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EIGHTH EDITION

LABOR ECONOMICS

GEORGE J. BORJAS

Mc Graw Hill Education

Labor Economics

Eighth Edition

George J. Borjas
Harvard University

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Professor Borjas has written extensively on labor market issues. He is the author of several books, including *Wage Policy in the Federal Bureaucracy* (American Enterprise Institute, 1980), *Friends or Strangers: The Impact of Immigrants on the U.S. Economy* (Basic Books, 1990), *Heaven's Door: Immigration Policy and the American Economy* (Princeton University Press, 1999), *Immigration Economics* (Harvard University Press, 2014), and *We Wanted Workers: Unraveling the Immigration Narrative* (Norton, 2016). He has published more than 150 articles in books and scholarly journals, including the *American Economic Review*, the *Journal of Political Economy*, and the *Quarterly Journal of Economics*.

Professor Borjas was elected a Fellow of the Econometric Society in 1998, and a Fellow of the Society of Labor Economics in 2004. In 2011, Professor Borjas was awarded the IZA Prize in Labor Economics. He was an editor of the *Review of Economics and Statistics* from 1998 to 2006. He also has served as a member of the Advisory Panel in Economics at the National Science Foundation and has testified frequently before congressional committees and government commissions.

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To Sarah, Timothy, and Rebecca

Preface to the Eighth Edition

The original motivation for writing *Labor Economics* grew out of my years of teaching labor economics to undergraduates. After trying out many of the textbooks in the market, it seemed to me that students were not being exposed to what the essence of labor economics was about: To try to *understand* how labor markets work. As a result, I felt that students did not really grasp *why* some persons choose to work, while other persons withdraw from the labor market; *why* some firms expand their employment at the same time that other firms are laying off workers; or *why* earnings are distributed unequally.

The key difference between *Labor Economics* and competing textbooks lies in its philosophy. I believe that knowing the *story* of how labor markets work is, in the end, more important than showing off our skills at constructing elegant models of the labor market or remembering hundreds of statistics and institutional details summarizing labor market conditions at a particular point in time.

I doubt that many students will (or should!) remember the mechanics of deriving a labor supply curve or what the unemployment rate was at the peak of the Great Recession 10 or 20 years after they leave college. However, if students could remember the *story* of how the labor market works—and, in particular, that workers and firms respond to changing incentives by altering the amount of labor they supply or demand—the students would be much better prepared to make informed opinions about the many proposed government policies that can have a dramatic impact on labor market opportunities, such as a "workfare" program requiring that welfare recipients work or a payroll tax assessed on employers to fund a national health-care program or a guest worker program that grants tens of thousands of entry visas to high-skill workers. The exposition in this book, therefore, stresses the *ideas* that labor economists use to understand how the labor market works.

The book also makes extensive use of labor market statistics and reports evidence obtained from hundreds of research studies. These data summarize the stylized facts that a good theory of the labor market should be able to explain, as well as help shape our thinking about the way the labor market works. The main objective of the book, therefore, is to survey the field of labor economics with an emphasis on *both* theory and facts. The book relies much more heavily on "the economic way of thinking" than competing textbooks. I believe this approach gives a much better understanding of labor economics than an approach that minimizes or ignores the story-telling aspects of economic theory.

Requirements

The book uses economic analysis throughout. *All* of the theoretical tools are introduced and explained in the text. As a result, the only prerequisite is that the student has some familiarity with the basics of microeconomics, particularly supply and demand curves. The exposure acquired in the typical introductory economics class more than satisfies this prerequisite. All other concepts (such as indifference curves, budget lines, production functions, and isoquants) are motivated, defined, and explained as they appear in our story. The book does not make use of any mathematical skills beyond those taught in high school algebra (particularly the notion of a slope).

Labor economists also make extensive use of econometric analysis in their research. Although the discussion in this book does not require any prior exposure to econometrics, the student will get a much better "feel" for the research findings if they know a little about how labor economists manipulate data to reach their conclusions. The appendix to Chapter 1 provides a simple (and very brief) introduction to econometrics and allows the student to visualize how labor economists conclude, for instance, that winning the lottery reduces labor supply, or that schooling increases earnings. Additional econometric concepts widely used in labor economics—such as the difference-in-differences estimator or instrumental variables—are introduced in the context of policy-relevant examples throughout the text.

Changes in the Eighth Edition

The Eighth Edition offers a thorough rewriting of the entire textbook, making it the most significant revision in quite a few years. As one edition rolls into the next and material gets added to or deleted from the textbook, I think many authors discover that the book keeps moving further away from what the author originally intended. There comes a time when one needs to take a step back, get reacquainted with the entire manuscript free from the pressures of having to get the next edition out the door, take stock of how all the pieces fit together in the context of an ever-evolving field, and do a thorough rethinking of how to best present the material once more as part of a cohesive whole. I experienced that feeling about 3 years ago, shortly after the last edition was published, and decided at the time to tackle the Eighth Edition as if I were writing the textbook for the first time. And that is precisely what I have done.

