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SEVENTH EDITION



JAMES A. BRICKLEY | CLIFFORD W. SMITH | JEROLD L. ZIMMERMAN

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Managerial Economics and Organizational Architecture

Seventh Edition

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MANAGERIAL ECONOMICS AND ORGANIZATIONAL ARCHITECTURE

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Dedicated to our children—

London, Nic, Alexander, Taylor, Morgan, Daneille, and Amy.

PREFACE

The past few decades have witnessed spectacular business failures and scandals. In 2019, German prosecutors criminally charged top executives at Volkswagen for allegedly misleading shareholders in the months before the so-called Diesel-Gate Scandal became public. Wells Fargo has continued to struggle to regain the confidence of consumers, regulators, and the general public following its 2016 retail banking scandal. In 2007 and 2008, prominent financial institutions around the world shocked financial markets by reporting staggering losses from subprime mortgages. Société Générale, the large French bank, reported over \$7 billion in losses due to potentially fraudulent securities trading by one of its traders. JPMorgan Chase bailed out Bear Stearns, a top-tier investment bank, following its massive subprime losses. Washington Mutual and Lehman Brothers were added to the list of “top business failures of all time.” In 2001 and 2002, Enron, WorldCom, and Arthur Andersen, as well as other prominent companies, imploded in dramatic fashion. Around the same time internationally, scandals emerged at companies such as Parmalat, Royal Dutch Shell, Samsung, and Royal Ahold. Due to these cases and many others, executives now face a more skeptical investment community, additional government regulations, and stiffer penalties for misleading public disclosures.

A common perception is that bad people caused many of these problems. Others argue that the sheer complexity of today’s world has made it virtually impossible to be a “good” manager. These views have raised the cry for increased government regulation, which is argued to be a necessary step in averting future business problems.

We disagree with these views. We believe that many business problems result from poorly structured organizational architectures. The blueprints for many of these prominent business scandals were designed into the firms’ “organizational DNA.” This book, in addition to covering traditional managerial economic topics, examines how leaders can structure organizations that channel employees’ incentives into actions that create, rather than destroy, firm value. This topic is critical to anyone who works in or seeks to manage organizations—whether for-profit or not-for-profit.

New Demands: Relevant Yet Rigorous Education

Fifty years ago, teaching managerial economics to business students was truly a “dismal science.” Many students dismissed standard economic tools of marginal analysis, production theory, and market structure as too esoteric to have any real relevance to the business problems they anticipated encountering. Few students expected they would be responsible for their prospective employers’ pricing decisions. Most sought positions in large firms, eventually hoping to manage finance, operations, marketing, or information systems staffs. Traditional managerial economics courses offered few insights that obviously were relevant for such careers. But a new generation of economists began applying traditional economic tools to problems involving corporate governance, mergers and acquisitions, incentive conflicts, and executive compensation. Their analysis focused on the internal structure of the firm—not on the firm’s external markets. In this book, we draw heavily from this research and apply it to how organizations can create value through improved organizational design. We also present traditional economic topics—such as demand, supply, markets, and strategy—in a manner that emphasizes their managerial relevance within today’s business environment.

Today's students must understand more than just how markets work and the principles of supply and demand. They also must understand how self-interested parties within organizations interact, and how corporate governance mechanisms can control these interactions. Consequently, today's managerial economics course must cover a broader menu of topics that are now more relevant than ever to aspiring managers. Yet, to best serve our students, offering relevant material must not come at the expense of rigor. Students must learn how to think logically about both markets and organizations. The basic tools of economics offer students the skill set necessary for rigorous analysis of business problems they likely will encounter throughout their careers.

Besides the heightened interest in corporate governance, global competition and rapid technological change are prompting firms to undertake major organizational restructurings as well as to produce fundamental industry realignments. Firms now attack problems with focused, cross-functional teams. Many firms have shifted from functional organizational structures (manufacturing, marketing, and distribution) to flatter, more process-oriented organizations organized around product or region. Moreover, the pace of change shows no sign of slowing. Today's students recognize these issues; they want to develop skills that will make them effective executives and prepare them to manage organizational change.

Business school programs are evolving in response to these changes. Narrow technical expertise within a single functional area—whether operations, accounting, finance, information systems, or marketing—is no longer sufficient. Effective managers within this environment require cross-functional skills. To meet these challenges, business schools are becoming more integrated. Problems faced by managers are not just finance problems, operations problems, or marketing problems. Rather, most business problems involve facets that cut across traditional functional areas. Big data, artificial intelligence and data analytics are transforming the way managers make decisions. For these reasons, the curriculum must encourage students to apply concepts they have mastered across a variety of courses.

This book provides a multidisciplinary, cross-functional approach to managerial and organizational economics. We believe that this is its critical strength. Our interests span economics, finance, accounting, information systems, and financial institutions; this allows us to draw examples from a number of functional areas to demonstrate the power of this underlying economic framework to analyze a variety of problems managers face regularly.

We have been extremely gratified by the reception afforded the first six editions of *Managerial Economics and Organizational Architecture*. Adopters report that the earlier editions helped them transform their courses into one of the most popular courses within their curriculum. This book has been adopted in microeconomics, human resources, and strategy courses in addition to courses that focus specifically on organizational economics. The prior editions presented powerful economic tools and frameworks that enable managers not only to make better strategic and operating decisions, but also to design organizations that motivate self-interested individuals to make choices that increase firm value. Our seventh edition continues to focus on the fundamental importance of both markets and organizational design.

