

Second Edition

INTERMEDIATE MICROECONOMICS

James P. Quirk



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To Spotty Quirk, 89 years young

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Preface

This is the second edition of a text designed to provide a nonmathematical introduction to the principles of microeconomic theory. Because of the book's literary and graphical approach, no mathematics beyond the high school level are used in the body of the text. Still, the objective has been to develop rigorously the scope and limitations of modern microeconomic theory and to illustrate the theory through applications.

Compared to other texts currently available, this text takes a more explicit general equilibrium approach, especially in the later chapters dealing with applied welfare economics. In the same vein, simultaneous market equilibrium is taken up early in the book in the treatment of the law of supply and demand, and there is an introductory chapter stressing the interrelationships among markets.

Markets for assets and intertemporal decision making are given more detailed treatment than in most intermediate texts. There is also a discussion of the determination of the rate of interest in the market for newly produced capital goods. Welfare economics is approached from a general equilibrium point of view, with the revealed preference version of Pareto superiority as the guide to judging among policy proposals. Among the topics treated in the book are the Averch-Johnson effect, the prisoner's dilemma, the notion of a Nash equilibrium, the minimax theorem, measurable utility theory, hedging in futures markets, the value of information, Cournot and Stackelberg versions of oligopoly theory, consumer's surplus, compensated demand functions, and homogeneous and homothetic production func-

tions. Production theory is developed from an activity analysis point of view, and utility maximization and revealed preference are both used as approaches in the chapters on consumer theory.

Compared to the first edition of this book, a large number of boxed applications and examples of the theory have been added; much of the text has been reworked to improve readability and comprehension; end-of-chapter notes have been added to provide certain results in calculus notation for students with more advanced mathematical backgrounds; and solutions to all even-numbered problems in the book have been added at the end of the book.

I want to thank those students from Caltech and elsewhere who have suggested changes, as well as the reviewers of the text. Among the reviewers were David L. Cleeton (Oberlin College), John Hoag (Bowling Green State University), and Roger Sherman (University of Virginia).

I owe a special debt of gratitude to Dave Montgomery, Lance Davis, Roger Noll, Stu Burness, Ted Bergstrom, and Mohamed El Hodiri for their comments and criticisms, and to Bob Huttenback. Bob Bovenschulte made the original suggestion to me to write the book, and David Bruce Caldwell worked closely with me on the first edition and encouraged me to do the present revision. Michael Zamczyk has been most helpful in shepherding this edition, and I've been lucky enough to have Gretchen Hargis again as editor.

Mrs. Roxanna Hippe did a professional job of typing the manuscript under rush conditions. Finally, once again my wife, Shirley, made it all worthwhile.

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Introduction

For about the last forty years, or roughly since John Maynard Keynes's *General Theory of Employment, Interest, and Money* made its way into the classroom through Paul Samuelson's pathbreaking textbook, economics has been neatly divided into two parts: macro and micro. Macroeconomics deals with problems of the overall performance of the economy as measured by such indicators as gross national product (GNP), the inflation rate of the consumer price index, unemployment, the money supply, labor productivity, the government deficit, and the balance of trade. On the other hand, microeconomics concerns the behavior of elemental economic units—individual consumers, firms, resource owners, industries, commodities, and markets.

Also, in part because different kinds of questions are posed in macro than in micro, the approaches adopted in the two branches of economics differ as well. In arriving at its predictions and explanations, macroeconomics relies primarily on directly observed aggregate relationships such as the consumption function, which links consumption expenditures to the level of disposable income, or the investment function, which links investment expenditures to

such variables as the interest rate, business and consumer expectations, and the GNP's level and rate of change. In contrast, microeconomics bases its predictions and explanations on a rather elaborate and well-developed theory of the individual behavior of consumers, firm managers, and resource owners as this behavior is expressed in a system of markets. The aim of this book is to provide an introduction to that theory.

