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CFA INSTITUTE INVESTMENT SERIES

ECONOMICS FOR INVESTMENT DECISION MAKERS

Micro, Macro, and International Economics

Christopher D. Piros, CFA • Jerald E. Pinto, CFA

Foreword by Larry Harris, PhD, CFA, USC Marshall School of Business

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Each book in the CFA Institute Investment Series is geared toward industry practitioners along with graduate-level finance students and covers the most important topics in the industry. The authors of these cutting-edge books are themselves industry professionals and academics and bring their wealth of knowledge and expertise to this series.

ECONOMICS FOR INVESTMENT DECISION MAKERS

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WILEY

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FOREWORD

The opportunity to learn economics from a book sponsored by CFA Institute is a special privilege.

Most economics textbooks are written by one or two authors who decide what subjects should appear in them. The results invariably reflect the values and life experiences of the authors, who usually are academics. Academic authors have written many truly excellent economics textbooks on their own, but these sometimes do not speak to the needs of learners whose interest in economics stems from a desire to understand and solve practical economic problems that they regularly encounter, or expect to encounter, in their working lives.

In contrast, highly respected practicing financial analysts and senior academic economists worked together to select the topics that appear in this book. The topics were chosen from the body of knowledge that the CFA Institute Education Advisory Committee identified as topics that CFA Program candidates need to learn for earning the well-regarded Chartered Financial Analyst (CFA) designation. The Candidate Body of Knowledge™ consists of the knowledge, skills, and abilities that are necessary to analyze and solve common practical problems that arise in investing, valuing investments or companies, and managing portfolios.

This volume is an edited compilation of readings on economics from the CFA Program curriculum. The chapters are written by highly regarded economists and practitioners who were asked to present the topics in a way that is readily accessible to everyone. The authors were chosen by CFA Institute for the depth of their understanding of the topics assigned to them and also for their proven ability to effectively teach the topics.

The readings in the CFA Program curriculum always start with a set of learning outcome statements (LOS) that briefly and clearly state what candidates should know after completing the reading. The editors have included the LOS associated with each topic covered in this text to assist you with your learning. If you can confidently and honestly say that you understand the knowledge described in the various learning outcome statements, you will have mastered the knowledge presented in this book.

The CFA Program curriculum also includes practice problems at the end of every reading. These problems allow CFA Program candidates to practice solving practical problems and to measure their learning progress. The editors have included many of these problems (and some others as well) in a workbook to help you learn the material.

For students interested in possibly earning the CFA charter, this book is an excellent introduction to what would be in the CFA Program curriculum. If that is not your objective, don't fret. The topics presented in this volume are of universal interest, and it provides an excellent introduction to economics for all readers.

WHY ECONOMICS?

Economics is the study of how people make decisions when faced with scarce resources. Decisions amenable to economic analysis include business decisions as well as personal decisions. Scarce resources may be tangible things, such as iron or wool; financial assets, such as money or bonds; or intangibles, such as personal time or emotional energy. The decisions that people make influence the actions that they take. Accordingly, understanding economics will help you understand human behavior.

Examples of human behaviors that economics can help you understand include how much companies produce (theory of the firm), why people buy certain products (consumer choice theory), and even how many children families choose to have (demand theory).

THEORY VERSUS PRACTICE

Although the economic topics have been selected for their relevance to practitioners, plenty of economic theory appears in this book. The economic theory is included because it will help you understand economic problems.

This book is full of the application of economics to problems, but you cannot understand the application without understanding the economic theory behind the application. Theory and practice are not antithetical to each other in economics. A thorough understanding of practical problems requires an in-depth understanding of the underlying theory. Accordingly, you must learn economic theory to acquire the skills to understand, analyze, and solve practical problems that interest you.

Some economists have developed theories that do not (yet) have obvious practical applications. Be assured that this book does not present such theories. All theory presented in this book is either necessary to understand practical problems or necessary to understand other theories needed to understand practical problems.

A PRACTICAL EXAMPLE

First, consider some information that you may already know about the oil refining business. The profits that refiners make depend critically on the difference between the price of the crude oil that they buy and the summed prices of the refined products they produce from the oil and then sell. As an aside, this difference is called the "crack spread" because refiners often use a process called "cracking" to split such long-chain hydrocarbons as heavy oil to produce such lighter short-chain products as gasoline.

Now, consider some economic history. Several years ago, before the recent financial crisis occurred, the world economy was growing quickly and the demand for petroleum products, such as gasoline, diesel fuel, and jet fuel, exceeded the capacity of refiners to produce them. As a result, the prices of these fuels rose substantially. The higher product prices discouraged some users from consuming them, so aggregate demand declined and became equal to the capacity of the refiners.

