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Author(s): Fritz Machlup

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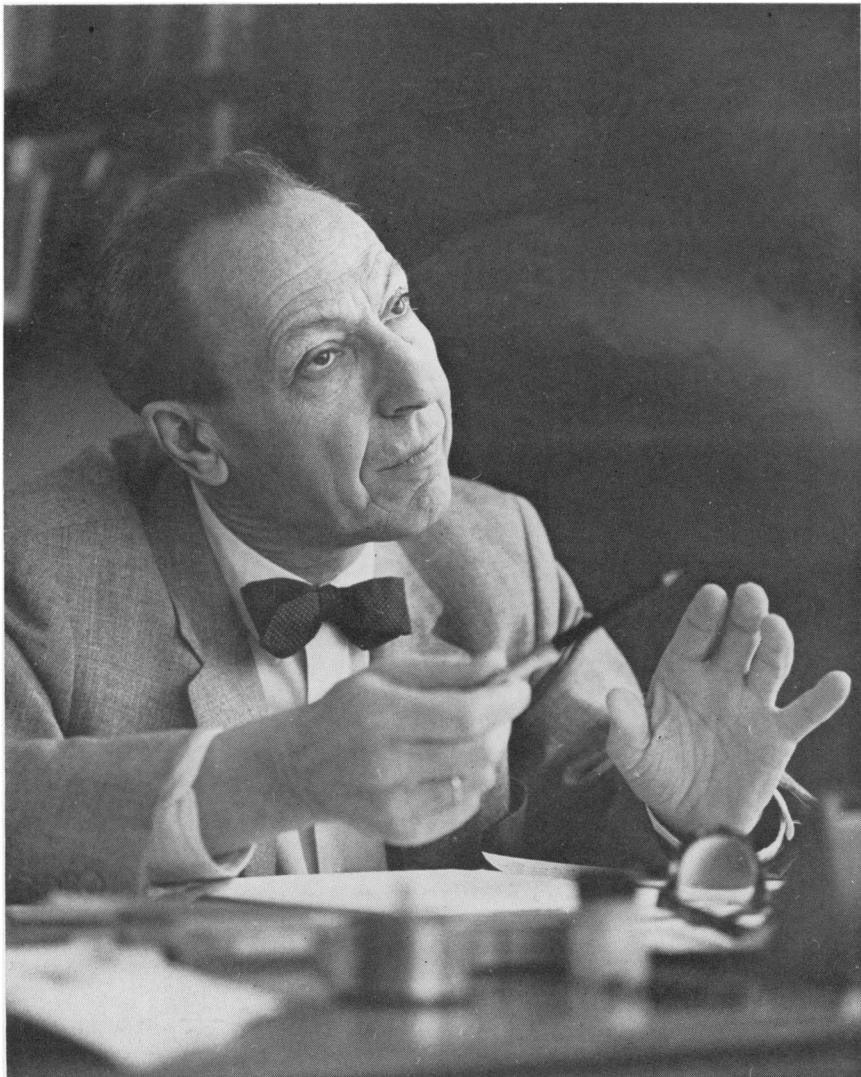
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THEORIES OF THE FIRM: MARGINALIST, BEHAVIORAL, MANAGERIAL*

By FRITZ MACHLUP

Last year, when it was my task to plan the program for the annual meeting of our association, a friend suggested that, with twenty years having passed since the outbreak of the "marginalism controversy," it was appropriate to review what has since happened to the embattled theory of the firm. The topic did not fit the general theme I had chosen for the 1965 meeting, but I reasoned that 1966 would give me a good opportunity to undertake the review myself.

The Battlefield Revisited

So let us recall that literary feud and the warriors, and let us revisit the battlefield. The major battlefield was the *American Economic Review*, with six articles and communications between March 1946 and March 1947 [16] [43] [21] [17] [22] [44]. There had been earlier gunfire elsewhere, chiefly in the *Oxford Economic Papers* in 1939 [14]. But, since the shooting then was not returned and it takes at least two opponents to join battle, it must be agreed that the real hostilities were the exchanges in the *AER*.

The fight was spirited, even fierce. Thousands of students of economics, voluntary or involuntary readers, have been either shocked or entertained by the violence of some of the blows exchanged and may have thought that the opponents must have become mortal enemies forever. These readers would have been wrong. Even before we came out for the last round of the fight, we exchanged friendly letters (December 1946) assuring each other that we would bear no grudges.

We have remained the best of friends; for several years now Richard Lester and I have been colleagues in the same department; and, as a token of our friendship, he has generously accepted my invitation to share this platform with me today as chairman of the session. Thus the veterans of both sides of the War of 1946 are now joined in revisiting

* Presidential address delivered, in a shorter version, at the Seventy-ninth Annual Meeting of the American Economic Association, San Francisco, December 28, 1966.

the battlefield. This, incidentally, does not mean that either of us has succeeded in converting the other to the "true faith."

What was the outcome of the controversy? Who won? We could not possibly say if we have not first agreed on precisely what the shooting was about. I have heard it said that Machlup won the battle but Lester won the war. What this means, however, cannot be known unless we know what the issues and objectives of the war had been. Was it merely to make economics safe for or from marginalism? Were there not several other issues being fought over?

Some of the Major Issues

There were no doubt a good many contentions of all sorts—major, minor, essential, incidental, interpretative, factual, methodological, substantive, and all the rest. To present a complete catalogue of the issues involved would be too ambitious a task for this occasion, but a partial listing might be helpful.

The chief issue, of course, was whether marginal analysis was invalid and ought to be discarded, especially as far as the theory of prices, cost, wages, and employment in manufacturing industry is concerned. This issue, however, implied the question of the correct interpretation of marginal analysis, including the tenets of the marginal-productivity principle. In this connection, differences in the models of the firm customarily used in different kinds of analysis became relevant. Involved here was the question of whether the postulate of maximizing money profits led to conclusions very different from those derivable from assumptions of conduct guided by a variety of largely nonpecuniary considerations.

Underlying all these questions were some issues of general scientific methodology: the legitimacy and usefulness of abstract theorizing on the basis of unrealistic assumptions, or perhaps on the basis of assumptions regarded as "reasonable" thought not "universally true." These issues, in particular, were whether an assumption of profit maximization as the effective objective of the firm in the theoretical model may be accepted as a tenable hypothesis only if it can be verified that all or a majority of those who actually run business firms in the real world agree that this is their only or major objective, that they are capable of obtaining all the information and of performing all the calculations needed for the realization of that objective, and are really carrying out the actions found to be optimal in this fashion; or, alternatively, whether all these tests may be dispensed with and the assumption of profit maximization nevertheless accepted as a fruitful postulate from which conclusions can be derived which correspond with what can be observed in the records of prices and quantities.

Concerning the empirical testing of theoretical conclusions, there were issues of the validity of surveys through mailed questionnaires and of the proper interpretation of responses to various types of questions about managerial judgment. In the background of the whole controversy, but undoubtedly of pervasive significance, was the comparative acceptability of empirical findings to the effect that the elasticity of demand for labor was virtually zero and of the conventional theoretical inference that the elasticity was normally above zero.

Realizing how manifold were the issues of the controversy, one can appreciate that no clear decision can be made about its outcome. Some of the issues had been raised decades or centuries before 1946 and were not decided in this confrontation one way or the other. Attacks on the assumption of maximizing behavior and on the lack of realism in price theory have occurred with great regularity ever since "economic man" and similar postulates were introduced. The running battles between the classical and the historical schools were largely on these points. The *Methodenstreit* of 1883-84 dealt essentially with the same issues. And in the United States, institutionalism may be seen as a movement animated by the same spirit of protest against abstract theory.

However, the particular form of explicit marginalism (under the name of "theory of the firm") which became the target of the attacks of 1939 and 1946 had only come into being in the 1930's—if one suppresses the memory of the great master of 1838 [9]. Ironically, some interpreter of recent history of economic thought—I have forgotten who it was—regarded the 1933-34 versions of the theory of the firm [8] [32] [41] as the theorists' concession to institutionalism, as attempts to supplement the neoclassical model of the firm under atomistic competition with some "more realistic" models allowing for a greater variety of conditions. It was this theory of the profit-maximizing firm in all sorts of market positions, in monopolistic and oligopolistic competition as well as in pure and perfect competition, that was attacked by the researchers in Oxford; and it was the marginal-productivity principle in the explanation of the demand for labor on the part of the individual firm that was the prime target of the attack of 1946.

If the chief aim of the attack was to force the abandonment or subversion of marginalism, and if the chief aim of the defense was to turn back the subversive forces and secure the reign of marginalism once and for all, then, to be sure, the war of 1946 ended in a draw. Look at the textbooks and you will find that marginalism has continued to dominate the teaching of microeconomics, perhaps though with occasional reservations and references to current attempts at greater real-

ism. But look at the journals and monographs and you find that research on alternative approaches to the theory of the firm is regularly reported with the implication that a superior theory may eventually replace marginalism. This replacement, however, according to the proponents of the best-known alternatives to marginalism, is expected chiefly with regard to industries where firms are few and competition is ineffective. The marginalist solution of price determination under conditions of heavy competition is not seriously contested.

