

Classical and Neoclassical Elements in Industrial Organization

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The treatment of profits in neoclassical theory has long been the object of sustained criticism from many quarters (Sraffa, 1960; Marx, 1981; Pasinetti, 1977). The debate has remained for the most part theoretical. This may leave the impression that what is involved is simply a clash of incommensurable paradigms. But in fact the neoclassical notion of profits bears little relationship to the behavior of real profits in real economies, and has proven to be a poor guide to empirical research. This article will try to show this by examining industrial organization studies of monopolistic and competitive pricing. Our analysis will focus on the central debates of the 1950s, 1960s, and 1970s which formed the theoretical basis of the modern industrial organization paradigm.¹ We will argue that despite claims to the contrary, and often unknowingly, the majority of these studies adopted a mixture of both classical and neoclassical elements.² We will try to show that the lack of a firm theoretical grounding has led to three types of confusion in this literature. First, there is a lack of clarity concerning what measure of profitability should be equalized in competitive equilibrium. A debate has developed concerning whether the rate of profit, total profit, or the profit margin, is the appropriate variable to study. Second, the industrial organization approach to monopoly and competition has never adequately resolved over what period of time profit-rate differentials must be studied. In this regard, Yale Brozen's criticism of the short-run nature of early profit rate-market structure studies is discussed. Third, we will argue that from a classical point of view, firm studies of profitability which draw conclusions for industry phenomena have been misguided. Harold Demsetz' work on concentration and efficiency will be referred to as an illustration. We will conclude by questioning the practicability of a purely neoclassical grounding for industrial economists, since they have been impelled to abandon this approach in their investigation of reality.

THEORETICAL FOUNDATIONS

In order to understand the theoretical basis of applied studies of monopoly and competition we will first consider the classical and neoclassical theories of price as comparable paradigms. We will try to formulate the empirical guidelines that each theory offers the applied economist. When approaching the neoclassical view we will consider it through the eyes of the industrial organization field, which has tried to modify its understanding of neoclassical economics to make it more applicable to empirical research.

Classical Theory

The classical theory of price can only be understood if we bear in mind that the basic classical concept of the firm differs significantly from the neoclassical version. In the neoclassical theory, as we elaborate below, the firm is seen as an agency which hires the factors of production and seeks to maximize the mass of profits, defined as the difference between total revenue and total costs. Only in more elaborate recent models are such features as credit rationing and asymmetric information introduced. The basic concept of the firm in classical theory, by contrast, assumes that the firm owns a finite amount of money capital which it seeks to expand as fast as possible; financial markets, and interest as the opportunity cost of capital, are introduced to the analysis as subsequent refinements. Under such conditions, profit maximization is

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equivalent to maximizing the rate of profit on the firm's capital, and it is the latter formulation that the classicals used.³

The classical analysis of prices has been described by a number of authors (Eatwell, 1982; Dumenil & Levy, 1984; Clifton, 1977; Semmler/Flaschel, 1985, Shaikh, 1978). According to the classical economists, in the competitive process there is a double mechanism which pushes industry profit rates toward equality in the long run. On the one hand, investors move capital across industries seeking the highest rate of profit, and therefore expand the supply in those industries with above-average profitability. On the other hand, augmented supplies meet demand constraints which force down prices and profits. The same process can work in reverse as well, as capital exits low-profit-rate sectors. Such a crossover dynamic process has been modeled in a number of different ways and shown to converge to an equalized rate of profit (Dumenil & Levy, 1984; Semmler/Flaschel, 1985; Borrgio, 1984). In the classics, complete adjustment is described only as a long-term regulating position, since constant perturbations in the economy transform this convergence process into one of oscillation. Empirically, the classical expectation would be the existence of unequal rates of profit at any one time, due to the continually present oscillatory deviations. But over a long-run period, industries should have equal average profit rates, which largely wash out the short-term fluctuations and approximate the uniform profit rate consistent with the long-run equilibrium prices which act as "centers of gravity." This view can be found in an explicit form in Smith, Ricardo and Marx: Smith calls this the "natural price;" Marx calls them "prices of production."

Marx developed further the distinction between firm and industry rates of profit. In Marx's discussion, competition first establishes a single uniform price for each industry. Given different cost structures, a single industry price implies that firm profit rates remain heterogeneous. The process of the formation of prices of production through capital movements equalizes the average rates of profit between industries, i.e., rates of profit on the average conditions of production in each industry:

What competition brings about, first of all in one sphere, is the establishment of a uniform market value and market price out of the various individual values of commodities. But it is only the competition of capitals in different spheres that brings forth the production price that equalizes the rate of profit between those spheres (Marx, 1981, p. 281).

