Pierre Cahuc, Stéphane Carcillo, and André Zylberberg

LABOR ECONOMICS

second edition

Labor Economics

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PIERRE CAHUC,
STÉPHANE CARCILLO,
AND
ANDRÉ ZYLBERBERG

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Preface

Ten years have now gone by since the first edition of *Labor Economics*. At the outset our purpose was to offer a survey of the theoretical foundations of labor economics and the empirical evaluations this discipline can furnish, expounding the models with enough detail to allow readers to see how they function. The perspective has changed, and this new edition aims to do rather more than bring the earlier one up to date. Methods of evaluation have advanced over the course of the last decade and hold a prominent place now in academic publications, a development due especially to the multiplication of individual databases and the organization of experiments. This new edition incorporates these advances: we set ourselves the goal of explaining current methods and instructing readers in how to use them by replicating research publications that have proved to be milestones in labor economics. We also devote more space to the analysis of public policy and the levers available to policy makers, with new chapters on income redistribution and the provision of protection against the risks inherent in the functioning of the labor market. There are now dedicated chapters on wage inequality and uneven access to employment, whether these phenomena arise out of technological progress, globalization, or discriminatory practices in the workplace.

In presenting current empirical methodology, we now draw heavily on research articles that have become references for the profession and so for this book, explaining their lines of reasoning and their techniques in detail. The data, as well as the corresponding Stata codes, are available at the website linked to this book, www.labor-economics.org. For each chapter, this site also puts at the disposition of readers current data related to the figures and tables in the book, up-to-date indications of important publications, and slides illustrating the main points of the chapter, which may be used as course aids. The site also includes a discussion forum.

The task we set ourselves was ambitious, too much so for just the pair of us. The gearbox needed an extra gear, so Stéphane Carcillo joined the team. Thanks to him, we have been able to bring this project to completion.

Pierre Cahuc and André Zylberberg

Introduction

On 4 April 1980, following a conflict with the Peruvian government, Cuban President Fidel Castro ordered the guards posted in front of the Peruvian embassy in Havana withdrawn. Seizing the chance offered by this absence, almost 11,000 Cubans stormed into the embassy and demanded political asylum. Images of a multitude of hungry and thirsty men, women, and children who were seen perched in trees and on the roof of the embassy, were immediately broadcast worldwide. After difficult negotiations and under strong pressure from the international community, the Cuban government agreed to allow all the asylum seekers in the embassy to leave the country. They were taken in by Costa Rica, Spain, Peru, and the United States. To counter the negative image created by this event, Fidel Castro announced, in his famous speech of 20 April 1980, that he was throwing open the port of Mariel, a municipality 25 miles west of Havana, so that anyone who wanted to leave the island of Cuba could do so. A veritable human tidal wave followed this speech: starting in May, almost 90,000 Cubans left their country for the United States. It is estimated that by the time the port of Mariel was closed again in September 1980, more than 125,000 Cubans had emigrated. Half of them settled in Miami, causing the labor force there to swell by 7%.

Between April and July 1980, in the space of three months, the unemployment rate in Miami soared, going from 5% to 7.1%. This flare-up of unemployment aroused the kind of reaction one can imagine. In some quarters the Cuban refugees were recklessly accused of stealing work from the least qualified Americans. Perhaps those who think that the number of jobs is bounded by (mysterious) limits independent of the size of the labor force were about to be proved right. If they were, this expansion of the labor force would do nothing other than expand the volume of unemployment. One way to test this thesis—the only way, actually—is to address this question: what would have happened in Miami if the Mariel boatlift had never taken place?

A Canadian economist, David Card, took on this problem. But he is not a seer, just a professor at the University of California at Berkeley, incapable of knowing any better than anyone else what would have happened in Miami if the Mariel boatlift had not occurred, since in reality it did occur. Economists very often encounter problems of this type. They try to solve them by comparing the real circumstance to a "control" situation, one that mirrors the real circumstance as closely as possible without the "disturbance" the effects of which they want to assess. In the case at hand, the Mariel boatlift constitutes the disturbance. David Card had the idea of taking as his controls U.S. cities with economic and demographic profiles similar to those of Miami but which had not been affected by the great wave of Cuban immigration in 1980. He picked Atlanta, Los Angeles, Houston, and Tampa–St. Petersburg. Like Miami, these four cities included large black and Hispanic communities and had undergone similar changes in employment and unemployment in the years before the Mariel boatlift. Card compared the average movements of wages and unemployment before and after the Mariel boatlift in the black,

Hispanic, and white communities in these five cities, taking into account differences of education, experience, marital status, industry sector, and amount of part-time work. This approach, called difference-in-differences, has become one of the core empirical strategies in labor economics.