In pointing this out, I am not trying to claim that marginal analysis is invincible and forever irreplaceable. If I follow the philosophy of science which, instead of pronouncing theories "false" or "true," distinguishes only between those "rejected" and those "still open to criticism" [30, pp. 246-48], the only victory that can be claimed for the cause of marginalism is that it is still open to criticism. I must go beyond this and concede that some anti-marginalist suggestions have led in recent years to a number of revisions in the marginal analysis of the firm which amount to the incorporation of other goals besides money profits into expanded marginalist objective functions.

The Alternative Approaches

In their arguments against the profit-maximization model the various alternative approaches to the theory of the firm are very much alike; only their positive programs can distinguish them.

The program of behaviorism is to reject preconceptions and assumptions and to rely only on observation of overt behavior. Thus, behaviorism rejects the assumption of marginal analysis that economic action is directed by the objective to maximize the attainment of ends with given means, and that business action can be deduced from a postulate that firms attempt to maximize money profits. Instead, we are directed to *observe* how businessmen really act and by what processes they reach decisions.

Perhaps it is not entirely fair to suggest here an association between "behaviorism" and the working program of the proponents of a "behavioral theory of the firm" [10]. In any case, behavioral research proposes to observe and study the "real processes," in the sense of a "well-defined sequence of behaviors" by which decisions are reached in "actual business organizations." The hope—faithfully inductive—is to develop a theory "with generality beyond the specific firms studied" [10, p. 2]. Such a theory will be based on "four major sub-theories" regarding "organizational goals, organizational expectations, organizational choice, and organizational control" [10, p. 21]. It is assumed that five organizational goals—a production goal, an inventory goal, a sales goal, a market-share goal, and the profit goal—become the sub-

ject of bargaining among the various members of the "coalition" which make up the business organization but that the goals are continually adapted and are being pressed with varying force [10, pp. 40-43]. The behavior theory of the firm, with regard to the determination of prices and outputs, will run in terms of a "quasi resolution of conflict" within the organization, of an "adaptively rational, multiple-objective process" with responses to "short-run feedback on performance" and with continuing "organizational learning" [10, pp. 269-70].

This behavioral approach has been characterized as striving for "realism in process," in contrast to approaches aiming at more "realism in motivation" [48, p. 11]. Such realism in motivation is felt to be needed chiefly because of the separation of ownership and control in the modern corporation, whose managements have great power and wide discretion.

In principle, I could expect three different views to be taken regarding the relative independence of corporation management: (1) Whereas owners would run their business chiefly with a view to a maximum of money profits, managers run it with several supplementary and partly competing goals in mind. (2) Whereas owners, especially wealthy ones, would often allow nonprofit considerations to enter their decision-making, managers have a sense of dedication and identification with the business that makes them the more single-minded seekers of profits. (3) Even if managers are inclined to indulge in seeking other goals as long as profits look satisfactory, they are as professionals, trained in the art and science of management, able to make better profits than the owners could ever hope to make running their own show.

What consequences can be drawn from this? One attitude would be to stick with the assumption of profit maximization because it is the simplest and is applicable with much less detailed information to the largest field.¹ Another attitude would be to insist on starker realism with a complete catalogue of goals and indices of their effectiveness in each firm. A third attitude would be to select two or three of the most

¹ "To use marginalism in the theory of the firm it is not necessary to assert that firms attempt to maximize money profits only nor to deny that a goodly portion of all business behavior may be nonrational, thoughtless, blindly repetitive, deliberately traditional, or motivated by extra-economic objectives. It merely presupposes that the 'rational-economic' portion of business conduct is by and large sufficiently important to affect what is going on in the world to an extent large enough to warrant analysis; and that the substitution of money profits for a composite of pecuniary and nonpecuniary rewards simplifies the analysis so much that the gain in expediency far exceeds the loss in applicability" [23 pp. 30-31]. A similar view is expressed by Scitovsky: "Empirical studies of businessmen's behavior suggest the need for modifying or qualifying the assumption of profit maximization here and there, rather than scrapping it altogether. Accordingly, . . . we shall retain the assumption that the firm aims at maximizing its profit. But we shall regard this assumption as a working hypothesis rather than as a universal rule" [37, p. 111].

important managerial objectives of a type that can be reduced to quantitative analysis and to combine them in a single manageable "objective function." This third approach merges marginalism with managerialism in that it integrates money profits with other managerial goals within one formula of "maximizing behavior."

The question is whether managerial marginalism is prescribed for general application or only for so-called noncompetitive cases. Its most prominent proponents prefer to use the old formula, based on profit maximization, in situations where competition is effective and managerial discretion therefore narrowly circumscribed. In the next sections we shall discuss matters that at first blush may seem unrelated to this issue but on reflection can shed indirect light on it.

The Analogy of the Theoretical Automobile Driver

One of the best remembered points in my exposition was the use of an analogy designed to warn against mistaking theoretical variables and their links for realistic descriptions of observable processes. This was the analogy of the "theory of overtaking" automobiles on the highways [21, pp. 534-35].

Analogies are often misleading, but in this particular case it served its main purpose: to show that the theoretical variables need not be estimated and the theoretical equations need not be solved through actual calculation by the actors in the real world whose idealized types are supposed to perform these difficult operations in the models constructed for the explanation of recorded observations.² The critics of marginal analysis believed they had refuted it if they could show that the exact numerical calculations of marginal magnitudes—cost, revenue, productivity—were difficult or impossible to perform by real decision-makers.

Yet, my analogy was only partially successful. An implication which should have been obvious has been widely overlooked: that the type of action assumed to be taken by the theoretical actor in the model under specified conditions need not be expected and cannot be predicted actually to be taken by any particular real actor. The empiricist's inclination is to verify the theoretically deduced action by testing individual behavior, although the theory serves only to explain and predict effects of mass behavior.

We may illustrate this again by means of the same analogy, the theory of overtaking. Assume a change of driving conditions occurs, say, that the roads have become wet and slippery and fog has reduced visi-

²The theoretical automobile driver had to estimate, among other things, the speeds of three vehicles and the distances between them, and to perform calculations involving potential acceleration and a few other things, before he could decide to overtake the truck ahead of him. An actual driver simply "sizes up" the situation and goes ahead.

bility. Theory enables us to predict that traffic will be slower and accidents more frequent, but it does not enable us to predict that any particular driver will drive more slowly or have an accident. The model of the reactions of the individual driver was not designed to explain the actual driving of any particular operator but only to explain the observable consequences of the observed change of conditions by deducing from the model the theoretical reactions of a hypothetical driver.

Our analogy can also show us the limitations of the model: the prediction will hold only if there is a large number of automobiles on the road. If only a very few cars are around, there may be no accident and there need not be a reduction in their speed. Conceivably, the operators may all be good and self-confident drivers. Marginal analysis of hypothetical driver reaction will suffice for explaining and predicting the consequences of a change in driving conditions if the number of automobiles on the highways is large. If the number is small, behavioral research will be needed, though it may or may not be worth the cost.

Still another use can be made of our analogy: to show the vast differences in the scope of questions to which answers can or cannot be expected with the aid of a given theory, for example, from the theory of overtaking as sketched in my article. Compare the following four questions: (1) How fast will traffic move? (2) How fast will the automobile driven by Mr. X move? (3) How will the speed of traffic be affected by fog? (4) How will the speed of Mr. X's driving be affected by fog?

The theory sketched by me offers no answer to the first question, because each of the variables specified may have very different values for different cars and drivers; it has no answer to the second question, and only a suggestion, a rebuttable presumption, for answering the fourth question, because the theory is not really concerned with particular persons or their actions and reactions. The theory is equipped only to answer the third question, regarding the effects of a change in driving conditions on automobile traffic in general, and even this answer will be qualitative only, without good clues to numerical results. It may be interesting to get answers to all four questions, but since Question 3 can be answered with a fraction of the information that would be needed to answer the other questions, it would be foolish to burden the models designed for Question 3 with irrelevant matters, or to reject such models because they cannot do what they are not designed to do.⁸

⁸ A behavioral theory of automobile driving would probably study the process by which the decision to pass a truck is arrived at in a sequence of bickering among the members of the family: Mama and Sis trying to argue against taking an unnecessary risk, Sonny egging on his Dad to speed up and pass the truck "crawling" ahead of them. Moreover, the theory would not be satisfied with "explaining" the decision to overtake but it would

Confusion of Purposes

The same sort of confusion about the scope of problems and models for their solution has been fostered in recent writings on the theory of the firm: models have been condemned or rejected because they could not be used for purposes for which they had not been designed, and significant differences in the questions to be answered have been obscured or underemphasized.

Let us again pose four typical questions and see which of them we might expect to answer with the aid of "price theory." (1) What will be the prices of cotton textiles? (2) What prices will the X Corporation charge? (3) How will the prices of cotton textiles be affected by an increase in wage rates? (4) How will the X Corporation change its prices when wage rates are increased?

