the expected results of the actual operation of competition.

The remainder of the article is structured as follows: Section 2 discusses the classical approach to competition as articulated by Smith, Ricardo and J.S. Mill. Section 3 focuses on the development of the neoclassical conception of competition and discusses the phenomena that within this theory would constitute *prima facie* evidence of the lack of competition as a description of a situation rather than as a rivalrous process. Section 4 shows that the same phenomena that would indicate the presence of monopoly or power of firms over market forces, in Marx’s analysis, are precisely the results that one would expect from the operation of capitalist competition and the tendential equalization of the profit rates across industries. Finally, Section 5 provides a summary and some concluding remarks.

2. Classical Conception of Competition

Classical economists viewed competition as the mechanism that coordinates the conflicting self-interests of independently acting individuals and directs them to the attainment of equilibrium in a dynamic sense of the term, that is, a never-ending processes of elimination of any excess profits or losses and the tendential establishment of natural prices as the centres of gravitation of market prices. This is the reason why Smith notes that despite the fact that each individual is pursuing the satisfaction of his own self-interest, nevertheless “is led by an invisible hand to promote an end which was no part of his intention” (Smith, *Wealth*, p. 456). J.S. Mill is more explicit about this coordinating mechanism, which enables us to study economic phenomena in a rigorous and therefore scientific way. He notes:

Only, through the principle of competition has political economy any pretension to the character of science. So far as rents, profits, wages, prices, are determined by competition, laws may be assigned for them. Assume competition to be the exclusive regulator, and principles of broad generality and scientific precision may be laid down, according to which they will be regulated. (J.S. Mill, 1848, p.147)

Although from the above often-cited quotation, one cannot derive exactly how J.S. Mill defines competition, nevertheless he argues that through competition both natural prices and incomes can be determined in a rigorous way and what is more important “independently of people’s will”; that is, J.S. Mill recognizes that in the economy

operate objective mechanisms (or “laws”) that can be theorized. Classical economists described competition as an endless rivalrous equilibrating process and not as an end-state or a state of affairs as is portrayed in neoclassical economics. For instance, Smith describes this rivalrous price-cutting process through which capitals (firms) are in constant pressure to innovate. Smith notes,

Competition of producers who, in order to undersell one another, have recourse to new divisions of labour, and new improvements of art, which might never otherwise have been thought of. (Smith, *Wealth*, p.706)

Furthermore, in this competitive process actual prices are attracted to their natural levels, and by doing so the rate of profit together with wages and rents (in the case of agricultural products) tend to their normal levels. The condition *sine qua non* for the attainment of these normal levels is the free mobility of capitals, or what Adam Smith calls “perfect liberty”. Notes Smith,

Every man, as long as he does not violate the laws of justice, is left perfectly free to pursue his own interests in his own way, and to bring both his industry and his capital into competition with those of any other man. (Smith, *Wealth*, p. 687)

Again Smith refers this time implicitly to the “invisible hand”, when he points out that competition essentially directs the actions of each individual pursuing his own self-interest to promote society’s welfare, even though this is not part of his intentions,

Every individual is continually exerting himself to find out the most advantageous employment for whatever capital he can command. It is his own advantage, indeed, and not that of the society which he has in view. But the study of his own advantage naturally, or rather necessarily, leads him to prefer that employment which is most advantageous to the society. (Smith, *Wealth*, p. 338)

However, classical economists in general were not particularly clear as to the requirements of competitive behaviour and how it was affected by the number of participants. Thus although competition was conceived as a rivalrous process nevertheless often there are statements that could be interpreted as supporting a quantitative, and therefore neoclassical perspective of competition. A characteristic example is the following quotation from Smith

The quantity of grocery goods, for example, which can be sold in a particular town, is limited by the demand of that town and its neighbourhood. The capital, therefore, which can be employed in the grocery trade, cannot exceed what is sufficient to purchase that quantity. If

this capital is divided between two different grocers, their competition will tend to make both of them sell cheaper than if it were in the hands of one only; and if it were divided among twenty, their competition would be just so much the greater, and the chance of their combining together, in order to raise the price, just so much the less. Their competition might, perhaps, ruin some of themselves; but to take care of this, is the business of the parties concerned, and it may safely be trusted to their discretion. It can never hurt either the consumer or the producer; on the contrary, it must tend to make the retailers both sell cheaper and buy dearer, than if the whole trade was monopolized by one or two persons. (Smith, *Wealth*, p. 272)

Hence, one could discern some of the seeds of a quantitative notion of competition. Stigler (1957 and 1987), in particular, read in the above lines the description of the basic requirement of perfect competition, which is that competition is directly related to the number of participants. A closer examination of the above quotation reveals that even in this case competition is fought through the lowering of prices regardless of the structure of the industry, that is, the number of combatants (McNulty, 1967 and Moudud, 2010). Nevertheless, neoclassical authors interpret statements such as the above to mean that in Smith there was an early development of the perfect competition theory, which Smith could not define with the necessary precision, because economic theory was still in its makings and its full development ought to wait until (or even long after) the marginal revolution, as we will see in the next session. But, if only one thinks of Smith's "trifling example" of the pin factory, where there is an ever-present pressure to undercut unit costs by increasing productivity through the division of labour then any effort to attribute to Smith a neoclassical notion of (perfect) competition is out of his spirit. Thus, the above quotation is in the context of a mercantile economy dominated by trade guilds monopolizing both production (producers) and consumption (shop-keepers) rather than to capitalist enterprises operating in towns or cities in accordance to the mobility of both capital and labour.¹ The trouble with Smith, Ricardo and J.S. Mill was that they did not distinguish in any sufficiently clear and, therefore, theoretically adequate way, between inter-industry and intra-industry competition; thereby, subsuming the difference of these two distinctive types of competitive behaviour and phenomena into various time spans.

¹ In similar fashion one can interpret the following quotation "competition rages in direct proportion to the number, and in inverse proportion to the magnitudes, of the antagonistic capitals" (Marx, 1867, p. 626), which really refers in the context of a precapitalist society.