However, in Marx's view, a uniform price in each industry combined with the existence of various technologies and cost structures, leads to the logical consequence of an equalized rate of profit across industries coexisting with a hierarchy of firm rates of profit within industries. This is the case which the classicals believed would exist empirically because of the constant process of unequal firm innovation. Thus, we can distinguish between two types of equilibrium states. The situation emphasized by Marx has been labelled "quasi" equilibrium, as opposed to "full" equilibrium, the latter being the long-run state where both firms and industry profit rates are equalized (Dumenil & Levy, 1984).

If we begin with Smith and Ricardo and trace the development of the classical paradigm of competition through Marx (without ignoring its modern developments), we can derive a number of empirical expectations for a competitive economy which should guide empirical work on monopoly and competition.

1. Capitalist firms respond to signals from differential profit rates. Other balance sheet and income statement ratios should be considered as secondary regarding capital's decisions to invest.
2. The movement of capital equalizes rates of profit between industries, and to a much lesser extent, between firms.
3. At any point in time, industry profit rates should be expected to be unequal. Thus, a classical study of competition must be long-run in nature. According to the classics, only long-run industry average rates of profit should tend to be equal.

Neoclassical Theory

The neoclassical theory of the firm has two well-defined models which act as ideal limits for the analysis of actual markets: the perfectly competitive model and the pure monopoly model. We summarize the features of each below.

The core model of neoclassical theory is the static textbook parable of the firm in a perfectly competitive market. Economists are quite familiar with this model. It is used to instill the neoclassical "vision" of a competitive market economy, yet it is seldom seriously investigated or used as the basis of applied work. In this model, the firm is assumed to be operating so as to maximize profits at every instant of time, where profits are defined as total revenues, net of all costs (including the cost of capital). The firm is an economic agent which purchases the services of the factors of production and combines them to produce a homogeneous output (condition (i) for a competitive market). It operates within an industry, defined as the collection of all firms which produce the same kind of output. The number of firms within the industry is infinite, or at least large enough so that, even in the presence of less-than-infinitely-elastic market demand, variations in the level of output by any one firm do not affect the market price of the good (condition (ii) for a competitive market) (Varian, 1984, p. 82)

For a such a competitive market to be judged perfect we require the following additional properties:⁴ (iii) perfect communication, (iv) instantaneous equilibrium, (v) zero transactions costs.⁵ When all these conditions are fulfilled for an entire perfectly competitive economy, all firms earn zero economic profits, since the presence of positive profits would mean that some reallocation of productive resources (by existing or new firms) could improve the overall efficiency of the economy. The latter is not possible in equilibrium if conditions (i) through (v) hold.

Neoclassical economists are fully aware of the "unreality" of such a model of market behavior of firms. They correctly maintain, however, that scientific knowledge largely consists of developing such abstract models as the way of uncovering the fundamental structure of reality:

... this competitive story represents a limiting case of market behavior that is very useful for economic analysis, just as the study of a frictionless system is useful for a physicist. (Varian, *ibid*)

The real question, however, is not the legitimacy of this kind of limit-case analysis, but whether real firms and markets are more or less imperfect approximations to this particular ideal type, or instances of an altogether different one, such as the ideal type in classical theory discussed above.⁶

The polar opposite of perfect competition is pure monopoly. Here the firm equals the industry, so the industry demand curve is directly perceived by the firm. As is well known, in such a situation the marginal revenue curve lies well below the demand (average revenue) curve. This means that the profit-maximizing equation of marginal costs to marginal revenues will yield a suboptimal output level and a selling price well above marginal cost. This model thus allows for economic profits to obtain at equilibrium.

While this model is useful to show the efficiency losses due to departure from perfect competition, it is just as unrealistic as the latter for most industries. It requires a single seller free to set prices at will, with no threat of potential entry by other firms.

These two polar cases—perfect competition and perfect monopoly—represent the core models to which industrial organization economists refer as their starting point for any subsequent static analysis of market structure.⁷ The question of dynamic behavior is not explicitly addressed in the textbooks. Nevertheless, any attempt at empirical investigation forces the researcher to operate under some assumptions about dynamic firm and market behavior, whether the assumptions are explicit or not.

Statics and Dynamics

The most rigorous version of the model of perfect competition is Walras' model of general equilibrium, which received its highest formal expression in Debreu (1959). In this version of the model, there exists a unique price vector which uniquely clears all markets (both present and future) and achieves a Pareto-optimal intertemporal outcome. A major weakness of this model is that it requires a mythical auctioneer to discover this unique price vector before any exchanges can take place. Once this is done, all exchanges, for time zero to infinity, take place on that basis.

Thus this model does not admit of any dynamics whatsoever: no exchanges take place until the economy achieves equilibrium, and once it does all exchanges are set for all time. This is even stronger than saying that a changing economy is in equilibrium at every instant: it says that there is only *one*

(intertemporal) equilibrium, with all temporal development collapsed into it. Clearly this is too unrealistic to even consider as the limit case for actual markets. So applied economists operate with a putatively less sophisticated but more realistic "vision" of dynamic adjustment, based on Marshallian partial-equilibrium analysis.