Readers will find that although much will seem familiar, big chunks of the book have been completely rewritten and streamlined. The book still offers many detailed policy discussions and still uses the evidence reported in state-of-the-art research articles to illustrate the many applications of modern labor economics. The text continues to make frequent use of such econometric tools as fixed effects, the difference-in-differences estimator, and instrumental variables—tools that play a central role in the toolkit of labor economists. And the Eighth Edition even adds to the toolkit by introducing the synthetic control method.

But the text is now much leaner, making it a shorter and easier-to-read book. And it emphasizes, from the very beginning, how these empirical tools are a central part of the methodological revolution that changed labor economics in the past two decades. Empirical analysis must be much more than calculating a correlation describing the relation between two variables. It must instead reflect a well-thought-out strategy that attempts to *identify* the direct consequences of the many shocks that continually hit the labor market.

Among the specific changes in the Eighth Edition are:

1. There are several new extensions of theoretical concepts throughout the book, including a new section on household production (Chapter 2) and on the education production function (Chapter 6). Similarly, there are more detailed discussions of some empirical applications, including the signaling value of the General Equivalency Diploma (GED) and the male–female wage gap in the "gig economy."
2. The important distinction that empirical labor economics now makes between estimating correlations and identifying consequences from specific labor market shocks is introduced early in the book. Specifically, Chapter 2 has a new section discussing the

age-old distinction between correlation and causation in the context of evidence from the labor supply literature, which measures the labor supply consequences of winning a lottery or of how taxi drivers are compensated.

3. The section on the employment effects of the minimum wage provides a detailed discussion of the studies that measure the impact of the minimum wage in Seattle, with an illustration of how empirical work in labor economics, particularly when it addresses politically contentious issues, can often lead to wildly different conclusions.
4. A reorganization of the human capital material in Chapters 6 and 7. Because of the voluminous research on the economics of education, a detailed discussion of the education decision and of how to measure the returns to education now fills up Chapter 6. Chapter 7 continues the study of the human capital model by focusing on postschool investments, on the link between human capital and the wage distribution, and on the determinants of increasing wage inequality. The discussion also introduces the canonical model used in the wage structure literature that uses the Constant Elasticity of Substitution (CES) production function to derive a relative demand curve between high- and low-skill labor. The Mathematical Appendix now includes a detailed derivation of how the model is used to estimate the elasticity of substitution between two labor inputs.
5. The material on immigration, again one of those topics where the number of studies is growing rapidly, has also been reorganized and tightened. Some users of the earlier edition suggested that because of the intimate link between the wage impact of immigration and the efficiency gains from immigration, the introduction of the immigration surplus should follow immediately after the discussion of the wage impact, and I concur. The immigration material in the geographic mobility chapter now focuses on two issues that are more directly related to the migration decision: The self-selection of immigrants and the assimilation of immigrants in the receiving labor market.

Organization of the Book

The instructor will find that this book is much shorter than competing labor economics textbooks—particularly after the thorough rewriting in the Eighth Edition. The book contains an introductory chapter, plus 11 substantive chapters. If the instructor wished to cover all of the material, each chapter could serve as the basis for about a week's worth of lectures in a typical undergraduate semester course. Despite the book's brevity, the instructor will find that all of the key topics in labor economics are covered systematically. The discussion, however, is kept to essentials as I have tried very hard not to deviate into tangential material, or into 10-page-long ruminations on my pet topics.

Chapter 1 presents a brief introduction that exposes the student to the concepts of labor supply, labor demand, and equilibrium. The chapter uses the "real-world" example of the Alaskan labor market during the construction of the oil pipeline to introduce these concepts. In addition, the chapter shows how labor economists contrast the theory with the evidence, as well as discusses the limits of the insights provided by both the theory and the data. The example used to introduce the student to regression analysis is drawn from "real-world" data—and looks at the link between differences in mean wages across occupations and differences in educational attainment as well as the "female-ness" of occupations.

The book begins the detailed analysis of the labor market with a detailed study of labor supply and labor demand. Chapter 2 examines the factors that determine whether a person chooses to work and, if so, how much, while Chapter 3 examines the factors that determine how many workers a firm wants to hire. Chapter 4 puts together the supply decisions of workers with the demand decisions of employers and shows how the labor market "balances out" the conflicting interests of the two parties. These three chapters jointly form the core of the neoclassical approach to labor economics.

