Managerial Economics

SECOND EDITION

Managerial economics, meaning the application of economic methods in the managerial decision-making process, is a fundamental part of any business or management course. The current business environment presents managers with increasingly difficult decisions, amidst the covid-19 pandemic and associated lockdowns, as well as the digital revolution and improved technology. Now in its second edition, this textbook features a new focus on how managerial economics has been transformed by the increasing importance of digitization within both the workplace and wider economy. It also features a new chapter on consumer theory, which emphasizes psychological factors and behavioural economics. Wilkinson adopts a user-friendly problem-solving approach to take the reader in gradual steps from simple problems through increasingly difficult material to complex case studies, demonstrating how to apply the principles of managerial economics to real-life situations. This book will be invaluable to business and economics students at both undergraduate and graduate levels.

Nick Wilkinson is Professor of Economics at Richmond International University. He has authored two books, *Managerial Economics: A Problem-Solving Approach* (Cambridge University Press), and *An Introduction to Behavioral Economics* (Palgrave Macmillan), now in its third edition.

Managerial Economics
Problem-Solving in a Digital World

SECOND EDITION

Nick Wilkinson

Richmond, the American International University in London

CAMBRIDGE
UNIVERSITY PRESS

CAMBRIDGE
UNIVERSITY PRESS

Contents

vi   **Contents**

PART V   Government Policy

Detailed Contents

xviii   **Detailed Contents**

Figures

Tables

Preface

Managerial economics, meaning the application of economic methods to the managerial decision-making process, is a fundamental part of any business or management course. It has been receiving more attention in business as managers become more aware of its potential as an aid to decision-making, and this potential is increasing all the time. This is happening for several reasons.

- It is becoming more important for managers to make good decisions and to justify them, as their accountability either to senior management or to shareholders increases. For government decisions, accountability to voters is also important.
- As the number and size of multinationals increases, the costs and benefits at stake in the decision-making process are also increasing.
- In the age of 'big data' it is more imperative to use quantitative and rationally based methods, rather than 'intuition'.
- The pace of technological development is increasing with the impact of the digital economy; there is an increased need for economic analysis because of the greater uncertainty and the need to evaluate it.
- Improved technology has also made it possible to develop more sophisticated methods of data analysis, involving not just traditional statistical methods but also artificial intelligence with machine learning and related techniques.

The impact of all the above factors has been very evident with the covid pandemic, which has battered the global economy since the start of 2020. There has been huge uncertainty relating to the nature, transmission and effects of the virus, and its lightning spread from country to country has made quick decision-making in the light of imperfect information vital, both for firms and, even more so, for governments.

As the discipline of managerial economics has increased in importance, so the number of books on the subject has proliferated. Many of the more recent ones claim – like this one – to take a problem-solving approach. I have found from my own teaching experience that, in spite of this, students of the subject tend to have two main problems.

- They claim to understand the theory but fail to see how to put principles into practice when faced with the kind of problems they find in the textbooks, even though these are considerably simplified compared with real-life situations.
- They fail to see the relevance of the techniques presented in the books in terms of application to real-life situations.

xxvii

The two problems are, of course, related. Textbook problems are obviously simplified, in terms of the amount of data and decision variables, to make them easier for students to analyse. However, the result of this is that the textbook problems tend to fall between two stools: they are still too difficult in some cases for students to tackle without considerable help (the first problem), yet they are too simplified and abstract for students to see how textbook methods can be applied to real-life situations (the second problem).

This book attempts to overcome the considerable obstacles above. It adopts a user-friendly problem-solving approach, which takes the reader in gradual steps from easy, very simplified problems through increasingly difficult material to complex case studies.

Central Theme

The central theme of this edition is the increasing importance of the digital economy, and the implications of this for managerial decision-making. The last decade has seen a revolution, sometimes called the 'Fourth Industrial Revolution' or 'Industry 4.0'. This revolution is based on the concept of digitization. Although this term can be defined in many ways, and some writers have drawn a distinction between digitization and digitalization, McKinsey's definition (2018)[1] is clear and concise: **the nearly instant, free, and flawless ability to connect people, devices, and objects anywhere**.

There are four main aspects to this revolution.

- **Big data**: there has been a huge increase in the amount of data available, combined with greater connectivity and networks.
- **Advanced data analytics**: the enormous amounts of available data can now be processed in various ways by artificial intelligence (AI) applications that involve machine and deep learning – that is, the use of self-learning algorithms and neural networks for diagnostic, predictive and prescriptive purposes.
- **A pervasive human–machine interface**: the combination of human and machine skills and abilities, such as touch interfaces and augmented-reality systems, can achieve optimal results.
- **Advances in the translation of ideas into reality**: the ability to transfer digital instructions to the physical world, using devices such as advanced robotics, the 'product cloud' and 3D printers.

Examples of this revolution are as follows.

- People with medical conditions can now wear sensors that can detect abnormal heart rhythms and changes in blood chemistry, hormone levels or brain activity that can alert patients and their doctors to an impending cardiac arrest or epileptic fit, and provide a remedy or preventive strategy.