Throughout the book we provide contemporary examples and applications to help students appreciate the managerial relevancy of the material. Among these are case studies of corporate scandals (e.g., Volkswagen and Wells Fargo) that we use to illustrate how poorly designed organizational architectures can be catastrophic. Most other managerial economics textbooks provide little coverage of such managerially critical topics as developing effective organizational architectures, including

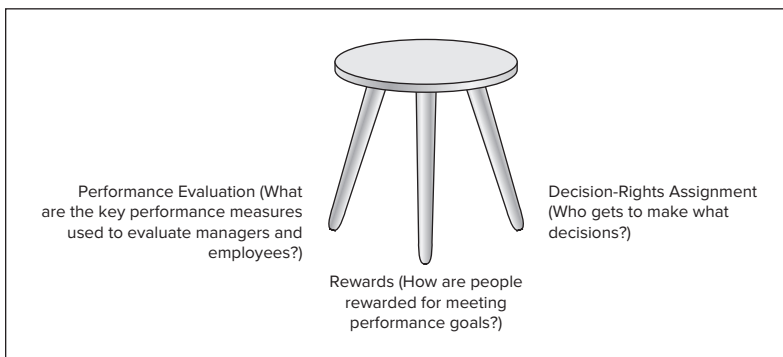
performance-evaluation systems and compensation plans; assigning decision-making authority among employees; and managing transfer-pricing disputes among divisions. Given the increased importance of corporate governance, this omission has been both significant and problematic. One of our primary objectives in writing this book is to provide current and aspiring leaders with a rigorous, systematic, comprehensive framework for addressing such organizational problems. To that end, we have endeavored to write the underlying theoretical concepts in simple, intuitive terms and illustrate them with numerous examples—most drawn from actual company practice.

The Conceptual Framework

Although the popular press and existing literature on organizations are replete with jargon—Six Sigma, reengineering, outsourcing, teaming, venturing and empowerment—they fail to provide managers with a systematic, comprehensive framework for examining organizational problems. This book uses economic analysis to develop such a framework and then employs that framework to organize and integrate the important organizational problems, thereby making the topics more accessible.

Throughout the text, readers will gain an understanding of the basic tools of economics and how to apply them to solve important business problems. While the book covers the standard managerial economics problems of pricing and production, it pays special attention to organizational issues. In particular, the book will help readers understand:

- How the business environment (technology, regulation, and competition in input and output markets) drives the firm's choice of strategy.
- How strategy and the business environment affect the firm's choice of organizational design—what we call *organizational architecture*.
- How the firm's organizational architecture is like its DNA; it plays a key role in determining a firm's ultimate success or failure because it affects how people in the organization will behave in terms of creating or destroying firm value.
- How corporate policies such as strategy, financing, accounting, marketing, information systems, operations, compensation, and human resources are interrelated and thus why it is critically important that they be coordinated.
- How the three key features of organizational architecture—the assignment of decision-making authority, the reward system, and the performance-evaluation system—can be structured to help managers to achieve their desired results.



These three components of organizational architecture are like three legs of the accompanying stool. Firms must coordinate each leg with the other two so that the stool remains functional. Moreover, each firm's architecture must match its strategy; a balanced stool in the wrong setting is dysfunctional: Although milking stools are quite productive in a barn, tavern owners purchase taller stools.

Reasons for Adopting Our Approach

This book focuses on topics that we believe are most relevant to managers. For instance, it provides an in-depth treatment of traditional microeconomic topics (demand, supply, pricing, and game theory) in addition to corporate governance topics (assigning decision-making authority, centralization versus decentralization, measuring and rewarding performance, outsourcing, and transfer pricing). We believe these topics are more valuable to prospective managers than topics typically covered in economics texts such as public-policy aspects of minimum-wage legislation, antitrust policy, and income redistribution. A number of other important features differentiate this book from others currently available, such as:

- Our book provides a comprehensive, cross-functional framework for analyzing organizational problems. We do this by first describing and integrating important research findings published across several functional areas, then demonstrating how to apply the framework to specific organizational problems.
- This text integrates the topics of strategy and organizational architecture. Students learn how elements of the business environment (technology, competition, and regulation) drive the firm's choice of strategy as well as the interaction of strategy choice and organizational architecture.
- Reviewers, instructors, and students found the prior editions accessible and engaging. The text uses intuitive descriptions and simple examples; more technical material is provided in appendices for those who wish to pursue it.
- Numerous examples drawn from the business press and our experiences illustrate the theoretical concepts. These illustrations, many highlighted in boxes, reinforce the underlying principles and help the reader visualize the application of more abstract ideas. Each chapter begins with a specific case history that is used throughout the chapter to unify the material and aid the reader in recalling and applying the main constructs.
- Nontraditional economics topics dealing with strategy, corporate culture, outsourcing, leadership, organizational form, corporate ethics, and the implementation of management innovations are examined. Business school curricula often are criticized for being slow in covering topics of current interest to business, such as corporate governance. The last six chapters examine recent management trends and demonstrate how the book's framework can be used to analyze and understand topical issues.
- Problems, both within and at the end of chapter, are drawn from real organizational experience—from the business press as well as our contact with executive MBA students and consulting engagements. We have structured exercises that provide readers with a broad array of opportunities to apply the framework to problems like ones they will encounter as managers.

Organization of the Book

- **Part 1: Basic Concepts** lays the groundwork for the book. Chapter 2 summarizes the economic view of behavior, stressing its management implications. Chapter 3 presents an overview of markets, provides a rationale for the existence of organizations, and stresses the critical role of the distribution of knowledge within the organization.

