

SECOND EDITION

**THE ECONOMICS
OF INDUSTRIAL
ORGANIZATION**

William G. Shepherd



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1 INTRODUCTION

This book is about competition and monopoly power, two basic conditions of free market economies. You know a good deal about them already from competing in sports, in classes, in getting jobs, even in playing Monopoly. A hundred students writing answers to an examination are engaged in a version of pure competition among themselves. Your town may have 20 or more restaurants competing against each other. In other markets, competitors are often much fewer. The controls on your television set give you a choice among perhaps 3 to 15 competing channels. And a tennis match, and the *Time-Newsweek* magazine rivalry, involve only two competitors. Indeed, International Business Machines in computers and Kodak in films hold the lion's share of their markets, with no close rival. There are also genuine monopolies, holding all of their markets; you deal with them whenever you turn on an electric light, make a local telephone call, and mail a letter.

Competition comes in many varieties, evidently, but its basic role is quite straightforward. Effective competition makes the market system perform well. Monopoly power does the reverse; it usually impairs that performance. Therefore competition and monopoly are momentous conditions. Indeed, their workings throughout thousands of markets in the economy define the nature of "competitive" capitalism itself.

"Industrial organization" is the name given to the body of ideas and research about these conditions. It is a remarkable field about an astonishing phenomenon. Like most scientific fields, this one has a double identity. On one plane, *the field is abstract*, a set of analytical concepts about competition and monopoly. Competition provides efficiency; monopoly power can prevent it; scale economies may justify a degree of monopoly (often called market power, too). Such scientific concepts are intended to be precise and neutral, and so they are a little dry. Fortunately, the concepts are relatively few and not hard to learn. On a second plane, *the topic is about real markets*, teeming with the excitement and drama of struggles among real firms. The combat has occurred daily in numberless real markets, throughout virtually every economy. For example, an early monopoly is mentioned by Aristotle (in *Politics*, Book 1, Chapter 12)

in 347 B.C.:

There was a man of Sicily who, having money deposited with him, bought up all the iron from the iron mines; afterwards, when the merchants from the various markets came to buy, he was the only seller, and without much increasing the price he gained 200 percent.

In modern markets, the stakes can be very large. For example, General Motors, Ford, and Chrysler so dominated the U.S. automobile market in the 1960s that they grew less efficient in minimizing costs and designing cars that consumers wanted. The resulting invasion of Japanese automobiles in the 1970s cost over 100,000 U.S. workers their jobs and many billions in stockholder losses. When the vast Bell telephone system monopoly was divided up on January 1, 1984, after decades of debate and legal struggles, the changes were mostly caused and guided by the ideas you will find in these chapters. On a smaller but universal scale, every town's markets for foods, clothing, shelter, and other goods fit the concepts. The field applies the concepts to the reality. It shows what competition and monopoly really are; what their effects are; and how they can be measured and tested.

I. BASIC CONCEPTS AND TRENDS

Competition and monopoly involve struggles whose details pack the pages of the business press every day. But beneath the human drama and the blizzard of details lie certain basic concepts. They can be conveyed in the following brief form:

1. In every market, firms try to attain and exploit large market shares, as they attempt to maximize their profits.
2. When these firms' strivings hold each other in check, no firm is able to capture a large market share. The result is a healthy process of competition, which holds down prices, forces firms to be efficient, and stimulates innovation.
3. But if one or several firms do attain high market shares, they can usually get extra profits by setting prices above costs and restricting output. Their monopoly power can impose social losses by causing inefficiency, a retarding of innovation, and unfair shifts in income and wealth.
4. These costs of monopoly may possibly be offset, in part or whole, by benefits from scale economics or an *increase* in innovation.

These points involve both logic and facts, as in all economics. The *logic* is simple: Market power imposes certain types of social costs, but it may also provide certain benefits. The topic has about ten related concepts that need to be learned. Then one faces questions of fact, of the amounts of market power and its effects. Is monopoly extensive or scarce? Is it spreading or shrinking? Are its effects severe? Do the benefits outweigh the costs, in some or many cases? The factual answers will turn out to be complex, as befits a vast, complicated business world.

The concept of *effective competition* is central and deserves discussion here at the outset. It prevents firms from raising their prices much above their costs. If they do raise prices, customers will go elsewhere and their sales will melt away. In contrast, when the monopolist raises its price above cost, the buyers have no alternative to turn to, and so the monopolist's sales go down only moderately. There is a fundamental conflict between sellers and buyers, in which the degree of choice is crucial. The monopolist has a large degree of choice (that is, control) over price, because its customers have relatively little choice. The competitive firm, by contrast, has little choice or control, because its customers do have a wide range of choice and can turn to other suppliers.