For several years, the high product prices substantially increased the crack spreads and thus refiner profits. Some investors saw these high profits and assumed that they would continue. So, they bid up the stock prices of the refiners. For various reasons not important to this discussion, the price of crude oil later rose.

Here is the practical question: What effect do you expect the higher price of crude oil had on the value of the common stocks of the refiners? Would you have bought or sold the refiners' common stocks?

When learning economics, putting yourself into the problem is always helpful. When you read this book and see an example, always ask yourself, "What would I do? How would I solve this problem?"

Many investors apparently thought that the higher crude oil prices would further increase the refiners' profits because the refiners sold oil products. Thus, they further bid up the stock prices of oil refiners. Those investors did not understand the economic topics presented in this book.

In fact, the refiners passed on the higher crude oil prices by raising prices for their refined products. Those that did not raise prices would have gone out of business. These higher end-user product prices decreased product demand to the point that the refiners were no longer operating at capacity. The crack spread then fell substantially because the refiners had excess capacity. The common stock of the refiners dropped when investors finally understood the true implications of the higher crude oil prices for the refiners.

If you bought the refiners' common stocks without understanding the underlying economics, you would have lost money, and perhaps also the ability to retire in greater comfort and with greater security. If you sold them short, which means borrowing and selling a security you do not own with the expectation that you will be able to buy it later at a lower price, you would have made money and, with it, the power to command more resources in the economy.

The difference between winners and the losers in the stock market is an in-depth understanding of the underlying economics informed by a trivial understanding of what refiners do. When the refiners were operating at capacity, the refiner's total capacity was a choke point in the supply chain between the wellhead and the consumer—refining capacity then was the most important scarce resource. You will learn in this book that scarce resources earn exceptional profits when they are in high demand. After the price of crude oil rose, the choke point in the supply chain moved from the refiners to the wellhead. Oil producers profited but not the oil refiners.

Studying this book carefully will help you think through problems such as these. This refinery problem touched on several economic topics that appear in this book: supply and demand, derived factor demands, competitive market equilibrium, supply chain dynamics, and the origins of economic rents.

THE ROLE OF THE ABSTRACT

Many people criticize economics for being too theoretical or for drawing conclusions from simplistic assumptions that do not reflect real-world realities. In short, they see economics as being too abstract.

Don't be put off by the use of the abstract in economics. The abstract is a natural result of the desire to identify the most important characteristics of a problem. Understanding problems is much easier when the problem has been reduced to its essentials. With that basis of understanding, you then can add back characteristics of the problem that you initially assumed away and ask whether or how the result changes. Your job as a student is to continually consider whether essential characteristics of a problem have been assumed away.

Your studies will be most productive when you take a critical view of your lessons. The more you challenge this text and the instructors who assigned it to you, the more you will come to appreciate the value of economic thought.

You may have heard that economists often disagree with each other. That is far less true than it seems. Disagreements make news whereas agreements are not as interesting. Essentially, all reputable economists agree with the ideas presented in this book. But as I noted in the previous paragraph, you should challenge everything you learn.

The disagreements among economists generally are not about their theories but about their personal values. Everyone is entitled to their opinions about what should be. For example, should the U.S. government impose quotas that limit the importing of sugar to protect U.S. farmers who grow corn to process into corn sweetener? Economics cannot answer this question, but it can tell you what the implications are of various policies. For example, imported sugar quotas are the reason why U.S. consumers drink Coca-Cola sweetened with corn sweetener, whereas everyone in the rest of the world drinks Coca-Cola sweetened with sugar. Economists may disagree about whether the government should limit the importation of sugar into the United States, but they all agree on the effects of the policy.

The ideas in this book are very powerful. When you understand them well, you will have the power to apply them throughout your life.

Good luck with your studies!

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ABOUT THE CFA INSTITUTE INVESTMENT SERIES

CFA Institute is pleased to provide you with the CFA Institute Investment Series, which covers major areas in the field of investments. We provide this best-in-class series for the same reason we have been chartering investment professionals for more than 45 years: to lead the investment profession globally by setting the highest standards of ethics, education, and professional excellence.

The books in the CFA Institute Investment Series contain practical, globally relevant material. They are intended both for those contemplating entry into the extremely competitive field of investment management as well as for those seeking a means of keeping their knowledge fresh and up to date. This series was designed to be user friendly and highly relevant.