- **Part 2: Managerial Economics** applies the basic tools of economic theory to the firm. Chapters 4 through 7 cover the traditional managerial-economics topics of demand, production and cost, market structure, and pricing. These four chapters provide the reader with a fundamental set of microeconomic tools and use these tools to analyze basic operational policies such as input, output, and product pricing decisions. Chapters 8 and 9 focus on corporate strategy—the former on creating and capturing values and the latter on employing game theory methods to examine the interaction between the firm and its competitors, suppliers, as well as other parties. These chapters also provide important background material for the subsequent chapters on organizations: A robust understanding of the market environment is important for making sound organizational decisions. Chapter 10 examines conflicts of interest that exist within firms and how contracts can be structured to reduce or control these conflicts.
- **Part 3: Designing Organizational Architecture** develops the core framework of the book. Chapter 11 provides a basic overview of the organizational-design problem. Chapters 12 and 13 focus on two aspects of the assignment of decision rights within the firm—the level of decentralization chosen for various decisions followed by the bundling of various tasks into jobs and then jobs into subunits. Chapters 14 and 15 examine compensation policy. First, we focus on the level of compensation necessary to attract and retain an appropriate group of employees. We then discuss the composition of the compensation package, examining how the mix of salary, fringe benefits, and incentive compensation affects the value of the firm. In Chapters 16 and 17, we analyze individual and divisional performance evaluation. Part 3 concludes with a capstone case on Arthur Andersen.
- **Part 4: Applications of Organizational Architecture** uses the framework that we have developed to provide insights into contemporary management issues. Chapters 18 through 23 discuss the legal form of organization, outsourcing, leadership, regulation, ethics, and management innovations.

Fitting the Text into the Business Curriculum

Our book is an effective tool for a variety of classes at the MBA, executive MBA, and undergraduate levels. Although this text grew out of an MBA elective course in the economics of organizations at the University of Rochester, the book's modular design allows its use in a variety of courses. We have been encouraged by the creativity instructors have shown in the diversity of courses adopting this text. Besides the introductory microeconomics course, this book also is used in elective courses on corporate governance, strategy, the economics of organizations, and human resources management. The basic material on managerial economics is presented in the first 10 chapters. The tools necessary for understanding and applying the organizational framework we develop within this text have been selected for their managerial relevance. In our experience, these economics tools are invaluable for those students with extensive work experience, and for those who didn't major in economics as an undergraduate. Those with an economics background may choose to forgo components of this material. We have structured our discussions of demand, production/cost, market structure, pricing, and strategy to be optional. Thus, readers who do not require a review of these tools can skip Chapters 4 through 9 without loss of continuity.

We strongly recommend that all readers cover Chapters 1 through 3 and 10; these chapters introduce the underlying tools and framework for the text. Chapters 4 through 9, as we noted above, cover the basic managerial-economics topics of demand, costs, production, market structure, pricing, and strategy. Chapters 11 through 17 develop the organizational architecture framework; we recommend that these be covered in sequence. Finally, Chapters 18 through 23 cover special managerial topics: outsourcing, leadership, regulation, ethics, and the process of management innovation and managing organizational change. They are capstone chapters—chapters that apply and illustrate the framework. Instructors can assign them based on their specific interests and available time.

Seventh Edition

This book is noted for using economics to analyze real-world management problems. The seventh edition maintains and extends this focus.

Basic economic principles and concepts do not change greatly over time. Key frameworks, such as supply and demand analysis, have existed for over 100 years and have stood the test of time. What does change with reasonable rapidity is the business environment, the quantity of data useful for decision making, and the corresponding demands placed on managers. Examples and illustrations of economic concepts that were highly relevant just a few years ago quickly become outdated and hard for students to relate to.

This edition continues to focus on core economic concepts that are critical for managers. It significantly updates the motivating case studies that permeate each chapter, as well as the problem sets, boxed materials and exhibits. Updated references and recent relevant research are cited. Data has been updated, where appropriate. These changes will help students to better understand how economics can be used both to compete in today's marketplace and to design more effective organizations.

Supplements

The following ancillaries are available for quick download and convenient access via the Instructor Library material available through McGraw-Hill Connect®.

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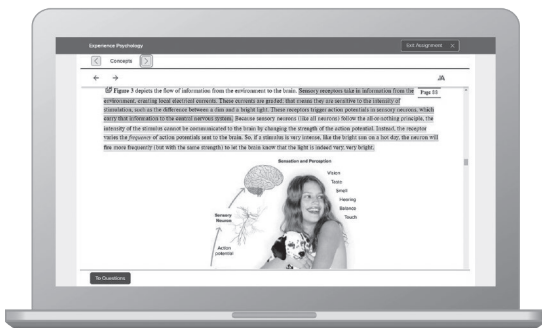
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- Jordan Cunningham,
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No textbook springs from virgin soil. This book has its intellectual roots firmly planted in the work of dozens who have toiled to develop, test, and apply organization theory. As we detailed in the preface to the first edition, the genesis of this book was a course William Meckling and Michael Jensen taught on the economics of organizations at the University of Rochester in the 1970s. Bill's and Mike's research and teaching stimulated our interest in the economics of organizations, prompted much of our research focused on organizational issues, and had a profound effect on this text. No amount of citation or acknowledgments can adequately reflect the encouragement and stimulation that they provided, both personally and through their writings.

