

THIRD EDITION

PERSONNEL ECONOMICS IN PRACTICE



EDWARD P. LAZEAR • MICHAEL GIBBS

WILEY



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Third Edition

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WILEY



In memory of Gary Becker

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PREFACE

WHAT IS THIS BOOK ABOUT?



The performance of organizations and economies is the sum result of the motivations, decisions, and actions of many individuals. These individuals and their actions combine to create innovation, higher economic growth, more job opportunities, and better products. The process by which this occurs is one of the miracles of modern economies and modern firms. It is also the topic of this book.

One can hardly overestimate the importance of understanding better how firms organize themselves and manage their employees. In large corporations, roughly three-quarters of all costs are human resource related. Similarly, roughly 70 percent of worldwide wealth is in the form of human capital—the skills and knowledge of individuals—rather than in physical or financial capital. Economies grow and change through the creativity and motivation of entrepreneurs and employees. The strategy of many firms today is explicitly human resource driven, emphasizing customization, service, and innovation.

Organization and management are also of fundamental importance to you. The topics discussed in this book take on increasing importance as your career progresses. Those at an early stage tend to focus on specialized areas of knowledge. As careers evolve, however, jobs tend to increasingly depend on supervision and management of others. A broader, general manager perspective becomes essential to coordinate the work of many. As the career evolves further, the ability to set up, structure, and manage the entire organization becomes important. A strategic overview of the organization, and how it relates to the firm's goals and environment, is necessary.

In order for a manager to be effective at these various stages, it helps to have a structured, rigorous framework for analyzing the issues you will face. Gut instinct, common sense, and wisdom from years of experience can be extremely valuable. However, combined with a deeper understanding of the issues and tradeoffs behind them, you can become even more effective. The purpose of this book is to give you a rigorous framework for understanding organizational design and the management of your employees.

The study of organizations and human resources has not always been rigorous, but that is changing. Economics has proven to be a powerful approach in this area, adding rigor and structure and clarifying many important issues. This area of economics is often called Personnel Economics.

DOES MANAGEMENT MATTER?



A recent study collected data on management practices and performance for a large set of companies around the world to try to assess whether organizational design was important for performance. Most of the policies analyzed were the kind discussed in this book, such as the firm's emphasis on continuous improvement, the extent to which it hires and retains the best performers, and the use of targets and incentives.

Does management matter? Their evidence is that it does, significantly. The study found that good management practices are strongly correlated with higher productivity, better quality of products and services, and better odds that the firm will survive competition and grow.

The researchers also found that management practices vary considerably within industries and countries and across the world. Firms that face stronger competition, including by competitors exporting from other countries, tend to have good practices. Multinational firms also tend to have better practices. By contrast, government- and family- owned firms tend to be less well managed. The fact that significant variation exists in management practices, even within the same industry in the same country, suggests that there is room for improvement, especially in emerging markets.

Source: Bloom and van Reenen, 2010



WHAT IS PERSONNEL ECONOMICS?

It may seem odd to apply economics to human resource and general management topics. In fact, it makes perfect sense. Economics is a methodology that has been applied to many areas of human activity and has had enormous influence on the social sciences. That methodology is quite flexible and can be applied to many problems involving human behavior. The ability to apply a consistent methodology allows us to develop a useful framework for studying organizational design.

Economists recognize two elements that drive human behavior. One is psychology (preferences). Understanding preferences and their formation and evolution is the realm of classical psychology. The second is the environment in which people act to attain their goals. This is the realm of economics which focuses on budgets, prices, constraints, information, and incentives. It also focuses on social interactions, because an employee's colleagues, manager, and customers play important roles in driving behavior.

This distinction between preferences and the environment is recognized in psychology. The subfield of social psychology generally focuses on the impact of the environment on individual behavior—just like economics. The fields of social psychology and personnel economics study many of the same issues, although from somewhat different perspectives. This also means that what we often think of as psychology is not, in the purest sense.

Because economics focuses on the effects of the environment on behavior, it generally starts with only crude assumptions about preferences of individual employees. This is more of a virtue than it might seem. The more abstract and general the model, the wider its applicability. Thus, in economics we may assume that employees attempt to maximize their pay. By pay, we mean not only compensation, but also benefits, job amenities, work environment, and other things offered by the firm that they might value. A theory of pay for performance then has relevance for using any motivational tool, not just cash.

