PREFACE TO THE HANDBOOK

Purpose and motivation

The *Handbook of Industrial Organization* aims to serve as a source, reference, and teaching supplement for industrial organization (or industrial economics), the broad field within microeconomics that focuses on business behavior and its implications both for market structures and processes, and for public policies towards them.[1] Our purpose has been to provide reasonably comprehensive and up-to-date surveys of recent developments and the state of knowledge in the major areas of research in this field as of the latter part of the 1980s, written at a level suitable for use by non-specialist economists and students in advanced graduate courses.

We feel that the preparation and publication of the *Handbook of Industrial Organization* is particularly timely due to the confluence of several exciting trends in this field of economics. First, industrial organization is a primary locus of the recent and ongoing revolution that is re-examining all microeconomic phenomena as strategic interactions with explicitly-specified (and often asymmetric) information structures. This trend alone has generated an unprecedented burst of theoretical research on industrial organization, with new answers to old questions rivalled in quantity only by the volume of new answers to new questions.

Second, new waves of empirical and experimental work in industrial organization are gathering momentum, driven by clarified views of the limitations of the previous focus on cross-sectional interindustry studies, and by the profusion of new hypotheses and possibly testable conclusions produced by the explosion of theoretical work.

Third, the boundaries between historically distinct fields of economics, such as international trade and macroeconomics, and industrial organization, have recently become blurred. The perfectly competitive model traditionally central to other fields is being replaced by explicit models of imperfect competition derived from industrial organization. As a consequence, important new results are being generated in these fields, and significant new issues for the field of industrial organization are emerging.

[1]This Handbook attempts to cover only those themes and issues that have been prominent in what de Jong (1986) has called "Anglo-Saxon thinking" in industrial organization. He presents an interesting overview of the rather different continental European tradition.

Finally, a bevy of significant policy issues squarely in the domain of industrial organization has been at the forefront of public and political attention in recent years. Takeover and merger activity, the movement towards deregulation, increasing globalization of competition, and concerns about national competitiveness have all been powerful stimuli to theoretical, empirical, and policy research, and have increased awareness of the magnitude of the work still to be done in industrial organization.

These trends both make the field of industrial organization exciting and enhance the value that this Handbook can provide by communicating the state-of-the-art in that field to those who seek to contribute to it or to apply it to their own concerns. This potential value has motivated us as editors and has induced the authors of the chapters that follow to contribute so generously of their enormously productive efforts.

Organization

The organization of the *Handbook of Industrial Organization* reflects our perspectives on the principal topics in the field that have recently received intensive research attention or that otherwise are most needful of a new integrative survey. Each of the chapters in the Handbook can be read independently, though they are organized into Parts with some logic, and many pairs are close complements.

Part 1 begins the Handbook with four chapters on the firm. In much of economics, the firm has been viewed as just a black box that maximizes profits subject to an exogenous production or cost function. Because firm behavior is so important in industrial organization, scholars in this field have been productively working to open that box. John Panzar (Chapter 1) focuses on the impact of costs and technology on the organization of production among firms in an industry. He surveys the body of theoretical results on the connections between detailed properties of multiproduct cost functions and details of firm and market structure, and discusses methods of applying these results in empirical analyses of such industries as electric power and telecommunications.

Bengt Holmstrom and Jean Tirole (Chapter 2) consider the implications of imperfect information for the behavior of firms viewed as organizations of self-interested owners, managers, and employees. They summarize the burgeoning body of research that formally analyzes from this perspective the existence, scope, financing, internal structure, control, and objectives of firms. In a complementary chapter, Oliver Williamson (Chapter 3) analyzes the consequences of the minimization of transactions costs for the structures of firms and for the locations of boundaries between firms and markets. Martin Perry (Chapter 4) focuses on vertical integration as an important dimension of firm structure. His presentation surveys the long line of research on the incentives for and effects of vertical integration, and connects this body of work to the perspectives of transactions costs and information asymmetries.

A solid understanding of the firm is a logical prerequisite to answering what has long been the central research question in industrial organization: "How can behavior and performance in a market be understood and predicted on the basis of observable data?" Scholars who attempt to answer this question generally deal also with its sequel: "Can government policy somehow improve market performance?" Parts 2–5 of this Handbook concentrate on these questions. Antitrust policy issues are discussed as they arise in the chapters in Parts 2–4 (and in several of the chapters in Part 1); Part 5 focuses on economic and social regulation.

Part 2 is devoted to the theoretical literature on market behavior and performance, which has grown explosively in the last decade and a half, and to the implications of this research for antitrust policy.[2] Much of this work draws on recent developments in noncooperative game theory, especially the theory of dynamic games of incomplete or imperfect information. Drew Fudenberg and Jean Tirole (Chapter 5) present an overview of the game-theoretic tools that have been most widely applied in this spate of new research, and employ representative models as examples of the analytic techniques.

The next two chapters provide complementary analyses of the determinants of the intensity of rivalry among sellers in a market. Carl Shapiro (Chapter 6) integratively summarizes the state of oligopoly theory, running the gamut from the classical models of Cournot and Bertrand to the latest models set in the context of repeated games with imperfect information. Alexis Jacquemin and Margaret Slade (Chapter 7) consider related theoretical work focusing on cartels, explicit and implicit collusion, and mergers, and the implications of this work for antitrust policy.