Bill and Mike emphasized three critical features of organizational design: (1) the assignment of decision rights within the organization, (2) the reward system, and (3) the performance-evaluation system. These three elements, which we call *organizational architecture*, serve as an important organizing device for this book. As readers will discover, this structure offers a rich body of knowledge useful for managerial decision making.

Important contributions to the literature on the economics of organizations have been made by a host of scholars. Through the work of these individuals, we have learned a tremendous amount. A number of our colleagues at Rochester also contributed to the development of the book. Ray Ball, Rajiv Dewan, Shane Heitzman, Scott Keating, Stacey Kole, Andy Leone, Glenn MacDonald, Larry Matteson, David Mayers, Kevin Murphy, Michael Raith, Mike Ryall, Greg Schaffer, Ronald Schmidt, Larry Van Horn, Karen Van Nuys, Ross Watts, Gerald Wedig, Michael Weisbach, and Ron Yeaple offered thoughtful comments and suggestions that helped to clarify our thinking on key issues. Don Chew, editor of the *Journal of Applied Corporate Finance*, provided invaluable assistance in publishing a series of articles based on the book; his assistance in writing these articles improved the exposition of this book enormously. Our collaboration with Janice Willett on *Designing Organizations to Create Value: From Strategy to Structure* (McGraw-Hill, 2003) enriched our understanding and exposition of many important topics.

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This book represents the current state of the art. Nonetheless, development is ongoing as the research evolves and as we continue to learn. *Managerial Economics and Organizational Architecture* covers an exciting, dynamic area. We hope that a small portion of that excitement is communicated through this text. Reviewers, instructors, and students frequently mention the relevance of material to the business community, the accessibility of the text, and the logical flow within the text's framework. However, in the final analysis, it is instructors and their students who will determine the true value of our efforts.

We appreciate the extensive feedback we have received from many readers; their generous comments have improved this edition substantially. Although we had a definite objective in mind as we wrote this book, it is important to be open to suggestions and willing to learn from others who are traveling a similar yet distinct path. Although we are unlikely to please everyone, we will continue to evaluate suggestions critically and to be responsive where consistent with our mission. If readers would like to share their thoughts on this work or their classroom experiences, please feel free to contact any of us at the University of Rochester. Many thanks in advance for the assistance.

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1

Introduction

CHAPTER
OUTLINE

Managerial Economics and
Organizational Architecture

Organizational
Architecture

Economic Analysis

Economic Darwinism

Survival of the Fittest

Economic Darwinism
and Benchmarking

Purpose of the Book

Our Approach to
Organizations

LEARNING OBJECTIVES

1. Define *organizational architecture* and discuss how economics can be used to help managers solve organizational problems and structure more effective organizational architectures.
2. Define *economic Darwinism* and discuss its implications related to the benchmarking of business practices.

Volkswagen (VW), which is German for the “People’s Car,” was founded in 1937 in Berlin. The company now sells vehicles throughout the world and in 2019 ranked number nine on the *Fortune* Global 500 list with revenues of over \$278 billion. VW is the second largest automobile manufacturer in the world, behind only Toyota.

In September 2015, the U.S. Environmental Protection Agency (EPA) issued a notice to VW asserting that the company had violated the *Clean Air Act* by intentionally programming turbocharged diesel engines to activate emissions controls during regulatory testing.¹ The vehicles in actuality emitted up to 40 times more nitrogen oxides in real-world driving than in regulatory tests. Volkswagen’s stock price fell by about a third in the days immediately following the EPA announcement. Regulators in many countries began investigations. VW subsequently admitted guilt and paid billions of dollars in legal settlements and penalties. Top-company executives were fired and, in September 2019, were charged criminally by German prosecutors for allegedly misleading shareholders in the months before the so-called Diesel-Gate Scandal became public.

It was subsequently revealed that the deceptive computer programming began as early as 2005. Many employees throughout the firm, including software engineers and technicians, were involved with and/or knew about this practice, and more than 50 employees have subsequently confessed under an amnesty program. So, what went wrong? Why did so many employees behave in such destructive and potentially criminal ways for so many years?

Subsequent investigations by regulators, media, and others suggest that VW’s problems were rooted in a flawed organizational design—it suffered from

¹The September 18, 2015, letter from the EPA to VW can be obtained at <https://www.epa.gov/sites/production/files/2015-10/documents/vw-nov-cao-09-18-15.pdf>. Our discussion of the subsequent scandal is based on the subsequent widespread coverage by the U.S. and international press.

“bad management.”² First, VW was organized as a highly centralized hierarchy where important decisions were made primarily by top-level executives who established performance goals, goals that were unlikely to be met without the company engaging in deceptive practices. Second, the performance of lower-level employees was evaluated based on whether they achieved their performance targets. Third, rewards and punishments provided employees strong incentives to meet their performance targets, even if they had to engage in deceptive practices to do so. As one former employee subsequently noted, “To keep your job, you had no escape.” Some VW engineers and technicians tried to alert superiors as far back as 2011 but were ignored. Many employees, however, remained quiet in fear that their bonus pay would be cut if they raised the issue. The “mindset” throughout the company was that higher-level managers tolerated, if not encouraged, breaches of the rules in order to achieve financial targets.

Managerial Economics and Organizational Architecture

Standard managerial economics books address a number of questions that are important for organizational success:

- Which markets will the firm enter?
- How differentiated will the firm’s products be?
- What mix of inputs should the firm use in its production?
- How should the firm price its products?
- Who are the firm’s competitors, and how are they likely to respond to the firm’s product offerings?

