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Economic Theory, Ideal Types, and Rationality

Abstract: Contemporary economic theory is generally regarded as a scientific or at least potentially so. The replacing of the cardinal theory of utility measurement by the ordinal theory was supposed to prepare the groundwork for economics as a genuine science. But in adopting the ordinal approach, theorists saw fit to anchor ordinal theory to axioms of choice founded on principles of rational behavior. Behavior according to these axioms was embodied in the ideal type model of rational economic man. This model served the basis for scientific explanation of the choices made by actual economic agents. I argue though that the postulate of rationality is a normative principle and that this compromises the scientific pretensions of economic theory. Yet the theorist must rely on this principle to formulate predictive and explanatory theories. This raises questions as to whether it is possible that economic theory satisfy the same kind of scientific criteria set down for research in the natural sciences.

I.

It is generally assumed that of all the social sciences, economics is the most promising candidate for acceptance as a science. Theories in economics conform to the formal requirements demanded of theories in natural science in the sense that they possess basic postulates, axioms and laws whose function is to describe at a fundamental level some segment of the empirical world particular to the discipline itself. Predictive and explanatory theories are then constructed from these posited axioms and postulates. For example, microeconomic theory which is founded on a set of axioms of choice purports to predict and explain the behavior of the consumer and that of the entrepreneur. Within microeconomic theory universal propositions like the law of demand and the law of diminishing marginal rate of substitution play a prominent role.

Furthermore, the claim of economics to scientific maturity is evidenced by the accepted formal distinction between what are described as positive economics and normative economics. Positive economics constitutes the factual or empirically decidable theories of economics, while normative economics refers to the evaluative or policy-oriented area of economics. The bulk of normative economics today is generally characterized as welfare economics and rivals the theories of positive economics in formal rigor.

Although the consensus in the social scientific community is that economics has not yet attained that level of experimental

rigor that would place in on par with any of the natural sciences in terms of methodology, the general belief is that a science of economics is indeed logically possible because of the empirical nature of the subject matter.

The purpose of this paper, however, is to argue that the scientific claims of economics are to be questioned because of the normative content of the idea of rational choice as exemplified in the ideal type rational economic man. The focus of the discussion will be on microeconomic choice theory since this branch of economics is at the core of economic theory. The structure of the basic axioms of choice theory is determined by the postulate of rationality, and the theories which are founded on these axioms purport to describe the choices of economic agents. But it will be argued that the postulate of rationality describes only the behavior of rational economic man, a theoretical construct best described as an ideal type. It will also be shown that the usage of an ideal type construct, lacking in empirical content, as the core of an empirical theory can be justified only on normative grounds. The discussion will proceed in the following general way: an introductory statement on the basis for the usage of the postulate of rationality as a key postulate in positive economic theory will first be given, then the notion of rational economic man as an ideal type construct will be examined. Finally an argument in favor of rational economic man as a normative construct will be explored.

II.

One notes to begin that Bentham's attempts to measure utility, though unsuccessful, served as the basis for postclassical and neoclassical economics until a new approach was proposed by the revisionist work of Hicks and others. The post-Benthamite neoclassical economists like Jevons and Walras did not raise any serious methodological questions concerning the measurability of utility, although the amount of utility consumers derived from making choices was not subject to direct empirical test. Jevons (1970, 174) denied the direct measurability of utility but proposed indirect measurement by means of the constancy of the marginal utility of money - an idea taken up and developed by Marshall.

Despite its usage in analysis, however, theorists were not able to offer a solution to the problem of measuring utility and subsequently the theory of the cardinal measurement of utility gave way to the ordinal theory of choice. The latter involved the analysis of consumer choice only in terms of the rankings assigned to choices under the ordinal ordering, which were considered unique up to a monotonic transformation: in other words, assign any set of indices to a given ordering so long as the assignment is order preserving. Note that this new approach was introduced by theorists like Pareto and Fisher. The most important contribution to the new trend was that of Hicks. Cardinal measurement gave way to the ordinal measurement of utility and the law of diminishing marginal

utility gave way to the diminishing marginal rate of substitution. Witness the following from Hicks:

"We have now to undertake a purge, rejecting all concepts which are tainted by qualitative utility, and replacing them, so far as they need to be replaced, by concepts which have no such implication. The first victim must evidently be marginal utility itself. If total utility is arbitrary, so is marginal utility. ...