The key part of the economic approach is to focus on how the environmental variables—information, resources, constraints, decisions, and incentives—affect the outcome. Those are the issues that are analyzed in this book. More often than not, the analysis results in a statement of one or more important tradeoffs between benefits and costs that must be balanced.

Two results of this approach are worth noting here. First, the economic tools that we employ are used to analyze a variety of problems. This allows us to provide a more structured approach to the topics covered in this book. By the end of the book, we will be able to develop a framework for thinking about organizational design as a whole.

Second, economics focuses on variables that managers have a great deal of control over. The primary factors analyzed in this book are information, decisions, investment, and incentives. These are exactly the levers that managers tend to have the most ability to pull to better design their organizations. It is much easier to alter the incentives than to change the psychology of your workforce.

Recently many firms have begun using “workforce analytics” techniques to analyze the design and effects of personnel policies such as recruiting, training, feedback, and performance evaluation. Personnel economists have been doing the same for decades—practice is finally catching up with the research. Scholars have collected many novel datasets, drawn from personnel records and intranet systems inside firms, surveys of employees and employers, matched worker–firm datasets collected by governmental statistical agencies, and experiments run by companies. Some of the examples we describe in this book come from just this kind of research, and they illustrate that the concepts, frameworks, and way of thinking presented in the book are even more practical in the days of workforce analytics.

It was mentioned earlier that economics and social psychology are different fields analyzing similar topics (organizational sociology could be added to this group as well). There is a great deal of healthy dialogue (competitive and cooperative, as it should be) between economists, social psychologists, and sociologists studying the issues covered in this textbook. Personnel economics has grown out of this dialogue. It started as a small subfield of labor economics. It then incorporated new insights from informational economics to start studying management of employees inside firms. Over time, personnel economics became more refined and more successful and started to incorporate insights, evidence, and topics from social psychology and organizational sociology. (It can be argued that personnel economics is causing those fields to evolve as well.) Thus, while our approach and emphasis is economics, this book is more properly thought of as the result of an active debate between, and mixing of, different social sciences that study management issues.

Of course, a full understanding of human resource management also requires the study of psychology and sociology. This text does not pretend to be the final word on organizational design. Rather, it is a strong complement to more traditional approaches, as well as a fresh approach for most students and managers.

One final note: economics facilitates a relatively rigorous analysis of organizational design. Many of the chapters in this book have appendices with more mathematical discussion of key concepts. The appendices are available online at our Companion site, <http://www.Wiley.com/College/Lazear>. We strongly encourage you to study the appendices for each chapter as you work through the book.

◆◆◆◆ WHO IS THIS BOOK FOR?

This book has several natural audiences. Undergraduates would benefit greatly from studying the book. In fact, we believe that in most cases, they will benefit more by taking a course using this book than they would by taking a traditional labor economics course. Not only will they learn and apply ideas from microeconomics, such as incentive theory, but they will learn principles that will be valuable in their careers.

We both teach MBA students and write this book from that perspective. It provides a way to think about overall organizational design, as well as specific human resource policies. Because MBAs tend to become consultants, general managers, or run organizations themselves, the issues and approach used here are extremely relevant for such students. Executive MBA students should also find the book useful. It will provide them with rigorous frameworks to better understand and use their well-earned experience and common sense to make it even more powerful and effective.

Although the focus of the book is on personnel policies and organizational design, it is not written for a human resource specialist. Specialist texts focus on detailed examination of how to implement personnel policies, such as design of a pension plan or a performance appraisal form. Nevertheless, the text should be extremely valuable to an HR specialist, because it provides a strategic and analytical overview for human resource policies. It provides the broader perspective that is necessary before focusing on the details. For similar reasons, the sophisticated general manager who seeks a rigorous and practical understanding of HR and organizational design may find this book to be a more challenging read than most business books, but also of far more substance.

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Part One

SORTING AND INVESTING IN EMPLOYEES

The textbook has three core sections, followed by a shorter section with applications and advanced summary discussions. In this first section, we take a simple view of employees that is quite similar to that taken in much of biology: nature versus nurture. In our context, employees bring to the workplace certain innate abilities, such as to think quickly or creatively or to work with numbers. They also develop new or more advanced skills through education, experience, and on-the-job training.