As is well known, Marshall distinguished between short-run and long-run equilibrium in a single market. Short-run equilibrium typically involves selecting the profit-maximizing level of output for a fixed plant capacity, whereas long-run equilibrium allows for adjustment of industry capacity. The implicit dynamic behavior from short- to long-run equilibrium is as follows:

1. If price $>$ minimum average cost (profits $>$ 0), then industry supply will increase until price = minimum average cost.
2. If price $<$ minimum average cost (profits $<$ 0), then industry supply will decrease until price = minimum average cost.

This model of firm behavior is more realistic and therefore resembles more closely the model which applied economists implicitly use in their work. There are some well-known problems with it, however, due to the fact that the analysis is confined to a single industry. This leaves open the question of whether the adjustment process converges once the impact on other industries and their feedback effects is taken into account. As things now stand, neoclassical economics is left with a grand vision of equilibrium with no plausible story of how the economy converges to it, and a small vision of dynamic adjustment to equilibrium which is incapable of specifying toward what the adjustment proceeds.⁸

In spite of these unresolved problems, the Marshallian view of dynamic adjustment is the one most economists subscribe to. Moreover—although this is not a necessary consequence of the theory—most adherents to this model believe that the economy is normally in long-run equilibrium. Thus in this view the occasional external shock is responsible for the sporadic cases of disequilibrium. Such shocks perturb firms and markets from their equilibrium state, after which there is a damped asymptotic convergence back toward the equilibrium position. With respect to profits, therefore, this version of the basic model implies that—occasional short-run profits and losses notwithstanding—profits should equal zero in the long run throughout the economy.

As discussed above, the firm in neoclassical theory is an economic agent which seeks to maximize gains by hiring factors of production and selling the resultant output for more than it cost to obtain them. In its purest form, the neoclassical firm does not own any productive assets on which it seeks to maximize the rate of return; rather, it seeks to maximize what amounts to economic rent by strategically placing itself in the proper market. It is therefore no accident that the textbooks show this firm maximizing the total mass of profits, rather than any *rate* of profit (i.e., the ratio of profits to some measure of assets).

In Marshallian short-run equilibrium, the plant capacity is fixed; for this case, therefore, maximizing total profits also means maximizing the ratio of total profits to (fixed) productive assets.⁹ The dynamic adjustment process to long-run equilibrium, however, is ruled by the firm's search for profit maximization. Once the amount of capital is free to vary, profit-maximizing behavior will no longer be equivalent to profit-rate-maximizing behavior. Assume that a neoclassical firm is faced with two alternative investments: project A, which is expected to yield, say, one million dollars with a three million dollar investment, and project B, which will yield one million and one dollars on a *thirty* million dollar investment. Neoclassical theory tells us that the firm will choose project B.¹⁰

We have seen that the only theory of dynamic firm behavior that Neoclassical theory has consists of the transition from short- to long-run equilibrium. The long-run is defined by Marshall as the time frame necessary to make all inputs variable. However, the standard theory is not a growth model, so it specifically assumes other factors to remain constant, most notably the level of technology. This has significant consequences for the theory.

By assuming a constant technology, it follows that the optimum plant size (by extension, firm size) is fixed. This implies that the long-run adjustments of capacity in an industry take place through the entry and exit of firms (plants) using identical technology. It follows that when profits in an industry are positive, the same level of profits obtains for all firms in it. And when long-run equilibrium is achieved, that is, when

entry or exit no longer take place, profits are zero for all firms in that industry. In Neoclassical theory, therefore, there are no inframarginal firms earning positive profits in an industry in long-run equilibrium. This unexamined assumption has led to confusion in the literature when contrasting the results of firm and industry studies, as we discuss below.

Theoretical Compromises in Industrial Organization

In industrial organization, on the other hand, there exist no generally agreed upon basic models of economic behavior, and the underlying assumptions are often contested . . . In industrial organization, investigators simply do not have the same degree of confidence in their theoretical constructs as exists in other areas" (Comanor, 1971, p. 405, 407).

In the 1950s, in order to formulate empirically testable hypotheses, the industrial organization field bypassed the neoclassical notions of perfect competition or workable competition, in favor of the structure-conduct-performance paradigm. This framework was developed as an inductive generalization of purely descriptive industry studies done in the past (e.g., Berle & Means, 1938, and case studies by Edward Mason's Harvard group during the late 30's and early 40's). In this paradigm, market structures (primarily the degree of concentration and barriers to entry) and conduct (firm strategies regarding product innovation, advertising, R and D, etc.) determine performance (allocative and productive efficiency). This paradigm, it was hoped, would allow relationships to be established empirically, thus avoiding the problems of theoretical specification.