The second victim (a more serious one this time) must be the principle of Diminishing Marginal Utility. If marginal utility has no exact sense, diminishing marginal utility can have no exact sense either. But by what shall we replace it? By the rule that the indifference curves must be convex to the axes. This may be called, in our present terminology, the principle of Diminishing Marginal Rate of Substitution." (Hicks 1946, 19 f.)

The replacing of the cardinal measurement of utility with the ordinal approach was even more firmly endorsed by the important theorist, Paul Samuelson:

"The discrediting of utility as a psychological concept robbed it of its only possible virtue as an explanation of human behavior in other than a circular sense revealing its emptiness as even a construction." (Samuelson 1966, 3)

Yet, the decidedly behaviorist and empirical approach to the problem of choice as expressed by the ordinal measurement theory of utility was based on assumptions that raised anew the scientific claims of economic methodology. Recall that the critique of the cardinalist's program was founded mainly on its methodological inability to bridge the gap between empirical choice and the psychological laws that ultimately determine choice. The cardinalist approach required a publicly acceptable measuring rod for the measurement of the subjective states of utility. This inability to quantify utility explains the theorist's reluctance to make interpersonal comparisons of utility. It is taken for granted that states of pleasure and pain experienced as a result of publicly observed stimuli are similar for different individuals within a given community, but this assumption cannot be really proved in a strict scientific or philosophical way.

Witnessing someone grimace when hit by a hard object is enough, under normal conditions, to assume that pain is being felt, but the painful sensation is not experienced by anyone other than the individual who grimaces. Others can only infer that pain is being felt. The fact is that although the choices individuals make are public, the mental states that prompt those choices are private. The soundness of the cardinalist thesis depended on the availability of introspective data which was not available. There was thus a basis for criticism of the scientific pretensions of economic theory.

The ordinalist program begins by positing basic postulates of choice from which consumer theory is logically deduced. These axioms of choice give rise to what theorists call "States of the economy". It is assumed further that these choice axioms are established on the basis of special ranking criteria which establish choice relations between objects. Strong

preference, weak preference, and indifference are the usual ranking relations. These ranking relations then satisfy conditions (axioms) of completeness, reflexivity and transitivity for any state of the economy.¹

These conditions constitute together what might be called conditions of rational choice. The explanation and prediction of agent choice is then determined according to the model of rational economic man, formulated on the above-mentioned conditions of rational choice. Rational economic man, according to the model, is a utility maximizer subject to stated constraints. In the case of the consumer, consumption maximization is the predicted end; for the entrepreneur, profit maximization. But it is well known that economic agents do not always conform to the model of rational behavior as formulated by the axioms of choice theory.

Economic agents may not always have all the facts relevant for choice-making at their disposal, and even when all the facts are available, errors of judgment are always possible. It is possible that some agent, though intent on making some set of choices in conformity with the model of rational choice, make errors of judgment because of the complex nature of the inferences involved. It is just this indeterminacy of human choice-making that renders the "problem" of economics somewhat inscrutable.

What is of further significance though is that economic agents may decide to make choices at variance with the model of choice theory and not admit that an error of inference or calculation was made. The point is that choices which entail inference suggested by the axioms cannot be defended on logical grounds. For example, some agent may make some choice at variance with the axiom of transitivity yet not make an error comparable to one that could be made in logic and mathematics. For example, if $A = B$ and $B = C$, then transitive inference permits only $A = C$. Any other kind of inference would be logically inadmissible. On the other hand, given three objects A, B, and C, it is permissible that some agent prefer A to B, B to C yet express indifference between A and C or even prefer C to A. The voting habits of individuals are a good example of the above phenomenon.

It is on this basis that the limitations of ordinal rankings are apparent. As long as the theory of ordinal utility does not require that preference intensities be measurable then it becomes difficult for the theorist to argue that the rules of rational choice-making can be consistently defended. The argument put forward here is reinforced by the fact that the ordinal theory does not permit interpersonal comparisons of utility. The behaviorist foundations of the ordinal theory should lead to the formulation of theories based only on the observed choices of agents. In this regard, all reference to rational behavior should ideally be avoided. But, as will be argued in this paper, the theorist is forced to retain the axioms of rational choice, in order to develop predictive theories.

The result is the formulation of the model of rational economic man. One possible explanation for this is that unrecognized ideological assumptions which lead to the reification of the concept of rational choice, are at work here.