Conventional price theory is not equipped to answer any but the third question; it may perhaps also suggest a rebuttable answer to the fourth question. But Questions 1 and 2 are out of reach. We could not obtain all the information that would be required for their answers and there is, therefore, no use burdening the models with variables remaining silent and inactive throughout the show.

We ought to guard against an easy misunderstanding of our denial that conventional price theory can predict actual prices of specified goods. Prediction of future prices of a particular commodity may in fact be quite manageable if we know its present price. It should be obvious, however, that this is Question 3, not Question 1. Or, one may be able to predict prices on the basis of good information on production cost. But this presupposes that we know the demand for the commodity and assume it will remain unchanged; which again comes down essentially to evaluations of changes of some variables with others held constant, that is, to Question 3.

If the number of firms producing cotton textiles is large and the X Corporation does not supply a very large part of the aggregate output of the industry, price theory may suggest an answer to Question 4, although this is not the purpose of the theory and there may be a considerable chance for the suggested answer to be wrong. The point is that a model of a theoretical firm in an industry consisting of a large number of firms can do with a much smaller number of assumptions, provided the model is used to predict, not the actual reactions of any one particular firm, but only the effects of the hypothetical reactions of numerous anonymous "reactors" (symbolic firms). If it were to be applied to predictions of reactions of a particular firm, the model would have to

also wish to determine the speed of driving, the frequency and length of stops at roadside stands, and all the rest.

be much more richly endowed with variables and functions for which information could be obtained only at considerable effort and with results that may or may not be worth the cost of the required research.

My charge that there is widespread confusion regarding the purposes of the "theory of the firm" as used in traditional price theory refers to this: The model of the firm in that theory is not, as so many writers believe, designed to serve to explain and predict the behavior of real firms; instead, it is designed to explain and predict changes in observed prices (quoted, paid, received) as effects of particular changes in conditions (wage rates, interest rates, import duties, excise taxes, technology, etc.). In this causal connection the firm is only a theoretical link, a mental construct helping to explain how one gets from the cause to the effect.⁴ This is altogether different from explaining the behavior of a firm. As the philosopher of science warns, we ought not to confuse the *explanans* with the *explanandum*.

Misplaced Concreteness

To confuse the firm as a theoretical construct with the firm as an empirical concept, that is, to confuse a heuristic fiction with a real organization like General Motors or Atlantic & Pacific, is to commit the "fallacy of misplaced concreteness." This fallacy consists in using theoretic symbols as though they had a direct, observable, concrete meaning.

In some fields, investigators are protected from committing the fallacy, at least with regard to some of their problems, by the fact that a search for any empirical counterpart to the theoretical construct seems hopeless. Thus, some physicists working on particle theory were able

⁴The same statement can be made about the household. The "household" in price theory is not an object of study; it serves only as a theoretical link between changes in prices and changes in labor services supplied and in consumer goods demanded. The hypothetical reactions of an imaginary decision-maker on the basis of assumed, internally consistent preference functions serve as the simplest and heuristically satisfactory explanation of empirical relationships between changes in prices and changes in quantities. In other words, the household in price theory is not an object of study.

Behavioral studies of real households are something entirely different. A realistic, behavioral theory of the household might conceivably distinguish the large, children-dominated household from a simpler, father-dominated one. The decisions in the children-dominated household, where mother frequently and father occasionally try to exercise some influence, are probably not consistent, since different preference systems are made explicit at various times, with varying decibels and gestures deployed to make them prevail over the preferences of other members of the family.

One can imagine studies on the behavior of particular households selected at random or in structured samples. If the researcher learns that a spoiled brat in a family wants to eat nothing but beef and throws a tantrum every time his mother tries to feed him other kinds of meat, a reduction in the price of chicken will probably not substantially increase the consumption of chicken in this family. Thus, the weight of the child's taste in the decision process of the family can explain a low elasticity of its demand for chicken. But none of this has much bearing on general price theory.

to answer the question "Does the Neutrino Really Exist?" [11, pp. 139-41] laconically with "Who cares?" and to explain that any belief in the "real existence" of atoms, electrons, neutrinos, and all the rest, would hold up the progress of our knowledge. Some biologists working in genetics warned, after empirical genes were discovered, that these "operational genes" should not be confused with the "hypothetical genes," which had been useful constructs in explanatory models before the discovery of any empirical referents [42, p. 814]. Economists, however, know for sure that firms exist as empirical entities and, hence, they have a hard time keeping the theoretical firm and the empirical firm apart.

For certain economic problems the existence of the firm is of the essence. For example, if we study the size distribution of firms or the growth of the firm, the organization and some of its properties and processes are the very objects of the investigation. In such studies we insist on a high degree of correspondence between the model (the thought-object) and the observed object. For other problems, however, as for problems of competitive-price theory, any likeness between the theoretical construct of the firm and the empirical firm is purely coincidental.

Economists trained in scientific methodology understand this clearly. I might quote a dozen or more writers, but will confine myself to one quotation, which states that "in economic analysis, the business firm is a postulate in a web of logical connections" [15, p. 196]. Let me add the statement of another writer, who however was plaintiff rather than advocate when he wrote that "It is a fascinating paradox that the received theory of the firm, by and large, assumes that the firm does not exist" [45, p. 249].

Here is what I wrote on one of the several occasions when I have discussed this problem:

. . . the firm in the model world of economic micro-theory ought not to call forth any irrelevant associations with firms in the real world. We know, of course, that there are firms in reality and that they have boards of directors and senior and junior executives, who do, with reference to hundreds of different products, a great many things—which are entirely irrelevant for the microtheoretical model. The fictitious firm of the model is a "uni-brain," an individual decision-unit that has nothing to do but adjust the output and the prices of one or two imaginary products to very simple imagined changes in data [26, p. 133].

I went on, of course, to say that this purely fictitious single-minded firm, helpful as it is in competitive-price theory, will not do so much for us in the theory of monopoly and oligopoly. To explain and predict price reactions under monopoly and oligopoly we need more than the

construct of a profit-maximizing reactor.⁵ I shall come back to this after discussing the demands for "more realistic" assumptions where they are plainly irrelevant and therefore out of place.

Realistic Models of the Firm under Competition

Many of the proponents and protagonists of a more realistic theory of the firm are quite aware of the fact that the managerial extension and enrichment of the concept of the firm was not needed except where firms in the industry were large and few, and not under the pressure of competition. There are many very quotable statements to this effect.⁶

Too many students, however, want a realistic model of the firm for all purposes. They forget the maxim of Occam's Razor that unnecessary terms in a theory be kept out (or shaved off). These students seem to miss in a simplified model the realistic trimmings of the observable world; they distrust such a model because it is obviously

⁵ You may wonder whether I have changed my mind on these matters. Incidentally, I hold that it is important for scholars and scientists to have an open mind, and the only evidence showing that they do are instances in which they have actually changed their minds. On this particular issue, however, I cannot oblige. Whether I am right or wrong, I have been consistent regarding these points. Let me quote from an article I wrote 28 years ago: "The problem of oligopoly is by definition the problem of the effects of the actions of few, giving a greater importance to the behavior of each member of the group. . . . The theory of the oligopoly price involves an interpretation of the significant motives behind the actions of a small number of people. . . . Even the most superficial theory will have to include many more ideal types of behavior in order to handle the problem of few sellers than it takes to handle the problem of a *mass* of competitive sellers" [20, p. 235].

On the other hand, I must plead guilty to a charge of the same error of misplaced concreteness against which I have just warned. It occurred in a sentence in which I spoke of various magnitudes (subjectively) "perceived or fancied by the men whose decisions or actions are to be explained (the business men) . . ." [21, p. 521]. If this sentence referred only to oligopolistic or monopolistic behavior, it would not be so bad, for, as I said above, the theoretical constructs of decision-makers in this case have a closer correspondence to real businessmen than the constructs in the theory of competitive prices. But the sentence was supposed to apply to the constructs of the firm in any position whatever. Hence it was a misleading sentence in that (1) it gave the impression that the decision-makers in question were *real* men (real businessmen, whom you could interview) and (2) it said that the actions of these men were to be explained, whereas the purpose of the theory was not to explain observed actions but only observable *results* of imtgined (postulated) reactions to observable events.

I apologize for this error. Not that I do not approve of a busy shuttle-traffic between the domain of theoretical construction and the domain of empirical observation, but we must never fail to specify the side of the frontier on which we happen to be. The theoretical terms may have empirical referents (counterparts), but to believe, or allow an impression of belief, that the two are identical is a methodological fallacy.

⁶ "When the conditions of competition are relaxed . . . the opportunity set of the firm is expanded. In this case, the behavior of the firm as a distinct operating unit is of separate interest. Both for purposes of interpreting particular behavior within the firm as well as for predicting responses of the industry aggregate, it may be necessary to identify the factors that influence the firm's choices within this expanded opportunity set and embed these in a formal model" [48, pp. 2-3].