Addressing these questions is certainly important—and in this book, we do—yet the troubles at VW suggest that this list is woefully incomplete. It is also important to address questions about the internal organization of the firm. A poorly designed organization can result in lost profits and even in the failure of the institution.

With the benefit of hindsight, it seems easy to identify elements of VW’s organization that, if changed, might have reduced the likelihood of its collapse. But the critical managerial question is whether, before the fact, one reasonably could be expected to identify the potential problems and to structure more productive organization. We believe the answer to this fundamental managerial question is a resounding yes. To examine these issues, a rich framework that can be applied consistently is required.

We are not, of course, the first to recognize the importance of corporate organization or to offer analysis of how to improve it. The business section of any good bookstore displays a virtually endless array of prescriptions: *benchmarking*, *empowerment*, *total quality management*, *reengineering*, *outsourcing*, *teaming*, *corporate culture*, *venturing*, *matrix organizations*, *just-in-time production*, and *downsizing*. The authors of all these books would strongly agree that the firm’s organization and the associated policies, adopted by management, can have profound effects on performance and firm value; all buttress their recommendations with selected stories of firms that followed their advice and realized fabulous successes.

²For example, see J. Rothfeder (2016), “The Volkswagen Settlement: How Bad Management Leads to Big Punishment,” *The New Yorker* (July 1).

The problem with such approaches, however, is that each tends to focus on a particular facet of the organization—whether it be quality control, or worker empowerment, or the compensation system—to the virtual exclusion of all others. As a consequence, the suggestions offered by the business press are regularly myopic. These publications tend to offer little guidance as to which tools are most appropriate in which circumstances. The implicit assumption of most is that their technique can be successfully adopted by all companies. This presumption, however, is invariably wrong. Ultimately, this literature fails to provide managers with a productive framework for identifying and resolving organizational problems.

Organizational Architecture

In contrast to the approach of most business best sellers, we seek to provide a systematic framework for analyzing such issues—one that can be applied consistently in addressing organizational problems and structuring more effective organizations. In this book, we offer a framework that identifies three critical aspects of corporate organization:

- The assignment of decision rights within the company.
- The methods of rewarding individuals.
- The structure of systems to evaluate the performance of both individuals and business units.

Not coincidentally, these are the same three aspects of the organization we identified in the VW example.

We introduce the term **organizational architecture** to refer specifically to these three key aspects of the firm. We hesitate to simply use “organization” to refer to these three corporate features because common usage of that term refers only to the organization’s hierarchical structure—that is, decision-right assignments and reporting relationships—while it generally ignores the performance-evaluation and reward systems. We thus use organizational architecture to help focus specific attention on all three of these critical aspects of the organization.

Stated as briefly as possible, our argument is that successful firms assign decision rights in ways that effectively link decision-making authority with the relevant information for making good decisions. When assigning decision rights, however, senior leadership—including both management and the company’s board of directors—must also ensure that the company’s reward and performance-evaluation systems provide decision makers with appropriate incentives to make value-increasing decisions.

Depending on its specific circumstances, the firm will assign decision-making authority differently (some will decentralize particular decisions but centralize others) and will tailor its reward and performance-evaluation systems. Even though no two firms might adopt precisely the same architecture, successful firms ensure that these three critical aspects of organizational architecture are coordinated.

Our approach is integrative in the sense that it draws on a number of disciplines: accounting, finance, information systems, marketing, management, operations, political science, and strategy. But what also distinguishes our approach most clearly from that of the best sellers is our central reliance on the basic principles of economics.

ACADEMIC APPLICATIONS

R&D and Executive Turnover

Suppose a firm links the CEO's bonus to earnings and the CEO plans to retire in two years. The CEO might reduce the firm's research and development budget to boost earnings this year and next. Five years down the road, earnings will suffer with no new products coming on stream. By then, however, this CEO will be long gone. In fact, research suggests that this can be a problem for some R&D-intensive firms.

Source: C. Driverm, M. Joao, and C. Guedes (2017), "R&D and CEO Departure Date: Do Financial Incentives Make CEOs More Opportunistic?" *Industrial and Corporate Change* (October), 801-820.

Economic Analysis

Economics long has been applied to questions of pricing policy—for example, “how would raising the price of the firm's products affect sales and firm value?” We address standard managerial-economics questions involving pricing, advertising, scale, and the choice of inputs to employ in production. In addition, we apply these same tools to examine questions of organizational architecture. For example, “how would changing a division from a cost center to a profit center change incentives, alter employee decisions, and impact firm value?”

In essence, economics provides a theory to explain the way individuals make choices. For example, in designing organizations, it is important to keep in mind that individuals respond to incentives. Managers and employees can be incredibly resourceful in devising methods to exploit the opportunities they face. This also means, however, that when their incentives are structured inappropriately, they can act in ways that reduce the firm's value. In choosing corporate policies, it is critical that managers anticipate potential responses by customers, suppliers, or employees that might produce undesirable outcomes. Neglecting to do so invites individuals to “game” the system and can result in utter failure of well-intentioned policies.

