



INDUSTRIAL ORGANIZATION

Contemporary Theory and Empirical Applications

5E

Lynne Pepall • Dan Richards • George Norman

WILEY



Industrial Organization

Contemporary Theory and Empirical Applications

Fifth Edition

Lynne Pepall

Dan Richards

George Norman



WILEY

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About The Authors

Lynne Pepall is Professor of Economics and Dean of the Graduate School of Arts and Sciences at Tufts University. Professor Pepall received her undergraduate degree in mathematics and economics from Trinity College, University of Toronto, and her Ph.D. in economics from the University of Cambridge in England. She has written numerous papers in industrial organization, appearing in *The Journal of Industrial Economics*, *International Journal of Industrial Organization*, *Journal of Economics and Management Strategy*, *Economic Journal*, *Journal of Finance*, *Canadian Journal of Economics*, *Economica*, and the *American Journal of Agricultural Economics*. She has taught industrial organization and microeconomics at both the graduate and undergraduate levels at Concordia University, Queens University, and Tufts. Professor Pepall lives in Newton, Massachusetts, with her husband, a co-author of this book, and their dog, Churchill.

Dan Richards is Professor and current Chair of Economics at Tufts University. Professor Richards received his A.B. in economics and history from Oberlin College and his Ph.D. in economics at Yale University. Professor Richards has written numerous articles in both macroeconomics and industrial organization, appearing in the *American Economic Review*, *Quarterly Journal of Economics*, *Journal of Industrial Economics*, *Economica*, the *B. E. Journals in Economic Analysis and Policy*, *Canadian Journal of Economics*, the *Journal of Money, Credit, and Banking*, and the *American Journal of Agricultural Economics*. He served as Director of the Graduate Program in Economics from 1989 through 1998, and has also served as a consultant to the Federal Trade Commission. From 1996 to 2005 he taught Applied Economics in the Sloan Fellows Program at MIT's Sloan School of Management. Professor Richards lives in Newton, Massachusetts, with his wife, a co-author of this book, and their dog, Churchill.

George Norman holds the Cummings Family Chair of Entrepreneurship and Business Economics at Tufts University. He came to Tufts in 1995 from Edinburgh University, where he had served as head of the department of economics. Prior to that, Professor Norman was the Tyler Professor of Economics at the University of Leicester (England). Professor Norman attended the University of Dundee (Scotland) where he was awarded the MA in Economics with first class honors. He received his Ph.D. in economics from the University of Cambridge, England. His more than 70 published articles have appeared in

vi About The Authors

such professional journals as the *American Economic Review*, *Review of Economic Studies*, *Quarterly Journal of Economics*, *Journal of Industrial Economics*, and *International Journal of Industrial Organization*. He is currently an Associate Editor for two journals, the *Bulletin of Economic Research* and *Regional Science and Urban Economics*. He is also on the editorial board of the *BE Journals in Economic Analysis and Policy*. In addition to this book, Professor Norman has written and edited, either alone or in collaboration with others, 17 other books. Professor Norman has taught courses in industrial organization and microeconomic theory at both the graduate and undergraduate levels. He has also taught introductory economics, corporate strategy, international economics, and entrepreneurship. Professor Norman lives in Newbury, Massachusetts, with his wife Margaret who, while *not* a co-author, has provided invaluable support and assistance in his work on this book.



Preface to the Fifth Edition

We are greatly pleased by the publication of the fifth edition of *Industrial Organization: Contemporary Theory and Practice*. It is gratifying to have such continued market confirmation of our conceptualization of the field and its major contributions—in particular, that the application of rigorous thinking about strategic interaction yields important and testable insights into real world events. We believe that this edition of our textbook renews this message.

Overall, the organization of the book is roughly the same as the previous edition but there are important changes. The two chapters on price-fixing and anti-trust policy vis-à-vis collusion (Chapters 14 and 15 in the fourth edition) have been streamlined and combined into one chapter. The same is true for the formerly two separate chapters on advertising (Chapters 20 and 21 in the fourth edition). More importantly, we have added a new chapter on strategic interaction as it applies to international competition and the scope this introduces for strategic trade policies. The net change is one less chapter and a more concise text.

The two most substantive changes, however, are: 1) the inclusion of a somewhat extended discussion of a single empirical study in each chapter; and 2) the shift of all calculus derivations to chapter appendices. The first of these builds on the innovation in the fourth edition in which we included an empirical study in roughly every other chapter. Finding studies that are both appropriate for each chapter's subject matter and also well suited to the statistical training of the variety of students using the text is not an easy task. However, we believe that we have done a good job in this respect. This includes the inclusion of a straightforward empirical comparison of antitrust enforcement across countries in the introductory first chapter.

Shifting the calculus sections to the appendix will, we hope, make the book more usable for those teaching classes without a strong mathematics prerequisite while still making that material available for those who want a more formal approach. This is not to say that there is no math in the current text. We still include a lot of algebra and derive a lot of results from the first order condition of marginal revenue equal to marginal cost. Algebraic analysis is also prevalent in the empirical applications of each chapter. However, those seeking a formal calculus presentation fully integrated into the primary text may be better served by the quantitative alternative version, *Contemporary Industrial Organization: A Quantitative Approach*.