This great truth is best illustrated by the simple familiar demand curve of the firm, as in Figure 1. The firm facing strong competition has no range of choice over its price, as demand curve 1 shows. The monopolist's range of possible prices may be large, as shown by the steep slope of demand curve 3. Or monopoly power may be slight, as shown by curve 2. All firms wish for sloping demand (more precisely, inelastic demand) because that permits high profits, in ways to be shown in Chapter 2. Competition shifts firms' demand curves downward and forces their prices down toward cost. The slopes of demand can vary by degrees, of course, and so all gradations between pure monopoly and pure competition are possible.

Ideally, demand curves would be known exactly, and degrees of competition could be listed simply as elasticities of demand, as easily as reading a temperature on a thermometer. Unfortunately, few such reliable measures can be made for real markets, and so economists have come to study mainly the firms' percentage shares of their markets. A higher market share usually gives the firm a higher degree of monopoly within any given market.

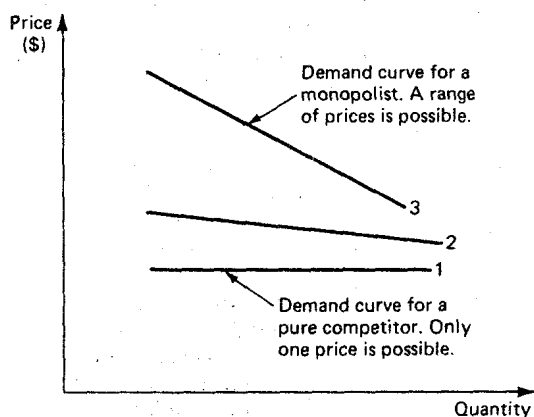


FIGURE 1 The monopolist's demand curve slopes down.

The monopolist can set the price anywhere that it chooses along its demand curve. A pure competitor, by contrast, has no control over price. When the demand curve is horizontal, only one price is possible.

Accordingly, several categories of markets have been defined to reflect degrees of competition, as is shown in Table 1. Pure monopoly is one extreme, with just one firm (electricity, telephones, and postal service, for example). Often its demand is highly inelastic. Next comes the "dominant firm," which has a majority of the market and no close rival (IBM and Kodak are instances). That shades into "tight oligopoly," in which the leading four firms have a combined market share of over 60 percent. They too enjoy some inelasticity of demand, and they are often able to cooperate in setting prices.

"Loose oligopoly" has a combined four-firm share below 40 percent and little real chance to hold prices high by means of price fixing. Each firm's relatively elastic demand tempts it to cut prices, and so prices are pressed down close to the level of cost. Moving further down in the degree of monopoly, "monopolistic competition" has many competitors, each with a slight degree of market power. Then comes the extreme case of pure competition, with many competitors, none of which has any influence on the market at all. These last three classes (from loose oligopoly on down) are all *effectively competitive*; their results consistently come close to the competitive ideal of efficiency and innovation. The other market types will frequently, or usually, deviate markedly from that ideal. Only if there are large economies of scale in production or innovation will some degree of monopoly be needed.

TABLE 1
Types of Markets, Shading from Pure Monopoly
to Pure Competition

MARKET TYPE	MAIN CONDITION	FAMILIAR INSTANCES
<i>Pure monopoly</i>	One firm has 100 percent of the market	Electric, telephone, water, bus, and other utilities
<i>Dominant firm</i>	One firm has 50–100 percent of the market and no close rival	Soup (Campbell), razor blades (Gillette), newspapers (most local markets), film (Eastman Kodak)
<i>Tight oligopoly</i>	The leading four firms, combined, have 60–100 percent of the market; collusion among them to fix prices is relatively easy	Copper, aluminum, local banking, TV broadcasting, lightbulbs, soaps, textbook stores
<i>Loose oligopoly</i>	The leading four firms, combined, have 40 percent or less of the market; collusion among them to fix prices is virtually impossible	Lumber, furniture, small machinery, hardware, magazines
<i>Monopolistic competition</i>	Many effective competitors, none with more than 10 percent of the market	Retailing, clothing
<i>Pure competition</i>	Over 50 competitors, all with negligible market shares	Wheat, corn, cattle, hogs, poultry

These are conditions of *market structure*, which is another pivotal concept in this field. A market's structure is comprised mainly of the market shares of its firms and, to a lesser extent, any barriers against new competitors. Each market's structure is somewhere in the range between monopoly (a high market share and entry barrier) and pure competition (low shares and low barriers).