We use economics to examine how managers can design organizations that motivate individuals to make choices that will increase a firm's value. For example, the evidence suggests that the problem highlighted in the accompanying box on chief executive officers (CEOs) slashing research and development (R&D) budgets prior to their retirement is not widespread.³ The research suggests that these perverse incentives can be controlled by basing the CEO's incentive compensation on stock prices and by managing CEO succession so that decision rights are gradually transferred to the successor over the years prior to the final departure. Moreover, CEOs' post-retirement opportunities for election to board seats appear linked to performance over the final years of their tenure.⁴

Standard economic analysis generally characterizes the firm simply as a “black box” that transforms inputs (labor, capital, and raw materials) into outputs. Little consideration traditionally has been given to the internal architecture of the firm.⁵

³K. Murphy and J. Zimmerman (1993), “Financial Performance Surrounding CEO Turnover,” *Journal of Accounting and Economics* 16, 273-315.

⁴J. Brickley, J. Linck, and J. Coles (1999), “What Happens to CEOs after They Retire? New Evidence on Career Concerns, Horizon Problems, and CEO Incentives,” *Journal of Financial Economics* 52, 341-378.

⁵Of course, there are several notable exceptions: F. Knight (1921), *Risk, Uncertainty, and Profit* (London School of Economics: London); R. Coase (1937), “The Nature of the Firm,” *Economica* 4, 386-405; and F. Hayek (1945), “The Use of Knowledge in Society,” *American Economic Review* 35, 519-530.

MANAGERIAL APPLICATIONS

Creative Responses to a Poorly Designed Incentive System

A manager at a software company wanted to find and fix software bugs more quickly. He devised an incentive plan that paid \$20 for each bug the Quality Assurance people found and \$20 for each bug the programmers fixed. Because the programmers who created the bugs were also in charge of fixing them, they responded to the plan by creating bugs in software programs. This action increased their payoffs under the plan—there were more bugs to detect and fix. The plan was canceled within a single week after one employee netted \$1,700 under the new program.

Source: S. Adams (1995), “Manager’s Journal: The Dilbert Principle,” *The Wall Street Journal* (May 22), A12.

In recent years, economists have focused more on questions of organizational architecture.⁶ But little effort has been devoted to synthesizing the material in an accessible form that emphasizes the managerial implications of the analysis. We apply the basic tools of economics to examine the likely effect on a firm’s value of decisions such as centralization versus decentralization, the bundling of tasks into specific jobs and jobs into business units within the firm, the use of objective versus subjective performance measures, compensating employees through fixed versus variable (or “incentive”) compensation, and retaining activities within the firm versus outsourcing. In sum, we examine how managers can structure organizational architecture to motivate individuals to make choices that increase the firm’s value.

In this analysis, ideas of equilibrium—the interplay of supply and demand in product, labor, and capital markets—represent important constraints on managerial decisions. Understanding how prices and quantities change in response to changes in costs, product characteristics, or the terms of sale is a critical managerial skill. For example, the more than five-fold increase in crude oil prices from below \$12 per barrel in 1999 to over \$135 in 2008 prompted oil companies to increase production, encouraged petrochemical companies to alter their input mix to economize on a now-more-expensive input, made salespeople reevaluate their decisions about contacting potential customers by phone rather than in person, and encouraged auto producers to focus more on gas economy in the design of new models. Yet these incentives to change depend on the structure of the organization. For instance, a salesperson is less likely to switch to greater reliance on telephone and mail when the firm reimburses all selling expenses than when salespeople are responsible for the costs of contacting potential customers.

⁶For example, R. Coase (1960), “The Problem of Social Cost,” *Journal of Law and Economics* 3, 1-44; S. Cheung (1969), “Transaction Costs, Risk Aversion, and the Choice of Contractual Arrangements,” *Journal of Law and Economics* 12, 23-42; A. Alchian and H. Demsetz (1972), “Production, Information Costs, and Economic Organization,” *American Economic Review* 62, 777-795; K. Arrow (1974), *The Limits of Organization* (W. W. Norton: New York); R. Gibbons and J. Roberts (Eds.; 2013), *The Handbook of Organizational Economics* (Princeton University Press); M. Jensen and W. Meckling (1976), “Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure,” *Journal of Financial Economics* 3, 305-360; Y. Barzel (1982), “Measurement Costs and the Organization of Markets,” *Journal of Law and Economics* 25, 27-48; O. Williamson (1985), *The Economic Institutions of Capitalism: Firms, Markets, Rational Contracting* (Free Press: New York); and B. Holmstrom and J. Tirole (1989), “The Theory of the Firm,” in R. Schmalensee and R. Willig (Eds.), *Handbook of Industrial Organization* (North-Holland: New York).

Economic Darwinism

Survival of the Fittest⁷

The collapse of Enron, Charles Darwin might have noted, is an example of how competition tends to weed out the less fit. As described in *The Origin of Species*, natural history illustrates the principle of “survival of the fittest.” In industry, we see **economic Darwinism** in operation as competition weeds out ill-designed organizations that fail to adapt. Competition in the marketplace provides strong pressures for efficient decisions—including organizational decisions. Competition among firms dictates that those firms with low costs are more likely to survive. If firms adopt inefficient, high-cost policies—including their organizational architecture—competition will place strong pressures on these firms to either adapt or close.

Fama and Jensen suggest that “the form of organization that survives in an activity is the one that delivers the product demanded by customers at the lowest price while covering costs.” This survival criterion helps highlight that while a well-crafted organizational architecture can contribute to a firm’s success, it is not sufficient for success. The firm must have a business strategy that includes products for which the prices customers are willing to pay exceed costs. The potential for value creation by a company that manufactures only buggy whips is quite limited no matter how well structured the firm’s organizational architecture.

