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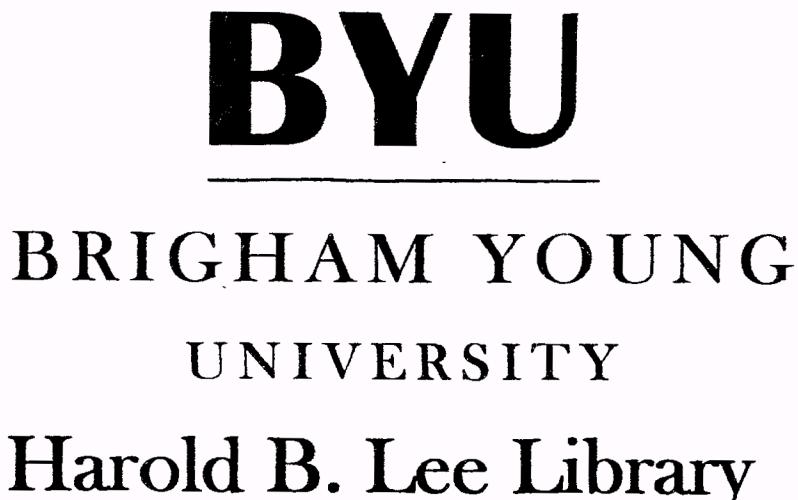
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Is Economics the Science of Choice?

From time to time it is probably necessary to detach oneself from the technicalities of the argument and to ask quite naively what it is all about.

F. A. HAYEK, *Economics and Knowledge*

Robert Mundell commences his Preface to *Man and Economics* with the assertion: "Economics is the science of choice."¹ Most professional scholars who check off the box marked "Economist" on the Register of Scientific Personnel find no quarrel with Mundell's statement. Despite some danger of once again being called iconoclastic, I propose to examine this assertion seriously and critically. In the process, I shall not discuss what economics is or is not, should or should not be, at least in any direct sense. My question is more elementary and its answer is obvious once it is asked. I want to ask whether a *science of choice* is possible at all. Are we not involved in a contradiction in terms?

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¹ New York, 1968.

There is no need to go beyond the everyday usage of the two words. I am neither competent nor interested in detailed etymological inquiry. To choose means "to take by preference out of all that are available," "to select."² Choice is the "act of choosing," or "selecting." In particular, choosing should be distinguished from behaving. The latter implies acting but there is no reference to conscious selection from among alternatives. Behavior can be predetermined and, hence, predictable. Choice, by its nature, cannot be predetermined and remain choice. If we then define science in the modern sense of embodying conceptually refutable predictions, a science of choice becomes self-contradictory.³

This elementary proposition is recognized by those who accept the Mundell position. If this is the case, what are the reasons for adherence to what, at first glance, seems glaring methodological inconsistency? To the economist, choice seems to be imposed by the fact of scarcity. Given an acknowledged multiplicity of ends and a limitation on means, it becomes necessary that some selection among alternatives be made. It is in such a very general setting that economics has been classified as the study of such selection, or choice. Once that is done, replacing the word *study* with the word *science* becomes a natural extension of language. Is the science so defined devoid of predictive content? Some scholars might answer affirmatively, but surely there are many others who, at the same time that they acquiesce in Mun-

² *Oxford Universal Dictionary*, 1955.

³ In a wholly determinist universe, choice is purely illusory, as is discussion about choice. I do not treat this age-old issue, and I prefer to think that the subject discussed as well as the discussion itself is not illusory.

dell's statement, busy themselves with the empirical testing of hypotheses. Are such professionals unaware of their methodological contradictions? It seems useful to try to answer these questions in some detail.

I The Categories of Economic Theory

1 *The Logic of Economic Choice*

The legitimacy of a "science of choice" may be questioned, but there should be no doubts about the usefulness of a "logic of choice." Much of orthodox economic theory is precisely this, and is, therefore, concerned with choice, as such. This logical theory provides students with the "economic point of view" and it can be posed in either a normative or a positive setting. In the former, the logic reduces to the economic principle, the simple requirement that returns to like units of outlay or input must be equalized at the margins in order to secure a maximum of output. In this most general sense, the principle is empirically empty. It instructs the chooser, the decision-maker, on the procedures for making selections without requiring that he define either his own preference ordering of output combinations or the resource constraints within which he must operate. Empirical emptiness should not, however, be equated with uselessness. If a potential chooser is made aware of the principle in its full import, he will weigh alternatives more carefully, he will think in marginal terms, he will make evaluations of opportunity costs, and, finally, he will search more diligently for genuine alternatives. The norms for choice can be meaningfully discussed, even if the specific implementation takes place only in the internal calculus of

the decision-maker. Instructing the decision-maker as to how he should choose may produce "better" choices as evaluated by his own standards.