The remainder of the book extends and generalizes the basic supply–demand framework. Chapter 5 stresses that jobs differ in their characteristics, so that jobs with unpleasant working conditions may have to offer higher wages in order to attract workers. Chapter 6 stresses that workers are different because they differ in their educational attainment, while Chapter 7 notes that workers also differ in how much on-the-job training they acquire. These investments in human capital help determine the shape of the wage distribution. Chapter 8 describes a key mechanism that allows the labor market to balance out the interests of workers and firms, namely labor turnover and migration.

The final section of the book discusses distortions and imperfections in labor markets. Chapter 9 analyzes how labor market discrimination affects the earnings and employment opportunities of minority workers and women. Chapter 10 discusses how labor unions affect the relationship between the firm and the worker. Chapter 11 notes that employers often find it difficult to monitor the activities of their workers, so that the workers will often want to "shirk" on the job. The chapter discusses how different types of incentive pay systems arise to discourage workers from misbehaving. Finally, Chapter 12 discusses why unemployment can exist and persist in labor markets.

The text uses a number of pedagogical devices designed to deepen the student's understanding of labor economics. A chapter typically begins by presenting a number of stylized facts about the labor market, such as wage differentials between blacks and whites or between men and women. The chapter then presents the story that labor economists have developed to understand why these facts are observed in the labor market. Finally, the chapter extends and applies the theory to related labor market phenomena. Each chapter typically contains at least one lengthy application of the material to a major policy issue, as well as boxed examples showing the "Theory at Work."

The end-of-chapter material also contains a number of student-friendly devices. There is a chapter summary describing briefly the main lessons of the chapter; a "Key Concepts" section listing the major concepts introduced in the chapter (when a key concept makes its first appearance, it appears in **boldface**). Each chapter includes "Review Questions" that the student can use to review the major theoretical and empirical issues, a set of 15 problems (many of them brand new) that test the students' understanding of the material, as well as a list of "Selected Readings" to guide interested students to many of the standard references in a particular area of study.

Supplements for the Book

There are several learning and teaching aids that accompany the eighth edition of *Labor Economics*. These resources are available to instructors for quick download and convenient access via the Instructor Resource material available through McGraw-Hill Connect®.

A *Solutions Manual* and *Test Bank* have been prepared by Robert Lemke of Lake Forest College. The Solutions Manual provides detailed answers to all of the end-of-chapter problems. The comprehensive Test Bank offers over 350 multiple-choice questions in Word and electronic format. Test questions have now been categorized by AACSB learning categories, Bloom's Taxonomy, level of difficulty, and the topic to which they relate. The computerized Test Bank is available through *McGraw-Hill's EZ Test Online*, a flexible and easy-to-use electronic testing program. It accommodates a wide range of question types and you can add your own questions. Multiple versions of the test can be created and any test can be exported for use with course management systems such as Blackboard. The program is available for Windows and Macintosh environments. *PowerPoint Presentations* prepared by Michael Welker of Franciscan University of Steubenville, contain a detailed review of the important concepts presented in each chapter. The slides can be adapted and edited to fit the needs of your course. A *Digital Image Library* is also included, which houses all of the tables and figures featured in this book.

Acknowledgments

I have benefited from countless e-mail messages sent by users of the textbook—both students and instructors. These messages often contained very valuable suggestions, most of which found their way into the Eighth Edition. I strongly encourage users to contact me (gborjas@harvard.edu) with any comments or changes that they would like to see included in the next revision. I am grateful to Robert Lemke of Lake Forest College, who updated the quiz questions for this edition, helped me expand the menu of end-of-chapter problems, and collaborated in and revised the *Solutions Manual* and *Test Bank*; and Michael Welker, Franciscan University of Steubenville, who created the PowerPoint presentation for the Eighth Edition. I am particularly grateful to many friends and colleagues who have generously shared some of their research data so that I could summarize and present it in a relatively simple way throughout the textbook, including Daniel Aaronson, David Autor, William Carrington, Chad Cotti, John Friedman, Barry Hirsch, Lawrence Katz, Alan Krueger, David Lee, Bhashkar Mazumder, and Solomon Polachek. Finally, I have benefited from the countless comments—far too numerous to mention individually—made by many colleagues on the earlier editions.

Contents in Brief

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Chapter 1

Introduction

Observations always involve theory.

—*Edwin Hubble*

Most of us will allocate a substantial fraction of our time to the labor market. How we do in the labor market helps determine our wealth, what we can afford to consume, with whom we associate, where we vacation, which schools our children attend, and even who finds us attractive. Not surprisingly, we are all eager to learn how the labor market works. **Labor economics** studies how labor markets work.