"descriptively false." In view of this sentimental hankering for realism, it may be helpful to survey some of the inclusions which various writers have proposed in order to meet the demands for greater realism in the "theory of the firm," and to examine their relevance to the theory of competitive price. The following considerations are supposed to supplement, qualify, restrict, or replace the objective of maximizing money profits.

- (1) Entrepreneurs and managers cannot be expected to have an inelastic demand for leisure; indeed, one must assume that this demand is income-elastic so that higher profit expectations will cause them to sacrifice some income for the sake of more leisure [36, p. 356].
- (2) Managers are anxious to avoid resentment on the part of their colleagues and subordinates and will, therefore, not enforce their orders with the sternness required for maximization of profits; similarly, minor functionaries do not want to disturb the routines of their superiors and, hence, they often abstain from suggesting improvements which would maximize profits [31, p. 452].
- (3) Managers are more interested in their own salaries, bonuses, and other emoluments, than in the profits of the firm or the income of its owners [27, pp. 226-27].
- (4) The realization of certain asset preferences (for example, liquidity as against inventories and fixed assets) may be in conflict with profit maximization [5, p. 99].
- (5) The flow and biased screening of information through the various levels of management may cause systematic misinformation resulting in earnings far below the maximum obtainable [27, p. 229].
- (6) The objective of maintaining control in the hands of the present control group may require a sacrifice of profit opportunities [31, p. 455].
- (7) The preference for security may be so strong that even relatively conservative ways of making higher profits are eschewed [12, pp. 270-71].
- (8) The striving for status, power, and prestige may be such that it results in conduct not consistent with a maximum of profit [1, p. 145] [28, p. 207] [13, p. xii] [27, p. 227].
- (9) The wish to serve society, be a benefactor, or soothe one's social conscience, may militate against actions or policies that would maximize profits [7, pp. 16-17] [13, pp. 339-40].
- (10) The instinct of workmanship [46, p. 187], a desire to show professional excellence [1, p. 146], a pervasive interest in feats of engineering, may lead to performance in conflict with highest possible profits.
- (11) Compromises among the different goals of executives with different interests—production, sales, personnel relations, finance, research and development, public relations, etc.—are sure to "compromise" the objective of maximum profits [10, p. 29].
- (12) A variety of influences may be exerted on management decisions, perhaps pulling in different directions and possibly away from maximum profits, as for example influences from labor organizations, suppliers of materials,

customers, bankers, government agencies [13, p. 340] [12, p. 270] [28, pp. 195-205].

I shall not prolong this catalogue even if it is far from complete. Let us admit that each of the possible deviations from maximum profit may be "real" in some circumstances. But how effective and significant are they? If the industry is effectively competitive—and it does not have to be "purely" competitive or "perfectly" competitive—is there much of a chance that the direction in which firms react, through their decisions regarding prices, inputs and output, to a change in conditions would be turned around by any of the "forces" listed? Before we say apodictically no, we should examine a few of the reservations.

Security and Managerial Coordination

Let us single out two items which have been given especially wide play: the "objective of security" and the question of "managerial coordination."

The demand for the recognition of a separate "security motive" conflicting with the profit motive deserves a good discussion. But when I prepared for it, I reread what I had written on this subject and found that I could not improve on it. Will you do me the favor of reading it [23, pp. 51-53 and 424-28] and, if you like it, make your students read it?

That there are no business profits without risks and that there is not much point in treating the two quite separately; that it would be silly to call a decision one of profit-maximizing if it increased risk and uncertainty so much as to reduce the chance of survival; that the notion of long-run profits comprises all considerations of risks of loss; that, in terms of my automobile-driving analogies, only a fool would assume that maximization of speed means driving 120 miles an hour regardless of curves and bumps; these are some of the things that have to be said in this connection. But the most essential point to be made is that in the economics of *adjustment to change* the issues of security, survival, and maximum profit are merged. How primitive again to confuse new ventures and daring moves with mere responses to stimuli, obvious reactions to change. If a change in conditions calls for a certain reaction in the name of maximum profits, the very same reaction is called for also in the name of security of survival.

The other matter is of a more "behavioral" nature: the coordination of different goals and judgments on the part of different members of the management and the deviations from profit maximization that may be involved in the process. Frankly, I cannot quite see what great difference organizational matters are supposed to make in the firm's price reactions to changes in conditions. Assume, for example, the import duties on foreign products competing with the products of domes-

tic industry are raised, with a resulting increase in the demand for the products of the firm. Why should the clashes and compromises of divergent opinions reverse the direction of the change that would be "dictated" by the simple rule of profit maximization? Perhaps one vice president wants to raise prices without increasing output, while another wants to increase output without (at least at the moment) raising prices. No matter what their compromise will be, it is likely to conform with what the simple rule suggests. But if not, so what? Remember we are talking about industries with more than a few firms and with free entry.⁷

Other Qualifications to Competitive Price Theory

Substitution between income and leisure looks like the strongest reason for a qualification in cases in which the change in conditions is such that not only the locus of maximum profits is shifted but also the amount of profit obtainable is changed. Take again the example of a tariff increase shutting out foreign competition. The firms in the industry will find that given outputs will now fetch higher prices and that increased outputs can be sold at prices higher than those prevailing before tariffs were raised. And profits will be higher in any case, so that managers—even owner-managers—will be inclined to relax their efforts. Yet would anybody seriously argue that the substitution of leisure (coffee breaks, cocktail parties, golf) for potential profits would be such that total output would be reduced instead of increased? It is not a likely story, and where the industry consists of several or many firms, the small probability vanishes quickly. What remains of the argument is that total output would increase, in reaction to the tariff increase, somewhat less than it would if the managers were eager beavers and did not relax in their efforts when profits increased. Thus, the elasticity of supply of the products in question is a little smaller. But since we do not know how much it would be anyhow, the unknown subtraction from an unknown number should not cause the economic theorist any serious anxieties. (And if the politicians who push for the tariff increase decide to push less hard if we tell them that their friends in the industry will enjoy some of the added protection in the form of more leisure and recreation, we would not really mind.)

Even if formal accuracy demanded that we accept the maximization of the decision-maker's total utility as the basic assumption, simplicity and fruitfulness speak for sticking with the postulate of maximization of money profits for situations in which competition is effective. The question is not whether the firms of the real world will *really* max-

⁷ A great champion of more realistic theories of the firm summed up his reflections on their implications for general economics with this statement: "We shall not be far wrong in concluding . . . that the impact of more realistic theories of the firm on static price analysis is likely to be small" [6, p. 42].

imize money profits, or whether they even *strive* to maximize their money profits, but rather whether the *assumption* that this is the objective of the theoretical firms in the artificial world of our construction will lead to conclusions—"inferred outcomes"—very different from those derived from admittedly more realistic assumptions.

The second qualification in my list—regarding bosses, colleagues and subordinates—is quite irrelevant, except perhaps for questions of welfare economics, where it matters whether firms "really" do all they can to maximize efficiency. For theories concerned with *changes* in prices, inputs, and outputs in response to *changes* to conditions (of production, resource availability, and product demand) the strictness with which efficiency is watched in the firm does not matter. The effects of the tariff increase in our illustration, or the effects of changes in wage rates, interest rates, tax rates, and so forth, are if there is effective competition, essentially independent of the relations among the various levels in the managerial hierarchy of the firm.

It would take too much time here to go through our entire list of reservations. Anybody who makes the effort will find that some of the "realistic assumptions" proposed for inclusion in the theory can affect (by an unknown amount) the magnitude but not the direction of any change that is likely to result from a specified change in conditions; and that other assumptions will not even do that much. In short, they are all irrelevant for purposes of competitive price theory.

Oligopoly, Monopoly, and Managerial Discretion

I repeat: In the theory of competitive price the "real existence" of firms is irrelevant; imaginary (postulated) agents pursuing a simple (postulated) goal react to assumed changes in conditions and thereby produce (or allow us to infer) changes in prices, inputs, and outputs [24, pp. 13-14]. The correspondence between these inferences (deduced changes) and actual observations (observed changes in prices, inputs, and outputs, following observed changes in conditions) is close for two reasons: (1) The number of firms in the real world is so large that it suffices if some of them react as posited by the theory; and (2) the profits of firms are only about "normal," that is, excess profits are about zero, because of competitive pressures from newcomers (oligopolistic pressures [23, pp. 211-23]), so that profits below the maximum obtainable would in fact be net losses in an economic sense.

These two reasons do not hold in the theories of oligopoly and monopoly price.⁸ For these theories the real existence of firms (that is, an

⁸ The idea that profit maximization is the appropriate hypothesis for the theory of competitive price but not necessarily for the theory of monopoly or oligopoly price has been expressed repeatedly over the last century.