There is a positive counterpart to the logic of choice, and this extends theory to the interaction among separate decision-makers. Commencing with the fact that choosers choose and that they do so under constraints which include the behavior of others, the economist can begin to make meaningful statements about the results that emerge from the interaction among several choosers. Certain "laws" can be deduced, even if conceptually refutable hypotheses cannot be derived. Analysis makes no attempt to specify preference orderings for particular choosers. The "law" of choice states only that the individual decision-maker will select that alternative that stands highest on his preference ordering. Defined in purely logical terms, this produces the "law of demand." In this way, trade or exchange can be explained, even in some of its most complex varieties. Characteristics of equilibrium positions can be derived, these being defined in terms of the coordination between expected and realized plans of the separate decision-takers.

In the strictest sense, the chooser is not specified in the pure logic of choice. Under the standard assumptions, the analysis applies to the individual. But the logic requires no such limitation; it applies universally. The norms for efficient choice can be treated independently of the processes through which decisions are actually made. It is not, therefore, explicitly in error to present decision-making norms for non-existent collective entities who do not, in fact, choose. Under some conditions, it may be helpful to discuss the economizing as if such entities existed, although, as we shall note in section two, this is the source of much confusion.

In its normative variant, the logical theory of choice involves the simple principle of economizing, nothing more. This is the mathematics of maxima and minima. Much of modern economic theory is limited to various elaborations on this mathematics. By modifying the formal properties of the objective function and the constraints, interesting exercises in locating and in stating the required conditions for ensuring satisfaction of the norms can be produced. Whether or not such exercises command too much of the professional investment of modern economists remains an open question.

The logical theory of interaction among many choosers may also be classified as pure mathematics. But this mathematics is not that which has attracted major interest of the professionals in that discipline, and there is some legitimacy in the economists' preemptive claim. Game theory, as one part of a general theory of interaction, owes its origin to a mathematician, but the elegant theory of competitive equilibrium was developed by economists. Major strides are being made in this purely logical theory of interaction among many choosers, some of which are aimed at relating game theory, more generally the theory of coalition formation, to the theory of competitive equilibrium. The marginal productivity of mathematically inclined economists in this area of research appears much higher than that which is aimed at working out complex variations of the simple maximization problem.

2 *The Abstract Science of Economic Behavior*

In the logical theory summarized, no objectives are specified. Choice remains free, and because of this, it remains choice. As we move beyond this pure logic, however, and into economic theory as more generally, if ambiguously,

conceived, choice becomes circumscribed. Specific motivation is imputed to the decision-maker, and it is seldom recognized that, to the extent that this takes place, genuine choice is removed from the theory. What we now confront is *behavior*, not choice, behavior that is subject to conceptually predictable laws. The entity that acts, that behaves, does so in accordance with the patterns imposed by the postulates of the theoretical science. The actor is, so to speak, programmed to behave in direct response to stimuli. The abstract science of economic behavior, as I have here classified this, has empirical content that is wholly missing in the pure logic of economic choice. This content is provided by restricting the utility function. Several degrees of restrictiveness may be imposed. Minimally, nothing more than a specification of "goods" may be introduced. From this alone, conceptually refutable hypotheses emerge. The acting-behaving unit *must* choose more of any "good" when its "price" relative to other "goods" declines.⁴ Additional restrictiveness takes the form of specifying something about the internal trade-offs among goods in the utility function of the behaving unit. This step produces the *homo economicus* of classical theory who must, when confronted with alternatives, select that which stands highest on his preference ranking, as evaluated in terms of a *numéraire*. The pure economic man must behave so as to take more rather than less when confronted with simple monetary alternatives. He must maximize income-wealth and minimize outlays. He must maximize profits if he plays the role of entrepreneur.