SELF-INTEREST AND INCENTIVES

The most fundamental idea underlying microeconomic theory is the view of a society as an organism in which *each individual participating in the society is motivated by self-interest and acts in response to it*. The microeconomist takes it as a basic premise that the structure of incentives (monetary and otherwise) plays a crucial role in determining the pattern of economic activity in a society. The notion of self-interest and of the efficacy of incentives is as fundamental to microeconomics as Newton's laws are to physics.

A basic objective of microeconomic theory is to explain and predict how the production, exchange, and distribution of goods and services responds to the structure of incentives in a

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society. That is to say, a prime goal of the theory is to arrive at testable assertions about a society's economic activities. Thus microeconomic theory is, in a formal sense, a scientific theory.

THE NATURE OF SCIENTIFIC THEORY AND ITS DEVELOPMENT

Any scientific theory, whether in the physical or the social sciences, is an attempt to provide a consistent, logical, and testable explanation for a range of phenomena found in reality. Such a theory isolates for study certain objects and their interrelationships. Empirical observations establish the characteristics of these objects, as well as any observable regularities in their interrelationships. At the base of the theory, then, are empirical observations.

But reality is infinitely complex. To construct a manageable explanation, the theory abstracts from reality, suppressing all but the most essential features of the objects under study. As Einstein is reported to have remarked, "The essence of good science is to make things as simple as possible—but no simpler." The theory is constructed by stating certain *axioms* about the characteristics of the objects and their interrelationships and then deriving *propositions* that express the joint implications of the axioms and can be deduced from them by pure logic. The axioms are generally empirically based, describing in abstract form the observed features of the objects; similarly, the propositions are often empirically testable through observations of the objects as they exist in reality.

The ultimate test of the scientific validity of a theory is the extent to which it gives rise to propositions that are verified by observations. But the theory plays another role as well, in providing an understanding of the phenomena it is designed to predict. Science is concerned not only with making correct predictions, but also with pro-

viding an understanding of why the predictions work. The scientific theory provides the logical apparatus for getting at both of these issues.

No scientific theory is ever completed in the sense that its axiom system and its set of testable propositions are completely known, verified, and unchanging over time. The essential reason for this incompleteness is that, by the very nature of a scientific theory, reality has been simplified so as to be logically manageable. The process of simplification involved in constructing a scientific theory necessarily introduces distortions into the descriptions of the objects under study. When a theory is first developed, it is designed to explain and predict a rather narrow range of phenomena. The theory is tested through its predictions about these phenomena. Given success in these predictions, the theory evolves through wider and wider applications. As the range of the theory is increased, the probability that the distortions built into the theory will lead to disverification increases. Once empirical tests contradict the theory's propositions, it is time to reexamine the axiom system to develop a revised characterization of the objects and their interrelationships.

Thus there is a close link between empirical work on the one hand, aimed at both determining the limits of a theory's applicability and specifying more finely the characteristics of the objects under study, and theoretical work on the other hand, aimed at restructuring the axiom system so that the theory's testable propositions jibe with observed results. In a very real sense, constructing and testing a scientific theory are never finished. No scientific theory either intends or accomplishes a complete mirroring of the complexity of reality. It is this very complexity that leads in the first place to constructing the simplified model that constitutes the scientific theory. This trait is as true of, say, physics as of microeconomic theory.

THE ROLE OF THEORY IN MICROECONOMICS

The objects under study in microeconomic theory are individuals—in their roles as consumers, firm managers, or resource owners—and markets. Microeconomic theory postulates certain behavioral rules for individuals and makes certain assumptions about the way markets function. Given these axioms and given subsidiary assumptions about a society's institutional structure (its laws, property rights, customs, and the like), various testable propositions can be derived about the operation of the society's economic system.

The behavioral rules for consumers, firm managers, and resource owners that appear in microeconomic theory are derived from the self-interest hypothesis: consumers maximize utility, firm managers maximize profits, and resource owners maximize the income from the use of their resources. The theory also postulates that prices are established in markets according to the law of supply and demand, in that prices are assumed to clear markets; that is, the quantity supplied on a market equals the quantity demanded. Self-interest motivated behavior and market-clearing prices represent the fundamental axioms of microeconomic theory; all the theory's testable propositions ultimately rest on them.