- Cars can be connected to the product cloud, so that the car's software can be modified to improve performance without the driver having to take the car to a dealer.
- Sensors that can monitor driving performance can be attached to a car and can provide feedback to an insurer, which can use relevant data analytics to determine the appropriate premium to charge a driver.
- Retailers can use data analytics to examine the buying habits of their customers and make online recommendations to them about other products they may wish to buy based on their past purchases.
- Surgeons can diagnose a patient's condition and perform operations using remote robotics from thousands of miles away.

Although the basic concepts and tools of managerial economics remain the same as ever, there have been some fundamental shifts in the interpretation and application of these traditional economic concepts. These shifts include the following.

- The definition of 'product' is changing. For example, what is Facebook's product?
- The definition of 'industry' is changing. Boundaries between industries are becoming increasingly blurred, so that industries are now seen as operating within an ecosystem, determined more by technology than by the nature of the products they produce. Uber is an example, whereby a new industry will soon emerge combining three existing industries: hired car transportation; driverless or autonomous vehicles; and electrically powered vehicles.
- The traditional trade-off between price and quality is disappearing. Firms no longer have to choose between achieving a cost advantage or a benefit advantage. For example, Norwegian Airlines has offered transatlantic fares as low as £69 by achieving low costs, but at the same time it provides improved customer service by using modern Boeing 787 aircraft with free Wi-Fi.
- Asking the right question is becoming more important than getting the right answer. Getting the right answer to the wrong question may be a path to bankruptcy. For example, an airline may decide to add 50 more seats to a Boeing 777, to improve profit by reducing costs per passenger mile; this increase in margin may more than offset any loss of passenger volume arising from reduced passenger comfort. However, maybe the airline should be asking instead whether it would be better to operate 787 aircraft, which are far more fuel-efficient, rather than continuing to operate 777s.
- Pricing is becoming a less important component of the marketing mix. The various dimensions of product quality and customer service, such as convenience, are often more important and the pricing decision is becoming more dependent on other strategy elements.
- Problems must often be solved quickly with limited information, rather than with perfect rationality. Jeff Bezos, founder and CEO of Amazon, has claimed that it may often be optimal to make decisions with only 70 per cent of the information one would like, because

if one waited until 90 per cent of the information is available it may be too late, and one's position relative to competitors may suffer irretrievably.
- Firms are going out of business at a very fast rate, not just because of covid. Back in 2015 John Chambers, ex-CEO of Cisco Systems, estimated that 40 per cent of existing firms would fail in the next ten years; 70 per cent of firms would attempt to transform to adapt to digitization, but only 30 per cent would succeed. Many of these failures are predicted to occur because of a failure to appreciate that digitization causes massive disruption to the whole value chain process. The change occurring in today's business environment has been likened to evolutionary biology, with equilibria punctuated by phases of mass extinctions caused by the failure to adapt to rapidly changing environments. Particularly with the impact of covid, also an evolved biological phenomenon, we may be entering a phase of mass extinctions in business.

As a result of these shifts in economic and technical processes, business models are becoming radically different from those that were standard even ten years ago. Who would have guessed at the turn of the millennium that Facebook's business model would ever be successful?

Just as many businesses are struggling to keep up with change, let alone trying to be at the leading edge of it, so have many managerial economics texts failed to keep up adequately with the changing environment. This new edition aims to address this issue in the post-covid global economy.

Pedagogical Features

These remain largely unchanged from the first edition, but there are some additions to be noted.

- Objectives of each chapter are clearly stated at the start of the chapter.
- Case studies are plentiful and have been carefully selected. These are designed to be global in their application and relevance, and of recent origin. Thus, they include most of the main tech firms: Facebook, Amazon, Apple, Netflix and Tesla. They are sometimes longer than the typical case study in textbooks, in order to achieve a fuller flavour of real life, and they concentrate on the managerial decision-making aspect. The cases are also integrated with the material in the text, not just in terms of relevance but also in terms of asking specific questions, often of a quantitative nature.
- Examples are given throughout the text of firms or situations, to illustrate principles and their real-life application; an effort is made to use examples to which students can easily relate from their own experience.
- There is an emphasis on the interdisciplinary aspects of managerial economics; problems are addressed in all the main functional areas of marketing, finance, production and human resources.

- Quantitative techniques are introduced only when they are relevant to the material discussed, and they are then applied in that context. This is contrary to the common treatment, whereby many techniques are explained in the early part of textbooks, before the relevant economic theory. Teaching experience suggests that students comprehend the techniques more easily if they can immediately see their application. It is assumed in the text that students already have a basic knowledge of calculus and statistics.
- Many chapters include a section called *a problem-solving approach*, at the end of the chapter, in order to bridge the gap described above as the first student problem. These sections include several solved problems, with the rationale for the methodology explained as well as the calculations.
- Summaries are provided at the end of each chapter of the key points.
- Review questions are included at the end of each chapter for students to test their understanding of the material.
- Problems of a quantitative nature are also included at the end of chapters. These can be used by both students and instructors, as test questions or assignments.
- Starred material is included, which indicates a greater degree of difficulty; this is more suitable for MBA students, and can be omitted without causing problems with understanding the remaining material. Sometimes the starred material relates to whole sections, sometimes to subsections, sometimes just to particular headings.
- Key terms and concepts are written in bold, with definitions and interpretations given alongside.
- Throughout the book there is an effort to tie economic theory and practice together.