Confusion has arisen between this abstract science of eco-

⁴ This approach may be associated with the work of A. A. Alchian and his colleagues. See A. A. Alchian and W. R. Allen, *University Economics*, 2d ed. (Belmont, Calif., 1967).

nomic behavior and the pure logic of choice because of ambiguities that are involved in the several means of bounding the utility functions of the acting units. In the pure logic of choice, the arguments in the utility function are not identified; "goods" and "bads" are unknown to the external observer. In any science of economic behavior, the goods must be classified as such. But under minimally restricted utility functions, specific trade-offs among these may remain internal to the acting units. The individual chooses in the sense that his selection from among several desirable alternatives remains unpredictable to the observer. What we have here is an extremely limited "science" of behavior combined with an extensive "logic" of genuine choice. We move beyond this essentially mixed framework when the trade-offs are more fully specified. Additional "laws of behavior" can then be derived; and, more important, predictions can be made about the results of the interaction processes. These predictions can be conceptually refuted by empirical evidence. If internal trade-offs among goods in utility functions are fully specified, behavior becomes completely predictable in the abstract. Normal procedure does not, however, involve the extension to such limits.

As noted earlier, the pure logic of choice may be interpreted in either a normative or a positive sense. If choice is real, it is meaningful to refer to "better" and "worse" choices, and the simple maximizing principle can be of some assistance to the decision-taker. By relatively sharp contrast, there is no normative content in the abstract science of economic behavior. The reason is obvious. The acting unit responds to environmental stimuli in predictably unique fashion; there is no question as to the "should" of behavior. The unit responds and that is that. Failure to note

this basic difference between the pure logic of choice and the pure science of behavior provides, I think, an explanation of the claim, advanced especially by Mises, that economic theory is a general theory of human action.⁵ The logical theory is indeed general but empty; the scientific theory is nongeneral but operational.

At this point, it seems useful to refer to the distinction between the "subjectivist economics," espoused by both Mises and Hayek, and the "objectivist economics," which is more widely accepted, even if its limitations are seldom explicitly recognized. In the logic of choice, choosing becomes a subjective experience. The alternatives for choice as well as the evaluations placed upon these exist only in the mind of the decision-maker. Cost, which is the obstacle to choice, is purely subjective and this consists in the chooser's evaluation of the alternative that must be sacrificed in order to attain that which is selected. This genuine opportunity cost vanishes once a decision is taken. By relatively sharp contrast with this, in the pure science of economic behavior choice itself is illusory. In the abstract model, the behavior of the actor is predictable by an external observer. This requires that some criteria for behavior be objectively measurable, and this objectivity is supplied when the motivational postulate is plugged into the model. An actor behaves so as to maximize utility, defined in a nonempty sense. It becomes impossible, in the formal model, for an actor to "choose" less rather than more of the common denominator units, money or some *numéraire* good, when he is faced with such alternatives. Cost, in this objectivist theory, the pure science of economics, is measurable by the observer. This cost is

⁵ See Ludwig von Mises, *Human Action* (New Haven, 1949).

unrelated to choice, as such, since the latter really does not exist. The opportunity cost of using a resource unit in one way rather than another consists in the *money* earnings of that unit in its most productive alternative use. These earnings may be objectively estimated and quantified. In this setting, the cost of a beaver is two deer, and there is no relationship between cost and sacrifice.⁶ To say here that nonpecuniary elements may affect choice is to confuse the model of pure economic behavior with the model of the logic of choice. Insofar as nonpecuniary noneconomic elements actually enter the resource owner's calculus, the behavioral model is falsified.⁷

The motivational postulate, the behavior of *homo economicus*, effectively converts the purely logical theory of choice into an abstract science of behavior. It accomplishes this by replacing the subjectivity of the logical theory by objective payoffs. Generality in explanation is and must be sacrificed in crossing this bridge. But this is replaced by predictability. The abstract science of economic behavior is the familiar world of *ceteris paribus*. This science provides the analyst with tools for discussing the complex interaction of market processes to the extent that individual participants

⁶ For an extended discussion of the concept of cost in contrasting methodological settings, see my *Cost and Choice: An Inquiry in Economic Theory* (Chicago: Markham Publishing Co., 1969).