Pareto, for example, said that "pure economics" cannot tell us anything about the con-

empirical counterpart to the theoretical construct) is required, because the explanation of changes in prices, inputs, and outputs is at the same time an explanation of decisions of some particular firms, in the sense of organizations of men acting in particular, sometimes unpredictable, ways. Various attempts have been made to develop patterns of oligopolistic and monopolistic conduct and to correlate these patterns with types of organization or with types of personalities exercising ultimate decision-making power. The success has thus far been small; even if the decision-making (say, pricing) in a particular firm was sometimes satisfactorily modeled (for example, in a simulated computer program), the model has usually not been transferable to other cases, to predict decisions in other firms. I do not recall, moreover, that the behavior patterns in these cases were shown to be inconsistent with the postulate of profit maximization.

Under these circumstances, retreat to simpler, less realistic models of firms in oligopoly and monopoly positions is indicated. The first approach is to apply the polypolistic model, in full awareness that the actual facts are entirely different. In many instances the use of the polypolistic model for situations which in our judgment would merit to be labeled as oligopolistic will still yield satisfactory explanations and predictions. Where this is not so, the analyst will resort to the use of models of oligopolistic or monopolistic firms, postulating the simplest possible pattern of action and reaction, dispensing with all peculiar attitudes and "special" strategies. Only where these simple models of oligopolistic and monopolistic firms yield quite unsatisfactory predictions will the analyst need to go further, to more special types of behavior, provided he finds it worth while. It depends on the research interests and on the problems under examination how much effort one wishes to invest in behavioral research where the findings hold little promise of yielding generalizations of wide applicability.

There are, however, some simple models of oligopolistic behavior

tinuing shifts of position of competing oligopolists, and we have to turn to "the observation of facts," which would show us the variety of possibilities [29, pp. 601-2].

Schumpeter, in 1928, had this to say about the dichotomy: "We have much less reason to expect that monopolists will . . . charge an equilibrium price than we have in the case of perfect competition; for competing producers *must* charge it as a rule under penalty of economic death, whilst monopolists, although having a *motive* to charge the monopolistic equilibrium price, are not forced to do so, but may be prevented from doing so by other motives" [33, p. 371].

Finally, Scitovsky in 1951 stated that "not only does the monopolist's secure market position enable him to relax his efforts of maximizing profit, but his very position may prevent his aiming at maximum profit. He may regard his immunity from competition as precarious or be afraid of unfavorable publicity and public censure; and for either reason, he may judge it wiser to refrain from making full use of his monopoly position. We conclude, therefore, that although in some cases the monopolist will aim at maximizing his profit . . . in other cases—which may well be the important ones—he will refrain from maximizing profit" [37, p. 377].

which seem to be of sufficiently wide applicability. A model that equips the oligopolistic decision-maker not under heavy competitive pressure with an objective of gross-revenue ("sales") maximization, subject to the constraint of satisfactory net-revenue ("profit") [2, p. 49], succeeds in explaining the lack of response to some cost-increasing events observed in several instances. There are other simple models explaining the same phenomenon, and one may think of good reasons for finding one model or another more satisfactory. If the sales-maximization hypothesis can explain a greater variety of observed responses or nonresponses than other hypotheses can, and if it seems to correspond better with self-interpretations offered by interviewed businessmen, it merits acceptance, at least for the time being.

An alternative to the maximization of sales is the maximization of the growth rate of sales [3, p. 1086]. This hypothesis is especially interesting because it involves an endogenous relation with profits: while some of the growth of gross revenue may encroach on profits, it does so with an automatic limit in that profits are needed to finance the investment required for the growth of sales.

Another extension of the objective function proposed on the basis of behavioral research combines two managerial preferences for specific expenses of the firm with the usual profit motive. The two additional motives are expenditures for staff personnel and expenditures for managerial emoluments; both figure prominently in the utility functions of executives of companies which, sheltered from competitive pressures, make enough profits to allow management to indulge in these personal desires [48, pp. 38-60].

All these "managerial-discretion models" are simple and sufficiently general to allow relatively wide application. We shall have more to say about them later.

Effective Competition and Managerial Discretion

In mapping out the area of applicability for theories of managerial discretion, we have spoken of "oligopoly," "monopoly," and of "firms not under heavy competitive pressure." These are rather vague guide-posts, but unfortunately the literature has not been very helpful in ascertaining precisely what it is that allows or restricts the exercise of wide managerial discretion.

Some writers stress the size of the firm, suggesting that it is only in the *large* firm that management can exercise discretion. Others stress the condition of *diffused ownership* as the one that affords management the opportunity of pursuing objectives other than maximization of profits. Those who stress oligopoly as the domain for which objective functions richer than profit maximization are needed are usually not quite specific as to their criterion of an oligopoly position: it may be

fewness of firms active in the same industry, or the subjective state of awareness of the *interdependence of price making* often characterized as "conjectural variation," or simply the *absence of aggressive competition for increasing shares in the market*. Others again stress *closed entry*, or absence of newcomers' competition, as the essential condition for a profit level sufficiently comfortable to allow managers to indulge in the satisfaction of objectives other than maximization of profits.

To combine all these conditions would probably be far too restrictive; it would confine the application of managerial-discretion models to large firms with diffused ownership, few competitors, full awareness of interdependence in pricing, absence of aggressive efforts by existing competitors to increase their market shares, and little danger of new competitors entering the field. The size of the firm may actually not be relevant, and diffused ownership may not be a necessary condition for some deviations from profit maximization to occur, say, in the interest of larger sales or larger expenditures for staff. Fewness of competitors may be more significant, chiefly because the danger of newcomers' competition is likely to be small where the number of firms has been few and continues to be few; partly also because the few competitors may have learnt that aggressive price competition does not pay. The essential conditions, it seems to me, are these two: that no newcomers are likely to invade the field of the existing firms, and that none of the existing firms tries to expand its sales at such a fast rate that it could succeed only by encroaching on the business of its competitors.

Competition from newcomers, from aggressive expansionists, or from importers is sometimes called "heavy," "vigorous," or "effective." The simplest meaning of these adjectival modifiers is this: a firm is exposed to heavy, vigorous, or effective competition if it is kept under continuing pressure to do something about its sales and its profits position. Under this "competitive pressure" the firm is constantly compelled to react to actual or potential losses in sales and/or reductions in profits, so much so that the firm will not be able to pursue any objectives other than the maximization of profits—for the simple reason that anything less than the highest obtainable profits would be below the rate of return regarded as normal at the time.

I am aware of a defect in this definition: its criterion is lodged in the effect rather than in an independently ascertainable condition. Perhaps, though, "effective" is quite properly defined in this fashion, namely, by whether certain effects are realized: competition is effective if it continually depresses profits to the level regarded as the minimum tolerable. What makes it effective is not part of the definition, but has to be explained by the conditions of entry, aggressive attitudes on the part of existing firms, or imports from abroad.

If my reasoning is accepted, several formulations proposed in the

literature will have to be amended. Managerial discretion will be a function, not of the independence of the management from the control of the owners, but chiefly of the independence of the management from urgent worries about the sufficiency of earnings. If one insists, one may still say that all managers are primarily interested in their own incomes. But, since it is clear that their long-term incomes are jeopardized if profits go below the acceptable rate of return, maximization of managerial incomes and maximization of profits come to the same thing if competition is effective.⁹

There can be no doubt about the fact that competition is not effective in many industries and that many, very many, firms are not exposed to vigorous competition. It follows that managerial discretion can have its way in a large enough number of firms to secure wide applicability of well-designed managerial-discretion models—or to invite the use of managerial total-utility models.

I was fully aware, when I wrote my 1946 article, that there were many qualifications and exceptions to the principle of profit maximization.¹⁰ But I considered it hopeless for predictive purposes to work with total-utility maximization and I did not see the possibility of combining a few selected managerial goals with the profit motive.

Marginalism Extended: Total Utility

In order to show how hopeless it is to construct a comprehensive total-utility model and obtain from it definite predictions of the effects of changes in conditions upon the dispositions of the managers, one merely has to visualize the large variety of possible "satisfactions" and the still larger variety of things that may contribute to their attain-

⁹ For competition to be effective it is not necessary that competition is either pure or perfect or that all or any of the markets in which the firm buys or sells are perfect.

¹⁰ Several of my statements, if I presented them without source reference, might well be mistaken for quotations from critics of marginalism, including behavioralists and managerialists. Here are samples [21]: ". . . a business man is motivated by considerations other than the maximization of money profits"; "it is preferable to separate the non-pecuniary factors of business conduct from those which are regular items in the formation of money profits" (p. 526); "one may presume that producing larger production volumes [or] paying higher wage rates . . . than would be compatible with a maximum of money profits may involve for the business man a gain in social prestige or a certain measure of inner satisfaction"; "it is not impossible that considerations of this sort substantially weaken the forces believed to be at work on the basis of a strictly pecuniary marginal calculus"; for patriotic reasons during the war "many firms produced far beyond the point of highest money profits"; "the conflict of interests between the hired managers and the owners of the business" may call for "important qualifications" (p. 527); "the interest of the former in inordinately large outlays or investments may be capable of descriptions in terms of a pecuniary calculus, but it is not maximization of the firm's profits which serves here as the standard of conduct" (pp. 527-28); "maximization of salaries and bonuses of professional managers may constitute a standard of business conduct different from that implied in the customary marginal analysis of the firm"; and "the extent to which the two standards would result in sharply different action under otherwise similar conditions is another open question in need of investigation" (p. 528).

ment. The satisfactions consist not only in receiving money incomes, immediate or deferred, and various incomes in kind, but also in distributing incomes to others and in gaining prestige, power, self-esteem, as well as in enjoying a good conscience and other pleasurable feelings.