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 Russell Pittman, Department of Justice</p> |
|--|---|

Raymond Raab, University of Minnesota
 James Reitzes, The Brattle Group
 Vasco Rodrigues, Catholic University,
 Portugal
 Steve Rubb, Bentley College
 Michael Salinger, Boston University
 Tim Sass, Georgia State University
 Nicholas Schmitt, Simon Fraser University
 John Sessions, University of Bath
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Part One

Foundations

We begin our study of industrial organization by reviewing the basic building blocks of market analysis. The first chapter provides a road map for the entire enterprise. Here, we describe the central aim of industrial organization, namely, the investigation of firm behavior and market outcomes in settings of less than perfect competition. We emphasize that an understanding of strategic interaction is a critical component of this analysis. We end the chapter with a study by Nicholson (2008) relating the strength of active antitrust policy to exposure to trade and measures of economic development.

In Chapter 2, we review the basic microeconomics of the two polar textbook cases of perfect competition and pure monopoly. This permits the introduction of basic supply and demand analysis, as well as the notions of consumer surplus, producer surplus, and total surplus necessary for welfare evaluation of market outcomes. In addition, we introduce intertemporal considerations, discounting, and the Coase durable goods conjecture. We conclude with a review of the Chevalier and Goolsbee (2009) paper testing the rational forward-looking behavior reflected in student textbook purchasing decisions.

Chapter 3 focuses on how we might identify those markets where market power is likely to be a problem. This is an obvious place to introduce such measures as the n -firm concentration ratio and the Herfindahl-Hirschman Index. However, we also take the additional step of introducing the most explicit measure of monopoly price distortions, namely, the Lerner Index. This includes an extended empirical application explaining the many attempts at measuring the economy-wide welfare loss from such distortions beginning with Harberger (1954).

Finally, in Chapter 4, we turn to a discussion of some of the reasons that markets may exhibit the structural conditions that make perfect competition unlikely. Chief among these are cost considerations, and it is in this chapter that we explore cost concepts most formally. We review the notion of marginal cost that has already been introduced and then turn our attention to those remaining cost concepts that most directly relate to market structure such as sunk costs, average cost, and both scale and scope economies. We also explore the implications of endogenous sunk cost as emphasized by Sutton (1991). Chapter 4 also includes an empirical application based on the early work of Pulley and Braunstein (1992), investigating scale and scope economies in the banking sector.

1

Industrial Organization: What, How, and Why

A sample of business press from just the last few years includes the following items: the emergence of a price war in the e-reader market involving Amazon's *Kindle* and Barnes & Noble's *Nook* and even Apple's *iPad*; guilty pleas from ten (so far) real estate investors admitting that they colluded to rig bids at public foreclosure auctions in California; widespread evidence that hospitals charge different prices for the same procedure depending on who the patient is (including evidence that the uninsured are often charged *higher* prices); and the filing of a suit by the US Department of Justice to block a proposed merger between two large mobile phone companies, AT&T and T-Mobile.

Students often feel that there is a considerable gap between stories like those just described and the economics they study in the classroom. This is so despite the fact that most modern texts include real world applications. Indeed, it is difficult to think of a contemporary economics textbook that does not include examples drawn from the practical business experience. Nevertheless, it is still far from unusual to hear remarks such as “economics is too abstract” or “this wasn’t covered in the microeconomics that I studied.”

This book is very much in keeping with the modern practice of illustrating the applications of economic theory. Our aim is, however, more ambitious than just showing that economics can illuminate the everyday events of the business world. Our goal is to develop a way of thinking about such experiences—a mental framework that permits students to form hypotheses about the mechanisms underlying such events and to consider how to test those hypotheses against empirical evidence. Of course, we cannot offer a single framework for analyzing all economic phenomena, but we can develop one that applies to a large class of events including the ones described above. That framework lies at the heart of the field that economists call industrial organization.

1.1 WHAT IS INDUSTRIAL ORGANIZATION?

What is industrial organization? Certainly for those outside the economics profession, the answer to that question is far from clear. In fact, probably no subfield of economics has a less informative name. Unlike those working in international trade, environmental economics, and most other economics fields with highly self-explanatory titles, those of us working in industrial organization can rarely expect non-economists to understand what we

do from the name of the field alone. One possible answer to the question is that industrial organization has to do with how market production is arranged. Another is that it is really applied business economics. Yet while each of these responses has a grain of truth, each is also wide of the mark. In our view, the simplest and most direct answer is that the field of industrial organization is that branch of economics that is concerned with the study of imperfect competition with the further qualification that this is done almost exclusively in a partial equilibrium framework.

Given that you are reading this book, the chances are very good that you have had some economics classes, especially microeconomics classes, already. As a result, you have probably been exposed to the concept of perfect competition—that somewhat utopian vision of markets populated by numerous small firms and characterized by economic efficiency. You are also likely to have read about the most obvious counter example, pure monopoly. The case of a market dominated by one firm alone offers a clear contrast to the ideal of perfect competition. But what happens when the truth lies, as it almost always does, between these two polar extremes? What happens when there are two, or three, or several firms? How do competitive forces play out when each firm faces only a limited number of rivals? Will prices be driven to (marginal) costs, or will advertising and other promotional tactics avert this outcome? Will research and development of new products be the major source of competitive pressure? If so, how do monopolies come about? If firms can obtain monopoly power, can they also devise strategies to maintain such power? Is it possible to keep new competitors from coming into the market?