⁷ To avoid ambiguity here, I should note that nonpecuniary "goods" can be introduced in individual utility functions in the minimally restricted limits that were discussed above. Given the specification of such goods, conceptually refutable hypotheses about individual behavior can be derived. Nonpecuniary goods tend to be different for different individuals, however, and the limits of any predictive science are reached when those goods which are common to all persons are exhausted. This provides the basis for reliance on the strictly pecuniary motivation in the general model of the economic interaction process.

behave economically. Equilibrium characteristics can be objectively described in terms of quantifiable, measurable relationships among variables, among prices and costs. It is this abstract theory upon which most economists rely in making rudimentary predictions about reality. When asked, "What will happen when an excise tax is placed on product X?" the professional responds: "The price of X to consumers will rise, and less will be demanded, provided that other things remain unchanged, and provided that men behave economically." The last qualifying phrase, "provided that men behave economically," shifts the analysis into the science of behavior and enables conceptually refutable predictions to be advanced. By this qualifier, the economist states that he is preventing actors from behaving other than economically in the theoretical model that he is constructing. As we all recognize, many professionals do not go further than this; they do not consider it a part of their task either to examine the psychology of behavior more fully or to test empirically the predictions that the abstract science enables them to make.

Such methodological aloofness is acceptable only so long as the severe limitations of the scientist's role are appreciated. Failure to recognize these limitations leads naive professionals to claim far too much for the science and with such claims they infuriate those critics who concentrate attention on the noneconomic content in human choice patterns.

3 The Predictive Science of Economic Behavior

The abstract science is restricted to the derivation of propositions or hypotheses that are conceptually refutable. The realm of predictive science is entered only when these

hypotheses are subjected to empirical testing against real-world observations. One of the features of modern economic research has been its shift toward the rigorous testing of hypotheses. The pound of *ceteris paribus* no longer protects the scientist; he must, through imaginative construction of hypotheses and through exhaustive search for appropriate data, try to corroborate the predictions that the theory allows him to make. Because of empirical constraints, the range of his efforts must be more limited than that allowed to the free-floating abstract theorist. Data are difficult to come by, and even when these can be assembled, the hypotheses tester must be prepared for frustration and failure. Data can, at best, reflect the results of genuine choices made by participants in a very complicated interaction sequence. The economic behavior implicit in these choices may be nonexistent in some cases, and swamped in effect by noneconomic considerations in many others. The predictive hypotheses may be refuted at the initial levels of testing. But the scientist cannot readily use such refutation for overthrowing the general laws of behavior derived from the central structure of his theory. He must normally acknowledge his probable failure to isolate the economic from the noneconomic elements of choice, and, accordingly, he must acknowledge the continuing challenge of empirical testability for his theoretically based hypotheses.

This amounts to saying that, despite his efforts, the predictive scientist remains chained to the vision of the economic universe produced in the abstract theory of economic behavior. He can, when successful, show that indeed "water runs down hill," but, with contrary results, he can rarely, if ever, refute the economic analogue to the law of gravity. At best, the predictive science is an extension of the

abstract science. It must incorporate the basic motivational postulate of *homo economicus*; indeed this provides the source for deriving the hypotheses to be tested. The paradigms are unchanged over the two subdisciplines.

There are, however, significant differences. In some strict sense, the abstract science treats only of pure economic man, unalloyed by noneconomic behavioral traits. Accordingly, the theorems are simple, elegant and aesthetically satisfying. But the real world is a grubby place, and it is this world that must be the raw source for any science that aims at operational validity. In the face of the apparent divergence of the real world from the paradigms of the abstract science, the empirical corroboration of many predictive hypotheses is perhaps surprising.

The fact that his hypotheses refer to the behavior of *many* actors greatly facilitates the predictive scientist's efforts. He need only make predictions about the behavior of average or representative participants in the processes that he observes; he need not hypothesize about the behavior of any single actor. Hence even if noneconomic elements dominate the behavior of some participants, and even if these enter to some degree in the choices of all participants, given certain symmetry in the distributions of preferences, the hypotheses derived from the abstract theory may still be corroborated. For example, given comparable institutional constraints, the wage levels for plumbers and carpenters may tend toward equality even if a substantial proportion of plumbers exhibit strong noneconomic preferences for their chosen occupation and even if a substantial proportion of carpenters exhibit similar preferences for their own occupation. So long as some sufficient number of persons indicates some willingness to make the occupational shift on purely

economic grounds, the hypothesis about wage level equality is supported. The multiplicity of participants generates results that are identical to those predicted in the model that embodies the strict assumption that all actors behave economically.