Market structure is a key part of the conventional format of concepts in the field of industrial organization. That format is shown in the left side of Figure 2, and relates market structure to the other market conditions. (The righthand side shows the main public policies that are used to control monopoly. Three of them (antitrust, regulation, and public enterprise) are summarized in Chapters 16 and 17.).

Each market has a structure at each point in time. The structure usually influences the behavior of the firms as they compete and/or collude with each

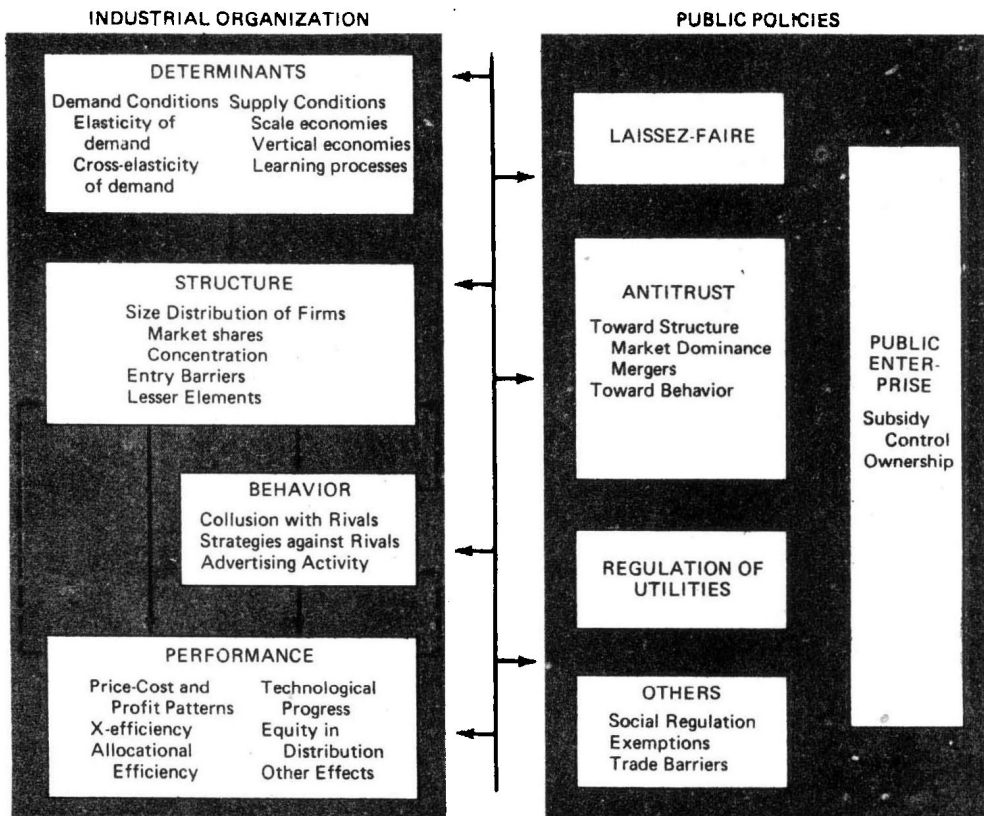


FIGURE 2 The underlying logic of industrial organization and public policy.

The typical industry is on the lefthand side. Causation runs mainly downward, as shown by the thick arrows, from determinants to structure, behavior, and performance. On the righthand side are the public policies that may be taken toward industries with monopoly power. The arrows in the middle go in both directions because policies not only apply to industries but are also affected by them.