Industrial organization forms the analytical core that economists use to answer these and many other related questions. Economists long ago worked out the analytics of perfect competition. What happens under the more common setting of imperfect competition—how close to or how far from working like the perfectly competitive market—is much less settled. This less settled domain is the field of industrial organization.

There is a good reason that industrial organization does not yield clear and simple answers regarding what happens in imperfectly competitive markets. When we describe a market as less than perfectly competitive, that still leaves open a wide range of possibilities. It could be a duopoly market with only two firms, or perhaps a market dominated by one large firm competing with many very small ones. The products of the different firms may be identical, as in the case of cement manufacturers, or perhaps highly differentiated, as in the case of cosmetics. Entry by new firms may be easy, as in the restaurant business, or difficult, as in the automobile industry. This variety of possible market characterizations makes it very difficult to make broad, unambiguous statements about imperfectly competitive markets.

Matters become even more complicated when we consider the decisions that the management of an imperfectly competitive firm must make. Start with perhaps a simple case such as a florist setting the price for a dozen roses. Should the price rise on Valentine's Day? Should the price for a dozen be exactly twelve times the price of a single rose? Or should the prospective buyer of flowers get a break if he or she buys in quantity?

Consider Jody Adams, the chef at one of the Boston area's top restaurants, *Rialto*. Jody must choose the complete menu of entrees and appetizers that the restaurant will serve at the start of each season as well as set the price of each menu entry. In making this choice, she must evaluate the cost and availability of different ingredients. For example, what seafood and vegetables are in season and can be served fresh? What price should she set for a la carte items and for the fixed price meal? Should she make available special dishes for those patrons with food allergies? How extensive a wine list should she maintain? These

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decisions make clear that product design decisions are just as important as pricing decisions. A critical design choice by Microsoft to package its Web browser, *Internet Explorer* with its *Windows* operating system and to sell the two as one product was perhaps the primary reason for *Internet Explorer's* success against *Netscape*. It also played a major role in the government's later decision to pursue antitrust charges against Microsoft.

Price and product design choices are not the only decisions that firms make, however. Another choice concerns promotional effort. For example, in September 2011, the soft-drink giant Pepsi announced that it had completed a new deal as an official sponsor of the National Football League extending from 2012 through the 2022 season. Under this deal, *Pepsi Max* will continue as the official soft drink of the NFL and *Gatorade* will continue its ubiquitous presence along the field sidelines of both teams. Pepsi also keeps the right to use the logos of the Super Bowl and other league properties in ads, signs, and banners. However, the deal is estimated to have cost Pepsi more than \$2.3 billion over its ten-year life or a little over \$200 million per year. What economic rationale can justify this expenditure?

Somewhat similarly, September 2011 also witnessed the introduction of Amazon's *Kindle Fire* as a direct competitor to Apple's *iPad*. What made this the right time for Amazon's entry into this market? What tactics might Amazon use to insure the success of this venture?

Firms make tough decisions like the ones just discussed on a daily basis. Industrial organization economists analyze those decisions and try to derive some predictions from that analysis to help us understand market outcomes. We also try to test those predictions using modern statistical analysis. This is the heart of what industrial organization is.

1.2 HOW WE STUDY INDUSTRIAL ORGANIZATION

One reason that analyzing imperfect competition is difficult is because of the interdependence that characterizes the firms' decisions in their markets. When Amazon introduces the *Kindle Fire*, it has to recognize that this will have a non-trivial effect on the other makers of smart tablets. They may react by cutting prices, or by changing their installed applications, or perhaps by cutting back on production so as to avoid a glut on the market. Similarly, when Pepsi thinks about putting in a high bid to become the National Football League's official soft drink, it has to wonder how Coke will respond. Will it bid even higher or pursue a similar contract with an alternative sports league? Will it instead "punish" Pepsi by launching a price war in the soft drink market?

As these examples indicate, imperfect competition is played out against a background of interdependence or, what economists call, a setting of strategic interaction. This means that determining a firm's optimal behavior can also be difficult. Because the firms are likely to be aware of the interdependency of their actions, each firm will wish to take into account its rivals' response to its action. Yet that response will also depend on how the rivals think the first firm will react to their reaction and so on. A firm in this situation needs to put itself in its rival's shoes to see how the rival will respond to different actions that the firm could take. The firm must do this to figure out what its best course of action is. To understand the logic of strategic interaction, we use game theory. Game theory provides us with the necessary framework for an analysis of settings in which the participants or players recognize that what they do affects other players and, in turn, what other players do affects them. It is for this reason that much of the recent work in industrial organization uses game theory to understand market outcomes under imperfect competition. While not all of the analysis in

this book relies on game theory, a good bit of our discussion is aimed at developing and applying the logic of game theory to market settings.

The ability of game theory to permit a clear and logically consistent analysis of strategic interaction makes it an indispensable tool in industrial organization. It is equally important, however, to recognize that game theory and, more generally, the understanding of strategic interaction serves a broader goal of understanding how industrial organization analysis is conducted. This perhaps is best expressed by reference to a quote from John Maynard Keynes who wrote insightfully, “the theory of economics does not furnish a body of settled conclusions immediately applicable to policy. It is a method rather than a doctrine, an

Reality Checkpoint

Show Time!