Our interest in labor markets, however, is sparked by more than our personal involvement. Many of the central issues in the debate over social policy revolve around the labor market experiences of particular groups of workers or various aspects of the employment relationship between workers and firms. The policy issues examined by modern labor economics include the following:

1. Do welfare programs create work disincentives?
2. What is the impact of immigration on the wage of native-born workers?
3. Do minimum wages increase the unemployment rate of less-skilled workers?
4. What is the impact of occupational safety and health regulations on employment and earnings?
5. Do government subsidies of human capital investments improve the economic well-being of disadvantaged workers?
6. Why did wage inequality in the United States rise so rapidly after 1980?
7. What is the impact of affirmative action programs on the earnings of women and minorities and on the number of women and minorities that firms hire?
8. What is the economic impact of unions, both on their members and on the rest of the economy?
9. Would merit pay for teachers improve the academic achievement of students?
10. Do generous unemployment insurance benefits lengthen the duration of spells of unemployment?

This diverse list of questions clearly illustrates why the study of labor markets is intrinsically more important and more interesting than the study of the market for butter (unless one happens to be in the butter business!). Labor economics helps us understand and address many of the social and economic problems facing modern societies.

1-1 An Economic Story of the Labor Market

This book tells the "story" of how labor markets work. Telling this story involves much more than simply recounting the history and details of labor law or presenting reams of statistics summarizing labor market conditions. Good stories have themes, characters that come alive with vivid personalities, conflicts that have to be resolved, ground rules that limit the set of permissible actions, and events that result inevitably from the interaction among characters.

The story we will tell about the labor market has all these features. Labor economists typically assign motives to the various "actors" in the labor market. Workers, for instance, are trying to find the best possible job and firms are trying to make money. Workers and firms, therefore, enter the labor market with clashing objectives—workers are trying to sell their labor at the highest price and firms are trying to buy labor at the lowest price.

The exchanges between workers and firms are constrained by the ground rules that the government imposes to regulate transactions in the labor market. Changes in these rules and regulations obviously lead to different outcomes. For instance, a minimum wage law prohibits exchanges that pay less than a particular amount per hour worked; occupational safety regulations forbid firms from offering working conditions that are deemed too risky to the worker's health.

The deals that are struck between workers and firms determine the types of jobs that are offered, the skills that workers acquire, the extent of labor turnover, the structure of unemployment, and the observed earnings distribution. The story thus provides a theory, a framework for understanding, analyzing, and predicting a wide array of labor market outcomes.

The underlying philosophy of the book is that modern economics provides a useful story of how the labor market works. The typical assumptions we make about the behavior of workers and firms, and about the ground rules under which the labor market participants make their transactions, suggest outcomes often corroborated by what we see in real-world labor markets.

The discussion is guided by the belief that learning the story of how labor markets work is as important as knowing basic facts about the labor market. The study of facts without theory is just as empty as the study of theory without facts. Without understanding how labor markets work—that is, without having a theory of why workers and firms pursue some employment relationships and avoid others—we would be hard-pressed to predict the labor market impact of changes in government policies or of changes in the demographic composition of the workforce.

A question often asked is which are more important—ideas or facts? This book stresses that "ideas *about* facts" are most important. We do not study labor economics so that we can construct elegant mathematical theories or to remember that the unemployment rate was 6.9 percent in 1993. Rather, we want to identify which economic and social factors generate a certain level of unemployment, and why.

The main objective of this book is to survey the field of labor economics with an emphasis on *both* theory and facts: Where the theory helps us understand how the facts are generated and where the facts can help shape our thinking about the way labor markets work.

1-2 The Actors in the Labor Market

Throughout the book, we will see that there are three leading actors in our story: workers, firms, and the government.[1]

As workers, we receive top casting. Without us, after all, there is no "labor" in the labor market. We decide whether to work or not, how many hours to work, how hard to work, which skills to acquire, when to quit a job, which occupations to enter, and whether to join a labor union.

Each of these decisions is driven by the desire to *optimize,* to choose the best available option from the various choices. In our story, workers will always act in ways that maximize their well-being. Adding up the decisions of millions of workers generates the economy's labor supply in terms of the number of persons seeking work, and also in terms of the quantity and quality of skills available to employers. As we will see throughout the book, persons who want to maximize their well-being tend to supply more time and more effort to those activities that have a higher payoff. The **labor supply curve,** therefore, is often upward sloping, as illustrated in Figure 1-1.