The topics of this section are how to sort employees by their innate or accumulated skills, how to invest further in their skills, and how to manage their exit from the organization, as a function of their talents and skills. One can think of a firm's career policies as a kind of pipeline, bringing employees in, developing and promoting them, and eventually transitioning them out. That is the sequence of this section.

In the process of exploring these issues, several important economic concepts are introduced: asymmetric information, investment, labor market constraints on firm policies, and different methods of contracting.

Asymmetric information refers to situations where two parties to an economic transaction (in our case, the firm and the employee) have different information that is relevant to the transaction. Problems of asymmetric information are ubiquitous in economies and organizations (e.g., the quality of a new hire or the effort that an employee expends on the job). They also tend to lead to inefficiencies, because incorrect decisions are made, because lack of information creates risk, or because one party exploits its informational advantage for personal gain at the expense of overall efficiency.

Asymmetric information arises in recruiting because the employee has more information about suitability for a job than does the firm (the opposite case may also arise). This presents a challenge for firms and employees during recruiting. We will see that one way to deal with this is to use the economic principle of *signaling*, which encourages

2 • Sorting and Investing in Employees

the employee to use his or her information in a constructive rather than strategic way. The idea of signaling has applications in many areas of business, and we shall mention a few. This is an example of how the tools used in this book have broad application outside of employment.

The second economic tool used is the idea of optimal investment. Employees and their employers can invest in their skills. In studying this issue, we use ideas that also play a role in finance courses. We will also consider the constraints that labor markets impose on human resource policies in firms—for example, whether a firm should invest in employee skills.

Finally, we will see three approaches to thinking about economic transactions or contracts. We start with the simplest—a spot market whereby the firm simply pays an employee's market price at each point in time. This is the standard view in introductory microeconomics classes. But in trying to improve recruiting, we will see the need for more complex, multiperiod *contracts* between the firm and the employee. These contracts will also be *contingent*, in this case on employee performance. Finally, in some cases we will see that the contract between the firm and the employee involves *implicit* or informal elements, because it is not always possible to write complete formal contracts. This gives us a useful framework for thinking about the overall employment relationship and even issues such as corporate culture.



SETTING HIRING STANDARDS

When you're around someone good, your own standards are raised.

—Ritchie Blackmore, 1973

In this chapter our goal is twofold: to introduce the topic of recruitment and to introduce the economic approach used in the textbook. Let's ease into both by considering an example.

AN EXAMPLE: HIRING RISKY WORKERS

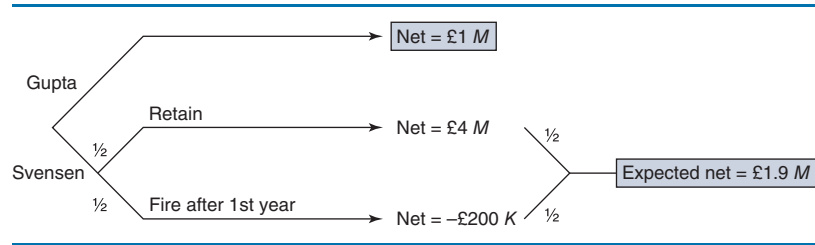


New Hires as Options

Imagine that you are a partner in an investment bank in the City (financial district) in London and are deciding between two candidates to fill a position as an associate (junior) investment banker. Gupta has the standard background of most of the applicants that you see, including a degree in economics, a few years of experience as a financial analyst, an MBA with a focus in finance, and a summer internship at an investment bank. You feel that his productivity is highly predictable, and that he can produce £200,000 of value per year. Svensen, however, has a very unusual background compared to other applicants. She has a strong track record and appears quite talented, but does not have much experience related to investment banking. Thus, you feel that her success is much less predictable. She may turn out to be a star, in which case she will produce £500,000 per year, but she may also turn out to be a disaster, actually losing £100,000 per year. Suppose that each of these outcomes for Svensen is equally likely (50 percent odds). Then *expected* (average) output from Svensen in any given year is exactly the same as the output from Gupta:

$$\text{Expected output from Svensen} = \frac{1}{2} \cdot \text{£}500,000 - \frac{1}{2} \cdot \text{£}100,000 = \text{£}200,000.$$

FIGURE 1.1
HIRING A RISKY OR PREDICTABLE WORKER



If the cost (wages and benefits) of both employees is the same, which is the better hire? The answer might seem counterintuitive, but often the firm should hire the *riskier* worker.