Perhaps no example of strategic interaction is more common than the annual or even seasonal game television networks play in scheduling their programming. The objective is to get the highest “average audience” rating as calculated by the A. C. Nielsen Company and defined as the percentage of homes with a television that are tuned to a program during an average minute of prime time viewing. This value determines the advertising fees that a network can charge and, hence, is crucial to the network’s profit. Indeed, scheduling strategy is understood throughout the broadcast industry as a crucial element in network success and a variety of well-known tactics have emerged over the years. These include: 1) *quick openers*—starting the evening with one’s strongest shows to set up the rest of the viewing night; 2) *infant protection*—the avoidance of scheduling promising new shows to compete with strong rival programming and/or using an existing strong network show to serve as a lead-in for the new one; 3) *counterprogramming*—scheduling say a police show in a slot where the major competition is a comedy; and 4) *bridging*—scheduling shows an hour long or longer so that competing shows of an hour’s length begin in the middle of the scheduled program.

For a long time, the undisputed ratings champ on network television was Fox’s *American Idol*. Recently though, *Idol* has been

overtaken by NBC’s *The Voice*, a similar musical competition show. Given the popularity of *The Voice* NBC decided to premier its new 2012 series, *Smash*, right after it on Monday nights. In contrast, CBS first moved its popular sitcom, *The Big Bang Theory*, to Thursday nights and then followed that by subsequently moving a second sitcom, *Two-and-a-Half Men*, to Thursday right afterwards. The idea appears to be the creation of a super comedy hour that attracts lots of viewers to CBS’s Thursday programming because advertisers highly value that night as the one in which consumers make weekend travel and spending plans.

All of these scheduling tactics though have been thrown into uncertainty with the rise of non-network show producers, such as Netflix and Amazon. In 2013, for example, Netflix offered a new mini-series, *House of Cards*, starring Kevin Spacey. Because this series could be downloaded and “streamed,” viewers could watch it on their own schedule—not that set by the networks.

Sources: B. Carter, “For Fox Rivals, ‘American Idol’ Remains a Schoolyard Bully.” *New York Times*, 20 February, 2007, p. C1.

B. Carter, “‘The Voice’ Keeps Up Super Bowl Momentum; ‘Smash’ Results Are Mixed,” *New York Times*, 7 February, 2012, p. B7.

B. Stelter, B. Carter, and B. Elliott, “‘Two and a Half Men’ Aims to Lift Thursday,” *New York Times*, 17 May, 2012, p. B9.

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apparatus of the mind, a technique of thinking which helps its possessor to draw correct conclusions.”¹ The same can be said for modern industrial organization. Investigating imperfect competition requires a technique of thinking. To be precise, it requires a way of thinking strategically and applying the insights to market behavior and outcomes.

Of course, no model is a complete description of reality. A complete detailing of each aspect of the actual marketplace would be far too lengthy and unwieldy to be of much use. Instead, any market model is like a road map. It is a deliberate simplification of a very complicated terrain, omitting some features and thereby emphasizing others. The aim of the model is to capture and make transparent the essential features of the interaction among firms. In this light, to say that the real world is more complicated than the model is no criticism. Indeed, if the modeling achieves its aim of making clear the underlying structure and the principles governing the market outcome, then its abbreviated portrait of the real world is its strength.

Whether or not a particular theoretical model is a good proxy for real world outcomes can be determined by testing the predictions of the model against actual data and observational evidence. Armed with ever-increasingly sophisticated statistical techniques, such testing has also become an essential part of the field of modern industrial organization. Throughout this book, you will find numerous Reality Checkpoints designed to illustrate the applicability of the concepts in question. In addition, you will find a number of recent empirical studies offering evidence on the validity of the various models. This combination of theory and evidence provide a useful guide to the likely outcome of strategic interaction in a variety of settings. In each such case studied, the basic interpretation of the model and associated data is that “this is how to think about what happens in an imperfectly competitive market when . . .” This is how we do industrial organization.



1.3 WHY: ANTITRUST AND INDUSTRIAL ORGANIZATION THEORY

The text of the principal US antitrust statutes is given in the Appendix to this chapter. Suffice it to say at this point that such legislation came early to the United States with the passage of the first major antitrust law—the Sherman Act—in 1890. This predates much of the formal modeling of imperfect competition and certainly its dissemination. However, economists had had an intuitive grasp of the potential problems of monopoly power as far back as Adam Smith. In his classic *The Wealth of Nations* (1776), Smith had written on both collusion among ostensibly rival firms and on the raw exercise of monopoly power:

People of the same trade seldom meet together, even for merriment or diversion, but the conversation ends in a conspiracy against the public, or in some contrivance to raise prices . . .

The monopolists, by keeping the market constantly understocked, by never fully supplying the effectual demand, sell their commodities much above the natural price . . .