What makes things really complicated is that the creation of these satisfactions is related to very different flows of funds into and out of the firm: some to gross revenue (sales volume), others to net revenue; some to profits distributed, others to profits retained; some to investment outlays, others to company expenses. The managers' immediate money incomes and some of the emoluments received in kind are partly at the expense of profits, partly at the expense of corporate income taxes (and every change in tax rates changes the trade-off ratios.) The same is true of several other company expenses which add to the prestige, power, and self-esteem of the managers. Special mention may be made of the provision of stock options for managers, which are either at the expense of the owners' equity (through watering down their stock) or at the expense of potential capital gains on treasury stock earmarked for such stock options, but which, on the other hand, may be a powerful force aligning the managers' personal interests with the goal of maximizing the net profits of the firm.

The point of it all is that the total utility of managers can be increased by decisions which increase expenses at the expense of profits. (Of course, this is confined to situations where profits are high enough to stand encroachments by avoidable expenses—to situations, that is, where the firm is not hard-pressed by competition.) The question is how various changes in conditions will affect managerial decisions on inputs, outputs, and prices if the objectives of management include the gratification of preferences for certain expenses of the firm that compete with the maximization of profits.¹¹

¹¹ Instead of cataloguing the various contributions to the "utility" of the management and their relationships to the sources and uses of the firm's funds, one may wish to classify the expenses of the firm with reference to "discretionary" decisions of the management influenced by the decision-makers' preferences. Here is a tentative classification of this sort:

1. Expenses required for the production of (a) current output of unchanged size, (b) additional current output, with marginal cost not exceeding marginal revenue (hence, contributing to higher profits), and (c) additional current output, with marginal cost exceeding marginal revenue (hence, reducing profits).
2. Expenses not required for the production of current output, but increasing the productive capacity or efficiency of the firm for future production.
3. Expenses for managerial personnel in the form of (a) salaries and bonuses, and (b) services rendered to them for their convenience and pleasure.
4. Expenses not required for either current or future production, but (a) expected of a profitable firm as a social service, and only slightly promoting the public image of management, (b) widely recognized as contributing to the social or national benefit and as indicative of the public spirit of the management, (c) contributing chiefly to the gratification of personal desires of supervisory and managerial personnel, and (d) largely

For purposes of illustration let us reproduce in a literary form the utility function of a management (perhaps of its "peak coordinator" [28, pp. 190-91]) in full control and confident that stockholders will not make any fuss as long as the firm makes a "normal" profit and pays out a fair share of it in dividends. Total utility, which the manager by his decisions will try to maximize, will be a function of a large number of variables, by virtue of the contributions they make to his pride, prestige, self-esteem, conscience, comfort, feeling of accomplishment, material consumption, and anticipations of future benefits and pleasures. Among the variables may be total profits of the firm, growth rate of profits, rate of profits to investment, total sales, growth rate of sales, increase in market share, dividends paid out, retained earnings, increase in market value of stock, price-earnings ratio of stock, investment outlay, salary and bonus received, stock options received (capital gains), expense accounts (consumption at company expense), services received (automobile, chauffeur, lovely secretary, theatre tickets, conferences at resorts), size of staff, expenses for public relations and advertising, expenses for research and development, technological and other innovations, leadership in wage increases and good industrial relations, expenses for public or private education and health, other contributions to public interest and patriotic causes, free time for leisure and recreation, and indications of influence over government, industry, and society. This list of variables is, of course, only representative, not exhaustive.¹²

Now what can one do with a utility function of this sort? Will it be of much use in telling us what the firm will do with its freedom of action if it has to respond to a change in conditions?

The answer will depend partly on a simple condition, namely, whether the acceptable trade-off ratios between all the factors contributing to total utility remain unchanged, or approximately the same, if any one of them, say, total profit, increases. If this were the case, we could shout hurrah or sigh a sigh of relief (depending on our temperament). For, if the marginal rates of substitution among all the various "utilifactors" are constant, the distribution of funds among them will remain unchanged with changes in conditions that increase or decrease the total of funds available. Only if the cost of any of the factors

wasteful, that is, contributing nothing, and economizing nothing but managerial effort or capability.

This list may be suggestive of the actions that may have to be taken when, after years of ease and growth, the firm finds its profits declining or disappearing.

¹² Perhaps there ought to be a place on the list for some gratifications that are more stable, less subject to quantitative variation, such as the pleasure of being known for honesty and fairness, on the one hand, and for sharpness and shrewdness, on the other, or at least the pleasure of being convinced of having and exercising these qualities. And last, though not least, there is the general feeling of gratification from "running" a large, well-known profitable, widely respected firm with growing assets and employment.

changed, say, the cost of staff personnel and, hence, the cost of prestige and other benefits that accrue from having a sizable staff, would the marginal rates of substitution be adapted to the new cost relation. In such a case we might also perhaps be able to tell the kind of response of the decision-makers.

Alas, the condition that the marginal rates of substitution are independent of the total funds available is not likely to be satisfied; in addition, certain types of change in conditions have the bad habit of affecting at the same time funds available and relative costs of utilifac-tors. For example, an increase in the corporate income tax will change the trade-off ratio between expensable outlays and profits in favor of avoidable expenses.

Marginalism Extended: Choice of Maximanda

If we were interested only in a formal solution, and perhaps in a proof of "existence" of an equilibrium position, we might be satisfied with the maximization of total utility by those who effectively run the firm. If, however, we want to predict the direction of the changes which a given change in conditions is likely to bring about, then mere formalism will not be enough. For predictive purposes we need *more* to go by with the help of *fewer* variables. Maximization of money profits is certainly the simplest "objective function," but it works only in the case of firms exposed to vigorous competition. The management of a firm that makes more than enough money need not go all out to maximize profits; it can afford to do a few other things that it likes, such as serving what by its own lights it regards as the national interest or indulging in other luxuries.

Would this imply "giving up" the principle of marginalism in the theory of the profitable firm? This is chiefly a semantic question. I have been inclined to use a more extended definition. In 1946, I called marginalism "the logical process of finding a maximum" [21, p. 519]. I did not say that it had to be maximization of money profits—though I struggled hard to justify the use of profit maximization in all cases. In the meantime several writers have shown that profit maximization may not be a completely unambiguous objective, even where it is used in splendid isolation from all competing goals, in that it may refuse to yield unambiguous conclusions regarding the effects of cer-tain changes, such as the effects of changes in profit taxes. In addition, it has been shown that several workable "objective functions" can be developed that give plausible results with a few relatively simple terms added. Any of these functions that can be maximized, with or without specific constraints, would still be a part of marginal analysis.

The choice of the *maximandum* is of course a pragmatic matter: we should prefer one that yields sufficiently good approximations to what

we consider reasonable on the basis of empirical research, with wide applicability and fruitfulness and with great simplicity. The compromise among these goals that we accept is, admittedly, a somewhat "subjective" standard of selection, but perfectly in line with the standard accepted in all scientific fields. Concessions to any one of these desiderata must be at the expense of the others.

Let us list some of the alternative *maximanda* that have been suggested and are available for our choice: Total quasi-rents over a short period of time (But how short? This is good only for a freshman course); total quasi-rents during the service-life of existing fixed assets (But is a replaceable part of a machine a fixed asset? This works only for a one-hoss shay); present value of all profits (after taxes) expected in the future, discounted at a "normal" or "competitive" rate; internal rate of return to equity; equity of controlling stockholders; present values of retained earnings; growth rate of equity; gross rate of total assets; growth rate of gross revenue (sales); gross revenue (sales), if net revenues (profits) are satisfactory (over what period of time?); salaries, bonuses, and other accruals (including services in kind) to management, over their entire lives; all accruals to management plus expenditure for staff personnel, compatible with minimum profits; all accruals to management, consistent with satisfactory profits and gradually rising prices of corporate stock; and, of course, the present values of the various combinations of flows mentioned.

Surely a much longer list could be prepared, but there is no use to this. The point should be clear: profit maximization proper may mean a variety of things—several entries apply to money profits—and in addition there are a few other *maximanda* of possible relevance. Incidentally, if profits or accruals to stockholders are not explicitly included in some of the entries, let no one believe that they are really out of the picture. No management could try to maximize its own accruals in the long run if it completely disregarded the interests of the stockholders. Hence, all *maximanda* are subject to the constraint of some minimum benefits to the owners of the business in the form of dividends, capital gains, or both.¹³

Subjective Information and the Charge of Tautology

I have a few remaining tasks, and one of them is to lay a ghost, one that has long played tricks on economists and led them astray. He has

¹³ The four "managerial" variables included in the list—sales, growth of sales, expenses for staff, and emoluments to the management—may well be the most important deviations from profit maximization, although I may easily be persuaded of the existence of other "extravagances" of management. Among the managements of our large corporations there are so many civic-minded men, bursting with social responsibility and cocksure of their ability to know what is in the national interest, that I incline to the thought that rather serious deviations from the profit motive occur in the area of virtuous striving for the so-called

done this in their discussions of the subject of information, its availability, its uncertainty, and its subjectivity. I mean, of course, information available to the "firm," and this raises the question whether we mean the firm as a purely theoretical construct or the firm as an organization of real people or anything else.