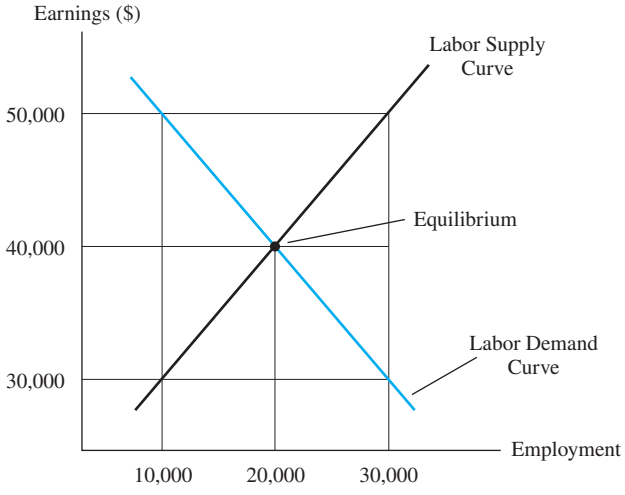
The hypothetical labor supply curve drawn in Figure 1-1 gives the number of engineers that will be forthcoming at every wage. For example, 20,000 workers are willing to supply their services to engineering firms if the engineering wage is $40,000 per year. If the engineering wage rises to $50,000, then 30,000 workers will choose to be engineers. In other words, as the engineering wage rises, more persons decide that the engineering profession is a worthwhile pursuit. More generally, the labor supply curve relates the number of person-hours supplied to the economy to the wage that is being offered. The higher the wage that is being offered, the larger the labor supplied.

Firms co-star in our story. Each firm must decide how many and which types of workers to hire and fire, the length of the workweek, how much capital to employ, and whether to offer a safe or risky working environment to its workers. Firms also have motives. We assume that firms want to maximize profits. From the firm's point of view, the consumer is king. The firm will maximize its profits by making the production decisions—and hence the hiring and firing decisions—that best serve the consumers' needs. In effect, the firm's demand for labor is a **derived demand,** a demand derived from the desires of consumers.

Adding up the hiring and firing decisions of millions of employers generates the economy's labor demand. The assumption that firms want to maximize profits implies that firms will want to hire many workers when labor is cheap but will refrain from hiring

[1] A fourth actor, trade unions, may have to be added in some countries. Unions may organize a large fraction of the workforce and represent the interests of workers in their bargaining with employers. In the United States, however, the trade union movement has been in decline for several decades. By 2016, only 6.4 percent of private-sector workers were union members.

FIGURE 1-1 Supply and Demand in the Engineering Labor Market
The labor supply curve gives the number of persons willing to supply their services to engineering firms at a given wage. The labor demand curve gives the number of engineers that firms will hire at that wage. Equilibrium occurs where supply equals demand, so that 20,000 engineers are hired at a wage of $40,000.



when labor is expensive. The relation between the price of labor and how many workers firms are willing to hire is summarized by the downward-sloping **labor demand curve** in Figure 1-1. As drawn, the labor demand curve tells us that firms in the engineering industry want to hire 20,000 engineers when the wage is $40,000 but will hire only 10,000 engineers if the wage rises to $50,000.

Workers and firms, therefore, enter the labor market with conflicting interests. Many workers are willing to supply their services when the wage is high, but few firms are willing to hire them. Conversely, few workers are willing to supply their services when the wage is low, but many firms are looking for workers. As workers search for jobs and firms search for workers, these conflicting desires are "balanced out" and the labor market reaches an **equilibrium.** In a free-market economy, equilibrium is attained when supply equals demand.

As drawn in Figure 1-1, the equilibrium wage is $40,000 and 20,000 engineers will be hired in the labor market. This wage–employment combination is an equilibrium because it balances out the conflicting desires of workers and firms. Suppose, for example, that the engineering wage was $50,000—above equilibrium. Firms would then want to hire only 10,000 engineers, even though 30,000 engineers are looking for work. The excess number of job applicants would bid down the wage as they compete for the few jobs available. Suppose, instead, that the wage was $30,000—below equilibrium. Because engineers are cheap, firms want to hire 30,000 engineers, but only 10,000 engineers are willing to work at that wage. As firms compete for the few available engineers, they bid up the wage.

There is one last major player in the labor market, the government. The government can tax the worker's earnings, subsidize the training of engineers, impose a payroll tax on

firms, demand that the racial and gender composition of engineers hired by firms exactly reflect the composition of the population, enact legislation that makes some labor market transactions illegal (such as paying engineers less than $50,000 annually), and increase the supply of engineers by encouraging their immigration from abroad. All these actions will change the equilibrium that will eventually be attained in the labor market.

The Trans-Alaska Oil Pipeline

In January 1968, oil was discovered in Prudhoe Bay in remote northern Alaska. The oil reserves were estimated to be greater than 10 billion barrels, making it the largest such discovery in North America.[2]

There was one problem with the discovery—the oil was located in a remote and frigid area of Alaska, far from where most consumers lived. To solve the daunting problem of transporting the oil to those consumers who wanted to buy it, the oil companies proposed building a 48-inch pipeline across the 789-mile stretch from northern Alaska to the southern (and ice-free) port of Valdez. At Valdez, the oil would be transferred to oil supertankers. These huge ships would then deliver the oil to consumers in the United States and elsewhere.