4 *The "Behavioristic" Science of the Economy*

Unless he is able to call upon the motivational postulate of the abstract science, the predictive scientist can scarcely derive the hypotheses that he seeks to test. It is folly for him to abandon this postulate deliberately in some misguided attempt at imitating the methods of the natural scientists who find it impossible to introduce comparable behavioral postulates. "Scientism" of this sort has been effectively criticized by Hayek⁸ and others, and this approach need not be examined in detail here. It seems clear that with no behavioral basis from which to begin his search for uniformities and regularities in the data that he observes, the pure "behaviorist" is reduced to massive efforts at observation with very limited prospects of successful results. He confronts a universe of prices, quantities, employment levels, measures for national aggregates. He presumably remains aloof from the behavior that generates these data as results, whether this behavior be economic or not. This is not to suggest that such efforts should be wholly abandoned. It seems clear, however, that the deliberate sacrifice of the directional hypotheses provided by the paradigms of economic science should be made with great caution.

A somewhat different behaviorist approach (and one that fits the terminology considerably better) involves an

⁸ F. A. Hayek, *The Counter-Revolution of Science* (Indianapolis: Liberty-Press, 1979).

attempt to specify noneconomic elements that enter into the individual's choice calculus. This approach, which we may associate with the work of Herbert A. Simon and his colleagues,⁹ calls upon psychological insight to assist in the development of motivational patterns that may be considerably more complex than the simple postulates of standard economic theory. Ultimately, the objective parallels those of orthodox economic science, the ability to make predictions about human behavior in the social interaction process. And, to the extent that the hypotheses of standard theory are refuted, such an approach as this offers the only avenue of advance for social science. This approach may proceed by relaxing or modifying the restrictions placed on individual utility functions, or, alternatively, the procedure may involve dropping the utilitarian framework.¹⁰

II The Confusions of Economic Theory

Economics, as this discipline is currently interpreted, embodies elements of each of the four categories listed. The confusions arise from the failure of economists to understand the categorical distinctions. Many of the continuing and unresolved arguments over particular methodological issues can be traced more or less directly to this source.

1 *The Derivation of Policy Norms*

One of these arguments concerns the relevance of theory for deriving policy conclusions. I shall illustrate some of

⁹ H. A. Simon, *Models of Man* (New York, 1957).

¹⁰ This summary review does not do justice to the approach under discussion. For the most part, the contributions here have been made by social scientists in disciplines other than economics. Indeed, to the extent that social "science" other than economics exists at all, it must be produced by those who adopt the approach summarized here.

the confusion here through the familiar prisoner's dilemma of game theory, interpreted variously in terms of the categories of Section I. The pedagogic advantages of this construction are immense; properly employed the dilemma allows us to introduce in a two-person interaction model many of the relevant issues of economic policy in the large.

The illustration below presents the dilemma in a form slightly modified from its classic setting. The game depicted is positive-sum. The first term in each cell indicates the payoff to A, the player who chooses between rows. The second term shows the payoff to B, the player who chooses between columns. Each player's result depends on the behavior of the other, but, for each player, there is a dominating strategy shown by the second row and second column. The independent-behavior solution, shown in the southeast cell of the matrix, depicts the dilemma; the combined payoffs are larger in the northwest cell.

		Player B	
		50, 50	20, 60
Player A	60, 20	30, 30	

With nothing more than the payoff matrix of the illustration, something has been said about the interaction of the two players. Their choice behavior has been related to the structure of the game itself, and the possible conflict between the independent-adjustment solution and the combined-

payoff potential outcome has been shown. Nonetheless, it should be noted that, to this point, nothing has been said about the nature of the payoffs. These have been treated strictly as numerical indicators of that which motivates choice behavior. In some respects, these payoffs may be thought of as being defined in utility units, so long as the purely subjective nature of utility in this context is kept in mind. In this setting, we have remained strictly in the pure logic of choice. There is absolutely no predictive content in the analysis.¹¹

We move from this pure logic of choice into the abstract science of economic behavior when we define the payoffs objectively. To do this, we need only to put dollar signs in front of the numbers in the matrix illustration. The solution seems to remain as before, but it is now limited to those situations where players do, in fact, behave economically. There will be no convergence to the southeast cell if players in the real world should choose to behave cooperatively rather than independently. The abstract theory of economics says that they will behave economically, that the southeast cell is the "solution" to the game. This prediction may be falsified, at least conceptually.