Unfortunately, the structure-conduct-performance paradigm cannot solve the problems industrial organization faces because it still requires implicit notions of the firm and its objectives, of markets, and of competition. Because of the lack of realism of these concepts in neoclassical theory, applied industrial economists have been forced to rely on ad hoc hypotheses which are in greater agreement with economic intuition and actual business practices. This practical approach to theory has unconsciously led the industrial-organization field back to elements of the classical theory of competition. This is the contention which we wish to demonstrate below, by focusing on three issues: the rate of profit, long-run dynamics, and the theoretical distinction between firms and industries.

DIFFERENCES OVER THE PROPER MEASURE OF PROFITABILITY

Profit-rate differentials have become a primary indicator of allocative inefficiency and have been related to market structure in a large number of studies.¹¹ Yet, there is simply no way to theoretically derive the link between allocative efficiency and the rate of profit on assets within neoclassical economic theory, if by profit we understand economic profit in excess of imputed interest. As is well known, neoclassical theory only establishes a link between monopoly and profit margins (profits/sales), where the latter depends on the elasticity of demand for the product.

In neoclassical theory, the existence of any economic profits in excess of all costs (including the cost of capital services) is incompatible with the efficient allocation of resources which only obtains in perfect competition. This is due to the neoclassical view of firms as ". . . essentially brokers between resource owners and consumers" (Stigler, 1957). In this view, the rate of return on capital (the rate of interest) is equalized throughout a competitive economy. However there is no concept of the profit rate as profit relative to some asset value, since capital in the neoclassical view is simply another factor of production whose services are hired. The equalization of rates of profit between industries is therefore explicitly treated only in classical economic models. Nevertheless, as we shall see below, this notion keeps intruding into the debates in the industrial organization literature.

After the second World War, the focus in industrial-organization studies switched from specific industry studies to statistical tests of an inter-industry nature. This was done in an attempt to establish general relationships between industrial structure and performance. Probably the most influential pioneering article of this type was Joe Bain (1951). Bain's 1951 article introduced the study of profit rate and market structure as an approach to monopoly and competition. Bain's model of the economy's

dynamic behavior is for the most part of unacknowledged classical origin and will be discussed in the next section. However, he does subscribe to the conventional neoclassical view that firms seek to maximize the total mass of economic profits, not the rate of return on their own assets:

The assumed motive . . . [of firms] is to maximize aggregate profits, and not average equity rates. Higher aggregate profits, in a given demand and cost situation, give a higher . . . excess profit rate on sales than lower aggregate profits associated with lower prices, but not necessarily a higher equity rate if the equity-sales ratio is sufficiently lower in the low-aggregate-profit case (Bain, 1951, p. 297)

Although Bain actually measures the profit rate on equity, he argues that this is used only as a proxy for profit divided by sales. And it is the latter which is the appropriate measure in his view, because monopoly power is seen as the ability to raise unit price above costs. Thus, the size of the profit-sales ratio is in turn a proxy measure of the degree of monopoly power.

Bain constructed his study as a cross-sectional regression between concentration ratios and profit rates for the average of the year 1936 to 1940. Although he found only a weak (but statistically significant) relationship, he concluded that collusive activity must be preventing the (classical) competitive process from occurring.

A second major study of competition and monopoly which focused on profit rate and market structure was carried out by George Stigler in 1963. As mentioned earlier, Stigler does not consider the classical analysis of competition to be a distinct paradigm, but instead a loose description of reality made more precise by later neoclassical work. Thus, Stigler discusses "economic theory" in general in his methodological sections. With regard to the measure of profitability which is equalized in competition, he writes:

There is no more important proposition in economic theory than that, under competition, the rate of return on investment tends toward equality in all industries (Stigler, 1963, p. 54).

By rate of return Stigler means the rate of profit on total assets—a notion of rate of return which is classical. Like Bain, rather than actually measuring the extent to which industries are gravitating around an equal long-run average, Stigler is concerned to measure the relationship between concentration and profit rate for a ten-year average. His results are unimpressive and he concludes against a strong version of collusion-determined differential profit rates. What is interesting for our purposes, however, is the disagreement between Bain and Stigler over what is the proper measure of profitability which (a) should be equalized under competitive conditions, and (b) should be used as a measure of monopoly power.

The Bain and Stigler studies are the most famous of the market structure/profit rate studies and they initiated a huge literature on the topic. This literature, in general followed suit in adopting the classical version of competition, although there are many subtle differences between the various authors. Important among these is the study by Michael Mann in 1966, since this paper introduced the study of barriers to entry into empirical market structure/profit rate analyses. Mann also explicitly adopted a rate of profit for his analysis. Mann found a relationship between high-profit-rate industries (for the years 1950-1960) and a complex set of variables which he called "barriers to entry."¹² Mann's study is classical in the sense that barriers to entry are also an important part of the classical discussion. Smith, for example, cites state interference and lack of information as a barrier to competitive equilibrium (Smith, 1965, p. 61). Marx also often discusses nonreproducible resources as a barrier to the free flow of capital.