The oil companies joined forces and formed the Alyeska Pipeline Project. The construction project began in the spring of 1974, after Congress gave its approval in the wake of the 1973 oil embargo. Construction work continued for 3 years and the pipeline was completed in 1977. Alyeska employed about 25,000 workers during the summers of 1974 through 1977, and its subcontractors employed an additional 25,000 workers. Once the pipeline was built, Alyeska reduced its pipeline-related employment to a small maintenance crew.

Many of the workers employed by Alyeska and its subcontractors were engineers who had built pipelines across the world. Very few of those engineers were resident Alaskans. The remainder of the Alyeska workforce consisted of relatively low-skill labor such as truck drivers and excavators. Many of the low-skill workers were resident Alaskans.

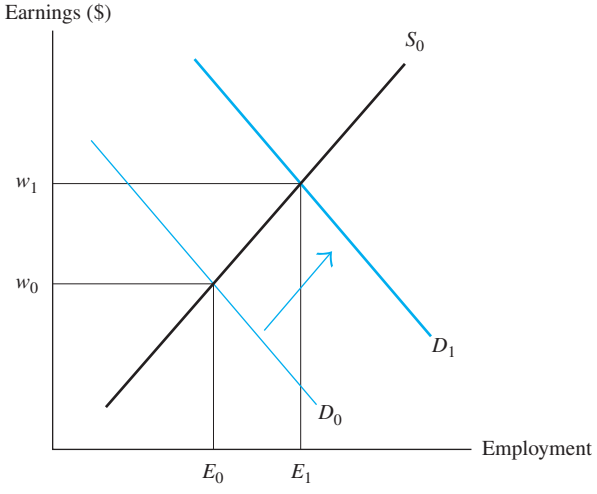
The theoretical framework summarized by the supply and demand curves can help us understand the shifts that *should* have occurred in the Alaskan labor market as a result of the Trans-Alaska Pipeline System. As Figure 1-2 shows, the labor market was initially in an equilibrium represented by the intersection of the demand curve D_0 and the supply curve S_0. A total of E_0 Alaskans were employed at a wage of w_0 in the initial equilibrium.

The construction project clearly led to a sizable increase in the demand for labor. Figure 1-2 illustrates this shift by showing the demand curve moving outward from D_0 to D_1. The outward shift in the demand curve implies that—at any given wage—Alaskan employers were looking for more workers.

The shift in demand should have moved the Alaskan labor market to a new equilibrium, represented by the intersection of the new demand curve and the original supply curve. At this new equilibrium, a total of E_1 persons were employed at a wage of w_1. The theory, therefore, predicts that the pipeline construction project should have increased *both* wages

[2] The discussion is based on William J. Carrington, "The Alaskan Labor Market during the Pipeline Era," *Journal of Political Economy* 104 (February 1996): 186–218.

FIGURE 1-2 The Alaskan Labor Market and the Construction of the Oil Pipeline
The construction of the oil pipeline shifted the labor demand curve in Alaska from D_0 to D_1, resulting in higher wages and employment. Once the pipeline was completed, the demand curve reverted back to its original level and wages and employment fell.



and employment. As soon as the project was completed, however, and the temporary need for additional workers disappeared, the demand curve would have shifted back to its original position at D_0. In the end, the wage should have gone back down to w_0 and E_0 workers would be employed. In short, the pipeline construction project should have led to a temporary increase in both wages and employment during the construction period.

Figure 1-3 shows what *actually* happened to employment and wages in Alaska between 1968 and 1983. Because the state's population was growing steadily for some decades, total employment was rising steadily even before the oil discovery in Prudhoe Bay. The data clearly show, however, that employment "spiked" in 1975, 1976, and 1977 and then went back to its long-run growth trend in 1977. The earnings of Alaskan workers also increased during the relevant period. After adjusting for inflation, monthly earnings rose from an average of $2,648 in the third quarter of 1973 to $4,140 in the third quarter of 1976, a surge of 56 percent. By 1979, real earnings were back to the level observed prior to the beginning of the pipeline construction project.

It turns out that the temporary increase in labor supply occurred for two distinct reasons. First, a larger fraction of Alaskans were willing to work when the wage increased. In the summer of 1973, about 39 percent of Alaskans worked. In the summers of 1975 and 1976, about 50 percent of Alaskans worked. Second, the rate of population growth in Alaska accelerated between 1974 and 1976, as workers living in the lower 48 states moved to Alaska to take advantage of the improved economic opportunities (despite the frigid weather conditions there). The increase in the rate of population growth, however, was temporary. Population growth reverted back to its long-run trend soon after the pipeline construction project was completed.