At this level, it becomes legitimate to derive limited policy implications from the analysis. As they behave in the real world, individuals are observed to adopt the dominating strategies, as these are identified in the eyes of the observer. In the objectified payoff structure imputed to the participants, there appears to exist a conflict between the independent-adjustment outcome and the jointly desired

¹¹ See John C. Harsanyi, "A General Theory of Rational Behavior in Game Situations," *Econometrica* 34 (1966): 613 f.

optimal outcome. Given nothing more than the potentiality of this conflict, it becomes plausible for the political economist to consider modifications in the choice structure that would enable individual participants to eliminate such a conflict, if indeed it should exist. If ways and means can be found to remove the restrictions of the potential dilemma, if institutional rearrangements can be made which will allow independent behavior of the participants to produce results that may be mutually more beneficial than those observed under present environmental conditions, these should, of course, be suggested. (In the strict prisoner's dilemma example, and limiting attention to the world of the two prisoners only, the introduction of communication between the two persons represents such an institutional change.) This point was recognized and well expressed by Sir Dennis Robertson when he called upon the economist to suggest ways to minimize the use of "that scarce resource Love."¹² Since Adam Smith, economists have been within the bounds of methodological propriety when they have proposed organizational-institutional arrangements that channel behavior that may be, but need not be, economically motivated in the direction of promoting what may be, but need not be, mutually desired economic objectives.

This very general policy position, which I shall call Smithian, requires minimal empirical backing along with minimal ethical content. All that is required is the conceptual possibility that payoffs relevant for individual behavior should be directionally linked with those emerging from the postulate of economic science. So long as a person may, other things

¹² D. H. Robertson, "What Does the Economist Economize?" in *Economic Commentaries* (London, 1956).

equal, respond to the change in stimuli, as objectified, in the direction suggested by the central postulate of the theory, the economist is justified in his search for institutional arrangements that will remove the restrictiveness of the dilemma, should it exist. In a very general sense, this amounts to little more than opening up avenues for potential trades which participants may or may not find it advantageous to exploit. The policy prescription is, in effect, limited to suggestions for widening the range for potential choice.¹³

To the extent that the empirical testing of hypotheses supports the central behavioral postulate of the abstract theory, the productivity of Smithean institutional reforms is enhanced. But the corroboration of the behavioral postulate by empirical evidence implies much more than the *ceteris paribus* limits of the abstract theory. Such corroboration indicates that economic behavior dominates all noneconomic elements of choice in the specific context examined. This offers a temptation to go much beyond the general institutional reforms implied by the Smithean position. If man can be shown to behave in some more direct relationship to an objectified payoff structure than the *ceteris paribus* potentiality implied by the abstract theory, direct manipulation of his behavior seems to become possible through the appropriate modification in the conditions for choice. It is one thing to say that, when given the opportunity, an individual will choose more rather than less provided other elements affecting his choice remain unchanged. It becomes quite a different thing to say that the representative indi-

¹³ For an earlier and somewhat different statement of this position, see my "Positive Economics, Welfare Economics, and Political Economy," *Journal of Law and Economics* 2 (October 1959): 124-38; reprinted in *Fiscal Theory and Political Economy* (Chapel Hill, 1960).

vidual will choose more rather than less in terms of objectified units in the *numéraire* without regard to noneconomic influences on his choice situation. Rarely will the multidimensional complexity of real-world choice allow results of such simplicity to be adduced. But, if it should do so, specific control of individual behavior through imposed changes in the payoff structures might be possible.