Suppose that both Svensen and Gupta can be expected to work at your firm for 10 years. Suppose further that it takes one full year to determine whether Svensen is a star. The salary is £100,000 a year, and for the moment let us assume that this will be the salary for the foreseeable future.¹ In that case, your firm earns a profit of £100,000 per year from Gupta, for a total value of £1 million over 10 years. The top branch of Figure 1.1 shows this choice.

Alternatively, you can hire Svensen. With probability equal to $\frac{1}{2}$ that Svensen is a star, producing £500,000 per year, your firm earns profits of £400,000 from employing her for 10 years, netting £4 million. With probability equal to $\frac{1}{2}$ that Svensen loses money for your firm, you can terminate her at the end of the year, so the total loss is £200,000, including her salary. These two outcomes are the remaining branches in Figure 1.1. Thus, the expected profit from hiring Svensen is:

$$\text{Expected profit from Svensen} = \frac{1}{2} \cdot £4,000,000 - \frac{1}{2} \cdot £200,000 = £1,900,000.$$

Svensen is therefore almost twice as profitable to hire as Gupta! Even though the two candidates have the same expected value, Svensen is worth much more. The firm can keep her if she turns out to be a good employee and dismiss her if she turns out to be a bad one. The firm has the option of firing poor workers and keeping the good ones.

This is the argument that is sometimes made for hiring workers with potential over conservative, proven ones. With the more proven worker, the firm gets a solid performer. With the risky worker, the firm may find that it made a mistake, but this can be remedied relatively quickly. It may also find that it has a diamond in the rough. In such a situation, it may make sense for the firm to *lower* (or broaden) recruiting standards and consider some less conventional candidates.

¹In this example, we ignore issues of present value by assuming that the interest rate is zero to keep things simple. When we do this in examples in this book, it is always the case that the intuition that is developed would be identical if we used discounted present values. Similarly, all examples in this text use inflation-adjusted figures, since inflation does not affect the conclusions.

This simple example can be quite surprising to many students, since it seems to contradict the intuition that, if expected values are equal, risk is always a bad thing. However, risk is not a bad thing in the case of real options such as hiring employees. It is a nice example because it illustrates how formal economic analysis can lead to better decisions. Our intuition tends to be the opposite of the correct answer in this case.

Analysis

The structure developed here suggests several other factors that are important in deciding whether to take a chance on a risky hire.

Downside Risk

The value of taking a chance on a risky candidate can be so large that it is often the better strategy even if the safe worker has a higher expected value per year. Even if Svensen might have been a total disaster, destroying £1,000,000 of value with a probability of $\frac{1}{2}$, it would have paid to take a chance on her. However, the more the potential there is for an employee to destroy value, the less likely is it to be optimal to take a chance on a risky worker.

Upside Potential

Svensen was potentially valuable because she could generate high profits if she turned out to be a star. The greater those profits, the greater the option value from a risky hire. Thus, in jobs where small increases in talent lead to large increases in value creation, hiring risky candidates will be even more valuable (as long as there is no increased downside risk as well). Think of an entrepreneur assembling a new management team. There is little to lose, but there may well be much to gain. In such a case, it will make more sense to take a chance on a risky candidate.

Our analysis applies better to job applicants with more uncertainty about their potential performance. Little is known about a recent graduate with a short resume, but someone who has 20 years of experience may have more predictable performance. Firms might take more chances on new labor market entrants. Similarly, a job applicant who is changing occupations may be worth considering.

Finally, firms should consider the upside potential of the specific candidate. An applicant with an unusual background, but with evidence of adaptability to different situations, creativity, and strong abilities, may be a good person to consider for a risky hire.

Termination Costs

The more costly it is to fire a worker, the more costly is a risky candidate. Nevertheless, it may still pay to hire the risky worker and terminate in the case that the worker does not turn out to be a good fit, even if there are high termination costs. In most countries, firms are prevented from terminating workers at will. Legal or social restrictions can make the option of firing a worker after one year costly. Consider the extreme case where hiring is for life. If the firm is risk neutral (is willing to accept any risks, as long as expected values are equal), as long as Svensen's expected productivity is equal to or greater than Gupta's, it will be a profitable bet to hire Svensen. More generally, the benefits from the

case where Svensen turns out to be a star are so high that it would often be worth hiring Svensen even if firing costs were high.