Thus “the law of one price” accepted by both classical and neoclassical economists² is supposed to operate in a short time span and since we are referring to the same commodity, it follows that we are necessarily referring to intra-industry competition. By contrast, the attainment of natural prices requires longer time spans, as capital flows in and out of industries tendentially equalizing profit rates and thus this type of competition is between industries. In a nutshell, Smith, Ricardo and J.S. Mill had conceived competition as a process, whose short-run expression was the establishment of an equal price (“law of one price”) and unequal profit rates between firms within industries and different prices between industries which nevertheless tend to be equalized, in the long run, with their natural prices, because of the inflow and outflow of capital (“law of equal profitability”). This becomes particularly pronounced in Ricardo, when he explains the adjustment mechanism of establishing equilibrium (natural) prices between industries:

There is perhaps no manufacturer, however rich, who limits his business to the extent that his own funds alone will allow [...]. When the demand for silks increases, and that for cloth diminishes, the clothier does not remove with his capital to the silk trade, but he dismisses some of his workmen, he discontinues his demand for the loan from bankers and monied men; while the case of the silk manufacturer is the reverse: he wishes to employ more workmen, and thus his motive for borrowing is increased: he borrows more, and thus capital is transferred from one employment to another, without the necessity of a manufacturer discontinuing his usual occupation. When we look to the markets of a large town, and observe how regularly they are supplied both with home and foreign commodities, in the quantity in which they are required, under all circumstances of varying demand [...] without often producing either the effect of a glut from too abundant a supply, or an enormously high price from the supply being unequal to the demand, we must confess that the principle which apportions capital to each trade in the precise amount that is required, is more active than is generally supposed. (Ricardo, *Principles*, p. 90)

In Ricardo the presence of excess profits or losses simply accelerates or decelerates the process of capital accumulation, furthermore the credit system facilitates and enhances the operation of this mechanism and there is no need for entry or exit of firms from other industries. These aspects of competition, however, are confused in Smith’s analysis and are not adequately clarified neither in Ricardo nor in J.S. Mill and as we will argue, after our discussion of the neoclassical competition, are explained in sufficient detail in Marx’s *Capital*.

² For example, Jevon’s “law of indifference” (*cf.*, Schumpeter, 1954, p.973)

3. Neoclassical Competition

The analysis of competition in the neoclassical theory is contained in the model of perfect competition, which describes the ideal conditions that must hold in the market so as to ensure the existence of perfectly competitive behaviour from the typical firm and, by extension, the characterisation of the industry as competitive or not. The model of perfect competition describes a market form consisting of a large number of small —relative to the size of the market— firms selling a homogeneous commodity to a large number of consumers. All market participants have perfect information about the prices and the costs of each good, consumer preferences are given and finally, there is a perfect mobility of the factors of production. The result of the above conditions is that the producers and consumers —because of their large number and small size— are incapable of influencing the price of the product, which becomes a *datum* for each and every individual firm or consumer in the market. The behaviour of the firms becomes completely passive with respect to the price of the product (“price taking behaviour”) and as for the production, the firm simply chooses the level of output consistent with the maximization of its profits which is achieved at the point where the price equals with the marginal cost of the product. The same price also maximizes consumers utility and by extension society’s welfare. The conception of perfect competition is therefore required for the neoclassical theory to render static equilibrium determinate.

The intensity of competition is directly proportional to the number of producers and, in general, the structure of an industry. In this “quantitative notion of competition”, the firm is conceived as the legal entity which by hiring and organizing the services of the factors of production supplies goods and services in the market. It is important to note that the firm does not own any of the factors of production; it merely hires the services of the factors of production offered by their owners, that is, the individuals. The larger the number of firms operating in an industry the more vigorous is their competitive behaviour and, so is the establishment of a uniform rate of profit across industries. By contrast, the smaller the number of firms, the more monopolistic or oligopolistic is the form of competition and therefore the higher the inter-industry profit rate differentials. In this non-competitive state of equilibrium, some prices are above the marginal cost, so society as a whole suffers welfare losses from the underproduction and the underutilisation of disposable productive resources. In the neoclassical microeconomic theory, if the firm or the industry displays profits

above normal, for a fairly long period of time, they are attributed to imperfections in the operation of the market and thus in the existence of some degree of monopoly.

The concept of perfect competition appears, perhaps for the first time, in Cournot (1838), whose analysis was premised on the maximising behaviour of the participating firms at the point of equality of marginal revenue and marginal cost and also related the number of firms to the market price, the larger the number of firms the lower their selling price and in the case of “unlimited competition”; that is, when the number of firms becomes infinitely large the selling prices becomes equal to the marginal cost. These concepts were also present in the writings of the other French engineers of the early nineteenth century, who although did not know anything about perfect competition, nevertheless they new pretty well the efficiency gains of the marginal cost pricing and the difficulties in its applications. The often cited didactic example of such inconsistencies has been advanced by Dupuit ([1844], 1969) and is related to the imposition of the correct price of crossing the bridge. We know that the marginal cost of crossing the bridge is zero and so must be the optimal price (toll) of crossing the bridge. But for a price equal to zero, there is no private incentive to build bridges and a positive price (toll) on the other hand leads to resource misallocation and society’s net welfare loss. Cournot’s and the French engineers’ ideas, however, could not attract much attention in the early nineteenth century because of the absolute dominance of classical economics and their view of competition as a process of rivalry and not as a static situation.

The neoclassical description of competition as a state rather than as a process of rivalry is far from the harsh reality of the results of competitive behaviour as is well known from the economic history the depression of 1873-1896 intensified price cutting behaviour and led to the elimination of a large number of weaker firms, massive unemployment and the concentration and centralization of capital. It has been observed that in dismal situations such as those of depressions, people, often, distant themselves from the harsh reality of the present and start fantasizing idealised situations. Clearly, an idealized situation is where firms are pictured as being independent of each other and each and every one of them is impotent with respect to price setting. Furthermore, the notion of perfect competition fits perfectly to the rest of the neoclassical theory, for it helped in the connection with which technology is being used. More specifically, perfect competition secures that firms, from the blueprint of available technologies, choose the lowest unit cost technology.