It is of further interest to note that even when the ordinalist program attempts corroboration by reliance on actual economic behavior, it, nevertheless, appeals to the axioms of pure choice theory or posits nonempirical analytical statements. Revealed preference theory purports to describe the choices of economic agents by establishing conditions for the formulation of indifference maps. The strong axiom of revealed preference (Houthaker 1950) states that if X^1, X^2, \dots, X^n is a set of n possible choices such that X^1 is revealed preferred to X^2, X^2 is revealed preferred to X^3, \dots, X^{n-1} revealed preferred to X^n , then X^n is not revealed preferred to X^1 . This inference is obviously based on the axiom of transitivity in choice theory. The weak axiom (Samuelson 1938) states that if X^2 is revealed preferred to X^1 , then X^1 should never be revealed preferred to X^2 . Proof of this is had by showing that in some situation in which the consumer purchases X^2 , he could also purchase X^1 . Thus X^2 is revealed preferred to X^1 if $p^2 X^1 \leq p^2 X^2$, where p^2 represents price. One should note at once that the weak axiom is somewhat unrealistic being tautologous in structure and limited to series of binary choices. The strong axiom of revealed preference is obviously an improvement on the weak axiom, but as we saw, it is compromised by reliance on the normative choice rule of transitive preference. But how should the theorist explain behavior that does not conform to the axioms of revealed preference? Note the answer offered by theorists Henderson and Quandt:

"If the consumer does not conform to the axioms, he is irrational by the definition of the earlier sections. If he is irrational and acts inconsistently, he does not possess an indifference map, and the shape of his utility function cannot be determined by observing his behavior." (Henderson/Quandt 1971, 41)

Thus, even when the ordinal theory promises to be strictly empiricist, it inevitably falls back on the normative axioms of choice theory, thereby making reference to "rational" and "irrational" choice-making. But no other alternative would seem feasible so long as ordinal theory argues against the measurement of preference intensity. It is this and the fact that the ordinal theory describes the world in purely static terms that some theorists have attempted to reintroduce a revised theory of cardinal utility under nonstatic conditions.

The major effort in this regard has been the work of von Neumann and Morgenstern, who explore the possibilities of establishing a theory of measureable utility on the basis of probability judgments. The aim is to determine the "difference in utilities" between choices some agent makes and other probable choices (v. Neumann/Morgenstern 1967, 18). For example, if the agent prefers A to B and B to C then, according to von Neumann and Morgenstern, it will be possible to determine the difference in utilities between the first and

second choices by offering the agent the choice of B over .5 probability of either A or C. Thus, if he prefers B to .5 probability of either A or C there are good grounds for arguing that the difference of utilities between B and C is greater than that between A and B. However, there has been some question as to whether the von Neumann-Morgenstern approach does succeed in establishing a theory of cardinal utility measurement (see, for example, Ellsberg 1954 and Friedman 1947). What is relevant for present purposes though is that the von Neumann-Morgenstern theory seems fit to rely on the postulate of rationality as a heuristic device for theory construction. The point is that the criticisms made against the usage of the postulate of rationality in the ordinal theory of utility apply also to those theories which aim at describing utility in quantitative terms or under conditions of uncertainty.

Concerning the latter, consider economist J. Marshak's (1950) argument that under conditions of uncertainty, individuals may deliberately make choices that seem irrational. According to Marshak, a mountain climber "may prefer a survival chance of 95 % to one of, say, 80 % but also to one of 100 %". It might appear that "love of danger" is the mark of an irrational disposition for individuals who would rather survive than perish. But Marshak "excludes love of danger as irrational", thereby saving the model of rational choice. Assumptions about rationality seem, therefore, to be necessary for the formulation of any of the theories of economic choice-making discussed so far. The scope of our critique is broadened as a result (Marshak 1950, 139).

III.

From the above discussion it is easy to understand how the idea of rational choice is embodied in the construct rational economic man. For it is this construct which makes choices according to the axioms of choice theory. Rational economic man, it seems, exists in an idealized world of utility and profit maximization, yet his choices constitute the basis for the formulation of the structure of contemporary economics.²

Consider too, the more recent observations of Hollis and Nell (1975) who raise questions about the realism of rational economic man as portrayed by the orthodox neoclassical model. For Hollis and Nell, "rational economic man is not an actual man. He is rather, an actual man who conforms to the model to be tested ...". (Hollis/Nell 1975, 55) It is instructive at this point to note the way in which the economic model of rational choice deals with deviations from that which the model predicts. Students of economic theory are quite familiar with the idea of the "ceteris paribus" assumption which attempts to explain deviations from the model of rational choice with the argument that the model's predictions would have taken place, but for intervening factors. In similar fashion, physical theory predicts the behavior of inanimate phenomena but with the assumption that there are no interfering factors.