In 1979, a year before the Mariel boatlift, the unemployment rate in the white population of Miami reached 5.1%; in 1981, a year after the Mariel boatlift, it fell to 3.9%. In other words, the unemployment rate in the white population of Miami went down by 1.2 percentage points between 1979 and 1981. Over the same period, the unemployment rate in the white population of the control cities also went down, but only by 0.1 percentage point. The comparison of these two figures, 1.2% and 0.1%, warrants the conclusion that the influx of Cubans into Miami did not have a negative effect on employment within the white population. This can be seen on the upper panel of figure I.1.

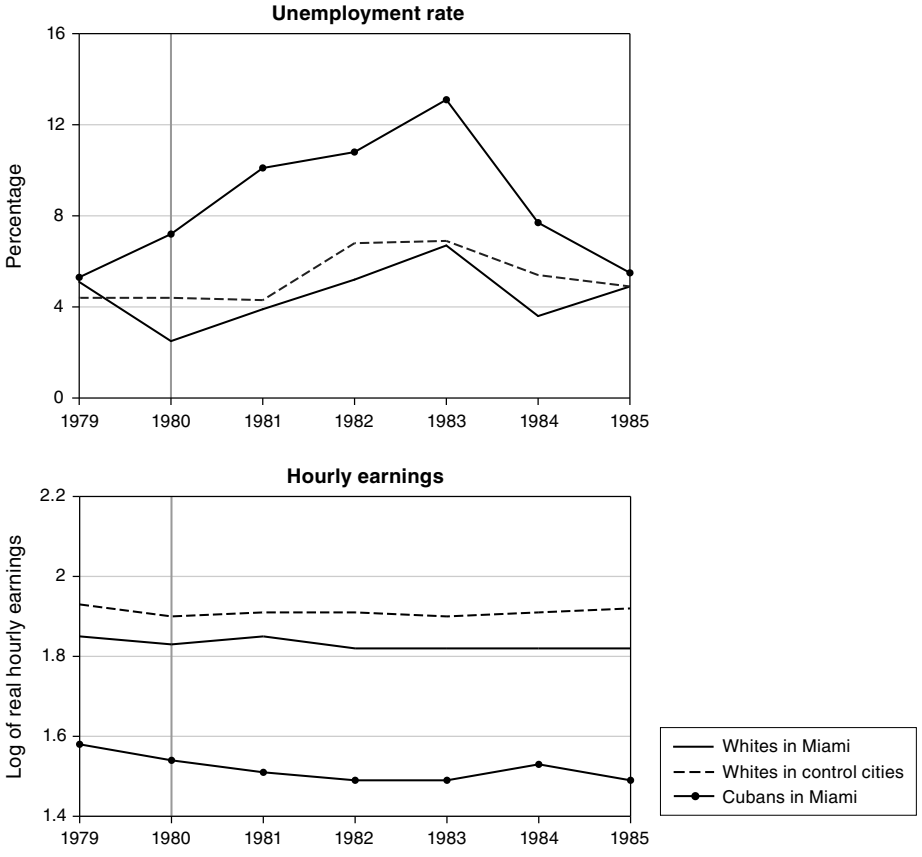

Figure I.1
Unemployment rate and earnings among whites and Cubans in Miami and control cities around 1980 (active population 16–61 years old).

Source: Card (1990, tables 3 and 4, pp. 250–251).