Similar conclusions are drawn from Walras's conception of attainment of equilibrium through the mediation of the auctioneer. We know that the participants in this model are assumed to act independently of each other and simply react to the prices announced by the auctioneer, who is supposed to know the preferences of all the participants in the market and records their responses to the set of announced prices. The auctioneer accounts for these responses in the new set of prices until all differences are eliminated and trade takes place exclusively at equilibrium prices. Clearly, if the participants in the Walrasian model act differently, then the attainment of equilibrium is no longer possible. As a consequence, perfect competition is a *sine qua non* assumption in the Walrasian model for the determination of equilibrium prices. In short, the concept of perfect competition is required for the proper operation of the Walrasian auctioneer, because no single participant knows anything more than anybody else and each and every one of them is acting independently of the others. These conditions are satisfied, when there is an infinitely large number of infinitesimally small, with respect to the size of the market, participants. From the above it becomes clear that the givens of the neoclassical theory, that is, the preferences of individuals, their endowments and technology, when combined, impose a type of competition which cannot be different from perfect competition.³ One consequence of the above is that the classical notion of competition was eventually side-stepped for it did not fit with the analytical framework of neoclassical economics, which is oriented towards equilibrium (see also Eatwell, 1987 and Clifton, 1977).

The formal requirements of perfect competition were worked out by Edgeworth (1881) who promoted the concept albeit with not much success. It is worth pointing out that such a model of competition could not gain broad acceptance not only because of its patently unrealistic nature but mainly because of the dominance of the ideas of classical economists. Marshall sought to circumvent the problems of acceptance of the new theory by assimilating the classical tradition with neoclassical economics. The classical dynamical process of competition gradually was to be translated into static terms, that is, the number of producers and the type of product may characterize the form of competition. However, even in Marshall's time, perfect

³ For example, Jevon's consumer's equilibrium position and also welfare economics require the passivity of consumers who simply react to prices. The same is true with Wicksteed's product exhaustion theorem of income distribution which works only in a perfectly competitive environment.

competition was not fully formulated into an operational model and this job was accomplished, to a great extent, in Knight's (1921) book, which was essentially his dissertation written under Allyn Young's diligent supervision.⁴ Knight in his book described in a comprehensive and meticulous way the requirements of perfect competition that could be used in the real economy. The trouble with such a description however was that it could not be easily applied to real economies and this according to Stigler (1957) paved the way for the development and wide acceptance of the notion of monopolistic competition in the 1930s.

The notion of perfect competition and the associated with it Marshallian theory of the firm has been criticized by Sraffa (1925, 1926) who showed that in a partial equilibrium framework one cannot define the usual U-shaped AC and MC curves which give rise to an upward sloping supply curve. As a consequence, constant returns to scale appear as the only logical assumption for the neoclassical theory of a perfectly competitive firm and under constant returns the given price cannot but coincide with the MC curve rendering thus the size of the firm and its supply decisions indeterminate. Under these circumstances, Sraffa suggested that either one should opt for a general equilibrium approach, which at that time was an exceedingly difficult task to accomplish, or for partial equilibrium analysis and monopolistic competition. The monopolistic competition suggestion was picked up a few years later independently by J. Robinson (1933) in the UK and by Chamberlin (1933) in the USA and essentially they were those that launched what came to be called as the "monopolistic competition revolution" in the 1930s. Both authors suggested that perfect competition should be abandoned in favour of monopolistic competition (see Tsoulfidis, 2009 and 2010, ch. 9). Robinson was explicit about the marginalization of perfect competition and the generality of imperfect competition, she noted

it is more proper to set out the analysis of monopoly treating perfect competition as a special case. (Robinson, 1933, p. 250-251)

Although Robinson openly admitted her influence from Sraffa's articles, nevertheless her analysis was based more on the tools of the Marshallian tradition and soon after the publication of her book she abandoned the further development of "imperfect competition" and the associated with it revolution. In fact, she wrote very little about imperfect competition (after the publication of her book) as she lost faith

⁴ Allyn Young is the supervisor of at least two famous dissertations one by Frank Knight and the other by Edwin Chamberlin.

in the concept and her interests diverted to other areas of economics such as the critique of the neoclassical theory of capital and economic growth. Chamberlin, on the other hand, although not willing at all to admit any external influences to his work and especially from Sraffa's articles and the theoretical developments in Cambridge England, nevertheless he produced a body of work which was much more faithful to Sraffa's suggestion than anybody else's and he managed to develop new analytical tools and to promote the "monopolistic competition" concept to the very end of his life.

The upshot of the monopolistic competition revolution was that (perfect) competition became a special case and imperfect (or monopolistic) competition became the norm. This sparked a debate among neoclassicals; on the one hand, economists mainly associated with Harvard University (Chamberlin, Mason, Galbraith, *inter alia*) argued that actual economic life is in deviation from that described in perfect competition and thus government's role is to correct these imperfections using as a benchmark the perfectly competitive model. On the other hand, economists mainly associated with Chicago University (Stigler, Friedman, Harberger, *inter alia*) argued that capitalism works and gives rise to results that are approximately those predicted by the model of perfect competition and that monopolistic competition is a much more complex approach (not even a single model) and its complexity is not justified by its predictive content. Thence came Friedman's (1953) famous methodological principle which stated that "a model is judged according to its predictive content and not the realism of its assumptions".⁵ In this context, he used the example of the price effects of an indirect tax imposed on cigarettes which could be predicted with sufficient accuracy using partial equilibrium analysis and perfect competition, although the cigarettes industry possesses the characteristics of monopolistic or oligopolistic competition. This debate in the 1930s and 1940s gave rise to the disciplines of industrial organization and government regulation of industry. By the end of the 1940s or early 1950s the "monopolistic competition revolution" was replaced by perfect competition as the norm until, at least, the second monopolistic competition revolution in the 1980s with the advent of new Keynesian and also new consensus macroeconomics.