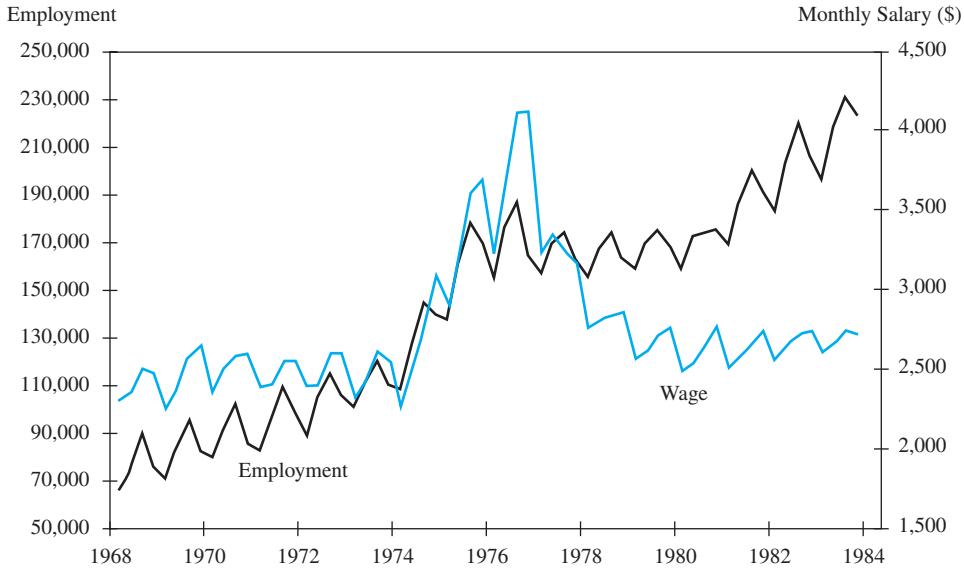


FIGURE 1-3
Wages and Employment in the Alaskan Labor Market, 1968–1984

Source: William J. Carrington, "The Alaskan Labor Market during the Pipeline Era," *Journal of Political Economy* 104 (February 1996): 199.

1-3 Why Do We Need a Theory?

We have just told a simple story of how the Trans-Alaska Pipeline System affected labor market outcomes in Alaska—and how each of the actors in our story played a major role. The government approved the pipeline project despite the potential environmental hazards involved; firms that saw income opportunities in building the pipeline increased their demand for labor; and workers responded to the change in demand by increasing the quantity of labor supplied to the Alaskan labor market.

We have, in effect, constructed a theory or **model** of the Alaskan labor market. Our model is characterized by an upward-sloping labor supply curve, a downward-sloping labor demand curve, and the assumption that an equilibrium is eventually attained that resolves the conflicts between workers and firms. This model predicts that the construction of the pipeline would temporarily increase wages and employment in the Alaskan labor market. Moreover, this prediction is testable—that is, the predictions about wages and employment can be compared with what actually happened. It turns out that the supply–demand model passes the test; the data confirm the theoretical predictions.

Needless to say, the model of the labor market illustrated in Figure 1-2 does not do full justice to the complexities of the Alaskan labor market. It is easy to come up with many variables that our simple model ignored and that could potentially change our predictions. For instance, it is possible that workers care about more than just the wage when they make labor supply decisions. The opportunity to participate in such a challenging or cutting-edge project as the construction of the Trans-Alaska Pipeline could have attracted engineers at wages lower than those offered by firms engaged in more mundane projects—despite the harsh working conditions in the field. The theoretical prediction that the construction of the pipeline project would increase wages would then be incorrect because the project could have attracted more workers at lower wages.

If the factors that we omitted from our theory play a crucial role in understanding how the Alaskan labor market operates, we might be wrongly predicting that wages and employment would rise. If these factors are only minor details, however, our model captures the essence of what goes on in the Alaskan labor market and our prediction would be valid.

We could try to build a more complex model, a model that incorporates every single one of the omitted factors. Now *that* would be a tough job! A completely realistic model would have to describe how millions of workers and firms interact and how these interactions work themselves through the labor market. Even if we knew how to accomplish such a difficult task, this "everything-but-the-kitchen-sink" approach defeats the whole purpose of having a theory. A theory that mirrored the real-world labor market in Alaska down to the minutest detail might indeed be able to explain all the facts, but it would be as complex as reality itself, cumbersome and incoherent, and would not really help us understand how the Alaskan labor market works.