The behavioral rules for consumers, firm managers, and resource owners are intended to express, in simplified and abstract form, patterns of behavior by these individuals as they would be observed in reality. Similarly, within the theory, the notion of a market is reduced to its essence as a structure within which prices are determined and exchanges of goods and services and money occur. Thus the axioms of the theory are empirically based.

A basic requirement for any viable scientific theory is that the theory predict at least the general pattern of observed regularities as they appear in reality. Scientific theorizing began his-

torically with attempts to identify the underlying principles that could explain and predict the most common and well-known phenomena—the falling of objects to earth, the combustion of certain substances, and the pattern of the tides. The same is true of microeconomic theory. As an illustration, consider Gresham's law.

Gresham's Law

In the late sixteenth century, Thomas Gresham, an English merchant, formulated what has come to be known as *Gresham's law: Bad money drives the good money out of circulation*. Gresham formulated this statement when he observed that, despite a continuing output of full-bodied silver coins from the British Mint, the coins in circulation were invariably "shaved" (silver was pared from the edges). Gresham's law is simply an observation of an empirical regularity that Gresham claimed applies to all kinds of money. But this law can also be viewed as a proposition that follows from the axiom system of microeconomic theory: it expresses an implication of the assumption that individuals follow their self-interest.

Assume that there are two types of money in an economy (say, shaved and unshaved silver coins), both being legal tender (creditors must accept either in payment of debts). If one type of money has more value than the other, then individuals, following self-interest, will pay their bills in the cheaper money and hoard the more valuable. The money that circulates will be the cheaper ("bad") money. Shaved silver coins force unshaved coins out of circulation.

Gresham's law has considerable predictive power. During the American Civil War, "greenbacks" (paper money with no convertibility into gold) replaced gold coins as the circulating medium in the North. Similarly, while the United States was legally on a bimetallic system during

most of the nineteenth century (both gold and silver were minted into coins), a systematic overvaluation of gold (relative to silver) at the mint converted this system to a de facto gold standard in the latter part of the century. Only gold coins were circulated, as would follow from Gresham's law. This situation led to William Jennings Bryan's famous "Cross of Gold" speech in the 1896 presidential campaign, calling for an increase in the mint price for silver. More recently, silver dollars disappeared from circulation in the 1960s, when the silver in the dollar became worth more than a dollar to industrial users. In these and similar cases, the legal tender laws created incentives for individuals to behave in certain ways—and they responded to these incentives.

The Instability of Cartels

Charles Schwab, steel magnate of the early twentieth century, once was asked whether he had heard of agreements to fix prices in the steel industry and how effective such agreements were. He is reported to have replied that he had heard of such agreements and that most of them lasted only as long as it took the participants to get to the telephone to give orders to cheat on the agreement.

When the price of a staple commodity rises, there is invariably a report that the firms in the industry have conspired to fix prices and output. Such fixing can certainly occur, as the OPEC oil cartel illustrates. But economists are generally rather skeptical of conspiracy theories. Predictably, their argument is based on the self-interest hypothesis. Assume that a cartel is formed; that is, a coalition of firms in an industry agrees to act in concert to raise profits for the group as a whole by splitting markets, limiting competition, restricting output, and raising the price of the industry's product. By combining, the firms can generally increase the level of profits for the cartel as a whole. But once the cartel agreement has been reached, then so long as the other cartel

members honor the agreement, it is in any cartel member's self-interest to violate the agreement.

For example, if all steel firms agree to restrict the output of steel to increase its price, then any one steel firm increases its own profits by expanding its output to sell it at the higher price. Also, the higher price invites new firms to enter the industry as well, attracted by the profit possibilities. For these reasons, economists conclude that, in the absence of effective methods to police the cartel agreement and punish violators, or effective barriers against the entry of new firms, cartels tend to be unstable and break up. To borrow Karl Marx's phrase, a cartel agreement contains the seeds of its own destruction.