But it is here again that the model of rational choice is deficient since the "ceteris paribus" assumption is not sufficient to explain the many diachronic mental decisions that entrepreneurs make between the time the decision to maximize profits is made and the time profit maximization occurs. In fact, the latter may not occur. On the other hand, inanimate phenomena, the subject matter of physical theory, do not make subjective decisions, hence prediction in physical theory is a less complicated matter, notwithstanding the constraints in prediction encountered in, say, quantum physics. The point is that modern physical theory eschews all references to teleological principles, which, on the contrary, must necessarily be considered in those disciplines that deal with human behavior.

It seems that the "ceteris paribus" assumption is not intended to explain such mental dispositions as hunches, gambles, ruthlessness, and other decisions characteristic of the "business" mind, which are quite often associated with profit maximization. In the case of consumer choice-making, it would seem that the "ceteris paribus" assumption is not meant to explain the behavior of the consumer who sincerely wishes to maximize satisfaction yet never manages to "attain his highest indifference curve".³

The problematic nature of the concept of rational behavior is further evidenced by the following observations of von Neumann and Morgenstern:

"Second, and this is even more fundamental, the rules of rational behavior must provide definitely for the possibility of irrational conduct of others. In other words: Imagine that we have discovered a set of rules for all participants - to be termed as 'optimal' or 'rational' - each of which is indeed optimal provided that the other participants conform. Then the question remains as to what will happen if some of the participants do not conform. If that should turn out to be advantageous for them - and quite particularly, disadvantageous to the conformists - then the above 'solution' would seem questionable. ... In whatever way we formulate the guiding principles and the objective justification of 'rational behavior', provisos will have to be made for every possible conduct of 'the others'. Only in this way can a satisfactory and exhaustive theory be developed." (von Neumann/Morgenstern 1967, 32)

Von Neumann and Morgenstern make the point that some objective justification must be established for the concept of rational behavior and that behavior not in conformity with the model of rational choice must be fully accounted for. Yet if one assumes that rational behavior is equivalent to optimal or ideal behavior, as von Neumann and Morgenstern do, then behavior not in conformity with the model of rational behavior can only be explained in terms of deviations from ideal behavior. In fact it is mainly because theorists were unable to give accounts for all the choices that agents make, that heuristic constructs like rational economic man were introduced. But although rational economic man facilitates the establishing of coherent theories of economic decision-making, epistemological questions must be raised about the empirical

content of those theories constructed according to the choice paths followed by rational economic man.

Perhaps, the problem of making allowances for all choice possibilities, which is not considered by the model of rational choice, derives from the fact that economic theory has not seriously examined the nature of rational choice. For the economic theorist, the concept of rational choice is based on the notions of means and ends, but "ends" are taken for granted, and it is only "means" that could possibly constitute problems concerning the viability of the model. The "ends" of profit maximization and consumer satisfaction are regarded as the objective ends of all agents. Yet how does the model deal with forms which do not seek to maximize profits, or consumers who choose to be frugal and not maximize satisfaction? The model of rational choice generally labels such deviations from the above prescribed ends as "irrational", but this cannot really be justified. For example, the entrepreneur who chooses to produce a superior product at the expense of profit maximization cannot truly be described in this context as irrational.

Some theorists, alert to the counter-factual cases that falsify the rationality thesis, have sought to make more flexible the concept of rational behavior by specifying just those circumstances in which a given choice may be considered rational or otherwise. For example, the entrepreneur who chooses to maximize leisure rather than profits, though considered irrational according to economic theory, may not be irrational as an individual. This is the basis for the appeal to the idea of "role premises" adopted by Benn and Mortimore (1976, 190) from the thesis of "role rationality", involving a "role premise" first suggested by Frolich, Oppenheimer and Young (1971). But for Benn and Mortimore, while "role premises are necessary for theory construction, there is no particular reason for calling them rationality conditions". The aim here is to avoid the rigidity implicit in the concept of rational economic man; a rigidity not warranted given the many instances of conscious self-justifying choice-making, divergent from the paths predicted by the model. A nonprofitmaximizing entrepreneur, according to Benn and Mortimore is, therefore, a real possibility.