Nonetheless, given a firm’s business strategy (including its product mix), its choice of organizational architecture can have an important impact on profitability and value. An appropriate architecture can lower costs by promoting efficient production; it also can boost the prices customers are willing to pay by helping to ensure high-quality production, reliable delivery, and responsive service.

Economic Darwinism and Benchmarking

In the biological systems that Darwin analyzed, the major forces at work were random mutations in organisms and shocks from the external environment (for instance, from changes in weather). But in the economic systems on which we focus, purposeful voluntary changes occur. For instance, in order to compete more effectively with Coke, Pepsi copied many of Coke’s practices. Pepsi spun off its fast-food chains (Taco Bell, KFC, and Pizza Hut) to focus on its core business—just as Coca Cola had done. Also, Pepsi changed its network of bottlers. One analyst remarked, “Pepsi is starting to look a lot more like Coke.”⁸ In fact, this practice has been formalized in the process of **benchmarking**.

Benchmarking generally means looking at those companies that are doing something best and learning how they do it in order to emulate them. But this process also occurs in less formal ways. As Armen Alchian argued, “Whenever successful

⁷This section draws on A. Alchian (1950), “Uncertainty, Evolution, and Economic Theory,” *Journal of Political Economy* 58, 211–221; G. Stigler (1951), “The Economics of Scale,” *Journal of Law and Economics* 1, 54–71; and E. Fama and M. Jensen (1983), “Separation of Ownership and Control,” *Journal of Law and Economics* 26, 301–325.

⁸N. Harris (1997), “If You Can’t Beat ‘Em, Copy ‘Em,” *BusinessWeek* (November), 50. Coke and Pepsi, however, also have employed somewhat different marketing strategies over time. See L. Gevorgyan (2018), “Marketing Strategies of Coca Cola and Pepsi: Which One Is Better,” <https://medium.com/@lucygevorgyan12/marketing-strategies-of-coca-cola-and-pepsi-which-one-is-better-34ab13f60e9b>.

MANAGERIAL APPLICATIONS

Economic Darwinism: Growth in Independent Board Leadership

The collapse of Enron in December 2001 and subsequent scandals at Adelphia, Tyco, WorldCom, and other companies in 2002 shook public confidence in corporate governance. In July 2002, the United States enacted the Sarbanes–Oxley Act, which mandated substantial changes in corporate accounting and governance practices. Additional scandals and failures during the 2007–2008 financial crisis raised additional concerns about corporate governance and motivated additional legislation and regulation.

These events altered the basic business environment for publicly traded corporations. Investors, regulators, stock exchanges, the media, and the general public have placed increased pressure on corporate boards of directors to become more independent and diligent in their monitoring of CEOs. In 2003, most Standard & Poor's (S&P) 500 boards were chaired by the company's CEO. Those that were not were usually chaired by the former CEO. Only 36 percent of S&P 500 boards had a lead/presiding director to chair executive sessions of the outside directors (lead directors are more powerful than presiding directors and have additional responsibilities). In dramatic contrast, in 2019 only six S&P 500 firms had no form of independent board leadership. Around one-third had independent board chairs, who met the applicable NYSE or NASDAQ standards for independence. Nearly all of the firms that combined the roles of board chair and CEO or had a separate, but non-independent chair, had a lead/presiding outside director.

If you were to benchmark the current governance practices of large publicly traded corporations, you would find the appointment of either a lead director or an independent chair is a dominant surviving practice in the current business environment. “One size,” however, is unlikely to fit all firms. Managers should not simply adopt the prevailing organizational practices of other firms. More careful analysis is required.

Source: Spencer Stuart (2019), “Spencer Stuart Board Index 2019,” www.spencerstuart.com.

enterprises are observed, the elements common to those observed successes will be associated with success and copied by others in their pursuit of profits or success.”⁹ For example, if the cover article in the next *Fortune* reports an innovative inventory control system at Toyota, managers across the country—indeed, around the globe—will read it and ask, *Would that work in my company, too?* Undoubtedly, the managers with the strongest interest in trying it will be those within firms currently suffering inventory problems.¹⁰ Some will achieve success, but others may experience disastrous results caused by unintended though largely predictable organizational “side effects” (such as VW's destruction of value resulting from a faulty organizational architecture).

Although competition tends to produce efficiently organized firms over the longer run, uncritical experimentation with the organizational innovation *du jour* can expose the firm to an uncomfortably high risk of failure. Organizational change is expensive. Moreover, successful organizations are not just a collection of “good ideas.” The elements of a successful organization must be carefully coordinated: The different elements of the firm's architecture must be structured to work together to achieve the firm's goals. For this reason, it is important to be able to analyze the likely consequences of a contemplated organizational change and forecast its impact on the entire firm.

This concept of economic Darwinism thus has important managerial implications. First, existing architectures are not random; there are sound economic explanations for

⁹A. Alchian (1950), “Uncertainty, Evolution, and Economic Theory,” *Journal of Political Economy* 58(3), 218.

¹⁰This raises the question of why any firm with an innovative idea would voluntarily disclose it. Perhaps the free publicity outweighs the lost competitive advantage.

the dominant organization of firms in most industries. Second, surviving architectures at any point in time are optimal in a *relative* rather than an *absolute* sense; that is, they are the best among the competition—not necessarily the best possible. Third, if the environment in which the firm operates changes—if technology, competition, or regulation change—then the appropriate organizational architecture normally changes as well. These three observations together suggest that although improvements in architecture are certainly always possible, a manager should resist condemning prevailing structures without careful analysis. Before undertaking major changes, executives should have a good understanding of how the firm arrived at its existing architecture and, more generally, develop a broader perspective of why specific types of organizations work well in particular settings. Finally, an executive should be particularly skeptical of claimed benefits of proposed organizational changes if the environment has been relatively stable.

