

Roger A. McCain

Markets, Decisions, and Organizations

Intermediate
Microeconomic
Theory



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MARKETS, DECISIONS, AND ORGANIZATIONS:

**intermediate microeconomic
theory**

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PREFACE

Markets, Decisions, and Organizations is, candidly, an ambitious book. Its central purpose is to serve as the main text in a standard course of intermediate microeconomic theory. However, the book has been designed to do several other things well, at the same time. First, *Markets, Decisions, and Organizations* should be accessible to the student with no prior training in economics, provided that the student is able and is willing to work quite hard. Such a student might, for example, be a first-term candidate for the Master of Business Administration degree. Second, the book introduces a few of the more modern nonmathematical developments in economic theory and theoretical perspectives on economic policy into intermediate microeconomic theory, so as to accommodate the teacher who would wish to experiment with a course syllabus which departs somewhat from the standard. With this in mind, the book has been designed for versatility. Third, the book lays the intuitive groundwork for the more abstract and mathematical material which is a major segment of modern graduate-level microeconomics. Thus, for example, optimization is stressed, the distinction between necessary and sufficient conditions is stressed, and cost curves are discussed in a way which points toward duality theory (although duality theory is not explicitly stated). Fourth and equally, the book lays the theoretical groundwork for applied economics and empirical economic theory. Thus *specific* empirical studies are discussed, not only in demand and cost estimation, but in imperfect competition, the economics of factor markets, and other topics. For the same reason, the discussion of price indices is given especial prominence, the identification problem is discussed in four distinct contexts, and extended historical and current-events examples are given. Finally, *Markets, Decisions, and Organizations* is written to teach by example and inquiry wherever possible, with specific examples *preceding* and following statements of general propositions, to assist the student who learns best when proceeding from the particular to the general (as most students do).

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FOUNDATIONS FOR MICROECONOMICS

1

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The idea of an economic system

The method of economic analysis: The example of supply and demand

Logic, terminology, and estimation in economic method

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MICROECONOMICS: THE WHOLE AND ITS PARTS

This is a text on microeconomics. That being so, it is necessary—custom demands it—to begin by defining microeconomics. This approach seems to be backward: the time to define a subject is after one has finished with it. Definition is a setting of limits, and who can know the limits of a study which is just about to begin? Truly we cannot define microeconomics now, but the reason for giving a definition is to forewarn the reader, so far as it is possible, of what is to come.

We may well begin with the Greek roots of the word “economics.” They are *oikos* and *nomos*. “Oikos” refers to a household, and “nomos” to laws, rules, or “rules of thumb.” Thus “oikonomia” would mean something like “sound rules for the conduct of a household,” that is, home economics. Home economics is the original economics (and the term “home economics” is redundant). In the eighteenth and nineteenth centuries, the subject we now know as economics was often called “political economy,” which would mean “sound rules for the conduct of a political household,” which is more or less what we would now mean by “applied macroeconomics.” Around the turn of the twentieth century, the unscientific-sounding adjective “political” was dropped, and the ending “y” was changed for “ics,” in imitation of “physics” and “optics,” giving us the modern term “economics.” Presumably, this is supposed to persuade us that economics is a science. Indeed it is a science (and some other things as well), but we might be more reassured of that if the economists had put less trust in the power of a name.

Economics has been variously defined, and the danger of any definition is that it may set limits which are narrower than those of the subject itself. Economists study a certain range of phenomena with a certain range of approaches. We might attempt to define either the phenomena or the approaches. If we were to define the phenomena, we might say

DEFINITION: *Economics is the study of the production, distribution, exchange, and consumption of goods and services.*

If we were to define the approaches, we might say, with Lionel Robbins,

DEFINITION: *Economics is that science which considers human behavior as a relation between ends and scarce means which have alternative uses.*¹

Most economic studies will come under both definitions, since Robbins's "ends" are goods and services for consumption, broadly speaking. Production is Robbins's primary means, and distribution and exchange are consequences of scarcity and ways of dealing with scarcity. Yet we ought not accept either definition to the exclusion of the other. To accept one definition would be to prejudge either the indispensibility of exchange in the face of scarcity or the universal role of scarcity in exchange. We must not prejudge these things, and so any study which fits under either definition is acceptable as economics.