The firm as a theoretical construct has exactly the kind of information the theorist chooses to endow it with in order to design a good, useful theory. The firm as an organization of real people has the information system that it actually happens to have and which, in some instances, the management scientists (operations researchers) have succeeded in developing. For purposes of competitive price and allocation theory, it does not make much difference whether the information which we assume the firm to have concerning the conditions of supply, production, and demand under which it works is correct or incorrect, as long as we may safely assume that any *change* in these conditions is registered correctly. If we want to inquire into the effects of a change in wage rates or tax rates or something of this sort, we must of course take it for granted that the decision-makers who supposedly react to the change have taken notice of it. But whether their "previous" store of information—from which they started when the change occurred—was accurate or not will only in exceptional instances make a qualitative difference to the reactions.

This important difference between information about conditions and information about changes in conditions has eluded several writers, who shouted "tautology" when they confronted my statements about the subjectivity of information. They reasoned like this: If firms act on the basis of information which is entirely subjective, then *anything* they do may be said to follow from whatever they believe they know: hence, the assumption of subjectivism defeats any explanatory purposes. This is a sad confusion. In teaching elementary economics we ought to be able to make our students grasp the difference between the shape and position of a curve, on the one hand, and the shift of a curve, on the other. The direction of the effects which we derive from the shift is usually, though not always, independent of the shape and position of the original curve. We need not fuss about the curve reflecting "accurate information" if we only want to see what happens when the curve shifts in a certain direction.

common good. I hope I am not excessively naive if I believe that the excess profits secured through restrictions on competition are to no small extent used for what the discretionary managers believe to be worthy causes. But I see no way of formulating any hypotheses that would enable us to predict either just what the firms' outlays in the public interest will be or how they will affect total output in the long run. I suppose that Boulding's witty question, "do we maximize profit subject to the constraints of morality or do we maximize virtue subject to the constraints of satisfactory profits? [7, p. 17] was not intended to suggest an answer with empirically fertile conclusions.

Since ghosts are hardy creatures, the laying of this one will probably not constitute a once-and-for-all execution. We shall probably see him again thumbing his nose at us in the next textbook or in the next issue of one of our journals.

Imperfect Information and the Question of "Satisficing" Behavior

The same confusion sometimes encumbers the discussions about the alleged "imperfection" of knowledge available to firms for their rational decision-making [39, pp. xxiv-xxvi, 40-41, 81-83, 241-42] and the screens and blockages in "the flow of information through the hierarchies of the organization" [27, pp. 228-29]. But what can be "imperfect" about the information on, say, a tax increase? Why should it take special theories of bureaucracy to explain how the news of a wage increase "flows" through various hierarchical levels up or down or across? Yet this, and this alone, is the information that is essentially involved in the theory of prices and allocation, since it is the *adjustment to such changes* in conditions for which the postulate of maximizing behavior is employed.

One can understand, of course, how the confusion arose. The proponents of managerial analysis have the creditable ambition to reorganize firms in such a way that their managements can really, as a matter of actual fact, maximize the results of their performance, not only in adjusting to changes in conditions, but also in making the most rational arrangements on the basis of the *complete environment* in which they operate.¹⁴ Incidentally, not only "normative micro-economics," as management science has been called [40, p. 279], has this ambition; many propositions of welfare economics are also based on such presuppositions.

As a matter of fact, the interesting distinction made between "satisficing" and "maximizing" or "optimizing" behavior [39, pp. xxiv-xxvi] [40, pp. 262-65] had its origin in precisely the same issue; management, realizing the complexity of the calculations and the imperfection of the data that would have to be employed in any determination of "optimal" decisions, cannot help being satisfied with something less: its behavior will be only "satisficing." What behavior? The mere adjustment to a simple change or the coordinated, integrated whole of its activities? Evidently, only the latter is the overly ambi-

¹⁴ "Economic man deals with the 'real world' in all its complexity," says Herbert Simon [39, p. xxv]. The *homo oeconomicus* I have encountered in the literature was not such a perfectionist. Incidentally, even Simon's "economic man," two years before the ambitious one just quoted, did not have "absolutely complete," but only "impressively clear and voluminous" knowledge of the "relevant aspects of his environment" [38, p. 99]. My point is that we ought to distinguish perfect or imperfect knowledge of (a) the entire environment, (b) the relevant aspects of the entire environment, (c) the relevant changes in environmental conditions.

tious aim. The theory of prices and allocation, viewed as a theory of adjustment to change, does not call for impossible performances.¹⁵ I ask you to remember what I spelled out, twenty years ago, about the difference between exact estimates and calculations, on the one hand, and "sizing up" in nonnumerical terms, on the other [21, pp. 524-25, 534-35]. And I ask you to realize how many more good predictions can be made on the basis of the assumption that firms try to maximize their profits than on the basis of the assumption that they want no more than satisfactory profits. Take one illustration: if an easy-money policy is introduced, we expect that some firms will increase their borrowings, some firms will increase their purchases, some firms will sell at higher prices, and some firms will increase their output. But if everybody was satisfied before the change, we cannot infer any of these things. On the other hand, if we assume that firms prefer a larger profit to a smaller one, all the mentioned consequences follow from the simple model.

The Twenty-one Concepts of the Firm

Several times in this paper I have spoken of the fallacy of misplaced concreteness, committed by mistaking a thought-object for an object of sense perception, that is, for anything in the real, empirical world. My warnings might have given rise to another confusion, namely, that there are only two concepts of the firm. There are many more, and I do not wish to suppress altogether my strong taxonomic propensities. I shall offer a list of ten different contexts calling for even more different concepts, some theoretical, some more empirical.

One of my favorite philosophers, who was a past-master of the art of making fine distinctions, enumerated 13 concepts of "pragmatism" [18], 66 concepts of "nature" [19, pp. 447-56], and "a great number" of concepts of "God."¹⁶ I am sure there are at least 21 concepts of the firm employed in the literature of business and economics,

¹⁵ Suppose the government imposes a 15 per cent surcharge on all import duties. The theory of the profit-maximizing firm will without hesitation tell us that imports will decline. What will the theory of the satisficing firm tell us? "Models of satisficing behavior are richer than models of maximizing behavior, because they treat not only of equilibrium but of the method of reaching it as well. Psychological studies of the formation and change of aspiration levels support propositions of the following kinds. (a) When performance falls short of the level of aspiration, search behavior (particularly search for new alternatives of action) is induced. (b) At the same time, the level of aspiration begins to adjust itself downward until goals reach levels that are practically attainable. (c) If the two mechanisms just listed operate too slowly to adapt aspirations to performance, emotional behavior—apathy or aggression, for example—will replace rational adaptive behavior" [40, p. 263]. I admit that this is an unfair use of the theory of satisficing, but I wanted to show that everything has its place and no theory can be suitable to all problems. I suspect, however, that Simon's theory of satisficing behavior will yield neither quantitative nor qualitative predictions.

¹⁶ Lovejoy Denied Approval by Senate Group," *The Baltimore Sun*, April 1, 1951.

but I shall exercise great forbearance and confine myself to a selection. Everyone may join in the game and fill in what I leave out. I shall first state the context, then delimit the concept, and finally add a few words of explanation.

1. In the theory of competitive prices and allocation, the firm is *an imaginary reactor to environmental changes*. By "imaginary" I mean to stress that this a pure construct for which there need not exist an empirical counterpart. By "reactor" I mean to deny that this robot or puppet can ever have a will of his own: he is the theorist's creature, programmed to respond in the predetermined way.

2. In the theory of innovation and growth, the firm is *an imaginary or a typical reactor or initiator*. Depending on which theory one has in mind, we see that several combinations are possible. In the theory of "entrepreneurial innovation" by men of very special qualities [34, pp. 78-94] the entrepreneur is neither imaginary nor a mere reactor; he is a typical initiator. By "typical" I do not refer to the ideal type of German sociology [47, p. 44] [35, pp. 20-63, 81] [25, pp. 21-57], but rather to the common-sense kind of person that many of us have met in person or, at least, have heard about. On the other hand, there are also theories of "induced invention"—assuming latent inventiveness (though an invention can never be a mere reaction)—and theories of "induced growth," employing the construct of the imaginary reactor.

3. In welfare economics, the firm is *an imaginary or a typical reactor or initiator with accurate knowledge of his opportunities*. Depending on the proposition in question, all combinations are again possible, but in any case a new requirement is introduced: accurate knowledge of the environmental conditions on the part of all reactors and initiators. For, in contrast to the theory of price and allocation, the welfare theorist wants to ascertain, not only in which direction price, input, and output will move in response to a change, but also whether this move will increase or reduce welfare. For such an exercise it is no longer irrelevant whether the subjective information of the firms is correct or false.