Purpose of the Book

The book provides basic material on managerial economics and discusses how it can be used for making operational decisions—for example, input, output, and pricing decisions. This material additionally supplies a set of economic tools, as well as an understanding of markets, that are important in making good organizational decisions. A second primary thrust of this book is to provide a solid conceptual framework for analyzing organizational problems and structuring an effective organizational architecture.

Our Approach to Organizations

We begin with two basic notions: People act in their own self-interest, and individuals do not all share the same information. As we already have suggested, this framework implies three critical elements of organizational architecture are the assignment of decision rights, the reward system, and the performance-evaluation system. Successful organizations assign decision rights in a manner that effectively links decision-making authority with the relevant information to make good decisions. Correspondingly, successful organizations develop reward and performance-evaluation systems that provide self-interested decision makers with appropriate incentives to make decisions that increase the values of their organizations.

It is also important to note that modern organizations are extremely complex and that developing an understanding of how people within them behave can be challenging. As in any book that addresses this set of topics, we face difficult trade-offs between adding more institutional richness to infuse more texture of the actual environment versus omitting details to keep the analysis more focused and manageable. At certain points (especially where little prior formal analysis of the problem exists), we take quite complex problems and discuss them in terms of simplified examples. Nonetheless, our experience suggests that in these cases, we derive important managerial insights to these topics through our admittedly simple examples.

Finally, we believe that a powerful feature of this economic framework is that it can be extended readily to incorporate a broad array of other managerial policies such as finance, accounting, information systems, human relations, operations, and marketing. In this sense, this book can play an important integrating role across the entire business curriculum. Such integration is becoming increasingly important with the expanded use of cross-functional teams within the business community.

ANALYZING MANAGERIAL DECISIONS: Société Générale

Société Générale was founded in the 1860s and, in 2013, was France's third largest bank. Beginning in the mid-1980s, it pioneered some of the most complex instruments in international finance and became a global powerhouse in trading derivatives like futures and options. Through its trading activities, the bank earned billions of dollars and gained the respect of bankers throughout the world. In January 2008, *Risk*, a monthly magazine about risk management, named Société Générale its "Equity Derivatives House of the Year."

In late January 2008, Société Générale announced that it had discovered fraudulent securities trading by one of its low-level traders, Jérôme Kerviel. The bank reported that it expected the fraud to cost it a staggering \$7.14 billion, making it one of the largest financial frauds in history. The announcement shocked the financial markets and made front-page headlines around the world. Observers questioned whether the bank could ever regain its former reputation and whether it could continue to exist without merging with another bank.

Société's CEO Daniel Bouton asserted that the fraud was the result of one employee's illegal activities, did not involve other employees at the bank, and represented the aberrant and unexplainable actions of one "rogue trader." He characterized Kerviel's actions as "irrational" since the trades were made on behalf of the bank "netting the trader no personal gains." Bouton emphasized that Kerviel was a low-level employee who had an annual salary and bonus for 2007 of less than \$145,700.

In principle, Kerviel engaged in a quite simple operation: arbitrage-trading, exploiting small differences between various stock market indexes such as the CAC in France and the DAX in Germany. Kerviel should have been able to lock in a virtually riskless profit by selling a security on the exchange with the higher price, while simultaneously buying an equivalent instrument on the exchange with the lower price. And although price differences are typically small, such arbitrage can produce a substantial profit if done in sufficient volume. In this arbitrage business, although Société Générale might accumulate large positions on both exchanges: those securities that it bought and those it sold should balance.

The bank was supposed to face little net exposure to price changes.

What the bank discovered was that Kerviel had bought securities on both markets. In effect, he had made enormous bets that European stock prices would increase. But they had fallen, and as a result the bank incurred a substantial loss.

The subsequent investigation revealed that Kerviel had been placing huge unhedged bets on European stocks for over a year. Prior to becoming a trader he had worked in the bank's trading accounting office. His knowledge of the bank's risk-management system allowed him to conceal the trades and bypass the firm's control system. He knew the timing of the nightly reconciliation of the day's trades and would delete and then reenter his unauthorized transactions without being caught. Bank managers, however, had apparently dismissed several warning signs about Kerviel's transactions. For example, the surveillance office at Eurex, one of Europe's biggest exchanges, alerted a compliance officer at the bank that for seven months a trader named Kerviel had engaged in "several transactions" that raised red flags. Kerviel's supervisors accepted his explanations for these trades apparently without much investigation.

Various bank officials, investigators, and traders who worked with Kerviel have concluded that Société Générale "allowed a culture of risk to flourish, creating major flaws in its operations" that enabled Kerviel's actions to proceed. Several current and former employees interviewed by *The New York Times*, indicated that Société Générale traders were rewarded for making risky investments with the bank's money and that it was not uncommon for traders briefly to exceed position limits imposed on their trading, despite the controls meant to prohibit this activity. Risk taking apparently was "embraced, as long as it made money for the bank." Top executives and other managers at the bank had received large bonuses because of the bank's successful trading operations.

Kerviel told investigators that all he wanted was to be respected and to earn a large bonus. He had come from a modest background and did not have the educational pedigree of many of his coworkers