Economics has two major branches: macroeconomics and microeconomics. The Greek roots "macro" and "micro" mean, respectively, "large" and "small" in some sense. But in what sense? Macroeconomics is concerned with the economic functioning of countries and regions (and the world) as wholes. Microeconomics is concerned with the functioning of the parts which make up those wholes: individual consumers and suppliers of resources, business firms and agencies, and markets for particular goods and services. Thus we are to understand "micro" as small in the way that a part is small, in relation to the whole of which it is a part. Since microeconomics is concerned with the functioning of the parts, it is a kind of analysis, and another term for microeconomics is *economic analysis*.

Thus we are embarking on an analysis of our economic system, to break it down to its component parts and study them, with a view to better understanding their interaction, which in turn defines the whole.

POSITIVE AND NORMATIVE ECONOMICS

We must pause to observe another major division between two kinds of economics, one which cuts across both microeconomics and macroeconomics. *Positive economics* is the study of the working of the economy as it is, not as we might want it to be. *Normative economics* consists of the criticism of existing economic arrangements and the proposal of improvements. That is, positive economics is concerned with "what is" and normative economics is concerned with "what ought to be."

The two cannot be kept entirely apart. To begin with, many of the

¹Adapted from Lord Lionel Robbins, *An Essay on the Nature and Significance of Economic Science*, 2nd ed. (London: MacMillan, 1935).

applications of positive economics are normative. That is, the insights of positive economics are used in proposals to improve government policy. But what is an "improvement" if not "what ought to be"? Conversely, seriously meant proposals to improve government policy must be based on a lively sense of what is possible, and thus on a systematic study of "what is." But for just these reasons, it is crucial to keep "what is" and "what ought to be" analytically separate. We can never offer any suggestions as to economic policy without saying "what ought to be," and "oughts" are not scientific statements. "Oughts" have to be derived from ethical and moral values. However, economic interactions are complicated, and it is not self-evident which policies will advance which values.

In microeconomics, normative reasoning takes the form of cost-benefit analysis and welfare economics. Cost-benefit analysis is an applied field. Whenever we do a cost-benefit study, there is at least an implicit, tentative recommendation that we ought to adopt the policy with the greatest excess of benefits over cost. However, the values are implied in the definition of costs and benefits, and one person's costs may be another person's benefits. Welfare economics is a more systematic and theoretical field, in which assumptions about "what is" and "what ought to be" are made explicit and ideal policies are deduced from them. As a rule, these policies are not likely to be feasible, but they are a basis for criticism of existing economic policies and of the practice of cost-benefit analysis.

INDIVIDUAL AND SOCIAL DECISIONS

Let us return to the second definition of economics, which "considers human behavior as a relation between ends and scarce means which have alternative uses." The word "scarce" must be carefully used. To say that a means or a resource is scarce is simply to say that there is not enough of that means to wholly satisfy every need or want that the resource might be used to satisfy. If the resource has *alternative* uses, that in itself implies that some of the uses must be given up, and so the resource is scarce, simply because it has *alternative* uses.

Therefore, scarcity implies the necessity of decision. Whenever a means or a resource has alternative uses, it must be decided which use will be made of that means. That being so, decisions play a central part in microeconomics. We shall, for example, give a good deal of attention to the consumer's decision as to how much of his scarce income to devote to each of the consumer's goods (ends) that he buys. We shall also give a good deal of attention to the businessman's decision as to how much to produce, and which scarce means (resources) to use in the production of it.

These are both individual decisions. The society as a whole also faces

scarcity and the consequent necessity of decision. A country has only so much land of a particular kind, only so much potential labor of a particular kind, only so much capacity to save and invest. How are these means to be used? What will be produced, and for whom? These are social decisions. In some (Soviet-type) countries, many of these questions are decided by a central planning board. However there is no country in which all the questions are decided by a central body, and in many countries there is no central economic planning at all. Thus, some of the social decisions must somehow arise from individual decisions on quite different matters. How can this be so, and what will the decisions be, in a given environment? The best we can say, at this stage, is that social decisions are the results of a decision *process* which may involve, at various stages, negotiation and exchange, voting, persuasion, coercion, hearings and decrees, blackmail and bribery, and other forms of social interaction. But even within a Soviet planning board, the same is true. The planning board is not a single mind but a group, which must by some process resolve the differences of its members and so produce a social decision.