There has been a long debate over whether a theory should be judged by the realism of its assumptions or by the extent to which it helps us understand and predict the labor market phenomena we are interested in. We obviously have a better shot at predicting correctly if we use more realistic assumptions. At the same time, a theory that mirrors the world too closely is too clumsy and does not isolate what *really* matters. The "art" of labor economics lies in choosing which details are essential to the story and which details are not. There is a tradeoff between realism and simplicity, and good economics hits the mark just right.

As we will see throughout this book, the supply–demand framework in Figure 1-1 helps to isolate the key factors that motivate the various actors in the labor market. The model provides a useful way of organizing our thoughts about how the labor market works. It also gives a solid foundation for building more complex and more realistic models. And, most important, the model works. Its predictions are often consistent with what is observed in the real world.

The supply–demand framework predicts that the construction of the Alaska oil pipeline would temporarily increase employment and wages in the Alaskan labor market. This prediction is an example of **positive economics.** Positive economics addresses the relatively narrow "What is?" questions, such as, What is the impact of the discovery of oil in Prudhoe Bay, and the subsequent construction of the oil pipeline, on the Alaskan labor market?

Positive economics, therefore, addresses questions that can, in principle, be answered with the tools of economics, without interjecting any value judgment as to whether the particular outcome is desirable or harmful. This book is devoted to the analysis of such positive questions as: What is the impact of the minimum wage on unemployment? What is the impact of immigration on the earnings of native-born workers? What is the impact of a tuition assistance program on college enrollment rates? What is the impact of unemployment insurance on the duration of a spell of unemployment?

These positive questions, however, beg many important issues. In fact, some would say that these positive questions beg *the* most important issues: *Should* the oil pipeline have been built? *Should* there be a minimum wage? *Should* the government subsidize college tuition? *Should* the United States accept more immigrants? *Should* the unemployment insurance system be less generous?

These questions fall in the realm of **normative economics,** which addresses much broader "What should be?" questions. By their nature, the answers to these normative questions require value judgments. Because each of us probably has different values, our answers to these normative questions may differ *regardless* of what the theory or the facts

tell us about the economic impact of the oil pipeline, the employment effects of the minimum wage, or the impact of immigration on the well-being of native workers.

Normative questions force us to make value judgments about the type of society we wish to live in. Consider, for instance, the impact of immigration on a particular host country. As we will see, the supply–demand framework implies that an increase in the number of immigrants lowers the income of competing workers but raises the income of the firms that hire those workers by even more. On net, therefore, the receiving country gains. Moreover, because immigration is typically a voluntary supply decision, it also makes the immigrants better off.

Suppose, in fact, that the evidence for a particular host country was consistent with the model's predictions. In particular, the immigration of 10 million workers improved the well-being of the immigrants (relative to their well-being in their country of birth); reduced the income of native workers by $25 billion annually; and increased the income of employers by $40 billion. Let's now ask a normative question: *Should* the country admit 10 million more immigrants?

This normative question cannot be answered solely on the basis of the theory or the facts. Even though total income in the host country has increased by $15 billion, there also has been a redistribution of wealth. Some persons are worse off and others are better off.

To answer the question of whether the country should continue to admit immigrants, one has to decide whose economic welfare we should care most about: that of immigrants, who are made better off; that of native workers, who are made worse off; or that of employers, who are made better off. One might even bring into the discussion the well-being of the people left behind in the source countries, who are clearly affected by the emigration of their compatriots. It is clear that any resolution of this issue requires clearly stated assumptions about what constitutes the "national interest," about who matters more.

Many economists often take a fallback position when these types of problems are encountered. Because the immigration of 10 million workers increases the *total* income in the destination country by $15 billion, it is then possible to redistribute income so that every person in that country is made better off. A policy that can *potentially* improve the well-being of everyone in the economy is said to be "efficient"; it increases the size of the economic pie available to the country. The problem, however, is that this type of redistribution seldom occurs in the real world; the winners typically remain winners and the losers remain losers. Our answer to a normative question, therefore, forces us to confront the tradeoff between efficiency and distributional issues.

As a second example, we will see that the supply–demand framework predicts that unionization transfers wealth from firms to workers, but that unionization also shrinks the size of the economic pie. Suppose that the facts unambiguously support these theoretical implications, unions increase the total income of workers by, say, $40 billion, but the country as a whole is poorer by $20 billion. Let's now ask a normative question: *Should* the government pursue policies that discourage workers from forming labor unions?

Our answer to this normative question again depends on how we balance the gains to the unionized workers with the losses to the employers who must pay higher wages and to the consumers who must pay higher prices for union-produced goods.

The lesson should be clear. As long as there are winners and losers—and government policies inevitably leave winners and losers in their wake—neither the theoretical implications of economic models nor the facts are sufficient to answer the normative question of whether a particular policy is desirable.