⁵ Stigler (1937) was the first to reject the imperfect competition approach on methodological grounds, although such a rejection is more associated with Friedman (1953) who by popularising this methodological principle so much ended up to associate it with his name.

It is important to point out that the dominance of the neoclassical theory in the field of microeconomics is due, at least partly, to heterodox economists. For reasons that have to be explained, many heterodox (radical) economists thought that the model of perfect competition was realistic for analyzing the capitalism of the nineteenth and perhaps early twentieth century, when the (absolute) size of firms was supposed to be small, and, therefore, firms were following market signals simply because they were impotent to change the market outcomes. Many heterodox economists (Kalecki, Sweezy, Foster, *inter alia*) have repeatedly asserted that the last decade of the nineteenth or the beginning of the twentieth century, have marked a new era of capitalism, where a small number of gigantic firms (megacorps) possess power over the market forces so that they can fix their prices and thus manage to secure a higher than average (competitive) rate of profit.

The problem with this view claiming that firms possess market power is that it does not provide the required evidence. There is no doubt that with the passage of time the absolute average capital requirements of firms have increased, but by no means has this implied that the power of firms over market forces has also increased, because, at the same time, the size of the market has increased immensely. Thus, only a relative with the size of the market comparison of firms might be meaningful and such a comparison is exceedingly difficult for the lack of data. Besides, larger relative size does not necessarily imply higher profitability and this is certainly an empirical question that gave rise to a voluminous literature in the USA and elsewhere. The evidence, to the extent that we know the literature, does not lend support to the view of “market power”, especially when the time span of the analysis is sufficiently long.

Schumpeter’s (1942) keen analysis was also dismissive of the idea of the existence of a perfectly competitive stage of capitalism, he notes:

[A]n entirely imaginary golden age of perfect competition that at some time somehow metamorphosed itself into the monopolistic age, whereas it is quite clear that perfect competition has at no time been more of reality than it is at present. (Schumpeter, 1942, p. 81)

Schumpeter (1942, p. 106) characterized such a competitive stage of capitalism as “wishful thinking”.⁶

⁶ It is important to stress that Schumpeter is not always consistent with his views on competition as he was influenced by the presence of Chamberlin and other economists at Harvard University that were among the protagonists of the monopolistic competition revolution. Thus, one cannot pinpoint with certainty what exactly Schumpeter thinks, it seems though that he did not completely break with the

While Schumpeter and also Austrian economists (*e.g.*, Kirzner, 1987) are critical of the static conception of competition (either in its perfect or in its monopoly form) and have many interesting insights on the nature of competition as a rivalrous process of discovery in which entrepreneurs seek new profit opportunities in a world of constant change. As a consequence, excess profits are by no means a sign of lack of adequate competition and index of inefficiency, but rather an indication that entrepreneurs are responding to shifting market conditions. In spite of the realism of their premises, Austrian and also evolutionary economists have failed, so far at least, to present their views in an accepted and, at the same time, workable model of competition. In what follows, we focus on Marx's work and the post-Marxian discussion, where again competition is viewed along the classical approach and to our view sheds light and helps to the understanding of many of the contemporaneous phenomena.

4. Marx on Competition

Marx intended to devote a whole book on the question of competition. In fact, volumes I and II of *Capital* are written on the assumption that there is no competition between capitals. Although Marx's plan was not fully accomplished, there are sporadic remarks on competition throughout his entire work. For example, there is a specific chapter on competition (Ch. X) in volume III of *Capital*, while, in general, competition between capitals is assumed throughout *Capital* III, since there is a tendential equalisation of the profit rates to the economy's average. Marx's analysis of competition bears many similarities to that of Smith and Ricardo. Nevertheless, there are also significant differences. The major difference is that competition in Marx is a derived concept and not the starting point of the analysis, which is the expansion of profits as an end in itself (Shaikh 1980; Semmler 1984). Competition among capitals in Marx's perspective follows the analysis of the laws of capitalist accumulation.⁷ As the units of capital strive to expand their market share, increase production, and realise surplus value, they must take actions to confront the efforts of other units of capital engaged in similar efforts. Consequently, one cannot start with

neoclassical view. For example, he notes: [P]erfect competition is not only impossible but inferior' (*ibid.*, p. 106), see also Michaelides and Milios (2005).

⁷ For example, Ricardo begins his analysis of value assuming an equalization of profit rates whereas for Marx this requires the writing of two volumes of *Capital* first and eight chapters from volume III.

an analysis of competition before the analysis of the laws of accumulation. Marx is explicit about that when he notes:

A scientific analysis of competition is not possible before we have a conception of the inner nature of capital (*Capital*, vol. I, p. 316).

He further notes that competition among capitals is the mechanism by which the laws of capitalist accumulation operate and become visible:

Competition makes the immanent laws of capitalist production to be felt by each individual capitalist, as external coercive laws. It compels him to keep constantly extending his capital, in order to preserve it, but extend it he cannot, except by means of progressive accumulation. (*Capital*, vol. I, p. 592).