Mr. Schwab's comment on steel cartels was certainly self-serving (he was the head of United States Steel Corporation, which accounted for almost 50 percent of U.S. steel output in the early 1900s), but there is an important grain of truth in it. When properly qualified, the assertion that cartels tend to be unstable is, like Gresham's law, a testable proposition following from the axiom system of microeconomic theory.

THE MEANING OF SELF-INTEREST IN MICROECONOMIC THEORY

Because self-interest plays such a central role in microeconomic theory, it is important that the economist's use of the term be made as clear as possible. In the examples just given, self-interest is identified with the money payoffs from decisions, and in fact many of the testable propositions of microeconomics concern the implications of purely monetary incentives. But self-interest is interpreted much more broadly than this by economists. In microeconomic theory, an individual's self-interest is what the individual himself determines it to be and is not at all confined simply to actions that increase his money holdings or wealth.

Incentives and Spillover Effects—Energy Research and Development Spending

Before the Arab oil embargo of 1973, the federal government funded research and development (R&D) programs in only one energy-related area, namely, nuclear power. After 1973, however, the rise of OPEC as a dominant force in international energy markets led to an expansion of federal government energy-related R&D spending into programs involving oil shale, solar heating and electricity generation, geothermal power, coal gasification, wind and wave power, and others. Admittedly, energy is a critical component of our economy, and admittedly energy shortages and escalating energy costs can have military and political overtones, as well as purely economic consequences. But won't the profit opportunities available to private firms from developing alternatives to expensive OPEC oil provide the appropriate incentives to ensure an adequate amount of energy-related R&D spending? Why is there a need for government R&D spending in the energy industry—or is there such a need?

As it turns out, there are circumstances in which activities with large benefits for the general public won't be entered into by private firms, because the incentives are inadequate. This observation is particularly true for activities that have important "spillover" effects, effects in the form of payoffs that cannot be captured by the firm engaging in the activity. For example, consider research on the cause of a deadly disease such as cancer. Knowing the cause of cancer would be of immense public benefit, but there is little that private firms can do to make money from such information. Consequently, we find cancer research being funded either by the government or by charitable organizations.

What spillover effects are at work with respect to energy-related R&D? Consider the following conditions. The OPEC cartel consists of most of the leading oil exporting countries, which also tend to be the world's low-cost producers of oil. Moreover, OPEC is not subject to the antitrust laws of the

United States or other countries as private energy firms are. Thus OPEC can be thought of as the low-cost producer of oil as well as an organization with substantial market power in the oil market, market power that is not subject to the usual monopoly regulations. In consequence, OPEC sets the price of oil above what it would be if the oil market were competitive, and substantially above OPEC's cost of producing oil.

Now consider the problem of a U.S. oil firm, say, trying to decide whether or not to invest in research aimed at producing a substitute for OPEC oil. If the firm can discover some substitute that will cost less than OPEC's cost, then it stands ready to make lots of money, since the substitute would take the market away from OPEC. On the other hand, suppose the firm develops a substitute that costs less than OPEC's price, but more than OPEC's cost. In such a situation, the innovating firm faces the problem that OPEC can cut its price to below the cost of the new product and still make a profit. Thus there are limited incentives for the firm to invest in products that cost out at less than the OPEC price but more than the OPEC cost.

On the other hand, any product developed that costs less than the OPEC price provides benefits for oil consumers throughout the world by lowering the price that OPEC can charge. This outcome is the spillover effect of energy-related R&D—benefits to the general public that cannot be captured by private firms. Moreover, there are almost no R&D projects in the energy industry that contemplate producing a product that will cost less than OPEC's products cost, and so essentially all energy-related R&D involves an important spillover component. Thus, even if we ignore the important political and military aspects of energy, there are economic grounds for arguing that private incentives do not provide a sufficient stimulus to R&D spending in the energy industry and that some government encouragement of R&D programs might be appropriate.