Neither did the Cuban influx have a negative effect on the black population, though that was the one most exposed to competition from the new refugees. It is true that the unemployment rate in the black population rose by 1.3 percentage points between 1979 and 1981, but in the same period it rose by 2.3 percentage points in the control cities. More generally, Card's study shows that patterns of development in the labor market in Miami and the control cities were very similar long after the Mariel boatlift. The earnings differentials across cities were also constant between 1979 and 1984, as shown on the lower panel of figure I.1 for the white population. So the Cuban immigration had no significant effect on the wages and employment of persons living in Miami, although it had a strong albeit temporary impact on the unemployment rate among Cubans because many had to look for a job upon their arrival. After a very strong upsurge of unemployment immediately following the arrival of the new immigrants (remember that the unemployment rate in Miami went from 5% to 7.1% between April and July 1980), all indications are that this city absorbed an exceptional influx of newcomers in the space of a year.

One objection immediately comes to mind. Might these results not be the result of the flight of a large proportion of the resident population, which left to seek jobs elsewhere because of the incoming tide of Cubans? Card was able to establish that in the years following the massive upswing of Miami's population in 1980, employment opportunities among the nonmigrants in this city did not degrade appreciably in comparison to the control cities. Thus, if there was a flight of the resident population, it was a small one. The majority of studies focusing on the United States, and on many other countries, come to analogous conclusions: inflows of migrants have a very weak impact on wages, employment, and the mobility of residents.

These results may occasion surprise, but they cannot be ignored. The rapid absorption of the Mariel immigrants was made possible by the presence in the Miami region of relatively low- to semi-skilled industries, such as apparel, textiles, agriculture, furniture, private household services, hotels and motels, and restaurants. These industries typically expanded at that time in cities with strong immigration. New cohorts of migrants also replaced earlier cohorts as the latter moved to more desirable jobs. These realities are incompatible with a static vision of the market, in which the number of jobs would be thought of as a set quantity and in which it would be taken for granted that immigration or any shock that increased the labor supply was certain to have strong, persistent, and detrimental effects on wages and unemployment.

We mention David Card's article right at the beginning of this book for a good reason: it can stand as a virtual emblem of the whole of labor economics in at least two respects. First, it brings to light relations of cause and effect. The Mariel boatlift constituted a sudden and unanticipated shift in a single variable, the quantity of immigrant labor present on the Miami market, just as in a laboratory experiment where scientists modify one factor in an environment while holding the rest constant. Thanks to this sudden and isolated change, Card was able to pinpoint, and throw into relief, the impact of the Cuban migration on a labor market in the United States. Hence the

Mariel boatlift qualifies as a "natural experiment." Over the last few decades the elaboration of experimental designs capable of registering genuine relations of cause and effect has profoundly reshaped labor economics. These techniques and their results are given plenty of space in our book. For that matter, David Card's experimental design yielded a "negative" result and so "disproved" a widely held misconception: massive as it was, the Cuban migration had no detectable impact on the path over time of the unemployment rate in Miami in comparison to other American cities that underwent no such influx. This counterintuitive result is a telling reminder of how quickly the labor market can react to change.

A second distinctive aspect of contemporary labor economics is this: the progress made since the 1980s in the acquisition of data has revealed that such phenomena as job creation and job destruction, and flows of manpower in general, have orders of magnitude hitherto unsuspected. These are fresh facts, and they too have profoundly reshaped our conception of the labor market. Today the labor economist conceives the labor market in a dynamic perspective that takes fully into account its incessant recomposition. Our book faithfully reflects this dynamic perspective.

The Importance of Labor

Labor economics is the study of the exchange of labor services for wages—a category that takes in a wide range of topics. The main ones are labor supply, labor demand, the impact of education on wages and employment, the influence of technological change, the influence of human migration, the role of unions, the labor contract, working conditions, job search by the unemployed, discrimination, the institutional framework in which hiring and firing take place, mandatory payroll contributions, and finally the impact of the levers used by policy makers to achieve income redistribution and stimulate (or protect) employment.