However, even in the case of assuming role premises as necessary for theory construction, considerations about ends cannot be avoided. Can the theorist ever construct a predictive theory in which truly objective ends are posited? Or must the predicted paths and goals of agents within society be determined necessarily by theories founded on assumptions that are implicitly ideological, hence normative? In fact it is just on these considerations that the significance of rational choice rests. The question raised here is far from innocuous, it is quite important with ramifications not only in social theory, but also in the technological application of scientific knowledge.

IV.

Our discussion up to this point has demonstrated that rational economic man is a construct invented by economists to make possible the coherent formulation of predictive and explanatory theories. In this regard, it is proper to refer to rational economic man as an ideal type (see Weber 1968, 497, for a modern definition of ideal types). The concept of ideal types has also been in usage in the natural sciences. It is on this basis that some philosophers of science have sought to defend the usage of ideal types in the social sciences. A successful defence of the usage of ideal types in the social sciences, by implication, would vindicate the role of rational economic man in economic theory. Consider, as an example, Hempel's statements on this topic.

"An ideal type, then, is meant to serve as interpretive or explanatory schema embodying a set of 'general empirical rules' which establish 'subjectively meaningful' connections between different aspects of some kind of phenomenon, such as purely rational economic behavior, a capitalistic society, a handicraft economy, a religious sect, or the like. But then, in intent at least, ideal types represent not concepts properly speaking, but rather theories; and the idea naturally suggests itself that if those theories are to serve their purpose, they must have a character quite similar to that of the theory of ideal gases, say." (Hempel 1963, 219)

But there would appear to be a methodological misunderstanding here: ideal types in the natural sciences represent special cases of particular theories logically implied by the empirically established cores of those theories.

In many cases, they serve as limiting conditions for theories under circumstances of extreme conditions. On the other hand, ideal types in the social sciences are posited concepts which have no genuine empirical content yet serve as cores of the theories in question. All pertinent data is interpreted in terms of the assumptions of the ideal type core theory. For the former case, consider Hempel's example of an ideal gas. The ideal gas laws represent an idealization in which "the potential energy of interaction between the molecules of a gas is negligible compared to their kinetic energy of motion". Let us call this state of affairs K. K, therefore, is logically implied by the empirically founded kinetic theory of gases: And in some cases the above limiting or extreme case is empirically confirmed. As Hempel himself put it:

"Thus, e.g., the Boyle-Charles law for ideal gases is rather closely satisfied by a large variety of gases within wide, specifiable ranges of pressure and temperature (for a mixed mass of gas), and it is for this reason that the law can be significantly invoked for explanatory purposes." (Hempel 1963, 226)

However, in the social sciences this is not the case, as could be demonstrated if one takes the case of the construct rational economic man. It is not logically acceptable to point out some agent and characterize his choices as rational without first comparing his behavior to some model of rational choice. One

cannot point to empirical examples of rational behavior in the way that one can point to examples of ideal gases. In the case of the former, the theorist must determine whether the observed behavior was really intended by the agent and whether the latter's concept of rational behavior conformed to that of the theorist for the case in question. Within the context of economic decision-making the rational agent is presumed to be a utility or profit maximizer and paths to these goals are suggested by theories of the consumer and the firm in economic theory. In the case of ideal gases nothing more than description is invoked for investigative purposes. The theorist does not prescribe that all gases conform to the ideal gas model nor would the explanatory power of those theories which examine the behavior of gases be seriously weakened were there no ideal gases. One may argue, therefore, that ideal types in the natural sciences are special cases of empirically determined theories; in the social sciences they are established on the basis of certain initially posited assumptions.

Yet indeed, one may argue that although ideal types may not possess empirical content, they are nevertheless necessary for scientific research. Nagel, for example, argues that ideal types demonstrate

"how phenomena are related when they are unaffected by numerous factors whose influence may never be completely eliminable but whose effects generally vary in magnitude with differences in the attendant circumstances under which the phenomena actually recur." (Nagel 1963, 215-216)

But this view applies specifically to the role of ideal types in natural science, not in the social sciences. The role of "ceteris paribus" in economic theory could be regarded as serving just this qualifying role: that an ideal type theory is being formulated. But given the role of the postulate of rationality for economic theory, the "ceteris paribus" phrase in economic theory does not safeguard the predictive powers of the theory in the event of interfering factors, it merely serves as a guarantor of economic choice in conformity with the postulate of rationality and its attendant axioms. The fact is that ideal types in the natural sciences serve in a capacity different from that in the social sciences.