For Marx, competition is envisioned as a turbulent and inherently violent process that resembles, in many respects, actual “war” (Marx, 1847). The market share of firms, for example, is like the territory of countries engaged in war, while technical change is like the arms race, since it is through technical change that firms can lower their unit cost and prices, attack their competitors and gain a larger share in the market for themselves (Shaikh, 1980). The war-like aspect of competition in Marx is discussed in his writings already prior to *Capital* (e.g., Marx, 1847) and also can be found in the writings of Engels, who generalized the rivalrous competition to many aspects of economic life. For instance he notes:

Competition is the completest expression of *the battle of all against all* which rules in modern civil society. This battle, a battle for life, for existence, for everything, in case of need a battle of life and death, is fought not between the different classes of society only, but also between the individual members of these classes. Each is in the way of the other, and each seeks to crowd out all who are in his way, and to put himself in their place. The workers are in constant competition among themselves as are the members of the bourgeoisie among themselves. The power-loom weaver is in competition with the hand-loom weaver, the unemployed or ill-paid hand-loom weaver with him who has work or is better paid, each trying to supplant the other. (Engels, *Condition of the Working Class in England*, 1845, emphasis added)

In Marx’s work, there is a clear distinction of competition between and within industries. For example, he notes:

What competition, first in a single sphere, achieves is a single market-value and market price derived from the various individual values of commodities. And it is competition of capitals in different spheres, which first brings about the price of production equalising the rates of profit in the different spheres. The latter process requires a higher

development of capitalist production than the previous one. (*Capital*, vol. III, p. 180)

In short, competition leads (tendentially) to the establishment of a common rate of profit with different equilibrium prices across industries and a uniform price with differential profit rates between firms in the same industry. In what follows, we present the salient features of these two aspects of competition and their synthesis through the concept of regulating capital.

Competition within industries

Starting with the aspect of competition between firms within an industry (Marx, 1894, pp. 138-39, 178-86, 197-98 and 641-45), firms are viewed as large units of capital, which fight mainly in a two-front war (Shaikh, 1980). The first, we have capital vs. labour in the production process over wages and conditions of work and above all the growth in productivity, and in the second front, where the battle is between capitals over market shares. Capitals in this war-like competition are successful only by reducing unit costs through innovations usually associated with the introduction of fixed capital. We say fixed capital because through this is achieved the effective division of labour, the increase in productivity, the reduction in unit cost of production which makes possible the undercutting of price and the elimination of competitors:

The battle of competition is fought by cheapening of commodities. The cheapness of commodities depends, *ceteris paribus*, on the productiveness of labour and this again on the scale of production. Therefore, the larger capitals beat the smaller. (*Capital*, vol. I, p. 626)

Although Marx was writing in the nineteenth-century his analysis begins with large units of capital, which are already in the battle to reduce unit production costs through increasing mechanization. Innovations leading to techniques with lower cost make possible the reduction of the selling price, thereby increasing the market share of innovators. Imitators cannot follow immediately for they are stuck with their fixed capital, which must be kept in operation for a certain period of time in order for their owners to realize its value. The innovators as they increase their capital per unit of output produced will temporarily reduce their profit rates. However, as they reduce the selling price of their commodity and expand their market share, their profit margin on sales increases and gradually their rate of profit becomes the highest in the

industry. Eventually, all producers sell the same commodity for approximately the same price, that is, “the law of one price” prevails:

Competition can only make the producers within the same sphere of production sell their commodities at the same price. (*Capital*, vol. III, p. 865)

As in the case of equalization of profit rates, the equalization of price within an industry only means that all firms in an industry sell at approximately the same price.

The tendential equalization of price within industries implies differential profit rates between firms in the same industry. If all firms sell at the same price it follows that firms with lower costs will tend to earn profit rates higher than those with higher costs. Thus, the tendential equalization of profit rate across industries is consistent with a hierarchy of firm rates of profit within industries. This situation would persist because some of the elements of production are not easily reproducible (*e.g.*, location, climate, natural resources, management, *etc.*) and because of unequal firm innovation and expectations.

Competition between Industries

The first consequence of the analysis of competition between industries is the tendential equalization of the inter-industry rates of profit. Firms in each industry are assumed to sell their commodities at market prices that tend to incorporate the economy's average rate of profit. The rationale for the formation of a general rate of profit between industries stems from the following considerations. Industries with a rate of profit above the general rate of profit attract most of the capital and thus they experience an acceleration of capital accumulation; by contrast, industries with a rate of profit below the average experience a deceleration of accumulation. This process is a dynamic one, in the sense that all industries (usually) grow, the difference being that industries with higher profit rates will grow faster than their demand and in doing so they reduce their market price and their profit rate to the economy's general rate of profit. The converse will be true for industries with lower than the average profit rate; capital accumulation grows at a rate lower than demand giving rise to a higher market price elevating the rate of profit closer to the economy's general rate of profit. Marx puts it as follows:

Competition levels the rates of profit of the different spheres of production into an average rate of profit through the continual transfer of capital from one sphere to another. The fluctuations of profits

caused by the cycle of fat and lean years succeeding one another in any given industry within given periods must, however, receive due consideration [...] Experience shows, moreover, that if a branch of industry such as say, the cotton industry, yields unusually high profits at one period, it makes very little profit, or even suffers losses, at another, so that in a certain cycle of years the average profit is much the same as in other branches. And capital soon learns to take this experience into account. (*Capital*, vol. III, p. 208)

This kind of turbulent equalization of profit rates implies that each industry's average profit rate should repeatedly cross over with the economy's average. In econometric terms, the time series data of the deviation of an industry's profit rate from the economy's average rate of profit should be stationary. In other words, the dispersion of the rates of profit around the average takes place quite regularly and never comes down to zero. This type of equalization does not mean that the two rates of profit eventually become equal to each other, but rather that at any moment in time, the two profit rates are unequal and, after long periods, the differences tend to cancel each other out.⁸ Put it in statistical terms the variance of the deviations of industries' profit rates from the economy's average should not display any particular pattern.

The second consequence of competition between industries is that the equalization of sectoral profit rates implies that the level of profit margins on sales (or on cost) is directly related to capital-output ratios. This result is derived in a straightforward manner from the definition of the profit rate. Thus, we write,

$$r = \frac{S}{K} = \frac{S/Q}{K/Q} = \frac{m}{K/Q} \text{ and } m = r \frac{K}{Q}$$

Where r is the rate of profit, S is the total profits, K is the fixed capital stock, Q is the gross output or total sales, m is the profit margin on sales and K/Q is the capital-output ratio.