Developing a specific field for labor economics is justified by the importance of the exchange of labor services in modern economies. A large part of the population is made up of employees who are earning wages and others aspiring to become wage earners in the future if they have not yet left the educational system, or aspiring to become wage earners right now if they are looking for work. Figure I.2 tracks the path over time of employees as a proportion of the overall population of working age in 18 OECD (Organization for Economic Co-operation and Development) countries from 1970 to 2010. The proportion of employees is clearly high and has been rising over the last 40 years. It is influenced by the demand for labor, and that is an explanatory factor for its sharp drops during the 2008–2009 recession. It is also influenced by education and labor supply decisions that we analyze in detail in this book. Naturally employees make up the bulk of the category of all workers, which includes independent workers and employers. Their share has increased over the past 40 years and now ranges from 70% to over 90%, as shown in Figure I.3 for the same 18 countries. This explains the focus of labor economics on labor contracts and relations between firms and employees.

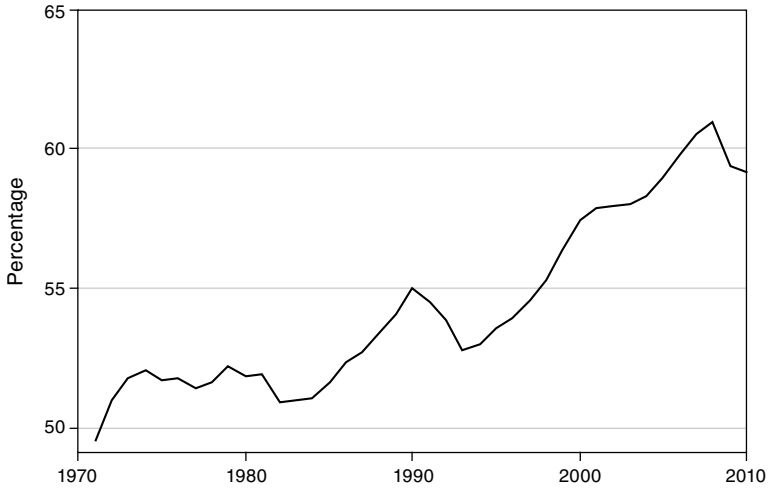

Figure I.2
Share of employees in the working-age population (15–64 years old) between 1970 and 2010 in 18 OECD countries.

Note: Nonweighted average of Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Korea, Norway, Portugal, Spain, Sweden, United Kingdom, United States.

Source: OECD Annual Labor Force database.

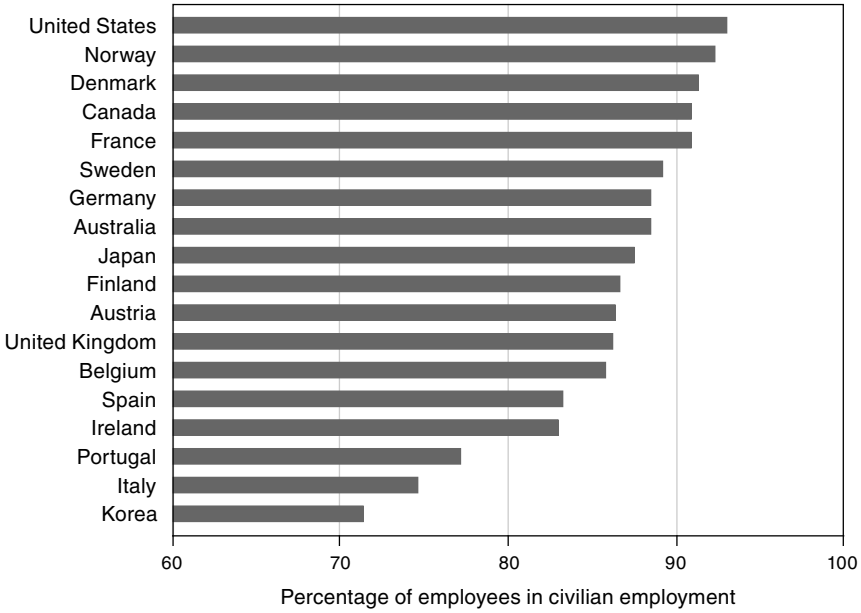

Figure I.3
Share of employees in civilian employment in 2010 in 18 OECD countries (Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Korea, Norway, Portugal, Spain, Sweden, United Kingdom, United States).

Source: OECD Annual Labor Force database.