Risk Aversion

If the firm is risk averse, it may still be optimal to hire Svensen. Svensen will now be costly to the firm in a different way, because she is risky. However, the differences in expected productivity are quite large and should more than compensate for typical levels of risk aversion.

AN IMPLEMENTATION PROBLEM



The issue of risk aversion raises an interesting point. When managers and recruiting specialists are taught this example, their typical response is to reject its conclusions, saying that they would be more conservative in hiring. Why is this the case? Is the theory wrong or are the managers wrong? Quite possibly, neither. Rather, the analysis assumes that the firm is relatively risk neutral. However, decision makers are typically risk averse, and this will affect their decisions. For example, they might expect that they will be criticized or receive a poor evaluation if they hire a bad candidate for the job. The more risk averse they are, the more they will make decisions to avoid such an outcome.

To the extent that a manager's risk aversion is different from that of the employer, this is an incentive problem or a conflict of interest. This is a topic that we will address in Chapters 9–12. In the meantime, if those who make hiring decisions are too conservative, a possible solution to the problem would be to try to avoid punishing them when they make mistakes in hiring. Another would be to appoint less conservative managers to handle recruitment.

Length of Evaluation

The time that it takes to evaluate whether Svensen is a star or a disaster affects the value of hiring a risky candidate. If the evaluation takes 10 years, in our example there is no value to hiring Svensen. If the evaluation takes only one year, the firm can limit its cost of a disastrous hire to only one year of pay and poor productivity.

Length of Employment

The value of hiring Svensen would have been even greater if the firm could have employed Svensen for more than 10 years. For example, if Svensen was 30 years old when hired and stayed at your company (for the same salary) until retirement, the profit from hiring Svensen would be £14 million if she turned out to be a star (£400,000 per year × 35 years). This suggests that the value of a risky hire will usually be larger the younger the new hire and the lower the turnover in the company (so that employees tend to stay with the firm longer).

A Counterargument

Our conclusions are only as good as the assumptions behind them. An important element of the economic approach to personnel is careful consideration of when the assumptions do or do not apply and of what the effect would be of changing key assumptions. In the model above, the conclusion rested primarily on one key assumption: that we can profit when we find a star employee. Let us reconsider this assumption.

If Svensen turns out to be a star, is it safe to assume that we can continue to pay her £100,000? Might she try to bargain for a better salary? Might other employers try to hire her away from us? What would happen to our argument if these considerations applied?

These questions bring up a crucial consideration throughout this book: The firm always has to match an employee's outside market value. More precisely, the firm offers a job *package* with many characteristics, including the type of work, extent of effort required to do the work, degree of training, pay and other benefits, possibility for further advancement, and job security. The employee will consider all elements of the package in valuing the job and compare it to alternative jobs offered by competing employers. Firms must make sure that their job offers match those of competing employers in terms of pay and other characteristics.

For now, let us keep things simple and focus on pay and productivity. Suppose that other employers can observe how productive Svensen is. Moreover, assume that Svensen's productivity as a star or a disaster would be the same at any other investment bank. These are reasonable starting assumptions for investment banking; the work is often quite public and is similar at most firms.

When this is the case, if Svensen is revealed to be a star, other investment banks will be willing to pay her more than £100,000 per year. In fact, they should be willing to pay as much as £500,000 per year, since that is her productivity. Labor market competition will tend to drive competing employers toward zero profit from hiring Svensen.

If Svensen is a disaster, no investment bank should be willing to hire her. She is likely to find better employment in a different industry where her productivity is not negative.

What is the benefit to your firm of hiring Svensen in this case? There is none. In order to retain her if she is a star, you have to compete with other firms and would end up paying about £500,000 per year. In other words, our conclusion that it would pay to hire a risky candidate rested on our ability to earn a profit from Svensen if she turned out to be a star.

How can we benefit from Svensen? There are two possibilities.

Asymmetric Information

Competing firms may not figure out Svensen's productivity, at least not immediately. Even though investment banking is often quite public work, some of it is not, and the work is also generally done in teams. Outside firms may find it difficult to estimate Svensen's individual contribution because of these factors. This implies that in industries where productivity is less individualistic and less public, hiring a risky candidate is more likely to be worthwhile. Furthermore, to the extent that your firm can delay

the ability of the labor market to figure out who your stars are, it can profit from the informational advantage. Therefore, your firm may want to avoid public recognition of Svensen's contribution.