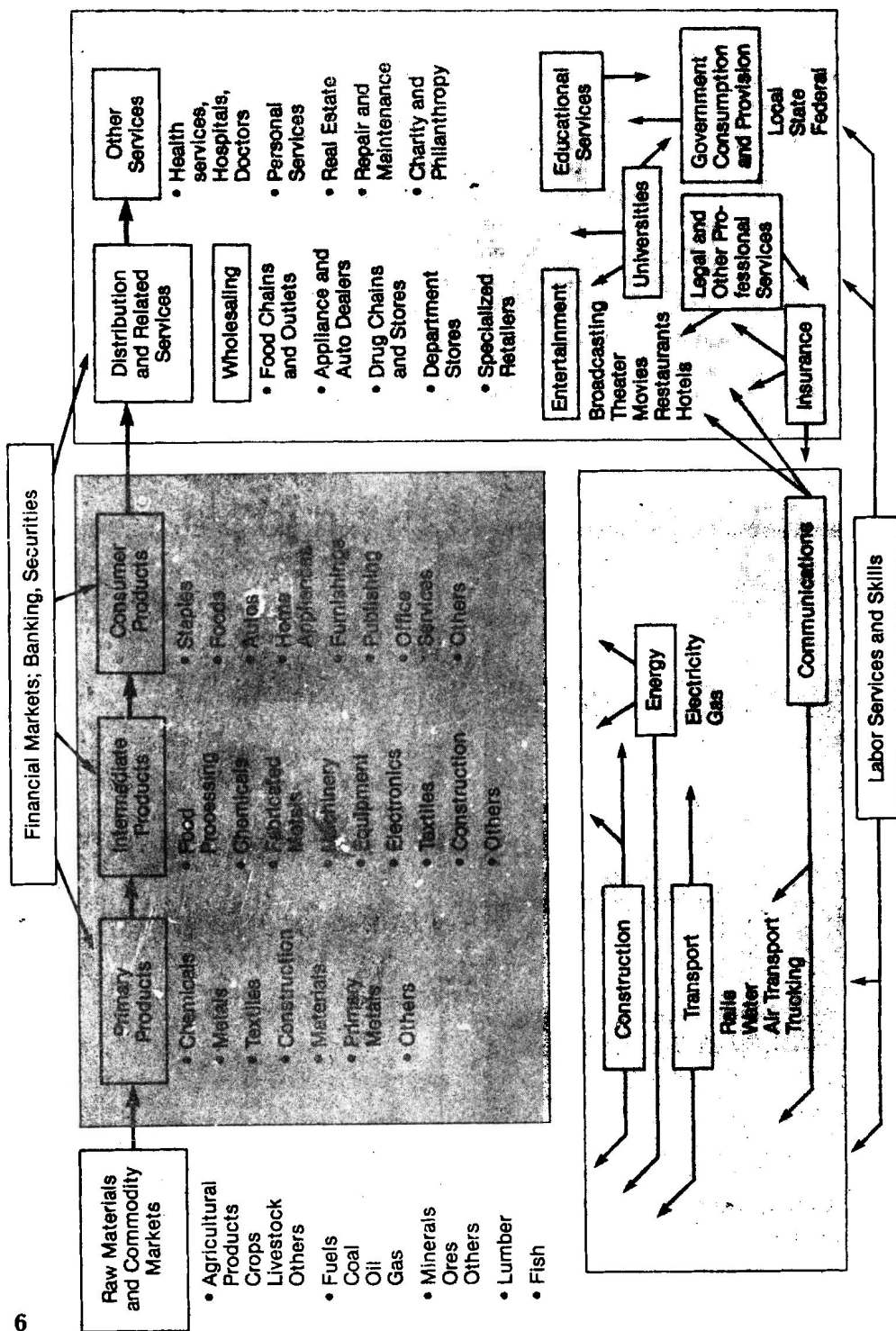


FIGURE 3 A schematic outline of sectors in the modern economy.

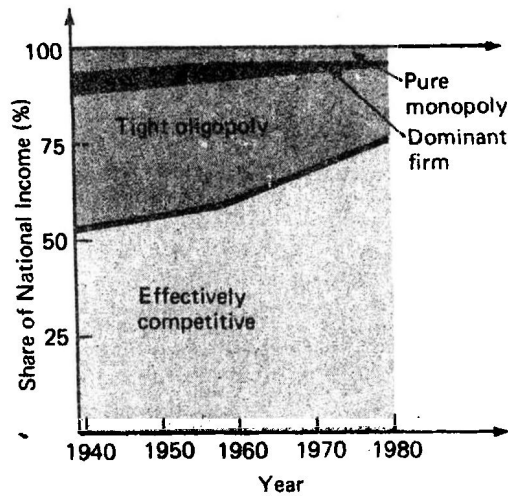


FIGURE 4 The trend of competition in the U.S. economy 1939 to 1980.

In 1939, just over half of all national income arose in markets that were effectively competitive (they were either loose oligopoly, monopolistic competition, or pure competition). The competitive share rose to 56 percent in 1958, and then to 76 percent in 1980. Much of the rise occurred in the 1970s.

SOURCE: From data in W. G. Shepherd, "Causes of Increased Competition in the U.S. Economy, 1939–1980," *Review of Economics and Statistics*, 64 (November 1982), 613–626. See Table 3 in Chapter 4 herein.

other. For example, in a tight oligopoly, the leading firms may behave collusively, setting prices together rather than competitively. Structure and behavior then affect the market's *performance*. Good performance mainly involves low prices, efficiency, innovation, and fairness. Though the causation runs mainly from structure to behavior and performance, there can be some reverse influence (for example, a firm's aggressive behavior and good performance can raise its market share).

Underlying this triad of conditions (structure, behavior, and performance) are the *determinants* that may shape structure itself. They include economies and diseconomies of scale. At one extreme is "natural competition," where economies of scale are small, so that firms can be small. At the other pole is "natural monopoly," with very large economies of scale. If a market's technology gives rise to large economies of scale, as for instance in electric power and telephone service at the local level, then there is room for only one firm, which will be a monopoly. But if technology favors small sizes of firms, and there is room for many firms, competition can be intense.