Within the United States, a sizable popular sentiment against monopoly became clear in the Jacksonian era. By the second half of the 19th century, this sentiment had grown large enough that political parties officially calling themselves the Anti-Monopoly Party emerged

¹ Keynes (1935).

in many states and even formed a national party in 1884.² By this time, many Americans had become convinced that a few large firms and trusts, such as Standard Oil and American Tobacco, had exploited their market power in just the ways Smith had forecast. A consensus emerged—one that has endured throughout the history of antitrust legislation—that some form of legal framework was needed to maintain competition in the market place.

Thus, it was popular sentiment reinforced by shrewd Smithian insight that led to the enactment of the first US antitrust law, the 1890 Sherman Act. Indeed, it is somewhat remarkable just how directly the concerns of Adam Smith are reflected in the two primary sections of the Sherman Act. Section 1 prohibits contracts, combinations, and conspiracies “in restraint of trade.” Section 2 makes illegal any attempt to monopolize a market. The view that government institutions were necessary to achieve these aims was also later reflected in the Clayton and Federal Trade Commission Acts.

Antitrust policy, in the beginning, focused primarily on prosecuting and preventing collusive agreements to raise prices under the authority of Section 1. Early cases such as the *Trans-Missouri Freight Association* and the *Addyston Pipe* case of 1897 and 1898, respectively, established this tradition. It remains a centerpiece of antitrust policy to this day,³ as evidenced by the successful prosecution in the past fifteen years of agricultural products giant Archer Daniels Midland; the world’s two largest auction houses, Sotheby’s and Christie’s, the international pharmaceutical giant Hoffman-LaRoche; the LCD manufacturers AU Optronics, LG Display, and Samsung; and the largest publishing houses with respect to their pricing of e-books.

However, unlike the Section 1 statute, the enforcement of Section 2 on monopolization has been more limited. Despite wide public perception that many of the giant firms emerging from the Industrial Revolution had abused and exploited their monopoly power, it was twelve years before one of these, the Standard Oil Company of New Jersey, was prosecuted under Section 2.⁴ That case eventually led to the famous Supreme Court ruling in 1911 that Standard Oil had illegally monopolized the petroleum refining industry. Similar findings against other trusts, including most notably the Tobacco Trust,⁵ followed quickly. Yet unlike the price-fixing cases, these monopolization decisions were less clear about what actions were illegal. In particular, the court established a “rule of reason” framework for monopolization cases that permitted the courts to examine not only whether monopolization of an industry had occurred but, if so, what the market context was surrounding the formation of that monopoly and the business practices used to achieve it. Only if this additional inquiry found an explicit intent to monopolize or an obvious exploitation of monopoly power was there a true violation.

Practically speaking, the rule of reason approach meant that there was a lot of ambiguity in exactly what actions were illegal. This had two important results. First, those who feared that such a legal framework might weaken antitrust enforcement were motivated to pursue additional reforms so that Section 2 of the Sherman Act would not become a “paper-toothed tiger.”⁶ This led in 1914 to the passage of the Clayton Act meant to stop monopolization

² See Ritter’s (1997) excellent book for a history of the anti-monopoly sentiment in 19th century America.

³ *United States v. Trans-Missouri Freight Association* 166 U.S. 290 (1897) and *United States v. Addyston Pipe & Steel Co.*, 85 F. 271 (6 Cir. 1898).

⁴ *Standard Oil Co. of New Jersey v. United States*, 221 U.S. 1 (1911). See also, Posner (1970).

⁵ *United States v. American Tobacco Co.*, U.S. 221 U.S. 106 (1911).

⁶ Berki, Sylvester (1966), ix.

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in its incipency by limiting the use of a number of business practices such as rebates, tying, and exclusive contracts that were used by Standard Oil in establishing its dominance. Section 7, which was later amended in the 1950s, was passed to prevent anticompetitive mergers.

The same fear also led to the passage of the Federal Trade Commission Act in 1914 that established an administrative agency, the Federal Trade Commission (FTC), endowed with powers of investigation and adjudication to handle Clayton Act violations. As later amended, this act also outlawed “unfair methods of competition” and “unfair and deceptive acts or practices.” Creation of the FTC gave antitrust policy a second arm of law enforcement in addition to that provided by the Justice Department (DOJ).

The second major result stemming from adoption of a rule of reason approach emerged later with the *U.S. Steel* case of 1920. In that case, the Court made clear that in its view “the law does not make mere size an offense or the existence of unexerted power an offense—it does not compel competition nor require all that is possible.”⁷ As a result, the Court found U.S. Steel—a firm that through a series of mergers had grown to control over 70 percent of US steel-making capacity—innocent of any antitrust violations.

The *U.S. Steel* decision had a major impact on both the steel industry and the US legal framework. For our purposes, however, the reason that this case was so important is that it served as a major intellectual stimulus to the field of industrial organization. For the conclusion to which many analysts were led by the 1920 decision was that without a good economic road map by which to understand imperfect competition, the making of antitrust policy was a difficult proposition at best. It was the subsequent effort to provide the road map that initiated the field that we now call industrial organization.

Economists such as Edward Chamberlin (1933) and Edward Mason (1939), both at Harvard, led the way. In their view, the microeconomics of the time offered little guidance either to policy makers or the legal system as to what evidence might be useful in determining the likely outcome that a market would produce. The Supreme Court’s dismissal of the government charges of monopolization in the *U.S. Steel* case was based on an argument that no exploitation of monopoly power or intent to monopolize had been shown. Only U.S. Steel’s large market share had been documented and, “*the law does not make mere size an offense*” [emphasis added]. Unless there was good reason to believe that a large market share offered strong evidence of monopolization, or until there was a coherent argument that identified other observable characteristics that in turn implied illegal behavior, the court’s decision had a fair bit of justification.