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Thus it is not inconsistent with the notion of self-interest for an individual to turn down a higher-paying job that involves more responsibility and stress, give large sums to charity, or engage in other “unselfish” acts. Decisions consistent with self-interest require only that the decision maker prefer the expected consequences of such decisions to the consequences of alternative decisions that could have been made. When self-interest is described in this way, it might appear that any behavior at all could be rationalized as being motivated by self-interest; after all, why would anyone take a certain action if he didn’t gain more (in some sense) from that action than from the other available alternatives?

But of course this line of reasoning presupposes that individuals make decisions in a “rational” manner, weighing the costs and benefits to themselves. This approach is the one taken in microeconomic theory. A distinctive feature of the theory is that all decision making by consumers, firm managers, and resource owners is assumed to be rational in this sense; decision makers are assumed to be purposive individuals whose choices are consistent with their evaluations of their self-interest. Furthermore, it is assumed that these individuals’ choices could be predicted simply from a knowledge of their preferences and the relevant features of the alternatives available to them. These assumptions describe the “economic man” of microeconomic theory, man as “rational actor,” or “rational” decision maker.

The economic man of microeconomic theory is an idealization of reality. Human behavior is never as predictable as the economist’s theory assumes, nor is it always possible to explain behavior by self-interest, even in the economist’s sense of this term. Economic man is a valuable construct in explaining and predicting certain aspects of societal functioning, particularly those relating to the production, distribution, and prices of goods and services. In other areas of

human behavior, such as family life and other interpersonal relationships, the self-interest hypothesis has only limited predictive or explanatory power, and other models of man the decision maker and man the social animal come to the fore.

Property Rights and Self-Interest

In any society there are, of course, restrictions on the expression of self-interest, including restrictions that apply to economic activities. This condition is an inevitable consequence of living together. Every society develops a set of laws, regulations, and customs that constrain and channel the expression of self-interest. Your ability to express your self-interest in a certain manner means, among other things, that I lack the ability to keep you from acting in that manner. Rules must be developed, if only by default, to resolve possible conflicts of self-interest and to encourage cooperative activities that further mutual self-interest, if the society is to function efficiently.

We will be concerned particularly with the restrictions and encouragements of self-interest that apply to the production, distribution, exchange, and consumption of goods and services. In this context, a matter of particular interest is the structure of a society’s property rights. Ownership of a commodity really means possession of a certain set of property rights with respect to that commodity, that is, the ability to take certain actions with respect to the commodity that are protected by the society’s laws. Among the most important of these is the right to limit access to the commodity by other individuals in the society. This amounts to the legally protected ability to charge others for the use of the services of the commodity (as in renting a piece of land) or to transfer the ownership of the commodity to someone else (as in selling the title to a piece of land).

Property rights vary widely from commodity to commodity within a society, and from society to society. Since 1865, property rights in human beings have been abolished in the United States. In many countries, ownership of a tract of land does not include ownership of the mineral resources beneath the soil. In the Middle Ages, ownership of an estate typically did not include the right to sell it. Possessing a sum of money available for lending does not include the right to charge “usurious” rates of interest (what usury is varies from state to state). The right to possess a bottle of liquor for sale to others was abrogated during the Prohibition era of the 1920s (but, interestingly, not the consumer’s right to possess a few bottles at home). The list goes on.

Many of the most paradoxical results of microeconomic theory arise because of the special nature of the property rights associated with specific commodities. For example, there is strong evidence that by decreasing the number of men and ships employed in ocean fishing, the harvest of fish could actually be increased on a sustained basis. This strange conclusion reflects the fact that ocean fisheries are *common-property* resources; that is, resources that anyone is free to exploit without being required to pay an access charge—there are no enforceable property rights to the stocks of most ocean fish. Common-property resources invite exploitation today without concern for tomorrow, since there is no way any individual or firm (say, a fishing firm) can capture the future rewards that accrue from practicing conservation today. Similarly, the inability to define and police individual property rights to underground pools of oil or water leads to inefficient pumping practices, which have spurred the development of new legal institutions such as unitized field management of oil fields and groundwater management districts for groundwater aquifers.