The above formulation shows the direct relationship between profit margin on sales and the capital-output ratios. If there is an equalization of profit rates in the economy, the unequal capital-output ratios imply unequal profit margin on sales between industries. A necessary consequence of the tendential equalization of the profit rates is that the profit margins on sales (or cost) tend to be proportional to the

⁸ For a formal presentation of the long-run equalization of profit rates as a gravitational process see Duménil and Lévy (1987) and Flaschel and Semmler (1987).

relative capital-output ratios.⁹ Thus the high profit margin on sales or costs do not necessarily reflect a kind of monopoly power possessed by firms over the market forces but rather the high profit margin on sales may simply ascertain the operation of capitalist competition and the interindustry equalization of profit rates to the economy's average.

A third consequence of competition is that for industries with a high capital-output ratio and thus high entry (and also exit) costs, variations in demand will be reflected more in variations in capacity utilization and less in price variations through the acceleration or deceleration of capital accumulation. In other words, when demand changes, industries with a high capital-output ratio tend to absorb demand variations through the necessary adjustments in the rate of capital utilization and employment, and less through price changes.

The observed large amounts of reserve capacity in the capital intensive industries as well as their sticky prices some heterodox economists have interpreted them to mean indexes of monopoly power, however on closer examination these same phenomena are precisely those that one expects to derive from the operation of capitalist competition. The firms activated in the heavy capital requirements industries tend to maintain relatively large amounts of reserve capacity, but this is quite normal for the size of these firms because it costs them less to accommodate variations in demand by fluctuations in their reserve capacity and not by changes in prices or output. And only in the longer run these firms respond to changes in demand by changing prices, profit margin on sales and profit rates. Thus if demand increases the heavy capital requirements industries will experience high profits as they reduce their reserve capacity and, at the same time, new investment and entry of firms are not easy because of high cost. The converse will be true if demand falls, the increase in excess capacity and the low profits will persist as disinvestment and exit of firms from these industries become costly in the short-run (see also Shaikh, 1980, Semmler, 1984 and Botwinik, 1994).

Once again, the observed price rigidity in industries with heavy capital requirements per unit of output is not necessarily a reflection of monopoly power, but rather the expected result of the operation of competition. In similar fashion, the profit

⁹ For an empirical test of this as well as of other core propositions of alternative theories of competition with respect to the determinants of the profit margins on sales see Semmler (1984) Ochoa and Glick (1992), Tsaliki and Tsoulfidis (1998).

rates in these heavy capital requirements industries are also expected to display smaller variability than those industries characterized by light capital requirements per unit of output. The idea is that if more of the variability in demand is absorbed in output than in price variations, it follows that the rate of profit will be less variable in high capital-output ratio industries than in the low ones.¹⁰

Regulating capital and its rate of profit

In the analysis of competition in Marx's *Capital*, we stumble upon the following seemingly contradictory situation. On the one hand, the rates of profit tend to be equalized across industries and, on the other hand, there is a stratification of the rates of profit between firms (capitals) within the same industry. How can these contradictory observations be reconciled? The answer is that the equalization of profit rates refers to the average rate of profit of all firms comprising the industry, and an industry consists of firms that use the latest technology and ideal location and firms with outdated technology and less privileged and therefore higher cost location. Classical economists were aware of these limitations in the flows of capital, and, therefore, they considered as the relevant rate of profit not necessarily the mean rate of profit but rather the type of capital where expansion or contraction of accumulation takes place. In a sense, classical economists had a view of marginal capital not in the neoclassical (or strictly mathematical) sense of infinitesimally small change, but rather as the type of capital on which changes take place. In Ricardo, for example, this kind of marginal capital is always associated with the worse (or in Ricardo's wording) the "most unfavourable" conditions of production, whereas in J.S. Mill (1848, p.131) with the best, while in Smith the pin factory, "a very trifling manufacturing", as he notes, is certainly not identified with the two extreme situations, but certainly with the one that changes take place and, therefore, shape the rhythm of capital accumulation characterizing the industry as expanding or contracting. The usual example is the case of agriculture, where the most fertile lands are already cultivated and are not available. In this situation, when demand expands, so does production but to less fertile lands provided that the selling price secures the normal (average) rate of profit. In this sense the type of land where expansion occurs is the "best" available. Ricardo

¹⁰ Practically, this means that the heavy capital requirements industries will display profit rates that will remain above (or below) the average for longer period of time than the light capital requirements industries (see also Botwinick, 1994, pp. 143-150).

(1821, p. 73 and pp. 86-87) dwelled in the details of this concept of regulating capital which he identified with “the most unfavourable” circumstances in agriculture and mining and he generalized it (to our view not successfully) to the rest of the economy.

In the other industries, the regulating conditions of each sector are determined by exactly the same method; that is, by the type of capital where expansion or contraction of accumulation takes place. The concept is similar to what business people and also input-output economists call “the best-practice method of production”. This should not lead to the conclusion that all firms adopt this method of production immediately, since firms operate fixed capitals of different vintages and managers have different expectations about the future direction of demand and profitability. Consequently, firms do not easily switch from one method of production to another. However, new capitals are expected to enter into the method of production, which can be duplicated and, furthermore, the expected rate of profit is attractive enough. The production method which is targeted by the new entrants is usually the most recent in the industry and not the older or the most profitable. The older methods of production, *ceteris paribus*, will have a rate of profit lower than the average, whereas the most profitable methods of production may not be easily reproducible or their reproduction may be associated with a certain degree of risk, which new entrants may not wish to undertake. Hence, over “a cycle of fat and lean years”, that is, a complete business cycle, there is a tendency for the rate of profit to equalize among regulating capitals across industries. In other words, investment flows, by and large, are attracted neither by the old type of capitals because of low profitability nor by the very new type of capitals because they are usually associated with too much risk and employ new, non-tested and not easily reproducible technologies (because of patents, better location, *etc*). In general, the regulating conditions of each industry may not necessarily coincide with the average conditions but are rather determined by the type of capital associated with “the lowest cost methods operating under generally reproducible conditions” (Shaikh, 2008, p. 167).