We hope you find this series helpful in your efforts to grow your investment knowledge, whether you are a relatively new entrant or an experienced veteran ethically bound to keep up to date in the ever-changing market environment. As a long-term, committed participant in the investment profession and a not-for-profit global membership association, CFA Institute is pleased to provide you with this opportunity.

THE TEXTS

One of the most prominent texts over the years in the investment management industry has been Maginn and Tuttle's *Managing Investment Portfolios: A Dynamic Process*. The third edition updates key concepts from the 1990 second edition. Some of the more experienced members of our community own the prior two editions and will add the third edition to their libraries. Not only does this seminal work take the concepts from the other readings and put them in a portfolio context, but it also updates the concepts of alternative investments, performance presentation standards, portfolio execution, and, very importantly, individual investor portfolio management. Focusing attention away from institutional portfolios and toward the individual investor makes this edition an important and timely work.

Quantitative Investment Analysis focuses on some key tools that are needed by today's professional investor. In addition to classic time value of money, discounted cash flow applications, and probability material, there are two aspects that can be of value over traditional thinking.

The first involves the chapters dealing with correlation and regression that ultimately figure into the formation of hypotheses for purposes of testing. This gets to a critical skill that challenges many professionals: the ability to distinguish useful information from the overwhelming quantity of available data. For most investment researchers and managers, their analysis is not solely the result of newly created data and tests that they perform. Rather, they synthesize and analyze primary research done by others. Without a rigorous manner by which to explore research, you cannot understand good research or have a basis on which to evaluate less rigorous research.

Second, the final chapter of *Quantitative Investment Analysis* covers portfolio concepts and takes the reader beyond the traditional capital asset pricing model (CAPM) type of tools and into the more practical world of multifactor models and arbitrage pricing theory.

Fixed Income Analysis has been at the forefront of new concepts in recent years, and this particular text offers some of the most recent material for the seasoned professional who is not a fixed-income specialist. The application of option and derivative technology to the once-staid province of fixed income has helped contribute to an explosion of thought in this area. Professionals have been challenged to stay up to speed with credit derivatives, swaptions, collateralized mortgage securities, mortgage-backed securities, and other vehicles, and this explosion of products has strained the world's financial markets and tested central banks to provide sufficient oversight. Armed with a thorough grasp of the new exposures, the professional investor is much better able to anticipate and understand the challenges our central bankers and markets face.

International Financial Statement Analysis is designed to address the ever-increasing need for investment professionals and students to think about financial statement analysis from a global perspective. The text is a practically oriented introduction to financial statement analysis that is distinguished by its combination of a true international orientation, a structured presentation style, and abundant illustrations and tools covering concepts as they are introduced in the text. The authors cover this discipline comprehensively and with an eye to ensuring the reader's success at all levels in the complex world of financial statement analysis.

Equity Asset Valuation is a particularly cogent and important resource for anyone involved in estimating the value of securities and understanding security pricing. A well-informed professional knows that the common forms of equity valuation—dividend discount modeling, free cash flow modeling, price/earnings modeling, and residual income modeling—can all be reconciled with one another under certain assumptions. With a deep understanding of the underlying assumptions, the professional investor can better understand what other investors assume when calculating their valuation estimates. This text has a global orientation, including emerging markets. The second edition provides new coverage of private company valuation and expanded coverage of required rate of return estimation.

Investments: Principles of Portfolio and Equity Analysis provides an accessible yet rigorous introduction to portfolio and equity analysis. Portfolio planning and portfolio management are presented within a context of up-to-date, global coverage of security markets, trading, and market-related concepts and products. The essentials of equity analysis and valuation are explained in detail and profusely illustrated. The book includes coverage of practitioner-important but often neglected topics, such as industry analysis. Throughout, the focus is on the practical application of key concepts with examples drawn from both emerging and developed markets. Each chapter affords the reader many opportunities to self-check his or her understanding of topics. In contrast to other texts, the chapters are collaborations of respected senior investment practitioners and leading business school faculty from around the globe. By virtue of its well-rounded, expert, and global perspectives, the book should be of interest to anyone who is looking for an introduction to portfolio and equity analysis.

The New Wealth Management: The Financial Advisor's Guide to Managing and Investing Client Assets is an updated version of Harold Evensky's mainstay reference guide for wealth managers. Harold Evensky, Stephen Horan, and Thomas Robinson have updated the core text of the 1997 first edition and added an abundance of new material to fully reflect today's investment challenges. The text provides authoritative coverage across the full spectrum of wealth management and serves as a comprehensive guide for financial advisors. The book expertly blends investment theory and real-world applications and is written in the same thorough but highly accessible style as the first edition.