David Qualls has been prominent in the exception he has taken to the classical notion of non-equalized profit rates as an indicator of monopoly. According to Qualls, microeconomics requires the analysis of excess profit or unequal profit margins rather than profit rates, and he is critical of Bain and others for having introduced the concept of the rate of profit. He writes for example:

The consideration that rates of return on equity may be inadequate indicators of price-cost margins could conceivably be an important limitation of the previous studies. All the theoretical arguments developed by Bain in regard to the impact of concentration and the height of entry barriers on resource allocation performance actually relate to the relationship of long-run price-economic cost margins to concentration and entry barrier heights. As is well known, a ranking of firms on the basis of accounting profit rates on equity would not necessarily correspond to a ranking of firms based on excess or economic profit rates on sales . . . (Qualls, 1972, p. 148).

Qualls reran the computation in the Bain and Mann articles using the same industries, time periods, and definitions of concentration and barriers to entry, but against profit margins rather than profit rates. His main concern was to study whether the same relationships which Bain and Mann found would also hold. He found that the Bain and Mann results (a weak significant relationship between concentration or barriers to entry and a measure of the profit rate) also held when the "excess profit margin" is substituted for the rate of profit.

In the classical treatment of competition, there is no a-priori appropriate choice of a definition of the rate of profit. Profit can be defined broadly or can be measured after taxes or after net interest. Capital can similarly be measured in different ways, as equity or total assets; it can include or exclude inventories, and can be measured at book value or replacement cost. What is clear in the classics is that what investors maximize is the return on total investment, for which the rate of profit is an empirical proxy. A whole range of uncharted waters concerning the best measure of the rate of profit exist. But without knowledge of this issue, it is impossible to determine whether profit rate differentials are the result of bias in measurement or some real economic process. These issues have only begun to be addressed (see Glick, 1985, Dumenil, Glick, Rangel, 1986). An important obstacle to this research is the idea that the maximization of total profits is the objective of firms, a view which is constantly finding its way back into the literature.

LONG-RUN VERSUS SHORT-RUN PERIODS

Most economists doing empirical work, following Marshall, distinguish between short-run and long-run equilibrium, and expect the economy to be at least sometimes in a long-run disequilibrium position. A careful reading of the literature, however, reveals the unacknowledged presence of classical notions of the short and long runs among the Marshallian discourse. As discussed in section I, the classical view of long-run equilibrium is that it is a regulator of actual market conditions, the latter fluctuating around the former, but never converging completely to it, due to the constantly changing position of this equilibrium. The Marshallian view was contrasted as one in which a disturbance from equilibrium (an exogenous shock, like a crop failure) leads to a gradual return to equilibrium conditions in a smooth monotonic convergence.

In Bain's study we find an unclear mixture of both views:

The a priori model from which the concentration-profits hypothesis is drawn really refers to firms and industries in long-run static equilibrium . . . The predictions drawn from this model may be extended to actual time-processes situations by arguing that what would hold for long-run static equilibrium should also tend to hold for average performance over time, although with numerous sources of dispersion from the central tendency thus identified (Bain, 1951, p. 306)

By contrast, Stigler's view of competition is one of industry profit rates gravitating around an equal center of gravity, although he never distinguishes his (classical) view from the Marshallian one:

The role of the word "tendency" raises further issues. Economic analysis tells us that the rates of return in competitive industries will be strictly equal (in a sense to be noted shortly) in *long-run equilibrium*, that is, after a period long enough to allow (enough) entrepreneurs to move to the industry they favor and operate at the rate of output they desire. But this very concept of long-run equilibrium reminds us that, in a world where all events are not perfectly anticipated, there will be a stream of unexpected disturbances that call for a stream of changes in the allocation of resources: unanticipated shifts in consumers' desires; the impact upon international markets of wars and political events; the irregular march of major advances in technology, and others (Stigler, 1963, p. 55)

Mann, like Bain and Stigler, unconsciously adopts the classical paradigm of competition when discussing price theory:

The emphasis on the long-run recognizes that actual profit rates may differ from normal in the short run for reasons independent of the number of sellers, e.g., changes in demand or cost which raise or lower profits until the allocation of resources pushes the industry toward long-run equilibrium (Mann, 1966, p. 296).