What is produced, exchanged, and consumed in a society is bundles of property rights that we

call *commodities*. The pattern of economic activity within a society is closely linked to the structure of that society’s property rights, because it is through acquiring property rights that self-interest is expressed and incentives operate.

Competition, Self-Interest, and the “Invisible Hand”

In *Wealth of Nations*, first published in 1776, Adam Smith argued that an “invisible hand” guided the self-interest-motivated actions of individual consumers and firm managers toward outcomes that are in the interest of society at large. Adam Smith’s guiding hand refers to the workings of *competition* in the structure of markets in a society.

Because it is in each person’s self-interest to “buy cheap and sell dear,” economists assume that this is what people in fact try to do. When there is a single seller of a product, output can be restricted and price increased so that the monopolist exploits his customers to the full in the course of maximizing profits. But with many producers selling the same product—that is, with competition present—any one producer’s ability to set his price high is constrained by the fact that his customers will buy elsewhere. Competition among producers forces each to sell at the level of the firm charging the lowest price. Moreover, competition encourages firms to seek cheaper production methods and use inputs efficiently. If they persist in using outmoded, costly technology, they will be undercut by their more efficient rivals. As consumers, we want to buy cheap; but with many consumers of a product, price will be bid up to a level that reflects the demands of those willing to pay the most for the good.

Competition protects individuals from exploitation by monopolistic buyers or sellers, and it provides incentives for firms to produce goods

that are demanded by consumers, as well as moving firms toward the least-cost methods of producing such goods. It should be emphasized that profit-maximizing conduct is crucial to these conclusions; there is nothing “antisocial” about a businessperson trying to make as much as possible, so long as he or she is constrained by the competition of others in the same industry trying to do the same thing. When competition is absent, problems develop for an economic system—not simply problems of a distorted distribution of income in favor of monopolists, but problems in the sense that there are inefficiencies in the system: either the right mix of outputs is not produced, or inputs are used inefficiently.

Admittedly, the question of whether or not competition converts self-interest-motivated actions into socially desirable results is a complex one, primarily because it involves issues that go beyond science and pertain to ethics instead. We shall spend a considerable portion of this book discussing this question.

NORMATIVE AND POSITIVE ECONOMICS

The foregoing discussion leads into the distinction between *normative economics* (sometimes called *welfare economics*) and *positive economics*. Positive economics comprises the scientific aspect of economics. It concerns predicting and explaining economic activities, whether at the macro or the micro level. Normative economics deals with the ethical aspect of economics. It concerns evaluating the patterns of economic activities that arise under different government policies or under different legal or social institutions. Positive economics asks “How does the economy (or a part of the economy) work?” and “Why does it work the way it does?” Normative economics asks, in effect, “How *should* the economy (or a part of the economy) work?”

Both normative and positive economics are involved when public policies such as taxes, tariffs, subsidies, income transfers, and the like are up for review by a legislative committee or a government bureau. Economists are asked to explain the effects of a given policy on economic activities and explain whether or not, on net balance, the policy produces a “desirable” or “undesirable” outcome. In such reviews, widely differing views are expressed by different economists. In turn, this divergence has given rise to widespread skepticism about economics as a discipline: “Put four economists in a room and they’ll come up with five different opinions,” or, at the other extreme, “If you lined up all the economists in the world, they still wouldn’t reach a conclusion.”

There are (at least) two separate issues involved here, reflecting the fact that both positive and normative aspects of economics are involved in policy reviews. The first issue is whether or not economists generally agree on a policy’s effects on the economy—do they agree in their predictions? The second issue is whether or not, given agreement on a policy’s predicted effects, economists agree on whether the effects are desirable or undesirable. Turning to the second (normative) issue first, we note that economists certainly can and do differ in their judgments of what is in the interest of society at large, that is, what are desirable or undesirable patterns of economic activity. The political views of members of the economics profession range from left-wing anarchy to somewhat to the right of Attila the Hun, and these views are reflected in their evaluations of the desirability (as contrasted with the effects) of economic policies.