These few concepts are applied to a vast and complex set of real markets, as summarized in Figure 3. At one extreme are such natural monopolies as

local electric power and city water and bus service. At the other extreme, much of agriculture and many retail shops and service markets are naturally competitive. Other markets lie in between. Many cases are familiar, ranging from local businesses to major corporations, the various telephone companies, newspapers, and sports teams.

In fact, we can use the market types of Table 1 to show how competitive the markets in Figure 3 really are and how the patterns have been changing. Figure 4 presents the main lines of competition and monopoly in the U.S. economy since 1939, showing how much economic activity is in the different classes of markets. Three lessons stand out clearly. First, the economy contains a wide variety of markets, from the 2 percent in pure monopolies to the 76 percent in effectively competitive markets. Second, the economy is mostly competitive; less than one-quarter of total production is now in pure monopolies, dominant firms, and tight oligopolies combined. Third, there has been a marked rise in competition. The effectively competitive share rose a little from 1939 to 1958 to 56 percent, and then shifted sharply up to 76 percent by 1980. The rise occurred in scores of markets, including automobiles, steel, cameras, aircraft, banking, parts of the telephone sector, and even in professional sports. It is a major change, reversing earlier trends that seemed in the 1930s to be a march toward monopoly. The U.S. economy now appears closer to the competitive model than many observers had expected to be possible.

Later chapters (especially Chapter 10) will explore and explain these remarkable patterns in detail. The underlying economies of scale have probably shrunk, imports have brought new competition, and certain government actions have helped raise the level of competition.

II. THE NATURE OF COMPETITION

You now know the basic concepts of the field and the main competitive patterns of the U.S. economy.

The rest of this book analyzes the many technical features of competition. But first you need to consider the nature of competition on a more fundamental level.¹ "Everybody knows" what competition is, but its nature is actually not obvious. The following brief summary sets the stage for the technical points in the remainder of the book.

¹ Basic sources on the nature of competition begin with Alfred Marshall's *Principles of Economics*, 8th ed. (London: Macmillan, 1920) and include Joan Robinson, *The Economics of Imperfect Competition* (London: Macmillan, 1933); Edward H. Chamberlin, *The Theory of Monopolistic Competition* (Cambridge, Mass.: Harvard University Press, 1933, 8th ed. 1965); Joseph A. Schumpeter, *Capitalism, Socialism and Democracy* (New York: Harper, 1942); Joe S. Bain, *Industrial Organization*, rev. ed. (New York: Wiley, 1968); and George J. Stigler, *The Organization of Industry* (Homewood, Ill.: Irwin, 1968).

1. Unity Among Alternative Types

Competition is a mutual striving, as is demonstrated by every sports event as well as markets. The basic question is how many comparable competitors are needed for effective competition: as many as 100 or 20 or eight, or instead as few as two? The problem has ancient origins. The dangers of market control have been evident since the dawn of civilization and trading. From the Phoenician traders to Athens' bustling *agora* down to the present, competitive markets have flourished in many periods and countries. But so has monopoly, and there is always the possibility of state controls to favor one firm.

What gives an effective degree of competition has been debated with increasing rigor since Adam Smith's *Wealth of Nations* in 1776.² He noted that competition spurs efficiency by stopping "indolence," and also that competitors are always tempted to suppress the competition: "People of the same trade seldom gather together, whether for merriment or diversion, but the conversation ends in some conspiracy against the public or some contrivance to raise prices." During the reign of classical economists, until the 1870s, competition was recognized to be crucial to a healthy economy. But it needed no precise definition, other than as a mutual striving among numerous sellers.

After 1870, neoclassical economists began to carry the concept of competition to its pure, "atomistic" extreme, deriving the precise efficiency results found in beginning economics texts, which Chapter 2 will rehearse in more detail. Competition came to be defined as an equilibrium result enforced by the relentless pressures of numberless tiny competitors.

Practical-minded observers have long disapproved of such models as too abstract and extreme. A strong degree of rivalry among several firms, they have said, can give the same general degree of efficiency, while also providing for rapid innovation. This realistic view of the competitive process among a few rivals is often said to conflict with the neoclassical analysis of equilibrium among numberless firms in atomistic markets. Economists are often said to be extremists who wish that markets could all be fragmented into hundreds of tiny firms, a change that would obviously be absurd for most modern industries.