The precise role of the long run in competition was made an issue of contention in this literature by Yale Brozen's response to the report to President Johnson's task force on antitrust policy. (Mueller, 1986, pp. 8-9) Included in this report was the "Concentrated Industries Act" which would have given authorities a mandate to reduce the market share of firms in concentrated industries, and by doing so, it was claimed, increase economic efficiency. As evidence supporting this proposal, the Bain, Stigler, and Mann articles were primarily referred to. Brozen's argument, embodied in what has become known as the "disequilibrium hypothesis," was that previous studies linking concentration to profit rates were unfaithful to their own theory. Brozen criticized the short-run nature of these studies on the grounds that the equalization of profit rates is a long-run process. Since only the classical theory of competition is long-run in nature, Brozen was criticizing this deviation from classical economics. Specifically, his "disequilibrium hypothesis" maintained that because of technological change in some industries or the relative newness of a particular product, certain industries should be expected to have higher rates of profit than others. By choosing a particular slice of time, researchers had been capturing only a phase in the historical evolution of industrial profitability which should eventually converge toward an average.

Indeed, Brozen was taking economists to task for simply stating the classical hypotheses without taking them seriously in the design of their studies. He is very clear that, in the short-run profit rate differentials should exist and that previous studies had not captured long-run equilibrium. However, he is unclear concerning the role of structural change and perturbation. It seems that, in his view, such disruptions will only result in a temporary disequilibrium rather than a permanent gravitation as in the classics. Thus, even Brozen vacillated at times between classical and Marshallian characterizations of the role of the long run.

In order to demonstrate his hypothesis, Brozen re-examined the data used in the Bain, Stigler and Mann studies. He argued that if these studies truly captured a relationship between profit rate and collusion, then the concentrated industries should sustain higher than average profit rates. If, however, it is disequilibrium which is being observed, then over time there should be some movement toward the average. Concerning the Bain data, Brozen found that:

In the most concentrated half of Bain's list of forty two industries, twelve 'earned' above average (1953-1957 average) rates of return in the period he examined. Nine 'earned' below average rates. We would expect rates in most above average return industries to decline, if this was a disequilibrium situation, accounting rates of return are not differentially biased, and differentials in risks do not cause most of the above average rates. Most did. They declined despite the above average concentration level. Of the twelve above average return concentrated industries, rates declined in nine and rose in three. We would also expect most below average return industries to rise, if this was a disequilibrium situation. Most did. Of the nine below average return industries, rates rose in seven and declined in two (Brozen, 1969, p. 284-285).

Brozen also found the same type of movement among the low concentration industries. Most of the above average rates fell, while most of the below average rates rose. He was careful to state that his hypothesis did not require that all of the industries converge, since a certain degree of perturbation could occur. But he believed, as a general rule, that large groups of industries should be expected to converge.

Brozen recreated the same results on the Stigler and Mann data as well. In both cases, he showed that when the time period was extended there was a tendency toward profit rate convergence. This convergence, in both cases, weakened or eliminated the statistical significance of the relationship found between market structure and profit rates.

In a defense of the deconcentration proposal, MacAvoy, McKie, and Preston attempted to construct a subset of the Bain data which they held consisted of "high and stable" profit rate industries (MacAvoy, McKie, and Preston, 1971). If this non-converging group was related to concentration, then the Brozen criticism might not be generally valid. Such a relationship, to some extent, was found. Brozen, however, replied by again demonstrating that even this smaller sample of high profit rate industries tended to converge over time. Since the sample never actually reached the average level, the debate culminated in a difference of interpretation. Nevertheless, the Brozen point was well made. The industrial organization literature had adopted the long-run classical point of view, but they had not remained faithful in their

methodology by adopting short-run regression methods (cross sectional regressions using one to five year averages).

In subsequent work on profit rate and market structure, the Brozen criticism seems to have been lost. The notion that in any single point in time disequilibrium will prevail has been largely ignored, as contemporary market structure/profit rate studies have utilized more sophisticated econometrics and greater industry detail, but they have not abandoned short-run cross-sectional regression analysis. Unfortunately, neither Brozen nor other applied economists have followed up the insights gained concerning long-run equilibrium. Such a criticism would have never even been necessary within a self-conscious, classically-informed applied research program, since the concept of gravitation necessarily implies long-run measurements.

FIRM VERSUS INDUSTRY PROFITABILITY

A last confusion in this literature is the lack of a clear understanding of the different roles played by firms and industries in competition. As mentioned above, the classicals, and in particular Marx, are quite explicit concerning this point. General equilibrium theory often treats the two in an identical manner, and in the empirical literature the issue often lacks clarity. Harold Demsetz, for example, has argued that the profit-rate concentration relationship is a natural result of the greater efficiency of large firms, and therefore, is not an effect of collusion. He writes, for example, that:

It is important to note, however, that there are reasons other than undesirable market power for expecting a positive correlation between profit rates and concentration. Some market concentration and some correlation of concentration with rates of return should be expected from a workable incentive system that rewards superior performance. Patents, copyrights, et cetera, are likely to produce such a correlation as a result of socially desirable superior performance. Superior abilities in lowering cost or in improving products, even when unpatented, are also likely to yield such correlation for non-trivial periods of time. (Demsetz, 1973a, pp. 19-20)

In order to show that this was the case, Demsetz examined the correlation between concentration and rates of return of large and small firms. In particular, he showed that although large firms in concentrated industries tended to have high rates of return, smaller firms did not.