The rate of profit earned on regulating capital is, therefore, the measure of new investment's return and determines the rhythm of accumulation in industries. If two regulating capitals have different rates of profit, the investment will flow differentially even in the industry with the lowest rate of profit, because of uncertainty and differences in expectations among investors. It is important to point out that the regulating conditions of production do not necessarily specify a single rate of profit,

but rather a narrow spectrum of rates of profit. This is true even in the case of a single regulating condition of production, because there are still differences in management, demand, *etc.* which may give rise to profit rate dispersions. Consequently, at any given moment in time, the rate of profit between regulating capitals across industries are not equal and only in the long run is there a tendential equalization of the respective rates of profit to an average.

The problem with the concept of regulating capital is its quantification in real economies. In principle, one can distinguish these conditions by observing an industry over time and collecting data for a group of firms with certain characteristics that persist over time. One way out is Shaikh's (1995 and 2008) idea according to which although we may not know the regulating capitals of each industry, however, we can estimate the profitability of these capitals through the concept of "incremental rate of return on capital" (henceforth IROR). In fact, the concept of IROR is used in the literature of corporate finance to assess the profitability of firms and forms one of the "fundamentals" that investors consider in their investment decisions. The argument is that the rate of profit which tends to be equalized between industries is not necessarily the mean rate of profit of the total industry but rather the rate of profit corresponding to the regulating conditions of production within an industry. In this context, the IROR is approximated by taking into account the following considerations: investment flows are conditioned more by a short-run rate of return such as the incremental rate of profit than the rate of profit over the lifetime of investment. Hence, Shaikh (1995 and 2008) expresses current profits (S_t) that accrue to a firm as the sum of profits from the most recent investment (the product of IROR, ρ_t , times investment of the previous period, I_{t-1}) and profits from all previous investments (S^*). Consequently, we write

$$S_t = \rho_t I_{t-1} + S^*$$

If we subtract profits of the past period from both sides of the above equation and solving for ρ we get:

$$\rho_t = \frac{\Delta S_t}{I_{t-1}} + \frac{S^* - S_{t-1}}{I_{t-1}}$$

The second term of the right hand side of the above equation is supposed to be negligible in comparison to the first and, for all practical purposes, it can be ignored.

The justification is the view that the shorter the evaluation horizon, the closer the current profits from all previous investments S^* to the last period's profit on the same investments (S_{t-1}). Moreover, since uncertainty and ignorance increase with the passage of time, it is reasonable to assume that the short-run (up to a year) is the relevant time horizon. After all, current profits are fraught with many ephemeral factors, and we know that abnormally high or low profits direct investment accordingly, which in turn gives rise to new uncertainty and thus profits or losses, and so forth. With these considerations in mind, it is reasonable to assume that expectations about future returns to investment are short-sighted; that is, expectations depend on the short-run rate of return. Consequently, the relevant index of profitability is the one estimated on new investment. Thus, we have

$$\rho_t = \frac{\Delta S_t}{I_{t-1}}$$

that is, the change in profits of each industry divided by the investment of the last period.

Alternatively, we can derive the IROR from the simple definition of the rate of profit $r_t = S_t/K_{t-1}$ or $S_t = r_t K_{t-1}$.¹¹ We differentiate with respect to K_{t-1} and we get:

$$\frac{dS_t}{dK_{t-1}} = r_t + K_{t-1} \frac{dr_t}{dK_{t-1}} = r_t \left(1 + \frac{dr_t}{dK_{t-1}} \frac{K_{t-1}}{r_t} \right) = \rho_t.$$

Where the connection between the IROR or ρ_t and the term dS_t/dK_{t-1} is based on the usual definition of the capital stock, $K_t = (1-\delta)K_{t-1} + I_t$, where δ is the depreciation rate and I_t is the gross investment. It follows that $\Delta K_t = I_t - \delta K_{t-1} = I_{Nt} =$ net investment. Thus, $dS_t/dK_{t-1} \approx \Delta S_t/I_{Nt} = \rho_t$. The fraction in the parenthesis above stands for the elasticity of the profit rate with respect to capital stock for which the following hold,

$$\text{if } \left(\frac{dr_t}{dK_{t-1}} \frac{K_{t-1}}{r_t} \right) \geq 0 \text{ then } \rho_t \geq r_t$$

$$\text{if } \left(\frac{dr_t}{dK_{t-1}} \frac{K_{t-1}}{r_t} \right) < 0 \text{ then } \rho_t < r_t$$

Clearly, the volatility of ρ with respect to the average rate of profit is determined by this elasticity of the profit rate with respect to investment. It can be shown that the IROR is a variable that can be broken down to its constituent components; that is, the wage (or profit) share, productivity, capacity utilization and also capital-output ratio.

¹¹ For the justification of lagged by one period capital stock (see also Shaikh, 2011).

In order to show the operation of all these variables, and starting from the simple definition of income (Y), we may write

$$Y_t = r_t K_{t-1} + w_t L_t$$

whose derivative with respect to K_{t-1} gives

$$\frac{dY_t}{dK_{t-1}} = r_t + K_{t-1} \frac{dr_t}{dK_{t-1}} + w_t \frac{dL_t}{dK_{t-1}} + \frac{dw_t}{dK_{t-1}} L_t = \rho_t + w_t \left(\frac{dL_t}{dK_{t-1}} + \frac{dw_t}{dK_{t-1}} \frac{L_t}{w_t} \right)$$

and solving for ρ_t , we get

$$\rho_t = \frac{dY_t}{dK_{t-1}} \frac{K_{t-1}}{Y_t} \left[1 - w_t \frac{L_t}{Y_t} \left(\frac{dL_t}{dY_t} \frac{Y_t}{L_t} + \frac{dw_t}{dY_t} \frac{Y_t}{w_t} \right) \right] u_t \left(\frac{Y_t}{K_{t-1}} \right)^*$$