Corporate Finance: A Practical Approach is a solid foundation for those looking to achieve lasting business growth. In today's competitive business environment, companies must find innovative ways to enable rapid and sustainable growth. This text equips readers with the foundational knowledge and tools for making smart business decisions and formulating strategies to maximize company value. It covers everything from managing relationships between stakeholders to evaluating merger and acquisition bids, as well as the companies behind them. The second edition of the book preserves the hallmark conciseness of the first edition while expanding coverage of dividend policy, share repurchases, and capital structure. Through extensive use of real-world examples, readers will gain critical perspective into interpreting corporate financial data, evaluating projects, and allocating funds in ways that increase corporate value. Readers will gain insights into the tools and strategies used in modern corporate financial management.

ECONOMICS FOR INVESTMENT DECISION MAKERS

CHAPTER 1

DEMAND AND SUPPLY ANALYSIS: INTRODUCTION

Richard V. Eastin

Gary L. Arbogast, CFA

LEARNING OUTCOMES

After completing this chapter, you will be able to do the following:

- Distinguish among types of markets.
- Explain the principles of demand and supply.
- Describe causes of shifts in and movements along demand and supply curves.
- Describe the process of aggregating demand and supply curves, the concept of equilibrium, and mechanisms by which markets achieve equilibrium.
- Distinguish between stable and unstable equilibria and identify instances of such equilibria.
- Calculate and interpret individual and aggregate demand and inverse demand and supply functions, and interpret individual and aggregate demand and supply curves.
- Calculate and interpret the amount of excess demand or excess supply associated with a nonequilibrium price.
- Describe the types of auctions and calculate the winning price(s) of an auction.
- Calculate and interpret consumer surplus, producer surplus, and total surplus.
- Analyze the effects of government regulation and intervention on demand and supply.
- Forecast the effect of the introduction and the removal of a market interference (e.g., a price floor or ceiling) on price and quantity.
- Calculate and interpret price, income, and cross-price elasticities of demand, and describe factors that affect each measure.

1. INTRODUCTION

In a general sense, **economics** is the study of production, distribution, and consumption and can be divided into two broad areas of study: macroeconomics and microeconomics. **Macroeconomics** deals with aggregate economic quantities, such as national output and national income. Macroeconomics has its roots in **microeconomics**, which deals with markets and decision making of individual economic units, including consumers and businesses. Microeconomics is a logical starting point for the study of economics.

This chapter focuses on a fundamental subject in microeconomics: demand and supply analysis. **Demand and supply analysis** is the study of how buyers and sellers interact to determine transaction prices and quantities. As we will see, prices simultaneously reflect both the value to the buyer of the next (or marginal) unit and the cost to the seller of that unit. In private enterprise market economies, which are the chief concern of investment analysts, demand and supply analysis encompasses the most basic set of microeconomic tools.

Traditionally, microeconomics classifies private economic units into two groups: consumers (or households) and firms. These two groups give rise, respectively, to the theory of the consumer and theory of the firm as two branches of study. The **theory of the consumer** deals with **consumption** (the demand for goods and services) by utility-maximizing individuals (i.e., individuals who make decisions that maximize the satisfaction received from present and future consumption). The **theory of the firm** deals with the supply of goods and services by profit-maximizing firms. The theory of the consumer and the theory of the firm are important because they help us understand the foundations of demand and supply. Subsequent chapters will focus on the theory of the consumer and the theory of the firm.

Investment analysts, particularly equity and credit analysts, must regularly analyze products and services—their costs, prices, possible substitutes, and complements—to reach conclusions about a company's profitability and business risk (risk relating to operating profits). Furthermore, unless the analyst has a sound understanding of the demand and supply model of markets, he or she cannot hope to forecast how external events—such as a shift in consumer tastes or changes in taxes and subsidies or other intervention in markets—will influence a firm's revenue, earnings, and cash flows.

Having grasped the tools and concepts presented in this chapter, the reader should also be able to understand many important economic relationships and facts and be able to answer questions such as:

- Why do consumers usually buy more when the price falls? Is it irrational to violate this law of demand?
- What are appropriate measures of how sensitive the quantity demanded or supplied is to changes in price, income, and prices of other goods? What affects those sensitivities?
- If a firm lowers its price, will its total revenue also fall? Are there conditions under which revenue might rise as price falls, and, if so, what are those conditions? Why might this occur?
- What is an appropriate measure of the total value consumers or producers receive from the opportunity to buy and sell goods and services in a free market? How might government intervention reduce that value, and what is an appropriate measure of that loss?
- What tools are available that help us frame the trade-offs that consumers and investors face as they must give up one opportunity to pursue another?