One interesting and recent attempt to vindicate the idea of ideal type usage in the social sciences is that of D. Papineau (1976, 137-146). Papineau attempts to defend the usage of ideal types in the social sciences on mainly heuristic grounds. In this regard, ideal types though lacking in empirical content (as Papineau argues) may serve in the diachronic development of theories. Ideal types are perceived then "as providing the kind of ladder which may well be thrown away once it has got one where one wants to go". (1976, 146) This approach is motivated by the "research programme" paradigm of I. Lakatos which characterized theoretical systems in science as constituting a set of unfalsifiable basic postulates ("negative heuristic" core) in working conjunction with a "positive heuristic" representing the "refutable variants" of the system itself. On these grounds, therefore, the notion that ideal

types constitute theoretical terms necessary for the elaboration of a scientific theory is rendered problematic. This latter view, espoused especially by Nagel, is critically examined by Papineau. But Papineau commits the same oversight as Nagel when he appeals to the usage of ideal types in the natural sciences as exemplifying usage in the social sciences. Papineau's appeal to the notion of ideal gas as an example does not recognize that the role of ideal types in natural science theory is minimal, not so their role in the social sciences.

It is for the reason that the initial ideal type assumptions of economic theory are difficult to defend in terms of their satisfying the canons of scientific inquiry, that some theorists have seen fit to establish the scientific claims of an economic theory purely on the predictive power of the theory. Friedman's essay "The Methodology of Positive Economics" (1968, 508-528) is generally taken to be a classical statement of this position. Friedman's instrumentalist approach eschews the importance of assumptions for scientific theory building with the argument that the extent of the realism of assumptions for some theory is not a crucial issue and that all that is required is that they be "good approximations for the purpose at hand". The basis of Friedman's argument is that this approach to theory construction is practised in the natural sciences. Friedman is correct here: the theoretical assumptions of many theories in natural science are accepted only when those theories yield accurate predictions and explain all that they set out to explain.

On this argument, Friedman is able to divert attention from questions concerning the all-important theoretical posit in economic theory: rational economic man. Friedman's thesis would be acceptable were the predictions of orthodox theory accurate. But as was pointed out elsewhere in this paper, the predictions of orthodox economic theory have not been particularly successful. Under these circumstances, orthodox research methodology requires that the theorist return to an examination of the theory's theoretical assumption: in this case, the ideal type construct rational economic man.

V.

If one accepts the argument that there is no genuine scientific basis for the usage of the ideal type rational economic man in economic theory, then the theory of rational economic behavior is, perhaps, best described as a set of analytic statements. But too, if the theory of rational economic behavior is regarded as having empirical content, or assumed to be descriptive of the actual choices made by economic agents then its usage is clearly normative. For example, in economic theory it is assumed that the decisions of rational economic man are in accordance with the principle of transitivity, but some theorists have recognized that the principle of transitivity is clearly normative in structure. Quirk and Saposnik, two theorists in choice theory, write:

"For example, in experiments involving choice by individuals among complex alternatives, the crucial axiom of transitivity is often violated by the subjects involved in the experiments. It is true, however, that when this is brought to the attention of the subjects, there is the reaction of 'having made a mistake', such as incorrectly answering a problem of mathematics. It might then be safer and more realistic to regard the transitivity axiom as a normative rule of consumer behavior rather than as a description of the actual choice patterns of consumers." (Quirk/Saposnik 1968, 15)

The effect of this on the empirical claims of economic theory is important. Despite the fact that not all its axioms and statements are normative, the existence of some normative statements within a theoretical framework renders the theory normative as long as those normative statements play a decisive role in the theory. Thus it is easy to add to the observation of Quirk and Saposnik, that "the crucial axiom of transitivity" is best described as a normative rule by arguing that the model of rational economic behavior is a normative model not only because it contains the normative axiom of transitivity, but also because agent behavior is often not in conformity with the model of rational behavior. Economic agents are not aware that their choices presuppose behavior in accordance with the axioms of completeness and reflexivity. This observation and the fact that "the postulate of rationality is the customary point of departure in the theory of consumer's behavior" (Henderson/Quandt 1971, 6; Henderson and Quandt make the same argument for the theory of the firm. In other words, theories of the firm are constructed on the assumption that not only the consumer but also the entrepreneur are rational economic men. See page 53) are sufficient support for the above argument. Consider a more trenchant analysis:

"In economic texts the question often arises why many economists do not admit that their sentences contain normative and theoretical components. Normative theoreticians are increasingly acquiring the habit of ogling reality. They maintain that their theoretical sentences refer to reality and confuse empirical and theoretical languages for this purpose." (Kroeber-Riel 1971, 338)

But basis axioms of consumer choice theory are indeed indispensable for the purposes of building predictive theories of economic decision-making. Once the attempt to establish basic psychological laws of human decision-making had been discredited by the well-founded critique of the theory of cardinal utility measurement, the theorist saw fit to have recourse to the ideal type construct, rational economic man, to establish a coherent theoretical structure for purposes of prediction and explanation. But our discussion on ideal types led to the conclusion that, the role of rational economic man in economic theory is essentially a normative one. The problem is further compounded by the fact that the postulate of rationality is an essential starting point for economic theory building. The thesis that positive economics conforms to the paradigm of scientific investigation is, therefore, open to a justifiable critique.

If it is indeed the case that the theories of positive economics are founded on normative postulates, then there is some question concerning the distinction theorists generally make between positive economics and normative economics. As has been argued in this paper, the source of the theorist's problem is the nature of rational behavior descriptive of the choices made by rational economic men. Since there is not much proof that the choices of actual agents conformed to the model of rational economic man, it was suggested that rational economic man was essentially an ideal type. It was argued that ideal types are devoid of empirical content serving as quasi-theoretical terms within theories which purport to describe reality.

There were some grounds for this approach since ideal type constructs are not unknown in the natural sciences. But it was shown that the role of ideal types in the natural sciences was different from that in the social sciences. In the former case, their role is minimal, since they serve mainly in the capacity of boundary conditions for empirical theories; in the latter case they serve as the crucial cores of theories avowedly scientific in intent. Though analytic in nature, the theories of economic behavior descriptive of the choices of rational economic agents were perceived as normative theories when applied as theories descriptive of reality.

One way out of the theorist's dilemma (the problem of cardinal measurement on the one hand and the problem of an adequate definition of rationality on the other) is to stress the role of theory building less and to rely more on observation. In this regard a greater reliance on econometric research could yield results that were predicted by theories. By including as many variables as possible in the predictive equations and making allowances for chance occurrences, the stress on theory construction could give way to the accuracy of a theory's predictive equations. The basis for this paradigm shift would be the fact that stochastic considerations constitute necessary assumptions for theories that emphasize accuracy of prediction. The orthodox models of economic theory are essentially deterministic in nature, structured as they are on the postulate of rational behavior.

Econometric models are indeed popular within the economics profession, a fact which tends to support the above argument. However, despite the added power in technique, theorists recognize that there is the problem of identification. This problem consists of identifying the set of meaningful equations from the data at hand. The problem is compounded by the fact that the set of predictive equations contain error terms which stand for the impact of variables not considered by the model. The point is that no matter how sophisticated the model constructed, there are determining variables which have not been included in the model because of observational constraints. Of course, the demand for theoretical completeness for any scientific theory is unrealistic, but the extent of the allowances made for error in any theory is an index of the predictive power of the theory. Furthermore, there is no rule whereby endogenous and exogenous variables may be clas-

sified; and the serious problem of possible multicollinearity among variables has not yet been resolved. Yet the probabilistic approach to the analysis of the data of economics has not shown itself to be markedly superior to the deterministic approach of classical choice theory. The fact that in the final analysis one must have recourse to an examination of the theoretical assumptions of econometric research is practical proof of the problematic nature of Friedman's thesis that the strength of a theory is determined only by the accuracy of its predictions.

Econometrician, Trygve Haavelmo, for example, argues just this point in stating that the "more stringent methods" that theorist have been trying to develop "have actually opened our eyes to recognize a plain fact: viz., that the 'laws' of economics are not very accurate in the sense of a close fit, and that we have been living in a dream-world of large but somewhat superficial or spurious correlations. We could of course also, as always, complain about bad statistical data. However, I think we may well find part of the explanation in a different direction, namely in the shortcomings of basic economic theory, and in the somewhat passive attitude of many econometricians when it comes to the choice of axioms and the economic content of the models we work on." (Haavelmo 1958, 355)

One other way in which the problem of rational behavior in economics may be tackled is to consider the applicability of the learning theory approach developed by researchers in the area of psychology. The major problem with this approach though is that fruitful results may be obtainable only from very simple experiments in which agents are constrained to binary choice situations. The aim here would be to observe the frequency and consistency with which agents make choices over a period of trials from a series of binary alternatives (see Estes 1965, 422-433).