No positive correlation between rates of return and concentration seems evident for firms under 50,000,000 dollars in asset size, and the smallest asset size classification under 500,000 dollars, shows evidence of a negative correlation. (ibid, p. 20)

Demsetz also found that the change in concentration was related to the change in large-firm profit rates but not to small-firm rates of return. He concluded that this is a result of the fact that more efficient large firms tend to increase industry concentration. Thus, superior performance of large firms led to both higher rates of return and concentration. But here he means higher industry rates of return. Such a proposition is contrary to the classical analysis. As was already argued in the first section, it may be the case that large efficient firms can increase their market share and therefore the degree of concentration in a particular industry, but for "non trivial periods of time" (Demsetz) such a situation can not be responsible for higher industry rates of profit. Superior performance of an individual firm increases its rate of return, according to the classics, at the expense of other firms in the same industry, but it cannot raise the entire industry's rate of profit. Demsetz' own data shows this, since industries whose large firms had higher profit rates showed no increase in industry rate of profit (Demsetz, 1973b, Table 2). This perplexed him:

Since a larger fraction of industry output is produced by larger firms in the more concentrated industries, these industries should exhibit higher rates of return than other industries . . . [However] in table 2, industry rates of return are reduced [to normal levels] even for concentrated industries in which large firms continue to perform well. (ibid)

Within a classical perspective, however, this result is precisely what would be expected.

CONCLUSION

We have shown above that familiarity with the real behavior of firms and markets led economists working in the industrial organization field to at times develop ad hoc categories incompatible with neoclassical theory, and at times to misinterpret data due to the lack of a dynamic theory or a theory of inframarginal profits. To the extent that headway was made in interpreting the empirical results, we saw that classical concepts were unconsciously being reintroduced. What we broadly refer to as classical economists have long been critical of the neoclassical theory's notion of profits and its lack of a realistic theory of dynamic adjustment. What this paper shows is that these theoretical shortcomings have practical consequences. The record of applied industrial organization shows a field where applied researchers are cut adrift as a result, and are forced to make do as best they can. In the language of paradigms, as long as neoclassical theory remains dominant, these results from industrial organization will be seen as "anomalies." Should that dominance fade, however, they will be retroactively seen as evidence of the inadequacy of the old paradigm.

REFERENCES

- Bain, J. 1951. "Relation of Profit Rate to Industrial Concentration, American Manufacturing, 1936-1940." *Quarterly Journal of Economics*, Aug.
- Berle, A.A. and Means, G.C. 1932. *The Modern Corporation and Private Property*, New York: Macmillan.
- Borrgio, L. 1984. "Convergence to Production Prices Under Alternative Disequilibrium Assumptions." University of Milano Mimeo.
- Brozen, Y. 1971a. "Brain's Concentration and Rates of Return Revisited." *Journal of Law and Economics*, Oct.
- _____ 1971b. "The persistence of 'High Rates of Return' in High Stable Concentrated Industries." *Journal of Law and Economics*, Oct.
- Clark, J. 1940. "Toward a Concept of Workable Competition." *American Economic Review*, June.
- Clifton, J. 1977. "Competition and the Evolution of the Capitalist Mode of Production." *Cambridge Journal of Economics*, June.
- Comanor, W. 1971. "Comments." in: *Frontiers of Quantitative Economics*. M. Intriligator, ed., Amsterdam: North-Holland.
- Demsetz, H. 1973a. *The Market Concentration Doctrine*. Wash. D.C.: American Enterprise Institute.
- _____ 1973b. "Industry Structure, Market Rivalry, and Public Policy." *Journal of Law and Economics*.
- Dumenil, G. and Levy, D. 1984. "The Dynamics of Competition: A Restoration of the Classical Analysis." CEPREMAP Working Paper.
- _____ 1985. "The Classics and the Neoclassicals: A Rejoinder to Frank Hahn." *Cambridge Journal of Economics*, Dec.
- Dumenil, G., Glick, M., and Rangel, J. 1986. "The Historical Record of the Rate of Profit in the U.S. 1899-1979." University of Utah Mimeo.
- Eatwell, J. 1982. "Competition." in *Classical and Marxian Political Economy*, Bradley and Howard, ed., London: Macmillan.
- Glick, M. 1985. *Competition versus Monopoly: Profit Rate Dispersion in U.S. Manufacturing Industries*. New School for Social Research PH.D. dissertation.
- Hahn, F. 1970. "Some Adjustment Problems." *Econometrica*, Jan.
- Hahn, R. 1982. "The NeoRicardians." *Cambridge Journal of Economics*, Dec.
- Hirshleifer, J. 1988. *Price Theory and Applications* New Jersey: Prentice-Hall.
- Jacquemin, A. 1987. *The New Industrial Organization* Massachusetts: MIT Press.
- Kirman, A. 1981. "Measure Theory and Applications to Economics." in *Handbook of Mathematical Economics*, K. Arrow and M. Intriligator, eds. Amsterdam: North-Holland.
- Koch, J. 1980. *Industrial Organization and Prices* New Jersey: Prentice-Hall.
- Lipsey, R. and Lancaster, K. 1956. "The General Theory of Second Best." *Review of Economic Studies*.
- Malinvaud, E. 1972. *Lectures on Microeconomic Theory* Amsterdam: North-Holland.
- Mann, M. 1966. "Seller Concentration, Barriers to Entry and Rates of Return in Thirty Industries, 1950-1960." *Review of Economics and Statistics*, Aug.
- MacAvoy, P., McKie, J., and Preston, L. 1971. "High and Stable Concentration Levels: Profitability and Public Policy: A Response." *Journal of Law and Economics*, Oct.
- Marx, K. 1981. *Capital*, Volume III. London: Penguin.
- Mueller, D. 1986. *Profits in the Long run*. New York: Cambridge Univ. Press.