It is precisely at this point that a pervasive and fundamental error emerges. The false step is taken when the explicitly objectified payoff structure that is postulated for use in the abstract theory of economic behavior is translated into direct guidelines for the explicit manipulation of choice alternatives. This procedure must assume that the actual *choice-maker* in the real world *behaves* strictly as the pure economic man of the theorist's model. Markets are held to "fail" because of the dilemma-type situations that are confronted by the idealized man of the theorist's analytical model. As a followup to this, policy suggestions are made which incorporate this rarefied behavioral postulate as reality. In a genuine sense, this whole procedure is absurd.

The point can be illustrated with the matrix of the illustration. The abstract theory bases its elaboration of the interaction processes on the postulate that individuals behave economically in the sense that they respond to objectified and externally measurable payoffs. In this context, it is meaningful to say that, in the model, player A selects row 2 rather than row 1 because of the \$10 difference in payoff, regardless of what he predicts about B's behavior. It is meaningful to say that, in this model, the opportunity cost to player A, "that which could be avoided by his not taking row 2," is \$10 in foregone payoffs. But this opportunity cost, embodied in the theoretical model for behavior, cannot then

be taken as the specific basis for policy prescription aimed at manipulating A's actual choice behavior. This violates the purpose and meaning of the abstract theory and, as suggested, has little or no empirical base. Despite this, such procedure is manifest in a substantial part of modern economic policy discussion.

It is not caricature to say that modern policy discussion, which I shall call Pigovian, proceeds as follows, still within the matrix illustration. The economist proposes a "corrective" tax on player A, a tax designed to make the costs that he privately confronts equivalent to those that are confronted by the collectivity in the two alternatives that are faced. The general welfare criterion becomes equality between *private* and *social* cost. To implement this result, private costs must be modified; but in order to know by how much, some assumption must be made about private payoff structures. The orthodoxy proceeds as if the purely economic man existed. The criterion calls for a tax of \$10+ to be imposed on A's returns in row 2 (or a subsidy of \$10+ on his returns in row 1). Given this change in his alternatives, player A (similarly for player B) will be motivated to "choose" that alternative that is jointly desired. The efficient collective outcome will be generated. The emphasis has been subtly shifted from the exploitation of potential gains-from-trade to the attaining of specifically defined results.

As the construction shows, if either A or B should behave noneconomically the suggested modification of the payoff matrix may not produce the desired results. Suppose, for example, that both players value independent action highly and are willing to sacrifice economic gain to secure this objective. In this instance, the independent-adjustment solution in the southeast cell remains dominant, regardless of the

imposition of the suggested corrective tax or subsidy. Some tax (or subsidy) will, of course, result in behavioral change, but the outcome may be less rather than more desirable in some "social" sense. The dilemma indicated to be present in objectified payoff structure may not exist when payoffs relevant to genuine choices are incorporated in the matrix. The artificiality of any objectified payoff structure, as conceived by the external observer, tends to be overlooked with the consequence that "dilemmas" which exist only in the mind of the observer may be imputed to actual participants in an interaction process.

The point of emphasis is clear. The costs that influence "choice" are purely subjective and these exist only within the mind of the decision-maker. The economist may, within limits, discuss this choice provided that he remains within what we have called the "logic of choice." He cannot, however, plug in the *homo economicus* introduced in his abstract models of economic behavior and then use this as the basis for constructing specific choice-influencing constraints aimed at welfare improvements. Individuals choose on the basis of their own preference orderings; they may, within limits, behave as the abstract theory of economics postulates. But rarely do they behave strictly as the automatons of the analytical models. Yet this is precisely the unrecognized assumption that is implicit in most modern policy discussion.

The critical distinction to be made is that between what I have called the Smithean policy position and what I have called the Pigovian policy norms. In the former, organizational-institutional changes, modifications in the structure of property rights, require only that possible conflicts between individually adjusted behavior and mutually desired collective outcomes be recognized. Specific definition of

"efficient" or "optimal" results is not needed. Such results are allowed to emerge from the choice process itself. In the Pigovian framework, by contrast, property rights are normally assumed to be fixed exogenously. Corrective measures take the form of specific modifications in the choice conditions that are confronted by individual participants. Clearly, this approach to policy requires much more knowledge about the actual preference orderings of individuals. Efficiency in outcomes is no longer defined by the observed absence of further gains from trade as revealed by the behavior of traders. This Smithian definition is replaced by the objectively defined set of equalities central to theoretical welfare economics.