Models

Throughout this book we make plenty of room for facts. But we also present theories, most often in the form of mathematical models that have been built by labor economists in order to probe these facts and elicit their meaning. We also present techniques that enable them to compare the predictions of their models against the facts. Hence, we move back and forth between facts and data on one hand and theoretical reasoning on the other. For example, the study of labor supply includes descriptive material on the evolution of participation rates and the number of hours worked, as well as a model that explains individual choices on the basis of traditional hypotheses about individual rationality and scarcity of resources. Methods of assessing this model empirically, and the main empirical results, are then laid out. In this way we are able to understand, assess quantitatively, and predict the impact of changes in wages, the fiscal system, or social assistance on the labor supply in different contexts.

Economics makes use mainly of mathematical models. This textbook conforms to that rule. At least three reasons may be cited in justification.

The first, and by no means the least compelling, lies precisely in the quasi-monopoly held by this approach. The student owes it to himself or herself to become familiar with it if he or she wants to be able to read specialized journals in the field. But the domination of formalized economics is not the outcome of a random draw from among several possible equilibria. For one thing, economic analysis lends itself to mathematization, since it deals with quantified magnitudes. The questions put to economists generally demand answers in the form of numbers: Is wage inequality rising? Is competition from low-wage countries destroying jobs? Are mandatory contributions favorable to employment? In order to be precise and operational, the answers to questions like those have to be given in numbers, justified by a coherent chain of reasoning, with the underlying hypotheses made clear.

These requirements constitute another justification of mathematization. A mathematical model allows us to clearly establish a linkage between hypotheses and results. It proves particularly effective, indeed indispensable, when the mechanisms studied are complex and involve relations among a number of variables. Mathematization is entirely unavoidable if we want to understand strategic interactions, decisions made in uncertainty, situations of asymmetric information, and the dynamic choices of agents, to give a few examples.

Labor economics and all of economics have undergone a profound theoretical restructuring in recent decades, benefiting especially from advances made in the study of dynamics, strategic behavior, and decisions in uncertain environments. Both the analysis of labor supply, labor demand, wage formation, and the determinants of employment and unemployment, and the evaluation by labor economists of government interventions have been profoundly shaped by these advances. Our aim is to set this spectrum of developments before the reader within a unified didactic framework and to show that they have measurably improved our understanding of the functioning of the labor market. We have nevertheless taken great care to make our models as simple as possible. A mathematical appendix at the end of the book supplies the toolkit needed

to understand all the models utilized in the text. Finally, we have tried to articulate our theoretical and empirical lines of reasoning.

Econometrics and Evaluation

Readers should be aware that, beginning in the 1970s, labor economics has become the preferred arena in which to apply the most advanced econometric methods (microeconometrics in particular). The surveys by DiNardo and Lee (2011), French and Taber (2011), Keane, Todd, and Wolpin (2011), and List and Rasul (2011), and the book by Angrist and Pischke (2009) trace the development of empirical research in this field. The 1990s and 2000s have been particularly fruitful in this regard, and such empirical techniques as the experimental method, techniques for the estimation of structural models, and dynamic approaches have gained in importance. For example, the development of structural models of duration has permitted a better understanding of the behavior of those hunting for work and of the role unemployment insurance plays. Evaluative techniques that rely on natural experiments, field experiments, or laboratory experiments have likewise permitted some answers to some of the questions arising out of such controversial matters as discrimination and the real effect of certain policy levers on employment. Yet much remains to be done.

In this book we therefore make plenty of room for presentations of the empirical techniques used by labor economists, stressing the hypothetical underpinning required to bring to light a causal relation (when that is possible). Our presentations rely on one or several published articles to which we refer in each chapter and list as Further Readings. These articles have been chosen because they rely on methods that have risen to classic status and on clear strategies. Convinced that learning comes from doing, we present these reference articles in detailed fashion so that the reader may follow the methods employed step by step and learn to understand the conditions of validity and the limitations of their results. The website linked to this book, www.labor-economics.org, contains databases and programs that allow users to work through the main results of these articles for themselves. In addition to the short list of these essential articles, we supply extensive bibliographies for each chapter.