Yet no such conflict over the true nature of competition really needs to exist. Since Smith's time, the aim has been only to have intense competition, so that firms are under strong mutual pressure. What is required for competition to be intense *enough* to be effective? Some economists say that two competitors are enough. Yet other economists note that the two rivals will constantly be tempted to collude with each other rather than compete, just as 2-horse races are more likely to be fixed than 8- or 12-horse races. Most economists say that at least eight or ten comparable firms in each market are needed for competition to be effective. Two firms *may* be strong rivals, at least some of the time, to make competition effective. But 20 or more equal-sized firms will bring the fully competitive results.

² *An Inquiry into the Nature and Causes of the Wealth of Nations* (New York: Modern Library, 1937).

One cannot just count firms in judging the degree of competition. The market must contain firms of reasonably comparable size, rather than, for example, one dominant firm with 90 percent, plus a large number of tiny firms holding negligible shares. Also, the firms' behavior must be watched, especially in oligopolies. If there are only several firms in the market, they will often wish to collude with one another rather than compete. Then three (or five or ten) supposedly "competitive" firms may, in fact, exert together nearly as much monopoly power as one complete monopolist would.

At times, even if there are only two competitors, their rivalry may be intense. Though one of the two firms may get the upper hand for a while in a market, the other may soon fight back and equalize its share of the market and profits. Such a continuing rugged rivalry may stir great efforts from the firms and force prices down close to the levels of their costs. Therefore, effective competition is possible even when there are as few as two or several firms. But whether such rivalry among two or several firms is usually intense, or instead weak and collusive, is a large, recurring question in this book.

Perfect competition is an ideal version, designed to define the basic outcomes as clearly as possible. Does this mean that it differs from "real" competition, such as rivalry? Not necessarily. Indeed, there is a fundamental unity. *All forms and degrees of competition—including rivalry—lead toward the same basic kinds of economic results.* They narrow the firm's range of choice over its price by lowering and flattening its demand curve, forcing the firm to reduce its costs and to adopt new techniques. Though strong rivalry may not always keep prices down exactly to minimum cost levels, it may keep them quite close to those levels. As long as there is some degree of competition, there is some pressure.

Therefore, competition is a process that can be effective even when it is less comprehensive than in the ideal, pure case. A main task in this book is to learn which conditions provide "enough" competition.

Competition is a complex phenomenon that can take many forms. It also has an important cultural role. Particularly in the United States, there is a strong reliance on competition as a fair and efficient process. This reliance derives from a number of roots, such as the cultural fluidity caused by large-scale immigration, the rigors of frontier life, and the Protestant ethic of effort and reward. Competition is a basic test of the ability of firms; the best competitors win and prove their superiority. Competition is the fair test by which superior talents prevail and gain rewards. Competition "on the merits" (in providing lower prices and better products) is rightly a sound basis for seeking good performance in markets.

2. Choice in a Balanced Competitive Process

Yet competition can be a complicated condition. Sports teach us the vast variety of possible competitive settings, from 15,000-runner marathons to 80-ship yacht races, 10-horse races, 4-person bowling matches, and 2-person arm-

wrestling, and other kinds of combat. In all cases, competition is a process involving a striving by two or more contestants for some reward. To economists, the core idea of competition is that *consumers have a high degree of choice among competing suppliers*. As the suppliers compete to make sales, they force one another's prices down into line with cost. Thus, when you switch on your radio, you have a choice among many competing stations. In contrast, when you switch on an electric light, you have no choice of electric power systems: There is only one in each area, a monopolist.

If a seller sets too high a price, you often can turn to a cheaper competitive source. But if there is no alternative, you must pay the monopolist's price, even though it is high, if you are to have the good. To be effective, the competitive process needs to be *open and free*, not predetermined, so that effort and skill are needed to compete successfully.

The competitors must also be *comparable*. A contest between unequals is not genuine competition. If one competitor has sharp advantages, then the "competition" is not meaningful. The different weight classes in wrestling and boxing recognize this: A bout between a heavyweight and a flyweight is not competition, but instead merely punishment. It does not test abilities or evoke the best performance by either competitor.

Also, true competition is a *continuing process*. A foot race or a game of Monopoly will come to an end; the competition is over once the prizes are gained. In real life, by contrast, competition in markets means a continuing mutual striving among more or less equal firms. If one competitor gains dominance over the rest of the firms in the market, effective competition is replaced by a degree of monopoly.

3. The Paradox

There lies a troubling paradox: Each contestant strives to win, but if one of them wins completely, then *monopoly* comes to exist! Even a partial victory (say a market share of 70 percent) creates a degree of monopoly. That outcome of competition itself moves the market away from competitive conditions, and it will prevent effective competition in the future. In contrast, effective competition requires an enduring balance of power, so that many comparable competitors continue, neutralizing one another. Therefore, each competitor must win enough to reward its best efforts, but not enough to eliminate or even dominate the other competitors. Any market power it does obtain must not last very long.