- Novshek, W. and Sonnenschein, H. 1987. "General Equilibrium with Free Entry: A Synthetic Approach to the Theory of Perfect Competition." *Journal of Economic Literature*, September.
- Pasinetti, L. 1977. *Lectures on the Theory of Production* New York: Columbia University Press.
- Qualls, D. 1972. "Concentration, Barriers to Entry, and Long-run Economic Profit Margins." *Journal of Industrial Economics*, XX, 2.
- Scherer, F. 1980. *Industrial Market Structure and Economic Performance* Boston: Houghton-Mifflin.
- Semmler, W., and Flaschel, P. 1985. "The Dynamic Equalization of Profit Rates on Multi-product Industry Levels." New School for Social Research Mimeo.
- Shaikh, A. 1978. "Political Economy and Capitalism: Notes on Dobbs' Theory of Crisis." *Cambridge Journal of Economics*, June.
- Shepherd, W. 1979. *The Economics of Industrial Organization* New Jersey: Prentice-Hall.
- _____ 1984. "Contestability versus Competition." *American Economic Review*, Sept. Smith, A. 1965. *The Wealth of Nations*. New York: Random House.
- Spence, M. 1983. "Contestable Markets and the Theory of Industrial Structure: A Review." *Journal of Economic Literature*, Sept.
- Sosnick, S. 1958. "A Critique of Concepts of Workable Competition." *Quarterly Journal of Economics*, Aug.
- Sraffa, P. 1960. *Production of Commodities by Means of Commodities* Cambridge: Cambridge University Press.
- Stigler, G. 1957. "Perfect Competition, Historically Contemplated." *Journal of Political Economy*, Feb.
- _____ 1963. *Capital and Rates of Return in Manufacturing Industries*. Princeton University Press, N.J.
- Varian, H. 1984. *Microeconomic Analysis*, Norton, N.Y.
- Weiss, L. 1971. "Quantitative Studies in Industrial Organization." in: *Frontiers of Quantitative Economics*, M. Intriligator, ed. North Holland, Amsterdam.

NOTES

1. The work of the "new" industrial organization school which has emerged in recent years (Jacquemin, 1987) is beyond the scope of this paper.
2. In this article we use classical to mean the concepts of the firm, industry, and competition found in Smith, Ricardo, Marx, and their current elaboration, as outlined below.
3. We shall see later that such equivalence breaks down when the firm has unconstrained access to capital markets.
4. See Hirshleifer (1988), p. 403. The distinction between perfect markets (not necessarily competitive) and perfectly competitive markets follows the original discussion in Stigler (1957).
5. Condition (iii) needs to be interpreted as including perfect foresight (i.e., no uncertainty) when dealing with intertemporal equilibrium.
6. Note that by "ideal type," we have in mind the Weberian (or even Newtonian) notion of the limiting case governing the behavior of actual entities in the real world. There is no implication here of a normative ideal.
7. E.g., see Scherer (1980), chapter 2; Shepherd (1979), chapter 3; Koch (1980), chapter 2.
8. There has recently been a recognition of this conundrum, and an attempt to bridge the gap between Marshallian dynamics and Walrasian general equilibrium in Novshek and Sonnenschein (1987).
9. Note, however, that—assuming rising marginal costs and positive profits—it does not imply maximizing profit margin (defined as price minus average cost).
10. We of course exclude the cost of capital (i.e., some interest rate) from the expected return level.
11. "Profit rates, at least in stable prosperity or mild recession, have come to serve as a sort of thermometer to evaluate market power." (Weiss, 1971, p. 371.)
12. Barriers to entry are defined as a combination of economies of scale, product differentiation, capital requirements, and control of scarce raw materials.