Road Map

This book is composed of four parts. Part One presents labor supply and labor demand behaviors. It shows how the interaction of supply and demand on competitive markets determines wages and employment. It also shows how the mechanisms of competition drive investments in education and training.

Chapter 1 presents consumption–leisure trade-off models and the theory of labor supply. Scrutiny of the trade-off between consumption and leisure is especially important for understanding fluctuations in the participation rates of different categories of the population and the choices people make about how much to work and when to retire. It includes a guide to the econometrics of labor supply and gives an example of

the identification of labor supply elasticities. Chapter 2 is dedicated to labor demand, first from a static perspective and then a dynamic one. Here we look at important questions like the impact of the costs of the factors of production on labor demand and substitution between capital and labor, the trade-off between workers and hours, and the effects of the adjustment costs of labor. Chapter 3 describes the basic competitive equilibrium model of the labor market. This model offers important insights into the problem of fiscal incidence. It also makes predictions on how wages and employment react to labor demand or supply shocks. As well the chapter provides examples of how to estimate labor demand elasticities. Extensions of this competitive model also predict how wage differentials should compensate for the laboriousness or danger of tasks, or how even minuscule differences in talent can translate into huge remuneration differentials. Chapter 4 presents decisions about education and their impact on individual performances in the labor market. This chapter specifies the determinants of individual choice about education and also the economic role played by education, which serves not just to transmit knowledge that improves productivity and socialization but also to select individuals within different productive sectors.

Part Two comprises four chapters devoted to imperfectly competitive labor markets. It shows how job search costs and asymmetric information shape workers' and employers' behaviors. It also provides insights on the role of unions and on the existence of discrimination.

Chapter 5 describes labor markets in the presence of job search costs. It explores the implications of costs arising from searching for a job when workers do not have cost-free access to perfect information about all the jobs available in the economy. The search model yields predictions that shed light on how the duration of unemployment depends on the characteristics of unemployed workers and how it is influenced by unemployment insurance. The chapter provides examples of how labor economists have gone about evaluating the impact of changes in unemployment insurance benefits. The search framework can also explain why identical workers can be paid differently and why small and large firms do not offer the same wages. Chapter 6 explores more deeply wage policies in situations of uncertainty and imperfect information, using agency and implicit contract models. These models throw interesting light on the logic of certain aspects of human resources management, like advancement by seniority and systems of promotion. The chapter explains under what circumstances firms and workers will have an interest in engaging in long-term relationships and why firms may have recourse to hierarchical promotions, internal markets, or other remuneration strategies to motivate workers. It also shows how social preferences and reputation effects may interact with incentives. Chapter 7 introduces collective bargaining, focusing on the behavior of unions and the manner in which we formalize the bargaining process. It analyzes the determinants of unionization and the impact of the bargaining power of workers on employment, profits, and productivity at the firm level; it also discusses strategies for the identification of these effects. The chapter looks as well at the opposition between employees with a steady job, the insiders, and workers who do not have this security, the outsiders, and shows that this opposition may be detrimental to employment and favor

the segmentation of the labor market. An example is given of the identification of the causal impact of labor unions in the United States. Chapter 8 shows how discrimination can arise and persist when labor markets are imperfectly competitive. It introduces several competing sources of discrimination known in the literature as "taste for discrimination" and "statistical discrimination," and it explains the role search frictions play in the persistence of discrimination. Several methods of estimating discrimination are presented in detail, notably for the cases of discrimination against blacks and women. Since discrimination can account for only a fraction of wage differences, other important "premarket" factors, such as ability and psychological attributes, are also discussed.

Part Three presents the contemporary perspective of labor economics on the phenomenon of unemployment and the role unemployment plays in the huge processes of job creation and job destruction that are going on at every moment in modern economies. These three chapters build on the job search and matching model and provide a detailed account of job and worker reallocations. This approach helps readers gain an understanding of the phenomenon of unemployment and the impact of technological progress and globalization on labor markets.