Students should be able to see how empirical studies are conducted and the role of these in testing theories; the relevance of this process to managerial decision-making is emphasized.

New features include the following.

- There is a focus on digitization and its effects, as already discussed, throughout the text, particularly in the case studies.
- There is a new chapter on consumer theory, which has an emphasis on psychological factors and behavioural economics.
- There is a greater emphasis on the interdisciplinary aspects of managerial economics, making more explicit the references to marketing and finance applications, as well as behavioural aspects mentioned above.
- There is a more explicit application of the problem-solving approach at the end of each chapter, so that the solved problems in the chapters clearly demonstrate the principles and steps involved in the approach.
- A headline case is presented at the start of each chapter, to give a flavour of the chapter material, which is then discussed at the end of the chapter.
- The topic of business strategy is divided into two chapters: one covers positioning and growth strategy and the other covers marketing mix strategy; this allows a more detailed discussion of this broad topic.

- A final capstone chapter has been added, consisting entirely of fairly lengthy case studies relating to decision-making in the face of certain current global issues of great importance.
- PowerPoint slides are provided for each chapter, which summarize the relevant material.

Structure and Content

The text is structured into parts, chapters, sections, subsections, headings and subheadings. The first four are self-explanatory; headings are titled alphabetically, while subheadings are titled numerically. An attempt is made to ensure both consistency of treatment and clarity of exposition, so that students can easily see how the various materials are related.

Part I of the text is an overview of the subject matter and is particularly concerned with the methodology employed and the objectives of firms and managers. Part II is concerned with examining demand analysis. This involves a discussion of consumer theory, the theoretical principles of demand and the empirical aspects of demand estimation. Considerable attention is given to examining statistical techniques of estimation, much more than the typical text. This is because of the increasing importance of the use of these techniques and the ubiquity of software packages for data analysis. Part III examines production theory and costs; the treatment is similar to the previous part, in that the principles of production and costs are discussed, and then the empirical and statistical aspects of estimation are explained. Part IV examines strategy analysis; this covers market structure and pricing, game theory, positioning and growth strategy, marketing mix strategy and investment analysis. Part V examines the impact of government policy on managerial decision-making and discusses prominent global issues. The coverage here is broader than a typical text, and there is particular emphasis on the consideration of non-price decisions, interdependent decision-making and government decision-making.

In each chapter there are three or four case studies, with questions attached. These are inserted into the text as close as possible to their points of relevance. Many chapters also include solved problems; sometimes these are embodied in the text as examples to illustrate the concepts involved, and in other cases they are included at the end of the chapter, according to whatever seems more appropriate. There are also review questions and, in many cases, additional problems at the end of the chapters, following the chapter summaries. The units involved in these problems vary in terms of the currency involved, being mainly in pounds sterling and US dollars; this is in keeping with the international nature of the material in both the text and the case studies.

As seen in the list of new features above, there are three main additions to the content in the first edition of the text in terms of chapters.

- A new chapter on consumer theory, Chapter 3; this was originally included in the chapter on demand theory, but extensive material has been added relating to consumer psychology, meriting an additional chapter.

- There are now two chapters relating to business strategy instead of just one; thus, one chapter focuses on positioning and growth strategy while the other focuses on the marketing mix.
- There is an additional chapter at the end of the book presenting three global issues of great current importance: challenges of digitization for government policy; government policy over covid; and climate change.

Acknowledgements

The original version of this text grew out of lecture material that I have developed while teaching courses at both undergraduate and graduate level, mainly but not entirely in managerial economics, over more than 20 years. During that time I have had many excellent students in my classes, who have enabled me to understand more clearly the requirements for a text of this type. Their comments and questions have contributed significantly to the style and form of the book. Other students have also contributed, in that their questions and problems have over the years led to certain methods of presentation and exposition that have, I hope, improved both the clarity and relevance of the material. This second edition has been prompted by the changing nature of the global economy in recent years as a result of digitization and, more recently, the covid pandemic. These events have profoundly changed the nature of all our everyday lives and the needs of students in particular. Again, I am grateful for the many comments and questions that students have expressed regarding these issues.

I am also grateful to the anonymous referees for various pieces of constructive advice regarding structure and content. In particular, I would like to thank John Mark from King's College London for his advice and encouragement. Finally, I would like to thank Yasmin, my wife, for her unending patience and support.

The majority of the material in the text has been class-tested, but I am sure that there is still scope for improvement in terms of both content and clarity of exposition. Constructive suggestions in these areas are certainly welcome.

REFERENCE

McKinsey (2018), 'The keys to a successful digital transformation', 29 October.