More generally, economists at that time realized that any informed legal judgment would require some practical way to determine from observable evidence whether the industry in question was closer to perfect competition or closer to monopoly. Accordingly, they viewed the highest priority of industrial economics to be the determination of whether and how one could infer illegal behavior from either firm size or other structural features. It was to provide this policy guide that the field of industrial organization began to emerge. The very name of the field—industrial organization—dates from this time.

Early work therefore focused on a set of key questions: how is the production of the industry organized? How is the market structured? How many firms are there and how large are they relative to each other? Are there clear barriers to entry? It was recognized from

⁷ *United States v. United States Steel Corporation*, 251 U.S. 417 (1920).

the outset, however, that answering these questions would not be enough to provide the legal framework needed by legislators and courts to determine whether or not the antitrust laws had been violated. Achieving this goal required not only that an industry's structural features be revealed but that clear links between structure and market outcomes also be identified. That is, industrial economists needed to obtain data on prices, profits, and market structure, and then use these data to identify statistical relationships between various market structures, on the one hand, and industrial performance, on the other.

This was the agenda explicitly announced by Edward Mason who in 1939 wrote, "The problem, as I see it, is to reduce the voluminous data concerning industrial organization to some sort of order through a classification of market structures. Differences in market structure are ultimately explicable in terms of technological factors. The economic problem, however, is to explain, through an examination of the structure of markets and the organization of firms, differences in competitive practices including price, production and investment policies."⁸ In sum, the early industrial organization economists viewed their goal as one of establishing links between both market structure and the conduct of firms in the market. In turn, that conduct would determine the likely outcome or performance of the market in terms of economic efficiency or general social welfare. For this reason, this early approach is typically referred to as the Structure-Conduct-Performance (or SCP) approach. Presumably, if the outcome for a particular industry given its structure was sufficiently bad, legal action was justified either to alter the conduct that structure would otherwise generate or, if necessary, to change the structure itself.

The basic principle behind the SCP paradigm was that perfect competition and monopoly are usefully viewed as opposite ends of a spectrum of market structures along which all markets lie. One natural measure of market structure is the degree of concentration, or the percentage of market output produced by the largest firms in that industry. Accordingly, the practice of industrial economics at that time became one of, first, accurately describing the structure of different markets and, second, deriving empirical relations between structures and outcomes in terms of price–cost margins, innovative efforts, and other performance measures. Research focused on examining statistically the broad hypotheses on market structure and performance implied by the SCP paradigm. Here, structure was often identified with the degree of concentration or the percentage of total market output accounted for by the few largest firms. Finding a road map for policy was interpreted to mean providing numerical answers to questions such as how much would a bit more concentration or a bit higher entry barriers raise price above cost.

In pursuit of the SCP quest, the 1930s and 1940s witnessed numerous studies attempting to document and to measure the link between industrial performance, say profitability, and an industry's structural features, such as concentration. In some respects, this goal was met. For example, the research appeared to establish a positive link between a measure of industrial concentration and industry profit and a similarly positive link between advertising and profitability. The first finding gave support to the view that an industry in which there was more than one but still just a few large firms was indeed somewhat close to the monopoly pole. The second finding was interpreted as evidence that firms used advertising to build customer loyalty and, thus, to deter other firms from entering the market. In turn, this permitted the incumbent firms to enjoy monopoly power and profit.

⁸ Mason (1939), 61–74.

1.3.1 The “New” Sherman Act and the Dominance of Structure-Based Analysis

The early findings of SCP scholars increasingly seemed to suggest that perhaps a firm’s “mere size” *could* imply a legal offense if it is sufficiently large. The practical question then became whether or not these developments would influence antitrust law. This question was answered in the affirmative with the 1945 Supreme Court case against Alcoa.

Alcoa was by far the largest aluminum manufacturer in North America. It had been prosecuted for antitrust violations a number of times prior to the 1945 case. In fact, so large a number of Supreme Court justices in 1945 had had previous litigation experience with Alcoa that they could not participate in this proceeding, with the result that the Supreme Court lacked a quorum to hear the case. For this reason, the 1945 decision was issued by a special panel of three circuit court judges. In a key decision, this panel overturned the finding of innocence by the lower district court and found Alcoa guilty of monopolization under Section 2 of the Sherman Act. An explicit consideration for the Court was the issue of size.⁹ Alcoa’s market share depended critically on how one measured the market, and much attention was given to this issue. Ultimately, the Court defined Alcoa’s relevant market to be primary aluminum ingot production. Using this definition, the Court found that Alcoa supplied 90 percent of the market. In effect, this decision was a major policy validation of the SCP approach.