From the above it follows that the IROR is directly related to the elasticity of output with respect to capital $(dY_t/dK_{t-1})(K_{t-1}/Y_t)$,¹² the rate of capacity utilization, $u_t = (Y_t/K_{t-1})/(Y_t/K_{t-1})^*$, the growth rate of labour productivity $(dY_t/dL_t)/(L_t/Y_t)$ and to the normal capacity output-capital ratio $(Y_t/K_{t-1})^*$. In addition, the IROR is inversely related to the share of labour income $(w_t L_t/Y_t)$ and the elasticity of wage with respect to income $(dw_t/Y_t)/(dY_t/w_t)$.¹³

The Figure below depicts the expected trajectories of the two rates of profit. We observe that the IROR, that is, the volatility of the short-run rate of profit is expected to reflect the uncertainty and all the noise and short-run behaviour in the economy. Thus the IROR is depicted as orbiting around the average rate of profit of the industry which displays much less variability.

¹² Of course, this elasticity in the case of a one-commodity world (or when the capital-labour is uniform across industries) is equal to the profit share of the economy.

¹³ It is important to note that the IROR is closely related to the internal rate of return (d) which is used in the economics of industrial organization and of corporate finance (See Tsoufidis and Tsaliki, 2011).

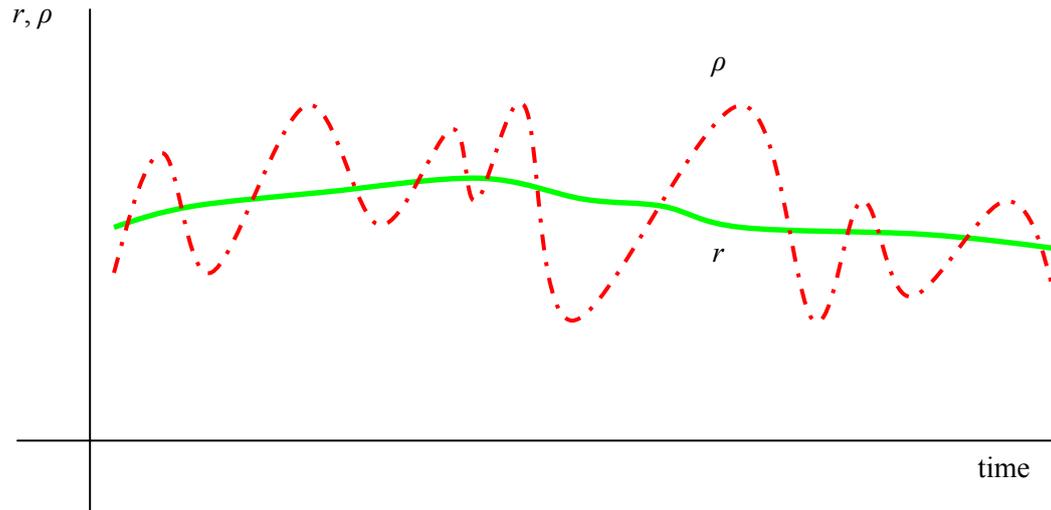


Figure. Average rate of profit vs. IROR

Figuratively speaking, the two rates of profit share approximately the same mean, although the variance of the IROR is much higher than that of the average rate of profit.¹⁴ The rationale is that the average rate of profit is the profits of all firms comprising the industry divided by the total capital of the industry; as a result, in the so estimated average are included firms with excessively high profit rates and firms with the lowest profit rates and taking the (weighted) average is likely that such extreme rates of profits will cancel each other out giving rise to an average with not much variability. By contrast, the group of firms forming the regulating conditions pretty much share the same type of production methods and are those where the inflow and outflow of investment takes place and thus their average profitability is expected to display considerably more variability than that of the industry wide average. As we showed the IROR and the average rate of profit are strictly related to each other and their difference is reflected in the elasticity of profit rate with respect to investment, a very volatile variable making the IROR to fluctuate erratically around the average rate of profit. Clearly, while the volatility of the IROR exceeds that of the average rate of profit by much, we cannot say the same thing with respect to their long-run averages which we do not expect them to differ in any substantial way. It goes without saying that in the cases of special industries such as for example those with non reproducible conditions (*e.g.*, agriculture, oil industry and the like) the

¹⁴ For actual estimates of the average IROR and the economy wide average rate of profit see Tsoulfidis and Tsaliki (2011).

regulating conditions will give rise to an (average) IROR much lower than the industry's average and the converse will be true in the technologically advanced industries, whereby the IROR although fluctuating nevertheless is expected to exceed persistently the industry's average.

5. Concluding Remarks

If perfect competition is an imaginary situation imposed by the requirements of the neoclassical theory, then we can say that the so called "monopolistic competition" revolution of the 1930s essentially led to the establishment of the unrealistic model of perfect competition not only for theoretical purposes but also to inform policy decisions. As a result, the classical conception of competition, as a process of rivalry between firms over market shares was set to the fringes of economic analysis. It is only in recent years that we are witnessing the resurfacing of the notion of competition as a process in the works of Marxists, Schumpeterian and Austrian economists. It is important to stress that the classical conception of competition because of its realistic approach can be also identified in the business literature. The work of Porter (1990) as well as the resource advantage theory (Hunt, 2000) have much in common with the dynamic conception of competition as a process of rivalry between firms in their incessant struggle to increase their market share by increasing productivity and reducing unit cost and by undercutting prices leading to a gradual displacement and subsequent absorption, or simply elimination, of rival firms. It is obvious that this kind of competition is not the same with "competition" as a static situation, where firms have all the time they need to decide on the amount of output to be produced based on a given price. The same argument holds true for other forms of competition, such as the monopolistic or oligopolistic competition, because these models are essentially attempts to inject doses of realism to the static and apparently unrealistic model of perfect competition. In our view, if one rejects the notion of perfect competition, then one should also reject the various derivative expressions of this "competition" which appear under the rubric "monopolistic" or "oligopolistic" competition.

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