This is not to say that economists have not hammered out some agreements about ethical judgments that are appropriate to normative economics. Over the last twenty-five to thirty years, a framework has developed within which

economists, by more or less tacit agreement, conduct their sometimes acrimonious discussions of ethics. The basic idea here is that any change in the pattern of economic activity that makes some people better off and no one worse off is a desirable change; in particular, it is a change that would receive no opposition in a public referendum. Nearly all Western economists would consider such a change “desirable,” and they would consider any policy that resulted in such a change “desirable” as well. Needless to say, however, since most government policies result in gains for some members of the society and losses for others, any public referendum on such policies would find both supporters and opponents. In such instances, since normative economics has little to say that is definitive, public disagreements among economists on the desirability of such policies are most evident.

Ceteris Paribus

Economists can differ also in their predictions of the precise effects a policy might have on economic activities. The economy is a complicated mechanism, and the development of finely calibrated models of it is still in infancy. Even when economists agree on the general rules that govern the economy’s behavior, they can disagree on the detailed quantitative properties that characterize it. Moreover, economists are often expected to somehow predict things that are far beyond the scope of economics as a discipline. For example, political decisions about Vietnam by the Johnson and Nixon administrations had a profound effect on prices, employment, and output patterns during the 1960s and early 1970s. Likewise, the Arab embargo of 1973, together with the rise of OPEC as a power in world oil markets, played a major role in the inflation of the last ten years, coupled with lagging economic growth, high unemployment, and balance of pay-

ments deficits. Economists have no special expertise in predicting such political developments, and yet such developments can be decisive in determining the pattern of national economic activities.

Because they recognize the limited nature of the economic models they employ, economists typically invoke a *ceteris paribus* restriction on their forecasts or analyses. *Ceteris paribus* can be roughly translated as “other things being equal” or “other things being unchanged.” As used in economic analysis, the phrase is intended as a warning that the economist is going to assume that all things except the specific ones included in his or her study are unchanging. Thus in predicting the effects of the income tax bill of 1981, the economist might assume that other tax rates will remain unchanged, that no international crisis will arise, that the courts won’t change their interpretation of the tax laws, and so forth.

At a more detailed level, in studying the effect of a tariff on, say, shoes, the economist might assume that the prices of other goods remain unchanged as well as, say, the general level of income and economic activity in the economy. One basic point about this discussion is that it makes a difference just what is assumed to be unchanged when making an economic forecast or preparing an economic analysis; different assumptions about what is unchanged can result in different forecasts. We will try to be as precise as possible in using the *ceteris paribus* assumption in the following chapters.

OVERVIEW OF THIS BOOK

Chapters 1 through 12 deal primarily with the axiom system of microeconomic theory and with deriving propositions from those axioms. The meaning of self-interest is discussed in some detail, as is the law of supply and demand. The

entire treatment is in the context of the simplest theoretical model employed by economists, namely, the model of a perfectly competitive economy. In such an economy, no individual—consumer, firm manager, or resource owner—possesses any market power. Because the competitive economy is so simplified, the theoretical abstractions employed by economists appear in their starkest form. By zeroing in on the operation of a highly simplified economic system, we can most easily trace the logic of self-interest as expressed through a system of markets.

Under idealized conditions, the perfectly com-

petitive economy performs according to Adam Smith's "invisible hand" in generating patterns of economic activity that have certain desirable properties. Thus the competitive economy can be used as a standard, against which other methods of organizing economic activity can be judged. This aspect is discussed in Chapter 13.

Using the intuition gained from studying the perfectly competitive economy, we can better understand the complications associated with market imperfections such as market power, uncertainty, and externalities. Chapters 14 through 17 deal with some of these problem areas.