Other cases also reflecting a newly found concern over market domination by large firms soon followed. In 1946, the Supreme Court found the big three tobacco companies—American Tobacco, Ligget & Myers, and R. J. Reynolds, which controlled 75 percent of domestic cigarette production—guilty of monopolization.¹⁰ A number of similar cases continued over the next twenty years, culminating with such well-known ones as the 1962 *Brown Shoe* case and the 1964 case against the Grinnell Corporation. All of these cases gave increasing weight to market structure as an indictment of proposed or past actions.¹¹ The (in)famous price discrimination case of *Utah Pie* (1967) may also be read as an indictment of any outcome in which a few large firms come to dominate the market.¹² In that case, the Court viewed the pricing strategies of the bigger nationwide companies to be evidence of predatory intent against a smaller firm primarily because the shares of the larger firms grew over a four-year period. In short, the period from 1945 into the late 1960s reflects the growing dominance of the SCP framework as the major intellectual influence on antitrust policy.¹³

1.3.2 The Tide Changes—The Chicago School and Beyond

Matters began to change in the 1970s. In part, this reflected a growing awareness among academic scholars that the SCP paradigm had important failings. One of these was that the vast array of empirical findings that the SCP researchers had amassed was actually subject

⁹ *United States v. Aluminum Co. of America (ALCOA)*, 148 F.2d 416 (2 Cir. 1945).

¹⁰ *American Tobacco Company v. United States*, 328 U.S. 781 (1946).

¹¹ *Brown Shoe Co. v. United States*, 370 U.S. 294 (1962) and *United States v. Grinnell Corp.*, 236 F.Supp. 244 (D.R.I. 1964).

¹² *Utah Pie Co. v. Continental Baking Co., et al.*, 386 U.S. 685 (1967).

¹³ For an excellent survey of antitrust history see Mueller (1996).

to different interpretations. For example, consider the frequent finding that firms with large market shares tend to earn greater profit. This could be taken as a verification of the basic SCP view that the larger a firm's market share, the greater the monopoly power and the higher its profit. However, a more benign interpretation of this evidence is also possible. It could be that the most efficient, or the lowest cost, firm gains the largest share of the market, so that both large size and healthy profit are simply reflections of a firm's superior technology or talent.¹⁴

What was really unsatisfactory about the SCP approach, however, was that in considering its middle link—firm conduct—little or no attention was paid to strategic interaction. A consideration of strategic interaction forces one to face a critical failure in the SCP paradigm. That failure is that it treats structure as exogenous—a factor that determines firm behavior but is not determined by it. Yet it is clear that firm conduct has important effects on market structure. For example, intense price competition among incumbent firms may make entry unattractive with the result that we may find industries with relatively high concentration to be precisely the industries with competitive pricing—a result not easily squared with the basic SCP approach.

To be sure, some of those working in the SCP tradition—notably Joe Bain (1956)—understood this limitation. Bain, in particular, was among the first who understood that entry considerations had to become a part of industrial economics. This important insight played a central role in the “contestability” theory developed much later by Baumol, Panzar, and Willig (1982). It is however a two-edged sword. The ease with which new firms can enter is at least partially the result of actions taken by the firms already in the market. That is, incumbent firms can pursue strategic actions meant to influence the entry decisions of other, potential rivals. Within the SCP paradigm, one could not easily address this issue.

The weaknesses in the SCP paradigm were accompanied by a discomfort that many felt concerning the more aggressive antitrust enforcements mentioned above. In the *Brown Shoe* case, for example, the Court disallowed the merger of two firms (Brown and Kinney) even though they only controlled about five percent of the national market (though a greater percentage of individual local markets). Similarly, the *Utah Pie* case seemed to be a decision that did more to protect a specific competitor (*Utah Pie*) than to protect competitive forces.

The rising concern over flaws in both the SCP approach and the public policy it had fostered made possible a counter movement led by lawyers and economists from the Chicago School such as Richard Posner, Robert Bork, and Sam Peltzman. These and other scholars began to point out that many of the practices that the courts had been viewing as harmful to competition and economic welfare could, when viewed through the lens of corporate strategy and tactics, be seen as actually improving economic efficiency and benefitting consumers. This work initially focused on the vertical relationships either between a firm and its suppliers or between a firm and its distributors. Many such vertical contracts include restrictions such as those that grant franchisees exclusive territories,

¹⁴ As shown later, this is a standard result in a Cournot model in which costs differ across firms. Specifically, if P is market price, η is the market demand elasticity at that price, and c_i and s_i are the i th firm's unit cost and market share, respectively, then it must be the case that: $\frac{P - c_i}{P} = \frac{s_i}{\eta}$. Lower cost firms will have larger market shares, larger profit margins, and larger total profit.

or that require distributors to sell at some minimum price. Chicago School economists argued that there were good economic reasons for these practices and that these restrictions actually brought benefits to consumers. Over time, these arguments were successful and many practices that had been previously found to be *per se* or outright illegal the court now began to review for their “reasonability” on a case-by-case method.¹⁵

The Chicago School influence on vertical relationships soon spread to more of antitrust policy. In 1974, the US Supreme Court rejected the government’s efforts to block a large merger in a case involving the General Dynamics Corporation.¹⁶ Many mergers that would previously have been prevented soon followed, justified on both grounds of cost savings and the potential for new entrants to constrain any attempt by the newly merged firm to exercise monopoly power. The government also lost several key cases accusing large firms such as Kodak and IBM of monopolization in violation of the Sherman Act. In addition, the precedent of the *Utah Pie* case was firmly rejected during these subsequent years. It became increasingly clear—most notably in the case involving a complaint by Zenith Corporation charging that seven Japanese television manufacturers had attempted to drive out competitors—that in the courts’ view, efforts to eliminate rivals by pricing below cost rarely made sense.¹⁷