The following two complementary chapters are concerned with the process of market entry. Richard Gilbert (Chapter 8) focuses on structural barriers to entry and mobility, bridging the gaps between the classical treatments of Bain and Stigler and the recent treatments that formally model the strategic incentives of both incumbents and potential entrants. Janusz Ordover and Garth Saloner (Chapter 9) emphasize rational strategic behavior designed to prevent or remove competition and use this theory to analyze antitrust policy towards "predatory" business behavior.

The next four chapters in Part 2 cover economic models of the "Four P's" of traditional marketing textbooks: Product, Price, Promotion (mainly advertising), and Place (distribution). Hal Varian (Chapter 10) summarizes and integrates the

[2]The reader interested in theoretical work in industrial organization should also consult Tirole (1988). One could argue that this Part might have contained a chapter on the theory of auctions and bargaining, which has advanced rapidly in recent years.

large literature on price discrimination, describes how a wide variety of selling practices are analytically equivalent when viewed through the lens of price discrimination, and contrasts the results of welfare analyses of such pricing with its treatment by antitrust policy. Michael Katz (Chapter 11), in a chapter that complements several of the chapters in Part 1, analyzes contracts between manufacturing firms and the wholesalers and retailers who distribute their wares. The formal treatment covers a host of vertical restraints and practices and their welfare effects. Curtis Eaton and Richard Lipsey (Chapter 12) survey models of product choice and product differentiation, focusing on the positive and normative implications unavailable from less structured models of oligopoly. Joseph Stiglitz (Chapter 13) focuses on the consequences of imperfectly informed buyers for the way that markets work, with specific attention to the implications for pricing, advertising, and other modes by which information is conveyed in market equilibria.

The last two chapters in Part 2 are concerned with issues of great empirical and policy importance that have recently begun to receive serious theoretical attention. Jennifer Reinganum (Chapter 14) provides a survey of game-theoretical work on competition in the processes of R&D and the dissemination of its technological fruits, focusing on both analytical technique and on the economic meaning of assumptions and results. Dennis Carlton (Chapter 15) considers evidence on price rigidity, industrial organization theories that are consistent with that evidence, and the associated implications for macroeconomics.

Part 3 contains four surveys of market-oriented empirical studies that bear on the issues raised in Part 2.[3] Until the start of this decade, industry-level cross-section studies of profitability differences dominated empirical work in industrial organization. Richard Schmalensee (Chapter 16) provides an overview of these and related studies, assessing the underlying methodologies and highlighting the robust regularities found in the data. Timothy Bresnahan (Chapter 17) contributes an integrative treatment of the tools and results that are emerging from the rapidly expanding stream of research devoted to building and testing structural models of firm behavior in individual markets. Wesley Cohen and Richard Levin (Chapter 18) survey the broad, interdisciplinary empirical literature on the determinants of technical progress. Their chapter is a natural complement to Chapter 14. Charles Plott (Chapter 19) concludes this Part of the Handbook with an overview of the methods, results, and analyses of the new wave of laboratory experiments designed to test industrial organization hypotheses.

[3]We had hoped that Part 3 would contain a chapter on the theoretical and empirical tools from modern finance theory that have proven valuable in industrial organization. For a useful discussion of one important aspect of the relation between these fields, see Schwert (1981). Some other aspects of this relation are discussed by Bengt Holmstrom and Jean Tirole in Chapter 2.

Part 4 consists of two chapters that take an explicitly global view of industrial organization. Paul Krugman (Chapter 20) describes recent theoretical work on imperfect competition in open economies. His analysis, relating closely to several chapters in Part 2, shows how the theory of international trade can be enriched with foundations drawn from the field of industrial organization, and how the international context raises new issues of theory and application for the field. Richard Caves (Chapter 21) explores the use of international comparisons in empirical research. This chapter, closely related to Chapter 16, shows the value of a broader perspective on industrial organization issues than is provided by the experience of any single nation.

Part 5 provides overviews of theoretical and empirical studies of regulatory policy.[4] Roger Noll (Chapter 22) contributes a chapter on the economic analysis of the political–economic determination of regulatory policies and other government interventions in the marketplace. The next three chapters consider economic regulation of price, entry, and conditions of sale, regulation which is nominally intended to limit the exercise of monopoly power. Ronald Braeutigam (Chapter 23) reviews and interprets the literature on optimal pricing for natural monopolies (whether regulated or publicly owned). David Baron (Chapter 24) provides an overview of recent formal research on the design of optimal regulatory mechanisms and institutions when information is asymmetric, connecting this literature to the classical treatment of rate-of-return regulation. Paul Joskow and Nancy Rose (Chapter 25) survey and critique the voluminous empirical literature on the effects of economic regulation. Howard Gruenspecht and Lester Lave (Chapter 26) conclude the *Handbook of Industrial Organization* with an overview of the economic rationales and effects of social regulatory policies directed at health, safety, environmental, and related problems.

Historical overviews

Because most of the individual chapters in the *Handbook of Industrial Organization* provide historical overviews of the topics they cover, it seems redundant to provide a general overview here. For additional discussions of the historical development of the field of industrial organization, see Scherer (1980), Bresnahan and Schmalensee (1987), Hay and Morris (1979), Schmalensee (1982, 1988), and Roberts (1987).

[4] We must again note a gap in coverage; we had hoped that this Part would contain an overview and analysis of competition (antitrust) policies and their enforcement.

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