The error extends through much of modern economics. This was at the base of the debate over the possibility of socialist calculation that took place in the 1930s. Mises and Hayek were, I think, indirectly making essentially the same point that I have tried to make here. Their arguments failed to convince their fellow economists; most economists continue to think that efficiency, at least ideally, can be produced by the enforcement of output and pricing *rules*, that these can effectively substitute for the modification in *property rights* dictated by the particular economic setting.

2 "Scientific" Decision-Making for the Collectivity: Systems Analysis, Operations Research, Cost-Benefit Analysis

The confusions embodied in the Pigovian norms are complemented by an even more elementary set of confusions when the economist extends his range to the "choices" of the collectivity. He tends to be trapped in the scarcity-choice maximization nexus, and it is not at all easy for him to accept the fact that a collective "decision-maker" or "chooser"

is nonexistent. Failing this, he tends to conceptualize some supraindividual entity which makes effective choices, which maximizes some objective function subject to appropriately defined constraints. This procedure allows the analyst to produce interesting and self-satisfying results. But error arises when either the analyst or his interpreters consider such results applicable to real-world issues.

Analysis of this sort is two dimensions away from real-world relevance. In the first place, the "logic of choice" for the single decision-maker is applied to a situation where no such person or entity exists. Since there is no maximizer, analysis is of questionable value when it is based on the assumption that one exists.¹⁴ In the second place, the costs and benefits of alternative courses of action must be objectified if the analyst is to do more than present his own value orderings. This objectification runs into the same difficulty as that noted in connection with the Pigovian approach. There may be little or no relationship between the objectively defined costs and benefits and the evaluations that individuals place on alternatives in actual choice situations.

In this latter respect, the analyst has even less to fall back on than the Pigovian welfare economist. The abstract science of economic behavior with its embodiment of economic man does provide some basis for considering modifications in the conditions of choice, as faced by acting persons. For the cost-benefit analyst, however, there is no prospect of

¹⁴ These comments apply only to the orthodox analyses under discussion here. It is possible to advance understanding of actual processes of group decision-making through an extension of the pure logic of choice applied to individual participants in these processes. In this approach, there need be no presumption that the collectivity, as such, maximizes anything, or indeed itself exists.

modifying the alternatives facing individual choosers. He must advance norms for choice itself. He is advising the collectivity quite specifically concerning how it "should" choose. Even if the complexities of group decision-making are ignored, the subjective evaluations of individuals are of a different dimension from the objectively quantifiable measurements placed on alternatives by the analyst. And it should be emphasized here that this difficulty is not removed by allowing the careful analyst to introduce "nonquantifiable" elements into his calculus. In point of fact, the more subjective that his own calculus becomes, the *less* relevant become his efforts. At best, he may be able to place values on cost and benefit streams that would characterize the world in which all men behave economically. This calculus would be of limited, but perhaps of positive value. Once this standard drawn from the behavioral postulate of the abstract science is left behind, however, there is nothing that the analyst can provide that assists in the understanding of actual collective decision processes.

III Conclusions

Modern economics, as practiced by professional scholars, embodies confusions that are fundamentally methodological. These have their historical foundations in the failure of economists to establish an effective synthesis between the objective and the subjective theory of value. The issues did not emerge with clarity, however, until efforts were made to extend the applicability of economic theory beyond its traditional limits. So long as the task of theory remained that of "explaining" the functioning of a market system, objective and subjective elements could exist side by side without open contradiction. During the past half-century, however, theory

has been called upon to do much more than this. It has been employed to derive norms for policy aimed at making allocation more "efficient." Economists have, in other words, proceeded as if theirs were a "science of choice."

It is in such extensions that the confusions that I have stressed in this paper have emerged. The critical methodological oversight was that which Hayek emphasized, with clarity but to little avail, in several of his fundamental papers in the late 1930s and early 1940s. The failure of economists to recognize that the sense data upon which individuals actually choose in either market or political choice structures are dimensionally distinct from any data that can be objectively called upon by external observers led directly to the methodological chaos that currently exists. Economics seems unlikely to escape from this chaos for many years, if indeed it survives at all as an independent discipline. Few economists are wholly free of the confusions that I have discussed. For myself, I advance no claim that my own thinking has yet fully rid itself of the paradigms of neoclassical orthodoxy.