In their striving all firms try to gain dominance, but they mutually offset one another's individual efforts to dominate. When competition is effective, no one competitor is permitted to win most or all of the rewards during any period. Instead, competition rewards all reasonably competent competitors, some more than others. Effective competition is the opposite of the usual tournament, which yields one "champion" who has eliminated all the others, who become "losers."

This paradox of competition is solved in sports by dividing competitors into leagues on the basis of age, size, sex, and so on. Competitors are evenly matched, or at least comparably so. Also, competition occurs and *recurs*, during distinct events, seasons, and yearly championships. A loss is not permanent. Play begins anew each tournament or season, with every person or team given a new start. A low finisher in one meet or season may win the top prize in the next. Also, athletes are mortal, and so each leading athlete eventually ages and declines, making way for others. Each champion has a limited time on top, and so competition is continually renewed.

In industrial competition these divisions, intervals and aging processes are largely absent, so competition can become lopsided and then stay locked in that pattern. By "winning," a firm may attain a lasting dominance of its markets, preventing effective competition in the future. Its monopoly profits are then used as resources to maintain its monopoly. The paradox of competition is therefore real and often urgent. How to reward competition while avoiding future monopoly is a continuing issue in the field. Fortunately, competition in most markets remains effective and balanced. But it can be a fragile condition, easily lost and hard to regain. How fragile it is will be a basic topic of this book.

III. THE FIELD EVOLVES

It is important to understand how this field of study has developed. "The field" is created by the thinking of specialists. What they write becomes "the literature." This thinking and its written results are influenced by what is happening in the economy. So reality shapes research and the images of markets. Public policies also interact with research.

This process ensures that the field will change and will (usually) progress as all three parts—rethinking, new events, and policies—breed new conditions and interact. You can learn the field best by first understanding how its history has grown out of this larger process. There is much human drama and irony in the subject. The few leading experts in each period are shaped by events and by one another. In turn, they shape the field and, ultimately, policies and real markets.

The field has a compact core of concepts and of methods for testing them. But they are not immutable laws. The concepts are open to divergent interpretations and uses. Also, the field often lags many years behind events, and some topics lie in neglect for decades. Specialists often make errors of logic or fact. There is room for widely differing, but reasonably plausible, views on nearly every issue. The result is a lively, changing, and fallible set of ideas. Each student must think these things through independently, with a keen sense for what is valid.

Most basic concepts of the field had been raised in discussion by 1910, as a sensational wave of trust-creating mergers stirred sharp debate and antitrust actions. Monopoly, economies of scale, efficiency, and potential entry, for

example, were all debated. But the modern field dates from the 1930s, when the extensive technical analysis of oligopoly began. Large-scale statistical studies also were started then to measure monopoly, profits, and cost conditions. The Time Line on pp. 14–15 shows the main events, and Appendix 1 gives more detail.

The field's evolution has not been just a steady progression to better concepts. Outside events in the economy have also shaped scholarly developments, and ideas have interacted with antitrust actions and changes in regulatory policies. During conservative periods on the political scene, scholars have usually responded by turning to narrower topics and emphasizing the prevalence of competition. The 1920s, 1952–1960, and 1980–1984 have been such intervals. In contrast, turbulent times, when policies have also grown stricter, have usually inspired economists to stress the impacts of monopoly. Such periods include 1904–1920, 1933–1952, and 1960–1968.

Yet there has also been a larger long-run trend toward improved analysis. Concepts and methods now are sharper and more powerful than those of 1900, or even 1950. The main developments are of three kinds. One is the organizing of the concepts into the clear format of Figure 2. Another is the extensive testing of evidence, starting mainly in the 1950s, as data and computing power improved. Third is a rising degree of technical rigor and detail, with a modeling of points abstractly to get precise conceptual results. This has occurred especially since 1970. But logical precision does not guarantee sensible results. An expert in this field needs to combine logic, evidence, and a good skeptical sense of reality.

The field is always the scene of sharp debates among the various schools of thought. Mainstream experts have stressed the importance and evils of monopoly power. Since 1950 they have been countered by Chicago-school economists claiming that competition is prevalent and powerful, while monopoly is weak and unimportant. The divergence of views has widened in recent years, and so the student will often encounter wide differences among views and “facts.” The task is to apply your independent judgment to the issues, and to form a balanced opinion on the basis of both logic and a mature, balanced perspective on facts.