Chapter 9 reviews the main facts regarding unemployment in the OECD countries and uses search and matching models to study the determinants of employment and wages in a labor market in which jobs are ceaselessly destroyed and created and in which the reallocation of manpower is costly and takes time. In this chapter we diagnose the importance of frictional unemployment arising from the process of job destruction and creation. Chapter 10 studies the effects of technological progress on income inequality and unemployment. It recognizes the heterogeneity of manpower by distinguishing workers according to their skill levels. The chapter shows that technological progress had a significant impact on wage inequality and on the occupational structure of the workforce over the last century, and it analyzes in detail the phenomenon of wage and job polarization observed in the advanced economies over the recent decades. Chapter 11 turns to the effects of globalization (trade and migrations) on income inequality and unemployment. It shows that trade may have a positive impact on the productivity of firms and, as a result, can influence inequality and unemployment, depending on the capacity of the labor market to adjust. The chapter also shows that the impact of migration on wages and unemployment ought to be small even in the short term. The long-term trends of trade and migration are presented in detail, along with a number of empirical identification strategies.

Part Four contains three chapters devoted to public policy and the levers available to policy makers. The aim of this part is to subject the rationale and the impact of such policy levers to analysis. This analysis is conducted from an international perspective, highlighting the strong heterogeneity across countries.

Chapter 12 focuses on income redistribution policies and analyzes the impact of taxes and benefits on wages, employment, unemployment, labor market participation, and hours of work. The question of fiscal incidence is examined in detail. The chapter also presents the main features of minimum wages, a policy lever that is integrated into overall income policy in a number of OECD countries. The impact of the minimum

wage on labor market performance is analyzed in detail, as well as the empirical debates that have arisen concerning the issue, notably in the United States. Chapter 13 turns to insurance policies and employment protection legislation. It provides an overview of the unemployment insurance and employment protection systems in the OECD area. The principles of optimal unemployment benefits are characterized in various settings, and the impact of employment protection measures on wages, unemployment, productivity, and segmentation is set out for the reader. The chapter explores the potential interactions between employment protection and unemployment benefits. Chapter 14 surveys the variety of active labor market policies that have been implemented in the OECD countries to lower unemployment and analyzes their respective advantages and drawbacks in an equilibrium framework. It discusses the methodological principles that guide the evaluation of such labor market policy levers and provides an assessment of their respective impacts. The chapter provides detailed examples of identification strategies with respect to equilibrium effects and a synthesis of empirical results based on meta-analyses of hundreds of evaluation papers.

How This Book May Be Used

We deal with a wide range of topics in this book, and not all of them present the same degree of formal and conceptual difficulty. Those to whom they are taught may be studying for a degree at the level of bachelor, master, or doctor. The book's length dictates, moreover, that instructors using it to prepare courses in labor economics will assign selected readings. Here we offer examples of what we think are practical sequences.

- A course in basic labor economics, foregrounding competitive structures and behaviors in an essentially static environment

  1. Facts about labor supply (chapter 1, section 1), the basic model of labor supply and its various extensions (chapter 1, sections 2.1 and 2.2), and the econometric approach (section 3.1) followed by the empirical results (section 3.2). The econometric approach can also be presented using the evaluation of the impact of taxes on labor supply (chapter 12, section 1.3).

  2. The static theory of labor demand (chapter 2, section 1) as well as empirical estimates of the elasticities of labor demand (section 2).

  3. The competitive equilibrium (chapter 3, section 1.1), the question of tax incidence (section 1.2), and the adjustment to a shock on labor supply (section 3.3).

  4. Problems connected to education (chapter 4), including the factual elements (section 1), the theory of human capital (section 2.1), and the empirical assessment of the returns to education (sections 4.1 and 5.1).

5. Introduction of obstacles to competition, leading to discussion of monopsony (chapter 12, section 2.2.1) and theories of discrimination (chapter 8, section 2), and empirical work on compensating differentials (chapter 3, section 2.2), on discrimination (chapter 8, section 4), and the minimum wage (chapter 12, section 2.3.2).

6. The evolution of wage inequalities (chapter 10, section 2.1), taking into consideration the role of technological progress (section 2.2), international competition (chapter 11, section 1.2), and migratory flows (chapter 11, section 3.2).

7. The assessment of labor market policies (chapter 14, section 2), including elements of methodology (section 3.1) and the main empirical results (section 4).