- Is it reasonable to expect markets to converge to an equilibrium price? What are the conditions that would make that equilibrium stable or unstable in response to external shocks?
- How do different types of auctions affect price discovery?

This chapter is organized as follows. Section 2 explains how economists classify markets. Section 3 covers the basic principles and concepts of demand and supply analysis of markets. Section 4 introduces measures of sensitivity of demand to changes in prices and income. A summary and a set of practice problems conclude the chapter.

2. TYPES OF MARKETS

Analysts must understand the demand and supply model of markets because all firms buy and sell in markets. Investment analysts need at least a basic understanding of those markets and the demand and supply model that provides a framework for analyzing them.

Markets are broadly classified as factor markets or goods markets. **Factor markets** are markets for the purchase and sale of factors of production. In capitalist private enterprise economies, households own the **factors of production** (the land, labor, physical capital, and materials used in production). **Goods markets** are markets for the output of production. From an economics perspective, firms, which ultimately are owned by individuals either singly or in some corporate form, are organizations that buy the services of those factors. Firms then transform those services into intermediate or final goods and services. (**Intermediate goods and services** are those purchased for use as inputs to produce other goods and services, whereas final goods and services are in the final form purchased by households.) These two types of interaction between the household sector and the firm sector—those related to goods and those related to services—take place in factor markets and goods markets, respectively.

In the factor market for labor, households are sellers and firms are buyers. In goods markets, firms are sellers and both households and firms are buyers. For example, firms are buyers of capital goods (such as equipment) and intermediate goods, while households are buyers of a variety of durable and nondurable goods. Generally, market interactions are *voluntary.* Firms offer their products for sale when they believe the payment they will receive exceeds their cost of production. Households are willing to purchase goods and services when the value they expect to receive from them exceeds the payment necessary to acquire them. Whenever the perceived value of a good exceeds the expected cost to produce it, a potential trade can take place. This fact may seem obvious, but it is fundamental to our understanding of markets. If a buyer values something more than a seller, not only is there an opportunity for an exchange, but that exchange will make *both* parties better off.

In one type of factor market, called **labor markets**, households offer to sell their labor services when the payment they expect to receive exceeds the value of the leisure time they must forgo. In contrast, firms hire workers when they judge that the value of the productivity of workers is greater than the cost of employing them. A major source of household income and a major cost to firms is compensation paid in exchange for labor services.

Additionally, households typically choose to spend less on consumption than they earn from their labor. This behavior is called **saving**, through which households can accumulate financial capital, the returns on which can produce other sources of household income, such as interest, dividends, and capital gains. Households may choose to lend their accumulated savings (in exchange for interest) or invest it in ownership claims in firms (in hopes of receiving dividends and capital gains). Households make these savings choices when their anticipated future returns are judged to be more valuable today than the present consumption that households must sacrifice when they save.

Indeed, a major purpose of financial institutions and markets is to enable the transfer of these savings into capital investments. Firms use **capital markets** (markets for long-term financial capital—that is, markets for long-term claims on firms' assets and cash flows) to sell debt (in bond markets) or equity (in equity markets) in order to raise funds to invest in productive assets, such as plant and equipment. They make these investment choices when they judge that their investments will increase the value of the firm by more than the cost of acquiring those funds from households. Firms also use such financial intermediaries as banks and insurance companies to raise capital, typically debt funding that ultimately comes from the savings of households, which are usually net accumulators of financial capital.

Microeconomics, although primarily focused on goods and factor markets, can contribute to the understanding of all types of markets (e.g., markets for financial securities).

EXAMPLE 1-1 Types of Markets

1. Which of the following markets is *least* accurately described as a factor market? The market for:
   A. land.
   B. assembly-line workers.
   C. capital market securities.

2. Which of the following markets is *most* accurately defined as a product market? The market for:
   A. companies.
   B. unskilled labor.
   C. legal and lobbying services.

Solution to 1: C is correct.

Solution to 2: C is correct.

3. BASIC PRINCIPLES AND CONCEPTS

In this chapter, we explore a model of household behavior that yields the consumer demand curve. **Demand**, in economics, is the willingness and ability of consumers to purchase a given amount of a good or service at a given price. **Supply** is the willingness of sellers to offer a given quantity of a good or service for a given price. Later, study on the theory of the firm will yield the supply curve.

The demand and supply model is useful in explaining how price and quantity traded are determined and how external influences affect the values of those variables. Buyers' behavior is