Neither the new nor the old research methods seem to give conclusive answers. Even the most basic issues remain open. Most topics can be approached in a variety of ways, and the resulting answers are rarely uniform. The companies' private stakes in the answers are very high, and so propaganda and self-serving assertions crop up repeatedly. Moreover, some specialists develop a missionary zeal about the competitive process and its lapses.

The period since 1970 has been a great watershed in the field, in the economy, and in policies toward monopoly power. As the economy has grown more competitive, many economists have grown more conservative in their views about monopoly. They have urged cuts in regulation and antitrust, and some of these changes have been made as the political climate has also become more conservative. The economy has become a vast case study in widespread competition, to a degree unprecedented in the modern world.

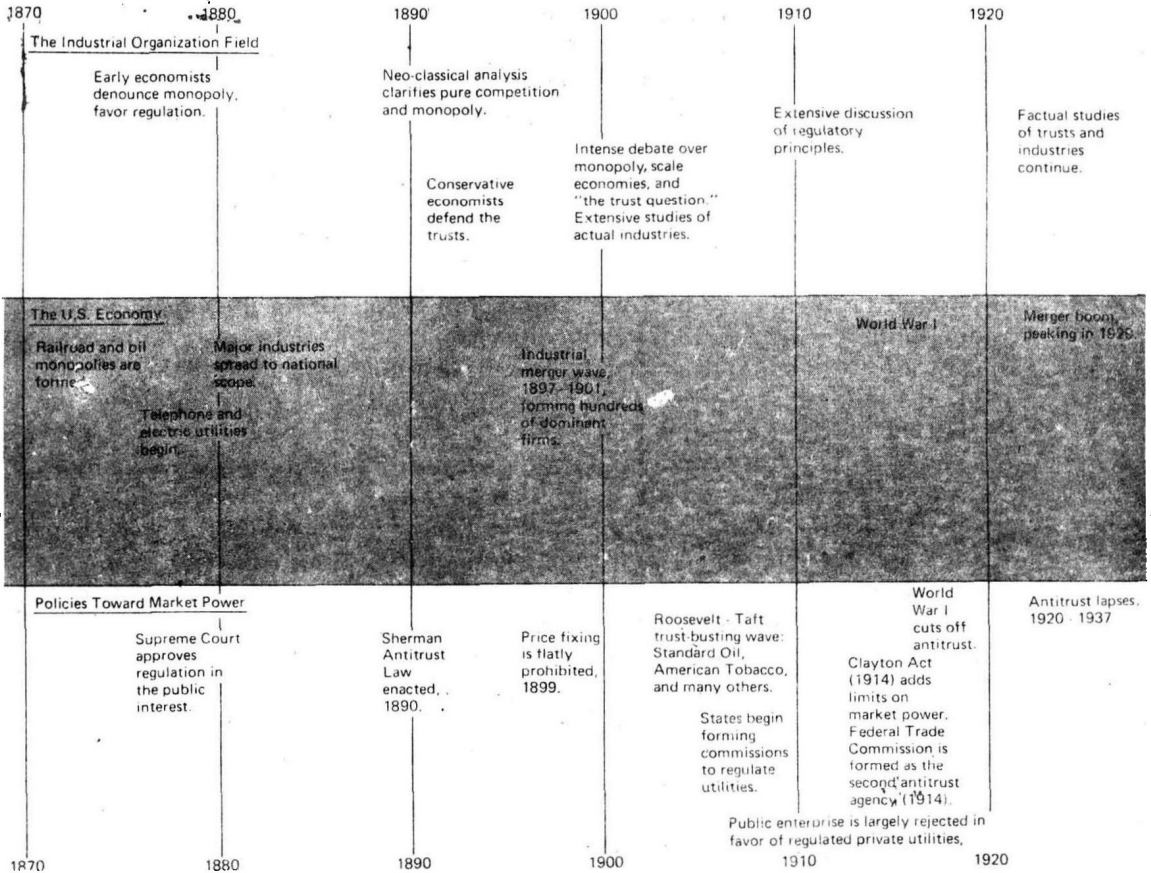


FIGURE 5 Time line of the field, the economy, and policies.

The field of industrial organization is also in flux, and you are lucky to enter it at a time of such extraordinary ferment and change. The concepts are on full view daily in the economy and in government policies, and the debates are lively and fateful. The field will be at the center of crucial events during at least the next decade or two. Using the concepts in this book, you will be able to understand these complex, fascinating developments.

IV. THE SEQUENCE OF TOPICS

The sequence of chapters is designed to present topics in the most logical order. The basic effects of competition and monopoly are given in Chapter 2. Then come the main four parts of the format given in Figure 1. Market structure is presented in Chapters 3 to 6, which comprise Part II. I show how