- An in-depth course oriented toward microeconomics and dealing with wage formation and dynamic and informational problems

1. The intertemporal labor supply (chapter 1, section 2.3), with an example of the identification of elasticities (chapter 1, section 3.1).

2. Problems connected to education (chapter 4), bringing in the determinants of the duration of studies (sections 2.2 and 2.3), the signaling model (section 3), and the shift from the model of human capital to empirical identification, with the main results (sections 4 and 5).

3. Compensating wage differentials (chapter 3, section 2).

4. The effect of talent on wage distribution (chapter 3, section 3).

5. The assignment of skills to tasks (chapter 10, section 2.2).

6. The job search model and how it applies to wage formation (chapter 5).

7. Optimal unemployment insurance (chapter 13, section 1).

8. The dynamic theory of labor demand (chapter 2, section 3).

9. The labor contract in the presence of uncertainty and problems of incentive (chapter 6).

10. Collective bargaining (chapter 7).

11. Discrimination (chapter 8).

- A course in labor economics more focused on problems of unemployment and inequality

  1. Job search (chapter 5).
  2. The search and matching model (chapter 9).
  3. Technological progress and unemployment (chapter 10, section 1).
  4. Technological progress and inequality (chapter 10, section 2).
  5. International trade (chapter 11, sections 1 and 2).
  6. Migrations (chapter 11, section 3).
  7. Taxes and benefits (chapter 12, section 1).
  8. Minimum wage (chapter 12, section 2).
  9. Unemployment insurance (chapter 13, section 1).
  10. Employment protection (chapter 13, section 2).
  11. Training, employment subsidies, and job search assistance (chapter 14).

Data and Stata Programs and Teaching Material

For most of the facts set forth in this book, and also for the complete set of reference articles that are given detailed presentations, the relevant data are available, chapter by chapter, at the website www.labor-economics.org. In addition to databases, the site offers files in the .do format that make it possible to reproduce the figures and tables of estimations under Stata.

There follows a nonexhaustive list of the topics of the empirical reference articles for which the data are available at www.labor-economics.org.

- Assessing labor supply elasticities following tax changes, using grouping estimates (Blundell, Duncan, and Meghir, 1998; chapter 1, section 3.1.2).
- Assessing labor demand elasticities following a shock on labor supply, using instrumental variables (Acemoglu, Autor, and Lyle, 2004; chapter 3, section 1.3).
- Evaluating the impact of education on earnings, using instrumental variables (Angrist and Krueger, 1991; chapter 4, section 4.2.3).

- Evaluating the impact of unemployment benefits on the duration of unemployment, using difference-in-differences and duration models (Lalive, van Ours, and Zweimuller, 2006; chapter 5, section 3).
- Identification of discrimination, based on wage equations (Neal and Johnson, 1996; Lang and Manove, 2011; chapter 8, section 3.1).
- Identification of discrimination, based on the Blinder-Oaxaca decomposition method (O'Neill and O'Neill, 2006; chapter 8, section 3.2).
- Measuring the influence of technological progress on wage inequality between high- and low-skilled workers (Acemoglu and Autor, 2011; Autor and Dorn, 2013; chapter 10, section 2.3).
- Empirical evidence on the relationship between trade and unemployment, based on macroeconomic data and using the Arellano-Bond method (Dutt, Devashish, and Priya, 2009; chapter 11, section 2.1).
- The effect of migration on local labor markets, using spatial correlations and instrumental variables (Boustan, Fishback, and Kantor, 2010; chapter 10, section 3.3.1).
- Measuring the impact of tax credits on labor market participation and hours, using a difference-in-differences estimator (Eissa and Liebman, 1996; chapter 12, section 1.3.1).
- Exploring the origins of the United States/Europe difference in working hours, based on macroeconomic data (Prescott, 2004; chapter 12, section 1.3.2).
- Identifying the impact of minimum wage increases on employment, using a difference-in-differences estimator (Card and Krueger, 1994; chapter 12, section 2.3.2).
- Identifying the impact of targeted job placement programs for skilled youth, based on a randomized experiment (Crépon, Duflo, Gurgand, Rathelot, and Zamora, 2013; chapter 14, section 3.2).

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