4. In the theory of oligopoly and monopoly, the firm is *a typical reactor and initiator in a small (or zero) interacting group*. I have explained earlier why a theory of oligopoly with nothing but imaginary reactors may not be widely applicable.

5. In the theory of organization (or bureaucracy), the firm is *a typical cooperative system with authoritative coordination*. I have accepted this formulation from one of the authorities [28, p. 187] and thus may disclaim responsibility for it.

6. In management science (or the art of business management), the firm is *a functional information system and decision-making system*

for typical business operations. The normative nature of management science should be stressed. Several management scientists include operations research among the agenda of management science. I take this to mean that the principal techniques of operations research of such matters as inventory problems, replacement problems, search problems, queueing problems, and routing problems have to be mastered by the management scientist. He should, however, make a distinction between the science and its application: the science deals with typical systems, but is applied to particular cases.

7. In operations research and consultation, the firm is *an actual or potential client for advice on optimal performance.* In this context the reference is not to the techniques and principles of operations research but rather to the particular projects planned or undertaken.

8. In accounting theory, the firm is *a collection of assets and liabilities.* It should be clear how different this concept is from most of the others.

9. In legal theory and practice, the firm is *a juridical person with property, claims, and obligations.* This may be a very deficient formulation; I defer to the experts, who will surely correct it.

10. In statistical description (such as the Census of Manufactures) the firm is *a business organization under a single management or a self-employed person with one or more employees or with an established place of business.* I have adopted here the definition used by the U.S. Census.

This exercise should have succeeded in showing how ludicrous the efforts of some writers are to attempt *one* definition of *the* firm as used in economic analysis, or to make statements supposedly true of "the" firm, or of "its" behavior, or what not. Scholars ought to be aware of equivocations and should not be snared by them.

A Sense of Proportion

I hope there will be no argument about which concept of the firm is the most important or the most useful. Since they serve different purposes, such an argument would be pointless. It would degenerate into childish claims about one area of study being more useful than another.

I also hope the specialist who uses one concept of the firm will desist from trying to persuade others to accept his own tried and trusted concept for entirely different purposes. The concept of the firm in organization theory, for example, need not at all be suitable for accounting theory or legal theory; and I know it is not suitable for either competitive price theory or for oligopoly theory.

Most of the controversies about the "firm" have been due to misun-

derstandings about what the other specialist was doing. Many people cannot understand that others may be talking about altogether different things when they use the same words.

I am not happy about the practice of calling any study just because it deals with or employs a concept of the firm "economics" or "micro-economics." But we cannot issue licenses for the use of such terms and, hence, must put up with their rather free use. My own prejudices balk at designating organization theory as economics—but other people's prejudices are probably different from mine, and we gain little or nothing from arguing about the correct scope of our field.

Now what conclusions from all our reviewing may we draw on the conflicts between marginal analysis, behavioral theory, and managerial theory of the firm? Fortunately, not much time is being wasted on descriptive studies of a narrowly behaviorist kind, in the sense of recording observed behavior without any prior theoretical design. Most proponents of behavioral studies of the firm are too competent theorists for that. As far as the proponents of managerial theories are concerned, they have never claimed to be anything but marginalists, and the behavior goals they have selected as worthy for incorporation into behavior equations, along with the goal of making profits, were given a differentiable form so that they could become part of marginal analysis.¹⁷ Thus, instead of a heated contest between marginalism and managerialism in the theory of the firm, a marriage between the two has come about.

Not all marriages, these days, are permanent; divorces are frequent. Whether this marriage will last or end in divorce will depend chiefly on what offspring it will produce. If the match of the profit hypothesis with the various managerial hypotheses proves fertile of sufficiently interesting deductions, the prospects of a lasting marriage are good.

It is not easy to judge the future sterility or fertility of this marriage between marginalism and managerialism, because most of us are inclined to underrate the kinds of problem on which we have never

¹⁷ While under profit maximization $MR - MC = 0$, sales maximization requires that $MR = 0$; hence, for some of the output sold marginal revenue is less than marginal cost, which cuts into profits. A minimum-profit constraint sets a limit to this.

In the case of maximization of the growth rate of sales the limit on nonremunerative selling is built into the objective itself because a growth of productive assets is required to support the growth of sales, and the acquisition of these assets presupposes a sufficiency of profits, either for internal financing or as a basis for outside finance [3, pp. 1086-87]. If at any time sales were pushed too hard at the expense of profits, there would arise a shortage of funds for acquiring the productive assets needed for producing more output. Thus no separate minimum-profit constraint has to be imposed, since it is inherent in the objective of maximization of the growth of sales. It should be understood, however, that the growth rate of assets under this objective is still less than it could be under straight profit maximization. (This shows why we should never speak of the "growth of the firm" without specifying by what criterion we measure it.)

worked: we have a bias in favor of our own research experience. Most of the researchers on behavioral versions of the theory of the firm look for their problems to the records of selected large corporations. They take it for granted that their theory must be designed to explain and predict the behavior of these firms. This, however, is less so in the case of economists engaged in the analysis of relative prices, inputs, and outputs. They look for their problems to the records of entire industries or industrial sectors. To be sure, some industries are dominated by large corporations, yet the accent of the analysis is not on the behavior of these firms but at best on some of the results of that behavior. Where the focus is not on the behavior of the firm, a theory that requires information on particular firms to be "plugged in" seems to them less serviceable than a more general theory, at least as long as only qualitative, not numerical, results are sought. Hence, even if the "partial-equilibrium analyst" knows full well that the actual situation is not a really competitive one, he probably will still make a first try using the competitive model with good old-fashioned profit maximization. And if the results appear too odd, appropriate qualifications may still be able to take care of them more simply than if he had started with a cumbersome managerial model. (In saying this, I am showing my bias.)

It is revealing to ask what kind of theory we would apply, at least in a first approximation, if we were called upon to predict the results of various kinds of public-policy measures. For questions regarding short-run effects of changes in the corporation income tax (or an excess-profits tax) I believe a strong case can be made in favor of a model of the firm with some managerial variables. If the problem is whether an increase in cigarette taxes is likely to be fully shifted onto the consumer or what portion of it may be absorbed by the producers, I may feel safer with a model that includes managerial objectives. If, however, the problem is what qualitative effects an increase in the import duty on a material used in several industries will have on its imports and on the prices and outputs of the various products of the industries in question, I would be inclined to work with the simple hypothesis of profit maximization. I would find it far too cumbersome in this case to go down to the level of the "real" firms; I could probably not obtain the necessary data and, even if I did, I might not be able to rely on the composite results obtained from a firm-by-firm analysis. The old theory of the firm, where all firms are pure fictions, may give me—in this case—most of the answers, in a rough and ready way, not with any numerical precision, but with sufficient reliability regarding the directions of change.

I conclude that the choice of the theory has to depend on the prob-

lem we have to solve.¹⁸ Three conditions seem to be decisive in assigning the type of approach to the type of problem. The simple marginal formula based on profit maximization is suitable where (1) *large groups* of firms are involved and nothing has to be predicted about particular firms, (2) the effects of a *specified change* in conditions upon prices, inputs, and outputs are to be explained or predicted rather than the values of these magnitudes before or after the change, and nothing has to be said about the "total situation" or general developments, and (3) only *qualitative answers*, that is, answers about directions of change, are sought rather than precise numerical results. Managerial marginalism is more suitable to problems concerning particular firms and calling for numerical answers. And, I am sure, there are also some problems to which behavioral theory may be the most helpful approach. My impression is that it will be entirely concerned with particular firms and perhaps designed to give answers of a normative, that is, advisory nature.

It looks as if I had prepared the ground for a love feast: I have made polite bows in all directions and have tuned up for a hymn in praise of peaceful coexistence of allegedly antagonistic positions. But I cannot help raising a question which may tear open some of the wounds of the battle of 1946. The question is whether the effects of an effective increase in minimum wages upon the employment of labor of low productivity can, at our present state of knowledge, be fruitfully analyzed with any other model than that of simple marginalism based on unadulterated profit maximization.

If I answer in the negative, does this mean that we are back at the old quarrel and have not learned anything? It does not mean this. Deficiencies in marginal analysis have been shown and recognized; and a great deal of good empirical as well as theoretical work has been accomplished. But the deficiencies dealt with were not just those which the critics twenty years ago attacked. That attack questioned the applicability of marginal analysis to the employment effects of wage increases in industries with many firms presumably under heavy competition [16, pp. 64, 75-77]. In such circumstances the managerial theories of the firm, according to their proponents, do not apply. On this narrow issue, therefore, the old-type marginalist cannot retreat.

¹⁸ As a matter of fact, it will also depend on the research techniques which the appointed analyst has learned to master; we can eliminate this bias by assuming an ideal analyst equally adept in all techniques.

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