Firm-Specific Productivity

Svensen's productivity may be higher at your firm than at other firms. To the extent that this is true, Svensen may be a star at your firm, but less so or not at all at other firms. Then they will not bid up Svensen's market value as much, and there may be profit to your firm from employing Svensen. In Chapter 3, we will discuss two important reasons why Svensen's productivity may be higher at your firm than elsewhere: firm-specific job matches or human capital. The more important is either, the more likely is it to be profitable to hire a risky candidate.

One last issue here: Even if there is profit from hiring Svensen compared to what she can earn from other employers, there is still a question of how that profit is split between Svensen and the firm. That raises the question of bargaining. We will not focus on that issue in this text. However, we do discuss it briefly in Chapter 3 when we analyze how to share investments in firm-specific human capital.

GOOGLE'S UNUSUAL APPROACH TO RECRUITING



Google, a leading Internet search engine, competes with many high-technology companies for talent. It desires talented, creative employees that fit with its geeky and informal culture. To distinguish itself from other recruiters, Google has been famous for its unusual methods.

In one case, it inserted an "aptitude" test in technology magazines. It included questions such as, "How many different ways can you color an icosahedron with one of three colors on each face?" In another case, it placed billboards that read only "(first 10-digit prime found in consecutive digits of e).com." The correct answer took you to a Web site seeking resumes of job applicants.²

Such tactics serve three purposes. One is to provide information to recruits about the type of candidate that fits at Google. Another is to set the tone for future employees, because Google has a distinctive corporate culture. Recruiting is a crucial point at which to start defining the implicit contract, a concept that is discussed in later chapters. Finally, the tactics get Google valuable attention in the press—and in textbooks.

Although these tactics generated attention, Google analyzed data on its recruits and employee performance and concluded that it focused too much on technical expertise

²An icosahedron has 20 sides, so you can color it with three colors as many as 3^{20} ways (allowing for some that use only one or two colors). That equals 3,486,784,401. The first 10-digit prime number in consecutive digits of e is 7,427,466,391.

and graduating from an elite university. The company also decided to use different hiring criteria for technical and nontechnical roles. Now they also try to assess applicants on criteria such as the applicant's ability to learn, humility, and emergent leadership (ability to effectively lead a work team toward a successful achievement of goals).

Source: New York Times, February 22, 2014

The example of risky hires is a good introduction to the economic approach to studying personnel issues. We used a simple model to analyze a complex decision. The model was useful in guiding us to important issues to consider in making this kind of hiring decision. Once the structure was set up, we were able to study the problem formally, even expressing some ideas in a few simple equations. The equations can be an effective way to rigorously express certain ideas. We will use these techniques throughout the book.

Simplification of a complex problem makes it easier to solve the problem and get concrete answers. Of course, too much or inappropriate simplification can lead to incorrect answers, so one must be careful. But when applied intelligently, simple economic modeling can lead to powerful and practical analyses.

When we analyze organizational issues in this textbook, we will see the same set of economic ideas appearing over and over again. By the end of the book, we will have an economic toolbox that can be used to analyze all sorts of personnel problems. You will see examples in Chapter 4, where we use the principles discussed in the first three chapters to analyze some specific personnel policies. Economic concepts that we use in analyzing risky hires include labor market competition (for employees), prices (salary), asymmetric information, and incentives. For those who have studied economics, this will be familiar territory: It is microeconomics applied to how firms are designed and their employees are contracted with.

SETTING HIRING STANDARDS



Let us now step back and think about what hiring standards the firm would like to establish, before it actually begins recruiting employees. In the following, keep in mind that the firm's objective is to maximize profit. We assume that there are no constraints on the firm's ability to hire as much labor as it desires. Finally, we also assume that the price at which the firm sells its output and the price per hour it pays employees are constants.

Balancing Benefits Against Costs

Managers often say that their goal in hiring is to obtain the best quality workers. It sounds like a good idea—but is it? The most productive workers are also likely to be the most expensive. Should the goal instead be to hire the least expensive workers? A simple analysis resolves this question.