The Chicago School’s contributions are difficult to underestimate and its legal influence is felt to this day. These scholars were right to point out the need to examine the logic and reasonability of a firm’s conduct. However, they were hampered by the fact that, as of that time, no language or framework in which to view such strategic behavior on a consistent basis had yet been developed. Yet such a framework was emerging. Building on the work of Von Neumann and Morgenstern (1944) and Nash (1951), Nobel Prize laureates Reinhard Selten, John Harsanyi, Michael Spence, and Thomas Schelling all made a number of crucial contributions that permitted game theory to become the language for modeling strategic interaction. As we noted earlier, the past two decades have witnessed the rapid spread of game theory to analyze virtually every aspect of imperfect competition. As a result, the field of industrial organization has again been transformed and now reflects, at least in part, what some call a post-Chicago view and what others simply refer to as the “new IO.”¹⁸

We have already noted that there is much to be said for pursuing a game-theoretic understanding of the strategic interaction of firms. What is important to note at this point is that it was game theory that allowed us a way to model and analyze firm behavior in imperfectly competitive markets. Moreover, as game theoretic analysis spread through modern industrial organization its insights have, to some extent, led to a diminishment of the Chicago School’s impact. However, it would be wrong to identify the advent of game theory models and the new post-Chicago approach as a total rejection of the Chicago School’s work. For example, the Merger Guidelines adopted jointly by the Federal Trade Commission and the Justice Department have deep roots in the Cournot-Nash game theoretic model that we describe more fully in Chapter 15. While these guidelines are far

¹⁵ See *Continental T.V. Inc. v. GTE Sylvania, Inc.*, 433 U.S. 36 (1977) and, more recently, *State Oil v. Khan, et al.*, 522 U.S. 3 (1997) and *Leegin Creative Leather Products, Inc. v. PSKS, Inc.*, 551 U. S. 877 (2007).

¹⁶ *United States v. General Dynamics Corp.* 415 U.S. (1974).

¹⁷ *Matsuhita Electric Industrial Co. v. Zenith Radio Corp.*, 475 U.S. 574 (1986).

¹⁸ Schmalensee (1988) provides a survey of the then “new IO” that is still relevant. Kovacic and Shapiro (2000) survey the influence of game theory on modern antitrust policy. Kwoka and White (2004) offer a discussion of recent antitrust cases.

from permissive, they still allow for many more mergers than would ever have legally occurred in the “New Sherman Act” years of the 1950s and 1960s.

The major point of this brief review is that since its inception, industrial organization has been associated with antitrust policy. More than that, however, industrial organization has emerged as the locus of work on strategic interaction among firms. In this regard, its goal is to understand business tactics and the market implications of corporate strategies. It therefore provides considerable insight into business life, and to some extent this understanding has become a goal in itself. We want to know how firms compete when they have market power, what implication that competition has, what the role of public policy might be in helping imperfectly competitive markets achieve outcomes closer to the competitive ideal, and what counter-tactics firms may employ. Finding the answers to these questions is why we study industrial organization.

1.4 EMPIRICAL APPLICATION: ANTITRUST AROUND THE GLOBE

As noted, a major motivation for the study of industrial organization on imperfect competition is the insights that it provides for antitrust policy. Industrial organization tools will be useful wherever antitrust is an active concern of government. To what nations does this apply? How extensively and to what depth are antitrust laws applied around the world?

Economist Michael Nicholson (2008) has provided some recent answers to the above questions by creating an Antitrust Law Index measuring the extent of anti-monopoly laws in fifty-two different countries as of 2005. For each of these countries, Nicholson (2008) examines three broad areas of antitrust concern: 1) collusive behavior to raise prices or otherwise restrain trade; 2) abuse of monopoly power such as below-cost pricing to drive out competitors; and 3) mergers. To this he adds a consideration of what remedies the laws specify and whether private parties can initiate antitrust actions. Within each of these areas, Nicholson looks for the presence of explicit laws; the country in question receives a score of 1 if it has such a law and 0 otherwise. For example, if a country has a law requiring (large) firms to pre-notify the authorities that they intend to merge, one point is added to its overall antitrust score while it gets 0 if it does not. Similarly, the presence of an explicit law against price-fixing also results in the award of 1 point. Over all such categories, the highest possible score is 31.

As mentioned, Nicholson (2008) constructs his Antitrust Law Index for fifty-two separate countries. Across these countries the Index ranges in value from 4 in Malta and Chile to 21 in the United States. The median value across all countries is about 14. The full set of index values by country is shown in Table 1.1.

Nicholson (2008) also briefly explores the source of these differences in each country. One point that seems clear is that emerging economies often adopt extensive antitrust laws, especially when they hope to eventually join an international trade group such as the European Union that already has strong antitrust laws. More explicitly, Nicholson presents evidence that the Antitrust Law Index initially falls with GNP, but ultimately rises with it. As a result, small economies and large economies will have a higher Antitrust Law Index than will medium-sized ones.