In a fairly small group, one possible group decision process is "Let George do it." That is, the decisions may all be entrusted to a single individual. In larger groups, including many business firms and other organizations, it is unfeasible to do this. Thus, more complex decision processes are required. One possibility is to decentralize the decision process, that is, to entrust a certain kind of decision to one person, and another class of decisions to someone else, and so on. One way to do this is by means of a private property system, in which each person is entrusted to decide on the disposition of the property which she or he owns.

What would we want a decision process to be like? We might, for example, want it to be *responsive* to the preferences of the members of the group. That is, if one member was to shift his preference from A to B, and no one else's preferences changed, yet the social decision shifted from B to A, we would probably consider that unsatisfactory. We might also want the process to be *decisive*—that is, for a given population, we might think that the decision should depend only on the set of alternatives offered. However, many choice processes in common use are not decisive. Voting, for example, may not be decisive if there are more than two alternatives.²

One family of decision processes is of particular interest to us. It includes *profit maximization* and *cost minimization* and, in general, any decision process which leads to the maximization or minimization of anything. Any such decision process may be called *optimization*. Optimization plays two

²Suppose, for example, that a club is planning to hold a party. They must decide whether it will be an evening or afternoon party, and also whether it is to be formal or informal. There are four possibilities all told, but the decision may well depend on which issue is taken first, the time or the dress.

roles in microeconomic theory, both of them quite important. On the one hand, optimization is an important explanatory concept of positive economics. It appears that people often act as though they were trying to maximize or minimize something. Second, optimization is an important concept of normative economics, since we may well feel that the proper function of a social institution or policy is to either maximize or to minimize something. Thus we shall digress to develop some useful concepts about optimization.

OPTIMIZATION AND FUNCTIONS

A hypothesis of optimization (maximization or minimization) will usually take the form "Variable x is chosen so as to maximize (minimize) y ," as, for example, "Output is chosen so as to maximize profits." This can be meaningful only if y is a function of x (in the mathematical sense). To say that y is a function of x is to say that there is a rule which will allow us to compute y whenever we know x . The rule will usually take the form of a series of computations which, when performed on x will yield y . For example, some functions are:

- 1-1. $y = x^2 - 2$: "Square x and subtract 2 to get y ."
- 1-2. $y = e^{(0.7)x} x^{0.35}$: "Raise the constant e to the power of x times zero point seven, raise x to the power zero point three five, and multiply them together to get y ."
- 1-3. $y = \begin{cases} x, & x > 1 \\ 0, & x \leq 1 \end{cases}$: "If x is greater than one, y is x . If x is less than or equal to one, y is zero."
- 1-4. $y = \text{decimal part of } x$: "Erase all the numbers to the left of the decimal point of x . What is left is y ."

In each case we could write $y = f(x)$, $y = F(x)$, $y = \phi(x)$, or $y = g(x)$, or some similar notation, in order to avoid writing out the rule in full each time we refer to it. The letter followed by parentheses $f(\cdot)$ or $\phi(\cdot)$ or whatever, is the name that we give to the rule. Thus $y = f(x)$ means "Apply the rule named $f(\cdot)$ to x to get y ." But this notation is not only shorthand. Sometimes we avoid writing down the rule in full because we do not know (or do not need to know) exactly which rule it is. It may be good enough if the rule $f(\cdot)$ is one member of a certain family of functions. We might, for example, say "let $f(x)$ be a polynomial function of x ." That would mean that $f(x)$ can be any rule of computation written

$$1-5. \quad y = a + b_1x + b_2x^2 + b_3x^3 + b_4x^4 + \dots$$

Where a , b_1 , b_2 , \dots are any numerical constants and there may be any number of terms. Equation 1-1 (above) is one member of that family. But we