The learning theory model though possessing all the ingredients for genuine empirical research may be too simplistic for the more complex choice-making situations that confront the agent in the real world. Some optimism concerning the eventual application of learning theory to economics is justified given the rapidly increasing sophistication of computers, but granted the strong commitment that theorists have for the idea of rational choice, progress in developing models purely descriptive of the choices agent make may be somewhat slow.

VI.

The problematic nature of the concept of rationality and its role in economic theory were explored in this paper. It was argued that the scientific claims of economic theory were rendered questionable by the fact that the normative postulate of rationality played a key role in theory construction. The normative postulate of rationality was defined according to the choice made by the ideal type construct rational economic man. Its heuristic limitations were then discussed. As possible solutions to the problem of rational behavior, econometric theory and the learning theory approach were briefly

explored. On the basis of the discussion, a legitimate question is raised concerning the validity of the distinction generally made between positive economics and normative economics. Should economics be regarded, therefore, as an essentially normative discipline? A further question is raised, and that is whether contemporary economic man, given the essentially unpredictable nature of his actions and the need of the theorist to impose structure and order on the empirical world, will be for the foreseeable future subjected to the Pavlovian machinations (advertising, etc.) of the so-called market economies or the commands of the planned economies. Perhaps the economist needs his "rational economic man" in the same way that the natural scientist must assume the "uniformity of nature" in order to establish predictive theories.

Notes

1 The ranking criteria mentioned above may be symbolized as follows: " R_k ", " P_k " and " I_k " stand respectively for "weak preference", "strong preference" and "indifference" for any agent K . Our axioms may be stated as follows:

- (i) Completeness: If $A, B \in E$, then AR_kB or BR_kA or AI_kB .
- (ii) Reflexivity: If $A \in E$, then AR_kA .
- (iii) Transitivity: If $A, B, C \in E$, and if AR_kB and BR_kC , then AR_kC .

For the ranking relation P , note the following: $A, B \in E$, then AP_kB if AR_kB and not BR_kA . And given $A, B \in E$, then AI_kB if BR_kA and AR_kB . In order to permit proper axiomatization of the theory of consumer choice a distinction is made between possible states of the economy, E and feasible states, Z .

2 In fact, most "normal science" texts or commentaries on economics begin with the initial posit of "rational economic man". Consider Herbert Simon's observations that "traditional economic theory postulates an 'economic man', who in the course of being 'economic' is also 'rational'. This man is assumed to have knowledge of the relevant aspects of his environment which, if not absolutely complete, is at least impressively clear and voluminous" (see Simon 1957, 241). Simon (ibid.) has made the interesting observation that the rationality principle operative in orthodox economic theory assumes "unbounded rationality", that is rational decision-making based on the idea that agents possess complete information. Simon argues that this assumption is unrealistic and suggests that the idea of "unbounded rationality" be replaced by that of "bounded rationality", according to which agents make choices within the constraints of imperfect knowledge. But modifications of this nature have no real impact on the argument of this paper, i.e. that the theorist cannot on the one hand hope to establish objective theories, yet on the other establish his theories on the epistemologically dubious construct, rational economic man. But consider again, "the rationality of economic man is fundamental to a substantial body of economic theory. This is so whether we consider neoclassical theory as so expertly outlined by Sir John Hicks in Value and Capital or more recent developments such as those begun by John von Neumann and Oskar Morgenstern with their publication of the Theory of Games and Economic Behavior. Indeed, there

is hardly any area of economics in which the rationality postulate is unimportant". (Tisdell 1976, 196)

- 3 It is hardly likely that the average consumer on maximizing satisfaction would recognize that his decisions entailed a set of technical operations that derive $\frac{-J_{q_i}}{J_{q_j}} = \frac{P_j}{P_i}$ (with the condition that bordered Hessian determinants alternative in sign) from a utility function $U = f(q_1, q_2 \dots q_n)$ and a budget constraint $y - \sum_{i=1}^n P_i q_i = 0$.

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